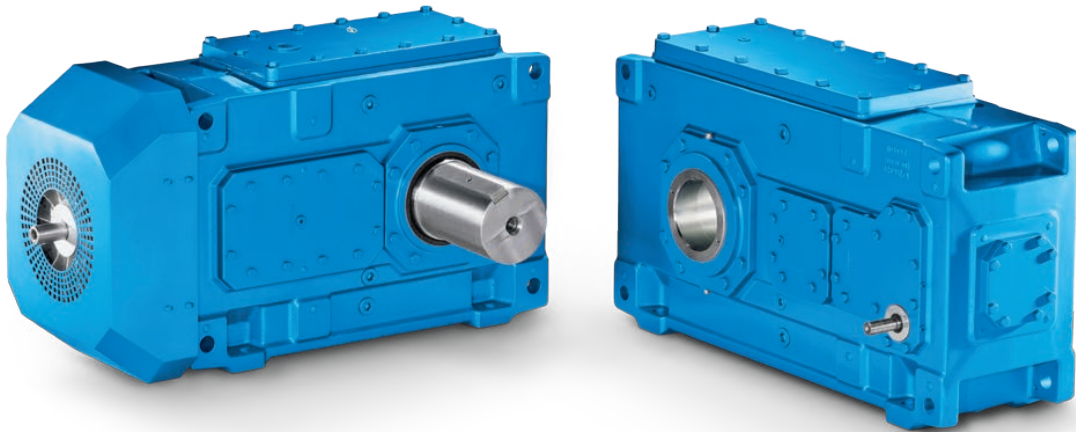


FLENDER GEAR UNITS  
CATALOG **MD 20.1**  
EDITION 2018 EN



# HELICAL AND BEVEL HELICAL GEAR UNITS

Innovative technology, tried and tested modular system.  
The original from Flender.

FLENDER

# RELATED CATALOGS

## FLENDER couplings

Standard Couplings  
MD 10.1  
E86060-K5710-A111-A5-7600



## Bucket Elevator Drives

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## PLANUREX 2

Planetary Gear Units  
MD 20.3  
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## SIPEX and BIPEX-S

Backlash-free Couplings  
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MD 20.7  
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## FLENDER SIP

Standard Industrial Planetary Gear Units  
MD 31.1  
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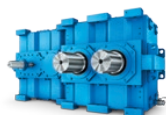
## DUORED 2

Helical Gear Units, Load-sharing  
MD 20.8  
E86060-K5720-A181-A1-6300



## FLENDER CHG

Helical Gear Units  
MD 20.10  
E86060-K5720-A231-A1-7400



## Pinion Drive for Tube Mills

MD 20.9  
E86060-K5720-A191-A1-7400



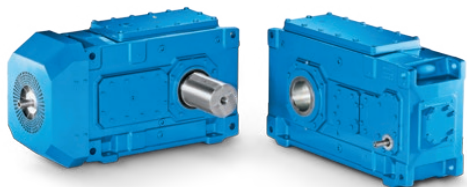
## Gear Units

Fast Track  
MD 20.12  
E86060-K5720-A221-A1-6300



FLENDER GEAR UNITS

# HELICAL AND BEVEL HELICAL GEAR UNITS



Catalog MD 20.1 · 2018

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The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with EN ISO 9001 (Certified Registration No. 01 100 000708). The certificate is recognized by all IQNet countries.



# COMPANY HISTORY

**1899** Founding of A. Friedr. Flender & Co. by Alfred Friedrich Flender for the manufacture and sale of wooden belt pulleys in Düsseldorf-Reisholz (Germany).

**1945** Resumption of small scale production after the production plants were largely destroyed during World War II.

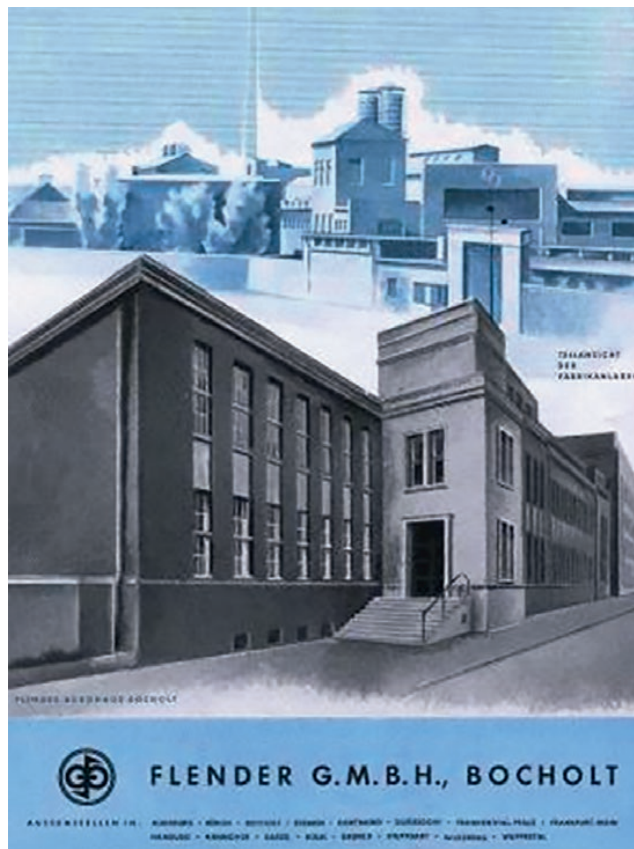
**1982** Takeover of the Himmelwerke in Tübingen from the Bauknecht bankruptcy estate.

**1986** Conversion of A. Friedr. Flender AG & Co. KG into a stock corporation.

**1989** Transition of 95 percent of A. Friedr. Flender AG to the ownership of the Deutsche Babcock AG.



Company founder, Dr. A. Friedrich Flender (1876–1939)



1927 – Gear unit production gets underway in Bocholt

**1990** Take-over of the Penig Getriebewerk in Saxony (the first acquisition of an East German company by a West German company).

**2000** Divestiture of all shares of FLENDER AG by Babcock Borsig AG to the holding company Citicorp Venture Capital, London.

**2001** Founding of Winergy AG as a separate legal entity.

**2005** Take-over of Flender GmbH by Siemens AG into the A&D Division.

**2010** Conclusion of the Flender integration as Business Unit Mechanical Drives (MD).

**2013** Sale of Siemens Gusstechnik GmbH, Wittgendorf, to Franken Guss GmbH & Co. KG (as part of a higher-level streamlining program).

**2015** Company-internal transfer of the geared motors and rail gear units business to the Business Unit PD LD. Start of the MD 2020 program.

**2017** Conversion of MD into an independent company under the aegis of Siemens: Founding of Flender GmbH.




*Company headquarters Bocholt today*

Competence  Benefit from good advice through interdisciplinary know-how

Availability  We are there whenever and wherever you need us


Maximum performance  The largest applications in the world are driven by us


Quality  We see your most stringent demands as our duty


Responsibility  You can expect commitment and trustworthiness from us


Experience  Rely on modern thinking based on decades of experience

Innovation  We are always thinking ahead. The goal: Your perfect solution.

Digitalization  The path to the right solution leads through information

Reliability  You can rely on our products, as well as on us

Flexibility  We are flexible in all of our processes

Reliable partner  You can trust our products, our company, and us

# FLENDER BY YOUR SIDE.

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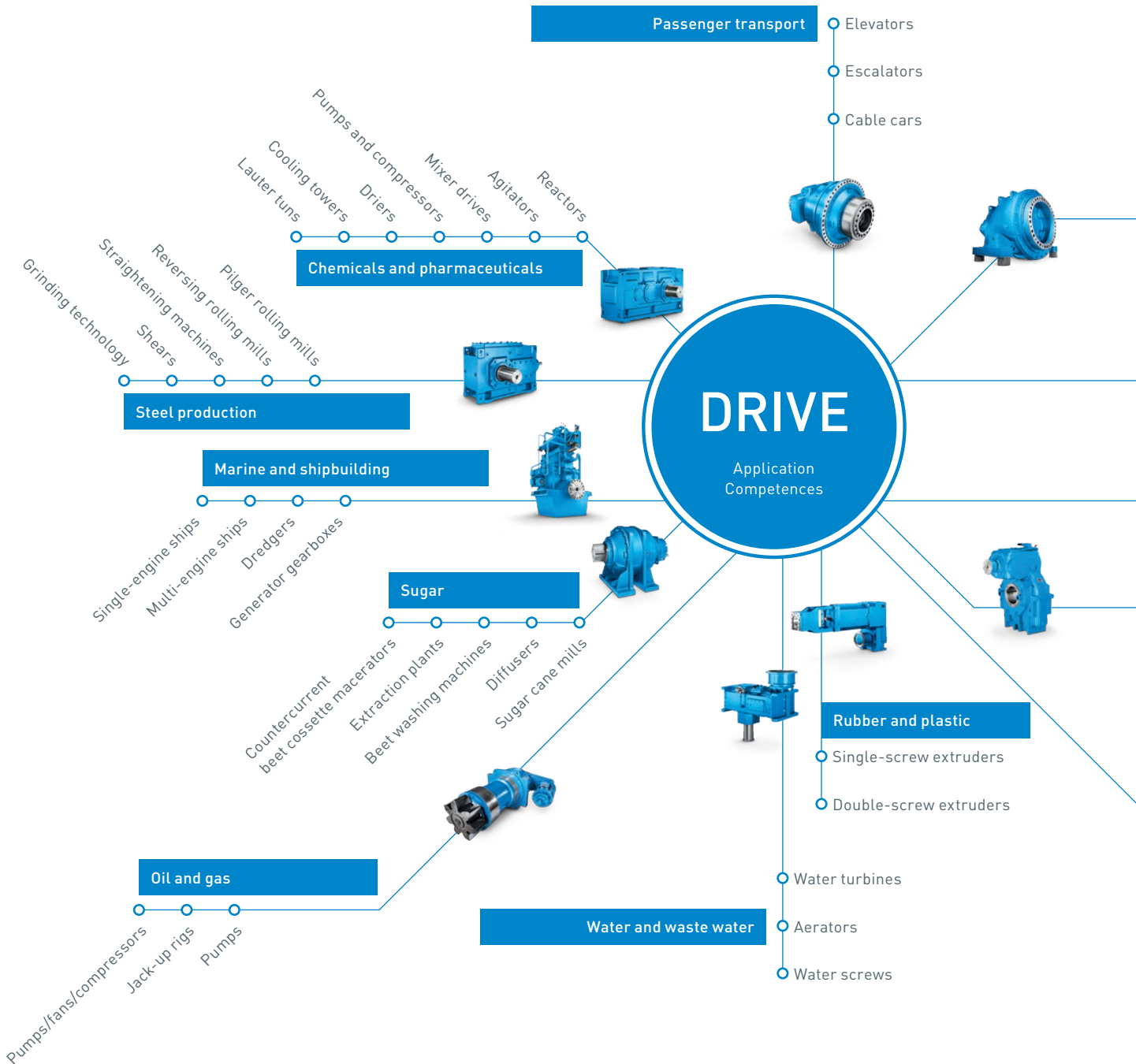
Flender stands for comprehensive knowledge of all aspects of mechanical drive technology and for maximum quality of products and services. For us, highly qualified and engaged employees have always been the key to innovative energy and performance capability. But they are also the basis for our special competence in consulting, which is supported by an almost unlimited range of products. Thanks to our comprehensive application know-how and decades of experience in many industries and in the acquisition of raw materials, we are able to competently advise our customers with an eye on their individual requirements.

As a full subsidiary of Siemens, we combine the stability and process reliability of a world-renowned company with the customer proximity and pragmatism of a medium-sized company, thus combining the best of both worlds.

Our customers regard Flender as a reliable, investment-safe partner. All of our business relationships are based on trust, responsibility and traditional business ethics. In this spirit, together with our customers, we look forward to writing a new chapter in the history of Flender.



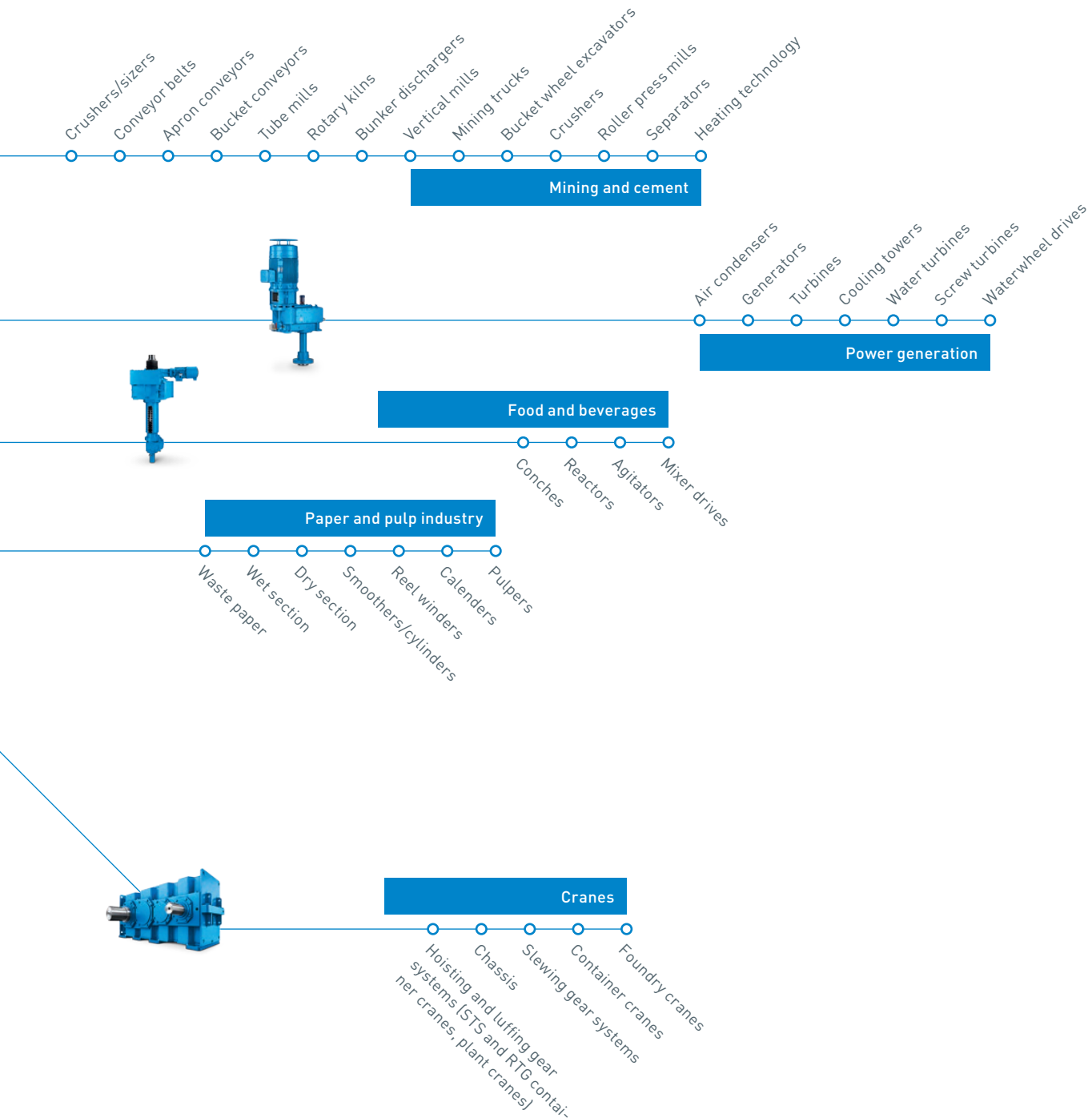
# MILLIONS OF APPLICATIONS, ONE CONCLUSION: ABSOLUTE RELIABILITY





The drive technology of Flender is simply reliable. This is verified by reference projects from all industries around the entire world in which our gear units have often been running reliably for many decades. In many applications, our components and systems ensure unflinching continuous operation.

Flender stands for reliable drives and efficient production, for available systems and stable processes, for dependable partnership and competent consulting, for responsible acting and sustainable thinking. This is our aspiration.



Flender's system competence turns first-class components into systems with tangible added value. Drive systems from Flender ensure maximum productivity, energy efficiency and reliability in any automation environment.

### Consultation

Our customers use our interdisciplinary know-how, our application competence, our innovation strength and, last but not least, our experience to find the right drive system for their individual requirements.

Reduced engineering time, lower costs



### Integrated drive portfolio

We provide more than just gear units and couplings. Thanks to the collaboration with Siemens, we also have the competence for electrical drive technology, which allows us to offer the entire drive train, including frequency converters, motors and controllers from a single source – perfectly integrated and optimally interacting with one another, as a standard or individual solution.

Fewer interface risks, more efficiency

# INDIVIDUAL SOLUTIONS.

## Flender service

From diagnostics and support, replacement part and repair services, all the way to maintenance and retrofit services – the Flender service portfolio creates individual solutions, fully and completely tailored to the needs of our customers. In this way, a gear unit remains an original Flender gear unit.

Increased system availability, reduced lifecycle costs

We have the right solution for you, even if your requirements are special. We no longer have to newly develop every special solution. Many solutions are already available.

At [flender.com](https://www.flender.com), we provide application-specific solutions for your special requirements.

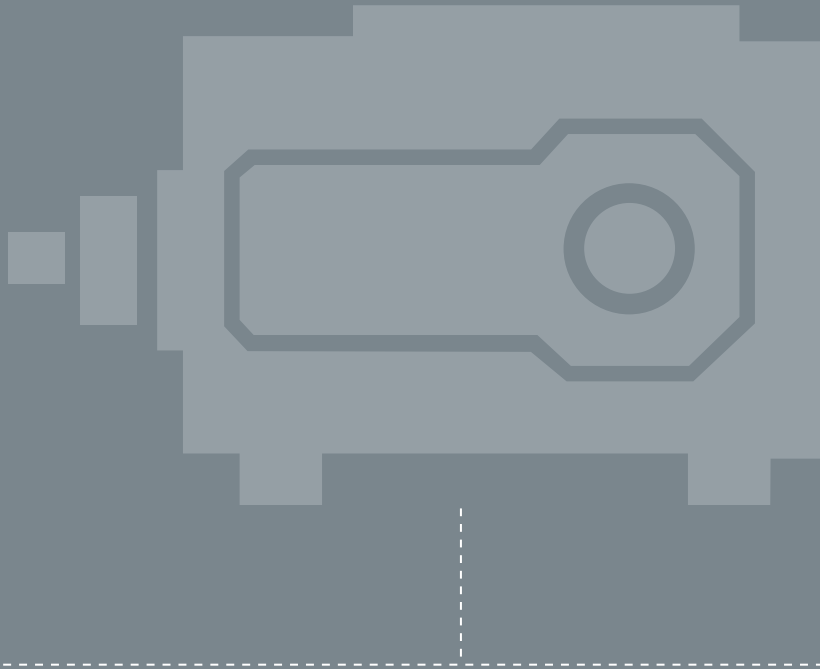
Use our online configurator, which allows you to create tailored product combinations.

## DIAGNOSTEX

Ensuring the process stability requires status-oriented maintenance of the drive train. With DIAGNOSTEX®, sensors measure deviations of our gear units from the target status. These can be analyzed and evaluated in terms of maximized system availability.

Industrie 4.0, reduced costs

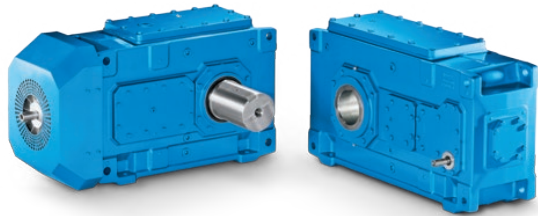




## THE RIGHT GEAR UNIT SOLUTION FOR ANY REQUIREMENT

We provide helical and planetary gear units made up of standard modules or as a complete application solution.

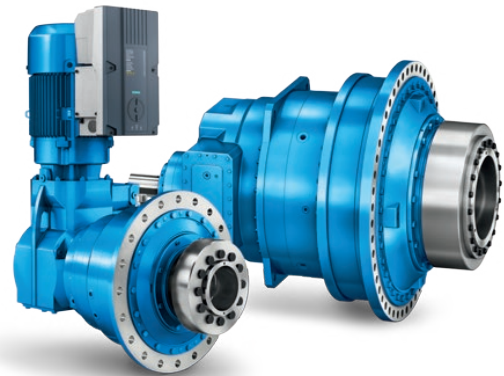
Helical and planetary gear units from Flender are modern drive solutions that satisfy the most varying and extreme demands, day after day and year after year. For decades, plant operators have been achieving high system reliability and low lifecycle costs in every conceivable industry with our helical gear units.



### Helical and bevel helical gear units

Flender helical and bevel helical gear units are by far the most comprehensive range of industrial gear units in the world. It ranges from a multi-faceted universal gear unit portfolio and application-specific gear units to customer-specific solutions.

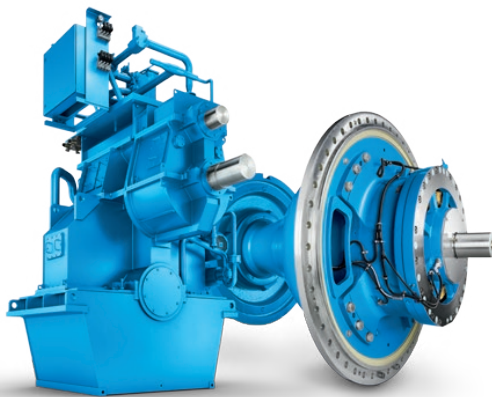
**Nominal output torque: 3,300 Nm ... 1,400,000 Nm**



### Planetary gear units

With Flender planetary gear units, we provide a range of durable, reliable and finely graduated gear unit solutions. The series wins customers over due to its highly integrated planetary geared motor and maximum conformity with all international motor standards. It also brings quality and performance in a good ratio of lifecycle costs to price.

**Nominal output torque: 10,000 Nm ... 5,450,000 Nm**



### Application-specific gear units

With application-specific gear units, Flender provides by far the most application solutions and thus covers nearly every drive-related need from hundreds of applications in industry and the acquisition of raw materials.

**Nominal output torque: Up to 10,000,000 Nm**



### Customer-specific designs

Our experts are available at any time for special requirements during the development of new products. From designing and simulating complex drive solutions to implementing them, we work together with you to resolve multi-layered tasks.

# GREAT EXPERTISE IN YOUR INDUSTRY TOO.

Each industry has its own conditions. Every application has its own specific requirements. We are looking forward to meeting your challenges.

We probably already have the right solution at hand. Here are a few examples:



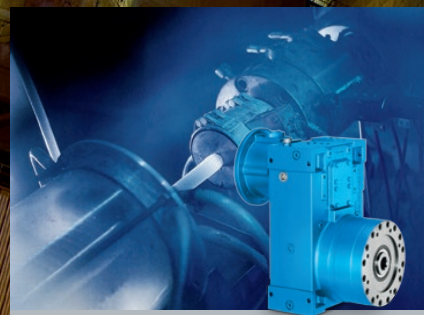
## Minerals and Mining

**Requirement:**  
Perfectly coordinated drive system



## Cement

**Requirement:**  
Low maintenance effort and cost,  
sealing due to dirt in surroundings



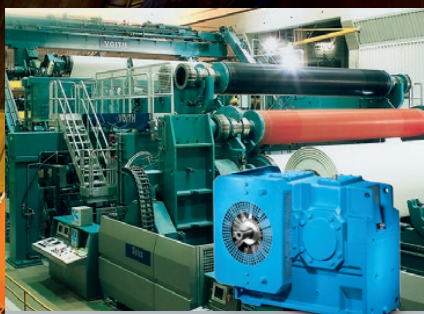
## Plastics and Rubber

**Requirement:**  
Absorption of high axial forces,  
suitability for explosion protection



## Environmental & Recycling

**Requirement:**  
Highest possible reliability, rugged  
design



## Pulp and Paper

**Requirement:**  
Suitability for centrally located  
lubrication



## Industrial Cranes

**Requirement:**  
Quick availability, version with  
double drive shaft



### Chemicals

**Requirement:**  
Absorption of forces from the manufacturing process



### Power Generation

**Requirement:**  
Effective cooling, speed adjustment for motor to fan



### Metals

**Requirement:**  
Harsh working conditions, high peak loads



### Harbour Cranes

**Requirement:**  
Specific axle clearance, frequent start-up



### Oil and Gas

**Requirement:**  
Flexible adaptation to speed requirements



### Water and Waste water

**Requirement:**  
Absorption of external forces, oil-retaining pipe required

# UNIVERSAL GEAR UNITS

The huge modular system with its finely spaced series of helical and bevel-helical gear units probably already includes the right solution close to your desired torque.

Nominal torque range

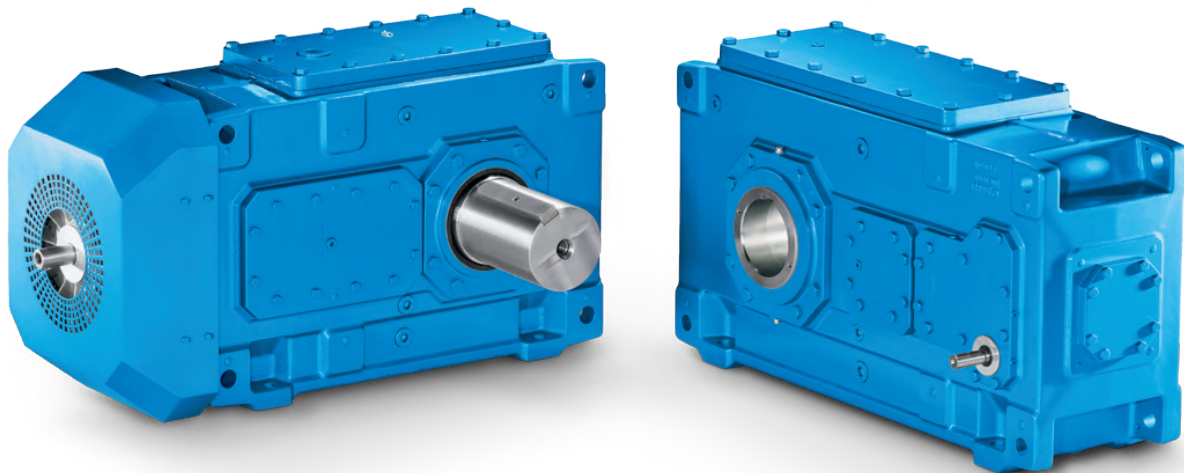
Monoblock design

Divided housing design

## DESIGNS AND SIZES

| TYPE                       | SIZE                     | 03           | 04           | 05           | 06           | 07           | 08           | 09           | 10           | 11           | 12           | 13          | 14           |
|----------------------------|--------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|
| Helical gear unit H1       | Nominal torque class T2N | 3,300 Nm     | -            | 9,600 Nm     | -            | 17,800 Nm    | -            | 28,700 Nm    | -            | 50,600 Nm    | -            | 75,700 Nm   | -            |
|                            | Type__Size               | H1__03       | -            | H1__05       | -            | H1__07       | -            | H1__09       | -            | H1__11       | -            | H1__13      | -            |
|                            | Ratio range (i)          | 1:1.25...5.6 | -            | 1:1.25...5.6 | -            | 1:1.25...5.6 | -            | 1:1.25...5.6 | -            | 1:1.6...5.6  | -            | 1:1.6...5.6 | -            |
| Helical gear unit H2       | Nominal torque class T2N | 3,500 Nm     | 6,700 Nm     | 11,200 Nm    | 14,400 Nm    | 20,300 Nm    | 25,600 Nm    | 33,700 Nm    | 42,200 Nm    | 59,300 Nm    | 73,800 Nm    | 86,000 Nm   | 107,000 Nm   |
|                            | Type__Size               | H2__03       | H2__04       | H2__05       | H2__06       | H2__07       | H2__08       | H2__09       | H2__10       | H2__11       | H2__12       | H2__13      | H2__14       |
|                            | Ratio range (i)          | 1:6.3...22.4 | 1:6.3...22.4 | 1:6.3...22.4 | 1:8...28     | 1:6.3...22.4 | 1:8...28     | 1:6.3...22.4 | 1:8...28     | 1:6.3...22.4 | 1:8...28     | 1:6.3...20  | 1:8...25     |
| Helical gear unit H3       | Nominal torque class T2N | -            | -            | 11,600 Nm    | 15,500 Nm    | 21,700 Nm    | 27,200 Nm    | 35,700 Nm    | 43,800 Nm    | 63,500 Nm    | 77,200 Nm    | 88,000 Nm   | 109,000 Nm   |
|                            | Type__Size               | -            | -            | H3__05       | H3__06       | H3__07       | H3__08       | H3__09       | H3__10       | H3__11       | H3__12       | H3__13      | H3__14       |
|                            | Ratio range (i)          | -            | -            | 1:25...90    | 1:31.5...112 | 1:25...90    | 1:31.5...112 | 1:25...90    | 1:31.5...112 | 1:25...90    | 1:31.5...112 | 1:22.4...90 | 1:28...112   |
| Helical gear unit H4       | Nominal torque class T2N | -            | -            | -            | -            | 21,700 Nm    | 27,200 Nm    | 35,700 Nm    | 44,200 Nm    | 61,600 Nm    | 78,000 Nm    | 90,700 Nm   | 113,000 Nm   |
|                            | Type__Size               | -            | -            | -            | -            | H4__07       | H4__08       | H4__09       | H4__10       | H4__11       | H4__12       | H4__13      | H4__14       |
|                            | Ratio range (i)          | -            | -            | -            | -            | 1:100...355  | 1:125...450  | 1:100...355  | 1:125...450  | 1:100...355  | 1:125...450  | 1:100...355 | 1:125...450  |
| Bevel-helical gear unit B2 | Nominal torque class T2N | -            | 6,200 Nm     | 9,400 Nm     | 12,000 Nm    | 19,000 Nm    | 23,800 Nm    | 29,900 Nm    | 38,000 Nm    | 54,000 Nm    | 66,300 Nm    | 81,100 Nm   | 101,000 Nm   |
|                            | Type__Size               | -            | B2__04       | B2__05       | B2__06       | B2__07       | B2__08       | B2__09       | B2__10       | B2__11       | B2__12       | B2__13      | B2__14       |
|                            | Ratio range (i)          | -            | 1:5...18     | 1:5...18     | 1:6.3...22.4 | 1:5...18     | 1:6.3...22.4 | 1:5...18     | 1:6.3...22.4 | 1:5...18     | 1:6.3...22.4 | 1:5...18    | 1:6.3...22.4 |
| Bevel-helical gear unit B3 | Nominal torque class T2N | 3,600 Nm     | 6,700 Nm     | 11,600 Nm    | 15,500 Nm    | 21,700 Nm    | 27,200 Nm    | 35,700 Nm    | 43,800 Nm    | 63,500 Nm    | 77,200 Nm    | 90,700 Nm   | 113,000 Nm   |
|                            | Type__Size               | B3__03       | B3__04       | B3__05       | B3__06       | B3__07       | B3__08       | B3__09       | B3__10       | B3__11       | B3__12       | B3__13      | B3__14       |
|                            | Ratio range (i)          | 1:20...71    | 1:12.5...71  | 1:12.5...71  | 1:16...90    | 1:12.5...71  | 1:16...90    | 1:12.5...71  | 1:16...90    | 1:12.5...71  | 1:16...90    | 1:12.5...71 | 1:16...90    |
| Bevel-helical gear unit B4 | Nominal torque class T2N | -            | -            | 11,600 Nm    | 15,500 Nm    | 21,700 Nm    | 27,200 Nm    | 35,700 Nm    | 44,200 Nm    | 61,600 Nm    | 78,000 Nm    | 90,700 Nm   | 113,000 Nm   |
|                            | Type__Size               | -            | -            | B4__05       | B4__06       | B4__07       | B4__08       | B4__09       | B4__10       | B4__11       | B4__12       | B4__13      | B4__14       |
|                            | Ratio range (i)          | -            | -            | 1:80...315   | 1:100...400  | 1:80...315   | 1:100...400  | 1:80...315   | 1:100...400  | 1:80...315   | 1:100...400  | 1:80...315  | 1:100...400  |





| 15                    | 16                     | 17                    | 18                     | 19                    | 20                     | 21                    | 22                    | 23                    | 24                     | 25                    | 26                     | 27                    | 28                    |
|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|-----------------------|
| 130,000 Nm            | -                      | 173,000 Nm            | -                      | 245,000 Nm            | -                      | -                     | -                     | -                     | -                      | -                     | -                      | -                     | -                     |
| H1__15<br>1:2...5.6   | -                      | H1__17<br>1:2.8...5.6 | -                      | H1__19<br>1:4...5.6   | -                      | -                     | -                     | -                     | -                      | -                     | -                      | -                     | -                     |
| 143,000 Nm            | 160,000 Nm             | 195,000 Nm            | 230,000 Nm             | 292,000 Nm            | 335,000 Nm             | 410,000 Nm            | 458,000 Nm            | 640,000 Nm            | 725,000 Nm             | 860,000 Nm            | 1,030,000 Nm           | 1,230,000 Nm          | 1,400,000 Nm          |
| H2__15<br>1:6.3...20  | H2__16<br>1:7.1...22.4 | H2__17<br>1:6.3...20  | H2__18<br>1:7.1...22.4 | H2__19<br>1:6.3...20  | H2__20<br>1:7.1...22.8 | H2__21<br>1:7.1...20  | H2__22<br>1:8...22.4  | H2__23<br>1:6.3...20  | H2__24<br>1:7.1...22.4 | H2__25<br>1:6.3...20  | H2__26<br>1:7.1...22.4 | H2__27<br>1:8...20    | H2__28<br>1:9...22.4  |
| 153,000 Nm            | 173,000 Nm             | 200,000 Nm            | 240,000 Nm             | 300,000 Nm            | 345,000 Nm             | 420,000 Nm            | 470,000 Nm            | 640,000 Nm            | 725,000 Nm             | 860,000 Nm            | 1,030,000 Nm           | 1,230,000 Nm          | 1,400,000 Nm          |
| H3__15<br>1:22.4...90 | H3__16<br>1:25...100   | H3__17<br>1:22.4...90 | H3__18<br>1:25...100   | H3__19<br>1:22.4...90 | H3__20<br>1:25...100   | H3__21<br>1:22.4...90 | H3__22<br>1:25...100  | H3__23<br>1:22.4...90 | H3__24<br>1:25...100   | H3__25<br>1:22.4...90 | H3__26<br>1:25...100   | H3__27<br>1:22.4...90 | H3__28<br>1:25...100  |
| 153,000 Nm            | 173,000 Nm             | 200,000 Nm            | 240,000 Nm             | 300,000 Nm            | 345,000 Nm             | 420,000 Nm            | 470,000 Nm            | 640,000 Nm            | 725,000 Nm             | 860,000 Nm            | 1,030,000 Nm           | 1,230,000 Nm          | 1,400,000 Nm          |
| H4__15<br>1:100...355 | H4__16<br>1:112...400  | H4__17<br>1:100...355 | H4__18<br>1:112...400  | H4__19<br>1:100...355 | H4__20<br>1:112...400  | H4__21<br>1:100...355 | H4__22<br>1:112...400 | H4__23<br>1:100...355 | H4__24<br>1:112...400  | H4__25<br>1:100...355 | H4__26<br>1:112...400  | H4__27<br>1:100...355 | H4__28<br>1:112...400 |
| 132,000 Nm            | 148,000 Nm             | 195,000 Nm            | 230,000 Nm             | -                     | -                      | -                     | -                     | -                     | -                      | -                     | -                      | -                     | -                     |
| B2__15<br>1:5...18    | B2__16<br>1:5.6...20   | B2__17<br>1:5.6...18  | B2__18<br>1:7.1...20   | -                     | -                      | -                     | -                     | -                     | -                      | -                     | -                      | -                     | -                     |
| 153,000 Nm            | 173,000 Nm             | 200,000 Nm            | 240,000 Nm             | 300,000 Nm            | 345,000 Nm             | 420,000 Nm            | 470,000 Nm            | 640,000 Nm            | 725,000 Nm             | 860,000 Nm            | 1,030,000 Nm           | 1,230,000 Nm          | 1,400,000 Nm          |
| B3__15<br>1:12.5...71 | B3__16<br>1:14...80    | B3__17<br>1:12.5...71 | B3__18<br>1:14...80    | B3__19<br>1:12.5...71 | B3__20<br>1:14...80    | B3__21<br>1:12.5...71 | B3__22<br>1:14...80   | B3__23<br>1:20...71   | B3__24<br>1:22.4...80  | B3__25<br>1:20...71   | B3__26<br>1:22.4...80  | B3__27<br>1:20...71   | B3__28<br>1:22.4...80 |
| 153,000 Nm            | 173,000 Nm             | 200,000 Nm            | 240,000 Nm             | 300,000 Nm            | 345,000 Nm             | 420,000 Nm            | 470,000 Nm            | 640,000 Nm            | 725,000 Nm             | 860,000 Nm            | 1,030,000 Nm           | 1,230,000 Nm          | 1,400,000 Nm          |
| B4__15<br>1:80...315  | B4__16<br>1:90...355   | B4__17<br>1:80...315  | B4__18<br>1:90...355   | B4__19<br>1:80...315  | B4__20<br>1:90...355   | B4__21<br>1:80...315  | B4__22<br>1:90...355  | B4__23<br>1:80...315  | B4__24<br>1:90...355   | B4__25<br>1:80...315  | B4__26<br>1:90...355   | B4__27<br>1:80...315  | B4__28<br>1:90...355  |



## THE PERFECT COUPLING FOR THE PERFECT GEAR UNIT

We provide elastic, highly elastic, rigid and hydrodynamic solutions.

Regardless of which demands are made on the coupling: Low or high performance, demanding operating conditions or high ambient temperatures, dusty or hazardous environments – we have the right portfolio. Our comprehensive range of couplings offers a large number of sizes and designs with a torque range from 0.5 to 10,000,000 Nm.

In over 90 years of development, conception and production, our product portfolio has grown to its current level of diversity. Nearly every matured coupling solution is available as a standard item in our modular system. This saves our customers time and money.

We are a powerful and flexible player in every market in the world – just like our customers. The production of our coupling components aims for maximum quality. As a trio, the setup, material and design result in optimal coupling solutions – rugged, dependable, largely low-maintenance and, above all, available at any time, anywhere. We provide high quality, first class delivery performance, and comprehensive service.



### Flexible couplings

Our elastic couplings are pluggable and easy to install. The elastomer element equalizes the shaft offset and absorbs impacts from the motor or driven machine.

**Nominal output torque: 12 Nm ... 1,300,000 Nm**



### Torsionally rigid couplings

Our compact steel couplings provide extremely precise transmission of high torques, especially in harsh operating conditions and extreme temperatures.

**Nominal output torque: 5 Nm ... 10,000,000 Nm**



### Hydrodynamic couplings

Soft start, overload protection, torsional vibration damping – FLUDEX® fluid couplings allow the torque-limited approach and have very little slippage at rated load.

**Nominal output torque: 1.2 kW ... 2,500 kW**



### Highly-flexible couplings

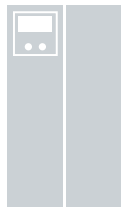
Highly flexible couplings are well-suited for connecting machines that operate asymmetrically. They are preferred for use in systems that are periodically operated.

**Nominal output torque: 24 Nm ... 90,000 Nm**

Converters/control systems

Motor

Couplings



# THE COUPLING IN THE DRIVE TRAIN

FLUDEX

## Hydrodynamic couplings

Soft start, overload protection, torsional vibration damping  
– FLUDEX fluid couplings allow the torque-limited approach and have very little slippage at rated load.

ZAPEX couplings and ARPEX all-steel couplings

## Torsionally rigid couplings

Our compact steel couplings provide extremely precise transmission of high torques, especially in harsh operating conditions and extreme temperatures.



FLUDEX  
fluid couplings

Power:  
1.2 kW ... 2,500 kW



ZAPEX  
couplings

Nominal output torque:  
1,020 Nm ... 7,200,000 Nm



N-ARPEX and ARPEX  
all-steel couplings

Nominal output torque:  
5 Nm ... 10,000,000 Nm

Gear units

Couplings



N-EUPEX, RUPEX and N-BIPEX

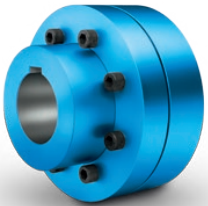
**Flexible couplings**

Flexible Flender couplings are pluggable and easy to install. The elastomer element equalizes the shaft offset and absorbs impacts from the motor or driven machine.

ELPEX, ELPEX-B and ELPEX-S

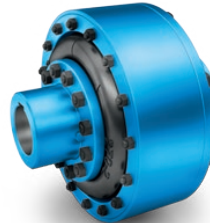
**Highly-flexible couplings**

Highly-flexible Flender couplings are well-suited for connecting machines that operate asymmetrically. They are preferred for use in systems that are periodically operated.



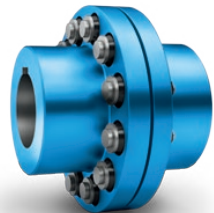
N-EUPEX  
cam couplings

Nominal output torque:  
19 Nm ... 62,000 Nm



ELPEX  
elastic ring couplings

Nominal output torque:  
1,600 Nm ... 90,000 Nm



RUPEX  
pin-and-bush couplings

Nominal output torque:  
200 Nm ... 1,300,000 Nm



ELPEX-B  
elastic tire couplings

Nominal output torque:  
24 Nm ... 14,500 Nm



N-BIPEX  
cam couplings

Nominal output torque:  
12 Nm ... 4,650 Nm



ELPEX-S  
rubber disk couplings

Nominal output torque:  
330 Nm ... 63,000 Nm



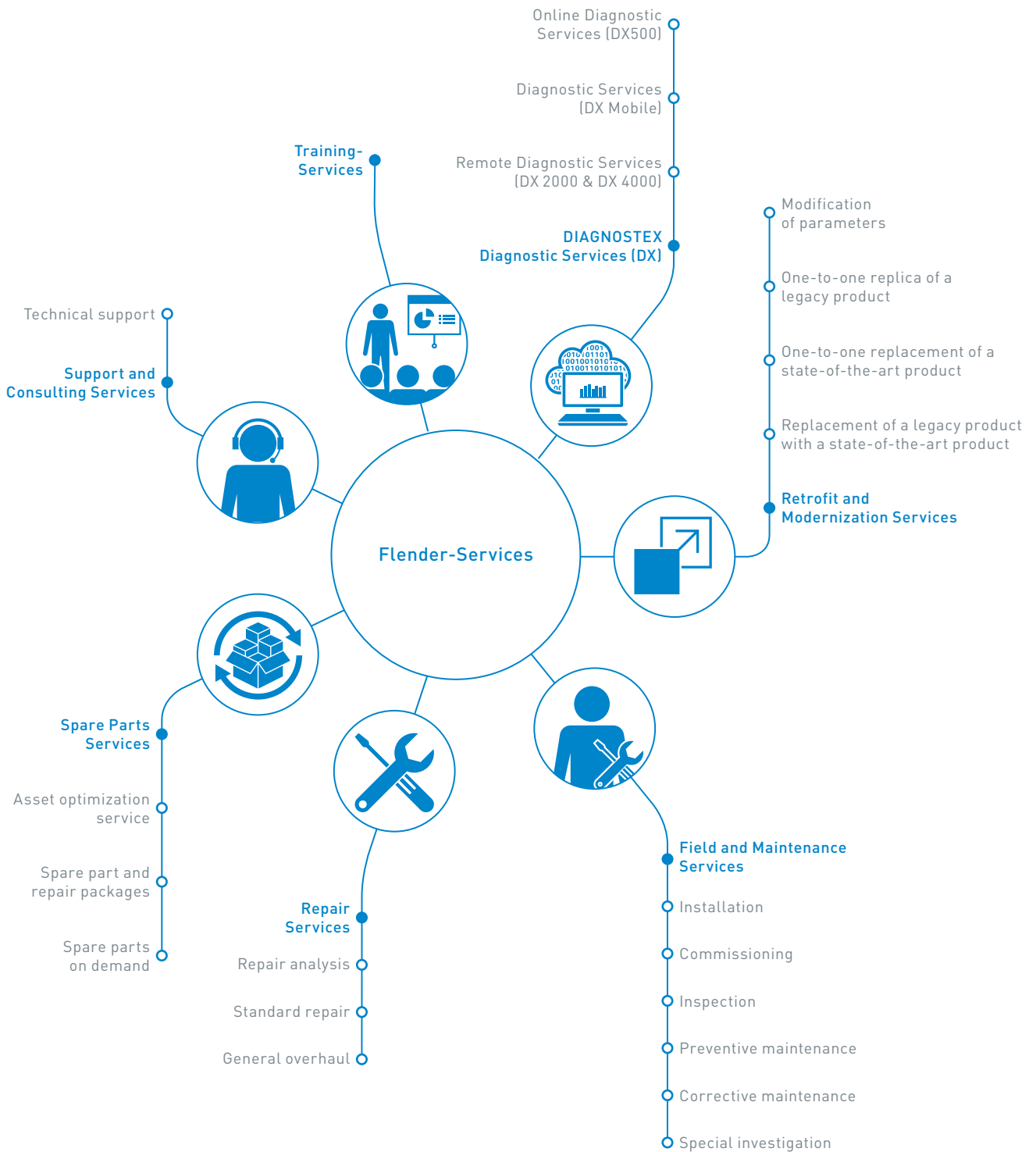
## SERVICES

Ever increasing requirements make it more and more important for industrial plants to work with maximum productivity and efficiency. Flender Services give companies a decisive advantage over the competition in industry, the acquisition of raw materials and energy production. In view of the high cost pressure, increasing energy prices and stricter and stricter environmental stipulations, our services are becoming a decisive factor to success over the competition.

Enjoy the support of our service experts, from planning, development and operation to the modernization of your plant and benefit from our experience and in-depth know-how of your application – in more than 100 countries, seven days a week, 24 hours a day.

Reduce standstills, minimize downtimes due to failure, and increase the productivity, flexibility and cost efficiency of your plant.

# OUR OFFER FOR GEAR UNITS AND COUPLINGS AT A GLANCE.

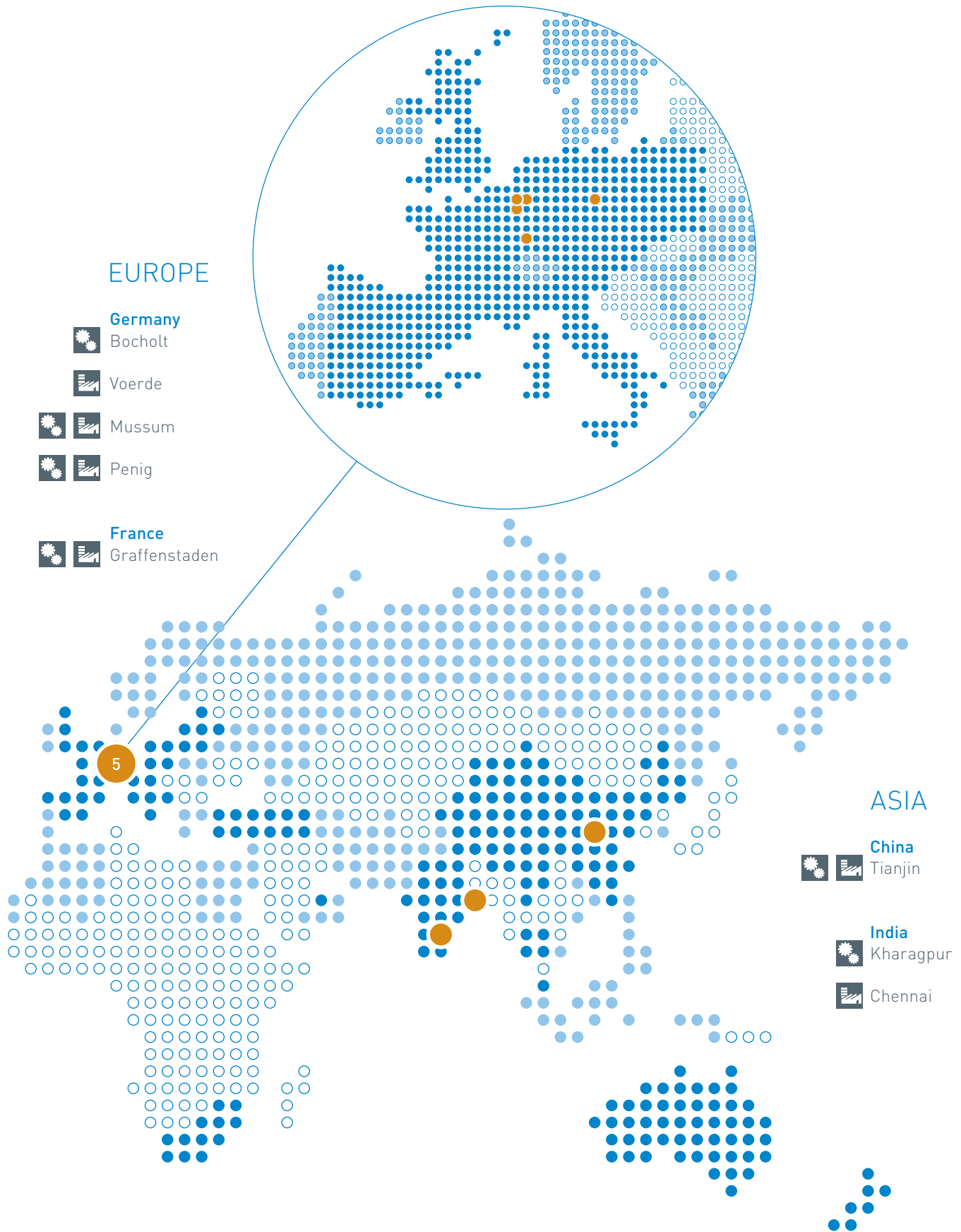


# BY YOUR SIDE.

Competency, flexibility and top performance on-site: With our setup, we can offer customer proximity worldwide. In addition to seven plants, we are broadly represented on five continents by sales and service locations. Thanks to our global setup, we have achieved a very high level of efficiency in production, installation, sales and service.







## EUROPE

### Germany



Bocholt



Voerde



Mussum



Penig

### France



Graffenstaden

## ASIA

### China



Tianjin

### India



Kharagpur



Chennai



Flender subsidiary



Sales and/or  
service partners



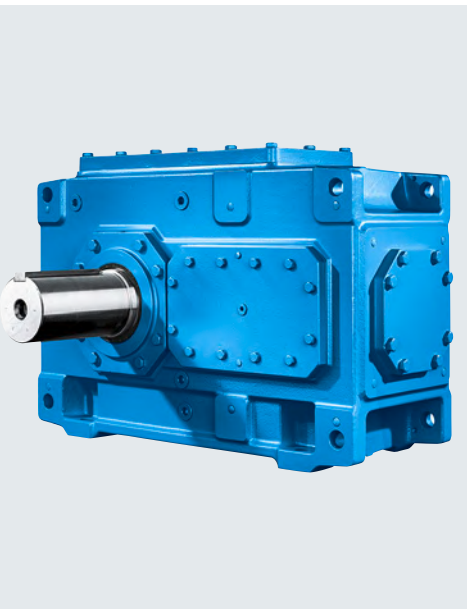
Manu-  
facturing



Assembly



## General



1/2  
1/2






### General

Certificates and approvals

# General

## Certificates and approvals

### Overview

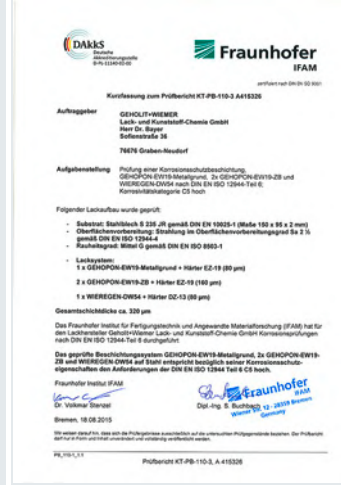
| ISO 9001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ISO 14001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | BS OHSAS 18001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p><b>Zertifikat</b></p> <p>Prüfungsnr. <b>ISO 9001:2008</b><br/>Zertifikat-Registrier-Nr. <b>01 100 000718</b></p> <p>Unternehmen: <b>Flender GmbH</b><br/>Alfred Flender-Str. 77<br/>40385 Bochum<br/>Deutschland<br/>mit den Standorten gemäß Anlage</p> <p>Geltungsbereich: Entwicklung, Konstruktion, Herstellung, Prüfung, Vertrieb und Service von Komponenten und Bauelementen der Antriebstechnik sowie von Getrieben und Apparaten der Überwachung, Steuerung und Regelung solcher Produkte.</p> <p>Durch ein Audit wurde der Nachweis erbracht, dass die Forderungen der ISO 9001:2008 erfüllt sind.</p> <p>Gültigkeit: Dieses Zertifikat ist gültig vom 01.09.2015 bis 31.08.2018.<br/>Erneuerungstermin 2021</p> <p>28.01.2018</p> <p>www.bvq.com   DAKS   TÜVRheinland®</p> |  <p><b>Zertifikat</b></p> <p>Prüfungsnr. <b>ISO 14001:2004</b><br/>Zertifikat-Registrier-Nr. <b>01 104 000501</b></p> <p>Unternehmen: <b>Flender GmbH</b><br/>Alfred Flender-Str. 77<br/>40385 Bochum<br/>Deutschland<br/>mit den Standorten gemäß Anlage</p> <p>Geltungsbereich: Entwicklung, Konstruktion, Herstellung, Prüfung, Vertrieb und Service von Komponenten und Bauelementen der Antriebstechnik sowie von Getrieben und Apparaten der Überwachung, Steuerung und Regelung solcher Produkte.</p> <p>Durch ein Audit wurde der Nachweis erbracht, dass die Forderungen der ISO 14001:2004 erfüllt sind.</p> <p>Gültigkeit: Dieses Zertifikat ist gültig vom 23.09.2015 bis 14.09.2018.<br/>Erneuerungstermin 2020</p> <p>28.01.2018</p> <p>www.bvq.com   DAKS   TÜVRheinland®</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  <p><b>Zertifikat</b></p> <p>Prüfungsnr. <b>BS OHSAS 18001:2007</b><br/>Zertifikat-Registrier-Nr. <b>01 213 110007</b></p> <p>Unternehmen: <b>Flender GmbH</b><br/>Alfred Flender-Str. 77<br/>40385 Bochum<br/>Deutschland<br/>mit den Standorten gemäß Anlage</p> <p>Geltungsbereich: Entwicklung, Konstruktion, Herstellung, Prüfung, Vertrieb und Service von Komponenten und Bauelementen der Antriebstechnik sowie von Getrieben und Apparaten der Überwachung, Steuerung und Regelung solcher Produkte.</p> <p>Durch ein Audit wurde der Nachweis erbracht, dass die Forderungen der BS OHSAS 18001:2007 erfüllt sind.</p> <p>Gültigkeit: Dieses Zertifikat ist gültig vom 19.10.2017 bis 18.10.2020.<br/>Erneuerungstermin 2011</p> <p>28.01.2018</p> <p>www.bvq.com   DAKS   TÜVRheinland®</p> |
|  <p><b>Zertifikat</b></p> <p>Prüfungsnr. <b>ISO 50001:2011</b><br/>Zertifikat-Registrier-Nr. <b>01 407 100040</b></p> <p>Unternehmen: <b>Siemens Industriegetriebe GmbH</b><br/>Thiersbacher Str. 24<br/>D-10523 Pasing</p> <p>Geltungsbereich: Entwicklung, Herstellung, Prüfung, Vertrieb und Service von Getrieben, Kupplungen, Getriebemotoren, Elektromotoren und antriebsmechanischen Systemlösungen.</p> <p>Durch ein Audit wurde der Nachweis erbracht, dass die Forderungen der ISO 50001:2011 erfüllt sind.</p> <p>Gültigkeit: Dieses Zertifikat ist gültig vom 28.09.2015 bis zum 27.09.2018.</p> <p>28.09.2015</p> <p>www.bvq.com   DAKS   TÜVRheinland®</p>                                                                                                                  |  <p><b>EXAM</b><br/>BSG Prüf- und Zertifikat GmbH</p> <p>- Richtlinie 94/9/EG -<br/>Geräte und Schutzgeräte zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen</p> <p><b>Bestätigung</b></p> <p>1. Nachweis des<br/><b>BVS 04 ATEX II/B 048</b><br/>entsprechend Artikel 8 (2) (b) (i)<br/>über den Erhalt der Übereinstimmung gemäß Anlage VIII Nummer 1</p> <p>Herausgeber: A. Fritsch, Flender AG<br/>Anschrift: Alfred Flender-Str. 77<br/>40385 Bochum</p> <p>Die Zertifikatsanträge der EXAM BSG Prüf- und Zertifikat GmbH, bezogen auf die 2014 gemäß Artikel 8 des Beschlusses 94/9/EG des Europäischen Parlaments und des Rates der Europäischen Gemeinschaften vom 23. März 1994, bestätigt, die im Folgenden aufgeführte Dokumentation am 06.07.2014 erhalten zu haben:</p> <p>Übereinstimmung vom Flender Zahnradgetriebe<br/>einger. BA 3036 DE, BA 3031 DE</p> <p>Die Übereinstimmung werden weiter auf Vollständigkeit nach mit Belegstücken geprüft. Sie werden von uns 10 Jahre lang wirksam. Falls der Herausgeber eine Begründung anfordert, werden wir diese so schnell wie möglich zur Verfügung stellen.</p> <p><b>EXAM BSG Prüf- und Zertifikat GmbH</b><br/>Bochum, Am 12.07.2014</p> <p><i>J. Fritsch</i><br/>Zertifikatsbeauftragter</p> <p><i>H. Dornik</i><br/>Präsident</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

Overview (continued)

Flender is represented in the FVA



Test certificate for corrosion protection coating



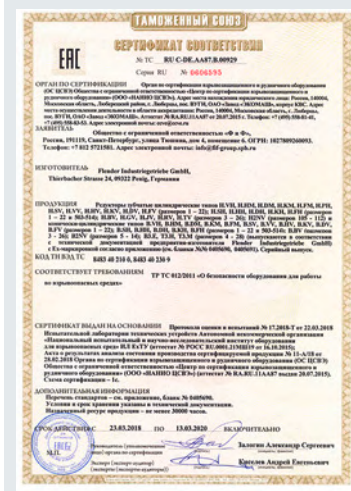
Flender has been a member of the AGMA (American Gear Manufacturer Association) since 1988



Flender is a member of the Cooling Technology Institute (relevant for cooling tower applications)



EAC certificate



MA certificate



## General

### Notes

## Introduction



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### Notes

Overview of types/  
Gear unit designation

Orientation in space

Information about basics

Data regarding rating plate

Notes on selection and operation

2

## Introduction

### Notes

## Overview of types/Gear unit designation

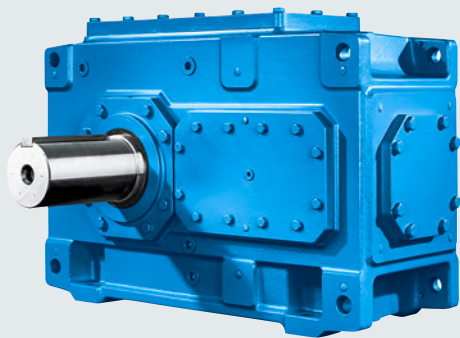
### Overview

#### Types

##### Helical gear units

Types H1..., H2..., H3..., H4...

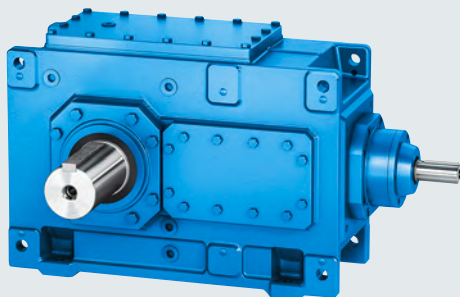
1- ... 4-stage,  $i_N = 1.25 \dots 450$



##### Bevel helical gear units

Types B2..., B3..., B4...

2- ... 4-stage,  $i_N = 5.6 \dots 400$



#### Structure of gear unit designation

| Type                          | B                                                                       | 3 | S | H | 1 | 1 |
|-------------------------------|-------------------------------------------------------------------------|---|---|---|---|---|
| Type                          | Helical gear units                                                      | H |   |   |   |   |
|                               | Bevel helical gear units                                                | B |   |   |   |   |
| No. of stages                 | 1                                                                       |   | 1 |   |   |   |
|                               | 2                                                                       |   | 2 |   |   |   |
|                               | 3                                                                       |   | 3 |   |   |   |
|                               | 4                                                                       |   | 4 |   |   |   |
| Design of the low speed shaft | Solid shaft with parallel key acc. to DIN 6885/1                        |   | S |   |   |   |
|                               | Solid shaft with parallel key acc. to DIN 6885/1 with reinforced spigot |   | V |   |   |   |
|                               | Solid shaft without parallel key                                        |   | C |   |   |   |
|                               | Hollow shaft with keyway acc. to DIN 6885/1                             |   | H |   |   |   |
|                               | Hollow shaft with shrink disk                                           |   | D |   |   |   |
|                               | Hollow shaft with spline acc. to DIN 5480                               |   | K |   |   |   |
|                               | Flanged shaft                                                           |   | F |   |   |   |
| Mounting position             | Horizontal                                                              |   |   | H |   |   |
|                               | Vertical                                                                |   |   | V |   |   |
|                               | Upright, low speed shaft (LSS) bottom <sup>*)</sup>                     |   |   | H |   |   |
|                               | Upright, low speed shaft (LSS) top <sup>*)</sup>                        |   |   | H |   |   |
| Gear unit size                | 3                                                                       |   |   |   | 0 | 3 |
|                               | 4                                                                       |   |   |   | 0 | 4 |
|                               | 5                                                                       |   |   |   | 0 | 5 |
|                               | ...                                                                     |   |   |   |   |   |
|                               | ...                                                                     |   |   |   |   |   |
|                               | ...                                                                     |   |   |   |   |   |
|                               | 27                                                                      |   |   |   | 2 | 7 |
|                               | 28                                                                      |   |   |   | 2 | 8 |

#### Further details required in orders

- Ratio  $i$
- Design of the shafts A, B, C, D, etc.

#### Example B3SH11A16

- 3-stage bevel helical gear unit
- Output in solid shaft design
- Horizontal mounting position
- Size 11
- Version A
- Ratio  $i = 16$

<sup>\*)</sup> Describe in the free text with "high speed shaft over low speed shaft" or "low speed shaft over high speed shaft" (observe oil supply and heat generation)



**Overview**

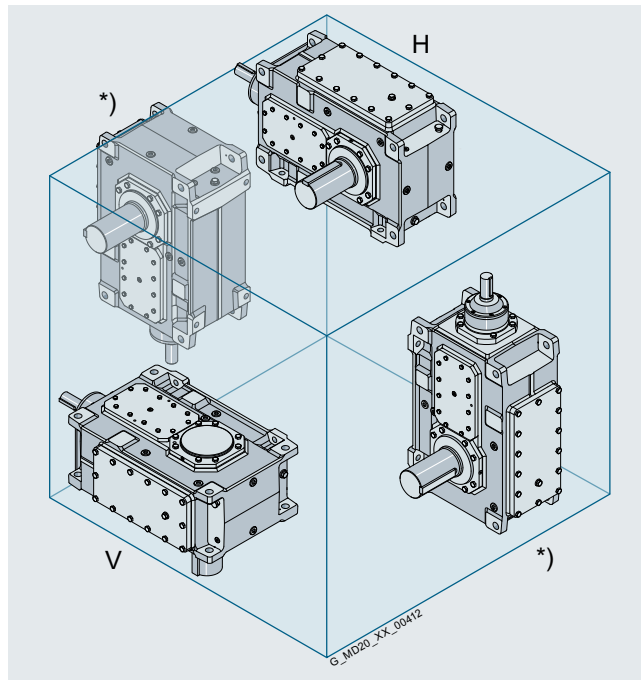
**Mounting positions**

Flender gear units are available for horizontal (H) and vertical (V) mounting position.

The upright mounting positions with low speed shaft at the bottom, low speed shaft at the top, and inclined or swiveling mounting positions are also possible following consultation:

\* Order in the horizontal mounting position (H) and describe in the free text with "high speed shaft (HSS) over low speed shaft (LSS)" or "low speed shaft over high speed shaft" (observe oil supply and heat generation).

The basic gear unit can be optimally adapted to customer requirements by fitting different add-on parts such as base rail feet, housing flanges, motor lanterns, gear unit swing bases or backstops.

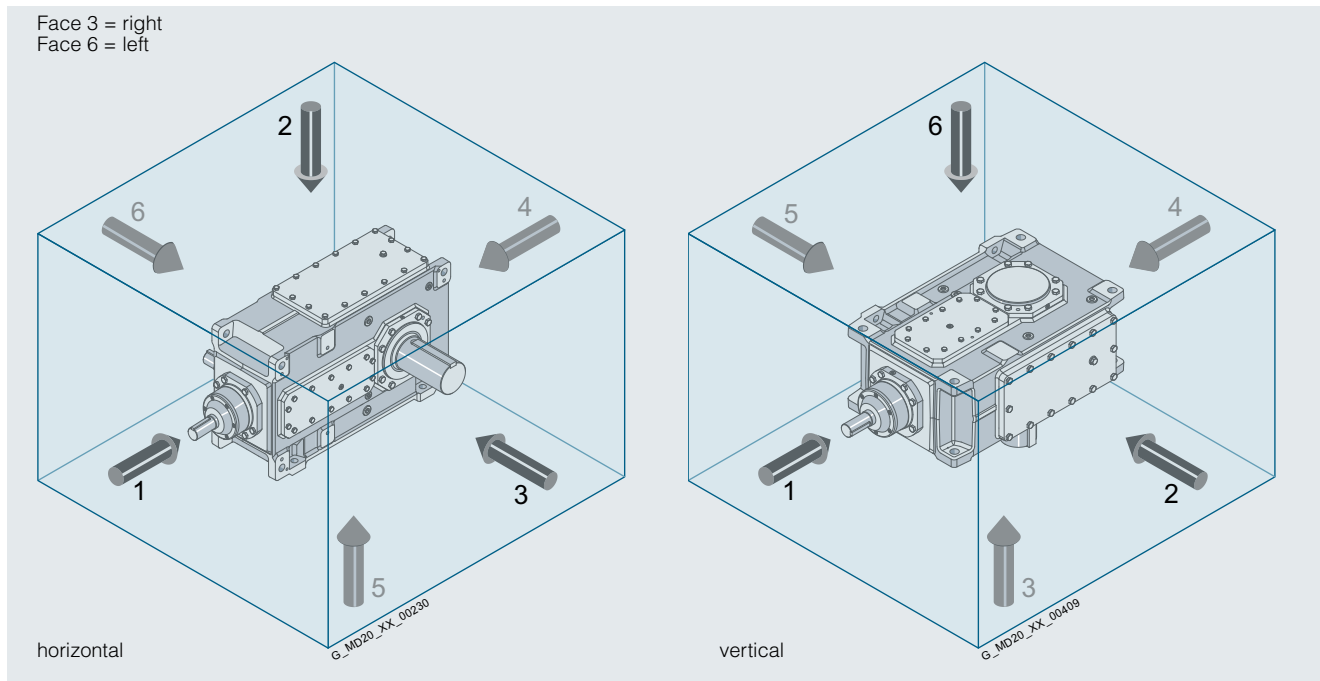


**Designation of gear unit faces**

Irrespective of the mounting position of the gear unit, the face designations "right" and "left" always refer to the horizontal mounting position with the view directed at the front of the housing for

the high speed shaft (face 1). Face 2 describes the side of the housing with the mounting or inspection hole cover.

Mounting cover top (2), with the view directed at the front of the housing of the high speed shaft (1):



Face 3 = right  
Face 6 = left

| Standard mounting surfaces |                  |
|----------------------------|------------------|
| Mounting position          | Surface          |
| Mounting position H        | Gear unit face 5 |
| Mounting position V        | Gear unit face 3 |

Alternative mounting surfaces to those specified above (depending on the mounting position) are available on request.

## Introduction

### Notes

#### Information about basics

#### Overview

##### Technical design

Flender gear units are the most successful and widespread standard gear units in the world.

Advantages are:

- Very solid and harmonious torque grading
- Extremely high degree of flexibility thanks to ability to be set up and used in nearly all mounting positions
- Reliable system availability due to the high quality of roller bearings used
- Wide range of variants from 7 types with different solid shaft or hollow shaft output versions
- Reliable gear unit seal thanks to protection of the radial shaft seal lip due to optionally selectable dust-proof Taconite seal
- Internal cooling or standardized fan mounting, as required
- Fast availability worldwide
- Attractive price/performance ratio.

The gearing is designed according to DIN 3990/3991. It is possible to calculate according to ISO 6336, ISO 10.300, AGMA 2003: AGMA 2001-B88; AGMA 2101-C95/D04; AGMA 6110-F97.

The shafts are calculated in accordance with DIN 743.

Roller bearings are designed in accordance with ISO 281.

Only roller bearings from certified suppliers which can meet the high quality demands over a long period of time are used.

The housings of the multi-stage gear units up to the torque  $\leq 78000$  Nm are laid out undivided in the monoblock design. The housings of the single stage gear units in horizontal mounting position are generally divided. All housings are extremely rugged and can be flexibly used.

The standard material for housings is lamellar graphite cast iron, which, at a minimum, satisfies the properties of EN-GJL-200. Upon request, housings made of spheroidal graphite EN-GJS-400 or welded versions can also be made available.

##### Application-specific drive solutions

A variety of special solutions can be serviced on the basis of Flender gear units.

A defined assortment of gear units can be built within 2 weeks using the "Fast Track" designator.

In addition, application-specific affiliate programs are available for nearly every use case, such as:

- Water screw gear units (pump application)
- Conveyor belt gear units
- Apron conveyor drives
- Scraper conveyor/scraper drives
- Bevel helical gear units for bucket elevator applications
- Gear units for crane applications/hoisting gear
- Traversing gear units
- Gear units for preparation engineering (crusher, shredder, etc.)
- Gear units for stirring and mixing processes for liquid media
- Single-screw extruder gear units

- Gear units for applications in paper production
- Sifter gear units
- Gear units for generating energy from hydro power (both water wheel drives and water turbine gear units)
- Auxiliary drives for rotary furnaces
- Gear units for cable railways
- Gear units for various pumps (both for centrifugal pumps and for oscillating pumps)

Many years of experience in the applications ensure maximum availability and efficient operation when Flender gear units are used.

##### Noise behavior

The noise levels of Flender gear units are well below the legal requirements.

This can be guaranteed throughout the series by the following solutions:

- Grinding the bevel gears
- Optimized gearing set
- Compact monoblock housings up to 78000 Nm for multi-stage gear units
- High contact ratios of the gearing.

##### Thermal behavior

Flender gear units have a favorable thermal behavior when the degree of efficiency is high.

The degree of efficiency of the gear units is directly proportional to the utilization of the gear units. Over-dimensioning leads to an increase in the amount of heat that needs to be dissipated.

Large fans with an air deflection hood that encompasses the entire housing already provide optimal heat dissipation in the basic design (costly solutions with 2 fans are not required).

The maximum oil temperature that is the basis for the gear unit selection lies within permitted ranges.

Due to the large number of factors that influence the determination of thermal capacities, a re-calculation of the exact drive application is recommended. The catalog data can only give a very limited depiction of the wide range of possibilities in regard to heat generation and dissipation. We recommend, especially for applications with low ratios or applications in which the gear unit is completely filled with oil, that the limits of the thermal capacities should not be fully utilized.

By that, the operational reliability will be increased and the maintenance overhead reduced due to longer oil change intervals.

The gear units up to and including size 22 are intended for use in an ambient temperature range of  $-25$  °C to  $40$  °C. In addition, and for applications in hazardous environments (ATEX),  $-20$  °C is defined as the lower limit value. Contact Flender regarding deviating temperatures.

##### Stock

Flender gear units have a modular design. Through this, the variety of components could be reduced. The components are mainly on stock, enabling manufacturing plants worldwide to be delivered at short term.

**Overview** (continued)**Corrosion protection version**

The Flender standard color RAL5015 and an assortment of preferred colors are primarily "silk-matt" and are applied using a solvent-free coating system.

The default coloring is comparable to corrosion protection category C3 "medium" according to EN ISO 12994-5.

Deviating coating systems possible on request.

The versions regarding corrosion protection according to the corrosivity categories according to EN ISO 12994-5 refer to the gear unit itself in the standard program. Add-on parts such as air guides/covers/protective covers made of a sheet steel are coated with "signal yellow" powder RAL 1003. Flender confirms the suitability of powder-coated built-on components for all corrosion protection classes. An assignment of the corrosivity categories is omitted.

This powder-coating is applied independently of the color scheme ordered for the gear unit or the required layer thickness.

In the combination of electrostatic attraction between the coating powder and the part to be coated and the melting of this powder by applying heat (between 140 – 200 °C), a closed film, the Duroplast color layer, is formed.

Powder coating has the following advantages over liquid painting:

- Better corrosion protection
- Better chemical resistance
- Better surface quality, considerably more resistant to impacts, scratches and abrasions
- Can be immediately used after the surface has cooled down
- Solvent- and emission-free, therefore very environmentally friendly
- Considerably lower risk of damage to the color system during assembly processes.

This generally concerns components that must be dismantled when mounting the drive or for some other purpose. For multi-layer color structures, the risk of damage due to slings or tools is considerably higher than for the design with plastic powder.

The gears are delivered preserved.

**Standard packaging**

The packaging on wooden frames is included in the standard delivery kit (as far as possible). Upon request, the packaging can also be shrink-wrapped.

Optionally, deliveries can also be delivered in containers or in stackable wooden crates for container transport. Please contact Flender to find out about the additional efforts.

## Introduction

### Notes

#### Information about basics

#### Overview (continued)

##### Interior preservation of gear units

Without additional measures, the corrosion protection for standard packaged gear units will last up to 6 months when transported and stored in a dry, draft-free and closed room without major temperature fluctuations.

The service life differs depending on the type of packaging.

Overview of the basic service life (in months) of the gear unit's interior preservation for hermetically sealed gear units:

| Packaging/storage environment of the unit                                                                                     | Transport/storage/non-operational setup under the following conditions (in months):                                                                                 |                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                               | • Air with little or no salt content and low or average humidity and<br>• low or average air pollution acc. to EN ISO 9223 (Annex C)<br>Corrosion category C1 or C2 | • Medium or high salinity air and/or<br>• high humidity and/or heavy air pollution acc. to EN ISO 9223 (Annex C)<br>Corrosion category C3 or higher |
| No packaging or basic packaging outdoors                                                                                      | 5                                                                                                                                                                   | 3                                                                                                                                                   |
| No packaging or basic packaging outdoors; seals taped with waterproof adhesive tape; gear units equipped with wet air filters | 13                                                                                                                                                                  | 9                                                                                                                                                   |
| No packaging or basic packaging in closed, dry room                                                                           | 20                                                                                                                                                                  | 14                                                                                                                                                  |
| Seaworthy packaging                                                                                                           | 24                                                                                                                                                                  | 24                                                                                                                                                  |

When labyrinth seals with a V-ring are used, the service life is halved (upper limit value 12 months).

The internal preservation of Flender gear units is dependent on the oil used and the shaft seals provided.

If the storage periods mentioned are exceeded, the anti corrosive agent in the gear unit must be renewed.

If gear units are stored outdoors, the maximum permissible storage time might be as little as 12 months depending on the packaging used.

Observe operating instructions!

##### Lubrication of Flender gear units

###### Dip lubrication

There are 2 types of dip lubrication.

1. Rotating components (toothed gears, roller bearings) are immersed in oil to the extent prescribed. Due to rotation at a high circumferential speed, all of the points of these components are immersed in oil during each rotation. The teeth generate a splashing effect. Some of the oil is also spattered onto the interior wall of the housing. An oil mist forms, which aids in the cooling, lubrication and heat dissipation during operation.

This type of lubrication is typically found in gear units that are in a horizontal mounting position.

If the temperatures are below the values as listed in the table on page 2/7, heating is required.

In case of dip lubrication, the oil temperature must not drop below the pour point of the selected oil.

2. In case of dip lubrication, all parts to be lubricated are submersed in oil.

The gear units are often inserted vertically and designed with an "oil expansion tank", to provide the space required by the change in volume of the oil due to the usual warming. This also applies to the "high speed shaft over low speed shaft" mounting position.

If the temperatures are below the values as listed in the table on page 2/7, heating is required.

In case of dip lubrication, the oil temperature must not drop below the pour point of the selected oil.

###### Forced lubrication/oil circulation lubrication

In an oil circulation lubrication system, all of the bearing points and meshing that are not located in oil are supplied with oil via a pump (motor pump, cooling/lubricating system pump or an attached flange-mounted pump).

For selection criteria, see Chapter 6.

When an oil circulation lubrication system is used, the operating viscosity must not exceed 1800 cSt.

At temperature limits below those listed in the table on page 2/7, dip lubrication or a gear unit heating system must be provided.

###### Combination of lubrication types

In practice, dip and forced lubrication are often provided together.

**Overview** (continued)**Selection of oil**

The Flender gear units can be filled with oil from approved oil suppliers. The oil producer or supplier is responsible for the quality of the product. For the selection of oil grade and viscosity, the limits of application given in the table are to be taken into consideration.

A minimum operating viscosity of 25 cSt must be ensured.

| Viscosity<br>ISO-VG<br>at 40 °C<br>in mm <sup>2</sup> /s (cSt) | Temperature limits for oil in °C |                     |         |                      |
|----------------------------------------------------------------|----------------------------------|---------------------|---------|----------------------|
|                                                                | Mineral oil                      |                     | PAO oil |                      |
|                                                                | Minimum                          | Maximum             | Minimum | Maximum              |
| Dip lubrication                                                |                                  |                     |         |                      |
| VG 220                                                         | -10                              | 90<br>(briefly 100) | -30     | 100<br>(briefly 110) |
| VG 320                                                         | -10                              |                     | -30     |                      |
| VG 460                                                         | -6                               |                     | -25     |                      |
| Oil circulation lubrication                                    |                                  |                     |         |                      |
| VG 220                                                         | 10                               | 90<br>(briefly 100) | 0       | 100<br>(briefly 110) |
| VG 320                                                         | 15                               |                     | 10      |                      |

Depending on the environmental and operating conditions, the use of different viscosities may be possible. Please contact Flender in this regard.

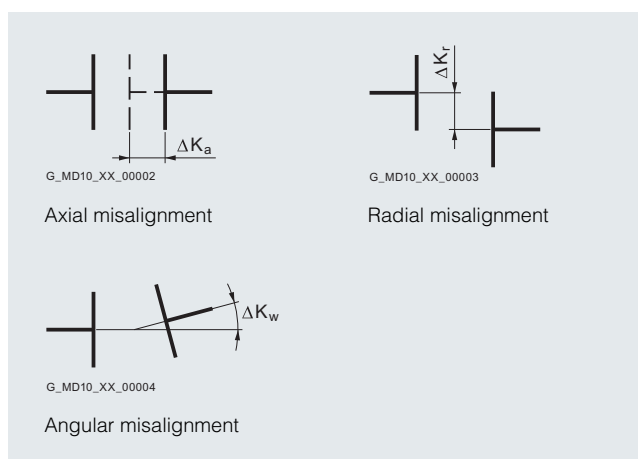
Data for other types of oils (e.g. oil suitable for foodstuffs) upon request.

**Shaft misalignment**

Shaft misalignment is the result of displacement during assembly and operation and, where machines constructed with two radial bearings each are rigidly coupled, will cause high loads being placed on the bearings. Elastic deformation of base frame, foundation and machine housing will lead to shaft misalignment, which cannot be prevented even by precise alignment. Furthermore, because individual components of the drive train heat up differently during operation, heat expansion of the machine housings causes shaft misalignment.

Poorly aligned drives are often the cause of seal or roller bearing failure. Alignment should be carried out by specialist personnel in accordance with the Flender operating instructions.

Depending on the direction of the effective shaft misalignment, a distinction is made between:



The shaft misalignment expected must be taken into account when the connection between the components and the low-speed or high-speed shaft is selected. Guidelines and limits for compensation of shaft misalignment can be obtained from the respective manufacturer.

## Introduction

### Notes

## Information about basics



### Overview (continued)

#### Maintenance

Compliance with the conditions for operation and installation is essential. To prevent damage to the gear unit or failure of the drive, regular inspection and maintenance must be performed as specified in the operating instructions.

#### Rating plate

The rating plate of the gear unit contains the most important technical specifications of the gear unit:

|                                                                                                   |    |                  |    |
|---------------------------------------------------------------------------------------------------|----|------------------|----|
| <b>FLENDER</b>                                                                                    |    | 1)               |    |
| No. NFJ / 461XXXX - 110 - 1 / 2018                                                                |    | 2)               |    |
|  1455 kg         |    | 3) 4)            |    |
| B3SH 11                                                                                           | 5) | P2 120 kW        | 6) |
| $n_1$ 1475 /min                                                                                   | 7) | $n_2$ 95,03 /min | 8) |
| Oil: CLP PAO VG 320 95l                                                                           |    | 9)               |    |
|  BA 5010, BA7300 |    | 10)              |    |
| Projekt-Nummer / Tagging xxx                                                                      |    | 11)              |    |
| FLENDER Industriegeräte GmbH, Penig                                                               |    | 12)              |    |
| Made in Germany                                                                                   |    | 13)              |    |

- ① Company logo
- ② Production no.: Production site code/  
Order no. position serial no./year of manufacture
- ③ Total weight in kg
- ④ Special information 1 (for special information)
- ⑤ Type, size
- ⑥ Driven machine output power rating P2 in kW or torque T2 in Nm
- ⑦ High speed  $n_1$
- ⑧ Slow speed  $n_2$
- ⑨ Oil data: oil grade, oil viscosity, amount of oil
- ⑩ Numbers of the operating instructions
- ⑪ Special information 2  
(entry of ATEX details; for special information)
- ⑫ Manufacturer and production site
- ⑬ Country of origin

This data and the agreements agreed contractually between Flender and the ordering party for the gear unit specify the limits for its proper use.

This label is designed as "printed" plastic label.

**Overview****Overview**















- Illustrations are examples only and are not strictly binding
- Dimensions are subject to change
- The weights are mean values and not strictly binding
- To prevent accidents, all rotating parts should be guarded
- Local and national safety regulations of the respective country must be observed
- Prior to commissioning, the operating instructions must be observed
- The gear units are delivered ready for operation but without oil filling
- Oil quantities given are recommended values only. The exact quantity of oil depends on the marks on the oil dipstick
- The oil viscosity has to correspond to the data given on the rating plate
- Approved lubricants only may be used. You will find current operating instructions and lubricant tables on the Internet at: <http://support.automation.siemens.com/WW/view/en/44231658>
- The gear units are supplied with radial shaft seals. For other sealing variants see [Chapter 10](#)
- The data regarding the direction of rotation refers to the low-speed shaft (output shaft  $d_2$ )
- The gear units are laid out by default for operating with 4-pole motors at 50 or 60 Hz
- The gear units are suitable for transmission in both low speed and high speed
- In case of outdoor installation, insulation is to be avoided. The customer has to provide adequate protection
  - Foundation bolts of minimum strength class 8.8
  - Tolerance of the fixing holes in the housing acc. to EN 20273 – "coarse" series.

**Torque specifications in the catalog**

- The nominal output torques specified in the catalog can be permanently transferred if the load direction is constant. The data applies to the drive speeds in the tables
- Since, as a rule, the actual motor speed can deviate from those in the tables and the usage and operating conditions also may not correspond to the laboratory conditions, a recalculation using the CFG calculating program and the actual operating data is recommended. When the gear units are well utilized (as a rule, in the range between 60 and 80% of the nominal output torque), the permitted load data lies above the values specified in the tables.

**Symbols on the gear unit and in the dimensional drawing**

The following symbols, some of which are color-highlighted, are provided for the gear unit:

|                                       |                                                                                       |        |
|---------------------------------------|---------------------------------------------------------------------------------------|--------|
| Earth connection point                |    |        |
| Air relief point                      |    | Yellow |
| Oil filling point                     |    | Yellow |
| Oil draining point                    |    | White  |
| Oil level indicator                   |    | Red    |
| Oil level measurement                 |    | Red    |
| Vibration monitoring connection point |  |        |
| Lubrication point                     |  | Red    |
| Apply grease                          |  |        |
| Lifting eye                           |  |        |
| Eyebolt                               |  |        |
| Do not unscrew                        |  |        |
| Alignment surface, horizontal         |  |        |
| Alignment surface, vertical           |  |        |

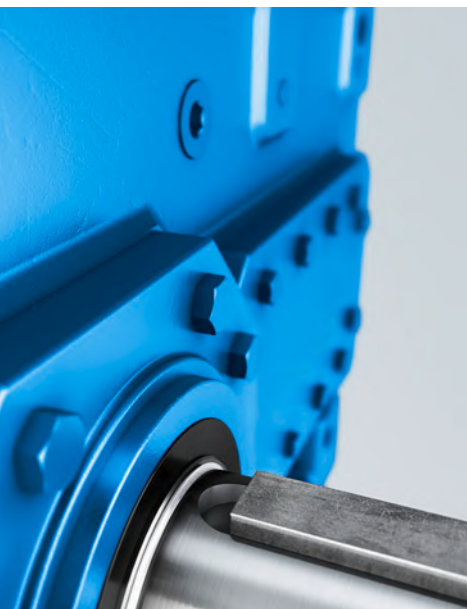
## Introduction

### Notes

2



## Design of the gear units



### 3/2 Determining the drive data – Checklist

#### Guidelines for selection

- 3/3 Constant mechanical power rating
- 3/5 Variable power rating
- 3/6 Selection aid for low speed shaft (LSS)
- 3/7 Explanation of designations
- 3/8 Calculation example
- 3/10 Service factors
- 3/13 Designs for crane applications

#### Overview tables




- 3/14 Type H1
- 3/20 Type H2
- 3/28 Type H3
- 3/36 Type H4
- 3/42 Type B2
- 3/48 Type B3
- 3/62 Type B4
- 3/68 Types H1, H2, H3, H4  
Mass moments of inertia  $J_1$
- 3/72 Types B2, B3, B4  
Mass moments of inertia  $J_1$
- 3/74 Types H1, H2, H3, H4  
Actual ratios
- 3/77 Types B2, B3, B4  
Actual ratios

# Design of the gear units





## Standardized helical and bevel helical gear units

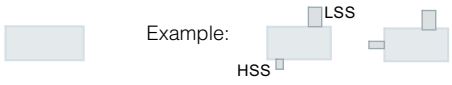
### Determining the drive data – Checklist

3

|                |                                        |                                                                                                                                 |                                                                                                                                       |                                                                                                                                      |                                                                 |
|----------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>General</b> | <b>Basic version and load data</b>     |                                                                                                                                 |                                                                                                                                       |                                                                                                                                      |                                                                 |
|                | <b>Gear unit type:</b>                 | <input type="checkbox"/> Helical gear units H  | <input type="checkbox"/> Bevel helical gear units B  | <input type="checkbox"/> Right-angle gear units W  | <input type="checkbox"/> Gear units with auxiliary drive        |
|                | <b>Quantity:</b>                       | _____ Unit                                                                                                                      | <b>Torque at low speed shaft (LSS):</b> _____ Nm                                                                                      |                                                                                                                                      | <b>Max. peak torque:</b> _____ Nm                               |
|                | <b>Motor power:</b>                    | _____ kW                                                                                                                        | <b>Permissible ratio:</b> _____ %                                                                                                     |                                                                                                                                      | <b>Required bearing lifetime L<sub>10 mh</sub>:</b> _____ Hours |
|                | <b>Motor speed:</b>                    | _____ rpm                                                                                                                       | <b>Max. permissible oil temperature:</b> _____ °C                                                                                     |                                                                                                                                      |                                                                 |
|                | <b>Power at low speed shaft (LSS):</b> | _____ kW                                                                                                                        |                                                                                                                                       |                                                                                                                                      |                                                                 |
|                | <b>Speed at low speed shaft (LSS):</b> | _____ rpm                                                                                                                       |                                                                                                                                       |                                                                                                                                      |                                                                 |
|                | <b>Service factor:</b>                 | _____                                                                                                                           |                                                                                                                                       |                                                                                                                                      |                                                                 |
|                | <b>Circuits, peak loads/hour:</b>      | _____ c/h                                                                                                                       | <input type="checkbox"/> Fluctuating direction of load                                                                                |                                                                                                                                      |                                                                 |
|                | <b>Line frequency:</b>                 | <input type="checkbox"/> 50 Hz <input type="checkbox"/> 60 Hz                                                                   | <input type="checkbox"/> For converter operation                                                                                      | <input type="checkbox"/> Min./max. frequency                                                                                         | _____ Hz                                                        |

|                                                                                   |                        |                                                   |  |
|-----------------------------------------------------------------------------------|------------------------|---------------------------------------------------|--|
| <b>Ambient conditions</b>                                                         |                        |                                                   |  |
| <b>Installation altitude:</b>                                                     | _____ m                | <input type="checkbox"/> Outdoor operation        |  |
| <b>Air humidity:</b>                                                              | _____ %                | <input type="checkbox"/> Operation in large halls |  |
| <b>Temperature:</b>                                                               | from _____ to _____ °C | <input type="checkbox"/> Operation in small rooms |  |
| <b>Brief description of the system:</b><br>(e.g. industry, conveyor system, etc.) |                        |                                                   |  |

|                       |                                                            |                                                                                                                             |                                                                                                                           |                                                                                                                     |
|-----------------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>Gear unit</b>      | <b>Mounting and mounting position</b>                      |                                                                                                                             |                                                                                                                           |                                                                                                                     |
|                       | <b>Mounting position:</b>                                  | <input type="checkbox"/> Horizontal H_H  | <input type="checkbox"/> Vertical H_V  | High speed shaft over low speed shaft                                                                               |
|                       |                                                            | <input type="checkbox"/> B_H             | <input type="checkbox"/> B_V           | Low speed shaft over high speed shaft <sup>*)</sup> Only shaft-mounted design                                       |
|                       |                                                            |                                                                                                                             |                                                                                                                           | <input type="checkbox"/> H_H <input type="checkbox"/> B_H <input type="checkbox"/> H_H <input type="checkbox"/> B_H |
| <b>Mounting type:</b> | <input type="checkbox"/> Foot-mounted design               | <input type="checkbox"/> Shaft-mounted design                                                                               | <input type="checkbox"/> Wall mounting                                                                                    | <input type="checkbox"/> On housing side _____                                                                      |
|                       | <input type="checkbox"/> With motor lantern for IEC motors | <input type="checkbox"/> With HSS coupling                                                                                  | <input type="checkbox"/> With LSS coupling                                                                                | <input type="checkbox"/> With gear unit swing base                                                                  |
|                       | <input type="checkbox"/> Hydraulic coupling                | <input type="checkbox"/> Flexible coupling                                                                                  | <input type="checkbox"/> Torsionally rigid coupling                                                                       | <input type="checkbox"/> With base frame                                                                            |
| <b>Motor type:</b>    | _____                                                      | <input type="checkbox"/> Housing flange, short, mounting flange - short spacer                                              | <input type="checkbox"/> Housing flange, long, mounting flange - long spacer                                              | <input type="checkbox"/> With torque reaction arm                                                                   |
|                       |                                                            |                                                                                                                             |                                                                                                                           | <input type="checkbox"/> With trestle                                                                               |

|                                                     |                                                               |                                                                                                                                                         |                                                                                                                                        |                                                          |
|-----------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <b>Gear unit</b>                                    | <b>Shafts</b>                                                 |                                                                                                                                                         |                                                                                                                                        |                                                          |
|                                                     | <b>Design of the low speed shafts:</b>                        | <input type="checkbox"/> Solid shaft with parallel key S                                                                                                | <input type="checkbox"/> Flanged shaft F                                                                                               | <input type="checkbox"/> Hollow shaft with keyway H      |
|                                                     |                                                               | <input type="checkbox"/> Solid shaft C for flange coupling with cylindrical drilled hole and zero-backlash conical clamping connection (without keyway) | <input type="checkbox"/> Flange coupling with cylindrical drilled hole and zero-backlash conical clamping connection for solid shaft C | <input type="checkbox"/> Hollow shaft with shrink disk D |
|                                                     |                                                               |                                                                                                                                                         |                                                                                                                                        | <input type="checkbox"/> Hollow shaft with spline K      |
| Special dimensions of high speed shaft:             | (d <sub>1</sub> × l <sub>1</sub> ) _____ × _____ mm           | Tol. _____                                                                                                                                              | Shaft shoulder distance: (G <sub>1</sub> ) _____ mm                                                                                    |                                                          |
| Special dimensions of low speed shaft:              | (d <sub>2</sub> × l <sub>2</sub> ) _____ × _____ mm           | Tol. _____                                                                                                                                              | Shaft shoulder distance: (G <sub>2</sub> /G <sub>4</sub> /G <sub>5</sub> ) _____ mm                                                    |                                                          |
| <b>Shaft arrangements:</b>                          | <input type="checkbox"/> High speed shaft (HSS) on both sides | <input type="checkbox"/> Low speed shaft (LSS) on both sides                                                                                            | Example:                                           |                                                          |
| <b>Other options:</b><br>(e.g. axial/radial forces) |                                                               |                                                                                                                                                         |                                                                                                                                        |                                                          |

|                                                  |                                                                              |                                                                                                                 |                                                                      |                   |                                                          |
|--------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------|----------------------------------------------------------|
| <b>General options</b>                           | <b>Surface treatment</b>                                                     |                                                                                                                 |                                                                      |                   | <b>ATEX</b>                                              |
|                                                  | <b>Surface protection in accordance with ISO 12944-2 (m):</b>                | <input type="checkbox"/> C2 <input type="checkbox"/> C3 <input type="checkbox"/> C4 <input type="checkbox"/> C5 | <input type="checkbox"/> RAL 5015 <input type="checkbox"/> RAL _____ | ATEX application? |                                                          |
|                                                  | <b>Other options</b>                                                         |                                                                                                                 |                                                                      |                   | <input type="checkbox"/> Yes <input type="checkbox"/> No |
|                                                  | <b>Auxiliary cooling:</b>                                                    | <input type="checkbox"/> Fan <input type="checkbox"/> Cooling coil; cooling water input temperature _____ °C    | <input type="checkbox"/> Oil/water                                   |                   |                                                          |
|                                                  | <input type="checkbox"/> Cooling unit <input type="checkbox"/> Oil/air       | <input type="checkbox"/> Heating, with temperature monitoring                                                   | U = _____ V, _____ Hz, IP _____                                      |                   |                                                          |
| <b>Direction of rotation of low speed shaft:</b> | <input type="checkbox"/> Clockwise <input type="checkbox"/> Counterclockwise | <input type="checkbox"/> Backstop                                                                               | If yes, please fill in ATEX checklist                                |                   |                                                          |

### Overview

#### 1. Determination of gear unit type and size

##### 1.1 Determination of the ratio

$$i_s = \frac{n_1}{n_2}$$

##### 1.2 Determination of the nominal power rating of the gear unit

$$P_{2N} \geq P_2 \times f_1 \times f_2$$

It is not necessary to consult us, if:

$$3.33 \times P_2 \geq P_{2N}$$

##### 1.3 Check for maximum torque

e.g.: Peak operating, starting torque or torque of a brake

$$P_{2N} \geq \frac{T_A \times n_1}{9550} \times f_3$$

Gear unit sizes and number of stages are given in rating tables depending on  $i_N$  and  $P_{2N}$ .

##### 1.4 Check of whether additional forces on the low speed shaft (LSS) are permissible; it is essential to consult Flender!

##### 1.5 Check whether the actual ratio $i$ is suitable, see pages 3/74 to 3/79.

#### 2. Determination of oil supply:

##### Horizontal mounting position (H)

- Dip lubrication (all parts to be lubricated are immersed in the oil or are splash lubricated)
- Oil circulation lubrication by means of flange-mounted pump (type H1 only)

##### Vertical mounting position (V)

- Dip lubrication with oil expansion tank
- Forced lubrication on request

##### Upright mounting positions

- Dip lubrication with oil expansion tank
- Forced lubrication on request

#### 3. Thermal factor $K_{th}$

Depending on the application, it is not the gear unit nominal power rating that is used for determining the required size of the gear unit on the basis of the thermal capacity, but a lesser rated output based on the typical load curves. This is taken into account via the thermal factor  $K_{th}$ . See page 3/11.

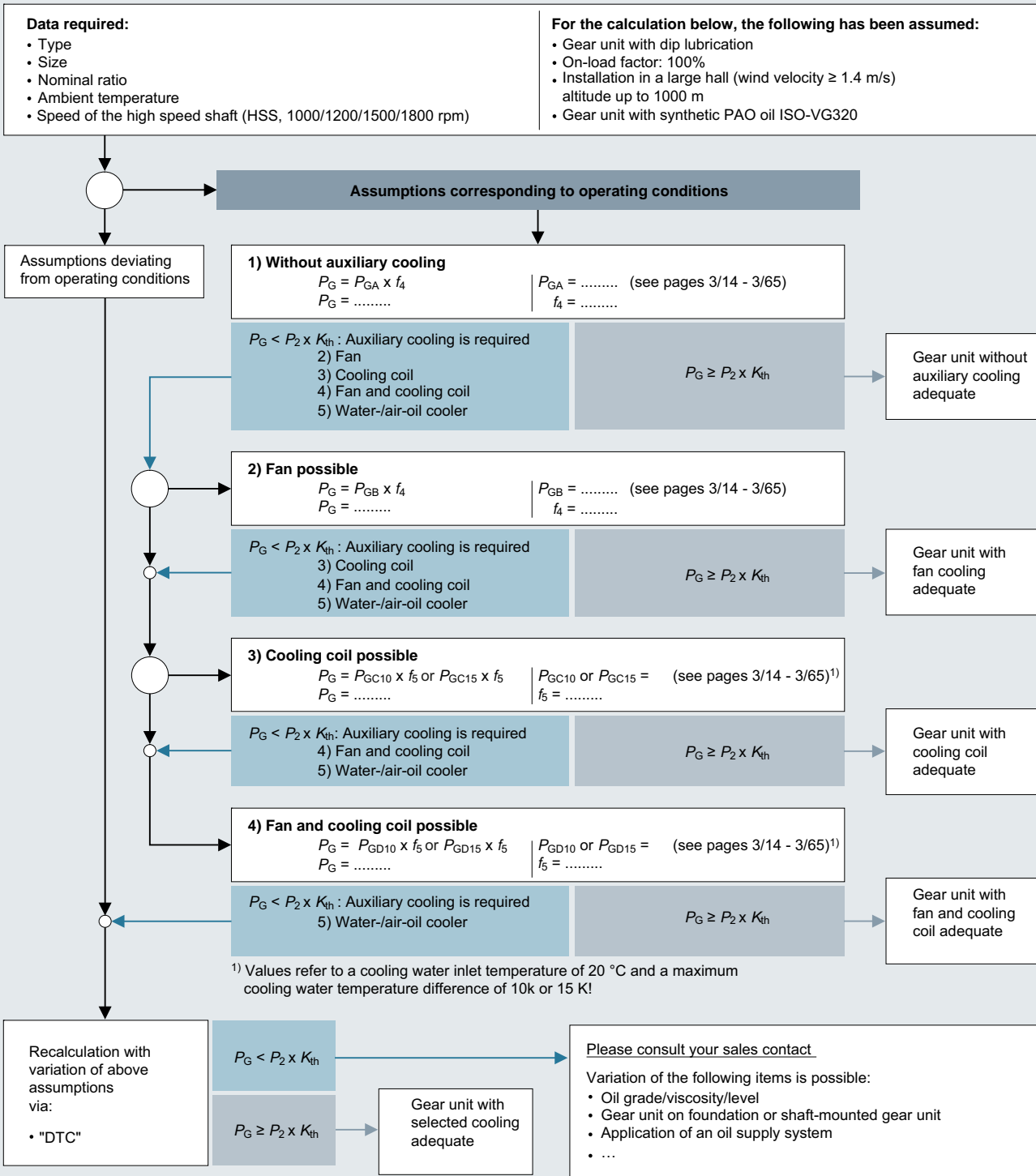
# Design of the gear units

## Guidelines for selection

### Constant mechanical power rating

#### Overview (continued)

#### 3. Determination of required thermal capacity $P_G$



The type of the possibly required auxiliary cooling is dependent on the operating conditions at the customer site (dust, cooling water connection, etc.)

G\_MD20\_EN\_00379

### Overview

For driven machines with constant speeds and variable power ratings the gear unit can be designed according to the equivalent power rating. For this, a working cycle where phases I, II...n require power  $P_I, P_{II} \dots P_n$  and the respective power ratings operate for percental time fractions  $X_I, X_{II} \dots X_n$  is taken as a basis. The equivalent power rating can be calculated from these specifications with the following formula:

$$P_{2eq} = \sqrt[6.6]{P_I^{6.6} \times \frac{X_I}{100} + P_{II}^{6.6} \times \frac{X_{II}}{100} + \dots + P_n^{6.6} \times \frac{X_n}{100}}$$

The size of the gear unit can then be determined analogously to points 1.1 ... 1.5 and 3.

The following applies:

$$P_{2N} \geq P_{2eq} \times f_1 \times f_2$$

Then, when  $P_{2N}$  has been determined, the power and time fractions must be checked by applying the following requirements.

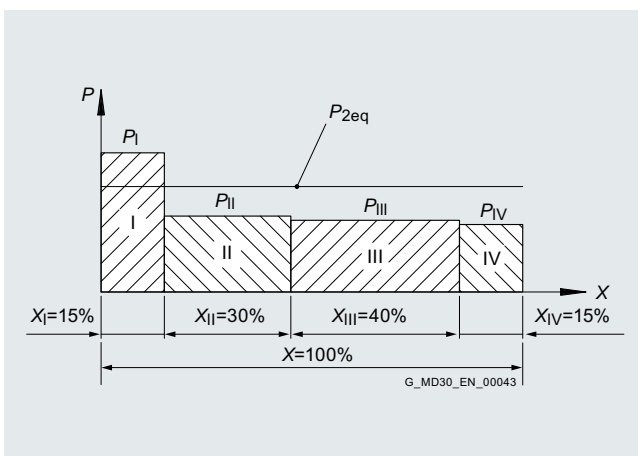
- The individual power fractions  $P_I, P_{II} \dots P_n$  must be greater than  $0.4 \times P_{2N}$ .
- The individual power fractions  $P_I, P_{II} \dots P_n$  must not exceed  $1.4 \times P_{2N}$ .
- For the power fractions  $P_I, P_{II} \dots P_n$  that are greater than  $P_{2N}$ , the total of the time fractions  $X_I, X_{II} \dots X_n$  must be a maximum of 10%.

If any one of these three requirements is not met,  $P_{2eq}$  must be recalculated.

Basically it has to be considered that a brief peak power rating not included in the calculation of  $P_{2eq}$  must not be greater than  $P_{max} = 2 \times P_{2N}$ .

In applications where the torque is variable but the speed constant, the gear unit can be designed on the basis of the so-called equivalent torque.

Example: Service classification



### Finite-life design

A gear unit design which is finite-life fatigue-resistant can be sufficient for certain applications. This includes such things as sporadic use (lock gate drives) or low speeds of the low speed shaft (LSS,  $n_2 < 4$  rpm).

In such case, consultation with Flender is required.

## Design of the gear units

### Guidelines for selection

#### Selection aid for low speed shaft (LSS)

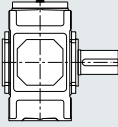
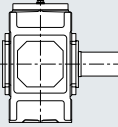
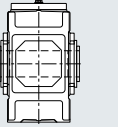
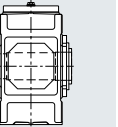
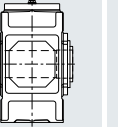
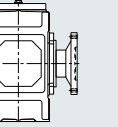
##### Overview

##### Low speed shaft (LSS)

The low speed shaft can be connected to the customer's machine in various different ways. A positively-driven or a friction-locked connection can be used. The following factors are important in selecting a suitable connection:

1. Operating mode and application
2. Ambient conditions
3. Requirements in terms of installation and detachability of the connection
4. General drive arrangement:
  - Mounted on machine shaft (shaft mounted)
  - Mounted on feet
    - Permanently
    - On foundation or
    - Metal substructure (base frame, base plate, etc.)
  - Mounting on side of gear unit housing
    - Wall mounting, permanent
    - Flange mounting, permanent

The following overview is intended as a guide to assist with the selection of a suitable LSS:

|                                                                        |                                                                                                             |                                                                                                           |                                                                                                                |                                                                                                  |                                                                                              |                                                                                                                    |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type                                                                   | Solid shaft with parallel key (S/V)                                                                                                                                                           | Solid shaft without parallel key (C)                                                                                                                                                        | Hollow shaft with keyway according to DIN 6885/1 (H)                                                                                                                                             | Hollow shaft with spline in acc. with DIN 5480 (K)                                                                                                                                  | Hollow shaft with shrink disk (D)                                                                                                                                                | Flanged shaft (F)                                                                                                                                                                                      |
| Characteristic                                                         | <ul style="list-style-type: none"> <li>• Additional coupling element required</li> <li>• Machine shaft manufacture is moderately difficult</li> <li>• Positively-driven connection</li> </ul> | <ul style="list-style-type: none"> <li>• Additional coupling element required</li> <li>• Machine shaft manufacture is moderately difficult</li> <li>• Friction-locked connection</li> </ul> | <ul style="list-style-type: none"> <li>• No additional coupling element required</li> <li>• Machine shaft manufacture is moderately difficult</li> <li>• Positively-driven connection</li> </ul> | <ul style="list-style-type: none"> <li>• No additional coupling element required</li> <li>• Machine shaft manufacture is complex</li> <li>• Positively-driven connection</li> </ul> | <ul style="list-style-type: none"> <li>• No additional coupling element required</li> <li>• Machine shaft manufacture is simple</li> <li>• Friction-locked connection</li> </ul> | <ul style="list-style-type: none"> <li>• Additional coupling element required</li> <li>• Machine shaft manufacture is moderately difficult to complex</li> <li>• Friction-locked connection</li> </ul> |
| Drive mounted directly on machine shaft with torque reaction arm       | -                                                                                                                                                                                             | ++                                                                                                                                                                                          | +++                                                                                                                                                                                              | +++                                                                                                                                                                                 | ++                                                                                                                                                                               | ++                                                                                                                                                                                                     |
| Drive mounted on foundation                                            | +++                                                                                                                                                                                           | +                                                                                                                                                                                           | ++                                                                                                                                                                                               | ++                                                                                                                                                                                  | +                                                                                                                                                                                | +                                                                                                                                                                                                      |
| Drive mounted on machine flange                                        | ++                                                                                                                                                                                            | -                                                                                                                                                                                           | ++                                                                                                                                                                                               | +++                                                                                                                                                                                 | -                                                                                                                                                                                | -                                                                                                                                                                                                      |
| Short overall length                                                   | +                                                                                                                                                                                             | +                                                                                                                                                                                           | +++                                                                                                                                                                                              | +++                                                                                                                                                                                 | ++                                                                                                                                                                               | ++                                                                                                                                                                                                     |
| Small installation space                                               | ++                                                                                                                                                                                            | +++                                                                                                                                                                                         | +                                                                                                                                                                                                | +                                                                                                                                                                                   | +                                                                                                                                                                                | +++                                                                                                                                                                                                    |
| Highly corrosive environment (C5)                                      | ++                                                                                                                                                                                            | ++                                                                                                                                                                                          | +                                                                                                                                                                                                | +                                                                                                                                                                                   | ++                                                                                                                                                                               | +++                                                                                                                                                                                                    |
| Easy to detach                                                         | ++                                                                                                                                                                                            | +                                                                                                                                                                                           | +                                                                                                                                                                                                | ++                                                                                                                                                                                  | +                                                                                                                                                                                | +                                                                                                                                                                                                      |
| Less complex connection including connecting element and machine shaft | +++                                                                                                                                                                                           | ++                                                                                                                                                                                          | +++                                                                                                                                                                                              | +                                                                                                                                                                                   | ++                                                                                                                                                                               | +++                                                                                                                                                                                                    |
| Intermittent operation, non-periodic and periodic operation (S3-S9)    | +                                                                                                                                                                                             | +++                                                                                                                                                                                         | +                                                                                                                                                                                                | ++                                                                                                                                                                                  | +++                                                                                                                                                                              | ++                                                                                                                                                                                                     |

- Not suitable
- + possible
- ++ highly suitable
- +++ extremely suitable

### Overview

#### Explanation of designations

| Designation        | Explanation                                                                                                                       | Chapter/page |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------|
| $E_D$              | ON period per hour in %<br>(e.g. ON period = 80% per hour)                                                                        |              |
| $f_1$              | Factor for driven machine                                                                                                         | 3/10         |
| $f_2$              | Factor for prime mover                                                                                                            | 3/12         |
| $f_3$              | Peak torque factor                                                                                                                | 3/12         |
| $f_4$              | Thermal factor                                                                                                                    | 3/12         |
| $f_5$              | Thermal factor                                                                                                                    | 3/12         |
| $f_6$              | Altitude factor                                                                                                                   | 3/12         |
| $f_7$              | Altitude factor                                                                                                                   | 3/12         |
| $i$                | Actual ratio                                                                                                                      | 3/74, 3/77   |
| $i_N$              | Nominal ratio                                                                                                                     |              |
| $i_s$              | Required ratio                                                                                                                    |              |
| $K_{th}$           | Thermal factor                                                                                                                    |              |
| $n_1$              | Speed of the high speed shaft (HSS, rpm)                                                                                          |              |
| $n_2$              | Speed of the low speed shaft (LSS, rpm)                                                                                           |              |
| $P_G$              | Required thermal capacity                                                                                                         | 3/4          |
| $P_{GA}$           | Thermal capacity for gear units without auxiliary cooling                                                                         |              |
| $P_{GB}$           | Thermal capacity for gear units with fan cooling                                                                                  |              |
| $P_{GC}$           | Thermal capacity for gear units with built-in cooling coil                                                                        |              |
| $P_{GC10}$         | Thermal capacity for gear units with built-in cooling coil,<br>limitation of cooling water temperature difference to 10 K         |              |
| $P_{GC15}$         | Thermal capacity for gear units with built-in cooling coil,<br>limitation of cooling water temperature difference to 15 K         |              |
| $P_{GD}$           | Thermal capacity for gear units with built-in cooling coil and fan                                                                |              |
| $P_{GD10}$         | Thermal capacity for gear units with built-in cooling coil and fan,<br>limitation of cooling water temperature difference to 10 K |              |
| $P_{GD15}$         | Thermal capacity for gear units with built-in cooling coil and fan,<br>limitation of cooling water temperature difference to 15 K |              |
| $P_{2N}$           | Nominal power rating of gear unit (kW), see rating tables                                                                         |              |
| $P_2$              | Power of driven machine (kW)                                                                                                      |              |
| $t$                | Ambient temperature (°C)                                                                                                          |              |
| $T_A$              | Max. torque occurring on high speed shaft (HSS), e.g.: Peak operating, starting or braking torque (Nm)                            |              |
| $T_{2N}$           | Nominal output torque on the low speed shaft (LSS, kNm)                                                                           |              |
| $T_{2max}$         | Max. permissible torque of low speed shaft (LSS, kNm)                                                                             |              |
| $T_M$              | Nominal motor torque (Nm)                                                                                                         |              |
| $T_{MA}$           | Motor starting torque (Nm)                                                                                                        |              |
| $T_{MK}$           | Motor pull-out torque (Nm)                                                                                                        |              |
| $P_{2eq}$          | Equivalent power rating (kW)                                                                                                      |              |
| $P_f, P_{fI}, P_n$ | Fractions of power (kW) from load spectrum                                                                                        |              |
| $X_f, X_{fI}, X_n$ | Fractions of time (%) load spectrum                                                                                               |              |

#### Notes and legend for tables of thermal capacities

|                                |                                                                    |                                |                                                                                                                                                                                           |
|--------------------------------|--------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| *                              | On request                                                         | $P_{GC10} / P_{GC15}$ (kW)     | Gear unit with built-in cooling coil                                                                                                                                                      |
| $P_{GA}$ (kW)                  | Gear unit without auxiliary cooling                                | $P_{GD10} / P_{GD15}$ (kW)     | Gear unit with fan and built-in cooling coil                                                                                                                                              |
| $P_{GB}$ (kW)                  | Gear unit with fan cooling                                         | The values are applicable for: | Operation cycle 100%<br>Installation in large hall<br>Altitude 0 m<br>Cooling water inlet temperature of 20 °C<br>with limiting of the cooling water temperature difference to 10 or 15 K |
| The values are applicable for: | Operation cycle 100%<br>Installation in large hall<br>Altitude 0 m |                                |                                                                                                                                                                                           |

## Design of the gear units

### Guidelines for selection

#### Calculation example

##### Overview

##### Known criteria for the calculation example

###### Prime mover

- Electric motor:  $P_1 = 75 \text{ kW}$
- Motor speed:  $n_1 = 1500 \text{ rpm}$
- Max. starting torque:  $T_A = 720 \text{ Nm}$

###### Driven machine

- Belt conveyor:  $P_2 = 71 \text{ kW}$
- Speed:  $n_2 = 26 \text{ rpm}$
- Duty: 12 h/day
- Starts per hour: 7
- ON period per hour:  $E_D = 100\%$
- Ambient temperature: 40 °C
- Installation in a large hall: Wind velocity  $\geq 1.4 \text{ m/s}$
- Altitude: Sea level

###### Gear unit design

- Bevel helical gear units
- Mounting position: horizontal
- Low speed shaft (LSS): on the right, version C, solid shaft
- Direction of rotation of low speed shaft (LSS): counter-clockwise

##### Required

- Type of gear unit
- Gear unit size

##### 1. Determination of gear unit type and gear unit size

###### 1.1 Determination of the ratio

$$i_s = \frac{n_1}{n_2} = \frac{1500}{26} = 57.7 \quad i_N = 56$$

###### 1.2 Determination of the nominal power rating of the gear unit

$$P_{2N} \geq P_2 \times f_1 \times f_2 = 71 \times 1.3 \times 1 = 92.3 \text{ kW}$$

Selected from power rating table type B3SH, gear unit size 9 with  $P_{2N} = 100 \text{ kW}$ .

$$3.33 \times P_2 \geq P_{2N} \quad 3.33 \times 71 = 236.4 \text{ kW} > P_{2N}$$

It is not necessary to consult us

###### 1.3 Check the starting torque

$$P_{2N} \geq \frac{T_A \times n_1}{9550} \times f_3 = \frac{720 \times 1500}{9550} \times 0.65 = 73.5 \text{ kW}$$

$$P_{2N} = 100 \text{ kW} > 73.5 \text{ kW}$$

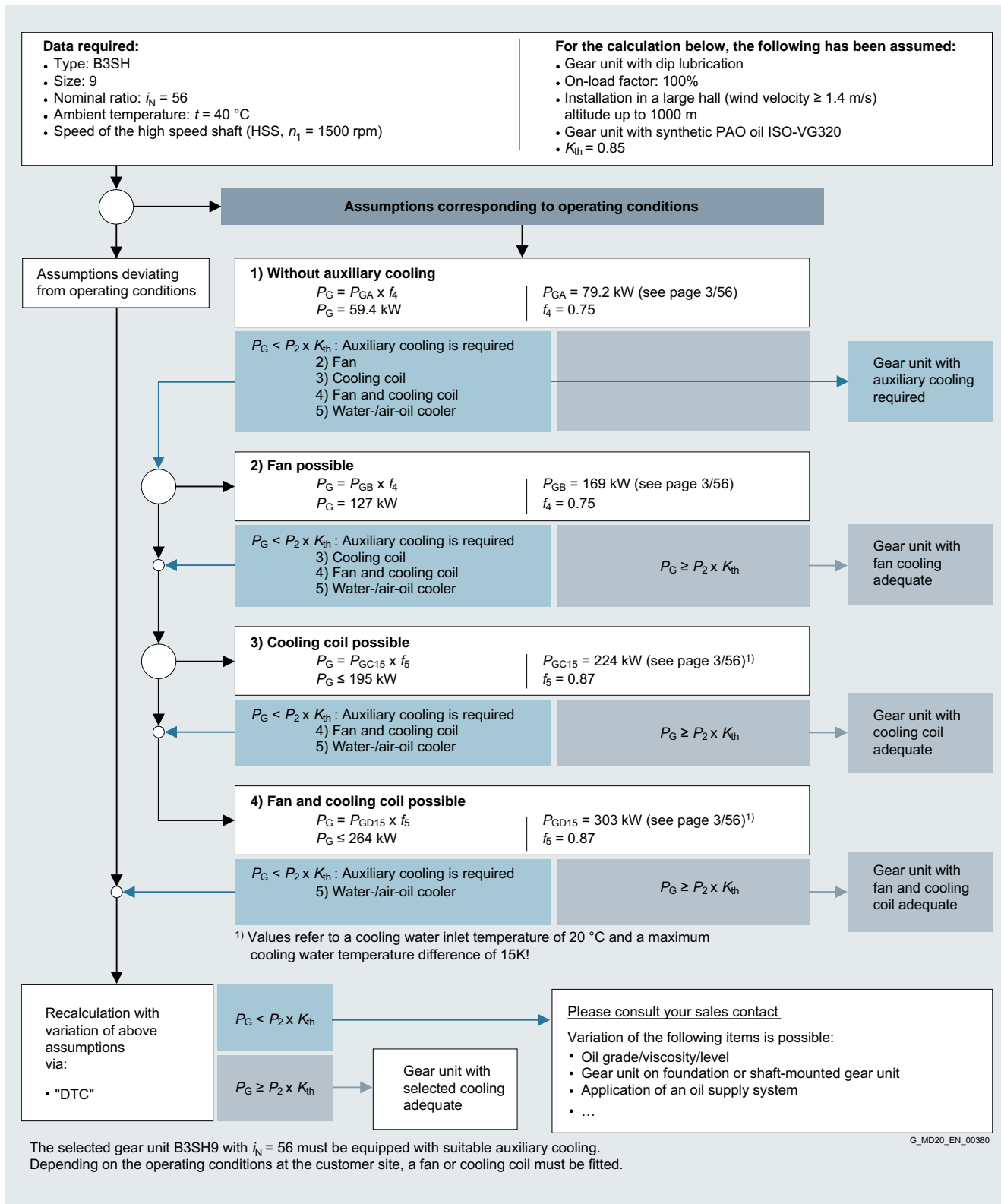
##### 2. Determination of oil supply

Gear unit with dip lubrication



**Overview** (continued)

3. Determination of required thermal capacity  $P_G$



# Design of the gear units

## Guidelines for selection

### Service factors

#### Overview

##### Driven machine factor $f_1$

| Driven machines                             | Effective operating period under load in hours |            |      |
|---------------------------------------------|------------------------------------------------|------------|------|
|                                             | ≤ 0.5                                          | > 0.5 - 10 | > 10 |
| <b>Waste water</b>                          |                                                |            |      |
| • Thickeners (central drive)                | –                                              | –          | 1.2  |
| • Filter presses                            | 1.0                                            | 1.3        | 1.5  |
| • Flocculation apparatus                    | 0.8                                            | 1.0        | 1.3  |
| • Aerators                                  | –                                              | 1.8        | 2.0  |
| • Raking equipment                          | 1.0                                            | 1.2        | 1.3  |
| • Combined longitudinal and rotary rakes    | 1.0                                            | 1.3        | 1.5  |
| • Pre-thickeners                            | –                                              | 1.1        | 1.3  |
| • Water screw pumps                         | –                                              | 1.3        | 1.5  |
| • Water turbines                            | –                                              | –          | 2.0  |
| <b>Pumps</b>                                |                                                |            |      |
| • Centrifugal pumps                         | 1.0                                            | 1.2        | 1.3  |
| • Displacement pumps                        |                                                |            |      |
| - 1 piston                                  | 1.3                                            | 1.4        | 1.8  |
| - > 1 piston                                | 1.2                                            | 1.4        | 1.5  |
| <b>Excavators</b>                           |                                                |            |      |
| • Bucket conveyors                          | –                                              | 1.6        | 1.6  |
| • Dumping devices                           | –                                              | 1.3        | 1.5  |
| • Caterpillars                              | 1.2                                            | 1.6        | 1.8  |
| <b>Bucket wheels</b>                        |                                                |            |      |
| - as pick-up                                | –                                              | 1.7        | 1.7  |
| - for primitive material                    | –                                              | 2.2        | 2.2  |
| • Cutter heads                              | –                                              | 2.2        | 2.2  |
| • Swing gears <sup>1)</sup>                 | –                                              | 1.4        | 1.8  |
| <b>Plate bending machines <sup>1)</sup></b> | –                                              | 1.0        | 1.0  |
| <b>Chemical industry</b>                    |                                                |            |      |
| • Extruders                                 | –                                              | –          | 1.6  |
| • Dough mills                               | –                                              | 1.8        | 1.8  |
| • Rubber calendars                          | –                                              | 1.5        | 1.5  |
| • Cooling drums                             | –                                              | 1.3        | 1.4  |
| <b>Mixers for</b>                           |                                                |            |      |
| - uniform media                             | 1.0                                            | 1.3        | 1.4  |
| - non-uniform media                         | 1.4                                            | 1.6        | 1.7  |
| <b>Agitators for/media with</b>             |                                                |            |      |
| - uniform density                           | 1.0                                            | 1.3        | 1.5  |
| - non-uniform density                       | 1.2                                            | 1.4        | 1.6  |
| - non-uniform gas absorption                | 1.4                                            | 1.6        | 1.8  |
| • Toasters                                  | 1.0                                            | 1.3        | 1.5  |
| • Centrifuges                               | 1.0                                            | 1.2        | 1.3  |
| <b>Metal working mills</b>                  |                                                |            |      |
| • Plate tilters                             | 1.0                                            | 1.0        | 1.2  |
| • Ingot pushers                             | 1.0                                            | 1.2        | 1.2  |
| • Winding machines                          | –                                              | 1.6        | 1.6  |
| • Cooling bed transfer frames               | –                                              | 1.5        | 1.5  |
| • Roller straighteners                      | –                                              | 1.6        | 1.6  |
| <b>Roller tables</b>                        |                                                |            |      |
| - continuous                                | –                                              | 1.5        | 1.5  |
| - intermittent                              | –                                              | 2.0        | 2.0  |
| • Reversing tube mills                      | –                                              | 1.8        | 1.8  |
| <b>Shears</b>                               |                                                |            |      |
| - Continuous cut <sup>1)</sup>              | –                                              | 1.5        | 1.5  |
| - Crank type <sup>1)</sup>                  | 1.0                                            | 1.0        | 1.0  |
| • Continuous casting drivers <sup>1)</sup>  | –                                              | 1.4        | 1.4  |

| Driven machines                                              | Effective operating period under load in hours |            |                                                |
|--------------------------------------------------------------|------------------------------------------------|------------|------------------------------------------------|
|                                                              | ≤ 0.5                                          | > 0.5 - 10 | > 10                                           |
| <b>Rolls</b>                                                 |                                                |            |                                                |
| - Reversing blooming mills                                   | –                                              | 2.5        | 2.5                                            |
| - Reversing slabbing mills                                   | –                                              | 2.5        | 2.5                                            |
| - Reversing wire mills                                       | –                                              | 1.8        | 1.8                                            |
| - Reversing sheet mills                                      | –                                              | 2.0        | 2.0                                            |
| - Reversing plate mills                                      | –                                              | 1.8        | 1.8                                            |
| • Roll adjustment drives                                     | 0.9                                            | 1.0        | –                                              |
| <b>Conveyor systems</b>                                      |                                                |            |                                                |
| • Bucket conveyors                                           | –                                              | 1.4        | 1.5                                            |
| • Hauling winches                                            | 1.4                                            | 1.6        | 1.6                                            |
| • Conveyor systems                                           | –                                              | 1.5        | 1.8                                            |
| • Belt conveyors ≤ 150 kW                                    | 1.0                                            | 1.2        | 1.3                                            |
| • Belt conveyors ≥ 150 kW                                    | 1.1                                            | 1.3        | 1.4                                            |
| • Goods elevators <sup>1)</sup>                              | –                                              | 1.2        | 1.5                                            |
| • Passenger elevators <sup>1)</sup>                          | –                                              | 1.5        | 1.8                                            |
| • Apron conveyors                                            | –                                              | 1.2        | 1.5                                            |
| • Escalators                                                 | 1.0                                            | 1.2        | 1.4                                            |
| • Railway vehicles                                           | –                                              | 1.5        | –                                              |
| <b>Piston compressors</b>                                    | –                                              | 1.8        | 1.9                                            |
| <b>Crane systems <sup>2)</sup></b>                           |                                                |            |                                                |
| • Slewing gears <sup>1)</sup>                                |                                                |            | See designs for crane applications, page 3/13. |
| • Luffing gears                                              |                                                |            |                                                |
| • Traveling gears                                            |                                                |            |                                                |
| • Hoisting gears                                             |                                                |            |                                                |
| • Derricking jib cranes                                      |                                                |            |                                                |
| <b>Cooling towers</b>                                        |                                                |            |                                                |
| • Cooling tower fans                                         |                                                | On request |                                                |
| • Blowers (axial and radial)                                 | –                                              | 1.4        | 1.5                                            |
| <b>Food industry</b>                                         |                                                |            |                                                |
| <b>Cane sugar production</b>                                 |                                                |            |                                                |
| • Cane knives <sup>1)</sup>                                  | –                                              | –          | 1.7                                            |
| • Cane mill                                                  | –                                              | –          | 1.7                                            |
| <b>Beet sugar production</b>                                 |                                                |            |                                                |
| • Beet cosettes macerators                                   | –                                              | –          | 1.2                                            |
| • Extraction plants, mechanical refrigerators, juice boilers | –                                              | –          | 1.4                                            |
| • Sugar beet washing machines, sugar beet cutters            | –                                              | –          | 1.5                                            |
| <b>Paper machines</b>                                        |                                                |            |                                                |
| • all types <sup>3)</sup>                                    | –                                              | 1.8        | 2.0                                            |
| • Pulper drives (on request)                                 |                                                |            |                                                |
| <b>Centrifugal compressors</b>                               | –                                              | 1.4        | 1.5                                            |
| <b>Cable railways</b>                                        |                                                |            |                                                |
| • Material ropeways                                          | –                                              | 1.3        | 1.4                                            |
| • To-and-fro system aerial ropeways                          | –                                              | 1.6        | 1.8                                            |
| • T-bar lifts                                                | –                                              | 1.3        | 1.4                                            |
| • Continuous ropeways                                        | –                                              | 1.4        | 1.6                                            |
| <b>Cement industry</b>                                       |                                                |            |                                                |
| • Concrete mixers                                            | –                                              | 1.5        | 1.5                                            |
| • Breakers <sup>1)</sup>                                     | –                                              | 1.2        | 1.4                                            |
| • Rotary furnaces                                            | –                                              | –          | 2.0                                            |
| • Tube mills                                                 | –                                              | –          | 2.0                                            |
| • Separators                                                 | –                                              | 1.6        | 1.6                                            |
| • Roll crushers                                              | –                                              | –          | 2.0                                            |

**Note:** The listed load parameters are empirical values. Prerequisite for their application is that the machinery and equipment mentioned correspond to generally accepted design and load specifications. In case of deviations from standard conditions, please contact us. For driven machines which are not listed in this table, please refer to us.

Design for driven machine output  $P_2$

<sup>1)</sup> Designed power corresponding to max. torque

<sup>2)</sup> Load can be exactly classified, for instance, according to FEM 1001

<sup>3)</sup> A check for thermal capacity is absolutely essential

### Overview (continued)

#### Thermal factor $K_{th}$

| Driven machines                             | $K_{th}$ |
|---------------------------------------------|----------|
| <b>Waste water</b>                          |          |
| • Thickeners (central drive)                | 1        |
| • Filter presses                            | 0.85     |
| • Flocculation apparatus                    | 0.85     |
| • Aerators                                  | 1        |
| • Raking equipment                          | 0.85     |
| • Combined longitudinal and rotary rakes    | 0.85     |
| • Pre-thickeners                            | 0.85     |
| • Water screw pumps                         | 0.85     |
| • Water turbines                            | 0.85     |
| <u>Pumps</u>                                |          |
| • Centrifugal pumps                         | 1        |
| • Displacement pumps                        |          |
| - 1 piston                                  | 1        |
| - > 1 piston                                | 1        |
| <b>Excavators</b>                           |          |
| • Bucket conveyors                          | 0.85     |
| • Dumping devices                           | 0.85     |
| • Caterpillars                              | 0.85     |
| <u>Bucket wheels</u>                        |          |
| - as pick-up                                | 0.85     |
| - for primitive material                    | 0.85     |
| • Cutter heads                              | 0.85     |
| • Swing gears <sup>1)</sup>                 | 0.85     |
| <b>Plate bending machines</b> <sup>1)</sup> | 0.85     |
| <b>Chemical industry</b>                    |          |
| • Extruders                                 | 0.9      |
| • Dough mills                               | 0.85     |
| • Rubber calenders                          | 0.85     |
| • Cooling drums                             | 0.85     |
| <u>Mixers for</u>                           |          |
| - uniform media                             | 0.85     |
| - non-uniform media                         | 0.85     |
| <u>Agitators for/media with</u>             |          |
| - uniform density                           | 0.85     |
| - non-uniform density                       | 0.85     |
| - non-uniform gas absorption                | 0.85     |
| • Toasters                                  | 0.85     |
| • Centrifuges                               | 0.85     |
| <b>Metal working mills</b>                  |          |
| • Plate tilters                             | 0.85     |
| • Ingot pushers                             | 0.85     |
| • Winding machines                          | 0.85     |
| • Cooling bed transfer frames               | 0.85     |
| • Roller straighteners                      | 0.85     |
| <u>Roller tables</u>                        |          |
| - continuous                                | 0.85     |
| - intermittent                              | 0.85     |
| • Reversing tube mills                      | 0.85     |
| <u>Shears</u>                               |          |
| - Continuous cut <sup>1)</sup>              | 0.85     |
| - Crank type <sup>1)</sup>                  | 0.85     |
| • Continuous casting drivers <sup>1)</sup>  | 0.85     |
| <u>Rolls</u>                                |          |
| - Reversing blooming mills                  | 0.85     |
| - Reversing slabbing mills                  | 0.85     |
| - Reversing wire mills                      | 0.85     |
| - Reversing sheet mills                     | 0.85     |
| - Reversing plate mills                     | 0.85     |
| • Roll adjustment drives                    | 0.85     |

| Driven machines                                              | $K_{th}$      |
|--------------------------------------------------------------|---------------|
| <b>Conveyor systems</b>                                      |               |
| • Bucket conveyors                                           | 0.85          |
| • Hauling winches                                            | 0.85          |
| • Conveyor systems                                           | 0.85          |
| • Belt conveyors ≤ 150 kW                                    | 0.9           |
| • Belt conveyors ≥ 150 kW                                    | 0.9           |
| • Goods elevators <sup>1)</sup>                              | 0.85          |
| • Passenger elevators <sup>1)</sup>                          | 0.85          |
| • Apron conveyors                                            | 0.85          |
| • Escalators                                                 | 0.85          |
| • Railway vehicles                                           | 0.85          |
| <b>Piston compressors</b>                                    | 1             |
| <b>Crane systems</b> <sup>2)</sup>                           |               |
| • Slewing gears <sup>1)</sup>                                | 0.85          |
| • Luffing gears                                              | 0.85          |
| • Traveling gears                                            | 0.85          |
| • Hoisting gears                                             | 0.85          |
| • Derricking jib cranes                                      | 0.85          |
| <b>Cooling towers</b>                                        |               |
| • Cooling tower fans                                         | 1             |
| • Blowers (axial and radial)                                 | 1             |
| <b>Food industry</b>                                         |               |
| <u>Cane sugar production</u>                                 |               |
| • Cane knives <sup>1)</sup>                                  | 0.85          |
| • Cane mill                                                  | 0.85          |
| <u>Beet sugar production</u>                                 |               |
| • Beet cassettes macerators                                  | 0.85          |
| • Extraction plants, mechanical refrigerators, juice boilers | 0.85          |
| • Sugar beet washing machines, sugar beet cutters            | 0.85          |
| <b>Paper machines</b>                                        |               |
| • all types <sup>3)</sup>                                    | 1             |
| • Pulper drives (on request)                                 | 0.85          |
| <b>Centrifugal compressors</b>                               | 1             |
| <b>Cable railways</b>                                        |               |
| • Material ropeways                                          | 0.85          |
| • To-and-fro system aerial ropeways                          | 0.85          |
| • T-bar lifts                                                | 0.85          |
| • Continuous ropeways                                        | 0.85          |
| <b>Cement industry</b>                                       |               |
| • Concrete mixers                                            | 0.85          |
| • Breakers <sup>1)</sup>                                     | 0.9           |
| • Rotary furnaces                                            | 0.85          |
| • Tube mills                                                 | 0.85          |
| • Separators                                                 | 0.85          |
| • Roll crushers                                              | 0.85          |
| <b>Further applications</b>                                  | <sup>*)</sup> |
| <u>Exceptions</u>                                            | $K_{th}$      |
| Hazardous environment (ATEX)                                 | 1             |
| Installation deviating from horizontal mounting position     | 1             |
| H1 and B2 gear units                                         | 1             |

**Note:** The listed load parameters are empirical values. Prerequisite for their application is that the machinery and equipment mentioned correspond to generally accepted design and load specifications. In case of deviations from standard conditions, please contact us. For driven machines which are not listed in this table, please refer to us.

<sup>\*)</sup> To be evaluated individually, consultation required (0.85 ... 1).

Design for driven machine output  $P_2$

<sup>1)</sup> Designed power corresponding to max. torque

<sup>2)</sup> Load can be exactly classified, for instance, according to FEM 1001

<sup>3)</sup> A check for thermal capacity is absolutely essential

## Design of the gear units

### Guidelines for selection

#### Service factors

##### Overview (continued)

##### Prime mover factor $f_2$

|                                                                                 | Prime mover factor $f_2$ |
|---------------------------------------------------------------------------------|--------------------------|
| Electric motors, hydraulic motors, turbines                                     | 1.0                      |
| Piston-driven machines 4 - 6 cylinders, degree of uniformity 1 : 100 to 1 : 200 | 1.25                     |
| Piston-driven machines 1 - 3 cylinders, degree of uniformity 1 : 100            | 1.5                      |

##### Peak torque factor $f_3$

|                               | Peak torque factor $f_3$ |        |          |       |
|-------------------------------|--------------------------|--------|----------|-------|
|                               | Load peaks per hour      |        |          |       |
|                               | 1 - 5                    | 6 - 30 | 31 - 100 | > 100 |
| Steady direction of load      | 0.5                      | 0.65   | 0.7      | 0.85  |
| Alternating direction of load | 0.7                      | 0.95   | 1.10     | 1.25  |

##### Thermal factor $f_4$

(Gear units without auxiliary cooling or with fan)

|                                              | Ambient temperature |       |       |       |       |       |       |       |       |  |
|----------------------------------------------|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                                              | 10 °C               | 15 °C | 20 °C | 25 °C | 30 °C | 35 °C | 40 °C | 45 °C | 50 °C |  |
| $f_4$ for PAO oil filling                    | 1.11                | 1.06  | 1.00  | 0.94  | 0.88  | 0.82  | 0.75  | 0.69  | 0.63  |  |
| $f_4$ for gear units filled with mineral oil | 0.78                | 0.74  | 0.70  | 0.66  | 0.62  | 0.57  | 0.53  | 0.48  | 0.44  |  |

##### Thermal factor $f_5$

(For cooling with cooling coil, or with fan and cooling coil)

|                                              | Ambient temperature |       |       |       |       |       |       |       |       |  |
|----------------------------------------------|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                                              | 10 °C               | 15 °C | 20 °C | 25 °C | 30 °C | 35 °C | 40 °C | 45 °C | 50 °C |  |
| $f_5$ for PAO oil filling                    | 1.05                | 1.03  | 1.00  | 0.97  | 0.93  | 0.90  | 0.87  | 0.84  | 0.81  |  |
| $f_5$ for gear units filled with mineral oil | 0.81                | 0.79  | 0.77  | 0.75  | 0.72  | 0.69  | 0.67  | 0.65  | 0.62  |  |

##### Altitude factor $f_6$

(Gear units without auxiliary cooling or with fan)

|                       | Altitude (meters above sea level) |            |            |            |            |
|-----------------------|-----------------------------------|------------|------------|------------|------------|
|                       | Up to 1000                        | Up to 2000 | Up to 3000 | Up to 4000 | Up to 5000 |
| Altitude factor $f_6$ | 1.00                              | 0.95       | 0.90       | 0.85       | 0.80       |

##### Altitude factor $f_7$

(For cooling with cooling coil, or with fan and cooling coil)

|                       | Altitude (meters above sea level) |            |            |            |            |
|-----------------------|-----------------------------------|------------|------------|------------|------------|
|                       | Up to 1000                        | Up to 2000 | Up to 3000 | Up to 4000 | Up to 5000 |
| Altitude factor $f_7$ | 1.00                              | 0.98       | 0.96       | 0.94       | 0.92       |

**Overview**

The Flender gear units are an economical solution for industrial and indoor cranes. The options often required for crane applications, such as high speed and/or low speed shafts on both sides, are available in the standard portfolio.

Service factors for crane systems

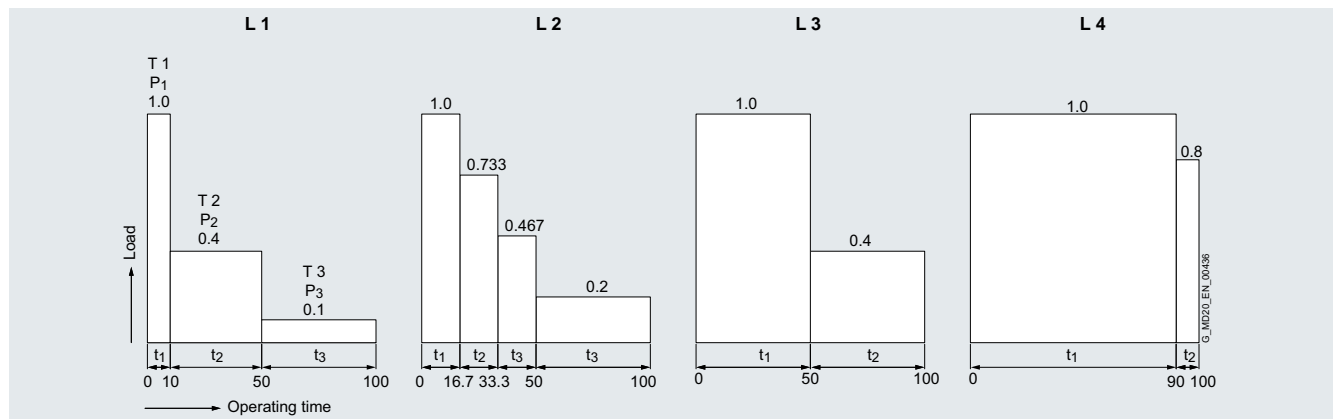
For the use of gear units with variable loads – such as those generally present in crane systems – an FEM classification is recommended. The driven machine factor  $f_1$  and the peak torque factor  $f_3$  corresponding to the mechanism group M1 to M8 – depending on the load (collective classes L1 to L4) and the duration of operation (operating classes T0 to T9) can be found in the tables below.

Regardless of the table values, a recalculation provides the basis for Flender for the right solution, because in many cases significantly smaller dimensioning is possible.

The cubic mean value K for the consideration of the load distribution for a variable load in a representative period of time "t" is calculated for:

$$K = \sqrt[3]{\left(\frac{P_1}{P}\right)^3 \cdot \frac{t_1}{t} + \left(\frac{P_n}{P}\right)^3 \cdot \frac{t_n}{t}}$$

For this,  $P_1 \dots P_n$  is the operating cycle in the time cycle  $t_1 \dots t_n$ .



| Classification of the driving gears into groups                                                          |                                             |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Crane type Designation                                                                                   | Type of driving gear                        |
|                                                                                                          | Hoisting gear      Retractable luffing gear |
| <b>Assembly cranes</b>                                                                                   | M2 ... M3      M1 ... M2                    |
| <b>Workshop cranes</b>                                                                                   | M6                                          |
| <b>Slipway cranes, dockyard cranes, disassembly cranes</b>                                               | M5 ... M6      M4 ... M5                    |
| <b>Harbor cranes (rotatable, on portal, etc.)</b><br><b>Floating cranes and floating shearing cranes</b> | M6 ... M7      M5 ... M6                    |

**Helical gear units Type H3 and H4 for crane applications (sizes 5 to 22)**

| Collective | Cubic mean value<br>k | Service factors   | Operating service life class  |                 |                 |                  |                   |                   |                    |                     |                     |         |      |    |      |    |      |    |      |    |      |    |
|------------|-----------------------|-------------------|-------------------------------|-----------------|-----------------|------------------|-------------------|-------------------|--------------------|---------------------|---------------------|---------|------|----|------|----|------|----|------|----|------|----|
|            |                       |                   | T0                            |                 | T1              |                  | T2                |                   | T3                 |                     | T4                  |         | T5   |    | T6   |    | T7   |    | T8   |    | T9   |    |
|            |                       |                   | Total operating time in hours |                 |                 |                  |                   |                   |                    |                     |                     |         |      |    |      |    |      |    |      |    |      |    |
|            |                       |                   | ≤ 100                         | > 200 ... ≤ 400 | > 400 ... ≤ 800 | > 800 ... ≤ 1600 | > 1600 ... ≤ 3200 | > 1600 ... ≤ 6400 | > 6400 ... ≤ 12500 | > 12500 ... ≤ 25000 | > 25000 ... ≤ 50000 | > 50000 |      |    |      |    |      |    |      |    |      |    |
| <b>L1</b>  | <b>0.42</b>           | $f_1$             | 1.1                           | M1              | 1.1             | M1               | 1.1               | M1                | 1.1                | M2                  | 1.1                 | M3      | 1.1  | M4 | 1.1  | M5 | 1.1  | M6 | 1.1  | M7 | 1.2  | M8 |
|            |                       | $f_{3,stat}^{1)}$ | 0.60                          |                 | 0.60            |                  | 0.60              |                   | 0.60               |                     | 0.60                |         | 0.60 |    | 0.60 |    | 0.60 |    | 0.60 |    | 0.60 |    |
| <b>L2</b>  | <b>0.51</b>           | $f_1$             | 1.1                           | M1              | 1.1             | M2               | 1.1               | M1                | 1.1                | M3                  | 1.1                 | M4      | 1.1  | M5 | 1.1  | M6 | 1.1  | M7 | 1.2  | M8 | 1.5  | M8 |
|            |                       | $f_{3,stat}^{1)}$ | 0.60                          |                 | 0.60            |                  | 0.60              |                   | 0.60               |                     | 0.60                |         | 0.60 |    | 0.60 |    | 0.60 |    | 0.60 |    | 0.60 |    |
| <b>L3</b>  | <b>0.64</b>           | $f_1$             | 1.1                           | M1              | 1.1             | M3               | 1.1               | M2                | 1.1                | M4                  | 1.1                 | M5      | 1.1  | M6 | 1.1  | M7 | 1.3  | M8 | 1.5  | M8 | 1.6  | M8 |
|            |                       | $f_{3,stat}^{1)}$ | 0.60                          |                 | 0.60            |                  | 0.60              |                   | 0.60               |                     | 0.60                |         | 0.60 |    | 0.60 |    | 0.60 |    | 0.60 |    | 0.60 |    |
| <b>L4</b>  | <b>0.81</b>           | $f_1$             | 1.1                           | M2              | 1.1             | M4               | 1.1               | M2                | 1.1                | M5                  | 1.1                 | M6      | 1.1  | M7 | 1.3  | M8 | 1.6  | M8 | 1.7  | M8 | 2.0  | M8 |
|            |                       | $f_{3,stat}^{1)}$ | 0.60                          |                 | 0.60            |                  | 0.60              |                   | 0.60               |                     | 0.60                |         | 0.60 |    | 0.60 |    | 0.60 |    | 0.60 |    | 0.60 |    |

A recalculation is absolutely required for the following gear units:  
 H3 size 6  $i = 31.5$  to 40  
 H3 size 11  $i = 25$  to 50  
 H3 size 12  $i = 31.5$  to 50  
 H3 size 19  $i = 22.4$   
 H3 size 20  $i = 25$

<sup>1)</sup> For H3 size 12, a recalculation is required.



# Design of the gear units

## Overview tables

### Type H1 – Nominal power ratings of gear unit sizes 3 to 19

#### Technical specifications

#### Nominal power ratings $P_{2N}$ (kW) type H1

| $i_N$ | $n_1$ | $n_2$ | Gear unit sizes |      |        |        |        |        |        |        |    |  |
|-------|-------|-------|-----------------|------|--------|--------|--------|--------|--------|--------|----|--|
|       |       |       | 3               | 5    | 7      | 9      | 11     | 13     | 15     | 17     | 19 |  |
| 1.25  | 1800  | 1440  | 437             | 1206 | 2291 * | 3724 * | –      | –      | –      | –      | –  |  |
|       | 1500  | 1200  | 364             | 1005 | 1909   | 3103   | –      | –      | –      | –      |    |  |
|       | 1200  | 960   | 291             | 804  | 1527   | 2482   | –      | –      | –      | –      |    |  |
|       | 1000  | 800   | 242             | 670  | 1273   | 2069   | –      | –      | –      | –      |    |  |
| 1.4   | 1800  | 1286  | 417             | 1104 | 2141 * | 3447 * | –      | –      | –      | –      |    |  |
|       | 1500  | 1071  | 347             | 919  | 1783   | 2870   | –      | –      | –      | –      |    |  |
|       | 1200  | 857   | 278             | 735  | 1426   | 2297   | –      | –      | –      | –      |    |  |
|       | 1000  | 714   | 231             | 613  | 1188   | 1913   | –      | –      | –      | –      |    |  |
| 1.6   | 1800  | 1125  | 388             | 1013 | 1920 * | 3192 * | *      | *      | –      | –      |    |  |
|       | 1500  | 938   | 324             | 844  | 1600   | 2661   | 4518   | *      | –      | –      |    |  |
|       | 1200  | 750   | 259             | 675  | 1280   | 2128   | 3612   | *      | –      | –      |    |  |
|       | 1000  | 625   | 215             | 562  | 1066   | 1773   | 3010   | 4410   | –      | –      |    |  |
| 1.8   | 1800  | 1000  | 282             | 921  | 1821 * | 2931 * | 4984 * | *      | –      | –      |    |  |
|       | 1500  | 833   | 235             | 767  | 1517   | 2442   | 4151   | *      | –      | –      |    |  |
|       | 1200  | 667   | 188             | 614  | 1215   | 1955   | 3324   | 4951 * | –      | –      |    |  |
|       | 1000  | 556   | 157             | 512  | 1013   | 1630   | 2771   | 4127   | –      | –      |    |  |
| 2     | 1800  | 900   | 263             | 885  | 1677 * | 2704 * | 4627 * | *      | *      | –      |    |  |
|       | 1500  | 750   | 219             | 738  | 1397   | 2253   | 3856   | *      | *      | –      |    |  |
|       | 1200  | 600   | 175             | 590  | 1118   | 1803   | 3084   | 4580 * | *      | –      |    |  |
|       | 1000  | 500   | 146             | 492  | 931    | 1502   | 2570   | 3816   | *      | –      |    |  |
| 2.24  | 1800  | 804   | 235             | 808  | 1498 * | 2416 * | 4259 * | *      | *      | –      |    |  |
|       | 1500  | 670   | 196             | 673  | 1248   | 2013   | 3549   | *      | *      | –      |    |  |
|       | 1200  | 536   | 157             | 538  | 999    | 1610   | 2839   | 4220 * | *      | –      |    |  |
|       | 1000  | 446   | 130             | 448  | 831    | 1340   | 2363   | 3511   | *      | –      |    |  |
| 2.5   | 1800  | 720   | 218             | 723  | 1341 * | 2163 * | 3814 * | *      | *      | –      |    |  |
|       | 1500  | 600   | 182             | 603  | 1118   | 1803   | 3179   | 4837 * | *      | –      |    |  |
|       | 1200  | 480   | 145             | 482  | 894    | 1442   | 2543   | 3870 * | *      | –      |    |  |
|       | 1000  | 400   | 121             | 402  | 745    | 1202   | 2119   | 3225   | 4900   | –      |    |  |
| 2.8   | 1800  | 643   | 208             | 646  | 1151 * | 1831 * | 3406 * | *      | *      | *      |    |  |
|       | 1500  | 536   | 173             | 538  | 959    | 1526   | 2839   | 4321 * | *      | *      |    |  |
|       | 1200  | 429   | 139             | 431  | 768    | 1221   | 2273   | 3458 * | *      | *      |    |  |
|       | 1000  | 357   | 115             | 358  | 639    | 1016   | 1891   | 2878   | 4485   | *      |    |  |
| 3.15  | 1800  | 571   | 185             | 573  | 1040   | 1680   | 2875 * | 4370 * | *      | *      |    |  |
|       | 1500  | 476   | 154             | 478  | 867    | 1400   | 2397   | 3643   | *      | *      |    |  |
|       | 1200  | 381   | 123             | 382  | 694    | 1121   | 1918   | 2916   | 4947 * | *      |    |  |
|       | 1000  | 317   | 102             | 318  | 577    | 932    | 1596   | 2426   | 4116   | *      |    |  |
| 3.55  | 1800  | 507   | 169             | 504  | 944    | 1518   | 2665 * | 3949 * | *      | *      |    |  |
|       | 1500  | 423   | 141             | 420  | 788    | 1266   | 2223   | 3295   | *      | *      |    |  |
|       | 1200  | 338   | 113             | 336  | 629    | 1012   | 1776   | 2633   | 4459 * | *      |    |  |
|       | 1000  | 282   | 94              | 280  | 525    | 844    | 1482   | 2196   | 3720   | *      |    |  |
| 4     | 1800  | 450   | 150             | 452  | 838    | 1352   | 2384 * | 3567 * | *      | *      |    |  |
|       | 1500  | 375   | 125             | 376  | 698    | 1126   | 1986   | 2972   | *      | *      |    |  |
|       | 1200  | 300   | 100             | 301  | 559    | 901    | 1589   | 2378   | 4083 * | *      |    |  |
|       | 1000  | 250   | 83              | 251  | 465    | 751    | 1324   | 1981   | 3403   | 4528   |    |  |
| 4.5   | 1800  | 400   | 104             | 322  | 661    | 1030   | 1926   | 2580 * | 4565 * | *      |    |  |
|       | 1500  | 333   | 87              | 268  | 550    | 857    | 1603   | 2147   | 3800   | *      |    |  |
|       | 1200  | 267   | 69              | 215  | 441    | 687    | 1286   | 1722   | 3047   | 4081 * |    |  |
|       | 1000  | 222   | 58              | 178  | 367    | 571    | 1069   | 1431   | 2533   | 3393   |    |  |
| 5     | 1800  | 360   | 90              | 271  | 520    | 885    | 1458   | 2197 * | 3581 * | 4674 * |    |  |
|       | 1500  | 300   | 75              | 226  | 433    | 738    | 1215   | 1831   | 2984   | 3895 * |    |  |
|       | 1200  | 240   | 60              | 180  | 346    | 590    | 972    | 1465   | 2387   | 3116 * |    |  |
|       | 1000  | 200   | 50              | 150  | 289    | 492    | 810    | 1220   | 1989   | 2596   |    |  |
| 5.6   | 1800  | 321   | 77              | 231  | 440    | 675    | 1226   | 1862 * | 3038 * | 3966 * |    |  |
|       | 1500  | 268   | 64              | 193  | 367    | 564    | 1024   | 1554   | 2536   | 3311 * |    |  |
|       | 1200  | 214   | 51              | 154  | 293    | 450    | 817    | 1241   | 2025   | 2644   |    |  |
|       | 1000  | 179   | 43              | 129  | 245    | 376    | 684    | 1038   | 1694   | 2211   |    |  |

Forced lubrication required for horizontal gear units  
\* on request



## Design of the gear units

### Overview tables

#### Type H1 – Thermal capacities $n_1 = 1000$ rpm

#### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type H1 $n_1 = 1000$ rpm

| $i_N$ |            | Gear unit sizes |       |       |       |        |        |        |       |      |
|-------|------------|-----------------|-------|-------|-------|--------|--------|--------|-------|------|
|       |            | 3               | 5     | 7     | 9     | 11     | 13     | 15     | 17    | 19   |
| 1.25  | $P_{GA}$   | 73.2            | *     | *     | *     | –      | –      | –      | –     | –    |
|       | $P_{GB}$   | 222             | 517   | 698   | 763   | –      | –      | –      | –     | –    |
|       | $P_{GC10}$ | 345             | 574   | 474   | 822   | –      | –      | –      | –     | –    |
|       | $P_{GD10}$ | 472             | 963   | 1117  | 1631  | –      | –      | –      | –     | –    |
| 1.4   | $P_{GA}$   | 77.7            | 83.5  | 167   | *     | –      | –      | –      | –     | –    |
|       | $P_{GB}$   | 222             | 525   | 728   | 827   | –      | –      | –      | –     | –    |
|       | $P_{GC10}$ | 335             | 581   | 514   | 880   | –      | –      | –      | –     | –    |
|       | $P_{GD10}$ | 458             | 957   | 1133  | 1656  | –      | –      | –      | –     | –    |
| 1.6   | $P_{GA}$   | 81.7            | 123.9 | *     | *     | *      | *      | –      | –     | –    |
|       | $P_{GB}$   | 218             | 550   | 790   | 883   | 1070   | 330    | –      | –     | –    |
|       | $P_{GC10}$ | 316             | 603   | 582   | 933   | 674    | 329    | –      | –     | –    |
|       | $P_{GD10}$ | 433             | 975   | 1184  | 1656  | 2047   | 1650   | –      | –     | –    |
| 1.8   | $P_{GA}$   | 93.5            | 138   | *     | *     | *      | *      | –      | –     | –    |
|       | $P_{GB}$   | 239             | 516   | 761   | 908   | 1168   | 778    | –      | –     | –    |
|       | $P_{GC10}$ | 337             | 565   | 572   | 955   | 820    | 254    | –      | –     | –    |
|       | $P_{GD10}$ | 464             | 897   | 1121  | 1637  | 2081   | 1956   | –      | –     | –    |
| 2.0   | $P_{GA}$   | 92.4            | 145   | *     | *     | *      | *      | *      | *     | *    |
|       | $P_{GB}$   | 231             | 502   | 750   | 919   | 1216   | 993    | 376    | *     | *    |
|       | $P_{GC10}$ | 319             | 550   | 575   | 965   | 919    | 509    | 376    | *     | *    |
|       | $P_{GD10}$ | 440             | 864   | 1092  | 1606  | 2079   | 2053   | 1529   | *     | *    |
| 2.24  | $P_{GA}$   | 90.5            | 147   | 171   | *     | *      | *      | *      | *     | *    |
|       | $P_{GB}$   | 221             | 480   | 715   | 908   | 1237   | 1155   | 745    | *     | *    |
|       | $P_{GC10}$ | 300             | 528   | 561   | 957   | 968    | 710    | 666    | *     | *    |
|       | $P_{GD10}$ | 415             | 822   | 1025  | 1553  | 2045   | 2092   | 1772   | *     | *    |
| 2.5   | $P_{GA}$   | 86.2            | 146   | 181   | *     | *      | *      | *      | *     | *    |
|       | $P_{GB}$   | 206             | 455   | 680   | 880   | 1253   | 1223   | 1068   | *     | *    |
|       | $P_{GC10}$ | 271             | 503   | 541   | 930   | 1011   | 858    | 824    | *     | *    |
|       | $P_{GD10}$ | 375             | 776   | 968   | 1480  | 2001   | 2081   | 1998   | *     | *    |
| 2.8   | $P_{GA}$   | 81.8            | 142.7 | 197.3 | *     | *      | *      | *      | *     | *    |
|       | $P_{GB}$   | 192             | 426.3 | 692.8 | 914   | 1238.4 | 1250.3 | 1209.5 | 690.6 | *    |
|       | $P_{GC10}$ | 247.8           | 473   | 556.4 | 969.3 | 1026.7 | 941.2  | 304.7  | 445.1 | *    |
|       | $P_{GD10}$ | 345             | 724   | 982   | 1516  | 1930   | 2040   | 2050   | 1694  | *    |
| 3.15  | $P_{GA}$   | 85.6            | 165   | 239   | 286   | 307    | *      | *      | *     | *    |
|       | $P_{GB}$   | 189             | 429   | 739   | 931   | 1354   | 1437   | 1480   | 1197  | *    |
|       | $P_{GC10}$ | 245             | 476   | 598   | 993   | 1157   | 1164   | 703    | 720   | *    |
|       | $P_{GD10}$ | 335             | 711   | 1056  | 1549  | 2033   | 2177   | 2281   | 2066  | *    |
| 3.55  | $P_{GA}$   | 79.9            | 164   | 230   | 284   | 351    | *      | *      | *     | *    |
|       | $P_{GB}$   | 174             | 418   | 681   | 869   | 1275   | 1400   | 1494   | 1352  | *    |
|       | $P_{GC10}$ | 220             | 466   | 559   | 933   | 1105   | 1163   | 824    | 330   | *    |
|       | $P_{GD10}$ | 303             | 693   | 973   | 1440  | 1893   | 2076   | 2216   | 2124  | *    |
| 4.0   | $P_{GA}$   | 72.9            | 152   | 217   | 259   | 365    | 385    | *      | *     | *    |
|       | $P_{GB}$   | 157             | 380   | 620   | 755   | 1189   | 1328   | 1498   | 1410  | 960  |
|       | $P_{GC10}$ | 194             | 428   | 514   | 816   | 1044   | 1128   | 924    | 587   | *    |
|       | $P_{GD10}$ | 268             | 631   | 883   | 1248  | 1751   | 1940   | 2140   | 2095  | *    |
| 4.5   | $P_{GA}$   | 85.5            | 163   | 239   | 325   | 386    | 474    | *      | *     | *    |
|       | $P_{GB}$   | 172             | 386   | 623   | 852   | 1112   | 1355   | 1704   | 1652  | 1424 |
|       | $P_{GC10}$ | 211             | 436   | 525   | 922   | 987    | 1166   | 1170   | 943   | *    |
|       | $P_{GD10}$ | 288             | 634   | 878   | 1379  | 1637   | 1961   | 2330   | 2281  | *    |
| 5.0   | $P_{GA}$   | 78.0            | 157   | 235   | 302   | 404    | 473    | 519    | *     | *    |
|       | $P_{GB}$   | 155             | 367   | 602   | 769   | 1098   | 1301   | 1734   | 1936  | 1820 |
|       | $P_{GC10}$ | 187             | 416   | 512   | 837   | 989    | 1127   | 1245   | 1208  | *    |
|       | $P_{GD10}$ | 256             | 604   | 849   | 1242  | 1612   | 1877   | 2330   | 2599  | *    |
| 5.6   | $P_{GA}$   | 70.5            | 143   | 214   | 298   | 391    | 459    | 536    | *     | *    |
|       | $P_{GB}$   | 139             | 328   | 538   | 738   | 1041   | 1185   | 1588   | 1837  | 2145 |
|       | $P_{GC10}$ | 164             | 375   | 462   | 812   | 943    | 1040   | 1168   | 1214  | *    |
|       | $P_{GD10}$ | 225             | 540   | 760   | 1196  | 1529   | 1701   | 2115   | 2423  | *    |

\* on request



### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type H1 $n_1 = 1200$ rpm

| $i_N$ |            | Gear unit sizes |       |      |      |      |      |      |      |      |
|-------|------------|-----------------|-------|------|------|------|------|------|------|------|
|       |            | 3               | 5     | 7    | 9    | 11   | 13   | 15   | 17   | 19   |
| 1.25  | $P_{GA}$   | 45.9            | 89.2  | *    | *    | –    | –    | –    | –    | –    |
|       | $P_{GB}$   | 234             | 508   | 686  | 599  | –    | –    | –    | –    | –    |
|       | $P_{GC10}$ | 368             | 500   | 306  | 502  | –    | –    | –    | –    | –    |
|       | $P_{GD10}$ | 524             | 978   | 1137 | 1604 | –    | –    | –    | –    | –    |
| 1.4   | $P_{GA}$   | 56.2            | 104.8 | *    | *    | –    | –    | –    | –    | –    |
|       | $P_{GB}$   | 236             | 530   | 730  | 729  | –    | –    | –    | –    | –    |
|       | $P_{GC10}$ | 359             | 522   | 376  | 635  | –    | –    | –    | –    | –    |
|       | $P_{GD10}$ | 510             | 985   | 1161 | 1661 | –    | –    | –    | –    | –    |
| 1.6   | $P_{GA}$   | 65.3            | *     | *    | *    | *    | *    | –    | –    | –    |
|       | $P_{GB}$   | 235             | 571   | 799  | 862  | 751  | 1146 | –    | –    | –    |
|       | $P_{GC10}$ | 341             | 561   | 467  | 781  | 65   | 346  | –    | –    | –    |
|       | $P_{GD10}$ | 485             | 1018  | 1217 | 1695 | 1911 | 826  | –    | –    | –    |
| 1.8   | $P_{GA}$   | 79.2            | *     | *    | *    | *    | *    | –    | –    | –    |
|       | $P_{GB}$   | 260             | 546   | 775  | 901  | 954  | 108  | –    | –    | –    |
|       | $P_{GC10}$ | 364             | 539   | 474  | 828  | 320  | 108  | –    | –    | –    |
|       | $P_{GD10}$ | 519             | 946   | 1158 | 1687 | 2009 | 1435 | –    | –    | –    |
| 2.0   | $P_{GA}$   | 80.4            | 92.2  | 128  | *    | *    | *    | *    | *    | *    |
|       | $P_{GB}$   | 252             | 536   | 780  | 915  | 1109 | *    | *    | *    | *    |
|       | $P_{GC10}$ | 346             | 531   | 501  | 853  | 518  | 487  | 1062 | *    | *    |
|       | $P_{GD10}$ | 494             | 916   | 1142 | 1657 | 2056 | 1724 | 539  | *    | *    |
| 2.24  | $P_{GA}$   | 80.4            | 108   | *    | *    | *    | *    | *    | *    | *    |
|       | $P_{GB}$   | 243             | 517   | 758  | 911  | 1188 | 767  | *    | *    | *    |
|       | $P_{GC10}$ | 326             | 515   | 514  | 858  | 670  | 41.4 | 1230 | *    | *    |
|       | $P_{GD10}$ | 466             | 875   | 1087 | 1604 | 2060 | 1904 | 1081 | *    | *    |
| 2.5   | $P_{GA}$   | 78.6            | 115   | *    | *    | *    | *    | *    | *    | *    |
|       | $P_{GB}$   | 226             | 494   | 728  | 905  | 1219 | 975  | *    | *    | *    |
|       | $P_{GC10}$ | 294             | 495   | 507  | 862  | 784  | 320  | 190  | *    | *    |
|       | $P_{GD10}$ | 422             | 829   | 1034 | 1546 | 2027 | 1970 | 1557 | *    | *    |
| 2.8   | $P_{GA}$   | 75.6            | 117   | 124  | 168  | *    | *    | *    | *    | *    |
|       | $P_{GB}$   | 211             | 465   | 747  | 954  | 1214 | 1120 | 751  | 1082 | *    |
|       | $P_{GC10}$ | 269             | 469   | 529  | 916  | 832  | 528  | 356  | 1081 | *    |
|       | $P_{GD10}$ | 389             | 776   | 1053 | 1595 | 1958 | 1982 | 1754 | 832  | *    |
| 3.15  | $P_{GA}$   | 82.9            | 153   | 201  | *    | *    | *    | *    | *    | *    |
|       | $P_{GB}$   | 210             | 476   | 809  | 996  | 1379 | 1363 | 1241 | 420  | *    |
|       | $P_{GC10}$ | 268             | 484   | 586  | 969  | 1023 | 899  | 658  | 420  | *    |
|       | $P_{GD10}$ | 380             | 771   | 1142 | 1647 | 2103 | 2163 | 2123 | 1545 | *    |
| 3.55  | $P_{GA}$   | 78.0            | 155   | 202  | 221  | *    | *    | *    | *    | *    |
|       | $P_{GB}$   | 194             | 465   | 750  | 939  | 1327 | 1351 | 1362 | 898  | *    |
|       | $P_{GC10}$ | 242             | 476   | 553  | 921  | 1019 | 944  | 329  | 209  | *    |
|       | $P_{GD10}$ | 343             | 752   | 1055 | 1539 | 1986 | 2079 | 2147 | 1807 | *    |
| 4.0   | $P_{GA}$   | 71.7            | 146   | 197  | 216  | 222  | *    | *    | *    | *    |
|       | $P_{GB}$   | 175             | 424   | 685  | 822  | 1257 | 1330 | 1396 | 1169 | 997  |
|       | $P_{GC10}$ | 213             | 438   | 513  | 814  | 990  | 979  | 557  | 440  | *    |
|       | $P_{GD10}$ | 304             | 686   | 961  | 1339 | 1855 | 1982 | 2093 | 1919 | *    |
| 4.5   | $P_{GA}$   | 87.7            | 163   | 231  | 297  | 315  | *    | *    | *    | *    |
|       | $P_{GB}$   | 194             | 434   | 698  | 941  | 1198 | 1396 | 1672 | 1500 | 831  |
|       | $P_{GC10}$ | 234             | 451   | 537  | 937  | 964  | 1075 | 914  | 458  | *    |
|       | $P_{GD10}$ | 329             | 693   | 964  | 1496 | 1751 | 2037 | 2347 | 2187 | *    |
| 5.0   | $P_{GA}$   | 80.4            | 156   | 231  | 284  | 354  | *    | *    | *    | *    |
|       | $P_{GB}$   | 176             | 412   | 675  | 853  | 1193 | 1355 | 1769 | 1818 | 1457 |
|       | $P_{GC10}$ | 207             | 431   | 525  | 857  | 981  | 1055 | 1084 | 772  | *    |
|       | $P_{GD10}$ | 292             | 660   | 933  | 1351 | 1734 | 1963 | 2403 | 2535 | *    |
| 5.6   | $P_{GA}$   | 72.9            | 143   | 213  | 286  | 350  | 370  | *    | *    | *    |
|       | $P_{GB}$   | 158             | 370   | 604  | 823  | 1136 | 1252 | 1660 | 1801 | 1835 |
|       | $P_{GC10}$ | 182             | 391   | 476  | 836  | 940  | 997  | 1073 | 941  | *    |
|       | $P_{GD10}$ | 257             | 594   | 837  | 1303 | 1647 | 1795 | 2219 | 2429 | *    |

\* on request

# Design of the gear units

## Overview tables

### Type H1 – Thermal capacities $n_1 = 1500$ rpm

#### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type H1 $n_1 = 1500$ rpm

| $i_N$ | Gear unit sizes | Gear unit sizes |      |      |      |      |      |      |      |    |
|-------|-----------------|-----------------|------|------|------|------|------|------|------|----|
|       |                 | 3               | 5    | 7    | 9    | 11   | 13   | 15   | 17   | 19 |
| 1.25  | $P_{GA}$        | *               | *    | *    | *    | –    | –    | –    | –    | –  |
|       | $P_{GB}$        | 238             | 494  | 562  | *    | –    | –    | –    | –    | –  |
|       | $P_{GC10}$      | 390             | 383  | 427  | *    | –    | –    | –    | –    | –  |
|       | $P_{GD10}$      | 587             | 996  | 1089 | 1369 | –    | –    | –    | –    | –  |
| 1.4   | $P_{GA}$        | *               | *    | *    | *    | –    | –    | –    | –    | –  |
|       | $P_{GB}$        | 245             | 524  | 662  | *    | –    | –    | –    | –    | –  |
|       | $P_{GC10}$      | 383             | 418  | *    | *    | –    | –    | –    | –    | –  |
|       | $P_{GD10}$      | 575             | 1009 | 1145 | 1530 | –    | –    | –    | –    | –  |
| 1.6   | $P_{GA}$        | *               | *    | *    | *    | *    | *    | –    | –    | –  |
|       | $P_{GB}$        | 250             | 572  | 784  | 657  | *    | *    | –    | –    | –  |
|       | $P_{GC10}$      | 368             | 467  | 220  | 334  | 318  | 227  | –    | –    | –  |
|       | $P_{GD10}$      | 550             | 1048 | 1239 | 1649 | 1285 | 1609 | –    | –    | –  |
| 1.8   | $P_{GA}$        | 45.2            | *    | *    | *    | *    | *    | –    | –    | –  |
|       | $P_{GB}$        | 281             | 557  | 781  | 778  | *    | *    | –    | –    | –  |
|       | $P_{GC10}$      | 393             | 464  | 281  | 478  | 339  | 652  | –    | –    | –  |
|       | $P_{GD10}$      | 591             | 983  | 1197 | 1682 | 1586 | 67   | –    | –    | –  |
| 2.0   | $P_{GA}$        | 52.4            | *    | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$        | 275             | 558  | 792  | 863  | 637  | *    | *    | *    | *  |
|       | $P_{GC10}$      | 375             | 473  | 339  | 587  | 581  | 869  | *    | *    | *  |
|       | $P_{GD10}$      | 564             | 963  | 1185 | 1682 | 1815 | *    | *    | *    | *  |
| 2.24  | $P_{GA}$        | 56.8            | *    | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$        | 266             | 548  | 779  | 895  | 865  | *    | *    | *    | *  |
|       | $P_{GC10}$      | 355             | 471  | 391  | 666  | 675  | 1042 | *    | *    | *  |
|       | $P_{GD10}$      | 534             | 929  | 1135 | 1655 | 1918 | *    | *    | *    | *  |
| 2.5   | $P_{GA}$        | 60.0            | *    | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$        | 250             | 530  | 758  | 897  | 1028 | *    | *    | *    | *  |
|       | $P_{GC10}$      | 321             | 462  | 407  | 704  | 217  | 223  | 653  | *    | *  |
|       | $P_{GD10}$      | 485             | 886  | 1088 | 1600 | 1956 | 1459 | *    | *    | *  |
| 2.8   | $P_{GA}$        | 60.0            | *    | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$        | 235             | 504  | 788  | 953  | 1117 | *    | *    | *    | *  |
|       | $P_{GC10}$      | 295             | 446  | 443  | 767  | 398  | 386  | 885  | *    | *  |
|       | $P_{GD10}$      | 447             | 835  | 1116 | 1655 | 1939 | 1686 | *    | *    | *  |
| 3.15  | $P_{GA}$        | 74.3            | 121  | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$        | 237             | 532  | 878  | 1033 | 1369 | 1133 | 350  | *    | *  |
|       | $P_{GC10}$      | 299             | 480  | 534  | 871  | 763  | 271  | 350  | 298  | *  |
|       | $P_{GD10}$      | 440             | 844  | 1229 | 1730 | 2159 | 2051 | 1501 | *    | *  |
| 3.55  | $P_{GA}$        | 71.3            | 130  | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$        | 220             | 523  | 825  | 993  | 1334 | 1226 | 814  | 762  | *  |
|       | $P_{GC10}$      | 269             | 477  | 518  | 854  | 809  | 484  | 813  | 761  | *  |
|       | $P_{GD10}$      | 399             | 826  | 1147 | 1633 | 2049 | 2031 | 1783 | *    | *  |
| 4.0   | $P_{GA}$        | 66.7            | 127  | 146  | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$        | 199             | 479  | 759  | 885  | 1274 | 1237 | 1099 | 282  | *  |
|       | $P_{GC10}$      | 237             | 442  | 492  | 774  | 816  | 628  | 250  | 282  | *  |
|       | $P_{GD10}$      | 354             | 756  | 1051 | 1437 | 1923 | 1956 | 1885 | *    | *  |
| 4.5   | $P_{GA}$        | 88.7            | 154  | 204  | 222  | *    | *    | *    | *    | *  |
|       | $P_{GB}$        | 225             | 496  | 792  | 1039 | 1257 | 1344 | 1546 | 1091 | *  |
|       | $P_{GC10}$      | 266             | 464  | 538  | 924  | 866  | 822  | 353  | 1090 | *  |
|       | $P_{GD10}$      | 386             | 770  | 1073 | 1629 | 1850 | 2036 | 2291 | *    | *  |
| 5.0   | $P_{GA}$        | 81.9            | 150  | 210  | 231  | *    | *    | *    | *    | *  |
|       | $P_{GB}$        | 204             | 472  | 768  | 950  | 1282 | 1325 | 1715 | 1546 | *  |
|       | $P_{GC10}$      | 235             | 445  | 532  | 857  | 920  | 843  | 692  | 405  | *  |
|       | $P_{GD10}$      | 344             | 734  | 1040 | 1482 | 1858 | 1981 | 2409 | 2346 | *  |
| 5.6   | $P_{GA}$        | 74.7            | 139  | 199  | 248  | *    | *    | *    | *    | *  |
|       | $P_{GB}$        | 183             | 425  | 689  | 925  | 1229 | 1271 | 1632 | 1622 | *  |
|       | $P_{GC10}$      | 206             | 405  | 485  | 847  | 894  | 857  | 781  | 277  | *  |
|       | $P_{GD10}$      | 302             | 662  | 935  | 1436 | 1773 | 1852 | 2243 | 2320 | *  |

\* on request

### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type H1 $n_1 = 1800$ rpm

| $i_N$ |            | Gear unit sizes |      |      |      |      |      |      |      |    |
|-------|------------|-----------------|------|------|------|------|------|------|------|----|
|       |            | 3               | 5    | 7    | 9    | 11   | 13   | 15   | 17   | 19 |
| 1.25  | $P_{GA}$   | *               | *    | *    | *    | –    | –    | –    | –    | –  |
|       | $P_{GB}$   | 230             | 418  | 317  | 874  | –    | –    | –    | –    | –  |
|       | $P_{GC10}$ | 396             | 192  | 184  | 352  | –    | –    | –    | –    | –  |
|       | $P_{GD10}$ | 637             | 969  | 907  | 840  | –    | –    | –    | –    | –  |
| 1.4   | $P_{GA}$   | *               | *    | *    | *    | –    | –    | –    | –    | –  |
|       | $P_{GB}$   | 240             | 483  | 463  | 962  | –    | –    | –    | –    | –  |
|       | $P_{GC10}$ | 389             | 256  | 239  | 452  | –    | –    | –    | –    | –  |
|       | $P_{GD10}$ | 624             | 998  | 1033 | 1117 | –    | –    | –    | –    | –  |
| 1.6   | $P_{GA}$   | *               | *    | *    | *    | *    | *    | –    | –    | –  |
|       | $P_{GB}$   | 253             | 555  | 667  | 277  | 759  | *    | –    | –    | –  |
|       | $P_{GC10}$ | 379             | 347  | 320  | 276  | 759  | –    | –    | –    | –  |
|       | $P_{GD10}$ | 602             | 1058 | 1186 | 1428 | *    | *    | –    | –    | –  |
| 1.8   | $P_{GA}$   | *               | *    | *    | *    | *    | *    | –    | –    | –  |
|       | $P_{GB}$   | 291             | 558  | 718  | 487  | 945  | *    | –    | –    | –  |
|       | $P_{GC10}$ | 411             | 380  | 344  | 486  | 945  | –    | –    | –    | –  |
|       | $P_{GD10}$ | 651             | 1007 | 1172 | 1557 | *    | *    | –    | –    | –  |
| 2.0   | $P_{GA}$   | *               | *    | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$   | 288             | 561  | 756  | 643  | 1090 | *    | *    | *    | *  |
|       | $P_{GC10}$ | 394             | 396  | 98   | 150  | 1089 | *    | *    | *    | *  |
|       | $P_{GD10}$ | 623             | 988  | 1182 | 1610 | *    | *    | *    | *    | *  |
| 2.24  | $P_{GA}$   | *               | *    | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$   | 282             | 552  | 774  | 752  | *    | *    | *    | *    | *  |
|       | $P_{GC10}$ | 374             | 401  | 209  | 311  | *    | *    | *    | *    | *  |
|       | $P_{GD10}$ | 591             | 953  | 1154 | 1620 | *    | *    | *    | *    | *  |
| 2.5   | $P_{GA}$   | *               | *    | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$   | 267             | 538  | 761  | 824  | *    | *    | *    | *    | *  |
|       | $P_{GC10}$ | 341             | 403  | 261  | 428  | *    | *    | *    | *    | *  |
|       | $P_{GD10}$ | 539             | 914  | 1114 | 1595 | 1694 | *    | *    | *    | *  |
| 2.8   | $P_{GA}$   | *               | *    | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$   | 253             | 520  | 790  | 905  | 799  | *    | *    | *    | *  |
|       | $P_{GC10}$ | 314             | 400  | 308  | 542  | 371  | 761  | *    | *    | *  |
|       | $P_{GD10}$ | 498             | 868  | 1143 | 1669 | 1785 | *    | *    | *    | *  |
| 3.15  | $P_{GA}$   | 60.3            | 66.3 | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$   | 260             | 570  | 903  | 1040 | 1252 | *    | *    | *    | *  |
|       | $P_{GC10}$ | 323             | 461  | 444  | 746  | 298  | *    | *    | *    | *  |
|       | $P_{GD10}$ | 495             | 898  | 1274 | 1778 | 2110 | *    | *    | *    | *  |
| 3.55  | $P_{GA}$   | 60.0            | 89.3 | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$   | 241             | 565  | 861  | 1002 | 1273 | 855  | *    | *    | *  |
|       | $P_{GC10}$ | 292             | 463  | 453  | 743  | 481  | 369  | 804  | *    | *  |
|       | $P_{GD10}$ | 449             | 883  | 1201 | 1680 | 2046 | 1824 | *    | *    | *  |
| 4.0   | $P_{GA}$   | 57.7            | 96.2 | *    | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$   | 219             | 521  | 804  | 901  | 1254 | 1022 | *    | *    | *  |
|       | $P_{GC10}$ | 258             | 434  | 446  | 690  | 593  | *    | *    | *    | *  |
|       | $P_{GD10}$ | 399             | 811  | 1110 | 1484 | 1951 | 1834 | *    | *    | *  |
| 4.5   | $P_{GA}$   | 87.0            | 137  | 157  | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$   | 253             | 548  | 859  | 1092 | 1266 | 1252 | *    | *    | *  |
|       | $P_{GC10}$ | 293             | 467  | 517  | 873  | 719  | *    | *    | *    | *  |
|       | $P_{GD10}$ | 439             | 834  | 1157 | 1715 | 1895 | 1990 | 2061 | *    | *  |
| 5.0   | $P_{GA}$   | 81.0            | 135  | 173  | *    | *    | *    | *    | *    | *  |
|       | $P_{GB}$   | 230             | 523  | 840  | 1012 | 1304 | 1245 | 1551 | *    | *  |
|       | $P_{GC10}$ | 260             | 449  | 519  | 827  | 797  | *    | *    | *    | *  |
|       | $P_{GD10}$ | 391             | 797  | 1126 | 1573 | 1912 | 1941 | 2305 | *    | *  |
| 5.6   | $P_{GA}$   | 74.6            | 129  | 172  | 183  | *    | *    | *    | *    | *  |
|       | $P_{GB}$   | 207             | 472  | 758  | 996  | 1263 | 1204 | 1561 | 1219 | *  |
|       | $P_{GC10}$ | 228             | 411  | 482  | 831  | 794  | 632  | 373  | 1218 | *  |
|       | $P_{GD10}$ | 345             | 719  | 1014 | 1536 | 1837 | 1824 | 2220 | *    | *  |

\* on request

## Design of the gear units

### Overview tables

#### Type H2 – Nominal power ratings of gear unit sizes 4 to 12

#### Technical specifications (continued)

#### Nominal power ratings $P_{2N}$ (kW) type H2

| $i_N$       | $n_1$ | $n_2$ | Gear unit sizes |     |     |     |     |      |     |      |      |  |
|-------------|-------|-------|-----------------|-----|-----|-----|-----|------|-----|------|------|--|
|             |       |       | 4               | 5   | 6   | 7   | 8   | 9    | 10  | 11   | 12   |  |
| <b>6.3</b>  | 1800  | 286   | 188             | 320 | –   | 607 | –   | 1009 | –   | 1775 | –    |  |
|             | 1500  | 238   | 157             | 266 | –   | 505 | –   | 839  | –   | 1477 | –    |  |
|             | 1200  | 190   | 125             | 212 | –   | 403 | –   | 670  | –   | 1179 | –    |  |
|             | 1000  | 159   | 104             | 178 | –   | 337 | –   | 561  | –   | 987  | –    |  |
| <b>7.1</b>  | 1800  | 254   | 172             | 297 | –   | 539 | –   | 896  | –   | 1577 | –    |  |
|             | 1500  | 211   | 143             | 247 | –   | 448 | –   | 744  | –   | 1310 | –    |  |
|             | 1200  | 169   | 115             | 198 | –   | 359 | –   | 596  | –   | 1049 | –    |  |
|             | 1000  | 141   | 95              | 165 | –   | 299 | –   | 497  | –   | 875  | –    |  |
| <b>8</b>    | 1800  | 225   | 157             | 263 | 318 | 478 | 603 | 793  | 994 | 1397 | 1738 |  |
|             | 1500  | 188   | 131             | 220 | 265 | 399 | 503 | 663  | 830 | 1167 | 1452 |  |
|             | 1200  | 150   | 105             | 175 | 212 | 318 | 402 | 529  | 662 | 931  | 1159 |  |
|             | 1000  | 125   | 87              | 146 | 176 | 265 | 335 | 441  | 552 | 776  | 965  |  |
| <b>9</b>    | 1800  | 200   | 140             | 234 | 301 | 425 | 536 | 705  | 883 | 1241 | 1545 |  |
|             | 1500  | 167   | 117             | 195 | 251 | 354 | 447 | 589  | 737 | 1036 | 1290 |  |
|             | 1200  | 133   | 93              | 155 | 200 | 282 | 356 | 469  | 587 | 825  | 1027 |  |
|             | 1000  | 111   | 77              | 130 | 167 | 235 | 297 | 391  | 490 | 689  | 857  |  |
| <b>10</b>   | 1800  | 180   | 118             | 197 | 271 | 382 | 482 | 635  | 795 | 1117 | 1390 |  |
|             | 1500  | 150   | 98              | 164 | 226 | 318 | 402 | 529  | 662 | 931  | 1159 |  |
|             | 1200  | 120   | 79              | 131 | 180 | 255 | 321 | 423  | 530 | 745  | 927  |  |
|             | 1000  | 100   | 65              | 109 | 150 | 212 | 268 | 352  | 441 | 620  | 772  |  |
| <b>11.2</b> | 1800  | 161   | 106             | 178 | 242 | 342 | 431 | 568  | 711 | 999  | 1244 |  |
|             | 1500  | 134   | 88              | 148 | 202 | 284 | 359 | 472  | 592 | 832  | 1035 |  |
|             | 1200  | 107   | 70              | 118 | 161 | 227 | 286 | 377  | 472 | 664  | 826  |  |
|             | 1000  | 89    | 58              | 98  | 134 | 189 | 238 | 314  | 393 | 552  | 687  |  |
| <b>12.5</b> | 1800  | 144   | 101             | 168 | 203 | 304 | 386 | 508  | 636 | 894  | 1112 |  |
|             | 1500  | 120   | 84              | 140 | 169 | 253 | 321 | 423  | 530 | 745  | 927  |  |
|             | 1200  | 96    | 67              | 112 | 135 | 203 | 257 | 338  | 424 | 596  | 741  |  |
|             | 1000  | 80    | 56              | 93  | 113 | 169 | 214 | 282  | 353 | 496  | 618  |  |
| <b>14</b>   | 1800  | 129   | 90              | 151 | 182 | 274 | 345 | 455  | 570 | 801  | 996  |  |
|             | 1500  | 107   | 75              | 125 | 151 | 227 | 286 | 377  | 472 | 664  | 826  |  |
|             | 1200  | 86    | 60              | 100 | 121 | 182 | 230 | 303  | 380 | 534  | 664  |  |
|             | 1000  | 71    | 49              | 83  | 100 | 150 | 190 | 250  | 313 | 440  | 548  |  |
| <b>16</b>   | 1800  | 113   | 79              | 132 | 170 | 240 | 301 | 398  | 499 | 701  | 873  |  |
|             | 1500  | 94    | 65              | 110 | 141 | 199 | 250 | 331  | 415 | 583  | 726  |  |
|             | 1200  | 75    | 52              | 87  | 113 | 159 | 200 | 264  | 331 | 465  | 579  |  |
|             | 1000  | 63    | 44              | 73  | 94  | 133 | 168 | 222  | 278 | 391  | 486  |  |
| <b>18</b>   | 1800  | 100   | 65              | 109 | 150 | 198 | 268 | 352  | 441 | 620  | 772  |  |
|             | 1500  | 83    | 54              | 91  | 125 | 165 | 222 | 292  | 366 | 515  | 641  |  |
|             | 1200  | 67    | 44              | 73  | 101 | 133 | 179 | 236  | 296 | 416  | 517  |  |
|             | 1000  | 56    | 36              | 61  | 84  | 111 | 150 | 197  | 247 | 347  | 432  |  |
| <b>20</b>   | 1800  | 90    | 62              | 105 | 135 | 179 | 241 | 317  | 397 | 558  | 695  |  |
|             | 1500  | 75    | 51              | 87  | 113 | 149 | 201 | 264  | 331 | 465  | 579  |  |
|             | 1200  | 60    | 41              | 70  | 90  | 119 | 160 | 211  | 265 | 372  | 463  |  |
|             | 1000  | 50    | 34              | 58  | 75  | 99  | 134 | 176  | 220 | 310  | 386  |  |
| <b>22.4</b> | 1800  | 80    | 52              | 91  | 113 | 165 | 201 | 277  | 353 | 488  | 618  |  |
|             | 1500  | 67    | 44              | 76  | 94  | 138 | 168 | 232  | 296 | 409  | 517  |  |
|             | 1200  | 54    | 35              | 61  | 76  | 111 | 135 | 187  | 238 | 329  | 417  |  |
|             | 1000  | 45    | 29              | 51  | 63  | 93  | 113 | 155  | 198 | 274  | 347  |  |
| <b>25</b>   | 1800  | 72    | –               | –   | 107 | –   | 180 | –    | 318 | –    | 556  |  |
|             | 1500  | 60    | –               | –   | 89  | –   | 150 | –    | 265 | –    | 463  |  |
|             | 1200  | 48    | –               | –   | 71  | –   | 120 | –    | 212 | –    | 370  |  |
|             | 1000  | 40    | –               | –   | 59  | –   | 100 | –    | 176 | –    | 309  |  |
| <b>28</b>   | 1800  | 64    | –               | –   | 93  | –   | 167 | –    | 278 | –    | 485  |  |
|             | 1500  | 54    | –               | –   | 78  | –   | 141 | –    | 235 | –    | 409  |  |
|             | 1200  | 43    | –               | –   | 62  | –   | 112 | –    | 187 | –    | 326  |  |
|             | 1000  | 36    | –               | –   | 52  | –   | 94  | –    | 156 | –    | 273  |  |

### Type H2 – Nominal power ratings of gear unit sizes 13 to 28

#### Technical specifications (continued)

#### Nominal power ratings $P_{2N}$ (kW) type H2

| $i_N$       | $n_1$ | $n_2$ | Gear unit sizes |      |        |        |        |        |        |        |        |        |      |      |    |    |    |    |
|-------------|-------|-------|-----------------|------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----|----|----|----|
|             |       |       | 13              | 14   | 15     | 16     | 17     | 18     | 19     | 20     | 21     | 22     | 23   | 24   | 25 | 26 | 27 | 28 |
| <b>6.3</b>  | 1800  | 286   | 2575            | –    | 4282 * | –      | *      | –      | *      | –      | *      | –      | *    | –    | *  | –  | *  | –  |
|             | 1500  | 238   | 2143            | –    | 3563   | –      | 4859   | –      | *      | –      | *      | –      | *    | –    | *  | –  | *  | –  |
|             | 1200  | 190   | 1710            | –    | 2845   | –      | 3879   | –      | *      | –      | *      | –      | *    | –    | *  | –  | *  | –  |
|             | 1000  | 159   | 1431            | –    | 2380   | –      | 3246   | –      | 4861   | –      | *      | –      | *    | –    | *  | –  | *  | –  |
| <b>7.1</b>  | 1800  | 254   | 2287            | –    | 3803 * | 4255 * | *      | *      | *      | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1500  | 211   | 1900            | –    | 3159   | 3535   | 4308   | *      | *      | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1200  | 169   | 1521            | –    | 2530   | 2831   | 3450   | 4070   | *      | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1000  | 141   | 1269            | –    | 2111   | 2362   | 2879   | 3395   | 4311   | 4946   | *      | *      | *    | *    | *  | *  | *  | *  |
| <b>8</b>    | 1800  | 225   | 2026            | 2520 | 3369 * | 3769 * | 4594 * | *      | *      | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1500  | 188   | 1692            | 2106 | 2815   | 3149   | 3838   | 4527   | *      | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1200  | 150   | 1350            | 1680 | 2246   | 2513   | 3062   | 3612   | 4586 * | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1000  | 125   | 1125            | 1400 | 1871   | 2094   | 2552   | 3010   | 3821   | 4384   | *      | *      | *    | *    | *  | *  | *  | *  |
| <b>9</b>    | 1800  | 200   | 1801            | 2240 | 2994 * | 3350 * | 4083 * | 4816 * | *      | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1500  | 167   | 1503            | 1871 | 2500   | 2797   | 3409   | 4021   | *      | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1200  | 133   | 1197            | 1490 | 1991   | 2228   | 2715   | 3203   | 4066 * | 4665 * | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1000  | 111   | 999             | 1243 | 1662   | 1859   | 2266   | 2673   | 3393   | 3893   | 4765   | *      | *    | *    | *  | *  | *  | *  |
| <b>10</b>   | 1800  | 180   | 1620            | 2016 | 2695 * | 3015 * | 3675 * | 4335 * | *      | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1500  | 150   | 1350            | 1680 | 2246   | 2513   | 3062   | 3612   | 4586 * | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1200  | 120   | 1080            | 1344 | 1796   | 2010   | 2450   | 2890   | 3669 * | 4209 * | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1000  | 100   | 900             | 1120 | 1497   | 1675   | 2041   | 2408   | 3057   | 3507   | 4293   | 4795   | *    | *    | *  | *  | *  | *  |
| <b>11.2</b> | 1800  | 161   | 1449            | 1803 | 2410 * | 2697 * | 3287 * | 3877 * | 4922 * | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1500  | 134   | 1206            | 1501 | 2006   | 2245   | 2736   | 3227   | 4097 * | 4700 * | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1200  | 107   | 963             | 1198 | 1602   | 1792   | 2184   | 2576   | 3271 * | 3753 * | 4593 * | *      | *    | *    | *  | *  | *  | *  |
|             | 1000  | 89    | 801             | 997  | 1332   | 1491   | 1817   | 2143   | 2721   | 3121   | 3820   | 4268   | 5376 | *    | *  | *  | *  | *  |
| <b>12.5</b> | 1800  | 144   | 1296            | 1613 | 2156 * | 2412 * | 2940 * | 3468 * | 4402 * | *      | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1500  | 120   | 1080            | 1344 | 1796   | 2010   | 2450   | 2890   | 3669   | 4209 * | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1200  | 96    | 864             | 1075 | 1437   | 1608   | 1960   | 2312   | 2935   | 3367 * | 4121 * | 4603 * | *    | *    | *  | *  | *  | *  |
|             | 1000  | 80    | 720             | 896  | 1197   | 1340   | 1633   | 1926   | 2446   | 2806   | 3434   | 3836   | 5026 | 5445 | *  | *  | *  | *  |
| <b>14</b>   | 1800  | 129   | 1161            | 1445 | 1931 * | 2161 * | 2634 * | 3106 * | 3944 * | 4525 * | *      | *      | *    | *    | *  | *  | *  | *  |
|             | 1500  | 107   | 963             | 1198 | 1602   | 1792   | 2184   | 2576   | 3271   | 3753   | 4593 * | *      | *    | *    | *  | *  | *  | *  |
|             | 1200  | 86    | 774             | 963  | 1287   | 1440   | 1756   | 2071   | 2629   | 3016   | 3692 * | 4124 * | *    | *    | *  | *  | *  | *  |
|             | 1000  | 71    | 639             | 795  | 1063   | 1189   | 1449   | 1709   | 2170   | 2490   | 3048   | 3405   | 4637 | 5049 | *  | *  | *  | *  |
| <b>16</b>   | 1800  | 113   | 1017            | 1266 | 1692 * | 1893 * | 2307 * | 2721 * | 3455 * | 3963 * | 4851 * | *      | *    | *    | *  | *  | *  | *  |
|             | 1500  | 94    | 846             | 1053 | 1407   | 1574   | 1919   | 2263   | 2874   | 3297   | 4035 * | 4508 * | *    | *    | *  | *  | *  | *  |
|             | 1200  | 75    | 675             | 840  | 1123   | 1256   | 1531   | 1806   | 2293   | 2630   | 3219 * | 3596 * | *    | *    | *  | *  | *  | *  |
|             | 1000  | 63    | 567             | 705  | 943    | 1055   | 1286   | 1517   | 1926   | 2209   | 2704   | 3021   | 4188 | 4548 | *  | *  | *  | *  |
| <b>18</b>   | 1800  | 100   | 900             | 1120 | 1497 * | 1675 * | 2041 * | 2408 * | 3057 * | 3507 * | 4293 * | 4795 * | *    | *    | *  | *  | *  | *  |
|             | 1500  | 83    | 747             | 929  | 1242   | 1390   | 1694   | 1998   | 2537   | 2911   | 3563 * | 3980 * | *    | *    | *  | *  | *  | *  |
|             | 1200  | 67    | 603             | 750  | 1003   | 1122   | 1368   | 1613   | 2048   | 2350   | 2876 * | 3213 * | *    | *    | *  | *  | *  | *  |
|             | 1000  | 56    | 504             | 627  | 838    | 938    | 1143   | 1348   | 1712   | 1964   | 2404   | 2685   | 3723 | 4218 | *  | *  | *  | *  |
| <b>20</b>   | 1800  | 90    | 810             | 1008 | 1347 * | 1507 * | 1837 * | 2167 * | 2751 * | 3157 * | 3863 * | 4316 * | *    | *    | *  | *  | *  | *  |
|             | 1500  | 75    | 675             | 840  | 1123   | 1256   | 1531   | 1806   | 2293   | 2630   | 3219 * | 3596 * | *    | *    | *  | *  | *  | *  |
|             | 1200  | 60    | 540             | 672  | 898    | 1005   | 1225   | 1445   | 1834   | 2104   | 2575 * | 2877 * | *    | *    | *  | *  | *  | *  |
|             | 1000  | 50    | 450             | 560  | 748    | 837    | 1020   | 1204   | 1528   | 1753   | 2146   | 2397   | 3063 | 3796 | *  | *  | *  | *  |
| <b>22.4</b> | 1800  | 80    | –               | 896  | –      | 1340 * | –      | 1926 * | –      | 2806 * | –      | 3836 * | –    | *    | –  | *  | –  | *  |
|             | 1500  | 67    | –               | 750  | –      | 1122   | –      | 1613   | –      | 2350   | –      | 3213 * | –    | *    | –  | *  | –  | *  |
|             | 1200  | 54    | –               | 605  | –      | 904    | –      | 1300   | –      | 1894   | –      | 2589 * | –    | *    | –  | *  | –  | *  |
|             | 1000  | 45    | –               | 504  | –      | 753    | –      | 1083   | –      | 1578   | –      | 2158   | –    | 3085 | –  | *  | –  | *  |
| <b>25</b>   | 1800  | 72    | –               | 806  | –      | –      | –      | –      | –      | –      | –      | –      | –    | –    | –  | –  | –  | –  |
|             | 1500  | 60    | –               | 672  | –      | –      | –      | –      | –      | –      | –      | –      | –    | –    | –  | –  | –  | –  |
|             | 1200  | 48    | –               | 537  | –      | –      | –      | –      | –      | –      | –      | –      | –    | –    | –  | –  | –  | –  |
|             | 1000  | 40    | –               | 448  | –      | –      | –      | –      | –      | –      | –      | –      | –    | –    | –  | –  | –  | –  |
| <b>28</b>   | 1800  | 64    | –               | –    | –      | –      | –      | –      | –      | –      | –      | –      | –    | –    | –  | –  | –  | –  |
|             | 1500  | 54    | –               | –    | –      | –      | –      | –      | –      | –      | –      | –      | –    | –    | –  | –  | –  | –  |
|             | 1200  | 43    | –               | –    | –      | –      | –      | –      | –      | –      | –      | –      | –    | –    | –  | –  | –  | –  |
|             | 1000  | 36    | –               | –    | –      | –      | –      | –      | –      | –      | –      | –      | –    | –    | –  | –  | –  | –  |

Forced lubrication required for horizontal gear units

\* on request

## Design of the gear units

### Overview tables

#### Type H2 – Nominal output torque of low speed shaft (LSS) gear unit sizes 3 to 12

##### Technical specifications (continued)

##### Nominal output torque of low speed shaft (LSS) $T_{2N}$ (kNm) type H2

| $i_N$ | Gear unit sizes |     |      |      |      |      |      |      |      |      | Type |
|-------|-----------------|-----|------|------|------|------|------|------|------|------|------|
|       | 3               | 4   | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   |      |
| 1.25  | 2.9             | –   | 8.0  | –    | 15.2 | –    | 24.7 | –    | –    | –    | H1   |
| 1.4   | 3.1             | –   | 8.2  | –    | 15.9 | –    | 25.6 | –    | –    | –    |      |
| 1.6   | 3.3             | –   | 8.6  | –    | 16.3 | –    | 27.1 | –    | 46.0 | –    |      |
| 1.8   | 2.7             | –   | 8.8  | –    | 17.4 | –    | 28.0 | –    | 47.6 | –    |      |
| 2     | 2.8             | –   | 9.4  | –    | 17.8 | –    | 28.7 | –    | 49.1 | –    |      |
| 2.24  | 2.8             | –   | 9.6  | –    | 17.8 | –    | 28.7 | –    | 50.6 | –    |      |
| 2.5   | 2.9             | –   | 9.6  | –    | 17.8 | –    | 28.7 | –    | 50.6 | –    |      |
| 2.8   | 3.1             | –   | 9.6  | –    | 17.1 | –    | 27.2 | –    | 50.6 | –    |      |
| 3.15  | 3.1             | –   | 9.6  | –    | 17.4 | –    | 28.1 | –    | 48.1 | –    |      |
| 3.55  | 3.2             | –   | 9.5  | –    | 18.8 | –    | 28.6 | –    | 50.2 | –    |      |
| 4     | 3.2             | –   | 9.6  | –    | 17.8 | –    | 28.7 | –    | 50.6 | –    |      |
| 4.5   | 2.5             | –   | 7.7  | –    | 15.8 | –    | 24.6 | –    | 46.0 | –    |      |
| 5     | 2.4             | –   | 7.2  | –    | 13.8 | –    | 23.5 | –    | 38.7 | –    |      |
| 5.6   | 2.3             | –   | 6.9  | –    | 13.1 | –    | 20.1 | –    | 36.5 | –    |      |
| 6.3   | –               | 6.3 | 10.7 | –    | 20.3 | –    | 33.7 | –    | 59.3 | –    |      |
| 7.1   | –               | 6.5 | 11.2 | –    | 20.3 | –    | 33.7 | –    | 59.3 | –    |      |
| 8     | –               | 6.7 | 11.2 | 13.5 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 9     | –               | 6.7 | 11.2 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 10    | –               | 6.3 | 10.5 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 11.2  | –               | 6.3 | 10.6 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 12.5  | –               | 6.7 | 11.2 | 13.5 | 20.2 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 14    | –               | 6.7 | 11.2 | 13.5 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 16    | –               | 6.7 | 11.2 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 18    | –               | 6.3 | 10.5 | 14.4 | 19.0 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 20    | –               | 6.6 | 11.2 | 14.4 | 19.0 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 22.4  | –               | 6.3 | 10.9 | 13.5 | 19.8 | 24   | 33.1 | 42.2 | 58.3 | 73.8 |      |
| 25    | –               | –   | 11.6 | 14.3 | 21.7 | 24   | 35.7 | 42.2 | 63.5 | 73.8 |      |
| 28    | –               | –   | 11.6 | 13.9 | 21.7 | 25   | 35.7 | 41.6 | 63.5 | 72.5 |      |
| 31.5  | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 35.5  | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 40    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 45    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 50    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 56    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 63    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 71    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 80    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 90    | –               | –   | 11.6 | 15.5 | 20.0 | 27.2 | 34.5 | 43.8 | 63.5 | 77.2 |      |
| 100   | –               | –   | –    | 14.5 | 21.7 | 27.2 | 35.7 | 43.8 | 61.6 | 77.2 |      |
| 112   | –               | –   | –    | 15.0 | 21.7 | 25.2 | 35.7 | 42.8 | 61.6 | 77.2 |      |
| 125   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 140   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 160   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 180   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 200   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 224   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 250   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 280   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 315   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 355   | –               | –   | –    | –    | 19.6 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 400   | –               | –   | –    | –    | –    | 27.2 | –    | 44.2 | –    | 78.0 |      |
| 450   | –               | –   | –    | –    | –    | 25.3 | –    | 42.8 | –    | 78.0 |      |

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 Type H4, see page 3/38

### Type H2 – Nominal output torque of low speed shaft (LSS) gear unit sizes 13 to 28

#### Technical specifications (continued)

#### Nominal output torque of low speed shaft (LSS) $T_{2N}$ (kNm) type H2

| $i_N$ | Gear unit sizes |     |      |     |     |     |     |     |     |     |     |     |     |      |      |      | Type |    |
|-------|-----------------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|----|
|       | 13              | 14  | 15   | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  | 25  | 26   | 27   | 28   |      |    |
| 1.25  | –               | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    | H1 |
| 1.4   | –               | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 1.6   | 67.4            | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 1.8   | 70.9            | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2     | 72.9            | –   | 129  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2.24  | 75.2            | –   | 130  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2.5   | 77.0            | –   | 117  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2.8   | 77.0            | –   | 120  | –   | 171 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 3.15  | 73.1            | –   | 124  | –   | 173 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 3.55  | 74.4            | –   | 126  | –   | 173 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 4     | 75.7            | –   | 130  | –   | 173 | –   | 245 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 4.5   | 61.6            | –   | 109  | –   | 146 | –   | 216 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 5     | 58.3            | –   | 95.0 | –   | 124 | –   | 174 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 5.6   | 55.4            | –   | 90.4 | –   | 118 | –   | 150 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 6.3   | 86.0            | –   | 143  | –   | 195 | –   | 292 | –   | 410 | –   | 500 | –   | 800 | –    | –    | –    | H2   |    |
| 7.1   | 86.0            | –   | 143  | –   | 195 | 230 | 292 | 335 | 410 | 458 | 520 | 565 | 825 | 910  | –    | –    |      |    |
| 8     | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 540 | 585 | 860 | 940  | 1055 | –    |      |    |
| 9     | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 555 | 610 | 860 | 985  | 1085 | 1205 |      |    |
| 10    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 575 | 625 | 860 | 1020 | 1130 | 1240 |      |    |
| 11.2  | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 575 | 645 | 860 | 1030 | 1175 | 1285 |      |    |
| 12.5  | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 600 | 650 | 860 | 1030 | 1210 | 1340 |      |    |
| 14    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 620 | 675 | 860 | 1030 | 1230 | 1375 |      |    |
| 16    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 640 | 695 | 860 | 1030 | 1230 | 1400 |      |    |
| 18    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 20    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 585 | 725 | 800 | 1030 | 1150 | 1400 |      |    |
| 22.4  | 88.0            | 107 | 153  | 160 | 200 | 230 | 300 | 335 | 420 | 458 | 600 | 660 | 860 | 910  | 1230 | 1310 |      |    |
| 25    | 88.0            | 107 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 620 | 675 | 860 | 1030 | 1230 | 1400 |      |    |
| 28    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 |      |    |
| 31.5  | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 35.5  | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 40    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 45    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 50    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 56    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 63    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 71    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 80    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 90    | 88.0            | 109 | 153  | 173 | 200 | 240 | 290 | 345 | 410 | 470 | 585 | 725 | 800 | 1030 | 1150 | 1400 |      |    |
| 100   | 90.7            | 109 | 153  | 173 | 200 | 226 | 300 | 335 | 420 | 465 | 640 | 660 | 860 | 910  | 1230 | 1310 |      |    |
| 112   | 90.7            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 125   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 140   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 160   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 180   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 200   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 224   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 250   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 280   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 315   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 355   | 90.7            | 113 | 140  | 173 | –   | 240 | 290 | 345 | 410 | 470 | 585 | 725 | 800 | 1030 | 1150 | 1400 |      |    |
| 400   | –               | 113 | –    | 158 | –   | 223 | –   | 335 | –   | 465 | –   | 660 | –   | 910  | –    | 1310 |      |    |
| 450   | –               | 113 | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | H4   |    |

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## Design of the gear units

### Overview tables

#### Type H3 – Nominal power ratings of gear unit sizes 5 to 12

##### Technical specifications (continued)

##### Nominal power ratings $P_{2N}$ (kW) type H3

| $i_N$       | $n_1$ | $n_2$ | Gear unit sizes |    |     |     |     |     |     |     |   |
|-------------|-------|-------|-----------------|----|-----|-----|-----|-----|-----|-----|---|
|             |       |       | 5               | 6  | 7   | 8   | 9   | 10  | 11  | 12  |   |
| <b>22.4</b> | 1800  | 80    | –               | –  | –   | –   | –   | –   | –   | –   | – |
|             | 1500  | 67    | –               | –  | –   | –   | –   | –   | –   | –   | – |
|             | 1200  | 54    | –               | –  | –   | –   | –   | –   | –   | –   | – |
|             | 1000  | 45    | –               | –  | –   | –   | –   | –   | –   | –   | – |
| <b>25</b>   | 1800  | 72    | 87              | –  | 163 | –   | –   | 269 | –   | 478 | – |
|             | 1500  | 60    | 72              | –  | 136 | –   | –   | 224 | –   | 398 | – |
|             | 1200  | 48    | 58              | –  | 109 | –   | –   | 179 | –   | 319 | – |
|             | 1000  | 40    | 48              | –  | 90  | –   | –   | 149 | –   | 265 | – |
| <b>28</b>   | 1800  | 64    | 77              | –  | 145 | –   | –   | 239 | –   | 425 | – |
|             | 1500  | 54    | 65              | –  | 122 | –   | –   | 201 | –   | 359 | – |
|             | 1200  | 43    | 52              | –  | 97  | –   | –   | 160 | –   | 285 | – |
|             | 1000  | 36    | 43              | –  | 81  | –   | –   | 134 | –   | 239 | – |
| <b>31.5</b> | 1800  | 57    | 69              | 92 | 129 | 162 | 213 | 261 | 379 | 460 |   |
|             | 1500  | 48    | 58              | 77 | 109 | 136 | 179 | 220 | 319 | 388 |   |
|             | 1200  | 38    | 46              | 61 | 86  | 108 | 142 | 174 | 252 | 307 |   |
|             | 1000  | 32    | 38              | 51 | 72  | 91  | 119 | 146 | 212 | 258 |   |
| <b>35.5</b> | 1800  | 51    | 61              | 82 | 115 | 145 | 190 | 233 | 339 | 412 |   |
|             | 1500  | 42    | 51              | 68 | 95  | 119 | 157 | 192 | 279 | 339 |   |
|             | 1200  | 34    | 41              | 55 | 77  | 96  | 127 | 155 | 226 | 274 |   |
|             | 1000  | 28    | 34              | 45 | 63  | 79  | 104 | 128 | 186 | 226 |   |
| <b>40</b>   | 1800  | 45    | 54              | 73 | 102 | 128 | 168 | 206 | 299 | 363 |   |
|             | 1500  | 38    | 46              | 61 | 86  | 108 | 142 | 174 | 252 | 307 |   |
|             | 1200  | 30    | 36              | 48 | 68  | 85  | 112 | 137 | 199 | 242 |   |
|             | 1000  | 25    | 30              | 40 | 56  | 71  | 93  | 114 | 166 | 202 |   |
| <b>45</b>   | 1800  | 40    | 48              | 64 | 90  | 113 | 149 | 183 | 265 | 323 |   |
|             | 1500  | 33    | 40              | 53 | 74  | 93  | 123 | 151 | 219 | 266 |   |
|             | 1200  | 27    | 32              | 43 | 61  | 76  | 100 | 123 | 179 | 218 |   |
|             | 1000  | 22    | 26              | 35 | 49  | 62  | 82  | 100 | 146 | 177 |   |
| <b>50</b>   | 1800  | 36    | 43              | 58 | 81  | 102 | 134 | 165 | 239 | 291 |   |
|             | 1500  | 30    | 36              | 48 | 68  | 85  | 112 | 137 | 199 | 242 |   |
|             | 1200  | 24    | 29              | 38 | 54  | 68  | 89  | 110 | 159 | 194 |   |
|             | 1000  | 20    | 24              | 32 | 45  | 56  | 74  | 91  | 132 | 161 |   |
| <b>56</b>   | 1800  | 32    | 38              | 51 | 72  | 91  | 119 | 146 | 212 | 258 |   |
|             | 1500  | 27    | 32              | 43 | 61  | 76  | 100 | 123 | 179 | 218 |   |
|             | 1200  | 21    | 25              | 34 | 47  | 59  | 78  | 96  | 139 | 169 |   |
|             | 1000  | 17.9  | 21              | 29 | 40  | 50  | 66  | 82  | 119 | 144 |   |
| <b>63</b>   | 1800  | 29    | 35              | 47 | 65  | 82  | 108 | 133 | 192 | 234 |   |
|             | 1500  | 24    | 29              | 38 | 54  | 68  | 89  | 110 | 159 | 194 |   |
|             | 1200  | 19    | 23              | 30 | 43  | 54  | 71  | 87  | 126 | 153 |   |
|             | 1000  | 15.9  | 19              | 25 | 36  | 45  | 59  | 72  | 105 | 128 |   |
| <b>71</b>   | 1800  | 25    | 30              | 40 | 56  | 71  | 93  | 114 | 166 | 202 |   |
|             | 1500  | 21    | 25              | 34 | 47  | 59  | 78  | 96  | 139 | 169 |   |
|             | 1200  | 16.9  | 20              | 27 | 38  | 48  | 63  | 77  | 112 | 136 |   |
|             | 1000  | 14.1  | 17              | 22 | 32  | 40  | 52  | 64  | 93  | 113 |   |
| <b>80</b>   | 1800  | 23    | 27              | 37 | 52  | 65  | 85  | 105 | 152 | 185 |   |
|             | 1500  | 18.8  | 22              | 30 | 42  | 53  | 70  | 86  | 125 | 151 |   |
|             | 1200  | 15    | 18              | 24 | 34  | 42  | 56  | 68  | 99  | 121 |   |
|             | 1000  | 12.5  | 15              | 20 | 28  | 35  | 46  | 57  | 83  | 101 |   |
| <b>90</b>   | 1800  | 20    | 24              | 32 | 41  | 56  | 72  | 91  | 132 | 161 |   |
|             | 1500  | 16.7  | 20              | 27 | 34  | 47  | 60  | 76  | 111 | 134 |   |
|             | 1200  | 13.3  | 16              | 21 | 27  | 37  | 48  | 60  | 88  | 107 |   |
|             | 1000  | 11.1  | 13              | 18 | 23  | 31  | 40  | 50  | 73  | 89  |   |
| <b>100</b>  | 1800  | 18    | –               | 27 | –   | 51  | –   | 82  | –   | 145 |   |
|             | 1500  | 15    | –               | 22 | –   | 42  | –   | 68  | –   | 121 |   |
|             | 1200  | 12    | –               | 18 | –   | 34  | –   | 55  | –   | 97  |   |
|             | 1000  | 10    | –               | 15 | –   | 28  | –   | 45  | –   | 80  |   |
| <b>112</b>  | 1800  | 16.1  | –               | 25 | –   | 42  | –   | 72  | –   | 130 |   |
|             | 1500  | 13.4  | –               | 21 | –   | 35  | –   | 60  | –   | 108 |   |
|             | 1200  | 10.7  | –               | 16 | –   | 28  | –   | 47  | –   | 86  |   |
|             | 1000  | 8.9   | –               | 13 | –   | 23  | –   | 39  | –   | 71  |   |



## Design of the gear units

### Overview tables

#### Type H3 – Nominal output torque of low speed shaft (LSS) gear unit sizes 3 to 12

##### Technical specifications (continued)

##### Nominal output torque of low speed shaft (LSS) $T_{2N}$ (kNm) type H3

| $i_N$ | Gear unit sizes |     |      |      |      |      |      |      |      |      | Type |
|-------|-----------------|-----|------|------|------|------|------|------|------|------|------|
|       | 3               | 4   | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   |      |
| 1.25  | 2.9             | –   | 8.0  | –    | 15.2 | –    | 24.7 | –    | –    | –    | H1   |
| 1.4   | 3.1             | –   | 8.2  | –    | 15.9 | –    | 25.6 | –    | –    | –    |      |
| 1.6   | 3.3             | –   | 8.6  | –    | 16.3 | –    | 27.1 | –    | 46.0 | –    |      |
| 1.8   | 2.7             | –   | 8.8  | –    | 17.4 | –    | 28.0 | –    | 47.6 | –    |      |
| 2     | 2.8             | –   | 9.4  | –    | 17.8 | –    | 28.7 | –    | 49.1 | –    |      |
| 2.24  | 2.8             | –   | 9.6  | –    | 17.8 | –    | 28.7 | –    | 50.6 | –    |      |
| 2.5   | 2.9             | –   | 9.6  | –    | 17.8 | –    | 28.7 | –    | 50.6 | –    |      |
| 2.8   | 3.1             | –   | 9.6  | –    | 17.1 | –    | 27.2 | –    | 50.6 | –    |      |
| 3.15  | 3.1             | –   | 9.6  | –    | 17.4 | –    | 28.1 | –    | 48.1 | –    |      |
| 3.55  | 3.2             | –   | 9.5  | –    | 18.8 | –    | 28.6 | –    | 50.2 | –    |      |
| 4     | 3.2             | –   | 9.6  | –    | 17.8 | –    | 28.7 | –    | 50.6 | –    |      |
| 4.5   | 2.5             | –   | 7.7  | –    | 15.8 | –    | 24.6 | –    | 46.0 | –    |      |
| 5     | 2.4             | –   | 7.2  | –    | 13.8 | –    | 23.5 | –    | 38.7 | –    |      |
| 5.6   | 2.3             | –   | 6.9  | –    | 13.1 | –    | 20.1 | –    | 36.5 | –    |      |
| 6.3   | –               | 6.3 | 10.7 | –    | 20.3 | –    | 33.7 | –    | 59.3 | –    |      |
| 7.1   | –               | 6.5 | 11.2 | –    | 20.3 | –    | 33.7 | –    | 59.3 | –    |      |
| 8     | –               | 6.7 | 11.2 | 13.5 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 9     | –               | 6.7 | 11.2 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 10    | –               | 6.3 | 10.5 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 11.2  | –               | 6.3 | 10.6 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 12.5  | –               | 6.7 | 11.2 | 13.5 | 20.2 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 14    | –               | 6.7 | 11.2 | 13.5 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 16    | –               | 6.7 | 11.2 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 18    | –               | 6.3 | 10.5 | 14.4 | 19.0 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 20    | –               | 6.6 | 11.2 | 14.4 | 19.0 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 22.4  | –               | 6.3 | 10.9 | 13.5 | 19.8 | 24   | 33.1 | 42.2 | 58.3 | 73.8 |      |
| 25    | –               | –   | 11.6 | 14.3 | 21.7 | 24   | 35.7 | 42.2 | 63.5 | 73.8 |      |
| 28    | –               | –   | 11.6 | 13.9 | 21.7 | 25   | 35.7 | 41.6 | 63.5 | 72.5 |      |
| 31.5  | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 35.5  | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 40    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 45    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 50    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 56    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 63    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 71    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 80    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 90    | –               | –   | 11.6 | 15.5 | 20   | 27.2 | 34.5 | 43.8 | 63.5 | 77.2 |      |
| 100   | –               | –   | –    | 14.5 | 21.7 | 27.2 | 35.7 | 43.8 | 61.6 | 77.2 |      |
| 112   | –               | –   | –    | 15   | 21.7 | 25.2 | 35.7 | 42.8 | 61.6 | 77.2 |      |
| 125   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 140   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 160   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 180   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 200   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 224   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 250   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 280   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 315   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 355   | –               | –   | –    | –    | 19.6 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 400   | –               | –   | –    | –    | –    | 27.2 | –    | 44.2 | –    | 78.0 |      |
| 450   | –               | –   | –    | –    | –    | 25.3 | –    | 42.8 | –    | 78.0 |      |

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**Type H3 – Nominal output torque of low speed shaft (LSS) gear unit sizes 13 to 28**
**Technical specifications (continued)**
**Nominal output torque of low speed shaft (LSS)  $T_{2N}$  (kNm) type H3**

| $i_N$ | Gear unit sizes |     |      |     |     |     |     |     |     |     |     |     |     |      |      |      | Type |    |
|-------|-----------------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|----|
|       | 13              | 14  | 15   | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  | 25  | 26   | 27   | 28   |      |    |
| 1.25  | –               | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    | H1 |
| 1.4   | –               | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 1.6   | 67.4            | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 1.8   | 70.9            | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2     | 72.9            | –   | 129  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2.24  | 75.2            | –   | 130  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2.5   | 77.0            | –   | 117  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2.8   | 77.0            | –   | 120  | –   | 171 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 3.15  | 73.1            | –   | 124  | –   | 173 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 3.55  | 74.4            | –   | 126  | –   | 173 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 4     | 75.7            | –   | 130  | –   | 173 | –   | 245 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 4.5   | 61.6            | –   | 109  | –   | 146 | –   | 216 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 5     | 58.3            | –   | 95.0 | –   | 124 | –   | 174 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 5.6   | 55.4            | –   | 90.4 | –   | 118 | –   | 150 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 6.3   | 86.0            | –   | 143  | –   | 195 | –   | 292 | –   | 410 | –   | 500 | –   | 800 | –    | –    | –    | –    |    |
| 7.1   | 86.0            | –   | 143  | –   | 195 | 230 | 292 | 335 | 410 | 458 | 520 | 565 | 825 | 910  | –    | –    | –    |    |
| 8     | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 540 | 585 | 860 | 940  | 1055 | –    | –    |    |
| 9     | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 555 | 610 | 860 | 985  | 1085 | 1205 | –    |    |
| 10    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 575 | 625 | 860 | 1020 | 1130 | 1240 | –    |    |
| 11.2  | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 575 | 645 | 860 | 1030 | 1175 | 1285 | –    |    |
| 12.5  | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 600 | 650 | 860 | 1030 | 1210 | 1340 | –    |    |
| 14    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 620 | 675 | 860 | 1030 | 1230 | 1375 | –    |    |
| 16    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 640 | 695 | 860 | 1030 | 1230 | 1400 | –    |    |
| 18    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 20    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 585 | 725 | 800 | 1030 | 1150 | 1400 | –    |    |
| 22.4  | 88.0            | 107 | 153  | 160 | 200 | 230 | 300 | 335 | 420 | 458 | 600 | 660 | 860 | 910  | 1230 | 1310 | –    |    |
| 25    | 88.0            | 107 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 620 | 675 | 860 | 1030 | 1230 | 1400 | –    |    |
| 28    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 31.5  | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 35.5  | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 40    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 45    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 50    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 56    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 63    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 71    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 80    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 90    | 88.0            | 109 | 153  | 173 | 200 | 240 | 290 | 345 | 410 | 470 | 585 | 725 | 800 | 1030 | 1150 | 1400 | –    |    |
| 100   | 90.7            | 109 | 153  | 173 | 200 | 226 | 300 | 335 | 420 | 465 | 640 | 660 | 860 | 910  | 1230 | 1310 | –    |    |
| 112   | 90.7            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 125   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 140   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 160   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 180   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 200   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 224   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 250   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 280   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 315   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 355   | 90.7            | 113 | 140  | 173 | –   | 240 | 290 | 345 | 410 | 470 | 585 | 725 | 800 | 1030 | 1150 | 1400 | –    |    |
| 400   | –               | 113 | –    | 158 | –   | 223 | –   | 335 | –   | 465 | –   | 660 | –   | 910  | –    | 1310 | –    |    |
| 450   | –               | 113 | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |

Type H1, see page 3/15  
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## Design of the gear units

### Overview tables

#### Type H4 – Nominal power ratings of gear unit sizes 7 to 12

##### Technical specifications (continued)

##### Nominal power ratings $P_{2N}$ (kW) type H4

| $i_N$ | $n_1$ | $n_2$ | Gear unit sizes |     |    |     |     |     |
|-------|-------|-------|-----------------|-----|----|-----|-----|-----|
|       |       |       | 7               | 8   | 9  | 10  | 11  | 12  |
| 100   | 1800  | 18    | 40              | –   | 67 | –   | 116 | –   |
|       | 1500  | 15    | 34              | –   | 56 | –   | 96  | –   |
|       | 1200  | 12    | 27              | –   | 44 | –   | 77  | –   |
|       | 1000  | 10    | 22              | –   | 37 | –   | 64  | –   |
| 112   | 1800  | 16.1  | 36              | –   | 60 | –   | 103 | –   |
|       | 1500  | 13.4  | 30              | –   | 50 | –   | 86  | –   |
|       | 1200  | 10.7  | 24              | –   | 39 | –   | 69  | –   |
|       | 1000  | 8.9   | 20              | –   | 33 | –   | 57  | –   |
| 125   | 1800  | 14.4  | 32              | 41  | 53 | 66  | 92  | 117 |
|       | 1500  | 12    | 27              | 34  | 44 | 55  | 77  | 98  |
|       | 1200  | 9.6   | 21              | 27  | 35 | 44  | 61  | 78  |
|       | 1000  | 8     | 18              | 22  | 29 | 37  | 51  | 65  |
| 140   | 1800  | 12.9  | 29              | 36  | 48 | 59  | 83  | 105 |
|       | 1500  | 10.7  | 24              | 30  | 39 | 49  | 69  | 87  |
|       | 1200  | 8.6   | 19              | 24  | 32 | 39  | 55  | 70  |
|       | 1000  | 7.1   | 16              | 20  | 26 | 32  | 45  | 57  |
| 160   | 1800  | 11.3  | 25              | 32  | 42 | 52  | 72  | 92  |
|       | 1500  | 9.4   | 21              | 26  | 35 | 43  | 60  | 76  |
|       | 1200  | 7.5   | 17              | 21  | 28 | 34  | 48  | 61  |
|       | 1000  | 6.3   | 14              | 17  | 23 | 29  | 40  | 51  |
| 180   | 1800  | 10    | 22              | 28  | 37 | 46  | 64  | 81  |
|       | 1500  | 8.3   | 18              | 23  | 31 | 38  | 53  | 67  |
|       | 1200  | 6.7   | 15              | 19  | 25 | 31  | 43  | 54  |
|       | 1000  | 5.6   | 12              | 15  | 20 | 25  | 36  | 45  |
| 200   | 1800  | 9     | 20              | 25  | 33 | 41  | 58  | 73  |
|       | 1500  | 7.5   | 17              | 21  | 28 | 34  | 48  | 61  |
|       | 1200  | 6     | 13              | 17  | 22 | 27  | 38  | 49  |
|       | 1000  | 5     | 11              | 14  | 18 | 23  | 32  | 40  |
| 224   | 1800  | 8     | 18              | 22  | 29 | 37  | 51  | 65  |
|       | 1500  | 6.7   | 15              | 19  | 25 | 31  | 43  | 54  |
|       | 1200  | 5.4   | 12              | 15  | 20 | 24  | 34  | 44  |
|       | 1000  | 4.5   | 10              | 12  | 16 | 20  | 29  | 36  |
| 250   | 1800  | 7.2   | 16              | 20  | 26 | 33  | 46  | 58  |
|       | 1500  | 6     | 13              | 17  | 22 | 27  | 38  | 49  |
|       | 1200  | 4.8   | 10              | 13  | 17 | 22  | 30  | 39  |
|       | 1000  | 4     | 9               | 11  | 14 | 18  | 25  | 32  |
| 280   | 1800  | 6.4   | 14              | 18  | 23 | 29  | 41  | 52  |
|       | 1500  | 5.4   | 12              | 15  | 20 | 24  | 34  | 44  |
|       | 1200  | 4.3   | 9.7             | 12  | 16 | 19  | 27  | 35  |
|       | 1000  | 3.6   | 8.1             | 10  | 13 | 16  | 23  | 29  |
| 315   | 1800  | 5.7   | 12              | 16  | 21 | 26  | 36  | 46  |
|       | 1500  | 4.8   | 10              | 13  | 17 | 22  | 30  | 39  |
|       | 1200  | 3.8   | 8.6             | 10  | 14 | 17  | 24  | 31  |
|       | 1000  | 3.2   | 7.2             | 9.1 | 11 | 14  | 20  | 26  |
| 355   | 1800  | 5.1   | 10              | 14  | 19 | 23  | 32  | 41  |
|       | 1500  | 4.2   | 8.6             | 11  | 15 | 19  | 27  | 34  |
|       | 1200  | 3.4   | 6.9             | 9.6 | 12 | 15  | 21  | 27  |
|       | 1000  | 2.8   | 5.7             | 7.9 | 10 | 12  | 18  | 22  |
| 400   | 1800  | 4.5   | –               | 12  | –  | 20  | –   | 36  |
|       | 1500  | 3.8   | –               | 10  | –  | 17  | –   | 31  |
|       | 1200  | 3     | –               | 8.5 | –  | 13  | –   | 24  |
|       | 1000  | 2.5   | –               | 7.1 | –  | 11  | –   | 20  |
| 450   | 1800  | 4     | –               | 10  | –  | 17  | –   | 32  |
|       | 1500  | 3.3   | –               | 8.7 | –  | 14  | –   | 26  |
|       | 1200  | 2.7   | –               | 7.1 | –  | 12  | –   | 22  |
|       | 1000  | 2.2   | –               | 5.8 | –  | 9.8 | –   | 17  |



## Design of the gear units

### Overview tables

#### Type H4 – Nominal output torque of low speed shaft (LSS) gear unit sizes 3 to 12

##### Technical specifications (continued)

##### Nominal output torque of low speed shaft (LSS) $T_{2N}$ (kNm) type H4

| $i_N$ | Gear unit sizes |     |      |      |      |      |      |      |      |      | Type |
|-------|-----------------|-----|------|------|------|------|------|------|------|------|------|
|       | 3               | 4   | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   |      |
| 1.25  | 2.9             | –   | 8.0  | –    | 15.2 | –    | 24.7 | –    | –    | –    | H1   |
| 1.4   | 3.1             | –   | 8.2  | –    | 15.9 | –    | 25.6 | –    | –    | –    |      |
| 1.6   | 3.3             | –   | 8.6  | –    | 16.3 | –    | 27.1 | –    | 46.0 | –    |      |
| 1.8   | 2.7             | –   | 8.8  | –    | 17.4 | –    | 28.0 | –    | 47.6 | –    |      |
| 2     | 2.8             | –   | 9.4  | –    | 17.8 | –    | 28.7 | –    | 49.1 | –    |      |
| 2.24  | 2.8             | –   | 9.6  | –    | 17.8 | –    | 28.7 | –    | 50.6 | –    |      |
| 2.5   | 2.9             | –   | 9.6  | –    | 17.8 | –    | 28.7 | –    | 50.6 | –    |      |
| 2.8   | 3.1             | –   | 9.6  | –    | 17.1 | –    | 27.2 | –    | 50.6 | –    |      |
| 3.15  | 3.1             | –   | 9.6  | –    | 17.4 | –    | 28.1 | –    | 48.1 | –    |      |
| 3.55  | 3.2             | –   | 9.5  | –    | 18.8 | –    | 28.6 | –    | 50.2 | –    |      |
| 4     | 3.2             | –   | 9.6  | –    | 17.8 | –    | 28.7 | –    | 50.6 | –    |      |
| 4.5   | 2.5             | –   | 7.7  | –    | 15.8 | –    | 24.6 | –    | 46.0 | –    |      |
| 5     | 2.4             | –   | 7.2  | –    | 13.8 | –    | 23.5 | –    | 38.7 | –    |      |
| 5.6   | 2.3             | –   | 6.9  | –    | 13.1 | –    | 20.1 | –    | 36.5 | –    |      |
| 6.3   | –               | 6.3 | 10.7 | –    | 20.3 | –    | 33.7 | –    | 59.3 | –    |      |
| 7.1   | –               | 6.5 | 11.2 | –    | 20.3 | –    | 33.7 | –    | 59.3 | –    |      |
| 8     | –               | 6.7 | 11.2 | 13.5 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 9     | –               | 6.7 | 11.2 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 10    | –               | 6.3 | 10.5 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 11.2  | –               | 6.3 | 10.6 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 12.5  | –               | 6.7 | 11.2 | 13.5 | 20.2 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 14    | –               | 6.7 | 11.2 | 13.5 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 16    | –               | 6.7 | 11.2 | 14.4 | 20.3 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 18    | –               | 6.3 | 10.5 | 14.4 | 19.0 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 20    | –               | 6.6 | 11.2 | 14.4 | 19.0 | 25.6 | 33.7 | 42.2 | 59.3 | 73.8 |      |
| 22.4  | –               | 6.3 | 10.9 | 13.5 | 19.8 | 24   | 33.1 | 42.2 | 58.3 | 73.8 |      |
| 25    | –               | –   | 11.6 | 14.3 | 21.7 | 24   | 35.7 | 42.2 | 63.5 | 73.8 |      |
| 28    | –               | –   | 11.6 | 13.9 | 21.7 | 25   | 35.7 | 41.6 | 63.5 | 72.5 |      |
| 31.5  | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 35.5  | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 40    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 45    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 50    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 56    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 63    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 71    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 80    | –               | –   | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |      |
| 90    | –               | –   | 11.6 | 15.5 | 20.0 | 27.2 | 34.5 | 43.8 | 63.5 | 77.2 |      |
| 100   | –               | –   | –    | 14.5 | 21.7 | 27.2 | 35.7 | 43.8 | 61.6 | 77.2 |      |
| 112   | –               | –   | –    | 15.0 | 21.7 | 25.2 | 35.7 | 42.8 | 61.6 | 77.2 |      |
| 125   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 140   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 160   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 180   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 200   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 224   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 250   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 280   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 315   | –               | –   | –    | –    | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 355   | –               | –   | –    | –    | 19.6 | 27.2 | 35.7 | 44.2 | 61.6 | 78.0 |      |
| 400   | –               | –   | –    | –    | –    | 27.2 | –    | 44.2 | –    | 78.0 |      |
| 450   | –               | –   | –    | –    | –    | 25.3 | –    | 42.8 | –    | 78.0 |      |

Type H1, see page 3/15  
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 Type H3, see page 3/30

## Type H4 – Nominal output torque of low speed shaft (LSS) gear unit sizes 13 to 28

## Technical specifications (continued)

Nominal output torque of low speed shaft (LSS)  $T_{2N}$  (kNm) type H4

| $i_N$ | Gear unit sizes |     |      |     |     |     |     |     |     |     |     |     |     |      |      |      | Type |    |
|-------|-----------------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|----|
|       | 13              | 14  | 15   | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  | 25  | 26   | 27   | 28   |      |    |
| 1.25  | –               | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    | H1 |
| 1.4   | –               | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 1.6   | 67.4            | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 1.8   | 70.9            | –   | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2     | 72.9            | –   | 129  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2.24  | 75.2            | –   | 130  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2.5   | 77.0            | –   | 117  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 2.8   | 77.0            | –   | 120  | –   | 171 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 3.15  | 73.1            | –   | 124  | –   | 173 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 3.55  | 74.4            | –   | 126  | –   | 173 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 4     | 75.7            | –   | 130  | –   | 173 | –   | 245 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 4.5   | 61.6            | –   | 109  | –   | 146 | –   | 216 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 5     | 58.3            | –   | 95.0 | –   | 124 | –   | 174 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 5.6   | 55.4            | –   | 90.4 | –   | 118 | –   | 150 | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 6.3   | 86.0            | –   | 143  | –   | 195 | –   | 292 | –   | 410 | –   | 500 | –   | 800 | –    | –    | –    | H2   |    |
| 7.1   | 86.0            | –   | 143  | –   | 195 | 230 | 292 | 335 | 410 | 458 | 520 | 565 | 825 | 910  | –    | –    |      |    |
| 8     | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 540 | 585 | 860 | 940  | 1055 | –    |      |    |
| 9     | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 555 | 610 | 860 | 985  | 1085 | 1205 |      |    |
| 10    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 575 | 625 | 860 | 1020 | 1130 | 1240 |      |    |
| 11.2  | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 575 | 645 | 860 | 1030 | 1175 | 1285 |      |    |
| 12.5  | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 600 | 650 | 860 | 1030 | 1210 | 1340 |      |    |
| 14    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 620 | 675 | 860 | 1030 | 1230 | 1375 |      |    |
| 16    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 640 | 695 | 860 | 1030 | 1230 | 1400 |      |    |
| 18    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 20    | 86.0            | 107 | 143  | 160 | 195 | 230 | 292 | 335 | 410 | 458 | 585 | 725 | 800 | 1030 | 1150 | 1400 |      |    |
| 22.4  | 88.0            | 107 | 153  | 160 | 200 | 230 | 300 | 335 | 420 | 458 | 600 | 660 | 860 | 910  | 1230 | 1310 |      |    |
| 25    | 88.0            | 107 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 620 | 675 | 860 | 1030 | 1230 | 1400 |      |    |
| 28    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 |      |    |
| 31.5  | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 35.5  | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 40    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 45    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 50    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 56    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 63    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 71    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 80    | 88.0            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 90    | 88.0            | 109 | 153  | 173 | 200 | 240 | 290 | 345 | 410 | 470 | 585 | 725 | 800 | 1030 | 1150 | 1400 |      |    |
| 100   | 90.7            | 109 | 153  | 173 | 200 | 226 | 300 | 335 | 420 | 465 | 640 | 660 | 860 | 910  | 1230 | 1310 |      |    |
| 112   | 90.7            | 109 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 125   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 140   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 160   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 180   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 200   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 224   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 250   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 280   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 315   | 90.7            | 113 | 153  | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 |      |    |
| 355   | 90.7            | 113 | 140  | 173 | –   | 240 | 290 | 345 | 410 | 470 | 585 | 725 | 800 | 1030 | 1150 | 1400 |      |    |
| 400   | –               | 113 | –    | 158 | –   | 223 | –   | 335 | –   | 465 | –   | 660 | –   | 910  | –    | 1310 |      |    |
| 450   | –               | 113 | –    | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    |      |    |

Type H1, see page 3/15  
Type H2, see page 3/22  
Type H3, see page 3/30

## Design of the gear units

### Overview tables

#### Type H4 – Thermal capacities $n_1 = 1000 \text{ rpm}$ , $n_1 = 1200 \text{ rpm}$

##### Technical specifications (continued)

##### Thermal capacities $P_G$ (kW) type H4 $n_1 = 1000 \text{ rpm}$

| $i_N$ |          | Gear unit sizes |      |      |      |      |      |      |      |     |     |     |     |     |     |     |     |
|-------|----------|-----------------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
|       |          | 7               | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| 100   | $P_{GA}$ | 50.6            | –    | 71.1 | –    | 104  | –    | 143  | –    | 201 | –   | 220 | –   | 286 | –   | 375 | –   |
| 112   | $P_{GA}$ | 48.6            | –    | 68.2 | –    | 104  | –    | 140  | –    | 192 | 208 | 210 | 227 | 274 | 294 | 366 | 383 |
| 125   | $P_{GA}$ | 47.2            | 54.3 | 66.2 | 72.1 | 99.6 | 116  | 136  | 153  | 186 | 198 | 203 | 217 | 267 | 282 | 358 | 374 |
| 140   | $P_{GA}$ | 45.0            | 52.1 | 64.1 | 69.2 | 96.5 | 115  | 132  | 150  | 179 | 191 | 196 | 209 | 258 | 274 | 344 | 365 |
| 160   | $P_{GA}$ | 43.3            | 50.6 | 60.7 | 67.2 | 91.9 | 110  | 125  | 146  | 172 | 185 | 188 | 202 | 249 | 266 | 332 | 350 |
| 180   | $P_{GA}$ | 41.8            | 48.3 | 58.3 | 65.0 | 88.6 | 107  | 120  | 141  | 169 | 178 | 184 | 195 | 240 | 256 | 327 | 338 |
| 200   | $P_{GA}$ | 40.6            | 46.5 | 56.8 | 61.6 | 85.0 | 102  | 118  | 134  | 166 | 174 | 180 | 190 | 234 | 246 | 330 | 333 |
| 224   | $P_{GA}$ | 37.9            | 44.8 | 54.1 | 59.2 | 81.3 | 98.1 | 113  | 129  | 155 | 171 | 168 | 185 | 225 | 240 | 315 | 335 |
| 250   | $P_{GA}$ | 35.9            | 43.5 | 51.3 | 57.5 | 76.4 | 94.0 | 107  | 126  | 148 | 160 | 160 | 174 | 215 | 231 | 300 | 321 |
| 280   | $P_{GA}$ | 34.7            | 40.6 | 49.5 | 54.9 | 73.0 | 89.9 | 104  | 121  | 143 | 152 | 156 | 165 | 207 | 221 | 291 | 305 |
| 315   | $P_{GA}$ | 33.8            | 38.5 | 46.8 | 52.1 | 71.1 | 84.5 | 98.7 | 114  | 136 | 147 | 149 | 161 | 202 | 212 | 281 | 296 |
| 355   | $P_{GA}$ | 31.9            | 37.1 | 45.7 | 50.2 | 67.1 | 80.7 | 93.6 | 111  | 133 | 140 | 145 | 153 | 191 | 207 | 267 | 285 |
| 400   | $P_{GA}$ | –               | 36.2 | –    | 47.5 | –    | 78.6 | –    | 105  | –   | 136 | –   | 149 | –   | 196 | –   | 271 |
| 450   | $P_{GA}$ | –               | 34.3 | –    | 46.4 | –    | 74.2 | –    | 99.7 | –   | –   | –   | –   | –   | –   | –   | –   |

##### Thermal capacities $P_G$ (kW) type H4 $n_1 = 1200 \text{ rpm}$

| $i_N$ |          | Gear unit sizes |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |
|-------|----------|-----------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|       |          | 7               | 8    | 9    | 10   | 11   | 12   | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| 100   | $P_{GA}$ | 53.6            | –    | 75.1 | –    | 110  | –    | 150 | –   | 210 | –   | 229 | –   | 295 | –   | 379 | –   |
| 112   | $P_{GA}$ | 51.5            | –    | 72.2 | –    | 109  | –    | 147 | –   | 201 | 217 | 220 | 237 | 285 | 304 | 372 | 388 |
| 125   | $P_{GA}$ | 50.0            | 57.5 | 70.0 | 76.3 | 105  | 122  | 143 | 161 | 195 | 207 | 213 | 227 | 278 | 294 | 367 | 381 |
| 140   | $P_{GA}$ | 47.8            | 55.3 | 68.0 | 73.3 | 102  | 122  | 139 | 158 | 188 | 201 | 206 | 220 | 269 | 286 | 355 | 375 |
| 160   | $P_{GA}$ | 46.0            | 53.7 | 64.4 | 71.2 | 97.3 | 117  | 132 | 153 | 181 | 194 | 198 | 213 | 260 | 277 | 344 | 362 |
| 180   | $P_{GA}$ | 44.4            | 51.3 | 61.9 | 69.0 | 93.9 | 113  | 127 | 149 | 178 | 187 | 194 | 205 | 251 | 268 | 340 | 351 |
| 200   | $P_{GA}$ | 43.3            | 49.4 | 60.5 | 65.4 | 90.5 | 108  | 126 | 141 | 176 | 183 | 190 | 201 | 246 | 258 | 346 | 346 |
| 224   | $P_{GA}$ | 40.4            | 47.7 | 57.8 | 62.8 | 86.6 | 104  | 120 | 136 | 165 | 181 | 178 | 196 | 238 | 253 | 332 | 352 |
| 250   | $P_{GA}$ | 38.3            | 46.4 | 54.8 | 61.3 | 81.5 | 100  | 114 | 134 | 157 | 170 | 170 | 184 | 227 | 244 | 317 | 338 |
| 280   | $P_{GA}$ | 37.0            | 43.3 | 52.9 | 58.6 | 77.9 | 95.8 | 111 | 128 | 152 | 162 | 166 | 175 | 219 | 233 | 308 | 322 |
| 315   | $P_{GA}$ | 36.1            | 41.1 | 50.0 | 55.6 | 75.9 | 90.1 | 105 | 122 | 145 | 157 | 158 | 172 | 214 | 225 | 297 | 313 |
| 355   | $P_{GA}$ | 34.1            | 39.7 | 48.8 | 53.6 | 71.7 | 86.2 | 100 | 118 | 141 | 149 | 154 | 163 | 203 | 219 | 283 | 302 |
| 400   | $P_{GA}$ | –               | 38.7 | –    | 50.7 | –    | 83.9 | –   | 112 | –   | 145 | –   | 159 | –   | 208 | –   | 287 |
| 450   | $P_{GA}$ | –               | 36.5 | –    | 49.5 | –    | 79.3 | –   | 106 | –   | –   | –   | –   | –   | –   | –   | –   |



### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type H4 $n_1 = 1500$ rpm

| $i_N$ |          | Gear unit sizes |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |
|-------|----------|-----------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|       |          | 7               | 8    | 9    | 10   | 11   | 12   | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| 100   | $P_{GA}$ | 57.1            | –    | 79.9 | –    | 116  | –    | 157 | –   | 218 | –   | 239 | –   | 302 | –   | 371 | –   |
| 112   | $P_{GA}$ | 54.9            | –    | 76.9 | –    | 116  | –    | 155 | –   | 210 | 225 | 230 | 248 | 293 | 312 | 370 | 381 |
| 125   | $P_{GA}$ | 53.5            | 61.5 | 74.8 | 81.2 | 112  | 130  | 151 | 169 | 204 | 217 | 224 | 239 | 288 | 303 | 370 | 380 |
| 140   | $P_{GA}$ | 51.2            | 59.1 | 72.6 | 78.2 | 109  | 129  | 147 | 166 | 198 | 211 | 217 | 232 | 281 | 297 | 362 | 379 |
| 160   | $P_{GA}$ | 49.3            | 57.5 | 68.9 | 76.1 | 104  | 124  | 140 | 162 | 191 | 205 | 210 | 225 | 272 | 290 | 354 | 371 |
| 180   | $P_{GA}$ | 47.7            | 55.0 | 66.3 | 73.8 | 100  | 121  | 135 | 158 | 188 | 198 | 206 | 217 | 263 | 281 | 351 | 362 |
| 200   | $P_{GA}$ | 46.6            | 53.0 | 65.2 | 70.0 | 97.3 | 115  | 135 | 150 | 188 | 194 | 203 | 213 | 261 | 271 | 365 | 358 |
| 224   | $P_{GA}$ | 43.6            | 51.2 | 62.3 | 67.4 | 93.3 | 111  | 129 | 145 | 177 | 194 | 191 | 210 | 252 | 269 | 351 | 372 |
| 250   | $P_{GA}$ | 41.4            | 50.0 | 59.2 | 66.2 | 87.9 | 108  | 123 | 144 | 168 | 182 | 182 | 197 | 242 | 260 | 336 | 358 |
| 280   | $P_{GA}$ | 40.0            | 46.8 | 57.2 | 63.2 | 84.1 | 103  | 119 | 138 | 164 | 173 | 179 | 188 | 233 | 249 | 328 | 342 |
| 315   | $P_{GA}$ | 39.1            | 44.4 | 54.2 | 60.1 | 82.0 | 97.2 | 114 | 131 | 156 | 169 | 170 | 185 | 228 | 240 | 317 | 333 |
| 355   | $P_{GA}$ | 36.9            | 43.0 | 52.9 | 58.0 | 77.6 | 93.1 | 108 | 127 | 152 | 161 | 166 | 176 | 217 | 234 | 302 | 322 |
| 400   | $P_{GA}$ | –               | 41.9 | –    | 55.0 | –    | 90.7 | –   | 121 | –   | 157 | –   | 172 | –   | 223 | –   | 307 |
| 450   | $P_{GA}$ | –               | 39.5 | –    | 53.6 | –    | 85.8 | –   | 115 | –   | –   | –   | –   | –   | –   | –   | –   |

#### Thermal capacities $P_G$ (kW) type H4 $n_1 = 1800$ rpm

| $i_N$ |          | Gear unit sizes |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |
|-------|----------|-----------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|       |          | 7               | 8    | 9    | 10   | 11   | 12   | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| 100   | $P_{GA}$ | 59.8            | –    | 83.5 | –    | 121  | –    | 162 | –   | 222 | –   | 244 | –   | 301 | –   | 347 | –   |
| 112   | $P_{GA}$ | 57.7            | –    | 80.6 | –    | 121  | –    | 160 | –   | 215 | 229 | 237 | 254 | 297 | 313 | 355 | 359 |
| 125   | $P_{GA}$ | 56.2            | 64.5 | 78.5 | 85.0 | 117  | 135  | 157 | 174 | 210 | 222 | 231 | 246 | 293 | 307 | 360 | 365 |
| 140   | $P_{GA}$ | 53.8            | 62.2 | 76.3 | 82.0 | 114  | 135  | 153 | 172 | 205 | 217 | 225 | 240 | 287 | 303 | 360 | 371 |
| 160   | $P_{GA}$ | 52.0            | 60.5 | 72.5 | 79.9 | 109  | 130  | 146 | 168 | 198 | 211 | 218 | 233 | 280 | 297 | 356 | 369 |
| 180   | $P_{GA}$ | 50.3            | 57.9 | 69.9 | 77.6 | 105  | 126  | 141 | 164 | 195 | 205 | 214 | 226 | 271 | 289 | 355 | 365 |
| 200   | $P_{GA}$ | 49.4            | 55.9 | 69.2 | 73.8 | 103  | 121  | 142 | 157 | 198 | 202 | 213 | 222 | 272 | 280 | 377 | 363 |
| 224   | $P_{GA}$ | 46.3            | 54.1 | 66.1 | 71.0 | 98.7 | 117  | 136 | 151 | 186 | 204 | 201 | 220 | 264 | 280 | 365 | 385 |
| 250   | $P_{GA}$ | 44.0            | 53.1 | 62.9 | 70.2 | 93.2 | 114  | 130 | 152 | 178 | 192 | 192 | 208 | 253 | 272 | 350 | 372 |
| 280   | $P_{GA}$ | 42.6            | 49.7 | 60.8 | 67.2 | 89.3 | 110  | 126 | 146 | 173 | 183 | 189 | 198 | 245 | 260 | 343 | 357 |
| 315   | $P_{GA}$ | 41.6            | 47.2 | 57.6 | 63.9 | 87.1 | 103  | 121 | 139 | 165 | 178 | 180 | 195 | 240 | 252 | 332 | 348 |
| 355   | $P_{GA}$ | 39.3            | 45.7 | 56.3 | 61.7 | 82.5 | 98.8 | 115 | 135 | 161 | 170 | 176 | 186 | 228 | 246 | 317 | 337 |
| 400   | $P_{GA}$ | –               | 44.6 | –    | 58.5 | –    | 96.4 | –   | 129 | –   | 166 | –   | 182 | –   | 234 | –   | 322 |
| 450   | $P_{GA}$ | –               | 42.1 | –    | 57.1 | –    | 91.3 | –   | 122 | –   | –   | –   | –   | –   | –   | –   | –   |

## Design of the gear units

### Overview tables

#### Type B2 – Nominal power ratings of gear unit sizes 4 to 18

##### Technical specifications (continued)

##### Nominal power ratings $P_{2N}$ (kW) type B2

| $i_N$ | $n_1$ | $n_2$ | Gear unit sizes |     |     |     |     |      |      |        |        |        |        |        |        |        |        |
|-------|-------|-------|-----------------|-----|-----|-----|-----|------|------|--------|--------|--------|--------|--------|--------|--------|--------|
|       |       |       | 4               | 5   | 6   | 7   | 8   | 9    | 10   | 11     | 12     | 13     | 14     | 15     | 16     | 17     | 18     |
| 5     | 1800  | 360   | 229             | 354 | –   | 716 | –   | 1127 | –    | 1734 * | –      | 2585 * | –      | 4598 * | –      | –      | –      |
|       | 1500  | 300   | 191             | 295 | –   | 596 | –   | 939  | –    | 1445   | –      | 2154   | –      | 3832 * | –      | –      | –      |
|       | 1200  | 240   | 153             | 236 | –   | 477 | –   | 751  | –    | 1156   | –      | 1723   | –      | 3065 * | –      | –      | –      |
|       | 1000  | 200   | 127             | 196 | –   | 397 | –   | 626  | –    | 963    | –      | 1436   | –      | 2554   | –      | –      | –      |
| 5.6   | 1800  | 321   | 208             | 315 | –   | 638 | –   | 1005 | –    | 1616 * | –      | 2339 * | –      | 4100 * | 4537 * | *      | –      |
|       | 1500  | 268   | 173             | 263 | –   | 533 | –   | 839  | –    | 1349   | –      | 1953   | –      | 3423 * | 3788 * | *      | –      |
|       | 1200  | 214   | 138             | 210 | –   | 425 | –   | 670  | –    | 1077   | –      | 1559   | –      | 2733 * | 3025 * | 4369 * | –      |
|       | 1000  | 179   | 116             | 176 | –   | 356 | –   | 560  | –    | 901    | –      | 1304   | –      | 2286   | 2530   | 3654 * | –      |
| 6.3   | 1800  | 286   | 185             | 281 | 359 | 569 | 712 | 895  | 1138 | 1503 * | 1760 * | 2210 * | 2551 * | 3893 * | 4222 * | *      | –      |
|       | 1500  | 238   | 154             | 234 | 299 | 473 | 593 | 745  | 947  | 1251   | 1465   | 1839   | 2123   | 3239 * | 3513 * | 4859 * | –      |
|       | 1200  | 190   | 123             | 187 | 238 | 378 | 473 | 594  | 756  | 998    | 1169   | 1468   | 1695   | 2586 * | 2805 * | 3879 * | –      |
|       | 1000  | 159   | 103             | 156 | 199 | 316 | 396 | 497  | 632  | 835    | 978    | 1228   | 1418   | 2164   | 2347   | 3246 * | –      |
| 7.1   | 1800  | 254   | 164             | 250 | 319 | 505 | 633 | 795  | 1010 | 1393 * | 1619 * | 2018 * | 2321 * | 3510 * | 3856 * | *      | *      |
|       | 1500  | 211   | 136             | 207 | 265 | 419 | 525 | 660  | 839  | 1157   | 1345   | 1676   | 1928   | 2916 * | 3203 * | 4308 * | *      |
|       | 1200  | 169   | 109             | 166 | 212 | 336 | 421 | 529  | 672  | 927    | 1077   | 1343   | 1544   | 2335 * | 2565 * | 3450 * | 4070 * |
|       | 1000  | 141   | 91              | 138 | 177 | 280 | 351 | 441  | 561  | 773    | 899    | 1120   | 1288   | 1948   | 2140   | 2879   | 3395 * |
| 8     | 1800  | 225   | 146             | 221 | 282 | 447 | 560 | 704  | 895  | 1272 * | 1486 * | 1884 * | 2155 * | 3109 * | 3486 * | 4594 * | *      |
|       | 1500  | 188   | 122             | 185 | 236 | 374 | 468 | 588  | 748  | 1063   | 1242   | 1574   | 1801   | 2598   | 2913 * | 3838 * | 4527 * |
|       | 1200  | 150   | 97              | 147 | 188 | 298 | 373 | 469  | 596  | 848    | 991    | 1256   | 1437   | 2073   | 2324 * | 3062 * | 3612 * |
|       | 1000  | 125   | 81              | 123 | 157 | 248 | 311 | 391  | 497  | 706    | 825    | 1047   | 1197   | 1727   | 1937   | 2552   | 3010   |
| 9     | 1800  | 200   | 129             | 196 | 251 | 397 | 498 | 626  | 795  | 1130 * | 1365 * | 1698 * | 1981 * | 2764 * | 3099 * | 4083 * | 4816 * |
|       | 1500  | 167   | 108             | 164 | 209 | 332 | 416 | 522  | 664  | 944    | 1140   | 1418   | 1654   | 2308   | 2588   | 3409 * | 4021 * |
|       | 1200  | 133   | 86              | 130 | 167 | 264 | 331 | 416  | 529  | 752    | 908    | 1129   | 1317   | 1838   | 2061   | 2715 * | 3203 * |
|       | 1000  | 111   | 72              | 109 | 139 | 220 | 276 | 347  | 441  | 627    | 757    | 942    | 1099   | 1534   | 1720   | 2266   | 2673   |
| 10    | 1800  | 180   | 116             | 177 | 226 | 358 | 448 | 563  | 716  | 1017 * | 1249 * | 1528 * | 1862 * | 2487 * | 2789 * | 3675 * | 4335 * |
|       | 1500  | 150   | 97              | 147 | 188 | 298 | 373 | 469  | 596  | 848    | 1041   | 1273   | 1551   | 2073   | 2324   | 3062 * | 3612 * |
|       | 1200  | 120   | 77              | 118 | 150 | 238 | 299 | 375  | 477  | 678    | 833    | 1019   | 1241   | 1658   | 1859   | 2450 * | 2890 * |
|       | 1000  | 100   | 64              | 98  | 125 | 198 | 249 | 313  | 397  | 565    | 694    | 849    | 1034   | 1382   | 1549   | 2041   | 2408   |
| 11.2  | 1800  | 161   | 104             | 158 | 202 | 320 | 401 | 504  | 640  | 910 *  | 1117 * | 1367 * | 1709 * | 2225 * | 2495 * | 3287 * | 3877 * |
|       | 1500  | 134   | 86              | 131 | 168 | 266 | 333 | 419  | 533  | 757    | 930    | 1137   | 1422   | 1852   | 2076   | 2736 * | 3227 * |
|       | 1200  | 107   | 69              | 105 | 134 | 212 | 266 | 335  | 425  | 605    | 742    | 908    | 1136   | 1478   | 1658   | 2184 * | 2576 * |
|       | 1000  | 89    | 57              | 87  | 111 | 177 | 221 | 278  | 354  | 503    | 617    | 755    | 944    | 1230   | 1379   | 1817   | 2143   |
| 12.5  | 1800  | 144   | –               | –   | 180 | –   | 358 | –    | 572  | –      | 999 *  | –      | 1528 * | –      | 2231 * | –      | 3468 * |
|       | 1500  | 120   | –               | –   | 150 | –   | 299 | –    | 477  | –      | 833    | –      | 1274   | –      | 1859   | –      | 2890 * |
|       | 1200  | 96    | –               | –   | 120 | –   | 239 | –    | 381  | –      | 666    | –      | 1019   | –      | 1487   | –      | 2312 * |
|       | 1000  | 80    | –               | –   | 100 | –   | 199 | –    | 318  | –      | 555    | –      | 849    | –      | 1239   | –      | 1926   |
| 14    | 1800  | 129   | –               | –   | 162 | –   | 321 | –    | 513  | –      | 895 *  | –      | 1369 * | –      | –      | –      | –      |
|       | 1500  | 107   | –               | –   | 134 | –   | 266 | –    | 425  | –      | 742    | –      | 1136   | –      | –      | –      | –      |
|       | 1200  | 86    | –               | –   | 108 | –   | 214 | –    | 342  | –      | 597    | –      | 913    | –      | –      | –      | –      |
|       | 1000  | 71    | –               | –   | 89  | –   | 176 | –    | 282  | –      | 492    | –      | 753    | –      | –      | –      | –      |

Forced lubrication required for horizontal gear units

\* on request

## Type B2 – Nominal output torque of low speed shaft (LSS) gear unit sizes 4 to 18

## Technical specifications (continued)

Nominal output torque of low speed shaft (LSS)  $T_{2N}$  (kNm) type B2

| $i_N$ | Gear unit sizes |      |      |      |      |      |      |      |      |      |      |     |     |     |     |     |     |     |     | Type |
|-------|-----------------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|
|       | 4               | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |      |
| 5     | 6.1             | 9.4  | –    | 19   | –    | 29.9 | –    | 46   | –    | 68.6 | –    | 122 | –   | –   | –   | –   | –   | –   | –   | B2   |
| 5.6   | 6.2             | 9.4  | –    | 19   | –    | 29.9 | –    | 48.1 | –    | 69.6 | –    | 122 | 135 | 195 | –   | –   | –   | –   | –   |      |
| 6.3   | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 50.2 | 58.8 | 73.8 | 85.2 | 130 | 141 | 195 | –   | –   | –   | –   | –   |      |
| 7.1   | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 52.4 | 60.9 | 75.9 | 87.3 | 132 | 145 | 195 | 230 | –   | –   | –   | –   |      |
| 8     | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 63.1 | 80.0 | 91.5 | 132 | 148 | 195 | 230 | –   | –   | –   | –   |      |
| 9     | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 65.2 | 81.1 | 94.6 | 132 | 148 | 195 | 230 | –   | –   | –   | –   |      |
| 10    | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 66.3 | 81.1 | 98.8 | 132 | 148 | 195 | 230 | –   | –   | –   | –   |      |
| 11.2  | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 66.3 | 81.1 | 101  | 132 | 148 | 195 | 230 | –   | –   | –   | –   |      |
| 12.5  | 5.5             | 9.4  | 12   | 17   | 23.8 | 28   | 38   | 52.4 | 66.3 | 79.5 | 101  | 132 | 148 | 195 | 230 | 250 | –   | 340 | –   |      |
| 14    | 6               | 9.8  | 12   | 18.2 | 23.8 | 29.5 | 38   | 56.7 | 66.3 | 81.6 | 101  | 137 | 148 | 195 | 230 | 262 | 295 | 360 | 405 |      |
| 16    | 6.6             | 10.5 | 12   | 19.8 | 21.5 | 31   | 35.6 | 59.9 | 66.3 | 83.8 | 99.4 | 142 | 154 | 200 | 230 | 275 | 308 | 380 | 422 |      |
| 18    | 6.7             | 11.3 | 12.6 | 21.1 | 23.1 | 33.9 | 37.5 | 62   | 69.5 | 86.7 | 102  | 148 | 160 | 200 | 240 | 288 | 320 | 400 | 438 |      |
| 20    | 6.7             | 11.6 | 13.2 | 21.7 | 26.5 | 35.7 | 39.3 | 63.5 | 72.7 | 90.7 | 105  | 153 | 167 | 200 | 240 | 300 | 332 | 420 | 455 |      |
| 22.4  | 6.7             | 11.6 | 14.2 | 21.7 | 27.2 | 35.7 | 41.8 | 63.5 | 75.6 | 90.7 | 108  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 25    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 28    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 31.5  | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 35.5  | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 40    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 45    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 50    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 56    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 63    | 6.6             | 11.4 | 15.5 | 21.4 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 71    | 6.6             | 11   | 15.5 | 20   | 27.2 | 34   | 43.8 | 60   | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 80    | –               | 11.6 | 14   | 21.7 | 26.9 | 35.7 | 43.8 | 61.6 | 77.2 | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 90    | –               | 11.6 | 14   | 21.7 | 25.2 | 35.7 | 43   | 61.6 | 75   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 100   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 112   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 125   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 140   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 160   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 180   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 200   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 224   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 250   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 280   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.3 | 44.2 | 61.6 | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 315   | –               | 11.2 | 15.5 | 20.5 | 27.2 | 34   | 44.2 | 60   | 78   | 90.7 | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 |      |
| 355   | –               | –    | 15.5 | –    | 26.5 | –    | 44.2 | –    | 78   | –    | 113  | –   | 173 | –   | 240 | –   | 345 | –   | 470 |      |
| 400   | –               | –    | 14.5 | –    | 25.5 | –    | 43   | –    | 75   | –    | 113  | –   | –   | –   | –   | –   | –   | –   | –   |      |

## Design of the gear units

### Overview tables

#### Type B2 – Thermal capacities $n_1 = 1000$ rpm

#### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type B2 $n_1 = 1000$ rpm

| $i_N$ |            | Gear unit sizes |      |      |      |      |     |     |      |      |      |      |      |      |      |      |
|-------|------------|-----------------|------|------|------|------|-----|-----|------|------|------|------|------|------|------|------|
|       |            | 4               | 5    | 6    | 7    | 8    | 9   | 10  | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   |
| 5     | $P_{GA}$   | 61.0            | 75.5 | –    | 93.5 | –    | 110 | –   | 116  | –    | *    | –    | *    | –    | –    | –    |
|       | $P_{GB}$   | 142             | 196  | –    | 314  | –    | 393 | –   | 598  | –    | 856  | –    | 1033 | –    | –    | –    |
|       | $P_{GC15}$ | 180             | 274  | –    | 426  | –    | 550 | –   | 711  | –    | 719  | –    | 705  | –    | –    | –    |
|       | $P_{GD15}$ | 251             | 379  | –    | 615  | –    | 791 | –   | 1121 | –    | 1403 | –    | 1640 | –    | –    | –    |
| 5.6   | $P_{GA}$   | 59.1            | 74.1 | –    | 94.6 | –    | 114 | –   | 140  | –    | *    | –    | *    | 82.2 | *    | –    |
|       | $P_{GB}$   | 136             | 189  | –    | 298  | –    | 376 | –   | 591  | –    | 860  | –    | 1068 | 1060 | 1050 | –    |
|       | $P_{GC15}$ | 172             | 263  | –    | 392  | –    | 508 | –   | 703  | –    | 736  | –    | 757  | 722  | 554  | –    |
|       | $P_{GD15}$ | 240             | 363  | –    | 568  | –    | 732 | –   | 1090 | –    | 1381 | –    | 1648 | 1668 | 1642 | –    |
| 6.3   | $P_{GA}$   | 58.0            | 72.6 | 87.1 | 94.8 | 108  | 119 | 118 | 151  | 155  | 171  | *    | *    | *    | *    | –    |
|       | $P_{GB}$   | 131             | 180  | 213  | 280  | 333  | 358 | 393 | 550  | 666  | 809  | 929  | 1063 | 1097 | 1102 | –    |
|       | $P_{GC15}$ | 164             | 243  | 316  | 356  | 355  | 466 | 580 | 660  | 766  | 714  | 770  | 789  | 776  | 653  | –    |
|       | $P_{GD15}$ | 229             | 336  | 425  | 518  | 555  | 674 | 814 | 1005 | 1206 | 1279 | 1486 | 1600 | 1687 | 1645 | –    |
| 7.1   | $P_{GA}$   | 54.9            | 69.5 | 85.0 | 91.8 | 108  | 119 | 122 | 160  | 177  | 187  | 182  | 193  | *    | *    | *    |
|       | $P_{GB}$   | 122             | 169  | 205  | 264  | 315  | 340 | 376 | 540  | 656  | 799  | 933  | 1039 | 1098 | 1109 | 1140 |
|       | $P_{GC15}$ | 149             | 222  | 305  | 327  | 339  | 429 | 557 | 651  | 757  | 711  | 786  | 792  | 807  | 706  | 678  |
|       | $P_{GD15}$ | 209             | 309  | 409  | 478  | 525  | 623 | 774 | 981  | 1172 | 1257 | 1461 | 1536 | 1636 | 1618 | 1690 |
| 8     | $P_{GA}$   | 51.9            | 66.4 | 82.5 | 89.4 | 106  | 117 | 126 | 160  | 185  | 195  | 208  | 223  | *    | *    | *    |
|       | $P_{GB}$   | 114             | 159  | 194  | 249  | 296  | 322 | 358 | 499  | 608  | 743  | 871  | 974  | 1074 | 1068 | 1154 |
|       | $P_{GC15}$ | 137             | 204  | 290  | 301  | 322  | 398 | 532 | 606  | 708  | 672  | 757  | 768  | 815  | 718  | 730  |
|       | $P_{GD15}$ | 193             | 286  | 387  | 443  | 492  | 580 | 732 | 903  | 1077 | 1162 | 1349 | 1425 | 1566 | 1533 | 1663 |
| 9     | $P_{GA}$   | 49.4            | 63.5 | 78.7 | 86.6 | 103  | 115 | 125 | 160  | 194  | 197  | 223  | 233  | 243  | *    | *    |
|       | $P_{GB}$   | 107             | 149  | 182  | 237  | 279  | 309 | 340 | 479  | 597  | 713  | 862  | 941  | 1004 | 1047 | 1110 |
|       | $P_{GC15}$ | 125             | 185  | 274  | 283  | 306  | 375 | 506 | 585  | 697  | 652  | 755  | 753  | 790  | 718  | 745  |
|       | $P_{GD15}$ | 177             | 260  | 364  | 417  | 464  | 548 | 692 | 866  | 1052 | 1115 | 1325 | 1374 | 1452 | 1486 | 1569 |
| 10    | $P_{GA}$   | 41.8            | 59.2 | 74.9 | 82.2 | 99.2 | 110 | 123 | 156  | 192  | 200  | 228  | 244  | 252  | 213  | *    |
|       | $P_{GB}$   | 88.9            | 136  | 171  | 220  | 263  | 290 | 323 | 450  | 550  | 675  | 797  | 889  | 969  | 1005 | 1088 |
|       | $P_{GC15}$ | 98.1            | 163  | 259  | 256  | 291  | 344 | 471 | 541  | 648  | 625  | 711  | 722  | 772  | 715  | 746  |
|       | $P_{GD15}$ | 141             | 232  | 342  | 379  | 438  | 504 | 644 | 801  | 966  | 1055 | 1223 | 1296 | 1401 | 1418 | 1518 |
| 11.2  | $P_{GA}$   | 40.6            | 53.6 | 71.1 | 74.8 | 96.0 | 100 | 120 | 144  | 189  | 189  | 229  | 236  | 262  | 216  | 241  |
|       | $P_{GB}$   | 85.8            | 122  | 160  | 197  | 251  | 257 | 310 | 404  | 527  | 608  | 764  | 804  | 914  | 912  | 1040 |
|       | $P_{GC15}$ | 93.4            | 142  | 243  | 224  | 279  | 296 | 443 | 470  | 625  | 572  | 688  | 663  | 741  | 666  | 741  |
|       | $P_{GD15}$ | 135             | 203  | 320  | 333  | 418  | 437 | 609 | 701  | 925  | 952  | 1173 | 1173 | 1322 | 1286 | 1447 |
| 12.5  | $P_{GA}$   | 42.3            | 56.1 | 66.1 | 84.4 | 90.8 | 113 | 115 | 176  | 183  | 243  | 230  | 306  | 254  | 320  | 242  |
|       | $P_{GB}$   | 85.7            | 121  | 146  | 204  | 233  | 269 | 291 | 433  | 495  | 661  | 722  | 862  | 825  | 997  | 944  |
|       | $P_{GC15}$ | 92.5            | 139  | 214  | 229  | 263  | 307 | 407 | 501  | 592  | 627  | 659  | 724  | 679  | 756  | 688  |
|       | $P_{GD15}$ | 132             | 198  | 284  | 336  | 390  | 447 | 560 | 729  | 869  | 1007 | 1107 | 1229 | 1194 | 1368 | 1313 |
| 14    | $P_{GA}$   | 38.3            | 50.3 | 59.7 | 76.0 | 82.6 | 103 | 105 | 160  | 168  | 223  | 215  | 285  | 323  | 311  | 345  |
|       | $P_{GB}$   | 76.6            | 107  | 131  | 180  | 208  | 240 | 259 | 386  | 442  | 591  | 650  | 771  | 884  | 899  | 1026 |
|       | $P_{GC15}$ | 81.3            | 120  | 186  | 198  | 238  | 268 | 350 | 435  | 534  | 568  | 601  | 658  | 741  | 694  | 776  |
|       | $P_{GD15}$ | 116             | 172  | 248  | 292  | 350  | 391 | 488 | 636  | 778  | 901  | 997  | 1102 | 1251 | 1233 | 1392 |

\* on request

### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type B2 $n_1 = 1200$ rpm

| $i_N$ |            | Gear unit sizes |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-------|------------|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|       |            | 4               | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   |
| 5.0   | $P_{GA}$   | 58.2            | 67.0 | –    | 71.3 | –    | *    | –    | *    | –    | *    | –    | *    | –    | –    | –    |
|       | $P_{GB}$   | 157             | 216  | –    | 340  | –    | 422  | –    | 611  | –    | 851  | –    | 946  | –    | –    | –    |
|       | $P_{GC15}$ | 197             | 299  | –    | 460  | –    | 586  | –    | 667  | –    | 616  | –    | 464  | –    | –    | –    |
|       | $P_{GD15}$ | 283             | 427  | –    | 687  | –    | 877  | –    | 1168 | –    | 1427 | –    | 1585 | –    | –    | –    |
| 5.6   | $P_{GA}$   | 57.0            | 66.8 | –    | 76.9 | –    | 85.0 | –    | *    | –    | *    | –    | *    | –    | *    | –    |
|       | $P_{GB}$   | 151             | 208  | –    | 324  | –    | 405  | –    | 618  | –    | 873  | –    | 1019 | 969  | 873  | –    |
|       | $P_{GC15}$ | 189             | 288  | –    | 425  | –    | 543  | –    | 678  | –    | 656  | –    | 564  | 475  | 148  | –    |
|       | $P_{GD15}$ | 271             | 409  | –    | 636  | –    | 815  | –    | 1145 | –    | 1431 | –    | 1640 | 1608 | 1501 | –    |
| 6.3   | $P_{GA}$   | 56.6            | 67.8 | 79.4 | 82.0 | 87.9 | 96.5 | 86.4 | 99.0 | *    | *    | *    | *    | *    | *    | –    |
|       | $P_{GB}$   | 146             | 199  | 235  | 307  | 366  | 389  | 423  | 585  | 685  | 845  | 930  | 1059 | 1046 | 1004 | –    |
|       | $P_{GC15}$ | 180             | 266  | 324  | 387  | 356  | 503  | 580  | 646  | 723  | 660  | 666  | 646  | 579  | 375  | –    |
|       | $P_{GD15}$ | 259             | 380  | 457  | 582  | 602  | 752  | 863  | 1061 | 1258 | 1341 | 1518 | 1622 | 1666 | 1591 | –    |
| 7.1   | $P_{GA}$   | 54.0            | 66.1 | 78.9 | 82.3 | 92.6 | 101  | 95.0 | 115  | *    | *    | *    | *    | *    | *    | *    |
|       | $P_{GB}$   | 136             | 187  | 227  | 290  | 350  | 370  | 406  | 578  | 691  | 846  | 952  | 1056 | 1085 | 1069 | 1044 |
|       | $P_{GC15}$ | 163             | 244  | 313  | 356  | 344  | 464  | 558  | 640  | 733  | 672  | 704  | 687  | 663  | 500  | 401  |
|       | $P_{GD15}$ | 236             | 349  | 440  | 538  | 573  | 697  | 822  | 1039 | 1233 | 1323 | 1518 | 1589 | 1667 | 1603 | 1624 |
| 8     | $P_{GA}$   | 51.2            | 63.7 | 79.0 | 84.3 | 97.2 | 103  | 105  | 124  | 135  | *    | *    | *    | *    | *    | *    |
|       | $P_{GB}$   | 128             | 177  | 215  | 281  | 332  | 353  | 390  | 536  | 648  | 790  | 915  | 1014 | 1094 | 1060 | 1107 |
|       | $P_{GC15}$ | 150             | 225  | 298  | 336  | 330  | 431  | 536  | 602  | 695  | 648  | 705  | 693  | 705  | 569  | 524  |
|       | $P_{GD15}$ | 218             | 323  | 417  | 509  | 539  | 649  | 780  | 959  | 1139 | 1230 | 1415 | 1494 | 1628 | 1552 | 1655 |
| 9     | $P_{GA}$   | 49.1            | 61.5 | 76.1 | 82.7 | 96.5 | 104  | 109  | 128  | 149  | 143  | *    | *    | *    | *    | *    |
|       | $P_{GB}$   | 120             | 165  | 202  | 269  | 314  | 339  | 371  | 517  | 639  | 761  | 912  | 991  | 1048 | 1050 | 1108 |
|       | $P_{GC15}$ | 137             | 203  | 283  | 315  | 315  | 407  | 514  | 584  | 689  | 632  | 717  | 691  | 716  | 591  | 593  |
|       | $P_{GD15}$ | 200             | 295  | 392  | 479  | 510  | 614  | 739  | 922  | 1115 | 1182 | 1397 | 1446 | 1527 | 1527 | 1599 |
| 10    | $P_{GA}$   | 41.8            | 57.7 | 72.8 | 79.7 | 95.3 | 102  | 111  | 131  | 156  | 153  | 170  | *    | *    | *    | *    |
|       | $P_{GB}$   | 100             | 152  | 191  | 251  | 297  | 319  | 354  | 488  | 592  | 723  | 851  | 943  | 1023 | 1033 | 1097 |
|       | $P_{GC15}$ | 107             | 179  | 267  | 287  | 302  | 372  | 493  | 557  | 645  | 611  | 688  | 682  | 715  | 614  | 614  |
|       | $P_{GD15}$ | 160             | 263  | 369  | 438  | 483  | 565  | 703  | 870  | 1027 | 1120 | 1296 | 1370 | 1476 | 1472 | 1567 |
| 11.2  | $P_{GA}$   | 40.7            | 52.4 | 69.8 | 73.1 | 93.1 | 93.2 | 110  | 125  | 158  | 150  | 176  | *    | *    | *    | *    |
|       | $P_{GB}$   | 96              | 136  | 178  | 225  | 284  | 284  | 340  | 438  | 569  | 654  | 817  | 855  | 973  | 949  | 1076 |
|       | $P_{GC15}$ | 102             | 156  | 254  | 251  | 291  | 321  | 475  | 503  | 625  | 562  | 669  | 633  | 702  | 585  | 637  |
|       | $P_{GD15}$ | 152             | 230  | 348  | 385  | 462  | 491  | 675  | 780  | 986  | 1013 | 1243 | 1243 | 1397 | 1341 | 1506 |
| 12.5  | $P_{GA}$   | 43.5            | 56.8 | 65.2 | 84.2 | 89.4 | 111  | 108  | 171  | 161  | 230  | 185  | 259  | *    | *    | *    |
|       | $P_{GB}$   | 97              | 136  | 163  | 229  | 265  | 300  | 320  | 480  | 538  | 726  | 776  | 936  | 880  | 1068 | 985  |
|       | $P_{GC15}$ | 102             | 154  | 236  | 252  | 275  | 337  | 444  | 547  | 595  | 637  | 646  | 719  | 650  | 722  | 612  |
|       | $P_{GD15}$ | 150             | 225  | 321  | 381  | 433  | 505  | 629  | 821  | 928  | 1088 | 1178 | 1321 | 1266 | 1457 | 1373 |
| 14    | $P_{GA}$   | 39.4            | 51.1 | 59.1 | 76.3 | 81.9 | 102  | 99   | 157  | 150  | 215  | 178  | 253  | 278  | 245  | 265  |
|       | $P_{GB}$   | 86.5            | 120  | 146  | 203  | 238  | 268  | 286  | 429  | 481  | 652  | 701  | 840  | 960  | 967  | 1101 |
|       | $P_{GC15}$ | 89.6            | 133  | 205  | 218  | 249  | 294  | 384  | 476  | 539  | 580  | 593  | 658  | 734  | 672  | 740  |
|       | $P_{GD15}$ | 133             | 195  | 281  | 331  | 389  | 443  | 548  | 717  | 833  | 976  | 1064 | 1187 | 1346 | 1318 | 1485 |

\* on request

## Design of the gear units

## Overview tables

Type B2 – Thermal capacities  $n_1 = 1500$  rpm

## Technical specifications (continued)

Thermal capacities  $P_G$  (kW) type B2  
 $n_1 = 1500$  rpm

| $i_N$ |            | Gear unit sizes |      |      |      |      |      |      |      |      |      |      |      |      |      |      |   |   |   |
|-------|------------|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---|---|---|
|       |            | 4               | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   |   |   |   |
| 5.0   | $P_{GA}$   | 48.7            | *    | –    | *    | –    | *    | –    | *    | –    | *    | –    | *    | –    | *    | –    | * | – | * |
|       | $P_{GB}$   | 177             | 239  | –    | 374  | –    | 439  | –    | 583  | –    | 764  | –    | 662  | –    | –    | –    | – | – |   |
|       | $P_{GC15}$ | 218             | 332  | –    | 507  | –    | 575  | –    | 554  | –    | 383  | –    | 54   | –    | –    | –    | – | – |   |
|       | $P_{GD15}$ | 327             | 490  | –    | 791  | –    | 938  | –    | 1180 | –    | 1369 | –    | 1355 | –    | –    | –    | – | – |   |
| 5.6   | $P_{GA}$   | 49.3            | *    | –    | *    | –    | *    | –    | *    | –    | *    | –    | *    | –    | *    | –    | * | – |   |
|       | $P_{GB}$   | 171             | 231  | –    | 359  | –    | 431  | –    | 613  | –    | 827  | –    | 804  | 677  | 339  | –    | – | – |   |
|       | $P_{GC15}$ | 210             | 319  | –    | 469  | –    | 562  | –    | 592  | –    | 479  | –    | 101  | 109  | 339  | –    | – | – |   |
|       | $P_{GD15}$ | 314             | 471  | –    | 735  | –    | 898  | –    | 1183 | –    | 1411 | –    | 1467 | 1371 | 1068 | –    | – | – |   |
| 6.3   | $P_{GA}$   | 51.4            | 53.8 | 57.6 | *    | *    | *    | *    | *    | *    | *    | *    | *    | *    | *    | *    | * | * |   |
|       | $P_{GB}$   | 166             | 222  | 262  | 344  | 398  | 421  | 442  | 601  | 658  | 832  | 842  | 936  | 824  | 673  | –    | – | – |   |
|       | $P_{GC15}$ | 201             | 296  | 327  | 430  | 341  | 540  | 559  | 593  | 605  | 534  | 426  | 320  | 104  | 672  | –    | – | – |   |
|       | $P_{GD15}$ | 300             | 438  | 496  | 675  | 648  | 851  | 914  | 1112 | 1277 | 1372 | 1458 | 1556 | 1487 | 1312 | –    | – | – |   |
| 7.1   | $P_{GA}$   | 50.0            | 55.7 | 59.5 | *    | *    | *    | *    | *    | *    | *    | *    | *    | *    | *    | *    | * | * |   |
|       | $P_{GB}$   | 155             | 210  | 253  | 327  | 383  | 403  | 434  | 607  | 690  | 851  | 906  | 996  | 961  | 857  | 707  | – | – |   |
|       | $P_{GC15}$ | 182             | 271  | 317  | 399  | 333  | 500  | 546  | 603  | 644  | 566  | 525  | 445  | 333  | 102  | 707  | – | – |   |
|       | $P_{GD15}$ | 274             | 404  | 478  | 627  | 617  | 790  | 875  | 1096 | 1277 | 1372 | 1500 | 1564 | 1580 | 1450 | 1337 | – | – |   |
| 8.0   | $P_{GA}$   | 47.9            | 55.6 | 65.6 | 65.1 | 69.5 | 71.4 | *    | *    | *    | *    | *    | *    | *    | *    | *    | * | * |   |
|       | $P_{GB}$   | 145             | 199  | 242  | 312  | 365  | 387  | 424  | 571  | 673  | 823  | 909  | 993  | 1024 | 949  | 898  | – | – |   |
|       | $P_{GC15}$ | 167             | 250  | 304  | 370  | 323  | 466  | 532  | 576  | 643  | 571  | 578  | 518  | 460  | 225  | 174  | – | – |   |
|       | $P_{GD15}$ | 253             | 374  | 454  | 583  | 585  | 738  | 835  | 1017 | 1196 | 1290 | 1455 | 1516 | 1609 | 1471 | 1485 | – | – |   |
| 9.0   | $P_{GA}$   | 46.6            | 55.3 | 67.3 | 66.4 | 73.8 | 75.3 | *    | *    | *    | *    | *    | *    | *    | *    | *    | * | * |   |
|       | $P_{GB}$   | 137             | 187  | 228  | 300  | 348  | 373  | 406  | 552  | 675  | 800  | 927  | 986  | 1033 | 971  | 988  | – | – |   |
|       | $P_{GC15}$ | 152             | 226  | 290  | 348  | 312  | 443  | 512  | 563  | 652  | 569  | 610  | 541  | 533  | 302  | 251  | – | – |   |
|       | $P_{GD15}$ | 232             | 341  | 429  | 551  | 555  | 699  | 794  | 981  | 1177 | 1244 | 1453 | 1488 | 1556 | 1471 | 1523 | – | – |   |
| 10    | $P_{GA}$   | 40.1            | 52.8 | 66.2 | 66.9 | 77.8 | 79.1 | 81.2 | *    | *    | *    | *    | *    | *    | *    | *    | * | * |   |
|       | $P_{GB}$   | 114             | 172  | 215  | 280  | 331  | 353  | 389  | 524  | 632  | 767  | 892  | 963  | 1025 | 987  | 1012 | – | – |   |
|       | $P_{GC15}$ | 119             | 199  | 275  | 316  | 301  | 408  | 494  | 541  | 620  | 566  | 613  | 563  | 558  | 383  | 329  | – | – |   |
|       | $P_{GD15}$ | 185             | 304  | 404  | 504  | 527  | 645  | 757  | 927  | 1091 | 1186 | 1362 | 1428 | 1525 | 1463 | 1523 | – | – |   |
| 11.2  | $P_{GA}$   | 39.2            | 48.3 | 64.4 | 62.6 | 78.6 | 75.6 | 84.2 | *    | *    | *    | *    | *    | *    | *    | *    | * | * |   |
|       | $P_{GB}$   | 110             | 154  | 202  | 252  | 317  | 315  | 376  | 473  | 610  | 696  | 863  | 889  | 1001 | 924  | 1034 | – | – |   |
|       | $P_{GC15}$ | 113             | 173  | 261  | 277  | 291  | 351  | 479  | 496  | 604  | 525  | 610  | 537  | 581  | 402  | 409  | – | – |   |
|       | $P_{GD15}$ | 177             | 266  | 381  | 444  | 505  | 561  | 728  | 837  | 1049 | 1076 | 1312 | 1301 | 1460 | 1361 | 1509 | – | – |   |
| 12.5  | $P_{GA}$   | 44.1            | 55.9 | 61.0 | 80.8 | 77.7 | 104  | 88   | 153  | 105  | 189  | *    | *    | *    | *    | *    | * | * |   |
|       | $P_{GB}$   | 112             | 156  | 185  | 261  | 297  | 339  | 355  | 535  | 578  | 801  | 823  | 1013 | 919  | 1122 | 970  | – | – |   |
|       | $P_{GC15}$ | 114             | 173  | 243  | 282  | 277  | 374  | 457  | 561  | 580  | 632  | 602  | 678  | 559  | 602  | 425  | – | – |   |
|       | $P_{GD15}$ | 176             | 262  | 352  | 442  | 474  | 584  | 687  | 900  | 993  | 1182 | 1250 | 1421 | 1330 | 1537 | 1398 | – | – |   |
| 14    | $P_{GA}$   | 40.1            | 50.6 | 55.6 | 74.1 | 72.3 | 96.2 | 83.1 | 144  | 105  | 188  | 102  | 174  | 182  | 110  | 101  | – | – |   |
|       | $P_{GB}$   | 100             | 138  | 166  | 232  | 267  | 304  | 318  | 480  | 521  | 722  | 747  | 915  | 1039 | 1028 | 1156 | – | – |   |
|       | $P_{GC15}$ | 101             | 149  | 220  | 244  | 252  | 327  | 415  | 511  | 530  | 582  | 557  | 630  | 693  | 589  | 624  | – | – |   |
|       | $P_{GD15}$ | 155             | 227  | 316  | 385  | 427  | 512  | 619  | 808  | 893  | 1065 | 1130 | 1282 | 1448 | 1399 | 1572 | – | – |   |

\* on request

### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type B2 $n_1 = 1800 \text{ rpm}$

| $i_N$ |            | Gear unit sizes |      |      |      |      |      |     |      |      |      |      |      |      |      |      |   |   |   |   |   |
|-------|------------|-----------------|------|------|------|------|------|-----|------|------|------|------|------|------|------|------|---|---|---|---|---|
|       |            | 4               | 5    | 6    | 7    | 8    | 9    | 10  | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   |   |   |   |   |   |
| 5.0   | $P_{GA}$   | *               | *    | –    | *    | –    | *    | –   | *    | –    | *    | –    | *    | –    | *    | –    | * | – | * | – | * |
|       | $P_{GB}$   | 192             | 254  | –    | 384  | –    | 430  | –   | 498  | –    | 583  | –    | 76   | –    | 185  | –    | – | – | – | – | – |
|       | $P_{GC15}$ | 235             | 357  | –    | 535  | –    | 522  | –   | 388  | –    | 76   | –    | 185  | –    | –    | –    | – | – | – | – | – |
|       | $P_{GD15}$ | 366             | 545  | –    | 867  | –    | 961  | –   | 1124 | –    | 1229 | –    | 975  | –    | –    | –    | – | – | – | – | – |
| 5.6   | $P_{GA}$   | *               | *    | –    | *    | –    | *    | –   | *    | –    | *    | –    | *    | –    | *    | –    | * | – | * | – | * |
|       | $P_{GB}$   | 186             | 247  | –    | 376  | –    | 431  | –   | 562  | –    | 700  | –    | 420  | 180  | *    | –    | – | – | – | – | – |
|       | $P_{GC15}$ | 227             | 344  | –    | 495  | –    | 523  | –   | 467  | –    | 214  | –    | 419  | 179  | –    | –    | – | – | – | – | – |
|       | $P_{GD15}$ | 351             | 524  | –    | 808  | –    | 926  | –   | 1160 | –    | 1309 | –    | 1162 | 969  | 317  | –    | – | – | – | – | – |
| 6.3   | $P_{GA}$   | 39.60           | *    | *    | *    | *    | *    | *   | *    | *    | *    | *    | *    | *    | *    | *    | * | * | * | * | * |
|       | $P_{GB}$   | 181             | 239  | 281  | 364  | 412  | 434  | 436 | 576  | 570  | 765  | 660  | 675  | *    | *    | –    | – | – | – | – | – |
|       | $P_{GC15}$ | 217             | 321  | 324  | 458  | 307  | 526  | 508 | 501  | 429  | 354  | 105  | 675  | 430  | 109  | –    | – | – | – | – | – |
|       | $P_{GD15}$ | 337             | 489  | 526  | 746  | 675  | 892  | 937 | 1125 | 1217 | 1322 | 1316 | 1339 | 1174 | 839  | –    | – | – | – | – | – |
| 7.1   | $P_{GA}$   | 42.0            | *    | *    | *    | *    | *    | *   | *    | *    | *    | *    | *    | *    | *    | *    | * | * | * | * | * |
|       | $P_{GB}$   | 170             | 228  | 272  | 348  | 402  | 421  | 437 | 594  | 635  | 805  | 775  | 822  | 696  | 446  | 133  | – | – | – | – | – |
|       | $P_{GC15}$ | 197             | 294  | 315  | 425  | 309  | 511  | 510 | 526  | 513  | 418  | 251  | 73   | 696  | 445  | 133  | – | – | – | – | – |
|       | $P_{GD15}$ | 308             | 451  | 508  | 693  | 648  | 851  | 905 | 1119 | 1257 | 1349 | 1397 | 1440 | 1357 | 1108 | 861  | – | – | – | – | – |
| 8.0   | $P_{GA}$   | 41.9            | *    | *    | *    | *    | *    | *   | *    | *    | *    | *    | *    | *    | *    | *    | * | * | * | * | * |
|       | $P_{GB}$   | 160             | 216  | 262  | 333  | 388  | 408  | 438 | 575  | 647  | 799  | 840  | 899  | 845  | 697  | 482  | – | – | – | – | – |
|       | $P_{GC15}$ | 181             | 271  | 304  | 394  | 309  | 493  | 513 | 524  | 546  | 457  | 395  | 254  | 80   | 696  | 481  | – | – | – | – | – |
|       | $P_{GD15}$ | 284             | 419  | 484  | 646  | 618  | 811  | 872 | 1048 | 1210 | 1304 | 1408 | 1444 | 1465 | 1273 | 1135 | – | – | – | – | – |
| 9.0   | $P_{GA}$   | 41.9            | 44.7 | *    | *    | *    | *    | *   | *    | *    | *    | *    | *    | *    | *    | *    | * | * | * | * | * |
|       | $P_{GB}$   | 151             | 204  | 248  | 320  | 370  | 395  | 425 | 563  | 666  | 788  | 880  | 915  | 926  | 771  | 733  | – | – | – | – | – |
|       | $P_{GC15}$ | 165             | 244  | 290  | 371  | 300  | 468  | 498 | 522  | 573  | 469  | 460  | 321  | 267  | 771  | 733  | – | – | – | – | – |
|       | $P_{GD15}$ | 261             | 382  | 457  | 610  | 587  | 770  | 832 | 1014 | 1204 | 1264 | 1436 | 1439 | 1490 | 1316 | 1305 | – | – | – | – | – |
| 10    | $P_{GA}$   | 36.7            | 44.6 | 52.6 | *    | *    | *    | *   | *    | *    | *    | *    | *    | *    | *    | *    | * | * | * | * | * |
|       | $P_{GB}$   | 126             | 188  | 235  | 301  | 354  | 375  | 412 | 541  | 643  | 775  | 868  | 921  | 946  | 854  | 810  | – | – | – | – | – |
|       | $P_{GC15}$ | 129             | 215  | 277  | 340  | 292  | 430  | 485 | 509  | 569  | 483  | 498  | 386  | 336  | 90   | 810  | – | – | – | – | – |
|       | $P_{GD15}$ | 208             | 340  | 432  | 559  | 559  | 711  | 796 | 964  | 1126 | 1214 | 1381 | 1417 | 1482 | 1358 | 1358 | – | – | – | – | – |
| 11.2  | $P_{GA}$   | 36.1            | 41.6 | 55.4 | 45.5 | *    | *    | *   | *    | *    | *    | *    | *    | *    | *    | *    | * | * | * | * | * |
|       | $P_{GB}$   | 122             | 169  | 221  | 272  | 341  | 336  | 398 | 491  | 627  | 710  | 857  | 860  | 957  | 824  | 893  | – | – | – | – | – |
|       | $P_{GC15}$ | 123             | 187  | 264  | 298  | 284  | 373  | 472 | 470  | 564  | 461  | 509  | 395  | 402  | 132  | 70   | – | – | – | – | – |
|       | $P_{GD15}$ | 199             | 299  | 408  | 493  | 537  | 620  | 767 | 871  | 1087 | 1108 | 1338 | 1311 | 1456 | 1282 | 1411 | – | – | – | – | – |
| 12.5  | $P_{GA}$   | 43.5            | 53.1 | 53.7 | 74.1 | 58.3 | 89.8 | *   | *    | *    | *    | *    | *    | *    | *    | *    | * | * | * | * | * |
|       | $P_{GB}$   | 125             | 173  | 203  | 287  | 320  | 370  | 378 | 575  | 599  | 853  | 839  | 1047 | 897  | 1095 | 871  | – | – | – | – | – |
|       | $P_{GC15}$ | 125             | 189  | 247  | 308  | 271  | 406  | 453 | 559  | 548  | 613  | 522  | 585  | 410  | 430  | 157  | – | – | – | – | – |
|       | $P_{GD15}$ | 199             | 296  | 377  | 496  | 504  | 651  | 726 | 957  | 1032 | 1252 | 1284 | 1481 | 1344 | 1560 | 1330 | – | – | – | – | – |
| 14    | $P_{GA}$   | 39.8            | 48.5 | 49.5 | 68.7 | 56.7 | 85.9 | *   | *    | *    | *    | *    | *    | *    | *    | *    | * | * | * | * | * |
|       | $P_{GB}$   | 112             | 154  | 182  | 255  | 289  | 332  | 341 | 519  | 541  | 772  | 765  | 956  | 1075 | 1041 | 1132 | – | – | – | – | – |
|       | $P_{GC15}$ | 110             | 163  | 224  | 267  | 249  | 354  | 413 | 512  | 504  | 569  | 496  | 568  | 602  | 453  | 454  | – | – | – | – | – |
|       | $P_{GD15}$ | 176             | 257  | 339  | 432  | 456  | 572  | 655 | 862  | 931  | 1130 | 1168 | 1344 | 1510 | 1436 | 1594 | – | – | – | – | – |

\* on request

## Design of the gear units

### Overview tables

#### Type B3 – Nominal power ratings of gear unit sizes 4 to 12

##### Technical specifications (continued)

##### Nominal power ratings $P_{2N}$ (kW) type B3

| $i_N$ | $n_1$ | $n_2$ | Gear unit sizes |     |     |     |     |     |     |     |     |  |
|-------|-------|-------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|--|
|       |       |       | 4               | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  |  |
| 12.5  | 1800  | 144.0 | 82              | 141 | –   | 256 | –   | 422 | –   | 790 | –   |  |
|       | 1500  | 120.0 | 69              | 118 | –   | 213 | –   | 351 | –   | 658 | –   |  |
|       | 1200  | 96.0  | 55              | 94  | –   | 170 | –   | 281 | –   | 526 | –   |  |
|       | 1000  | 80.0  | 46              | 78  | –   | 142 | –   | 234 | –   | 438 | –   |  |
| 14    | 1800  | 129.0 | 81              | 132 | –   | 245 | –   | 398 | –   | 765 | –   |  |
|       | 1500  | 107.0 | 67              | 109 | –   | 203 | –   | 330 | –   | 635 | –   |  |
|       | 1200  | 86.0  | 54              | 88  | –   | 163 | –   | 265 | –   | 510 | –   |  |
|       | 1000  | 71.0  | 44              | 72  | –   | 135 | –   | 219 | –   | 421 | –   |  |
| 16    | 1800  | 113.0 | 78              | 124 | 141 | 234 | 254 | 366 | 421 | 708 | 784 |  |
|       | 1500  | 94.0  | 64              | 103 | 118 | 194 | 211 | 305 | 350 | 589 | 652 |  |
|       | 1200  | 75.0  | 51              | 82  | 94  | 155 | 168 | 243 | 279 | 470 | 520 |  |
|       | 1000  | 63.0  | 43              | 69  | 79  | 130 | 141 | 204 | 234 | 395 | 437 |  |
| 18    | 1800  | 100.0 | 70              | 118 | 131 | 220 | 241 | 354 | 392 | 649 | 727 |  |
|       | 1500  | 83.0  | 58              | 98  | 109 | 183 | 200 | 294 | 325 | 538 | 604 |  |
|       | 1200  | 67.0  | 47              | 79  | 88  | 148 | 162 | 237 | 263 | 434 | 487 |  |
|       | 1000  | 56.0  | 39              | 66  | 73  | 123 | 135 | 198 | 219 | 363 | 407 |  |
| 20    | 1800  | 90.0  | 63              | 109 | 124 | 204 | 235 | 336 | 370 | 598 | 685 |  |
|       | 1500  | 75.0  | 52              | 91  | 103 | 170 | 196 | 280 | 308 | 498 | 570 |  |
|       | 1200  | 60.0  | 42              | 72  | 82  | 136 | 157 | 224 | 246 | 398 | 456 |  |
|       | 1000  | 50.0  | 35              | 60  | 69  | 113 | 130 | 186 | 205 | 332 | 380 |  |
| 22.4  | 1800  | 80.0  | 56              | 97  | 118 | 181 | 221 | 299 | 350 | 531 | 633 |  |
|       | 1500  | 67.0  | 47              | 81  | 99  | 152 | 185 | 250 | 293 | 445 | 530 |  |
|       | 1200  | 54.0  | 37              | 65  | 80  | 122 | 149 | 201 | 236 | 359 | 427 |  |
|       | 1000  | 45.0  | 31              | 54  | 66  | 102 | 124 | 168 | 196 | 299 | 356 |  |
| 25    | 1800  | 72.0  | 50              | 87  | 116 | 163 | 205 | 269 | 330 | 478 | 582 |  |
|       | 1500  | 60.0  | 42              | 72  | 97  | 136 | 170 | 224 | 275 | 398 | 485 |  |
|       | 1200  | 48.0  | 33              | 58  | 77  | 109 | 136 | 179 | 220 | 319 | 388 |  |
|       | 1000  | 40.0  | 28              | 48  | 64  | 90  | 113 | 149 | 183 | 265 | 323 |  |
| 28    | 1800  | 64.0  | 44              | 77  | 103 | 145 | 182 | 239 | 293 | 425 | 517 |  |
|       | 1500  | 54.0  | 37              | 65  | 87  | 122 | 153 | 201 | 247 | 359 | 436 |  |
|       | 1200  | 43.0  | 30              | 52  | 69  | 97  | 122 | 160 | 197 | 285 | 347 |  |
|       | 1000  | 36.0  | 25              | 43  | 58  | 81  | 102 | 134 | 165 | 239 | 291 |  |
| 31.5  | 1800  | 57.0  | 39              | 69  | 92  | 129 | 162 | 213 | 261 | 379 | 460 |  |
|       | 1500  | 48.0  | 33              | 58  | 77  | 109 | 136 | 179 | 220 | 319 | 388 |  |
|       | 1200  | 38.0  | 26              | 46  | 61  | 86  | 108 | 142 | 174 | 252 | 307 |  |
|       | 1000  | 32.0  | 22              | 38  | 51  | 72  | 91  | 119 | 146 | 212 | 258 |  |
| 35.5  | 1800  | 51.0  | 35              | 61  | 82  | 115 | 145 | 190 | 233 | 339 | 412 |  |
|       | 1500  | 42.0  | 29              | 51  | 68  | 95  | 119 | 157 | 192 | 279 | 339 |  |
|       | 1200  | 34.0  | 23              | 41  | 55  | 77  | 96  | 127 | 155 | 226 | 274 |  |
|       | 1000  | 28.0  | 19              | 34  | 45  | 63  | 79  | 104 | 128 | 186 | 226 |  |
| 40    | 1800  | 45.0  | 31              | 54  | 73  | 102 | 128 | 168 | 206 | 299 | 363 |  |
|       | 1500  | 38.0  | 26              | 46  | 61  | 86  | 108 | 142 | 174 | 252 | 307 |  |
|       | 1200  | 30.0  | 21              | 36  | 48  | 68  | 85  | 112 | 137 | 199 | 242 |  |
|       | 1000  | 25.0  | 17              | 30  | 40  | 56  | 71  | 93  | 114 | 166 | 202 |  |
| 45    | 1800  | 40.0  | 28              | 48  | 64  | 90  | 113 | 149 | 183 | 265 | 323 |  |
|       | 1500  | 33.0  | 23              | 40  | 53  | 74  | 93  | 123 | 151 | 219 | 266 |  |
|       | 1200  | 27.0  | 18              | 32  | 43  | 61  | 76  | 100 | 123 | 179 | 218 |  |
|       | 1000  | 22.0  | 15              | 26  | 35  | 49  | 62  | 82  | 100 | 146 | 177 |  |
| 50    | 1800  | 36.0  | 25              | 43  | 58  | 81  | 102 | 134 | 165 | 239 | 291 |  |
|       | 1500  | 30.0  | 21              | 36  | 48  | 68  | 85  | 112 | 137 | 199 | 242 |  |
|       | 1200  | 24.0  | 16              | 29  | 38  | 54  | 68  | 89  | 110 | 159 | 194 |  |
|       | 1000  | 20.0  | 14              | 24  | 32  | 45  | 56  | 74  | 91  | 132 | 161 |  |
| 56    | 1800  | 32.0  | 22              | 38  | 51  | 72  | 91  | 119 | 146 | 212 | 258 |  |
|       | 1500  | 27.0  | 18              | 32  | 43  | 61  | 76  | 100 | 123 | 179 | 218 |  |
|       | 1200  | 21.0  | 14              | 25  | 34  | 47  | 59  | 78  | 96  | 139 | 169 |  |
|       | 1000  | 17.9  | 12              | 21  | 29  | 40  | 50  | 66  | 82  | 119 | 144 |  |



### Technical specifications (continued)

#### Nominal power ratings $P_{2N}$ (kW) type B3 (continued)

| $i_N$     | $n_1$ | $n_2$ | Gear unit sizes |    |    |    |    |     |     |     |     |
|-----------|-------|-------|-----------------|----|----|----|----|-----|-----|-----|-----|
|           |       |       | 4               | 5  | 6  | 7  | 8  | 9   | 10  | 11  | 12  |
| <b>63</b> | 1800  | 29.0  | 20              | 34 | 47 | 64 | 82 | 108 | 133 | 192 | 234 |
|           | 1500  | 24.0  | 16              | 28 | 38 | 53 | 68 | 89  | 110 | 159 | 194 |
|           | 1200  | 19.0  | 13              | 22 | 30 | 42 | 54 | 71  | 87  | 126 | 153 |
|           | 1000  | 15.9  | 10              | 18 | 25 | 35 | 45 | 59  | 72  | 105 | 128 |
| <b>71</b> | 1800  | 25.0  | 17              | 28 | 40 | 52 | 71 | 89  | 114 | 157 | 202 |
|           | 1500  | 21.0  | 14              | 24 | 34 | 43 | 59 | 74  | 96  | 131 | 169 |
|           | 1200  | 16.9  | 11              | 19 | 27 | 35 | 48 | 60  | 77  | 106 | 136 |
|           | 1000  | 14.1  | 9.7             | 16 | 22 | 29 | 40 | 50  | 64  | 88  | 113 |
| <b>80</b> | 1800  | 23.0  | –               | –  | 33 | –  | 64 | –   | 105 | –   | 185 |
|           | 1500  | 18.8  | –               | –  | 27 | –  | 52 | –   | 86  | –   | 151 |
|           | 1200  | 15.0  | –               | –  | 21 | –  | 42 | –   | 68  | –   | 121 |
|           | 1000  | 12.5  | –               | –  | 18 | –  | 35 | –   | 57  | –   | 101 |
| <b>90</b> | 1800  | 20.0  | –               | –  | 29 | –  | 52 | –   | 90  | –   | 157 |
|           | 1500  | 16.7  | –               | –  | 24 | –  | 44 | –   | 75  | –   | 131 |
|           | 1200  | 13.3  | –               | –  | 19 | –  | 35 | –   | 59  | –   | 104 |
|           | 1000  | 11.1  | –               | –  | 16 | –  | 29 | –   | 49  | –   | 87  |



### Type B3 – Nominal power ratings of gear unit sizes 13 to 28

#### Technical specifications (continued)

#### Nominal power ratings $P_{2N}$ (kW) type B3 (continued)

| $i_N$     | $n_1$ | $n_2$ | Gear unit sizes |     |     |     |       |       |       |        |        |        |      |      |      |      |      |      |
|-----------|-------|-------|-----------------|-----|-----|-----|-------|-------|-------|--------|--------|--------|------|------|------|------|------|------|
|           |       |       | 13              | 14  | 15  | 16  | 17    | 18    | 19    | 20     | 21     | 22     | 23   | 24   | 25   | 26   | 27   | 28   |
| <b>63</b> | 1800  | 29.0  | 275             | 343 | 464 | 525 | 607 * | 728 * | 910 * | 1047 * | 1275 * | 1427 * | *    | *    | *    | *    | *    | *    |
|           | 1500  | 24.0  | 227             | 283 | 384 | 434 | 502   | 603   | 753   | 867    | 1055   | 1181   | *    | *    | *    | *    | *    | *    |
|           | 1200  | 19.0  | 180             | 224 | 304 | 344 | 397   | 477   | 596   | 686    | 835    | 935    | 1257 | 1396 | 1715 | 2054 | *    | *    |
|           | 1000  | 15.9  | 151             | 188 | 254 | 288 | 332   | 399   | 499   | 574    | 699    | 782    | 1047 | 1163 | 1429 | 1712 | 2044 | 2327 |
| <b>71</b> | 1800  | 25.0  | 237             | 295 | 400 | 452 | 523 * | 628 * | 785 * | 903 *  | 1099 * | 1230 * | *    | *    | *    | *    | *    | *    |
|           | 1500  | 21.0  | 199             | 248 | 336 | 380 | 439   | 527   | 659   | 758    | 923    | 1033   | *    | *    | *    | *    | *    | *    |
|           | 1200  | 16.9  | 160             | 199 | 270 | 306 | 353   | 424   | 530   | 610    | 743    | 831    | 1115 | 1239 | 1416 | 1823 | *    | *    |
|           | 1000  | 14.1  | 133             | 166 | 225 | 255 | 295   | 354   | 442   | 509    | 620    | 693    | 929  | 1032 | 1180 | 1519 | 1696 | 2065 |
| <b>80</b> | 1800  | 23.0  | –               | 272 | –   | 416 | –     | 578 * | –     | 830 *  | –      | 1131 * | –    | *    | –    | *    | –    | *    |
|           | 1500  | 18.8  | –               | 222 | –   | 340 | –     | 472   | –     | 679    | –      | 925    | –    | *    | –    | *    | –    | *    |
|           | 1200  | 15.0  | –               | 177 | –   | 271 | –     | 376   | –     | 541    | –      | 738    | –    | 1099 | –    | 1429 | –    | *    |
|           | 1000  | 12.5  | –               | 147 | –   | 226 | –     | 314   | –     | 451    | –      | 615    | –    | 916  | –    | 1191 | –    | 1715 |
| <b>90</b> | 1800  | 20.0  | –               | 236 | –   | –   | –     | –     | –     | –      | –      | –      | –    | –    | –    | –    | –    | –    |
|           | 1500  | 16.7  | –               | 197 | –   | –   | –     | –     | –     | –      | –      | –      | –    | –    | –    | –    | –    | –    |
|           | 1200  | 13.3  | –               | 157 | –   | –   | –     | –     | –     | –      | –      | –      | –    | –    | –    | –    | –    | –    |
|           | 1000  | 11.1  | –               | 131 | –   | –   | –     | –     | –     | –      | –      | –      | –    | –    | –    | –    | –    | –    |

\* on request

## Design of the gear units

### Overview tables

#### Type B3 – Nominal output torque of low speed shaft (LSS) gear unit sizes 4 to 12

##### Technical specifications (continued)

##### Nominal output torque of low speed shaft (LSS) $T_{2N}$ (kNm) type B3

| $i_N$ | Gear unit sizes |      |      |      |      |      |      |      |      |    | Type |
|-------|-----------------|------|------|------|------|------|------|------|------|----|------|
|       | 4               | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   |    |      |
| 5     | 6.1             | 9.4  | –    | 19   | –    | 29.9 | –    | 46   | –    |    | B2   |
| 5.6   | 6.2             | 9.4  | –    | 19   | –    | 29.9 | –    | 48.1 | –    |    |      |
| 6.3   | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 50.2 | 58.8 |    |      |
| 7.1   | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 52.4 | 60.9 |    |      |
| 8     | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 63.1 |    |      |
| 9     | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 65.2 |    |      |
| 10    | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 66.3 |    |      |
| 11.2  | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 66.3 |    |      |
| 12.5  | 5.5             | 9.4  | 12   | 17   | 23.8 | 28   | 38   | 52.4 | 66.3 |    |      |
| 14    | 6               | 9.8  | 12   | 18.2 | 23.8 | 29.5 | 38   | 56.7 | 66.3 |    |      |
| 16    | 6.6             | 10.5 | 12   | 19.8 | 21.5 | 31   | 35.6 | 59.9 | 66.3 |    |      |
| 18    | 6.7             | 11.3 | 12.6 | 21.1 | 23.1 | 33.9 | 37.5 | 62   | 69.5 |    |      |
| 20    | 6.7             | 11.6 | 13.2 | 21.7 | 26.5 | 35.7 | 39.3 | 63.5 | 72.7 |    |      |
| 22.4  | 6.7             | 11.6 | 14.2 | 21.7 | 27.2 | 35.7 | 41.8 | 63.5 | 75.6 |    |      |
| 25    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 28    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 31.5  | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | B3 |      |
| 35.5  | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 40    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 45    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 50    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 56    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 63    | 6.6             | 11.4 | 15.5 | 21.4 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 71    | 6.6             | 11   | 15.5 | 20   | 27.2 | 34   | 43.8 | 60   | 77.2 |    |      |
| 80    | –               | 11.6 | 14   | 21.7 | 26.9 | 35.7 | 43.8 | 61.6 | 77.2 |    |      |
| 90    | –               | 11.6 | 14   | 21.7 | 25.2 | 35.7 | 43   | 61.6 | 75   |    |      |
| 100   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 112   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 125   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 140   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 160   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 180   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 200   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 224   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 250   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 280   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.3 | 44.2 | 61.6 | 78   |    |      |
| 315   | –               | 11.2 | 15.5 | 20.5 | 27.2 | 34   | 44.2 | 60   | 78   |    |      |
| 355   | –               | –    | 15.5 | –    | 26.5 | –    | 44.2 | –    | 78   |    |      |
| 400   | –               | –    | 14.5 | –    | 25.5 | –    | 43   | –    | 75   |    |      |

### Type B3 – Nominal output torque of low speed shaft (LSS) gear unit sizes 13 to 28

#### Technical specifications (continued)

#### Nominal output torque of low speed shaft (LSS) $T_{2N}$ (kNm) type B3

| $i_N$ | Gear unit sizes |      |     |     |     |     |     |     |     |     |     |     |     |      |      |      | Type |    |
|-------|-----------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|----|
|       | 13              | 14   | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  | 25  | 26   | 27   | 28   |      |    |
| 5     | 68.6            | –    | 122 | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    | B2 |
| 5.6   | 69.6            | –    | 122 | 135 | 195 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 6.3   | 73.8            | 85.2 | 130 | 141 | 195 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 7.1   | 75.9            | 87.3 | 132 | 145 | 195 | 230 | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 8     | 80.0            | 91.5 | 132 | 148 | 195 | 230 | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 9     | 81.1            | 94.6 | 132 | 148 | 195 | 230 | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 10    | 81.1            | 98.8 | 132 | 148 | 195 | 230 | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 11.2  | 81.1            | 101  | 132 | 148 | 195 | 230 | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 12.5  | 79.5            | 101  | 132 | 148 | 195 | 230 | 250 | –   | 340 | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 14    | 81.6            | 101  | 137 | 148 | 195 | 230 | 262 | 295 | 360 | 405 | –   | –   | –   | –    | –    | –    | –    |    |
| 16    | 83.8            | 99.4 | 142 | 154 | 200 | 230 | 275 | 308 | 380 | 422 | –   | –   | –   | –    | –    | –    | –    |    |
| 18    | 86.7            | 102  | 148 | 160 | 200 | 240 | 288 | 320 | 400 | 438 | –   | –   | –   | –    | –    | –    | –    |    |
| 20    | 90.7            | 105  | 153 | 167 | 200 | 240 | 300 | 332 | 420 | 455 | 640 | –   | 860 | –    | 1230 | –    | –    |    |
| 22.4  | 90.7            | 108  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 25    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 28    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 31.5  | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 35.5  | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 40    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 45    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 50    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 56    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 63    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 71    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1150 | 1400 | –    |    |
| 80    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 910  | 1225 | 1310 | –    |    |
| 90    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 960  | 1225 | 1400 | –    |    |
| 100   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 970  | 1220 | 1400 | –    |    |
| 112   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 990  | 1220 | 1400 | –    |    |
| 125   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 990  | 1215 | 1400 | –    |    |
| 140   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1215 | 1400 | –    |    |
| 160   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1210 | 1400 | –    |    |
| 180   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1210 | 1400 | –    |    |
| 200   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1205 | 1400 | –    |    |
| 224   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1205 | 1400 | –    |    |
| 250   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1200 | 1400 | –    |    |
| 280   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 710 | 860 | 1030 | 1200 | 1400 | –    |    |
| 315   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 585 | 690 | 800 | 1030 | 1150 | 1400 | –    |    |
| 355   | –               | 113  | –   | 173 | –   | 240 | –   | 345 | –   | 470 | –   | 660 | –   | 910  | –    | 1310 | –    |    |
| 400   | –               | 113  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |

Type B2, see page 3/43  
Type B4, see page 3/64



### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type B3 $n_1 = 1000$ rpm (continued)

| $i_N$     |            | Gear unit sizes |      |      |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |
|-----------|------------|-----------------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|           |            | 4               | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| <b>63</b> | $P_{GA}$   | 23.4            | 33.6 | 41.3 | 50.2 | 61.6 | 69.4 | 81.1 | 103  | 131 | 145 | 177 | 208 | 223 | 257 | 276 | 312 | 334 | 383 | 404 |
|           | $P_{GB}$   | 38.3            | 57.6 | 70.6 | 85.9 | 104  | 123  | 143  | 203  | 257 | 283 | 344 | 398 | 428 | 541 | 577 | 677 | 712 | 797 | 831 |
|           | $P_{GC15}$ | 38.9            | 66.3 | 81.2 | 109  | 133  | 165  | 204  | 241  | 324 | 321 | 375 | 405 | 427 | 460 | 483 | *   | *   | *   | *   |
|           | $P_{GD15}$ | 52.8            | 88.3 | 108  | 141  | 171  | 213  | 259  | 330  | 436 | 445 | 526 | 579 | 615 | 725 | 764 | *   | *   | *   | *   |
| <b>71</b> | $P_{GA}$   | 22.0            | 31.5 | 37.9 | 47.2 | 56.6 | 64.2 | 74.3 | 94.9 | 120 | 134 | 163 | 196 | 215 | 244 | 266 | 298 | 326 | 366 | 395 |
|           | $P_{GB}$   | 35.9            | 53.6 | 64.3 | 80.1 | 95.2 | 113  | 130  | 185  | 233 | 260 | 313 | 373 | 409 | 509 | 552 | 638 | 689 | 750 | 805 |
|           | $P_{GC15}$ | 35.7            | 60.5 | 72.8 | 99.3 | 119  | 148  | 181  | 214  | 297 | 299 | 346 | 384 | 411 | 438 | 467 | *   | *   | *   | *   |
|           | $P_{GD15}$ | 48.7            | 80.8 | 97.0 | 129  | 154  | 191  | 231  | 295  | 398 | 412 | 482 | 545 | 589 | 684 | 733 | *   | *   | *   | *   |
| <b>80</b> | $P_{GA}$   | –               | –    | 36.2 | –    | 54.3 | –    | 71.1 | –    | 115 | –   | 156 | –   | 203 | –   | 253 | –   | 311 | –   | 377 |
|           | $P_{GB}$   | –               | –    | 61.0 | –    | 90.8 | –    | 124  | –    | 221 | –   | 298 | –   | 383 | –   | 519 | –   | 649 | –   | 758 |
|           | $P_{GC15}$ | –               | –    | 68.0 | –    | 112  | –    | 169  | –    | 286 | –   | 332 | –   | 390 | –   | 444 | –   | *   | –   | *   |
|           | $P_{GD15}$ | –               | –    | 90.9 | –    | 145  | –    | 216  | –    | 380 | –   | 461 | –   | 555 | –   | 692 | –   | *   | –   | *   |
| <b>90</b> | $P_{GA}$   | –               | –    | 34.1 | –    | 51.0 | –    | 66   | –    | 106 | –   | 144 | –   | –   | –   | –   | –   | –   | –   | –   |
|           | $P_{GB}$   | –               | –    | 57.1 | –    | 84.6 | –    | 114  | –    | 201 | –   | 273 | –   | –   | –   | –   | –   | –   | –   | –   |
|           | $P_{GC15}$ | –               | –    | 62.2 | –    | 102  | –    | 151  | –    | 264 | –   | 310 | –   | –   | –   | –   | –   | –   | –   | –   |
|           | $P_{GD15}$ | –               | –    | 83.5 | –    | 133  | –    | 194  | –    | 349 | –   | 426 | –   | –   | –   | –   | –   | –   | –   | –   |

\* on request





### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type B3 $n_1 = 1200$ rpm (continued)

| $i_N$     |            | Gear unit sizes |      |      |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |
|-----------|------------|-----------------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|           |            | 4               | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| <b>63</b> | $P_{GA}$   | 25.4            | 35.5 | 43.7 | 52.8 | 64.7 | 72.7 | 84.8 | 107  | 137 | 150 | 183 | 214 | 230 | 263 | 282 | 306 | 329 | 380 | 402 |
|           | $P_{GB}$   | 44.4            | 65.4 | 80.1 | 97.2 | 118  | 139  | 161  | 229  | 289 | 317 | 384 | 444 | 478 | 602 | 640 | 743 | 781 | 875 | 912 |
|           | $P_{GC15}$ | 43.8            | 73.6 | 90.1 | 121  | 147  | 184  | 228  | 267  | 339 | 336 | 393 | 423 | 445 | 478 | 502 | *   | *   | *   | *   |
|           | $P_{GD15}$ | 61.5            | 101  | 123  | 161  | 195  | 242  | 295  | 376  | 476 | 487 | 575 | 634 | 673 | 794 | 837 | *   | *   | *   | *   |
| <b>71</b> | $P_{GA}$   | 23.2            | 33.4 | 40.1 | 49.7 | 59.6 | 67.3 | 77.9 | 98.9 | 125 | 140 | 169 | 203 | 222 | 251 | 273 | 295 | 323 | 366 | 395 |
|           | $P_{GB}$   | 40.2            | 60.9 | 73.0 | 90.6 | 108  | 127  | 147  | 209  | 263 | 291 | 351 | 417 | 457 | 566 | 613 | 701 | 758 | 826 | 886 |
|           | $P_{GC15}$ | 39.1            | 67.1 | 81   | 110  | 132  | 164  | 202  | 237  | 312 | 313 | 362 | 401 | 430 | 456 | 485 | *   | *   | *   | *   |
|           | $P_{GD15}$ | 55.1            | 92.3 | 111  | 147  | 175  | 218  | 263  | 336  | 435 | 450 | 528 | 597 | 646 | 749 | 804 | *   | *   | *   | *   |
| <b>80</b> | $P_{GA}$   | –               | –    | 38.3 | –    | 57.2 | –    | 74.6 | –    | 120 | –   | 162 | –   | 211 | –   | 260 | –   | 311 | –   | 379 |
|           | $P_{GB}$   | –               | –    | 69.3 | –    | 103  | –    | 140  | –    | 249 | –   | 334 | –   | 428 | –   | 577 | –   | 715 | –   | 835 |
|           | $P_{GC15}$ | –               | –    | 75.3 | –    | 124  | –    | 188  | –    | 300 | –   | 348 | –   | 408 | –   | 463 | –   | *   | –   | *   |
|           | $P_{GD15}$ | –               | –    | 104  | –    | 165  | –    | 246  | –    | 415 | –   | 504 | –   | 608 | –   | 758 | –   | *   | –   | *   |
| <b>90</b> | $P_{GA}$   | –               | –    | 36.0 | –    | 53.8 | –    | 69.1 | –    | 111 | –   | 151 | –   | –   | –   | –   | –   | –   | –   | –   |
|           | $P_{GB}$   | –               | –    | 64.5 | –    | 95.7 | –    | 128  | –    | 227 | –   | 306 | –   | –   | –   | –   | –   | –   | –   | –   |
|           | $P_{GC15}$ | –               | –    | 68.7 | –    | 113  | –    | 168  | –    | 277 | –   | 325 | –   | –   | –   | –   | –   | –   | –   | –   |
|           | $P_{GD15}$ | –               | –    | 95.0 | –    | 151  | –    | 221  | –    | 381 | –   | 466 | –   | –   | –   | –   | –   | –   | –   | –   |

\* on request



### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type B3 $n_1 = 1500$ rpm (continued)

| $i_N$     |            | Gear unit sizes |      |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |      |
|-----------|------------|-----------------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
|           |            | 4               | 5    | 6    | 7    | 8    | 9    | 10   | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22   |
| <b>63</b> | $P_{GA}$   | 27.1            | 37.7 | 46.4 | 55.7 | 68.1 | 75.9 | 88.4 | 111 | 141 | 155 | 188 | 218 | 234 | 263 | 281 | 277 | 300 | 355 | 378  |
|           | $P_{GB}$   | 51.8            | 76.5 | 93.5 | 113  | 136  | 161  | 186  | 264 | 332 | 361 | 437 | 504 | 541 | 677 | 719 | 817 | 861 | 964 | 1006 |
|           | $P_{GC15}$ | 49.4            | 83.6 | 102  | 137  | 164  | 209  | 259  | 300 | 358 | 353 | 412 | 441 | 465 | 494 | 518 | *   | *   | *   | *    |
|           | $P_{GD15}$ | 72.4            | 119  | 145  | 188  | 225  | 284  | 345  | 436 | 530 | 540 | 638 | 704 | 748 | 880 | 926 | *   | *   | *   | *    |
| <b>71</b> | $P_{GA}$   | 24.7            | 35.5 | 42.6 | 52.4 | 62.9 | 70.5 | 81.5 | 103 | 130 | 144 | 175 | 208 | 226 | 253 | 274 | 275 | 298 | 349 | 376  |
|           | $P_{GB}$   | 46.9            | 71.2 | 85.2 | 105  | 125  | 147  | 170  | 241 | 302 | 332 | 399 | 473 | 518 | 638 | 690 | 775 | 836 | 914 | 979  |
|           | $P_{GC15}$ | 43.9            | 76.1 | 91.4 | 125  | 150  | 186  | 230  | 268 | 329 | 330 | 381 | 420 | 449 | 473 | 502 | *   | *   | *   | *    |
|           | $P_{GD15}$ | 64.7            | 109  | 130  | 172  | 205  | 255  | 307  | 391 | 484 | 500 | 586 | 664 | 718 | 832 | 891 | *   | *   | *   | *    |
| <b>80</b> | $P_{GA}$   | –               | –    | 40.8 | –    | 60.4 | –    | 78.2 | –   | 125 | –   | 168 | –   | 216 | –   | 264 | –   | 295 | –   | 367  |
|           | $P_{GB}$   | –               | –    | 80.9 | –    | 119  | –    | 161  | –   | 287 | –   | 380 | –   | 487 | –   | 650 | –   | 792 | –   | 926  |
|           | $P_{GC15}$ | –               | –    | 85.4 | –    | 141  | –    | 214  | –   | 316 | –   | 367 | –   | 428 | –   | 481 | –   | *   | –   | *    |
|           | $P_{GD15}$ | –               | –    | 122  | –    | 193  | –    | 287  | –   | 462 | –   | 560 | –   | 677 | –   | 842 | –   | *   | –   | *    |
| <b>90</b> | $P_{GA}$   | –               | –    | 38.4 | –    | 56.9 | –    | 72.6 | –   | 115 | –   | 156 | –   | –   | –   | –   | –   | –   | –   | –    |
|           | $P_{GB}$   | –               | –    | 75.3 | –    | 111  | –    | 148  | –   | 261 | –   | 349 | –   | –   | –   | –   | –   | –   | –   | –    |
|           | $P_{GC15}$ | –               | –    | 77.8 | –    | 128  | –    | 191  | –   | 293 | –   | 342 | –   | –   | –   | –   | –   | –   | –   | –    |
|           | $P_{GD15}$ | –               | –    | 112  | –    | 177  | –    | 258  | –   | 424 | –   | 518 | –   | –   | –   | –   | –   | –   | –   | –    |

\* on request



### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type B3 $n_1 = 1800$ rpm (continued)

| $i_N$     |            | Gear unit sizes |      |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |      |      |
|-----------|------------|-----------------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
|           |            | 4               | 5    | 6    | 7    | 8    | 9    | 10   | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21   | 22   |
| <b>63</b> | $P_{GA}$   | 28.4            | 39.4 | 48.3 | 57.5 | 70.3 | 77.6 | 90.5 | 113 | 143 | 156 | 189 | 216 | 231 | 255 | 270 | 230 | 256 | 308  | 332  |
|           | $P_{GB}$   | 58.8            | 86.7 | 106  | 127  | 153  | 180  | 208  | 294 | 369 | 399 | 480 | 553 | 593 | 737 | 781 | 871 | 919 | 1029 | 1076 |
|           | $P_{GC15}$ | 54.4            | 92.7 | 113  | 149  | 171  | 232  | 284  | 312 | 371 | 365 | 426 | 453 | 476 | 500 | 523 | *   | *   | *    | *    |
|           | $P_{GD15}$ | 82.6            | 135  | 165  | 211  | 246  | 322  | 386  | 474 | 576 | 586 | 692 | 763 | 809 | 950 | 999 | *   | *   | *    | *    |
| <b>71</b> | $P_{GA}$   | 25.8            | 37.1 | 44.5 | 54.3 | 65.1 | 72.4 | 83.6 | 105 | 132 | 146 | 176 | 207 | 225 | 247 | 267 | 235 | 258 | 312  | 334  |
|           | $P_{GB}$   | 53.2            | 80.7 | 96.4 | 119  | 141  | 165  | 190  | 268 | 336 | 367 | 440 | 520 | 568 | 696 | 751 | 828 | 894 | 978  | 1047 |
|           | $P_{GC15}$ | 48.2            | 84.2 | 101  | 138  | 158  | 207  | 255  | 289 | 342 | 342 | 395 | 432 | 461 | 480 | 510 | *   | *   | *    | *    |
|           | $P_{GD15}$ | 73.8            | 124  | 148  | 195  | 226  | 289  | 348  | 435 | 526 | 542 | 635 | 720 | 777 | 899 | 961 | *   | *   | *    | *    |
| <b>80</b> | $P_{GA}$   | –               | –    | 42.7 | –    | 62.6 | –    | 80.2 | –   | 127 | –   | 170 | –   | 215 | –   | 259 | –   | 260 | –    | 336  |
|           | $P_{GB}$   | –               | –    | 91.7 | –    | 134  | –    | 181  | –   | 319 | –   | 419 | –   | 535 | –   | 710 | –   | 848 | –    | 993  |
|           | $P_{GC15}$ | –               | –    | 94.5 | –    | 153  | –    | 238  | –   | 329 | –   | 380 | –   | 440 | –   | 489 | –   | *   | –    | *    |
|           | $P_{GD15}$ | –               | –    | 139  | –    | 217  | –    | 326  | –   | 502 | –   | 608 | –   | 734 | –   | 911 | –   | *   | –    | *    |
| <b>90</b> | $P_{GA}$   | –               | –    | 40.2 | –    | 59.1 | –    | 74.8 | –   | 118 | –   | 159 | –   | –   | –   | –   | –   | –   | –    | –    |
|           | $P_{GB}$   | –               | –    | 85.3 | –    | 125  | –    | 166  | –   | 291 | –   | 386 | –   | –   | –   | –   | –   | –   | –    | –    |
|           | $P_{GC15}$ | –               | –    | 85.9 | –    | 141  | –    | 212  | –   | 305 | –   | 355 | –   | –   | –   | –   | –   | –   | –    | –    |
|           | $P_{GD15}$ | –               | –    | 127  | –    | 201  | –    | 293  | –   | 461 | –   | 562 | –   | –   | –   | –   | –   | –   | –    | –    |

\* on request

## Design of the gear units

### Overview tables

#### Type B4 – Nominal power ratings of gear unit sizes 5 to 12

##### Technical specifications (continued)

##### Nominal power ratings $P_{2N}$ (kW) type B4

| $i_N$      | $n_1$ | $n_2$ | Gear unit sizes |     |     |     |    |    |     |     |
|------------|-------|-------|-----------------|-----|-----|-----|----|----|-----|-----|
|            |       |       | 5               | 6   | 7   | 8   | 9  | 10 | 11  | 12  |
| <b>80</b>  | 1800  | 23    | 27              | –   | 52  | –   | 85 | –  | 148 | –   |
|            | 1500  | 18.8  | 22              | –   | 42  | –   | 70 | –  | 121 | –   |
|            | 1200  | 15    | 18              | –   | 34  | –   | 56 | –  | 96  | –   |
|            | 1000  | 12.5  | 15              | –   | 28  | –   | 46 | –  | 80  | –   |
| <b>90</b>  | 1800  | 20    | 24              | –   | 45  | –   | 74 | –  | 129 | –   |
|            | 1500  | 16.7  | 20              | –   | 37  | –   | 62 | –  | 107 | –   |
|            | 1200  | 13.3  | 16              | –   | 30  | –   | 49 | –  | 85  | –   |
|            | 1000  | 11.1  | 13              | –   | 25  | –   | 41 | –  | 71  | –   |
| <b>100</b> | 1800  | 18    | 21              | 29  | 40  | 51  | 67 | 83 | 116 | 147 |
|            | 1500  | 15    | 18              | 24  | 34  | 42  | 56 | 69 | 96  | 122 |
|            | 1200  | 12    | 14              | 19  | 27  | 34  | 44 | 55 | 77  | 98  |
|            | 1000  | 10    | 12              | 16  | 22  | 28  | 37 | 46 | 64  | 81  |
| <b>112</b> | 1800  | 16.1  | 19              | 26  | 36  | 45  | 60 | 74 | 103 | 131 |
|            | 1500  | 13.4  | 16              | 21  | 30  | 38  | 50 | 62 | 86  | 109 |
|            | 1200  | 10.7  | 12              | 17  | 24  | 30  | 39 | 49 | 69  | 87  |
|            | 1000  | 8.9   | 10              | 14  | 20  | 25  | 33 | 41 | 57  | 72  |
| <b>125</b> | 1800  | 14.4  | 17              | 23  | 32  | 41  | 53 | 66 | 92  | 117 |
|            | 1500  | 12    | 14              | 19  | 27  | 34  | 44 | 55 | 77  | 98  |
|            | 1200  | 9.6   | 11              | 15  | 21  | 27  | 35 | 44 | 61  | 78  |
|            | 1000  | 8     | 9.7             | 12  | 18  | 22  | 29 | 37 | 51  | 65  |
| <b>140</b> | 1800  | 12.9  | 15              | 20  | 29  | 36  | 48 | 59 | 83  | 105 |
|            | 1500  | 10.7  | 12              | 17  | 24  | 30  | 39 | 49 | 69  | 87  |
|            | 1200  | 8.6   | 10              | 13  | 19  | 24  | 32 | 39 | 55  | 70  |
|            | 1000  | 7.1   | 8.6             | 11  | 16  | 20  | 26 | 32 | 45  | 57  |
| <b>160</b> | 1800  | 11.3  | 13              | 18  | 25  | 32  | 42 | 52 | 72  | 92  |
|            | 1500  | 9.4   | 11              | 15  | 21  | 26  | 35 | 43 | 60  | 76  |
|            | 1200  | 7.5   | 9.1             | 12  | 17  | 21  | 28 | 34 | 48  | 61  |
|            | 1000  | 6.3   | 7.6             | 10  | 14  | 17  | 23 | 29 | 40  | 51  |
| <b>180</b> | 1800  | 10    | 12              | 16  | 22  | 28  | 37 | 46 | 64  | 81  |
|            | 1500  | 8.3   | 10              | 13  | 18  | 23  | 31 | 38 | 53  | 67  |
|            | 1200  | 6.7   | 8.1             | 10  | 15  | 19  | 25 | 31 | 43  | 54  |
|            | 1000  | 5.6   | 6.8             | 9   | 12  | 15  | 20 | 25 | 36  | 45  |
| <b>200</b> | 1800  | 9     | 10              | 14  | 20  | 25  | 33 | 41 | 58  | 73  |
|            | 1500  | 7.5   | 9.1             | 12  | 17  | 21  | 28 | 34 | 48  | 61  |
|            | 1200  | 6     | 7.2             | 9.7 | 13  | 17  | 22 | 27 | 38  | 49  |
|            | 1000  | 5     | 6               | 8.1 | 11  | 14  | 18 | 23 | 32  | 40  |
| <b>224</b> | 1800  | 8     | 9.7             | 12  | 18  | 22  | 29 | 37 | 51  | 65  |
|            | 1500  | 6.7   | 8.1             | 10  | 15  | 19  | 25 | 31 | 43  | 54  |
|            | 1200  | 5.4   | 6.5             | 8.7 | 12  | 15  | 20 | 24 | 34  | 44  |
|            | 1000  | 4.5   | 5.4             | 7.3 | 10  | 12  | 16 | 20 | 29  | 36  |
| <b>250</b> | 1800  | 7.2   | 8.7             | 11  | 16  | 20  | 26 | 33 | 46  | 58  |
|            | 1500  | 6     | 7.2             | 9.7 | 13  | 17  | 22 | 27 | 38  | 49  |
|            | 1200  | 4.8   | 5.8             | 7.7 | 10  | 13  | 17 | 22 | 30  | 39  |
|            | 1000  | 4     | 4.8             | 6.4 | 9   | 11  | 14 | 18 | 25  | 32  |
| <b>280</b> | 1800  | 6.4   | 7.7             | 10  | 14  | 18  | 23 | 29 | 41  | 52  |
|            | 1500  | 5.4   | 6.5             | 8.7 | 12  | 15  | 19 | 24 | 34  | 44  |
|            | 1200  | 4.3   | 5.2             | 6.9 | 9.7 | 12  | 15 | 19 | 27  | 35  |
|            | 1000  | 3.6   | 4.3             | 5.8 | 8.1 | 10  | 13 | 16 | 23  | 29  |
| <b>315</b> | 1800  | 5.7   | 6.6             | 9.2 | 12  | 16  | 20 | 26 | 35  | 46  |
|            | 1500  | 4.8   | 5.6             | 7.7 | 10  | 13  | 17 | 22 | 30  | 39  |
|            | 1200  | 3.8   | 4.4             | 6.1 | 8.1 | 10  | 13 | 17 | 23  | 31  |
|            | 1000  | 3.2   | 3.7             | 5.1 | 6.8 | 9.1 | 11 | 14 | 20  | 26  |
| <b>355</b> | 1800  | 5.1   | –               | 8.2 | –   | 14  | –  | 23 | –   | 41  |
|            | 1500  | 4.2   | –               | 6.8 | –   | 11  | –  | 19 | –   | 34  |
|            | 1200  | 3.4   | –               | 5.5 | –   | 9.4 | –  | 15 | –   | 27  |
|            | 1000  | 2.8   | –               | 4.5 | –   | 7.7 | –  | 12 | –   | 22  |
| <b>400</b> | 1800  | 4.5   | –               | 6.8 | –   | 12  | –  | 20 | –   | 35  |
|            | 1500  | 3.8   | –               | 5.7 | –   | 10  | –  | 17 | –   | 29  |
|            | 1200  | 3     | –               | 4.5 | –   | 8   | –  | 13 | –   | 23  |
|            | 1000  | 2.5   | –               | 3.7 | –   | 6.6 | –  | 11 | –   | 19  |



## Design of the gear units

### Overview tables

#### Type B4 – Nominal output torque of low speed shaft (LSS) gear unit sizes 4 to 12

##### Technical specifications (continued)

##### Nominal output torque of low speed shaft (LSS) $T_{2N}$ (kNm) type B4

| $i_N$ | Gear unit sizes |      |      |      |      |      |      |      |      |    | Type |
|-------|-----------------|------|------|------|------|------|------|------|------|----|------|
|       | 4               | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   |    |      |
| 5     | 6.1             | 9.4  | –    | 19   | –    | 29.9 | –    | 46   | –    |    | B2   |
| 5.6   | 6.2             | 9.4  | –    | 19   | –    | 29.9 | –    | 48.1 | –    |    |      |
| 6.3   | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 50.2 | 58.8 |    |      |
| 7.1   | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 52.4 | 60.9 |    |      |
| 8     | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 63.1 |    |      |
| 9     | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 65.2 |    |      |
| 10    | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 66.3 |    |      |
| 11.2  | 6.2             | 9.4  | 12   | 19   | 23.8 | 29.9 | 38   | 54   | 66.3 |    |      |
| 12.5  | 5.5             | 9.4  | 12   | 17   | 23.8 | 28   | 38   | 52.4 | 66.3 |    |      |
| 14    | 6               | 9.8  | 12   | 18.2 | 23.8 | 29.5 | 38   | 56.7 | 66.3 |    |      |
| 16    | 6.6             | 10.5 | 12   | 19.8 | 21.5 | 31   | 35.6 | 59.9 | 66.3 |    |      |
| 18    | 6.7             | 11.3 | 12.6 | 21.1 | 23.1 | 33.9 | 37.5 | 62   | 69.5 |    |      |
| 20    | 6.7             | 11.6 | 13.2 | 21.7 | 26.5 | 35.7 | 39.3 | 63.5 | 72.7 |    |      |
| 22.4  | 6.7             | 11.6 | 14.2 | 21.7 | 27.2 | 35.7 | 41.8 | 63.5 | 75.6 |    |      |
| 25    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 28    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 31.5  | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 | B3 |      |
| 35.5  | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 40    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 45    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 50    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 56    | 6.7             | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 63    | 6.6             | 11.4 | 15.5 | 21.4 | 27.2 | 35.7 | 43.8 | 63.5 | 77.2 |    |      |
| 71    | 6.6             | 11   | 15.5 | 20   | 27.2 | 34   | 43.8 | 60   | 77.2 |    |      |
| 80    | –               | 11.6 | 14   | 21.7 | 26.9 | 35.7 | 43.8 | 61.6 | 77.2 |    |      |
| 90    | –               | 11.6 | 14   | 21.7 | 25.2 | 35.7 | 43   | 61.6 | 75   |    |      |
| 100   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   | B4 |      |
| 112   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 125   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 140   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 160   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 180   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 200   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 224   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 250   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.7 | 44.2 | 61.6 | 78   |    |      |
| 280   | –               | 11.6 | 15.5 | 21.7 | 27.2 | 35.3 | 44.2 | 61.6 | 78   |    |      |
| 315   | –               | 11.2 | 15.5 | 20.5 | 27.2 | 34   | 44.2 | 60   | 78   |    |      |
| 355   | –               | –    | 15.5 | –    | 26.5 | –    | 44.2 | –    | 78   |    |      |
| 400   | –               | –    | 14.5 | –    | 25.5 | –    | 43   | –    | 75   |    |      |



### Type B4 – Nominal output torque of low speed shaft (LSS) gear unit sizes 13 to 28

#### Technical specifications (continued)

#### Nominal output torque of low speed shaft (LSS) $T_{2N}$ (kNm) type B4

| $i_N$ | Gear unit sizes |      |     |     |     |     |     |     |     |     |     |     |     |      |      |      | Type |    |
|-------|-----------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|----|
|       | 13              | 14   | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  | 25  | 26   | 27   | 28   |      |    |
| 5     | 68.6            | –    | 122 | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    | B2 |
| 5.6   | 69.6            | –    | 122 | 135 | 195 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 6.3   | 73.8            | 85.2 | 130 | 141 | 195 | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 7.1   | 75.9            | 87.3 | 132 | 145 | 195 | 230 | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 8     | 80.0            | 91.5 | 132 | 148 | 195 | 230 | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 9     | 81.1            | 94.6 | 132 | 148 | 195 | 230 | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 10    | 81.1            | 98.8 | 132 | 148 | 195 | 230 | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 11.2  | 81.1            | 101  | 132 | 148 | 195 | 230 | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 12.5  | 79.5            | 101  | 132 | 148 | 195 | 230 | 250 | –   | 340 | –   | –   | –   | –   | –    | –    | –    | –    |    |
| 14    | 81.6            | 101  | 137 | 148 | 195 | 230 | 262 | 295 | 360 | 405 | –   | –   | –   | –    | –    | –    | –    |    |
| 16    | 83.8            | 99.4 | 142 | 154 | 200 | 230 | 275 | 308 | 380 | 422 | –   | –   | –   | –    | –    | –    | –    |    |
| 18    | 86.7            | 102  | 148 | 160 | 200 | 240 | 288 | 320 | 400 | 438 | –   | –   | –   | –    | –    | –    | –    |    |
| 20    | 90.7            | 105  | 153 | 167 | 200 | 240 | 300 | 332 | 420 | 455 | 640 | –   | 860 | –    | 1230 | –    | –    |    |
| 22.4  | 90.7            | 108  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 25    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 28    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 31.5  | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 35.5  | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1230 | 1400 | –    |    |
| 40    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 45    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 50    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 56    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 63    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1230 | 1400 | –    |    |
| 71    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 1030 | 1150 | 1400 | –    |    |
| 80    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 700 | 860 | 910  | 1225 | 1310 | –    |    |
| 90    | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 960  | 1225 | 1400 | –    |    |
| 100   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 970  | 1220 | 1400 | –    |    |
| 112   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 990  | 1220 | 1400 | –    |    |
| 125   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 990  | 1215 | 1400 | –    |    |
| 140   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1215 | 1400 | –    |    |
| 160   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1210 | 1400 | –    |    |
| 180   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1210 | 1400 | –    |    |
| 200   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1205 | 1400 | –    |    |
| 224   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1205 | 1400 | –    |    |
| 250   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 725 | 860 | 1030 | 1200 | 1400 | –    |    |
| 280   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 640 | 710 | 860 | 1030 | 1200 | 1400 | –    |    |
| 315   | 90.7            | 113  | 153 | 173 | 200 | 240 | 300 | 345 | 420 | 470 | 585 | 690 | 800 | 1030 | 1150 | 1400 | –    |    |
| 355   | –               | 113  | –   | 173 | –   | 240 | –   | 345 | –   | 470 | –   | 660 | –   | 910  | –    | 1310 | –    |    |
| 400   | –               | 113  | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –   | –    | –    | –    | –    |    |

Type B2, see page 3/43  
Type B3, see page 3/52

## Design of the gear units

### Overview tables

#### Type B4 – Thermal capacities $n_1 = 1000$ rpm, $n_1 = 1200$ rpm

##### Technical specifications (continued)

##### Thermal capacities $P_G$ (kW) type B4 $n_1 = 1000$ rpm

| $i_N$ |          | Gear unit sizes |      |      |      |      |      |     |      |     |      |     |     |     |     |     |     |     |     |
|-------|----------|-----------------|------|------|------|------|------|-----|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|
|       |          | 5               | 6    | 7    | 8    | 9    | 10   | 11  | 12   | 13  | 14   | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| 80    | $P_{GA}$ | 33.5            | –    | 50.6 | –    | 72.1 | –    | 108 | –    | 148 | –    | 203 | –   | 222 | –   | 285 | –   | 370 | –   |
| 90    | $P_{GA}$ | 32.7            | –    | 49.1 | –    | 70.6 | –    | 104 | –    | 144 | –    | 196 | 210 | 215 | 230 | 277 | 295 | 364 | 379 |
| 100   | $P_{GA}$ | 31.2            | 36.0 | 46.7 | 54.5 | 67.4 | 73.5 | 100 | 120  | 137 | 159  | 187 | 203 | 204 | 222 | 266 | 286 | 351 | 372 |
| 112   | $P_{GA}$ | 30.1            | 35.2 | 45.1 | 52.9 | 65.3 | 71.9 | 96  | 116  | 131 | 154  | 179 | 193 | 196 | 211 | 256 | 274 | 343 | 358 |
| 125   | $P_{GA}$ | 28.8            | 33.6 | 43.2 | 50.3 | 62.6 | 68.6 | 92  | 112  | 126 | 147  | 171 | 185 | 187 | 203 | 246 | 264 | 327 | 350 |
| 140   | $P_{GA}$ | 27.4            | 32.4 | 41.0 | 48.6 | 59.2 | 66.4 | 87  | 106  | 120 | 140  | 165 | 176 | 181 | 193 | 238 | 253 | 318 | 334 |
| 160   | $P_{GA}$ | 24.7            | 31.0 | 36.7 | 46.5 | 53.4 | 63.7 | 79  | 102  | 112 | 135  | 156 | 170 | 171 | 187 | 227 | 245 | 304 | 324 |
| 180   | $P_{GA}$ | 24.1            | 29.4 | 35.7 | 44.1 | 51.8 | 60.3 | 76  | 97   | 106 | 128  | 147 | 161 | 161 | 177 | 213 | 234 | 287 | 310 |
| 200   | $P_{GA}$ | 23.2            | 26.6 | 35.0 | 39.5 | 50.7 | 54.4 | 74  | 87   | 103 | 120  | 146 | 151 | 160 | 167 | 214 | 220 | 298 | 293 |
| 224   | $P_{GA}$ | 21.6            | 25.9 | 32.5 | 38.5 | 47.2 | 52.8 | 69  | 84   | 96  | 113  | 136 | 151 | 149 | 166 | 200 | 220 | 279 | 304 |
| 250   | $P_{GA}$ | 21.1            | 24.9 | 31.4 | 37.6 | 45.6 | 51.6 | 67  | 82   | 92  | 110  | 130 | 140 | 143 | 154 | 192 | 205 | 268 | 284 |
| 280   | $P_{GA}$ | 20.1            | 23.3 | 29.9 | 35.1 | 43.5 | 48.2 | 64  | 77   | 87  | 102  | 121 | 134 | 134 | 148 | 180 | 197 | 255 | 273 |
| 315   | $P_{GA}$ | 18.8            | 22.7 | 27.8 | 33.9 | 41.0 | 46.6 | 60  | 74   | 83  | 98   | 115 | 125 | 127 | 139 | 170 | 185 | 236 | 259 |
| 355   | $P_{GA}$ | –               | 21.6 | –    | 32.2 | –    | 44.4 | –   | 71   | –   | 92   | –   | 119 | –   | 131 | –   | 176 | –   | 241 |
| 400   | $P_{GA}$ | –               | 20.2 | –    | 30.0 | –    | 42.0 | –   | 66.0 | –   | 88.5 | –   | –   | –   | –   | –   | –   | –   | –   |

##### Thermal capacities $P_G$ (kW) type B4 $n_1 = 1200$ rpm

| $i_N$ |          | Gear unit sizes |      |      |      |      |      |      |      |      |      |     |     |     |     |     |     |     |     |
|-------|----------|-----------------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
|       |          | 5               | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| 80    | $P_{GA}$ | 35.3            | –    | 53.1 | –    | 75.6 | –    | 113  | –    | 154  | –    | 209 | –   | 230 | –   | 288 | –   | 364 | –   |
| 90    | $P_{GA}$ | 34.5            | –    | 51.7 | –    | 74.1 | –    | 109  | –    | 149  | –    | 203 | 216 | 223 | 238 | 282 | 298 | 362 | 373 |
| 100   | $P_{GA}$ | 33.0            | 38.0 | 49.2 | 57.3 | 70.8 | 77.1 | 105  | 126  | 143  | 165  | 194 | 210 | 213 | 231 | 272 | 291 | 351 | 371 |
| 112   | $P_{GA}$ | 31.8            | 37.1 | 47.5 | 55.7 | 68.7 | 75.5 | 101  | 121  | 137  | 160  | 187 | 201 | 205 | 221 | 263 | 281 | 346 | 360 |
| 125   | $P_{GA}$ | 30.5            | 35.5 | 45.6 | 52.9 | 65.9 | 72.1 | 96.4 | 117  | 132  | 153  | 179 | 193 | 197 | 213 | 254 | 272 | 332 | 354 |
| 140   | $P_{GA}$ | 28.9            | 34.3 | 43.3 | 51.2 | 62.5 | 69.9 | 91.6 | 112  | 125  | 147  | 173 | 185 | 190 | 203 | 246 | 261 | 324 | 340 |
| 160   | $P_{GA}$ | 26.2            | 32.8 | 38.8 | 49.1 | 56.4 | 67.2 | 82.7 | 107  | 118  | 141  | 164 | 179 | 181 | 197 | 235 | 254 | 311 | 331 |
| 180   | $P_{GA}$ | 25.6            | 31.1 | 37.8 | 46.6 | 54.8 | 63.7 | 80.2 | 102  | 111  | 134  | 155 | 170 | 171 | 187 | 222 | 243 | 295 | 318 |
| 200   | $P_{GA}$ | 24.7            | 28.2 | 37.8 | 41.9 | 53.9 | 57.6 | 79.0 | 91.7 | 109  | 126  | 154 | 160 | 169 | 177 | 224 | 229 | 312 | 301 |
| 224   | $P_{GA}$ | 22.8            | 27.5 | 34.9 | 40.8 | 50.1 | 55.9 | 73.6 | 88.9 | 101  | 119  | 144 | 159 | 158 | 175 | 209 | 231 | 292 | 318 |
| 250   | $P_{GA}$ | 22.1            | 26.5 | 33.5 | 40.6 | 48.0 | 54.9 | 70.7 | 87.4 | 97.2 | 117  | 138 | 148 | 151 | 163 | 202 | 216 | 282 | 298 |
| 280   | $P_{GA}$ | 21.0            | 24.5 | 31.3 | 37.6 | 45.6 | 51.1 | 66.7 | 81.4 | 90.7 | 108  | 128 | 142 | 141 | 156 | 189 | 208 | 268 | 287 |
| 315   | $P_{GA}$ | 19.7            | 23.8 | 29.7 | 36.1 | 43.0 | 49.0 | 62.4 | 78.1 | 86.7 | 104  | 121 | 132 | 133 | 146 | 180 | 195 | 249 | 273 |
| 355   | $P_{GA}$ | –               | 22.6 | –    | 33.8 | –    | 46.6 | –    | 73.8 | –    | 96.8 | –   | 125 | –   | 138 | –   | 185 | –   | 254 |
| 400   | $P_{GA}$ | –               | 21.2 | –    | 32.0 | –    | 44.0 | –    | 69.1 | –    | 92.7 | –   | –   | –   | –   | –   | –   | –   | –   |

### Technical specifications (continued)

#### Thermal capacities $P_G$ (kW) type B4 $n_1 = 1500$ rpm

| $i_N$ |          | Gear unit sizes |      |      |      |      |      |      |      |      |      |     |     |     |     |     |     |     |     |
|-------|----------|-----------------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
|       |          | 5               | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| 80    | $P_{GA}$ | 37.3            | –    | 55.8 | –    | 79.2 | –    | 117  | –    | 159  | –    | 210 | –   | 232 | –   | 284 | –   | 336 | –   |
| 90    | $P_{GA}$ | 36.5            | –    | 54.4 | –    | 77.8 | –    | 114  | –    | 154  | –    | 205 | 217 | 228 | 242 | 280 | 295 | 344 | 348 |
| 100   | $P_{GA}$ | 34.9            | 40.1 | 51.9 | 60.4 | 74.6 | 80.9 | 110  | 131  | 149  | 171  | 199 | 213 | 220 | 237 | 275 | 291 | 341 | 354 |
| 112   | $P_{GA}$ | 33.7            | 39.3 | 50.3 | 58.8 | 72.5 | 79.4 | 106  | 127  | 143  | 166  | 192 | 205 | 212 | 228 | 268 | 285 | 339 | 351 |
| 125   | $P_{GA}$ | 32.4            | 37.7 | 48.3 | 56.1 | 69.8 | 76.1 | 102  | 123  | 138  | 160  | 185 | 199 | 204 | 220 | 259 | 277 | 330 | 349 |
| 140   | $P_{GA}$ | 30.8            | 36.4 | 45.9 | 54.3 | 66.3 | 74.0 | 96.7 | 118  | 132  | 154  | 180 | 191 | 198 | 212 | 253 | 268 | 324 | 338 |
| 160   | $P_{GA}$ | 27.9            | 34.9 | 41.3 | 52.2 | 60.0 | 71.2 | 87.5 | 113  | 124  | 148  | 171 | 186 | 189 | 206 | 243 | 261 | 313 | 332 |
| 180   | $P_{GA}$ | 27.2            | 33.2 | 40.3 | 49.6 | 58.4 | 67.7 | 84.9 | 108  | 117  | 141  | 162 | 177 | 179 | 196 | 229 | 251 | 298 | 321 |
| 200   | $P_{GA}$ | 26.6            | 30.1 | 40.6 | 44.6 | 57.8 | 61.3 | 84.4 | 97.1 | 116  | 133  | 163 | 167 | 180 | 185 | 235 | 237 | 325 | 306 |
| 224   | $P_{GA}$ | 24.6            | 29.3 | 37.6 | 43.5 | 53.9 | 59.6 | 78.8 | 94.3 | 108  | 125  | 152 | 169 | 168 | 186 | 221 | 243 | 306 | 333 |
| 250   | $P_{GA}$ | 23.8            | 28.5 | 36.1 | 43.7 | 51.6 | 59.0 | 75.7 | 93.5 | 104  | 124  | 146 | 157 | 161 | 174 | 213 | 228 | 296 | 313 |
| 280   | $P_{GA}$ | 22.4            | 26.4 | 33.3 | 40.5 | 48.8 | 55.0 | 71.5 | 87.2 | 96.8 | 115  | 136 | 151 | 150 | 167 | 200 | 219 | 282 | 302 |
| 315   | $P_{GA}$ | 20.9            | 25.6 | 31.4 | 38.8 | 45.7 | 52.7 | 66.6 | 83.8 | 92.8 | 111  | 129 | 141 | 143 | 155 | 191 | 206 | 263 | 288 |
| 355   | $P_{GA}$ | –               | 24.1 | –    | 35.9 | –    | 49.8 | –    | 79.1 | –    | 104  | –   | 133 | –   | 148 | –   | 197 | –   | 268 |
| 400   | $P_{GA}$ | –               | 22.5 | –    | 33.9 | –    | 46.7 | –    | 73.6 | –    | 99.0 | –   | –   | –   | –   | –   | –   | –   | –   |

#### Thermal capacities $P_G$ (kW) type B4 $n_1 = 1800$ rpm

| $i_N$ |          | Gear unit sizes |      |      |      |      |      |       |      |      |     |     |     |     |     |     |     |     |     |
|-------|----------|-----------------|------|------|------|------|------|-------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|       |          | 5               | 6    | 7    | 8    | 9    | 10   | 11    | 12   | 13   | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  |
| 80    | $P_{GA}$ | 38.5            | –    | 57.5 | –    | 81.3 | –    | 120   | –    | 159  | –   | 204 | –   | 229 | –   | 269 | –   | 287 | –   |
| 90    | $P_{GA}$ | 37.8            | –    | 56.2 | –    | 80.0 | –    | 117   | –    | 156  | –   | 202 | 212 | 226 | 239 | 270 | 282 | 309 | 300 |
| 100   | $P_{GA}$ | 36.3            | 41.6 | 53.8 | 62.5 | 77.0 | 83.3 | 113.3 | 134  | 151  | 173 | 198 | 210 | 221 | 236 | 269 | 282 | 317 | 322 |
| 112   | $P_{GA}$ | 35.2            | 40.9 | 52.2 | 61.0 | 75.1 | 81.9 | 109   | 131  | 146  | 168 | 193 | 206 | 215 | 230 | 265 | 280 | 320 | 328 |
| 125   | $P_{GA}$ | 33.8            | 39.3 | 50.2 | 58.3 | 72.4 | 78.8 | 105   | 127  | 142  | 163 | 186 | 200 | 207 | 224 | 259 | 275 | 316 | 331 |
| 140   | $P_{GA}$ | 32.2            | 38.0 | 47.9 | 56.6 | 69.1 | 76.8 | 100   | 122  | 135  | 158 | 181 | 193 | 202 | 216 | 254 | 268 | 313 | 326 |
| 160   | $P_{GA}$ | 29.2            | 36.5 | 43.2 | 54.4 | 62.6 | 74.1 | 90.8  | 117  | 128  | 153 | 174 | 188 | 193 | 210 | 245 | 263 | 305 | 322 |
| 180   | $P_{GA}$ | 28.6            | 34.8 | 42.1 | 51.9 | 61.0 | 70.6 | 88.2  | 112  | 121  | 146 | 165 | 180 | 183 | 201 | 232 | 253 | 294 | 315 |
| 200   | $P_{GA}$ | 28.1            | 31.5 | 42.9 | 46.7 | 61.0 | 64.2 | 88.6  | 101  | 121  | 138 | 170 | 171 | 187 | 190 | 242 | 240 | 332 | 302 |
| 224   | $P_{GA}$ | 26.0            | 30.8 | 39.8 | 45.6 | 56.9 | 62.4 | 82.8  | 98.2 | 113  | 130 | 159 | 175 | 175 | 194 | 228 | 250 | 314 | 340 |
| 250   | $P_{GA}$ | 25.3            | 30.2 | 38.2 | 46.2 | 54.6 | 62.3 | 79.7  | 98.2 | 109  | 130 | 152 | 164 | 168 | 181 | 220 | 235 | 304 | 322 |
| 280   | $P_{GA}$ | 23.8            | 28.0 | 35.3 | 42.9 | 51.6 | 58.2 | 75.3  | 91.8 | 102  | 121 | 142 | 157 | 157 | 174 | 208 | 227 | 291 | 312 |
| 315   | $P_{GA}$ | 22.2            | 27.1 | 33.3 | 41.1 | 48.4 | 55.8 | 70.3  | 88.2 | 97.7 | 116 | 136 | 147 | 150 | 163 | 199 | 214 | 272 | 298 |
| 355   | $P_{GA}$ | –               | 25.5 | –    | 38.0 | –    | 52.7 | –     | 83.4 | –    | 109 | –   | 140 | –   | 155 | –   | 205 | –   | 278 |
| 400   | $P_{GA}$ | –               | 23.8 | –    | 35.9 | –    | 49.5 | –     | 77.7 | –    | 104 | –   | –   | –   | –   | –   | –   | –   | –   |

## Design of the gear units

### Overview tables

#### Type H1, H2 – Mass moments of inertia $J_1$ gear unit sizes 3 to 12

##### Technical specifications (continued)

The mass moment of inertia  $J_2$  in  $\text{kgm}^2$  relative to the low speed shaft (LSS) of a gear unit is calculated according to the following formula:

$$J_2 = i_N^2 \times J_1.$$

The mass moments of inertia  $J_1$  in  $\text{kgm}^2$  are relative to the high speed shaft (HSS) of the gear unit and apply to the high speed shaft (HSS) without fan.

For the high speed shaft (HSS) with fan,  $J_L$  must be added.

Values for flanged shaft gear units on request.

##### Mass moments of inertia $J_1$ in $\text{kgm}^2$ relative to the high speed shaft (HSS)

| $i_N$ | Gear unit sizes |         |         |         |         |         |         |         |         |         | Type |
|-------|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|
|       | 3               | 4       | 5       | 6       | 7       | 8       | 9       | 10      | 11      | 12      |      |
| 1.25  | 0.02855         | –       | 0.15709 | –       | 0.42300 | –       | 0.92932 | –       | –       | –       |      |
| 1.4   | 0.02589         | –       | 0.14349 | –       | 0.38558 | –       | 0.84322 | –       | –       | –       |      |
| 1.6   | 0.02243         | –       | 0.12352 | –       | 0.33519 | –       | 0.72861 | –       | 1.74977 | –       |      |
| 1.8   | 0.01974         | –       | 0.10903 | –       | 0.30515 | –       | 0.66019 | –       | 1.58798 | –       |      |
| 2.0   | 0.01820         | –       | 0.09932 | –       | 0.27747 | –       | 0.59704 | –       | 1.43757 | –       |      |
| 2.24  | 0.01677         | –       | 0.09029 | –       | 0.23964 | –       | 0.53840 | –       | 1.29698 | –       |      |
| 2.5   | 0.01479         | –       | 0.08187 | –       | 0.21652 | –       | 0.48366 | –       | 1.16495 | –       |      |
| 2.8   | 0.01347         | –       | 0.07398 | –       | 0.20156 | –       | 0.44378 | –       | 1.04055 | –       |      |
| 3.15  | 0.00915         | –       | 0.05006 | –       | 0.14031 | –       | 0.31089 | –       | 0.84211 | –       |      |
| 3.55  | 0.00807         | –       | 0.04369 | –       | 0.12256 | –       | 0.27320 | –       | 0.73595 | –       |      |
| 4.0   | 0.00702         | –       | 0.03797 | –       | 0.10584 | –       | 0.23756 | –       | 0.64640 | –       |      |
| 4.5   | 0.00522         | –       | 0.02975 | –       | 0.08623 | –       | 0.19980 | –       | 0.49550 | –       |      |
| 5.0   | 0.00451         | –       | 0.02756 | –       | 0.07492 | –       | 0.17089 | –       | 0.40618 | –       |      |
| 5.6   | 0.00384         | –       | 0.02332 | –       | 0.06407 | –       | 0.14114 | –       | 0.37471 | –       |      |
| $J_L$ | 0.060           | –       | 0.045   | –       | 0.100   | –       | 0.100   | –       | 0.290   | –       |      |
| 6.3   | –               | 0.01493 | 0.03380 | –       | 0.09209 | –       | 0.20124 | –       | 0.52103 | –       |      |
| 7.1   | –               | 0.01340 | 0.02812 | –       | 0.07563 | –       | 0.16652 | –       | 0.45488 | –       |      |
| 8.0   | –               | 0.01138 | 0.02503 | 0.03969 | 0.06630 | 0.11062 | 0.14592 | 0.23956 | 0.39684 | 0.63968 |      |
| 9.0   | –               | 0.01020 | 0.02227 | 0.03260 | 0.05805 | 0.08946 | 0.12771 | 0.19511 | 0.32236 | 0.55211 |      |
| 10    | –               | 0.00860 | 0.01857 | 0.02877 | 0.05058 | 0.07759 | 0.11102 | 0.16927 | 0.27967 | 0.47606 |      |
| 11.2  | –               | 0.00757 | 0.01619 | 0.02538 | 0.04457 | 0.06721 | 0.09506 | 0.14665 | 0.25168 | 0.37982 |      |
| 12.5  | –               | 0.00527 | 0.01187 | 0.02089 | 0.03379 | 0.05794 | 0.07209 | 0.12624 | 0.19234 | 0.32553 |      |
| 14    | –               | 0.00453 | 0.01013 | 0.01809 | 0.02691 | 0.05063 | 0.06102 | 0.10716 | 0.16348 | 0.29072 |      |
| 16    | –               | 0.00384 | 0.00853 | 0.01340 | 0.02264 | 0.03872 | 0.05133 | 0.08159 | 0.13633 | 0.22357 |      |
| 18    | –               | 0.00320 | 0.00758 | 0.01136 | 0.02005 | 0.03044 | 0.04385 | 0.06852 | 0.12189 | 0.18813 |      |
| 20    | –               | 0.00276 | 0.00649 | 0.00949 | 0.01712 | 0.02542 | 0.04039 | 0.05722 | 0.10460 | 0.15546 |      |
| 22.4  | –               | 0.00230 | 0.00550 | 0.00834 | 0.01578 | 0.02227 | 0.03414 | 0.04838 | 0.08840 | 0.13769 |      |
| 25    | –               | –       | –       | 0.00710 | –       | 0.01888 | –       | 0.04442 | –       | 0.11733 |      |
| 28    | –               | –       | –       | 0.00598 | –       | 0.01734 | –       | 0.03728 | –       | 0.09842 |      |
| $J_L$ | –               | 0.006   | 0.010   | 0.010   | 0.045   | 0.045   | 0.045   | 0.045   | 0.100   | 0.100   |      |

Mass moments of inertia for sizes 23 to 28 on request.

### Type H3, H4 – Mass moments of inertia $J_1$ gear unit sizes 3 to 12

#### Technical specifications (continued)

The mass moment of inertia  $J_2$  in  $\text{kgm}^2$  relative to the low speed shaft (LSS) of a gear unit is calculated according to the following formula:

$$J_2 = i_N^2 \times J_1.$$

The mass moments of inertia  $J_1$  in  $\text{kgm}^2$  are relative to the high speed shaft (HSS) of the gear unit and apply to the high speed shaft (HSS) without fan.

For the high speed shaft (HSS) with fan,  $J_L$  must be added.

Values for flanged shaft gear units on request.

#### Mass moments of inertia $J_1$ in $\text{kgm}^2$ relative to the high speed shaft (HSS)

| $i_N$ | Gear unit sizes |   |         |         |         |         |         |         |         |         | Type |    |
|-------|-----------------|---|---------|---------|---------|---------|---------|---------|---------|---------|------|----|
|       | 3               | 4 | 5       | 6       | 7       | 8       | 9       | 10      | 11      | 12      |      |    |
| 22.4  | –               | – | –       | –       | –       | –       | –       | –       | –       | –       | –    | H3 |
| 25    | –               | – | 0.00645 | –       | 0.01629 | –       | 0.03910 | –       | 0.10272 | –       | –    |    |
| 28    | –               | – | 0.00536 | –       | 0.01447 | –       | 0.03237 | –       | 0.08333 | –       | –    |    |
| 31.5  | –               | – | 0.00474 | 0.00682 | 0.01209 | 0.01734 | 0.02874 | 0.04142 | 0.07242 | 0.11030 | –    |    |
| 35.5  | –               | – | 0.00418 | 0.00565 | 0.01070 | 0.01536 | 0.02550 | 0.03413 | 0.06284 | 0.08898 | –    |    |
| 40    | –               | – | 0.00343 | 0.00498 | 0.00888 | 0.01278 | 0.02129 | 0.03021 | 0.05440 | 0.07704 | –    |    |
| 45    | –               | – | 0.00301 | 0.00438 | 0.00782 | 0.01129 | 0.01874 | 0.02673 | 0.04799 | 0.06659 | –    |    |
| 50    | –               | – | 0.00228 | 0.00358 | 0.00570 | 0.00933 | 0.01359 | 0.02221 | 0.03603 | 0.05741 | –    |    |
| 56    | –               | – | 0.00194 | 0.00313 | 0.00487 | 0.00819 | 0.01162 | 0.01949 | 0.02835 | 0.05047 | –    |    |
| 63    | –               | – | 0.00163 | 0.00238 | 0.00413 | 0.00597 | 0.00982 | 0.01419 | 0.02386 | 0.03805 | –    |    |
| 71    | –               | – | 0.00123 | 0.00202 | 0.00324 | 0.00509 | 0.00738 | 0.01210 | 0.01900 | 0.02979 | –    |    |
| 80    | –               | – | 0.00102 | 0.00169 | 0.00278 | 0.00430 | 0.00624 | 0.01020 | 0.01595 | 0.02500 | –    |    |
| 90    | –               | – | 0.00088 | 0.00128 | 0.00229 | 0.00337 | 0.00520 | 0.00768 | 0.01453 | 0.01991 | –    |    |
| 100   | –               | – | –       | 0.00106 | –       | 0.00289 | –       | 0.00648 | –       | 0.01667 | –    |    |
| 112   | –               | – | –       | 0.00091 | –       | 0.00238 | –       | 0.00539 | –       | 0.01517 | –    |    |
| $J_L$ | –               | – | 0.006   | 0.006   | 0.010   | 0.010   | 0.020   | 0.020   | 0.045   | 0.045   | –    |    |
| 100   | –               | – | –       | –       | 0.00328 | –       | 0.00667 | –       | 0.01753 | –       | –    | H4 |
| 112   | –               | – | –       | –       | 0.00274 | –       | 0.00552 | –       | 0.01560 | –       | –    |    |
| 125   | –               | – | –       | –       | 0.00243 | 0.00334 | 0.00486 | 0.00683 | 0.01310 | 0.01796 | –    |    |
| 140   | –               | – | –       | –       | 0.00202 | 0.00279 | 0.00428 | 0.00564 | 0.01164 | 0.01597 | –    |    |
| 160   | –               | – | –       | –       | 0.00176 | 0.00247 | 0.00348 | 0.00496 | 0.00970 | 0.01338 | –    |    |
| 180   | –               | – | –       | –       | 0.00153 | 0.00205 | 0.00300 | 0.00436 | 0.00848 | 0.01188 | –    |    |
| 200   | –               | – | –       | –       | 0.00124 | 0.00178 | 0.00230 | 0.00354 | 0.00595 | 0.00988 | –    |    |
| 224   | –               | – | –       | –       | 0.00097 | 0.00155 | 0.00195 | 0.00305 | 0.00508 | 0.00863 | –    |    |
| 250   | –               | – | –       | –       | 0.00081 | 0.00126 | 0.00163 | 0.00234 | 0.00428 | 0.00606 | –    |    |
| 280   | –               | – | –       | –       | 0.00065 | 0.00098 | 0.00134 | 0.00199 | 0.00354 | 0.00517 | –    |    |
| 315   | –               | – | –       | –       | 0.00060 | 0.00082 | 0.00112 | 0.00165 | 0.00304 | 0.00435 | –    |    |
| 355   | –               | – | –       | –       | 0.00050 | 0.00066 | 0.00097 | 0.00136 | 0.00252 | 0.00360 | –    |    |
| 400   | –               | – | –       | –       | –       | 0.00060 | –       | 0.00114 | –       | 0.00309 | –    |    |
| 450   | –               | – | –       | –       | –       | 0.00050 | –       | 0.00098 | –       | 0.00256 | –    |    |

Mass moments of inertia for sizes 23 to 28 on request.

## Design of the gear units

### Overview tables

#### Type H1, H2 – Mass moments of inertia $J_1$ gear unit sizes 13 to 22

##### Technical specifications (continued)

The mass moment of inertia  $J_2$  in  $\text{kgm}^2$  relative to the low speed shaft (LSS) of a gear unit is calculated according to the following formula:

$$J_2 = i_N^2 \times J_1.$$

The mass moments of inertia  $J_1$  in  $\text{kgm}^2$  are relative to the high speed shaft (HSS) of the gear unit and apply to the high speed shaft (HSS) without fan.

For the high speed shaft (HSS) with fan,  $J_L$  must be added.

Values for flanged shaft gear units on request.

##### Mass moments of inertia $J_1$ in $\text{kgm}^2$ relative to the high speed shaft (HSS)

| $i_N$ | Gear unit sizes |         |         |         |         |         |          |          |          |          | Type  |    |
|-------|-----------------|---------|---------|---------|---------|---------|----------|----------|----------|----------|-------|----|
|       | 13              | 14      | 15      | 16      | 17      | 18      | 19       | 20       | 21       | 22       |       |    |
| 1.25  | –               | –       | –       | –       | –       | –       | –        | –        | –        | –        | –     | H1 |
| 1.4   | –               | –       | –       | –       | –       | –       | –        | –        | –        | –        | –     |    |
| 1.6   | 3.74077         | –       | –       | –       | –       | –       | –        | –        | –        | –        | –     |    |
| 1.8   | 3.22057         | –       | –       | –       | –       | –       | –        | –        | –        | –        | –     |    |
| 2.0   | 2.90582         | –       | 6.86903 | –       | –       | –       | –        | –        | –        | –        | –     |    |
| 2.24  | 2.61258         | –       | 6.15225 | –       | –       | –       | –        | –        | –        | –        | –     |    |
| 2.5   | 2.33813         | –       | 5.52442 | –       | –       | –       | –        | –        | –        | –        | –     |    |
| 2.8   | 2.08042         | –       | 4.95982 | –       | 8.44258 | –       | –        | –        | –        | –        | –     |    |
| 3.15  | 1.67273         | –       | 3.91162 | –       | 6.72168 | –       | –        | –        | –        | –        | –     |    |
| 3.55  | 1.47399         | –       | 3.40747 | –       | 5.86409 | –       | –        | –        | –        | –        | –     |    |
| 4.0   | 1.28613         | –       | 2.93210 | –       | 5.05491 | –       | 9.52270  | –        | –        | –        | –     |    |
| 4.5   | 0.96567         | –       | 2.30308 | –       | 4.00905 | –       | 7.87489  | –        | –        | –        | –     |    |
| 5.0   | 0.89360         | –       | 1.96108 | –       | 3.55977 | –       | 6.66044  | –        | –        | –        | –     |    |
| 5.6   | 0.75803         | –       | 1.65759 | –       | 3.01084 | –       | 5.50473  | –        | –        | –        | –     |    |
| $J_L$ | 0.290           | –       | 0.690   | –       | 0.690   | –       | 0.690    | –        | –        | –        | –     |    |
| 6.3   | 1.10195         | –       | 2.69450 | –       | 5.30249 | –       | 10.62628 | –        | 14.12289 | –        | –     | H2 |
| 7.1   | 0.95997         | –       | 2.36587 | 2.93445 | 4.38152 | 5.79425 | 9.32889  | 11.42554 | 12.30855 | 15.24965 | –     |    |
| 8.0   | 0.83523         | 1.28897 | 2.07496 | 2.56276 | 3.85101 | 4.74843 | 8.17656  | 9.98029  | 10.71777 | 13.22687 | –     |    |
| 9.0   | 0.72509         | 1.11239 | 1.81611 | 2.23558 | 3.37587 | 4.15070 | 7.14706  | 8.70419  | 9.31584  | 11.46160 | –     |    |
| 10    | 0.62735         | 0.95870 | 1.58473 | 1.94622 | 2.94834 | 3.61890 | 6.27857  | 7.57118  | 8.14946  | 9.91374  | –     |    |
| 11.2  | 0.55925         | 0.82433 | 1.37708 | 1.68919 | 2.56216 | 3.14368 | 5.52433  | 6.62132  | 7.14789  | 8.63265  | –     |    |
| 12.5  | 0.42550         | 0.70636 | 1.14218 | 1.46006 | 2.04515 | 2.71748 | 4.44852  | 5.80139  | 5.67579  | 7.53848  | –     |    |
| 14    | 0.36723         | 0.62499 | 0.97937 | 1.20991 | 1.76837 | 2.16566 | 3.81731  | 4.67000  | 4.86012  | 5.98802  | –     |    |
| 16    | 0.31417         | 0.47348 | 0.82110 | 1.03247 | 1.51448 | 1.86457 | 3.23981  | 3.99197  | 4.12526  | 5.10635  | –     |    |
| 18    | 0.28054         | 0.40553 | 0.68720 | 0.86324 | 1.21881 | 1.59010 | 2.59172  | 3.37526  | 3.27028  | 4.31621  | –     |    |
| 20    | 0.23699         | 0.34428 | 0.56007 | 0.72007 | 1.10345 | 1.27695 | 2.24548  | 2.69238  | 2.81401  | 3.41219  | –     |    |
| 22.4  | –               | 0.30627 | –       | 0.58429 | –       | 1.15512 | –        | 2.32662  | –        | 2.92840  | –     |    |
| 25    | –               | 0.25717 | –       | –       | –       | –       | –        | –        | –        | –        | –     |    |
| 28    | –               | –       | –       | –       | –       | –       | –        | –        | –        | –        | –     |    |
| $J_L$ | 0.290           | 0.290   | 0.290   | 0.290   | 0.690   | 0.690   | 0.690    | 0.690    | 0.690    | 0.690    | 0.690 |    |

Mass moments of inertia for sizes 23 to 28 on request.

### Type H3, H4 – Mass moments of inertia $J_1$ gear unit sizes 13 to 22

#### Technical specifications (continued)

The mass moment of inertia  $J_2$  in  $\text{kgm}^2$  relative to the low speed shaft (LSS) of a gear unit is calculated according to the following formula:

$$J_2 = i_N^2 \times J_1.$$

The mass moments of inertia  $J_1$  in  $\text{kgm}^2$  are relative to the high speed shaft (HSS) of the gear unit and apply to the high speed shaft (HSS) without fan.

For the high speed shaft (HSS) with fan,  $J_L$  must be added.

Values for flanged shaft gear units on request.

#### Mass moments of inertia $J_1$ in $\text{kgm}^2$ relative to the high speed shaft (HSS)

| $i_N$                   | Gear unit sizes |         |         |         |         |         |         |         |         |         | Type      |
|-------------------------|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|
|                         | 13              | 14      | 15      | 16      | 17      | 18      | 19      | 20      | 21      | 22      |           |
| <b>22.4</b>             | 0.28093         | –       | 0.74161 | –       | 0.81650 | –       | 1.65788 | –       | 3.73410 | –       | <b>H3</b> |
| <b>25</b>               | 0.22706         | –       | 0.60098 | 0.76346 | 0.65739 | 0.85893 | 1.33246 | 1.72711 | 3.03258 | 3.82925 |           |
| <b>28</b>               | 0.18629         | 0.29678 | 0.52263 | 0.61732 | 0.56883 | 0.68913 | 1.15173 | 1.38384 | 2.63821 | 3.10389 |           |
| <b>31.5</b>             | 0.16244         | 0.23899 | 0.45433 | 0.53601 | 0.49253 | 0.59483 | 0.99457 | 1.19361 | 2.29194 | 2.69673 |           |
| <b>35.5</b>             | 0.14149         | 0.19520 | 0.36744 | 0.46523 | 0.39559 | 0.51371 | 0.85730 | 1.02850 | 1.98651 | 2.33968 |           |
| <b>40</b>               | 0.12303         | 0.16971 | 0.31814 | 0.37536 | 0.34093 | 0.41097 | 0.73692 | 0.88457 | 1.71599 | 2.02518 |           |
| <b>45</b>               | 0.10672         | 0.14739 | 0.28778 | 0.32445 | 0.30742 | 0.35319 | 0.65396 | 0.75863 | 1.47554 | 1.74703 |           |
| <b>50</b>               | 0.07610         | 0.12778 | 0.21066 | 0.29316 | 0.22462 | 0.31786 | 0.46753 | 0.67202 | 1.20329 | 1.50020 |           |
| <b>56</b>               | 0.06432         | 0.11049 | 0.17805 | 0.21496 | 0.18897 | 0.23297 | 0.39842 | 0.48071 | 1.01816 | 1.22342 |           |
| <b>63</b>               | 0.05428         | 0.07906 | 0.14889 | 0.18145 | 0.15726 | 0.19556 | 0.33619 | 0.40895 | 0.86937 | 1.03395 |           |
| <b>71</b>               | 0.04221         | 0.06666 | 0.12167 | 0.15152 | 0.13362 | 0.16237 | 0.28899 | 0.34446 | 0.69699 | 0.88189 |           |
| <b>80</b>               | 0.03866         | 0.05611 | 0.10341 | 0.12385 | 0.11393 | 0.13785 | 0.24205 | 0.29606 | 0.55341 | 0.70676 |           |
| <b>90</b>               | 0.03176         | 0.04362 | 0.08646 | 0.10516 | 0.09573 | 0.11733 | 0.19751 | 0.24759 | 0.50692 | 0.56061 |           |
| <b>100</b>              | –               | 0.03992 | –       | 0.08784 | –       | 0.09841 | –       | 0.20171 | –       | 0.51330 |           |
| <b>112</b>              | –               | 0.03274 | –       | –       | –       | –       | –       | –       | –       | –       |           |
| <b><math>J_L</math></b> | 0.045           | 0.045   | 0.100   | 0.100   | 0.100   | 0.100   |         |         |         |         |           |
| <b>100</b>              | 0.03962         | –       | 0.10814 | –       | 0.11315 | –       | 0.23894 | –       | 0.60939 | –       | <b>H4</b> |
| <b>112</b>              | 0.03254         | –       | 0.08764 | 0.10910 | 0.09173 | 0.11518 | 0.19488 | 0.24222 | 0.52729 | 0.61425 |           |
| <b>125</b>              | 0.02873         | 0.04034 | 0.07613 | 0.08829 | 0.07972 | 0.09324 | 0.16925 | 0.19732 | 0.45584 | 0.53127 |           |
| <b>140</b>              | 0.02534         | 0.03309 | 0.06605 | 0.07672 | 0.06922 | 0.08096 | 0.14680 | 0.17125 | 0.36516 | 0.45909 |           |
| <b>160</b>              | 0.02087         | 0.02919 | 0.05704 | 0.06652 | 0.05986 | 0.07022 | 0.12654 | 0.14842 | 0.31382 | 0.36751 |           |
| <b>180</b>              | 0.01806         | 0.02572 | 0.04990 | 0.05742 | 0.05247 | 0.06066 | 0.10759 | 0.12785 | 0.28076 | 0.31570 |           |
| <b>200</b>              | 0.01339         | 0.02115 | 0.03803 | 0.05022 | 0.03937 | 0.05313 | 0.08150 | 0.10862 | 0.21559 | 0.28235 |           |
| <b>224</b>              | 0.01135         | 0.01829 | 0.02994 | 0.03828 | 0.03102 | 0.03991 | 0.06851 | 0.08231 | 0.18183 | 0.21687 |           |
| <b>250</b>              | 0.00948         | 0.01358 | 0.02503 | 0.03013 | 0.02596 | 0.03140 | 0.05728 | 0.06915 | 0.15057 | 0.18284 |           |
| <b>280</b>              | 0.00794         | 0.01150 | 0.02100 | 0.02517 | 0.02181 | 0.02626 | 0.04677 | 0.05779 | 0.12952 | 0.15135 |           |
| <b>315</b>              | 0.00670         | 0.00960 | 0.01768 | 0.02111 | 0.01840 | 0.02206 | 0.04283 | 0.04716 | 0.10994 | 0.13017 |           |
| <b>355</b>              | 0.00559         | 0.00803 | 0.01616 | 0.01777 | 0.01685 | 0.01859 | 0.03572 | 0.04318 | 0.09172 | 0.11046 |           |
| <b>400</b>              | –               | 0.00678 | –       | 0.01625 | –       | 0.01702 | –       | 0.03599 | –       | 0.09213 |           |
| <b>450</b>              | –               | 0.00565 | –       | –       | –       | –       | –       | –       | –       | –       |           |

Mass moments of inertia for sizes 23 to 28 on request.

## Design of the gear units

### Overview tables

#### Type B2, B3, B4 – Mass moments of inertia $J_1$ gear unit sizes 4 to 12

##### Technical specifications (continued)

The mass moment of inertia  $J_2$  in  $\text{kgm}^2$  relative to the low speed shaft (LSS) of a gear unit is calculated according to the following formula:

$$J_2 = i_N^2 \times J_1.$$

The mass moments of inertia  $J_1$  in  $\text{kgm}^2$  are relative to the high speed shaft (HSS) of the gear unit and apply to the high speed shaft (HSS) without fan.

For the high speed shaft (HSS) with fan,  $J_L$  must be added.

Values for flanged shaft gear units on request.

##### Mass moments of inertia $J_1$ in $\text{kgm}^2$ relative to the high speed shaft (HSS)

| Gear unit sizes |         |         |         |         |         |         |         |         |         |      |
|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|
| $i_N$           | 4       | 5       | 6       | 7       | 8       | 9       | 10      | 11      | 12      | Type |
| 5.0             | 0.03211 | 0.07501 | –       | 0.20154 | –       | 0.44627 | –       | 1.29058 | –       | B2   |
| 5.6             | 0.03024 | 0.06915 | –       | 0.17137 | –       | 0.37934 | –       | 1.08250 | –       |      |
| 6.3             | 0.02673 | 0.05791 | 0.08406 | 0.13819 | 0.23057 | 0.30248 | 0.50622 | 0.85265 | 1.48203 |      |
| 7.1             | 0.02249 | 0.04955 | 0.07668 | 0.11905 | 0.19554 | 0.25734 | 0.42923 | 0.73360 | 1.23242 |      |
| 8.0             | 0.01814 | 0.03799 | 0.06347 | 0.08858 | 0.15603 | 0.18973 | 0.33932 | 0.53110 | 0.96847 |      |
| 9.0             | 0.01486 | 0.03115 | 0.05410 | 0.07952 | 0.13365 | 0.17287 | 0.28749 | 0.48051 | 0.82632 |      |
| 10              | 0.01037 | 0.02538 | 0.04185 | 0.06883 | 0.09965 | 0.14614 | 0.21259 | 0.41113 | 0.60295 |      |
| 11.2            | 0.00931 | 0.02176 | 0.03406 | 0.05956 | 0.08888 | 0.12482 | 0.19220 | 0.35269 | 0.54127 |      |
| 12.5            | –       | –       | 0.02760 | –       | 0.07596 | –       | 0.16085 | –       | 0.45737 |      |
| 14              | –       | –       | 0.02366 | –       | 0.06566 | –       | 0.13741 | –       | 0.39227 |      |
| $J_L$           | 0.020   | 0.045   | 0.045   | 0.100   | 0.100   | 0.100   | 0.100   | 0.290   | 0.290   |      |
| 12.5            | 0.00756 | 0.01615 | –       | 0.04549 | –       | 0.10285 | –       | 0.27616 | –       | B3   |
| 14              | 0.00734 | 0.01575 | –       | 0.04455 | –       | 0.09999 | –       | 0.26878 | –       |      |
| 16              | 0.00623 | 0.01371 | 0.01750 | 0.03768 | 0.04966 | 0.08727 | 0.11205 | 0.23571 | 0.30357 |      |
| 18              | 0.00610 | 0.01346 | 0.01695 | 0.03713 | 0.04831 | 0.08550 | 0.10750 | 0.23105 | 0.29302 |      |
| 20              | 0.00569 | 0.01248 | 0.01458 | 0.03464 | 0.04011 | 0.07999 | 0.09297 | 0.21547 | 0.25301 |      |
| 22.4            | 0.00527 | 0.01157 | 0.01422 | 0.03229 | 0.03933 | 0.07329 | 0.09015 | 0.18297 | 0.24635 |      |
| 25              | 0.00456 | 0.01073 | 0.01308 | 0.02828 | 0.03637 | 0.06097 | 0.08364 | 0.14675 | 0.22734 |      |
| 28              | 0.00394 | 0.00881 | 0.01206 | 0.02376 | 0.03369 | 0.05206 | 0.07633 | 0.12605 | 0.19285 |      |
| 31.5            | 0.00335 | 0.00730 | 0.01109 | 0.01922 | 0.02934 | 0.04011 | 0.06322 | 0.09389 | 0.15405 |      |
| 35.5            | 0.00271 | 0.00586 | 0.00911 | 0.01568 | 0.02463 | 0.03275 | 0.05390 | 0.08401 | 0.13203 |      |
| 40              | 0.00190 | 0.00416 | 0.00755 | 0.01100 | 0.01996 | 0.02660 | 0.04168 | 0.07225 | 0.09842 |      |
| 45              | 0.00177 | 0.00393 | 0.00605 | 0.00984 | 0.01624 | 0.02280 | 0.03393 | 0.06249 | 0.08784 |      |
| 50              | 0.00129 | 0.00301 | 0.00431 | 0.00812 | 0.01143 | 0.01784 | 0.02750 | 0.04683 | 0.07516 |      |
| 56              | 0.00105 | 0.00248 | 0.00405 | 0.00682 | 0.01020 | 0.01462 | 0.02357 | 0.03850 | 0.06498 |      |
| 63              | 0.00087 | 0.00207 | 0.00310 | 0.00589 | 0.00840 | 0.01242 | 0.01844 | 0.03265 | 0.04876 |      |
| 71              | 0.00067 | 0.00157 | 0.00256 | 0.00467 | 0.00705 | 0.00997 | 0.01509 | 0.02622 | 0.04002 |      |
| 80              | –       | –       | 0.00213 | –       | 0.00607 | –       | 0.01280 | –       | 0.03390 |      |
| 90              | –       | –       | 0.00162 | –       | 0.00481 | –       | 0.01027 | –       | 0.02719 |      |
| $J_L$           | 0.006   | 0.010   | 0.010   | 0.020   | 0.020   | 0.045   | 0.045   | 0.100   | 0.100   |      |
| 80              | –       | 0.00240 | –       | 0.00589 | –       | 0.01293 | –       | 0.03573 | –       | B4   |
| 90              | –       | 0.00227 | –       | 0.00543 | –       | 0.01193 | –       | 0.03317 | –       |      |
| 100             | –       | 0.00200 | 0.00244 | 0.00468 | 0.00600 | 0.01100 | 0.01317 | 0.02895 | 0.03644 |      |
| 112             | –       | 0.00176 | 0.00230 | 0.00404 | 0.00551 | 0.00903 | 0.01212 | 0.02431 | 0.03375 |      |
| 125             | –       | 0.00145 | 0.00202 | 0.00344 | 0.00474 | 0.00749 | 0.01114 | 0.01969 | 0.02939 |      |
| 140             | –       | 0.00117 | 0.00178 | 0.00278 | 0.00409 | 0.00600 | 0.00915 | 0.01603 | 0.02467 |      |
| 160             | –       | 0.00091 | 0.00147 | 0.00195 | 0.00348 | 0.00427 | 0.00759 | 0.01127 | 0.01999 |      |
| 180             | –       | 0.00085 | 0.00118 | 0.00181 | 0.00281 | 0.00402 | 0.00608 | 0.01007 | 0.01626 |      |
| 200             | –       | 0.00058 | 0.00092 | 0.00132 | 0.00198 | 0.00308 | 0.00433 | 0.00830 | 0.01145 |      |
| 224             | –       | 0.00047 | 0.00086 | 0.00108 | 0.00183 | 0.00254 | 0.00407 | 0.00696 | 0.01021 |      |
| 250             | –       | 0.00043 | 0.00058 | 0.00090 | 0.00134 | 0.00211 | 0.00312 | 0.00600 | 0.00841 |      |
| 280             | –       | 0.00033 | 0.00047 | 0.00069 | 0.00109 | 0.00160 | 0.00257 | 0.00476 | 0.00705 |      |
| 315             | –       | 0.00028 | 0.00043 | 0.00058 | 0.00091 | 0.00136 | 0.00214 | 0.00405 | 0.00608 |      |
| 355             | –       | –       | 0.00034 | –       | 0.00070 | –       | 0.00162 | –       | 0.00482 |      |
| 400             | –       | –       | 0.00028 | –       | 0.00059 | –       | 0.00138 | –       | 0.00409 |      |

Mass moments of inertia for sizes 23 to 28 on request.





# Design of the gear units

## Overview tables

### Type H1, H2, H3, H4 – Actual ratios $i$ gear unit sizes 3 to 12

#### Technical specifications (continued)

#### Actual ratios $i$ for types H1, H2, H3, H4

| $i_N$ | Gear unit sizes |        |        |         |         |         |         |         |         |         | Type |
|-------|-----------------|--------|--------|---------|---------|---------|---------|---------|---------|---------|------|
|       | 3               | 4      | 5      | 6       | 7       | 8       | 9       | 10      | 11      | 12      |      |
| 1.25  | 1.243           | –      | 1.256  | –       | 1.263   | –       | 1.270   | –       | –       | –       | H1   |
| 1.4   | 1.371           | –      | 1.378  | –       | 1.389   | –       | 1.400   | –       | –       | –       |      |
| 1.6   | 1.594           | –      | 1.588  | –       | 1.606   | –       | 1.625   | –       | 1.636   | –       |      |
| 1.8   | 1.829           | –      | 1.839  | –       | 1.774   | –       | 1.800   | –       | 1.806   | –       |      |
| 2.0   | 2.000           | –      | 2.034  | –       | 1.966   | –       | 2.000   | –       | 2.000   | –       |      |
| 2.24  | 2.194           | –      | 2.259  | –       | 2.308   | –       | 2.231   | –       | 2.222   | –       |      |
| 2.5   | 2.536           | –      | 2.520  | –       | 2.583   | –       | 2.500   | –       | 2.480   | –       |      |
| 2.8   | 2.808           | –      | 2.826  | –       | 2.800   | –       | 2.741   | –       | 2.783   | –       |      |
| 3.15  | 3.125           | –      | 3.190  | –       | 3.130   | –       | 3.208   | –       | 3.080   | –       |      |
| 3.55  | 3.500           | –      | 3.591  | –       | 3.524   | –       | 3.591   | –       | 3.478   | –       |      |
| 4.0   | 3.950           | –      | 4.050  | –       | 4.000   | –       | 4.050   | –       | 3.905   | –       |      |
| 4.5   | 4.435           | –      | 4.619  | –       | 4.400   | –       | 4.381   | –       | 4.421   | –       |      |
| 5.0   | 4.952           | –      | 4.900  | –       | 4.905   | –       | 4.947   | –       | 5.150   | –       |      |
| 5.6   | 5.579           | –      | 5.556  | –       | 5.526   | –       | 5.684   | –       | 5.474   | –       |      |
| 6.3   | –               | 6.319  | 6.286  | –       | 6.088   | –       | 6.260   | –       | 6.246   | –       |      |
| 7.1   | –               | 6.857  | 7.213  | –       | 7.048   | –       | 7.247   | –       | 6.900   | –       |      |
| 8.0   | –               | 7.778  | 7.889  | 7.792   | 7.799   | 7.676   | 8.018   | 7.848   | 7.644   | 7.941   |      |
| 9.0   | –               | 8.485  | 8.652  | 8.940   | 8.660   | 8.887   | 8.904   | 9.085   | 8.974   | 8.772   |      |
| 10    | –               | 9.722  | 10.002 | 9.778   | 9.660   | 9.833   | 9.932   | 10.053  | 10.046  | 9.718   |      |
| 11.2  | –               | 10.694 | 11.075 | 10.724  | 10.648  | 10.920  | 11.138  | 11.163  | 10.889  | 11.410  |      |
| 12.5  | –               | 12.444 | 12.326 | 12.397  | 11.807  | 12.180  | 12.574  | 12.452  | 12.174  | 12.773  |      |
| 14    | –               | 13.865 | 13.806 | 13.726  | 13.939  | 13.426  | 14.152  | 13.964  | 13.704  | 13.844  |      |
| 16    | –               | 15.556 | 15.581 | 15.278  | 15.717  | 14.887  | 15.962  | 15.765  | 15.556  | 15.478  |      |
| 18    | –               | 17.602 | 17.493 | 17.111  | 17.598  | 17.576  | 18.204  | 17.743  | 17.111  | 17.423  |      |
| 20    | –               | 19.444 | 19.534 | 19.311  | 19.742  | 19.817  | 19.312  | 20.012  | 19.074  | 19.778  |      |
| 22.4  | –               | 22.037 | 22.006 | 21.681  | 20.982  | 22.189  | 21.895  | 22.824  | 21.491  | 21.756  |      |
| 25    | –               | –      | 25.011 | 24.212  | 25.540  | 24.892  | 25.439  | 24.212  | 24.706  | 24.251  |      |
| 28    | –               | –      | 28.490 | 27.275  | 27.711  | 26.456  | 29.187  | 27.451  | 28.602  | 27.325  |      |
| 31.5  | –               | –      | 31.161 | 30.999  | 31.433  | 32.202  | 31.924  | 31.894  | 31.648  | 31.412  |      |
| 35.5  | –               | –      | 34.177 | 35.312  | 34.291  | 34.940  | 35.013  | 36.593  | 35.144  | 36.366  |      |
| 40    | –               | –      | 39.508 | 38.622  | 39.292  | 39.633  | 40.474  | 40.024  | 39.200  | 40.238  |      |
| 45    | –               | –      | 43.745 | 42.360  | 43.221  | 43.236  | 44.816  | 43.897  | 43.210  | 44.683  |      |
| 50    | –               | –      | 48.689 | 48.967  | 50.293  | 49.542  | 49.881  | 50.744  | 47.911  | 49.840  |      |
| 56    | –               | –      | 54.532 | 54.220  | 56.033  | 54.496  | 55.866  | 56.187  | 56.566  | 54.938  |      |
| 63    | –               | –      | 61.543 | 60.347  | 62.867  | 63.413  | 63.049  | 62.537  | 63.778  | 60.916  |      |
| 71    | –               | –      | 69.742 | 67.589  | 71.139  | 70.651  | 70.787  | 70.041  | 71.414  | 71.919  |      |
| 80    | –               | –      | 78.723 | 76.279  | 78.583  | 79.267  | 79.049  | 79.046  | 80.111  | 81.089  |      |
| 90    | –               | –      | 86.806 | 86.440  | 89.061  | 89.696  | 89.050  | 88.748  | 85.146  | 90.798  |      |
| 100   | –               | –      | –      | 97.572  | 101.554 | 99.083  | 101.210 | 99.106  | 103.639 | 101.856 |      |
| 112   | –               | –      | –      | 107.590 | 115.256 | 112.294 | 115.290 | 111.645 | 112.450 | 108.257 |      |
| 125   | –               | –      | –      | –       | 125.733 | 128.046 | 126.098 | 126.890 | 127.556 | 131.769 |      |
| 140   | –               | –      | –      | –       | 143.985 | 145.322 | 138.301 | 144.542 | 139.152 | 142.973 |      |
| 160   | –               | –      | –      | –       | 158.251 | 158.533 | 159.874 | 158.093 | 159.444 | 162.178 |      |
| 180   | –               | –      | –      | –       | 174.630 | 181.856 | 177.022 | 173.392 | 175.389 | 176.921 |      |
| 200   | –               | –      | –      | –       | 193.629 | 199.533 | 197.028 | 200.439 | 204.089 | 202.722 |      |
| 224   | –               | –      | –      | –       | 228.606 | 220.185 | 220.671 | 221.938 | 227.382 | 222.994 |      |
| 250   | –               | –      | –      | –       | 257.753 | 244.141 | 249.043 | 247.020 | 255.111 | 259.484 |      |
| 280   | –               | –      | –      | –       | 288.615 | 288.242 | 282.219 | 276.663 | 288.678 | 289.100 |      |
| 315   | –               | –      | –      | –       | 305.352 | 324.993 | 318.563 | 312.234 | 318.889 | 324.356 |      |
| 355   | –               | –      | –      | –       | 344.112 | 363.906 | 351.273 | 353.827 | 361.407 | 367.034 |      |
| 400   | –               | –      | –      | –       | –       | 385.010 | –       | 399.393 | –       | 405.444 |      |
| 450   | –               | –      | –      | –       | –       | 433.881 | –       | 440.402 | –       | 459.504 |      |



## Design of the gear units

### Overview tables

#### Type H1, H2, H3, H4 – Actual ratios $i$ gear unit sizes 25 to 28

##### Technical specifications (continued)

##### Actual ratios $i$ for types H1, H2, H3, H4

| $i_N$ | Gear unit sizes |         |         |         | Type |
|-------|-----------------|---------|---------|---------|------|
|       | 25              | 26      | 27      | 28      |      |
| 1.25  | –               | –       | –       | –       | H1   |
| 1.4   | –               | –       | –       | –       |      |
| 1.6   | –               | –       | –       | –       |      |
| 1.8   | –               | –       | –       | –       |      |
| 2.0   | –               | –       | –       | –       |      |
| 2.24  | –               | –       | –       | –       |      |
| 2.5   | –               | –       | –       | –       |      |
| 2.8   | –               | –       | –       | –       |      |
| 3.15  | –               | –       | –       | –       |      |
| 3.55  | –               | –       | –       | –       |      |
| 4.0   | –               | –       | –       | –       |      |
| 4.5   | –               | –       | –       | –       |      |
| 5.0   | –               | –       | –       | –       |      |
| 5.6   | –               | –       | –       | –       |      |
| 6.3   | 6.432           | –       | –       | –       |      |
| 7.1   | 7.102           | 7.323   | –       | –       |      |
| 8.0   | 8.292           | 8.085   | 8.164   | –       |      |
| 9.0   | 9.244           | 9.440   | 8.949   | 9.295   |      |
| 10    | 10.362          | 10.524  | 10.146  | 10.188  |      |
| 11.2  | 11.693          | 11.797  | 11.594  | 11.550  |      |
| 12.5  | 12.458          | 13.312  | 12.734  | 13.199  |      |
| 14    | 14.244          | 14.183  | 14.657  | 14.497  |      |
| 16    | 15.889          | 16.216  | 16.651  | 16.686  |      |
| 18    | 17.875          | 18.089  | 17.843  | 18.957  |      |
| 20    | 19.218          | 20.350  | 19.183  | 20.314  |      |
| 22.4  | 22.623          | 22.129  | 23.817  | 21.799  |      |
| 25    | 26.190          | 25.755  | 26.382  | 27.115  |      |
| 28    | 28.979          | 29.817  | 29.314  | 30.035  |      |
| 31.5  | 32.180          | 32.991  | 32.696  | 33.373  |      |
| 35.5  | 35.894          | 36.636  | 36.371  | 37.223  |      |
| 40    | 40.254          | 40.864  | 40.453  | 41.407  |      |
| 45    | 45.699          | 45.828  | 45.245  | 46.054  |      |
| 50    | 51.148          | 52.026  | 50.950  | 51.510  |      |
| 56    | 57.688          | 58.230  | 57.856  | 58.005  |      |
| 63    | 65.793          | 65.675  | 67.113  | 65.867  |      |
| 71    | 69.795          | 74.903  | 74.750  | 76.406  |      |
| 80    | 79.132          | 79.459  | 84.684  | 85.100  |      |
| 90    | 85.076          | 90.089  | 91.045  | 96.410  |      |
| 100   | 103.838         | 97.967  | 104.514 | 103.460 |      |
| 112   | 115.375         | 118.215 | 115.712 | 118.985 |      |
| 125   | 128.688         | 131.350 | 128.569 | 131.734 |      |
| 140   | 144.219         | 146.506 | 143.483 | 146.371 |      |
| 160   | 158.107         | 179.998 | 160.991 | 163.350 |      |
| 180   | 185.081         | 179.998 | 178.197 | 183.282 |      |
| 200   | 207.151         | 210.707 | 201.238 | 202.870 |      |
| 224   | 233.634         | 235.833 | 225.914 | 229.102 |      |
| 250   | 252.726         | 265.984 | 255.785 | 257.195 |      |
| 280   | 285.401         | 287.719 | 297.959 | 291.201 |      |
| 315   | 327.908         | 324.919 | 316.686 | 339.214 |      |
| 355   | 352.538         | 373.311 | 340.473 | 360.535 |      |
| 400   | –               | 405.953 | –       | 386.901 |      |
| 450   | –               | –       | –       | –       |      |

### Technical specifications (continued)

#### Actual ratios $i$ for types B2, B3, B4

| $i_N$ | Gear unit sizes |         |         |         |         |         |         |         |         |    | Type |
|-------|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|----|------|
|       | 4               | 5       | 6       | 7       | 8       | 9       | 10      | 11      | 12      |    |      |
| 5.0   | 4.936           | 5.006   | –       | 4.865   | –       | 5.002   | –       | 4.897   | –       |    | B2   |
| 5.6   | 5.480           | 5.488   | –       | 5.333   | –       | 5.483   | –       | 5.534   | –       |    |      |
| 6.3   | 6.296           | 6.386   | 6.205   | 6.206   | 6.135   | 6.381   | 6.271   | 6.296   | 6.226   |    |      |
| 7.1   | 6.959           | 7.058   | 6.802   | 6.860   | 6.725   | 7.053   | 6.875   | 7.037   | 7.036   |    |      |
| 8.0   | 7.549           | 7.657   | 7.915   | 7.880   | 7.825   | 8.101   | 8.000   | 7.994   | 8.005   |    |      |
| 9.0   | 8.693           | 8.817   | 8.749   | 8.569   | 8.649   | 8.810   | 8.842   | 8.693   | 8.947   |    |      |
| 10    | 9.872           | 10.108  | 9.490   | 9.823   | 9.935   | 10.099  | 10.157  | 9.965   | 10.164  |    |      |
| 11.2  | 10.769          | 10.923  | 10.928  | 10.615  | 10.804  | 10.914  | 11.045  | 10.769  | 11.052  |    |      |
| 12.5  | 12.034          | 12.703  | 12.528  | 12.433  | 12.385  | 12.554  | 12.662  | 12.334  | 12.670  |    |      |
| 14    | 13.484          | 13.964  | 13.538  | 13.515  | 13.385  | 14.137  | 13.683  | 13.821  | 13.692  |    |      |
| 16    | 15.601          | 15.835  | 15.826  | 16.275  | 15.773  | 15.952  | 15.693  | 15.522  | 15.888  |    |      |
| 18    | 17.482          | 17.407  | 17.307  | 17.692  | 17.041  | 17.963  | 17.724  | 17.393  | 17.572  |    |      |
| 20    | 19.614          | 19.645  | 19.729  | 19.948  | 20.648  | 20.259  | 19.940  | 19.744  | 19.995  |    |      |
| 22.4  | 21.919          | 21.954  | 21.575  | 22.146  | 22.308  | 22.208  | 22.520  | 21.643  | 22.114  |    |      |
| 25    | 25.380          | 25.421  | 24.349  | 25.446  | 25.152  | 25.843  | 25.400  | 25.185  | 25.103  |    |      |
| 28    | 27.836          | 27.881  | 27.211  | 28.125  | 27.923  | 28.563  | 27.842  | 27.836  | 27.517  |    |      |
| 31.5  | 30.196          | 30.245  | 31.508  | 30.509  | 32.084  | 30.985  | 32.400  | 31.975  | 32.021  |    |      |
| 35.5  | 34.771          | 34.827  | 34.557  | 35.131  | 35.461  | 35.679  | 35.811  | 34.771  | 35.392  |    |      |
| 40    | 39.487          | 39.551  | 37.486  | 39.896  | 38.468  | 40.902  | 38.846  | 39.861  | 40.654  | B3 |      |
| 45    | 43.077          | 43.146  | 43.166  | 43.523  | 44.296  | 44.202  | 44.732  | 43.077  | 44.209  |    |      |
| 50    | 49.060          | 49.139  | 49.021  | 49.568  | 50.304  | 50.341  | 51.280  | 49.060  | 50.681  |    |      |
| 56    | 55.152          | 55.240  | 53.477  | 55.723  | 54.877  | 56.592  | 55.417  | 55.152  | 54.769  |    |      |
| 63    | 60.808          | 60.906  | 60.904  | 61.438  | 62.499  | 62.396  | 63.114  | 60.808  | 62.376  |    |      |
| 71    | 69.293          | 69.404  | 68.467  | 70.011  | 70.259  | 71.102  | 70.951  | 69.293  | 70.121  |    |      |
| 80    | –               | 77.598  | 75.489  | 79.267  | 77.465  | 79.497  | 78.228  | 80.949  | 77.313  |    |      |
| 90    | –               | 86.720  | 86.022  | 88.585  | 88.274  | 88.842  | 89.143  | 89.869  | 88.101  |    |      |
| 100   | –               | 100.413 | 96.178  | 102.572 | 99.945  | 102.869 | 99.667  | 103.259 | 102.921 |    |      |
| 112   | –               | 110.130 | 107.484 | 112.498 | 111.694 | 112.824 | 111.384 | 114.129 | 114.262 |    |      |
| 125   | –               | 119.466 | 124.455 | 122.035 | 129.330 | 122.389 | 128.971 | 123.804 | 131.287 |    |      |
| 140   | –               | 137.567 | 136.499 | 140.525 | 141.846 | 140.933 | 141.452 | 142.562 | 145.106 |    |      |
| 160   | –               | 156.225 | 148.071 | 159.585 | 153.871 | 160.047 | 153.443 | 161.897 | 157.408 |    |      |
| 180   | –               | 170.427 | 170.506 | 174.092 | 177.184 | 174.597 | 176.692 | 176.615 | 181.258 |    |      |
| 200   | –               | 194.098 | 193.631 | 198.272 | 201.215 | 198.847 | 200.656 | 201.145 | 205.841 |    |      |
| 224   | –               | 218.199 | 211.234 | 222.891 | 219.508 | 223.537 | 218.898 | 226.121 | 224.554 |    |      |
| 250   | –               | 240.578 | 240.572 | 245.752 | 249.995 | 246.464 | 249.300 | 249.313 | 255.742 |    |      |
| 280   | –               | 274.147 | 270.443 | 280.042 | 281.036 | 280.855 | 280.256 | 284.101 | 287.497 |    |      |
| 315   | –               | 302.121 | 298.181 | 308.618 | 309.861 | 309.513 | 309.000 | 313.091 | 316.984 |    |      |
| 355   | –               | –       | 339.788 | –       | 353.097 | –       | 352.116 | –       | 361.214 |    |      |
| 400   | –               | –       | 374.460 | –       | 389.127 | –       | 388.046 | –       | 398.073 |    |      |

# Design of the gear units

## Overview tables

### Type B2, B3, B4 – Actual ratios $i$ gear unit sizes 13 to 24

#### Technical specifications (continued)

##### Actual ratios $i$ for types B2, B3, B4

| $i_N$ | Gear unit sizes |         |         |         |         |         |         |         |         |         |         |         | Type |    |
|-------|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|----|
|       | 13              | 14      | 15      | 16      | 17      | 18      | 19      | 20      | 21      | 22      | 23      | 24      |      |    |
| 5.0   | 4.967           | –       | 4.963   | –       | –       | –       | –       | –       | –       | –       | –       | –       | –    | B2 |
| 5.6   | 5.613           | –       | 5.609   | 5.630   | 5.514   | –       | –       | –       | –       | –       | –       | –       | –    |    |
| 6.3   | 6.386           | 6.156   | 6.340   | 6.362   | 6.234   | –       | –       | –       | –       | –       | –       | –       | –    |    |
| 7.1   | 7.138           | 6.957   | 7.132   | 7.192   | 7.012   | 7.239   | –       | –       | –       | –       | –       | –       | –    |    |
| 8.0   | 8.108           | 7.915   | 8.101   | 8.090   | 7.965   | 8.143   | –       | –       | –       | –       | –       | –       | –    |    |
| 9.0   | 8.817           | 8.847   | 8.810   | 9.190   | 8.662   | 9.250   | –       | –       | –       | –       | –       | –       | –    |    |
| 10    | 10.108          | 10.049  | 10.099  | 9.993   | 9.930   | 10.059  | –       | –       | –       | –       | –       | –       | –    |    |
| 11.2  | 10.923          | 10.928  | 10.914  | 11.456  | 10.731  | 11.531  | –       | –       | –       | –       | –       | –       | –    |    |
| 12.5  | 12.482          | 12.528  | 12.172  | 12.380  | 12.770  | 12.462  | 12.062  | –       | 12.256  | –       | –       | –       | –    |    |
| 14    | 13.721          | 13.538  | 13.810  | 13.832  | 13.790  | 14.654  | 13.709  | 13.698  | 13.902  | 13.719  | –       | –       | –    |    |
| 16    | 16.354          | 15.552  | 15.215  | 15.665  | 16.226  | 16.014  | 15.192  | 15.640  | 15.436  | 15.538  | –       | –       | –    |    |
| 18    | 17.978          | 17.007  | 17.262  | 17.290  | 17.522  | 18.620  | 17.267  | 17.252  | 17.510  | 17.279  | –       | –       | –    |    |
| 20    | 20.276          | 20.376  | 19.379  | 19.581  | 19.762  | 20.348  | 19.607  | 19.698  | 19.883  | 19.570  | 20.285  | –       | –    |    |
| 22.4  | 22.226          | 22.282  | 21.900  | 21.982  | 22.333  | 22.950  | 22.158  | 22.368  | 22.470  | 22.222  | 22.931  | 22.782  | –    |    |
| 25    | 25.864          | 25.131  | 24.916  | 24.842  | 25.409  | 25.936  | 25.048  | 25.278  | 25.400  | 25.113  | 25.794  | 25.753  | –    |    |
| 28    | 28.587          | 27.548  | 27.847  | 28.263  | 28.398  | 29.507  | 28.175  | 28.576  | 28.571  | 28.389  | 29.301  | 28.968  | –    |    |
| 31.5  | 32.838          | 32.057  | 31.634  | 31.588  | 32.259  | 32.979  | 32.005  | 32.143  | 32.456  | 31.933  | 31.863  | 32.907  | –    |    |
| 35.5  | 35.709          | 35.432  | 34.400  | 35.883  | 35.080  | 37.463  | 34.804  | 36.513  | 35.294  | 36.275  | 34.804  | 35.784  | –    |    |
| 40    | 40.936          | 40.700  | 39.435  | 39.021  | 40.215  | 40.738  | 39.899  | 39.706  | 40.461  | 39.446  | 39.899  | 39.216  | –    |    |
| 45    | 44.238          | 44.259  | 42.617  | 44.732  | 43.460  | 46.702  | 43.117  | 45.518  | 43.725  | 45.221  | 43.117  | 44.956  | –    |    |
| 50    | 50.383          | 50.737  | 48.536  | 48.341  | 49.496  | 50.469  | 49.106  | 49.190  | 49.798  | 48.869  | 49.106  | 48.583  | –    |    |
| 56    | 56.639          | 54.831  | 54.562  | 55.055  | 55.641  | 57.479  | 55.203  | 56.022  | 55.981  | 55.656  | 55.203  | 55.331  | –    |    |
| 63    | 62.448          | 62.446  | 60.158  | 61.892  | 61.348  | 64.616  | 60.865  | 62.978  | 61.722  | 62.567  | 60.865  | 62.201  | –    |    |
| 71    | 71.161          | 70.200  | 68.553  | 68.239  | 69.909  | 71.243  | 69.358  | 69.438  | 70.335  | 68.984  | 69.358  | 68.581  | –    |    |
| 80    | 82.118          | 77.400  | 78.131  | 77.761  | 76.506  | 81.184  | 79.977  | 79.127  | 77.639  | 78.610  | 79.208  | 78.150  | –    |    |
| 90    | 90.016          | 88.200  | 85.645  | 88.626  | 83.865  | 88.846  | 87.670  | 91.242  | 87.739  | 86.772  | 90.116  | 88.957  | –    |    |
| 100   | 104.750         | 101.780 | 99.664  | 97.150  | 97.593  | 97.391  | 102.020 | 100.017 | 99.821  | 98.061  | 100.718 | 101.207 | –    |    |
| 112   | 115.777         | 111.569 | 110.155 | 113.052 | 107.865 | 113.333 | 112.759 | 116.389 | 111.565 | 111.565 | 114.412 | 113.114 | –    |    |
| 125   | 125.592         | 129.831 | 126.535 | 124.952 | 123.904 | 125.263 | 129.526 | 128.641 | 126.733 | 124.690 | 124.416 | 128.494 | –    |    |
| 140   | 144.621         | 143.498 | 137.599 | 143.532 | 134.739 | 143.889 | 140.851 | 147.769 | 137.815 | 141.643 | 142.629 | 139.729 | –    |    |
| 160   | 165.791         | 155.663 | 157.741 | 156.082 | 154.462 | 156.471 | 161.470 | 160.690 | 157.989 | 154.029 | 154.135 | 160.183 | –    |    |
| 180   | 179.166         | 179.248 | 170.467 | 178.930 | 166.923 | 179.375 | 174.496 | 184.212 | 170.735 | 176.576 | 175.543 | 173.106 | –    |    |
| 200   | 204.050         | 205.487 | 194.143 | 193.365 | 190.107 | 193.846 | 198.732 | 199.073 | 194.448 | 190.821 | 197.340 | 197.148 | –    |    |
| 224   | 229.386         | 222.065 | 218.249 | 220.222 | 213.712 | 220.769 | 223.408 | 226.722 | 218.592 | 217.324 | 217.580 | 221.628 | –    |    |
| 250   | 252.913         | 252.907 | 240.634 | 247.566 | 235.631 | 248.182 | 246.322 | 254.874 | 241.012 | 244.309 | 247.940 | 244.359 | –    |    |
| 280   | 288.204         | 284.310 | 274.210 | 272.957 | 268.510 | 273.636 | 280.692 | 281.015 | 274.641 | 269.366 | 273.240 | 278.456 | –    |    |
| 315   | 317.612         | 313.470 | 302.191 | 311.045 | 295.909 | 311.818 | 309.334 | 320.226 | 302.666 | 306.952 | 298.462 | 306.869 | –    |    |
| 355   | –               | 357.210 | –       | 342.784 | –       | 343.636 | –       | 352.902 | –       | 338.273 | –       | 336.295 | –    |    |
| 400   | –               | 393.660 | –       | –       | –       | –       | –       | –       | –       | –       | –       | –       | –    |    |

### Technical specifications (continued)

#### Actual ratios $i$ for types B2, B3, B4

| $i_N$ | Gear unit sizes |         |         |         | Type |
|-------|-----------------|---------|---------|---------|------|
|       | 25              | 26      | 27      | 28      |      |
| 5.0   | –               | –       | –       | –       | B2   |
| 5.6   | –               | –       | –       | –       |      |
| 6.3   | –               | –       | –       | –       |      |
| 7.1   | –               | –       | –       | –       |      |
| 8.0   | –               | –       | –       | –       |      |
| 9.0   | –               | –       | –       | –       |      |
| 10    | –               | –       | –       | –       |      |
| 11.2  | –               | –       | –       | –       |      |
| 12.5  | –               | –       | –       | –       |      |
| 14    | –               | –       | –       | –       |      |
| 16    | –               | –       | –       | –       |      |
| 18    | –               | –       | –       | –       |      |
| 20    | 20.270          | –       | 20.764  | –       |      |
| 22.4  | 22.914          | 23.077  | 23.578  | 23.639  |      |
| 25    | 25.775          | 26.087  | 26.522  | 26.843  |      |
| 28    | 29.279          | 29.343  | 30.128  | 30.194  |      |
| 31.5  | 31.839          | 33.333  | 32.762  | 34.300  |      |
| 35.5  | 36.500          | 36.246  | 37.558  | 37.299  |      |
| 40    | 39.444          | 41.554  | 40.588  | 42.759  |      |
| 45    | 44.923          | 44.906  | 46.225  | 46.208  |      |
| 50    | 50.501          | 51.143  | 51.965  | 52.626  |      |
| 56    | 55.680          | 57.493  | 57.295  | 59.160  |      |
| 63    | 63.450          | 63.390  | 65.290  | 65.228  |      |
| 71    | 68.216          | 72.235  | 70.194  | 74.330  |      |
| 80    | 82.094          | 78.551  | 82.334  | 79.766  |      |
| 90    | 93.399          | 93.461  | 93.073  | 93.734  |      |
| 100   | 104.387         | 106.331 | 104.692 | 105.960 | B4   |
| 112   | 118.580         | 118.841 | 118.926 | 119.188 |      |
| 125   | 128.949         | 134.999 | 129.325 | 135.393 |      |
| 140   | 147.824         | 146.803 | 148.256 | 147.232 |      |
| 160   | 159.750         | 168.292 | 160.217 | 168.784 |      |
| 180   | 181.938         | 181.869 | 182.469 | 182.401 |      |
| 200   | 204.528         | 207.129 | 205.126 | 207.734 |      |
| 224   | 225.506         | 232.848 | 226.165 | 233.528 |      |
| 250   | 256.972         | 256.730 | 257.722 | 257.480 |      |
| 280   | 283.193         | 292.552 | 284.021 | 293.407 |      |
| 315   | 304.465         | 322.405 | 305.354 | 323.347 |      |
| 355   | –               | 350.596 | –       | 346.993 |      |
| 400   | –               | –       | –       | –       |      |

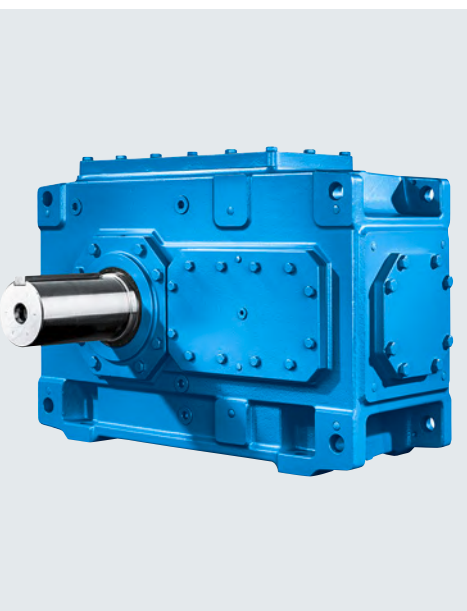
## Design of the gear units

### Notes

3



## Helical gear units Horizontal mounting position



|             |                                                                  |
|-------------|------------------------------------------------------------------|
| <b>4/2</b>  | <b>Type H1</b>                                                   |
| 4/2         | <u>Gear unit dimensions</u>                                      |
| 4/2         | Single-stage, gear unit sizes 3 to 11                            |
| 4/4         | Single-stage, gear unit sizes 13 to 19                           |
| <b>4/6</b>  | <b>Type H2</b>                                                   |
| 4/6         | <u>Gear unit dimensions</u>                                      |
| 4/6         | Two-stage, gear unit sizes 4 to 8                                |
| 4/8         | Two-stage, gear unit sizes 9 to 12                               |
| 4/10        | Two-stage, gear unit sizes 13 to 18                              |
| 4/12        | Two-stage, gear unit sizes 19 to 24                              |
| 4/14        | Two-stage, gear unit sizes 25 to 28                              |
| <b>4/16</b> | <b>Type H3</b>                                                   |
| 4/16        | <u>Gear unit dimensions</u>                                      |
| 4/16        | Three-stage, gear unit sizes 5 to 8                              |
| 4/18        | Three-stage, gear unit sizes 9 to 12                             |
| 4/20        | Three-stage, gear unit sizes 13 to 18                            |
| 4/22        | Three-stage, gear unit sizes 19 to 22                            |
| 4/24        | Three-stage, gear unit sizes 23 to 28                            |
| <b>4/26</b> | <b>Type H4</b>                                                   |
| 4/26        | <u>Gear unit dimensions</u>                                      |
| 4/26        | Four-stage, gear unit sizes 7 to 12                              |
| 4/28        | Four-stage, gear unit sizes 13 to 18                             |
| 4/30        | Four-stage, gear unit sizes 19 to 24                             |
| 4/32        | Four-stage, gear unit sizes 25 to 28                             |
| <b>4/33</b> | <b>Types H1, H2, H3 and H4</b>                                   |
| 4/33        | <u>Article No. overview</u>                                      |
| 4/33        | Article No., 10th to 12th position                               |
| 4/34        | Article No., 13th position                                       |
| 4/36        | Article No. supplement, 14th position                            |
| 4/37        | Article No. supplement,<br>15th and 16th position                |
| 4/38        | Shaft extension on both sides –<br>Gear unit versions G, H and I |

# Helical gear units horizontal mounting position

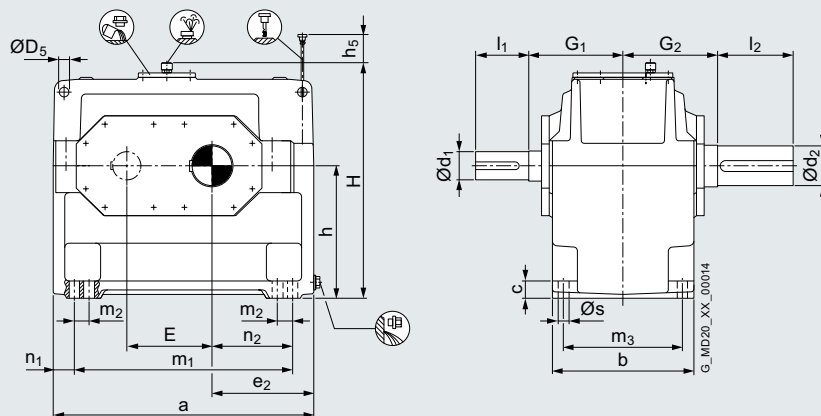
## Type H1

### Gear unit dimensions, single-stage, gear unit sizes 3 to 11

#### Selection and ordering data

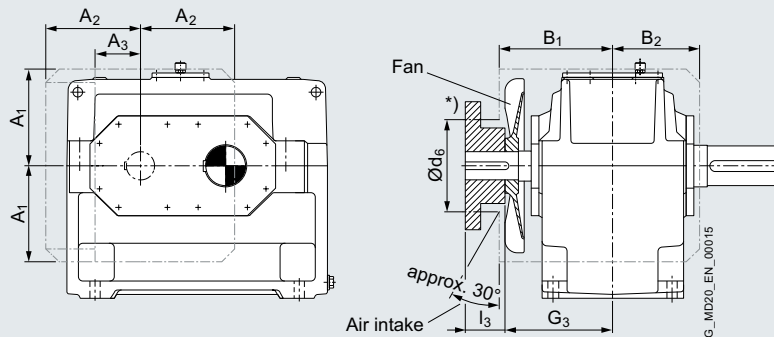
##### H1.H

2LP302-...30-...



##### H1.H with fan

2LP302-...30-...



Remove air guide cover before fitting the foundation bolts.

\*) For combinations of type H1 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | Dimensions in mm |       |       |       |       |       | Fan   |       |       |       |       |       |
|----------------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | $i_N$            | $d_1$ | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $A_3$ | $B_1$ | $B_2$ | $d_6$ |
| 3              | 1.25 - 2.8       | 60m6  | 125   | 105   | 170   | 190   | 150   | 145   | 80    | 205   | 130   | 130   |
|                | 3.15 - 4         | 45m6  | 100   | 80    |       |       |       |       |       |       |       |       |
|                | 4.5 - 5.6        | 32m6  | 80    | 60    |       |       |       |       |       |       |       |       |
| 5              | 1.25 - 2.8       | 85m6  | 160   | 130   | 210   | 240   | 225   | 215   | 115   | 255   | 185   | 190   |
|                | 3.15 - 4         | 60m6  | 135   | 105   |       |       |       |       |       |       |       |       |
|                | 4.5 - 5.6        | 50m6  | 110   | 80    |       |       |       |       |       |       |       |       |
| 7              | 1.25 - 2.8       | 100m6 | 200   | 165   | 250   | 285   | 255   | 250   | 120   | 300   | 230   | 245   |
|                | 3.15 - 4         | 75m6  | 140   | 105   |       |       |       |       |       |       |       |       |
|                | 4.5 - 5.6        | 60m6  | 140   | 105   |       |       |       |       |       |       |       |       |
| 9              | 1.25 - 2.8       | 110n6 | 200   | 165   | 280   | 315   | 300   | 265   | 140   | 330   | 265   | 280   |
|                | 3.15 - 4         | 90m6  | 165   | 130   |       |       |       |       |       |       |       |       |
|                | 4.5 - 5.6        | 75m6  | 140   | 105   |       |       |       |       |       |       |       |       |
| 11             | 1.6 - 2.8        | 130n6 | 240   | 205   | 325   | 360   | 360   | 330   | 190   | 375   | 320   | 350   |
|                | 3.15 - 4         | 110n6 | 205   | 170   |       |       |       |       |       |       |       |       |
|                | 4.5 - 5.6        | 90m6  | 170   | 135   |       |       |       |       |       |       |       |       |

| Gear unit size | Dimensions in mm |     |    |       |     |       |          |       |     |       |       |       |       |    |
|----------------|------------------|-----|----|-------|-----|-------|----------|-------|-----|-------|-------|-------|-------|----|
|                | a                | b   | c  | $D_5$ | E   | $e_2$ | $h^{1)}$ | $h_5$ | H   | $m_1$ | $m_3$ | $n_1$ | $n_2$ | s  |
| 3              | 420              | 200 | 28 | 18    | 130 | 165   | 200      | 85    | 375 | 310   | 160   | 55    | 110   | 19 |
| 5              | 580              | 285 | 35 | 24    | 185 | 230   | 290      | 100   | 525 | 440   | 240   | 70    | 160   | 24 |
| 7              | 690              | 375 | 45 | 24    | 225 | 270   | 350      | 75    | 625 | 540   | 315   | 75    | 195   | 28 |
| 9              | 805              | 425 | 50 | 28    | 265 | 315   | 420      | 50    | 735 | 625   | 350   | 90    | 225   | 35 |
| 11             | 960              | 515 | 60 | 36    | 320 | 375   | 500      | 40    | 875 | 770   | 440   | 95    | 280   | 35 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Helical gear units horizontal mounting position

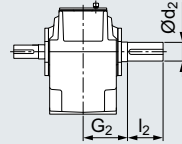
## Type H1

### Gear unit dimensions, single-stage, gear unit sizes 3 to 11

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|             |           |                |                | Oil quantity <sup>1)</sup><br>H1.H<br>WDR | Oil quantity <sup>1)</sup><br>H1.H<br>Labyrinth<br>seal | Weight <sup>1)2)</sup><br>H1.H | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |                                             |
|-------------|-----------|----------------|----------------|-------------------------------------------|---------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
|             |           |                |                | Article No.: <b>2LP302</b>                |                                                         | ■ - ■ ■ .30-....               |                                                                                                                    |                                             |
| Type        | Size      | d <sub>2</sub> | l <sub>2</sub> | G <sub>2</sub>                            | l                                                       | l                              | kg                                                                                                                 | Solid shaft with parallel key <sup>3)</sup> |
| <b>H1SH</b> | <b>3</b>  | 60 m6          | 125            | 170                                       | 7                                                       | 5.2                            | 128                                                                                                                | <b>0 - 2 A</b>                              |
|             | <b>5</b>  | 85 m6          | 160            | 210                                       | 22                                                      | 18                             | 302                                                                                                                | <b>0 - 4 A</b>                              |
|             | <b>7</b>  | 105 n6         | 200            | 250                                       | 42                                                      | 34                             | 547                                                                                                                | <b>0 - 6 A</b>                              |
|             | <b>9</b>  | 125 n6         | 210            | 270                                       | 68                                                      | 57                             | 862                                                                                                                | <b>0 - 8 A</b>                              |
|             | <b>11</b> | 150 n6         | 240            | 320                                       | 120                                                     | 100                            | 1515                                                                                                               | <b>1 - 1 A</b>                              |



#### Information on type H1:

H1 housings in the version according to the catalog are generally designed as split housings.

Shaft seals, [see page 10/2 onwards](#).

For details on the shafts, [see Chapter 9](#).

Cooling options, [see page 10/11 onwards](#).

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, [see page 9/7](#).

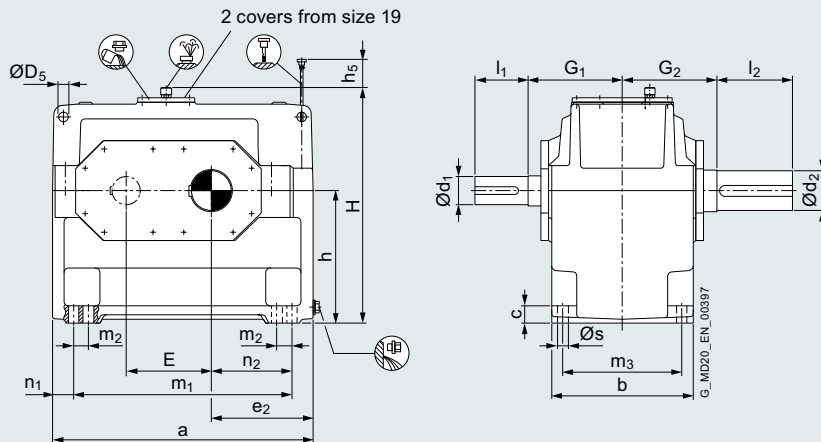
# Helical gear units horizontal mounting position

## Type H1

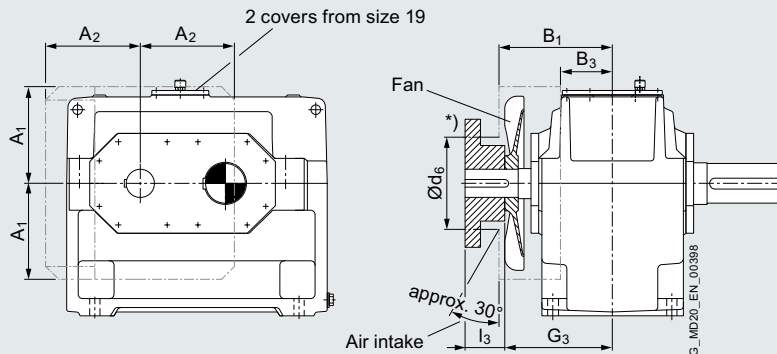
### Gear unit dimensions, single-stage, gear unit sizes 13 to 19

#### Selection and ordering data

**H1.H**  
2LP302-...30-....



**H1.H with fan**  
2LP302-...30-....



Remove air guide cover before fitting the foundation bolts.

\*) For combinations of type H1 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | $i_N$     | Dimensions in mm       |       |       |       |       | Fan   |       |       |       |       |  |
|----------------|-----------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                |           | High speed shaft (HSS) |       |       |       |       | Fan   |       |       |       |       |  |
|                |           | $d_1$                  | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $B_1$ | $B_3$ | $d_6$ |  |
| 13             | 1.6 - 2.8 | 150n6                  | 245   | 200   | 365   | 410   | 415   | 350   | 430   | 150   | 350   |  |
|                | 3.15 - 4  | 130n6                  | 245   | 200   |       |       |       |       |       |       |       |  |
|                | 4.5 - 5.6 | 100m6                  | 210   | 165   |       |       |       |       |       |       |       |  |
| 15             | 2 - 2.8   | 180n6                  | 290   | 240   | 360   | 410   | 500   | 430   | 430   | 120   | 450   |  |
|                | 3.15 - 4  | 150n6                  | 250   | 200   |       |       |       |       |       |       |       |  |
|                | 4.5 - 5.6 | 125n6                  | 250   | 200   |       |       |       |       |       |       |       |  |
| 17             | 2.8       | 200n6                  | 330   | 280   | 400   | 450   | 550   | 430   | 470   | 150   | 445   |  |
|                | 3.15 - 4  | 170n6                  | 290   | 240   |       |       |       |       |       |       |       |  |
|                | 4.5 - 5.6 | 140n6                  | 250   | 200   |       |       |       |       |       |       |       |  |
| 19             | 4         | 190n6                  | 340   | 290   | 440   | 490   | 630   | 475   | 510   | 190   | 445   |  |
|                | 4.5 - 5.6 | 160n6                  | 300   | 250   |       |       |       |       |       |       |       |  |

| Gear unit size | Dimensions in mm |     |    |       |     |       |          |       |      |       |       |       |       |       |    |
|----------------|------------------|-----|----|-------|-----|-------|----------|-------|------|-------|-------|-------|-------|-------|----|
|                | a                | b   | c  | $D_5$ | E   | $e_2$ | $h^{1)}$ | $h_5$ | H    | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | s  |
| 13             | 1100             | 580 | 70 | 39    | 370 | 430   | 580      | 40    | 1020 | 870   | -     | 490   | 115   | 315   | 42 |
| 15             | 1295             | 545 | 80 | 48    | 442 | 505   | 600      | 10    | 1115 | 1025  | -     | 450   | 135   | 370   | 48 |
| 17             | 1410             | 615 | 80 | 48    | 490 | 545   | 670      | -     | 1235 | 1170  | 130   | 530   | 120   | 425   | 42 |
| 19             | 1590             | 690 | 90 | 55    | 555 | 615   | 760      | -     | 1395 | 1290  | 150   | 590   | 150   | 465   | 48 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

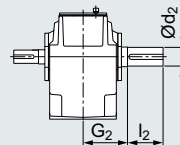
## Helical gear units horizontal mounting position Type H1

### Gear unit dimensions, single-stage, gear unit sizes 13 to 19

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|              |           |                |                | Oil quantity <sup>1)</sup><br>H1.H<br>WDR | Oil quantity <sup>1)</sup><br>H1.H<br>Labyrinth<br>seal | Weight <sup>1)2)</sup><br>H1.H | 10th to 13th position of Article No. and<br>Article No. supplement, for 14th to<br>16th position, see pages 4/33 to 4/37 |                                             |     |
|--------------|-----------|----------------|----------------|-------------------------------------------|---------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----|
| Article No.: |           |                |                |                                           |                                                         | 2LP302                         |                                                                                                                          | - .30-....                                  |     |
| Type         | Size      | d <sub>2</sub> | l <sub>2</sub> | G <sub>2</sub>                            | l                                                       | l                              | kg                                                                                                                       | Solid shaft with parallel key <sup>3)</sup> |     |
| <b>H1SH</b>  | <b>13</b> | 180 n6         | 310            | 360                                       | 175                                                     | 155                            | 2395                                                                                                                     | 1                                           | 3 A |
|              | <b>15</b> | 220 n6         | 350            | 360                                       | 190                                                     | 156                            | 3200                                                                                                                     | 1                                           | 5 A |
|              | <b>17</b> | 240 n6         | 400            | 400                                       | 270                                                     | 225                            | 4250                                                                                                                     | 1                                           | 7 A |
|              | <b>19</b> | 270 n6         | 450            | 440                                       | 390                                                     | 330                            | 5800                                                                                                                     | 2                                           | 0 A |



#### Information on type H1:

H1 housings in the version according to the catalog are generally designed as split housings.

Shaft seals, [see page 10/2 onwards](#).

For details on the shafts, [see Chapter 9](#).

Cooling options, [see page 10/11 onwards](#).

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, [see page 9/7](#).

# Helical gear units horizontal mounting position

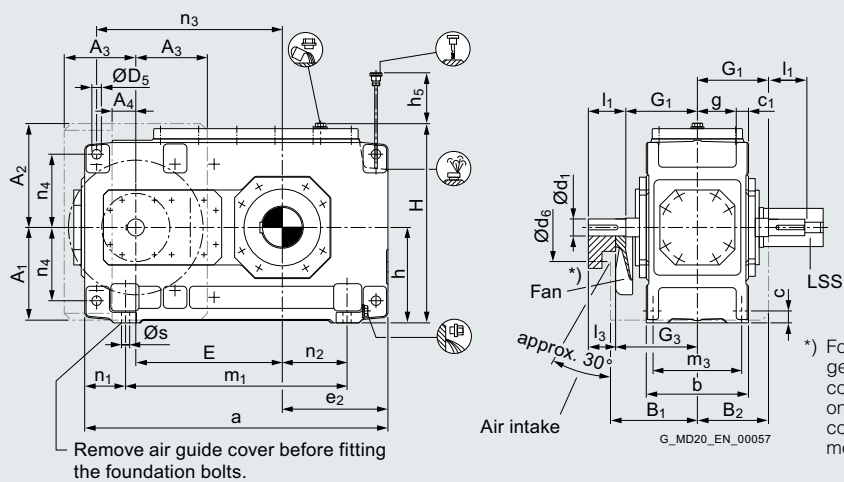
## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 4 to 8

#### Selection and ordering data

**H2.H**

2LP302-...40-...



\*) For combinations of type H2 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | Dimensions in mm       |       |       |       |       |       |       |       |       |       |       |       |     |
|----------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|
|                | High speed shaft (HSS) |       |       |       |       |       | Fan   |       |       |       |       |       |     |
| $i_N$          | $d_1$                  | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $A_3$ | $A_4$ | $B_1$ | $B_2$ | $d_6$ |     |
| 4              | 6.3-11.2               | 45 m6 | 100   | 80    | 170   | 190   | 195   | 225   | 150   | 30    | 205   | 158   | 136 |
|                | 12.5-22.4              | 32 m6 | 80    | 60    |       |       |       |       |       |       |       |       |     |
| 5              | 6.3-11.2               | 50 m6 | 100   | 80    | 195   | 215   | 225   | 260   | 175   | 55    | 230   | 178   | 150 |
|                | 12.5-22.4              | 38 m6 | 80    | 60    |       |       |       |       |       |       |       |       |     |
| 6              | 8-14                   | 50 m6 | 100   | 80    | 195   | 215   | 225   | 260   | 175   | 55    | 230   | 178   | 150 |
|                | 16-28                  | 38 m6 | 80    | 60    |       |       |       |       |       |       |       |       |     |
| 7              | 6.3-11.2               | 60 m6 | 135   | 105   | 210   | 240   | 272   | 305   | 210   | 70    | 255   | 210   | 200 |
|                | 12.5-22.4              | 50 m6 | 110   | 80    |       |       |       |       |       |       |       |       |     |
| 8              | 8-14                   | 60 m6 | 135   | 105   | 210   | 240   | 272   | 305   | 210   | 70    | 255   | 210   | 200 |
|                | 16-28                  | 50 m6 | 110   | 80    |       |       |       |       |       |       |       |       |     |

| Gear unit size | a   | b   | c  | $c_1$      | $D_5$ | E   | $e_2$ | g    | H   | $h^{1)}$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|-----|-----|----|------------|-------|-----|-------|------|-----|----------|-------|-------|-------|-------|-------|-------|-------|----|
| 4              | 565 | 215 | 28 | $30 \pm 1$ | 24H9  | 270 | 190   | 77.5 | 415 | 200      | 110   | 355   | 180   | 105   | 85    | 345   | 150   | 19 |
| 5              | 640 | 255 | 28 | $30 \pm 1$ | 24H9  | 315 | 205   | 97.5 | 482 | 230      | 150   | 430   | 220   | 105   | 100   | 405   | 180   | 19 |
| 6              | 720 | 255 | 28 | $30 \pm 1$ | 24H9  | 350 | 250   | 97.5 | 482 | 230      | 150   | 510   | 220   | 105   | 145   | 440   | 180   | 19 |
| 7              | 785 | 300 | 35 | $36 \pm 1$ | 28H9  | 385 | 250   | 114  | 572 | 280      | 190   | 545   | 260   | 120   | 130   | 500   | 215   | 24 |
| 8              | 890 | 300 | 35 | $36 \pm 1$ | 28H9  | 430 | 310   | 114  | 582 | 280      | 190   | 650   | 260   | 120   | 190   | 545   | 215   | 24 |

Shaft seals, see page 10/2 onwards.

1) Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

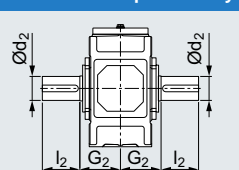
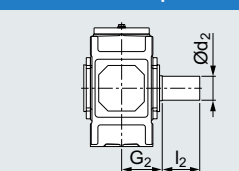
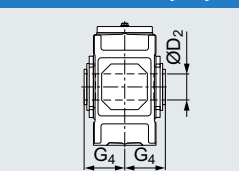
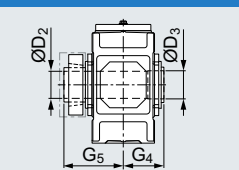
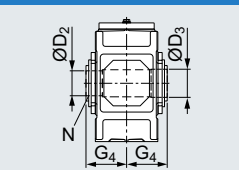
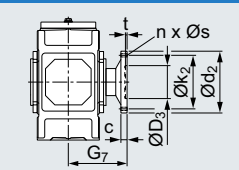
# Helical gear units horizontal mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 4 to 8

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                                                                                       |        |                 |                | Oil quantity <sup>1)</sup><br>H2.H<br>WDR | Oil quantity <sup>1)</sup><br>H2.H<br>Labyrinth | Weight <sup>1) 2)</sup><br>H2.H | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |                |
|---------------------------------------------------------------------------------------|--------|-----------------|----------------|-------------------------------------------|-------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------|
|                                                                                       |        | Article No.:    |                | 2LP302                                    |                                                 | - - - .40-....                  |                                                                                                                    |                |
| Type                                                                                  | Size   | d <sub>2</sub>  | l <sub>2</sub> | G <sub>2</sub>                            | l                                               | l                               | kg                                                                                                                 |                |
| <b>H2SH</b>                                                                           | 4      | 80 m6           | 170            | 140                                       | 10                                              | 7                               | 190                                                                                                                | 0 - 3 A        |
|                                                                                       | 5      | 100 m6          | 210            | 165                                       | 15                                              | 11                              | 300                                                                                                                | 0 - 4 A        |
|                                                                                       | 6      | 110 n6          | 210            | 165                                       | 16                                              | 12                              | 355                                                                                                                | 0 - 5 A        |
|                                                                                       | 7      | 120 n6          | 210            | 195                                       | 27                                              | 21                              | 505                                                                                                                | 0 - 6 A        |
| 8                                                                                     | 130 n6 | 250             | 195            | 30                                        | 23                                              | 590                             | 0 - 7 A                                                                                                            |                |
| <b>Solid shaft with parallel key<sup>3)</sup></b>                                     |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
|    |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
| Type                                                                                  | Size   | d <sub>2</sub>  | l <sub>2</sub> | G <sub>2</sub>                            | l                                               | l                               | kg                                                                                                                 |                |
| <b>H2CH</b>                                                                           | 4      | 95 h8           | 125            | 140                                       | 10                                              | 7                               | 190                                                                                                                | 0 - 3 F        |
|                                                                                       | 5      | 115 h8          | 125            | 165                                       | 15                                              | 11                              | 300                                                                                                                | 0 - 4 F        |
|                                                                                       | 6      | 115 h8          | 125            | 165                                       | 16                                              | 12                              | 355                                                                                                                | 0 - 5 F        |
|                                                                                       | 7      | 140 h8          | 155            | 195                                       | 27                                              | 21                              | 505                                                                                                                | 0 - 6 F        |
| 8                                                                                     | 140 h8 | 155             | 195            | 30                                        | 23                                              | 590                             | 0 - 7 F                                                                                                            |                |
| <b>Solid shaft without parallel key</b>                                               |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
|    |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
| Type                                                                                  | Size   | D <sub>2</sub>  | G <sub>4</sub> | l                                         | l                                               | kg                              |                                                                                                                    |                |
| <b>H2HH</b>                                                                           | 4      | 80 H7           | 140            | 10                                        | 7                                               | 190                             | 0 - 3 B                                                                                                            |                |
|                                                                                       | 5      | 95 H7           | 165            | 15                                        | 11                                              | 300                             | 0 - 4 B                                                                                                            |                |
|                                                                                       | 6      | 105 H7          | 165            | 16                                        | 12                                              | 355                             | 0 - 5 B                                                                                                            |                |
|                                                                                       | 7      | 115 H7          | 195            | 27                                        | 21                                              | 505                             | 0 - 6 B                                                                                                            |                |
| 8                                                                                     | 125 H7 | 195             | 30             | 23                                        | 590                                             | 0 - 7 B                         |                                                                                                                    |                |
| <b>Hollow shaft with keyway</b>                                                       |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
|   |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
| Type                                                                                  | Size   | D <sub>2</sub>  | D <sub>3</sub> | G <sub>4</sub>                            | G <sub>5</sub>                                  | l                               | l                                                                                                                  | kg             |
| <b>H2DH</b>                                                                           | 4      | 85 H7           | 85             | 140                                       | 205                                             | 10                              | 7                                                                                                                  | 190            |
|                                                                                       | 5      | 100 H7          | 100            | 165                                       | 240                                             | 15                              | 11                                                                                                                 | 300            |
|                                                                                       | 6      | 110 H7          | 110            | 165                                       | 240                                             | 16                              | 12                                                                                                                 | 355            |
|                                                                                       | 7      | 120 H7          | 120            | 195                                       | 280                                             | 27                              | 21                                                                                                                 | 505            |
| 8                                                                                     | 130 H7 | 130             | 195            | 285                                       | 30                                              | 23                              | 590                                                                                                                |                |
| <b>Hollow shaft for shrink disk</b>                                                   |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
|  |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
| Type                                                                                  | Size   | N/DIN 5480      | D <sub>2</sub> | D <sub>3</sub>                            | G <sub>4</sub>                                  | l                               | l                                                                                                                  | kg             |
| <b>H2KH</b>                                                                           | 5      | N95×3×30×30×9H  | 89 H11         | 100                                       | 165                                             | 15                              | 11                                                                                                                 | 300            |
|                                                                                       | 6      | N95×3×30×30×9H  | 89 H11         | 110                                       | 165                                             | 16                              | 12                                                                                                                 | 355            |
|                                                                                       | 7      | N120×3×30×38×9H | 114 H11        | 120                                       | 195                                             | 27                              | 21                                                                                                                 | 505            |
|                                                                                       | 8      | N120×3×30×38×9H | 114 H11        | 130                                       | 195                                             | 30                              | 23                                                                                                                 | 590            |
| <b>Hollow shaft with spline</b>                                                       |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
|  |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
| Type                                                                                  | Size   | c               | d <sub>2</sub> | D <sub>3</sub>                            | k <sub>2</sub>                                  | n x s                           | t                                                                                                                  | G <sub>7</sub> |
| <b>H2FH</b>                                                                           | 5      | 25              | 300            | 150 H6                                    | 260                                             | 16×22                           | 10                                                                                                                 | 255            |
|                                                                                       | 6      | 25              | 320            | 160 H6                                    | 280                                             | 18×22                           | 10                                                                                                                 | 255            |
|                                                                                       | 7      | 30              | 370            | 180 H6                                    | 320                                             | 16×26                           | 10                                                                                                                 | 300            |
|                                                                                       | 8      | 30              | 390            | 190 H6                                    | 340                                             | 18×26                           | 10                                                                                                                 | 300            |
| <b>Flanged shaft</b>                                                                  |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |
|  |        |                 |                |                                           |                                                 |                                 |                                                                                                                    |                |

Shaft seals, [see page 10/2 onwards](#).

For details on the shafts, [see Chapter 9](#).

Cooling options, [see page 10/11 onwards](#).

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, [see page 9/7](#).

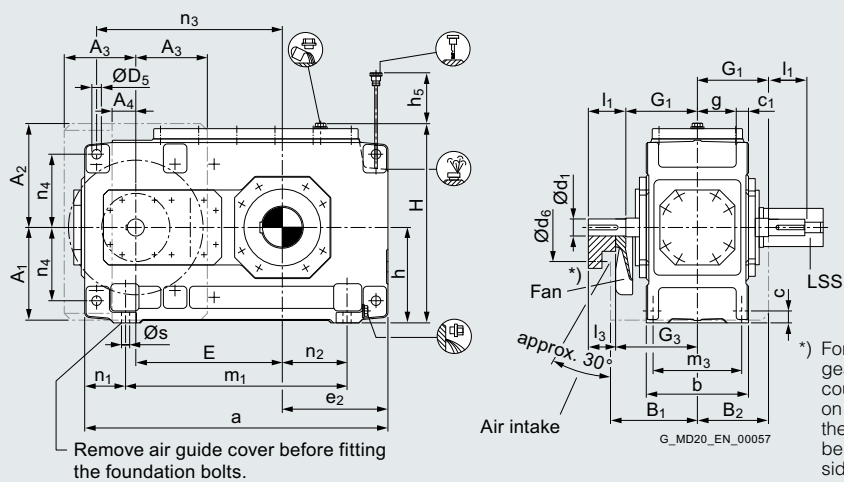
# Helical gear units horizontal mounting position

Type H2

## Gear unit dimensions, two-stage, gear unit sizes 9 to 12

### Selection and ordering data

**H2.H**  
2LP302-...40-...



\*) For combinations of type H2 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | Dimensions in mm       |       |       |       |       |       |       |       |       |       |       |       |     |
|----------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|
|                | High speed shaft (HSS) |       |       |       |       |       | Fan   |       |       |       |       |       |     |
| $i_N$          | $d_1$                  | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $A_3$ | $A_4$ | $B_1$ | $B_2$ | $d_6$ |     |
| <b>9</b>       | 6.3-11.2               | 75 m6 | 140   | 110   | 240   | 270   | 312   | 355   | 240   | 100   | 285   | 245   | 200 |
|                | 12.5-22.4              | 60 m6 | 140   | 110   |       |       |       |       |       |       |       |       |     |
| <b>10</b>      | 8-14                   | 75 m6 | 140   | 110   | 240   | 270   | 312   | 355   | 240   | 100   | 285   | 245   | 200 |
|                | 16-28                  | 60 m6 | 140   | 110   |       |       |       |       |       |       |       |       |     |
| <b>11</b>      | 6.3-11.2               | 90 m6 | 165   | 130   | 275   | 310   | 372   | 420   | 285   | 135   | 325   | 285   | 210 |
|                | 12.5-22.4              | 70 m6 | 140   | 105   |       |       |       |       |       |       |       |       |     |
| <b>12</b>      | 8-14                   | 90 m6 | 165   | 130   | 275   | 310   | 372   | 420   | 285   | 135   | 325   | 285   | 210 |
|                | 16-28                  | 70 m6 | 140   | 105   |       |       |       |       |       |       |       |       |     |

| Gear unit size | a    | b   | c  | $c_1$  | $D_5$ | E   | $e_2$ | g   | H   | $h^{1)}$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|------|-----|----|--------|-------|-----|-------|-----|-----|----------|-------|-------|-------|-------|-------|-------|-------|----|
| <b>9</b>       | 925  | 370 | 40 | 45±1.5 | 36H9  | 450 | 300   | 140 | 662 | 320      | 205   | 635   | 320   | 145   | 155   | 585   | 245   | 28 |
| <b>10</b>      | 1025 | 370 | 40 | 45±1.5 | 36H9  | 500 | 350   | 140 | 662 | 320      | 215   | 735   | 320   | 145   | 205   | 635   | 245   | 28 |
| <b>11</b>      | 1105 | 430 | 50 | 54±1.5 | 40H9  | 545 | 345   | 161 | 782 | 380      | 250   | 775   | 370   | 165   | 180   | 710   | 300   | 35 |
| <b>12</b>      | 1260 | 430 | 50 | 54±1.5 | 40H9  | 615 | 430   | 161 | 790 | 380      | 250   | 930   | 370   | 165   | 265   | 780   | 300   | 35 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.



# Helical gear units horizontal mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 9 to 12

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                                                   |           |                 |                | Oil quantity <sup>1)</sup><br>H2.H<br>WDR | Oil quantity <sup>1)</sup><br>H2.H<br>Labyrinth | Weight <sup>1)2)</sup><br>H2.H | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |                |         |    |      |         |
|---------------------------------------------------|-----------|-----------------|----------------|-------------------------------------------|-------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------|---------|----|------|---------|
|                                                   |           | Article No.:    |                | 2LP302                                    |                                                 | - - - .40-...                  |                                                                                                                    |                |         |    |      |         |
| Type                                              | Size      | d <sub>2</sub>  | l <sub>2</sub> | G <sub>2</sub>                            | l                                               | l                              | kg                                                                                                                 |                |         |    |      |         |
| <b>H2SH</b>                                       | <b>9</b>  | 140 n6          | 250            | 235                                       | 42                                              | 33                             | 830                                                                                                                | 0 - 8 A        |         |    |      |         |
|                                                   | <b>10</b> | 160 n6          | 300            | 235                                       | 45                                              | 34                             | 960                                                                                                                | 1 - 0 A        |         |    |      |         |
|                                                   | <b>11</b> | 170 n6          | 300            | 270                                       | 71                                              | 58                             | 1335                                                                                                               | 1 - 1 A        |         |    |      |         |
|                                                   | <b>12</b> | 180 n6          | 300            | 270                                       | 76                                              | 60                             | 1615                                                                                                               | 1 - 2 A        |         |    |      |         |
| <b>Solid shaft with parallel key<sup>3)</sup></b> |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
|                                                   |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
| <b>H2CH</b>                                       | <b>9</b>  | 140 h8          | 155            | 235                                       | 42                                              | 33                             | 830                                                                                                                | 0 - 8 F        |         |    |      |         |
|                                                   | <b>10</b> | 170 h8          | 155            | 235                                       | 45                                              | 34                             | 960                                                                                                                | 1 - 0 F        |         |    |      |         |
|                                                   | <b>11</b> | 170 h8          | 155            | 270                                       | 71                                              | 58                             | 1335                                                                                                               | 1 - 1 F        |         |    |      |         |
|                                                   | <b>12</b> | 210 h8          | 170            | 270                                       | 76                                              | 60                             | 1615                                                                                                               | 1 - 2 F        |         |    |      |         |
| <b>Solid shaft without parallel key</b>           |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
|                                                   |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
| <b>H2HH</b>                                       | <b>9</b>  | 135 H7          |                | 235                                       | 42                                              | 33                             | 830                                                                                                                | 0 - 8 B        |         |    |      |         |
|                                                   | <b>10</b> | 150 H7          |                | 235                                       | 45                                              | 34                             | 960                                                                                                                | 1 - 0 B        |         |    |      |         |
|                                                   | <b>11</b> | 165 H7          |                | 270                                       | 71                                              | 58                             | 1335                                                                                                               | 1 - 1 B        |         |    |      |         |
|                                                   | <b>12</b> | 180 H7          |                | 270                                       | 76                                              | 60                             | 1615                                                                                                               | 1 - 2 B        |         |    |      |         |
| <b>Hollow shaft with keyway</b>                   |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
|                                                   |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
| <b>H2DH</b>                                       | <b>9</b>  | 140 H7          | 145            | 235                                       | 330                                             | 42                             | 33                                                                                                                 | 830            | 0 - 8 C |    |      |         |
|                                                   | <b>10</b> | 150 H7          | 155            | 235                                       | 350                                             | 45                             | 34                                                                                                                 | 960            | 1 - 0 C |    |      |         |
|                                                   | <b>11</b> | 165 H7          | 170            | 270                                       | 400                                             | 71                             | 58                                                                                                                 | 1335           | 1 - 1 C |    |      |         |
|                                                   | <b>12</b> | 180 H7          | 185            | 270                                       | 405                                             | 76                             | 60                                                                                                                 | 1615           | 1 - 2 C |    |      |         |
| <b>Hollow shaft for shrink disk</b>               |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
|                                                   |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
| <b>H2KH</b>                                       | <b>9</b>  | N/DIN 5480      | D <sub>2</sub> | D <sub>3</sub>                            | G <sub>4</sub>                                  | l                              | l                                                                                                                  | kg             | 0 - 8 D |    |      |         |
|                                                   | <b>10</b> | N140x3x30x45x9H | 134 H11        | 145                                       | 235                                             | 42                             | 33                                                                                                                 | 830            | 1 - 0 D |    |      |         |
|                                                   | <b>11</b> | N140x3x30x45x9H | 134 H11        | 155                                       | 235                                             | 45                             | 34                                                                                                                 | 960            | 1 - 1 D |    |      |         |
|                                                   | <b>12</b> | N170x5x30x32x9H | 160 H11        | 170                                       | 270                                             | 71                             | 58                                                                                                                 | 1335           | 1 - 2 D |    |      |         |
| <b>Hollow shaft with spline</b>                   |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
|                                                   |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
| <b>H2FH</b>                                       | <b>9</b>  | c               | d <sub>2</sub> | D <sub>3</sub>                            | k <sub>2</sub>                                  | n x s                          | t                                                                                                                  | G <sub>7</sub> | l       | l  | kg   | 0 - 8 E |
|                                                   | <b>10</b> | 38              | 430            | 220 H6                                    | 380                                             | 20x26                          | 12                                                                                                                 | 350            | 42      | 33 | 915  | 1 - 0 E |
|                                                   | <b>11</b> | 38              | 470            | 240 H6                                    | 420                                             | 22x26                          | 12                                                                                                                 | 350            | 45      | 34 | 1050 | 1 - 1 E |
|                                                   | <b>12</b> | 42              | 510            | 260 H6                                    | 450                                             | 18x33                          | 12                                                                                                                 | 400            | 71      | 58 | 1465 | 1 - 2 E |
| <b>Flanged shaft</b>                              |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |
|                                                   |           |                 |                |                                           |                                                 |                                |                                                                                                                    |                |         |    |      |         |

Shaft seals, [see page 10/2 onwards](#).

For details on the shafts, [see Chapter 9](#).

Cooling options, [see page 10/11 onwards](#).

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, [see page 9/7](#).

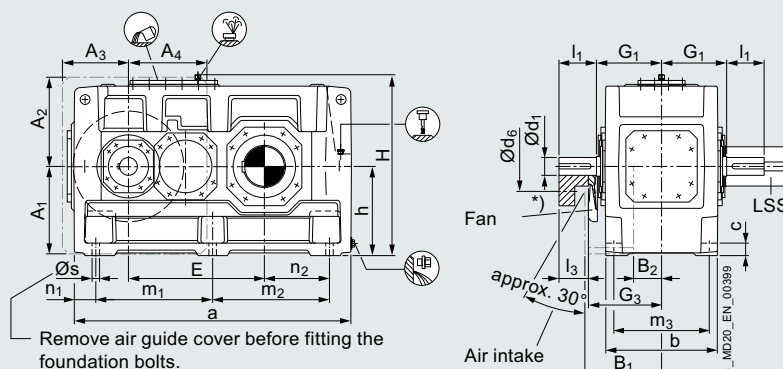
# Helical gear units horizontal mounting position

## Type H2

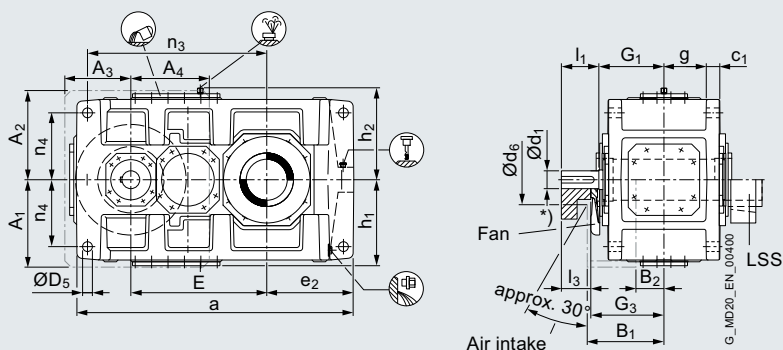
### Gear unit dimensions, two-stage, gear unit sizes 13 to 18

#### Selection and ordering data

**H2.H**  
2LP302-...40-....



**H2.M**  
2LP302-...41-....



\*) For combinations of type H2 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | Dimensions in mm       |        |       |       |       |       |       |       |       |       |       |       |       |
|----------------|------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | High speed shaft (HSS) |        |       |       |       |       | Fan   |       |       |       |       |       |       |
|                | $i_N$                  | $d_1$  | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $A_3$ | $A_4$ | $B_1$ | $B_2$ | $d_6$ |
| 13             | 6.3-11.2               | 100 m6 | 205   | 170   | 330   | 365   | 430   | 460   | 330   | 365   | 385   | 135   | 250   |
|                | 12.5-20                | 85 m6  | 170   | 135   |       |       |       |       |       |       |       |       |       |
| 14             | 8-14                   | 100 m6 | 205   | 170   | 330   | 365   | 430   | 460   | 330   | 365   | 385   | 135   | 250   |
|                | 16-25                  | 85 m6  | 170   | 135   |       |       |       |       |       |       |       |       |       |
| 15             | 6.3-11.2               | 120 n6 | 210   | 165   | 365   | 410   | 490   | 500   | 370   | 440   | 430   | 155   | 280   |
|                | 12.5-20                | 100 m6 | 210   | 165   |       |       |       |       |       |       |       |       |       |
| 16             | 7.1-12.5               | 120 n6 | 210   | 165   | 365   | 410   | 490   | 500   | 370   | 440   | 430   | 155   | 280   |
|                | 14-22.5                | 100 m6 | 210   | 165   |       |       |       |       |       |       |       |       |       |
| 17             | 6.3-11.2               | 125 n6 | 245   | 200   | 420   | 465   | 540   | 565   | 435   | 505   | 485   | 140   | 280   |
|                | 12.5-20                | 110 n6 | 210   | 165   |       |       |       |       |       |       |       |       |       |
| 18             | 7.1-12.5               | 125 n6 | 245   | 200   | 420   | 465   | 540   | 565   | 435   | 505   | 485   | 140   | 280   |
|                | 14-22.5                | 110 n6 | 210   | 165   |       |       |       |       |       |       |       |       |       |

| Gear unit size | Dimensions in mm |     |    |       |       |     |       |       |      |          |       |       |       |       |       |       |       |       |       |    |
|----------------|------------------|-----|----|-------|-------|-----|-------|-------|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
|                | a                | b   | c  | $c_1$ | $D_5$ | E   | $e_2$ | g     | H    | $h^{1)}$ | $h_1$ | $n_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
| 13             | 1290             | 550 | 60 | 61±2  | 48H9  | 635 | 405   | 211.5 | 900  | 440      | 450   | 460   | 545   | 545   | 475   | 100   | 305   | 835   | 340   | 35 |
| 14             | 1430             | 550 | 60 | 61±2  | 48H9  | 705 | 475   | 211.5 | 900  | 440      | 450   | 460   | 545   | 685   | 475   | 100   | 375   | 905   | 340   | 35 |
| 15             | 1550             | 625 | 70 | 72±2  | 55 H9 | 762 | 485   | 238   | 1000 | 500      | 490   | 500   | 655   | 655   | 535   | 120   | 365   | 1005  | 375   | 42 |
| 16             | 1640             | 625 | 70 | 72±2  | 55 H9 | 808 | 530   | 238   | 1000 | 500      | 490   | 500   | 655   | 745   | 535   | 120   | 410   | 1050  | 375   | 42 |
| 17             | 1740             | 690 | 80 | 81±2  | 55 H9 | 860 | 525   | 259   | 1110 | 550      | 555   | 560   | 735   | 735   | 600   | 135   | 390   | 1145  | 425   | 42 |
| 18             | 1860             | 690 | 80 | 81±2  | 55 H9 | 920 | 585   | 259   | 1110 | 550      | 555   | 560   | 735   | 855   | 600   | 135   | 450   | 1205  | 425   | 42 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Helical gear units horizontal mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 13 to 18

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                                                   |      | Oil quantity <sup>1)</sup><br>H2.H<br>WDR | Oil quantity <sup>1)</sup><br>H2.H<br>Labyrinth | Oil quantity <sup>1)</sup><br>H2.M | Weight <sup>1) 2)</sup><br>H2.H | Weight <sup>1) 2)</sup><br>H2.M | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |      |      |       |       |      |      |       |   |
|---------------------------------------------------|------|-------------------------------------------|-------------------------------------------------|------------------------------------|---------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------|------|------|-------|-------|------|------|-------|---|
|                                                   |      | Article No.:                              |                                                 |                                    | 2LP302                          |                                 | - - - .4.-....                                                                                                     |      |      |       |       |      |      |       |   |
| Type                                              | Size | d <sub>2</sub>                            | l <sub>2</sub>                                  | G <sub>2</sub>                     | l                               | l                               | l                                                                                                                  | kg   | kg   |       |       |      |      |       |   |
| <b>Solid shaft with parallel key<sup>3)</sup></b> |      |                                           |                                                 |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| H2SH                                              | 13   | 200 n6                                    | 350                                             | 335                                | 135                             | 120                             | -                                                                                                                  | 2000 | -    | 1 - 3 | A     |      |      |       |   |
|                                                   | 14   | 210 n6                                    | 350                                             | 335                                | 140                             | 130                             | -                                                                                                                  | 2570 | -    | 1 - 4 | A     |      |      |       |   |
|                                                   | 15   | 230 n6                                    | 410                                             | 380                                | 210                             | 190                             | -                                                                                                                  | 3430 | -    | 1 - 5 | A     |      |      |       |   |
|                                                   | 16   | 240 n6                                    | 410                                             | 380                                | 215                             | 200                             | -                                                                                                                  | 3655 | -    | 1 - 6 | A     |      |      |       |   |
|                                                   | 17   | 250 n6                                    | 410                                             | 415                                | 290                             | 260                             | -                                                                                                                  | 4650 | -    | 1 - 7 | A     |      |      |       |   |
|                                                   | 18   | 270 n6                                    | 470                                             | 415                                | 300                             | 270                             | -                                                                                                                  | 5125 | -    | 1 - 8 | A     |      |      |       |   |
| <b>Solid shaft without parallel key</b>           |      |                                           |                                                 |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| H2CH/<br>H2CM <sup>4)</sup>                       | 13   | 210 h8                                    | 170                                             | 335                                | 135                             | 120                             | 110                                                                                                                | 2000 | 1880 | 1 - 3 | F     |      |      |       |   |
|                                                   | 14   | 210 h8                                    | 170                                             | 335                                | 140                             | 130                             | 115                                                                                                                | 2570 | 2430 | 1 - 4 | F     |      |      |       |   |
|                                                   | 15   | 250 h8                                    | 190                                             | 380                                | 210                             | 190                             | 160                                                                                                                | 3430 | 3240 | 1 - 5 | F     |      |      |       |   |
|                                                   | 16   | 250 h8                                    | 190                                             | 380                                | 215                             | 200                             | 165                                                                                                                | 3655 | 3465 | 1 - 6 | F     |      |      |       |   |
| <b>Hollow shaft with keyway</b>                   |      |                                           |                                                 |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| H2HH/<br>H2HM <sup>4)5)</sup>                     | 13   | 190 H7                                    |                                                 | 335                                | 135                             | 120                             | 110                                                                                                                | 2000 | 1880 | 1 - 3 | B     |      |      |       |   |
|                                                   | 14   | 210 H7                                    |                                                 | 335                                | 140                             | 130                             | 115                                                                                                                | 2570 | 2430 | 1 - 4 | B     |      |      |       |   |
|                                                   | 15   | 230 H7                                    |                                                 | 380                                | 210                             | 190                             | 160                                                                                                                | 3430 | 3240 | 1 - 5 | B     |      |      |       |   |
|                                                   | 16   | 240 H7                                    |                                                 | 380                                | 215                             | 200                             | 165                                                                                                                | 3655 | 3465 | 1 - 6 | B     |      |      |       |   |
|                                                   | 17   | 250 H7                                    |                                                 | 415                                | 290                             | 260                             | 230                                                                                                                | 4650 | 4420 | 1 - 7 | B     |      |      |       |   |
|                                                   | 18   | 275 H7                                    |                                                 | 415                                | 300                             | 270                             | 240                                                                                                                | 5125 | 4870 | 1 - 8 | B     |      |      |       |   |
| <b>Hollow shaft for shrink disk</b>               |      |                                           |                                                 |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| H2DH/<br>H2DM <sup>4)5)</sup>                     | 13   | 190 H7                                    | 195                                             | 335                                | 480                             | 135                             | 120                                                                                                                | 110  | 2000 | 1880  | 1 - 3 | C    |      |       |   |
|                                                   | 14   | 210 H7                                    | 215                                             | 335                                | 480                             | 140                             | 130                                                                                                                | 115  | 2570 | 2430  | 1 - 4 | C    |      |       |   |
|                                                   | 15   | 230 H7                                    | 235                                             | 380                                | 550                             | 210                             | 190                                                                                                                | 160  | 3430 | 3240  | 1 - 5 | C    |      |       |   |
|                                                   | 16   | 240 H7                                    | 245                                             | 380                                | 550                             | 215                             | 200                                                                                                                | 165  | 3655 | 3465  | 1 - 6 | C    |      |       |   |
|                                                   | 17   | 250 H7                                    | 260                                             | 415                                | 600                             | 290                             | 260                                                                                                                | 230  | 4650 | 4420  | 1 - 7 | C    |      |       |   |
|                                                   | 18   | 280 H7                                    | 285                                             | 415                                | 600                             | 300                             | 270                                                                                                                | 240  | 5125 | 4870  | 1 - 8 | C    |      |       |   |
| <b>Hollow shaft with spline</b>                   |      |                                           |                                                 |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| H2KH/<br>H2KM <sup>4)5)</sup>                     | 13   | N190x5x30x36x9H                           | 180 H11                                         | 195                                | 335                             | 135                             | 120                                                                                                                | 110  | 2000 | 1880  | 1 - 3 | D    |      |       |   |
|                                                   | 14   | N190x5x30x36x9H                           | 180 H11                                         | 215                                | 335                             | 140                             | 130                                                                                                                | 115  | 2570 | 2430  | 1 - 4 | D    |      |       |   |
|                                                   | 15   | N220x5x30x42x9H                           | 210 H11                                         | 235                                | 380                             | 210                             | 190                                                                                                                | 160  | 3430 | 3240  | 1 - 5 | D    |      |       |   |
|                                                   | 16   | N220x5x30x42x9H                           | 210 H11                                         | 245                                | 380                             | 215                             | 200                                                                                                                | 165  | 3655 | 3465  | 1 - 6 | D    |      |       |   |
|                                                   | 17   | N250x5x30x48x9H                           | 240 H11                                         | 260                                | 415                             | 290                             | 260                                                                                                                | 230  | 4650 | 4420  | 1 - 7 | D    |      |       |   |
|                                                   | 18   | N250x5x30x48x9H                           | 240 H11                                         | 285                                | 415                             | 300                             | 270                                                                                                                | 240  | 5125 | 4870  | 1 - 8 | D    |      |       |   |
| <b>Flanged shaft</b>                              |      |                                           |                                                 |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| H2FH/<br>H2FM <sup>4)</sup>                       | 13   | 48                                        | 580                                             | 310 H6                             | 500                             | 20x33                           | 14                                                                                                                 | 480  | 135  | 120   | 110   | 2160 | 2040 | 1 - 3 | E |
|                                                   | 14   | 48                                        | 620                                             | 310 H6                             | 540                             | 24x33                           | 14                                                                                                                 | 480  | 140  | 130   | 115   | 2740 | 2600 | 1 - 4 | E |
|                                                   | 15   | 55                                        | 710                                             | 360 H6                             | 630                             | 28x33                           | 17                                                                                                                 | 550  | 210  | 190   | 160   | 3670 | 3480 | 1 - 5 | E |
|                                                   | 16   | 55                                        | 740                                             | 360 H6                             | 660                             | 30x33                           | 17                                                                                                                 | 550  | 215  | 200   | 165   | 3910 | 3720 | 1 - 6 | E |
|                                                   | 17   | 60                                        | 750                                             | 410 H6                             | 660                             | 24x39                           | 18                                                                                                                 | 600  | 290  | 260   | 230   | 4950 | 4720 | 1 - 7 | E |
|                                                   | 18   | 60                                        | 800                                             | 410 H6                             | 710                             | 26x39                           | 18                                                                                                                 | 600  | 300  | 270   | 240   | 5475 | 5220 | 1 - 8 | E |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, see page 9/7.

<sup>4)</sup> Slip-on gear units (H2.M) without labyrinth seal.

<sup>5)</sup> Sizes 13 and 15 only  $i_N = 6.3-18$ , sizes 17 and 19 only  $i_N = 6.3-18$ .

# Helical gear units horizontal mounting position

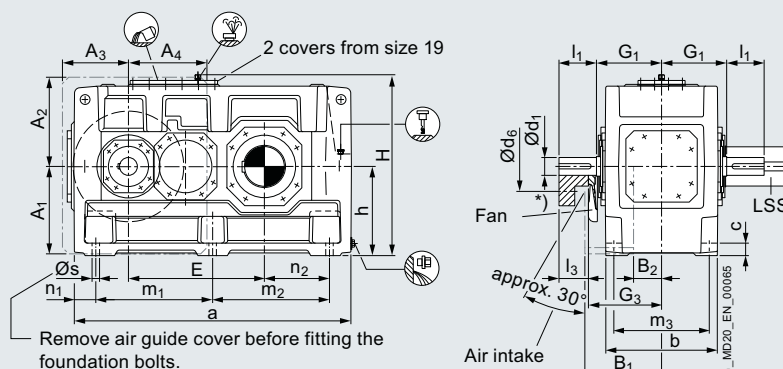
Type H2

## Gear unit dimensions, two-stage, gear unit sizes 19 to 24

### Selection and ordering data

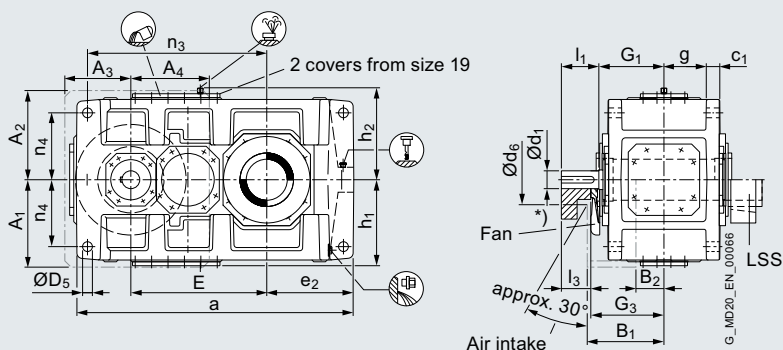
#### H2.H

2LP302-...40-....



#### H2.M

2LP302-...41-....



\*) For combinations of type H2 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | Dimensions in mm       |        |       |            |       |            |            |            |            |            |            |            |            |
|----------------|------------------------|--------|-------|------------|-------|------------|------------|------------|------------|------------|------------|------------|------------|
|                | High speed shaft (HSS) |        |       |            |       |            | Fan        |            |            |            |            |            |            |
|                | $l_N$                  | $d_1$  | $l_1$ | $l_3$      | $G_1$ | $G_3$      | $A_1$      | $A_2$      | $A_3$      | $A_4$      | $B_1$      | $B_2$      | $d_6$      |
| 19             | 6.3-11.2               | 150 n6 | 245   | 200        | 475   | 520        | 600        | 600        | 500        | 450        | 540        | 190        | 310        |
|                | 12.5-20                | 120 n6 | 210   | 165        |       |            |            |            |            |            |            |            |            |
| 20             | 7.1-12.5               | 150 n6 | 245   | 200        | 475   | 520        | 600        | 600        | 500        | 450        | 540        | 190        | 310        |
|                | 14-22.5                | 120 n6 | 210   | 165        |       |            |            |            |            |            |            |            |            |
| 21             | 6.3-11.2               | 170 n6 | 290   | 240        | 495   | 545        | 680        | 680        | 500        | 610        | 565        | 200        | 450        |
|                | 12.5-20                | 140 n6 | 250   | 200        |       |            |            |            |            |            |            |            |            |
| 22             | 7.1-12.5               | 170 n6 | 290   | 240        | 495   | 545        | 680        | 680        | 500        | 610        | 565        | 200        | 450        |
|                | 14-22.5                | 140 n6 | 250   | 200        |       |            |            |            |            |            |            |            |            |
| 23             | 6.3-10                 | 190 n6 | 330   | On request | 560   | On request | On request | On request | On request | On request | On request | On request | On request |
|                | 11.2-20                | 150 n6 | 250   |            |       |            |            |            |            |            |            |            |            |
| 24             | 7.1-11.2               | 190 n6 | 330   | On request | 560   | On request | On request | On request | On request | On request | On request | On request | On request |
|                | 12.5-22.4              | 150 n6 | 250   |            |       |            |            |            |            |            |            |            |            |

| Gear unit size | a    | b   | c   | $c_1$ | $D_5$ | E    | $e_2$ | g   | H    | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|------|-----|-----|-------|-------|------|-------|-----|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| 19             | 2010 | 790 | 90  | 91±2  | 65H9  | 997  | 590   | 299 | 1240 | 620      | 615   | 620   | 850   | 850   | 690   | 155   | 435   | 1345  | 475   | 48 |
| 20             | 2130 | 790 | 90  | 91±2  | 65H9  | 1057 | 650   | 299 | 1240 | 620      | 615   | 620   | 850   | 970   | 690   | 155   | 495   | 1405  | 475   | 48 |
| 21             | 2140 | 830 | 100 | 100±2 | 75H9  | 1067 | 655   | 310 | 1390 | 700      | 685   | 690   | 900   | 900   | 720   | 170   | 485   | 1400  | 520   | 56 |
| 22             | 2250 | 830 | 100 | 100±2 | 75H9  | 1122 | 710   | 310 | 1390 | 700      | 685   | 690   | 900   | 1010  | 720   | 170   | 540   | 1455  | 520   | 56 |
| 23             | 2380 | 930 | 115 | 120±2 | 80H9  | 1185 | 730   | 342 | 1565 | 780      | 765   | 785   | 1010  | 1010  | 810   | 180   | 550   | 1560  | 580   | 56 |
| 24             | 2510 | 930 | 115 | 120±2 | 80H9  | 1250 | 795   | 342 | 1565 | 780      | 765   | 785   | 1010  | 1140  | 810   | 180   | 615   | 1625  | 580   | 56 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

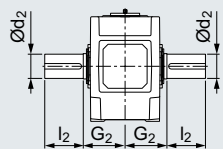
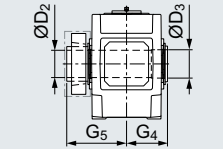
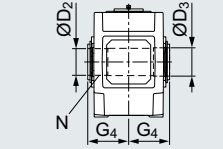
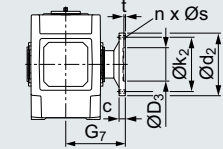
# Helical gear units horizontal mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 19 to 24

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                       |            | Oil quantity<br>1) | Oil quantity<br>1) | Weight<br>1) 2) | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |         |                                                                                     |         |                                                                                      |            |    |                                                                                       |         |
|-----------------------|------------|--------------------|--------------------|-----------------|-----------------|--------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------|---------|--------------------------------------------------------------------------------------|------------|----|---------------------------------------------------------------------------------------|---------|
|                       |            | H2.H<br>WDR        | H2.M               | H2.H            | H2.M            |                                                                                                                    |         |                                                                                     |         |                                                                                      |            |    |                                                                                       |         |
|                       |            | Article No.:       |                    | 2LP302          |                 | 4-....                                                                                                             |         |                                                                                     |         |                                                                                      |            |    |                                                                                       |         |
| Type                  | Size       | $d_2$              | $l_2$              | $G_2$           | $l$             | kg                                                                                                                 | kg      |  |         |                                                                                      |            |    |                                                                                       |         |
| H2SH                  | 19         | 290 n6             | 470                | 465             | 320             | –                                                                                                                  | 6600    |                                                                                     | 2 - 0 A |                                                                                      |            |    |                                                                                       |         |
|                       | 20         | 300 n6             | 500                | 465             | 340             | –                                                                                                                  | 7500    |                                                                                     | 2 - 1 A |                                                                                      |            |    |                                                                                       |         |
|                       | 21         | 320 n6             | 500                | 490             | 320             | –                                                                                                                  | 8900    |                                                                                     | 2 - 2 A |                                                                                      |            |    |                                                                                       |         |
|                       | 22         | 340 n6             | 550                | 490             | 340             | –                                                                                                                  | 9600    |                                                                                     | 2 - 3 A |                                                                                      |            |    |                                                                                       |         |
|                       | 23         | 360 n6             | 590                | 540             | 430             | –                                                                                                                  | 11600   |                                                                                     | 2 - 4 A |                                                                                      |            |    |                                                                                       |         |
| 24                    | 380 n6     | 590                | 540                | 450             | –               | 13000                                                                                                              | 2 - 5 A |                                                                                     |         |                                                                                      |            |    |                                                                                       |         |
| Type                  | Size       | $D_2$              | $D_3$              | $G_4$           | $G_5$           | $l$                                                                                                                | $l$     | kg                                                                                  | kg      |   |            |    |                                                                                       |         |
| H2DH/<br>H2DM<br>3)4) | 19         | 285 H7             | 295                | 465             | 670             | 320                                                                                                                | 300     | 6600                                                                                | 6300    |                                                                                      | 2 - 0 C    |    |                                                                                       |         |
|                       | 20         | 310 H7             | 315                | 465             | 670             | 340                                                                                                                | 320     | 7500                                                                                | 7200    |                                                                                      | 2 - 1 C    |    |                                                                                       |         |
|                       | 21         | 330 H7             | 335                | 490             | 715             | 320                                                                                                                | 350     | 8900                                                                                | 8400    |                                                                                      | 2 - 2 C    |    |                                                                                       |         |
|                       | 22         | 340 H7             | 345                | 490             | 725             | 340                                                                                                                | 370     | 9600                                                                                | 9200    |                                                                                      | 2 - 3 C    |    |                                                                                       |         |
|                       | 23         | 370 H7             | 375                | 540             | 800             | 430                                                                                                                | 470     | 11600                                                                               | 11000   |                                                                                      | 2 - 4 C    |    |                                                                                       |         |
| 24                    | 390 H7     | 395                | 540                | 825             | 450             | 500                                                                                                                | 13000   | 12300                                                                               | 2 - 5 C |                                                                                      |            |    |                                                                                       |         |
| Type                  | Size       | N/DIN 5480         | $D_2$              | $D_3$           | $G_4$           | $l$                                                                                                                | $l$     | kg                                                                                  | kg      |  |            |    |                                                                                       |         |
| H2KH/<br>H2KM<br>3)4) | 19         | On request         |                    |                 |                 |                                                                                                                    |         |                                                                                     |         |                                                                                      | 2 - 0 D    |    |                                                                                       |         |
|                       | 20         | On request         |                    |                 |                 |                                                                                                                    |         |                                                                                     |         |                                                                                      | 2 - 1 D    |    |                                                                                       |         |
|                       | 21         | On request         |                    |                 |                 |                                                                                                                    |         |                                                                                     |         |                                                                                      | 2 - 2 D    |    |                                                                                       |         |
|                       | 22         | On request         |                    |                 |                 |                                                                                                                    |         |                                                                                     |         |                                                                                      | 2 - 3 D    |    |                                                                                       |         |
|                       | 23         | On request         |                    |                 |                 |                                                                                                                    |         |                                                                                     |         |                                                                                      | 2 - 4 D    |    |                                                                                       |         |
| 24                    | On request |                    |                    |                 |                 |                                                                                                                    |         |                                                                                     |         | 2 - 5 D                                                                              |            |    |                                                                                       |         |
| Type                  | Size       | c                  | $d_2$              | $D_3$           | $k_2$           | $n \times s$                                                                                                       | t       | $G_7$                                                                               | $l$     | $l$                                                                                  | kg         | kg |  |         |
| H2FH/<br>H2FM<br>3)   | 19         | 65                 | 860                | 460 H6          | 770             | 30×39                                                                                                              | 18      | 670                                                                                 | 320     | 300                                                                                  | On request |    |                                                                                       | 2 - 0 E |
|                       | 20         | 65                 | 930                | 460 H6          | 830             | 32×39                                                                                                              | 18      | 670                                                                                 | 340     | 320                                                                                  | On request |    |                                                                                       | 2 - 1 E |
|                       | 21         | 75                 | 950                | 520 H6          | 850             | 28×45                                                                                                              | 20      | 710                                                                                 | 320     | 350                                                                                  | On request |    |                                                                                       | 2 - 2 E |
|                       | 22         | 75                 | 1040               | 520 H6          | 940             | 28×45                                                                                                              | 20      | 710                                                                                 | 340     | 370                                                                                  | On request |    |                                                                                       | 2 - 3 E |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Slip-on gear units (H2.M) without labyrinth seal.

4) Sizes 13 and 15 only  $i_N = 6.3-18$ , sizes 17 and 19 only  $i_N = 6.3-16$ .

# Helical gear units horizontal mounting position

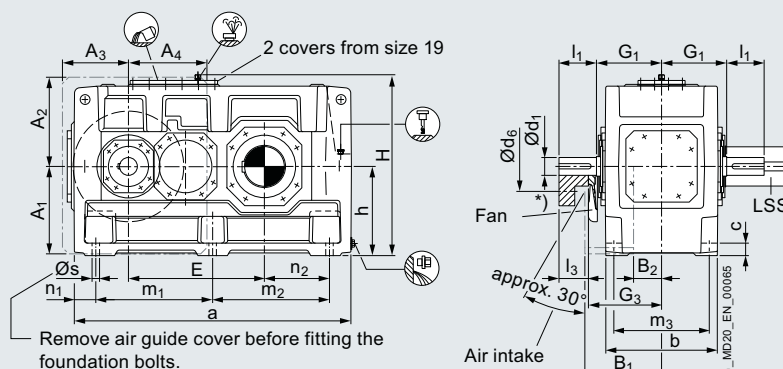
## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 25 to 28

#### Selection and ordering data

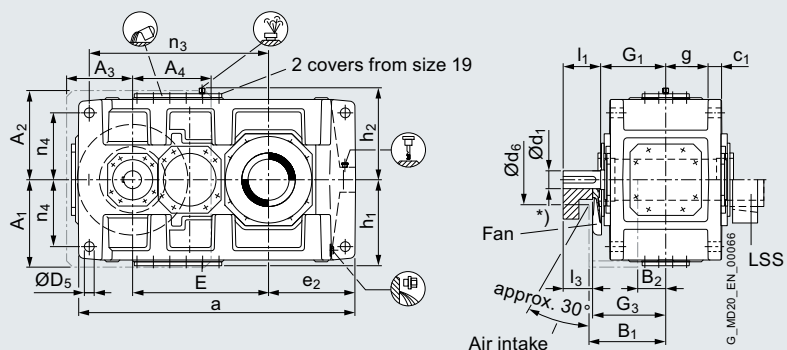
##### H2.H

2LP302-...40-....



##### H2.M

2LP302-...41-....



\*) For combinations of type H2 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | $i_N$     | Dimensions in mm<br>High speed shaft (HSS) |       |            |       |            | Fan        |            |            |            |            |            |            |            |            |
|----------------|-----------|--------------------------------------------|-------|------------|-------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|                |           | $d_1$                                      | $l_1$ | $l_3$      | $G_1$ | $G_3$      | $A_1$      | $A_2$      | $A_3$      | $A_4$      | $B_1$      | $B_2$      | $B_3$      | $d_6$      |            |
| 25             | 6.3-10    | 200 n6                                     | 340   | On request | 600   | On request | On request | On request | On request | On request | On request | On request | On request | On request | On request |
|                | 11.2-20   | 170 n6                                     | 300   |            |       |            |            |            |            |            |            |            |            |            |            |
| 26             | 7.1-11.2  | 200 n6                                     | 340   | On request | 600   | On request | On request | On request | On request | On request | On request | On request | On request | On request | On request |
|                | 12.5-22.4 | 170 n6                                     | 300   |            |       |            |            |            |            |            |            |            |            |            |            |
| 27             | 8.0-10    | 240 n6                                     | 380   | On request | 670   | On request | On request | On request | On request | On request | On request | On request | On request | On request | On request |
|                | 11.2-20   | 200 n6                                     | 340   |            |       |            |            |            |            |            |            |            |            |            |            |
| 28             | 9.0-11.2  | 240 n6                                     | 380   | On request | 670   | On request | On request | On request | On request | On request | On request | On request | On request | On request | On request |
|                | 12.5-22.4 | 200 n6                                     | 340   |            |       |            |            |            |            |            |            |            |            |            |            |

| Gear unit size | a    | b    | c   | $c_1$ | $D_5$ | E    | $e_2$ | g   | H    | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|------|------|-----|-------|-------|------|-------|-----|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| 25             | 2645 | 1045 | 130 | 120±2 | 90H9  | 1325 | 790   | 400 | 1740 | 860      | 860   | 880   | 1155  | 1090  | 910   | 200   | 590   | 1750  | 660   | 66 |
| 26             | 2825 | 1045 | 130 | 120±2 | 90H9  | 1415 | 880   | 400 | 1740 | 860      | 860   | 880   | 1155  | 1270  | 910   | 200   | 680   | 1840  | 660   | 66 |
| 27             | 2960 | 1170 | 150 | 145±2 | 100H9 | 1485 | 880   | 440 | 1900 | 950      | 930   | 950   | 1130  | 1390  | 1030  | 220   | 660   | 2000  | 720   | 74 |
| 28             | 3150 | 1170 | 150 | 145±2 | 100H9 | 1580 | 975   | 440 | 1900 | 950      | 930   | 950   | 1130  | 1580  | 1030  | 220   | 755   | 2095  | 720   | 74 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Helical gear units horizontal mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 25 to 28

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                                    |           | Oil quantity <sup>1)</sup> | Oil quantity <sup>1)</sup> | Weight <sup>1) 2)</sup> | Weight <sup>1) 2)</sup> |                                                                                                                    |       |       |       |   |   |   |   |  |  |  |  |  |  |
|------------------------------------|-----------|----------------------------|----------------------------|-------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------|-------|-------|-------|---|---|---|---|--|--|--|--|--|--|
|                                    |           | H2.H<br>WDR                | H2.M                       | H2.H                    | H2.M                    | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |       |       |       |   |   |   |   |  |  |  |  |  |  |
|                                    |           | Article No.:               |                            | 2LP302                  |                         | - - .4.-...                                                                                                        |       |       |       |   |   |   |   |  |  |  |  |  |  |
| Type                               | Size      | d <sub>2</sub>             | l <sub>2</sub>             | G <sub>2</sub>          | l                       | l                                                                                                                  | kg    | kg    |       |   |   |   |   |  |  |  |  |  |  |
| <b>H2SH</b>                        | <b>25</b> | 400 n6                     | 650                        | 605                     | 640                     | -                                                                                                                  | 15600 | -     | 2     | - | 6 | A |   |  |  |  |  |  |  |
|                                    | <b>26</b> | 420 n6                     | 650                        | 605                     | 680                     | -                                                                                                                  | 17500 | -     | 2     | - | 7 | A |   |  |  |  |  |  |  |
|                                    | <b>27</b> | 440 n6                     | 690                        | 680                     | 880                     | -                                                                                                                  | 22000 | -     | 2     | - | 8 | A |   |  |  |  |  |  |  |
|                                    | <b>28</b> | 460 n6                     | 750                        | 680                     | 940                     | -                                                                                                                  | 25000 | -     | 3     | - | 0 | A |   |  |  |  |  |  |  |
| Type                               | Size      | D <sub>2</sub>             | D <sub>3</sub>             | G <sub>4</sub>          | G <sub>5</sub>          | l                                                                                                                  | l     | kg    | kg    |   |   |   |   |  |  |  |  |  |  |
| <b>H2DH/<br/>H2DM<sup>3)</sup></b> | <b>25</b> | 410 H7                     | 415                        | 610                     | 895                     | 640                                                                                                                | 700   | 15600 | 14800 | 2 | - | 6 | C |  |  |  |  |  |  |
|                                    | <b>26</b> | 430 H7                     | 435                        | 610                     | 925                     | 680                                                                                                                | 740   | 17500 | 16500 | 2 | - | 7 | C |  |  |  |  |  |  |
|                                    | <b>27</b> | 460 H7                     | 465                        | 680                     | 1000                    | 880                                                                                                                | 970   | 22000 | 21000 | 2 | - | 8 | C |  |  |  |  |  |  |
|                                    | <b>28</b> | 470 H7                     | 475                        | 680                     | 1020                    | 940                                                                                                                | 1030  | 25000 | 23800 | 3 | - | 0 | C |  |  |  |  |  |  |
| Type                               | Size      | N/DIN 5480                 | D <sub>2</sub>             | D <sub>3</sub>          | G <sub>4</sub>          | l                                                                                                                  | l     | kg    | kg    |   |   |   |   |  |  |  |  |  |  |
| <b>H2KH/<br/>H2KM<sup>3)</sup></b> | <b>25</b> | On request                 |                            |                         |                         |                                                                                                                    |       |       |       | 2 | - | 6 | D |  |  |  |  |  |  |
|                                    | <b>26</b> | On request                 |                            |                         |                         |                                                                                                                    |       |       |       | 2 | - | 7 | D |  |  |  |  |  |  |
|                                    | <b>27</b> | On request                 |                            |                         |                         |                                                                                                                    |       |       |       | 2 | - | 8 | D |  |  |  |  |  |  |
|                                    | <b>28</b> | On request                 |                            |                         |                         |                                                                                                                    |       |       |       | 3 | - | 0 | D |  |  |  |  |  |  |

Shaft seals, [see page 10/2 onwards](#).

For details on the shafts, [see Chapter 9](#).

Cooling options, [see page 10/11 onwards](#).

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Slip-on gear units (H2.M) without labyrinth seal.

# Helical gear units horizontal mounting position

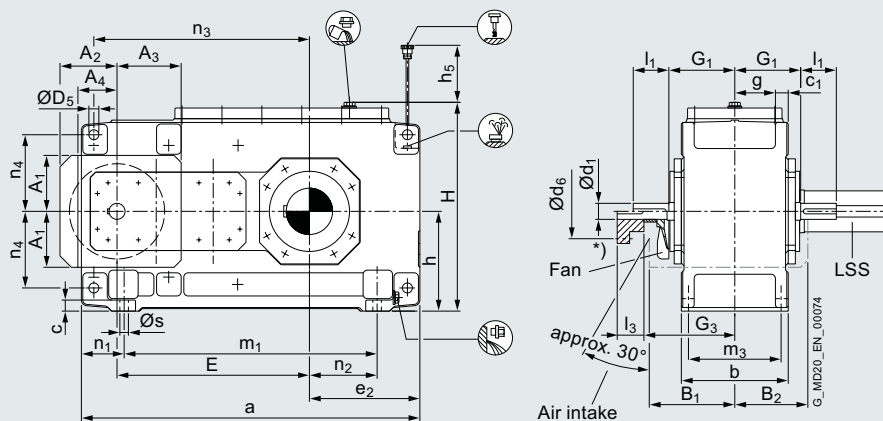
Type H3

Gear unit dimensions, three-stage, gear unit sizes 5 to 8

## Selection and ordering data

**H3.H**

2LP302-...50-...



\*) For combinations of type H3 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | Dimensions in mm       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | High speed shaft (HSS) |       |       |       |       | Fan   |       |       |       |       |       |       |       |
|                | $i_N$                  | $d_1$ | $l_1$ | $G_1$ | $l_3$ | $G_3$ | $A_1$ | $A_2$ | $A_3$ | $A_4$ | $B_1$ | $B_2$ | $d_6$ |
| <b>5</b>       | 25-45                  | 40 m6 | 70    | 160   | 70    | 220   | 137   | 135   | 140   | 80    | 215   | 175   | 60    |
|                | 50-63                  | 30 m6 | 50    |       | 50    |       |       |       |       |       |       |       |       |
|                | 71-90                  | 24 k6 | 40    |       | 40    |       |       |       |       |       |       |       |       |
| <b>6</b>       | 31.5-56                | 40 m6 | 70    | 160   | 70    | 220   | 137   | 135   | 140   | 80    | 215   | 175   | 60    |
|                | 63-80                  | 30 m6 | 50    |       | 50    |       |       |       |       |       |       |       |       |
|                | 90-112                 | 24 k6 | 40    |       | 40    |       |       |       |       |       |       |       |       |
| <b>7</b>       | 25-45                  | 45 m6 | 80    | 185   | 80    | 250   | 157   | 160   | 180   | 100   | 245   | 205   | 75    |
|                | 50-63                  | 35 m6 | 60    |       | 60    |       |       |       |       |       |       |       |       |
|                | 71-90                  | 28 m6 | 50    |       | 50    |       |       |       |       |       |       |       |       |
| <b>8</b>       | 31.5-56                | 45 m6 | 80    | 185   | 80    | 250   | 157   | 160   | 180   | 100   | 245   | 205   | 75    |
|                | 63-80                  | 35 m6 | 60    |       | 60    |       |       |       |       |       |       |       |       |
|                | 90-112                 | 28 m6 | 50    |       | 50    |       |       |       |       |       |       |       |       |

| Gear unit size | a   | b   | c  | $c_1$      | $D_5$ | E   | $e_2$ | g    | H   | $h^{1)}$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|-----|-----|----|------------|-------|-----|-------|------|-----|----------|-------|-------|-------|-------|-------|-------|-------|----|
| <b>5</b>       | 690 | 255 | 28 | $30 \pm 1$ | 24 H9 | 405 | 205   | 97.5 | 482 | 230      | 130   | 480   | 220   | 105   | 100   | 455   | 180   | 19 |
| <b>6</b>       | 770 | 255 | 28 | $30 \pm 1$ | 24 H9 | 440 | 250   | 97.5 | 482 | 230      | 130   | 560   | 220   | 105   | 145   | 490   | 180   | 19 |
| <b>7</b>       | 845 | 300 | 35 | $36 \pm 1$ | 28 H9 | 495 | 250   | 114  | 572 | 280      | 170   | 605   | 260   | 120   | 130   | 560   | 215   | 24 |
| <b>8</b>       | 950 | 300 | 35 | $36 \pm 1$ | 28 H9 | 540 | 310   | 114  | 582 | 280      | 160   | 710   | 260   | 120   | 190   | 605   | 215   | 24 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.



# Helical gear units horizontal mounting position

## Type H3

### Gear unit dimensions, three-stage, gear unit sizes 5 to 8

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|             |          |                 |                |                |                |         |     |                |    | Oil quantity <sup>1)</sup><br>H3.H          | Weight <sup>1)2)</sup><br>H3.H | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |  |  |
|-------------|----------|-----------------|----------------|----------------|----------------|---------|-----|----------------|----|---------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|--|--|
|             |          |                 |                |                |                |         |     |                |    | Article No.: <b>2LP302</b>                  | ■ - ■ ■ .50-....               |                                                                                                                    |  |  |
| Type        | Size     | d <sub>2</sub>  | l <sub>2</sub> | G <sub>2</sub> |                | l       | kg  |                |    | Solid shaft with parallel key <sup>3)</sup> |                                |                                                                                                                    |  |  |
| <b>H3SH</b> | <b>5</b> | 100 m6          | 210            | 165            |                | 16      | 320 | 0 - 4 A        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>6</b> | 110 n6          | 210            | 165            |                | 18      | 365 | 0 - 5 A        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>7</b> | 120 n6          | 210            | 195            |                | 29      | 540 | 0 - 6 A        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>8</b> | 130 n6          | 250            | 195            |                | 32      | 625 | 0 - 7 A        |    |                                             |                                |                                                                                                                    |  |  |
| Type        | Size     | d <sub>2</sub>  | l <sub>2</sub> | G <sub>2</sub> |                | l       | kg  |                |    | Solid shaft without parallel key            |                                |                                                                                                                    |  |  |
| <b>H3CH</b> | <b>5</b> | 115 h8          | 125            | 165            |                | 16      | 320 | 0 - 4 F        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>6</b> | 115 h8          | 125            | 165            |                | 18      | 365 | 0 - 5 F        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>7</b> | 140 h8          | 155            | 195            |                | 29      | 540 | 0 - 6 F        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>8</b> | 140 h8          | 155            | 195            |                | 32      | 625 | 0 - 7 F        |    |                                             |                                |                                                                                                                    |  |  |
| Type        | Size     | D <sub>2</sub>  |                | G <sub>4</sub> |                | l       | kg  |                |    | Hollow shaft with keyway                    |                                |                                                                                                                    |  |  |
| <b>H3HH</b> | <b>5</b> | 95 H7           |                | 165            |                | 16      | 320 | 0 - 4 B        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>6</b> | 105 H7          |                | 165            |                | 18      | 365 | 0 - 5 B        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>7</b> | 115 H7          |                | 195            |                | 29      | 540 | 0 - 6 B        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>8</b> | 125 H7          |                | 195            |                | 32      | 625 | 0 - 7 B        |    |                                             |                                |                                                                                                                    |  |  |
| Type        | Size     | D <sub>2</sub>  | D <sub>3</sub> | G <sub>4</sub> | G <sub>5</sub> | l       | kg  |                |    | Hollow shaft for shrink disk                |                                |                                                                                                                    |  |  |
| <b>H3DH</b> | <b>5</b> | 100 H7          | 100            | 165            | 240            | 16      | 320 | 0 - 4 C        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>6</b> | 110 H7          | 110            | 165            | 240            | 18      | 365 | 0 - 5 C        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>7</b> | 120 H7          | 120            | 195            | 280            | 29      | 540 | 0 - 6 C        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>8</b> | 130 H7          | 130            | 195            | 285            | 32      | 625 | 0 - 7 C        |    |                                             |                                |                                                                                                                    |  |  |
| Type        | Size     | N/DIN 5480      | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub> | l       | kg  |                |    | Hollow shaft with spline                    |                                |                                                                                                                    |  |  |
| <b>H3KH</b> | <b>5</b> | N95×3×30×30×9H  | 89 H11         | 100            | 165            | 16      | 320 | 0 - 4 D        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>6</b> | N95×3×30×30×9H  | 89 H11         | 110            | 165            | 18      | 365 | 0 - 5 D        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>7</b> | N120×3×30×38×9H | 114 H11        | 120            | 195            | 29      | 540 | 0 - 6 D        |    |                                             |                                |                                                                                                                    |  |  |
|             | <b>8</b> | N120×3×30×38×9H | 114 H11        | 130            | 195            | 32      | 625 | 0 - 7 D        |    |                                             |                                |                                                                                                                    |  |  |
| Type        | Size     | c               | d <sub>2</sub> | D <sub>3</sub> | k <sub>2</sub> | n x s   | t   | G <sub>7</sub> | l  | kg                                          | Flanged shaft                  |                                                                                                                    |  |  |
| <b>H3FH</b> | <b>5</b> | 25              | 300            | 150 H6         | 260            | 16 x 22 | 10  | 255            | 16 | 355                                         | 0 - 4 E                        |                                                                                                                    |  |  |
|             | <b>6</b> | 25              | 320            | 160 H6         | 280            | 18 x 22 | 10  | 255            | 18 | 405                                         | 0 - 5 E                        |                                                                                                                    |  |  |
|             | <b>7</b> | 30              | 370            | 180 H6         | 320            | 16 x 26 | 10  | 300            | 29 | 590                                         | 0 - 6 E                        |                                                                                                                    |  |  |
|             | <b>8</b> | 30              | 390            | 190 H6         | 340            | 18 x 26 | 10  | 300            | 32 | 675                                         | 0 - 7 E                        |                                                                                                                    |  |  |
|             |          |                 |                |                |                |         |     |                |    |                                             |                                |                                                                                                                    |  |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, see page 9/7.

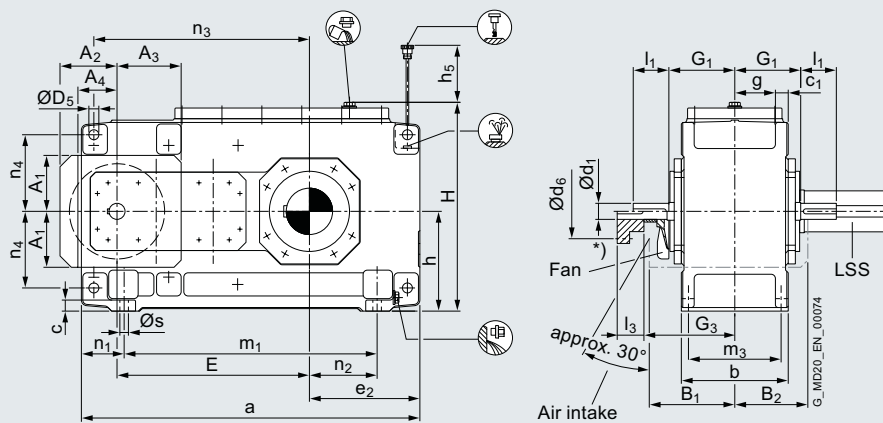
# Helical gear units horizontal mounting position

Type H3

Gear unit dimensions, three-stage, gear unit sizes 9 to 12

## Selection and ordering data

**H3.H**  
2LP302-...50-....



\*) For combinations of type H3 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | Dimensions in mm |                                             |       |       |       |               |       |       |       |                                                                           |       |       |       |       |       |     |
|----------------|------------------|---------------------------------------------|-------|-------|-------|---------------|-------|-------|-------|---------------------------------------------------------------------------|-------|-------|-------|-------|-------|-----|
|                | $i_N$            | High speed shaft (HSS)<br>Radial shaft seal |       |       |       | Taconite seal |       |       |       | Fan with radial shaft seal<br>(Dimensions with Taconite seal on request!) |       |       |       |       |       |     |
|                | $d_1$            | $l_1$                                       | $G_1$ | $l_3$ | $d_1$ | $l_1$         | $G_1$ | $G_3$ | $A_1$ | $A_2$                                                                     | $A_3$ | $A_4$ | $B_1$ | $B_2$ | $d_6$ |     |
| <b>9</b>       | 25-45            | 60 m6                                       | 125   | 230   | 105   | 60 m6         | 105   | 250   | 300   | 182                                                                       | 190   | 205   | 120   | 295   | 240   | 90  |
|                | 50-63            | 45 m6                                       | 100   |       | 80    | 45 m6         | 80    |       |       |                                                                           |       |       |       |       |       |     |
|                | 71-90            | 32 m6                                       | 80    |       | 60    | 32 m6         | 60    |       |       |                                                                           |       |       |       |       |       |     |
| <b>10</b>      | 31.5-56          | 60 m6                                       | 125   | 230   | 105   | 60 m6         | 105   | 250   | 300   | 182                                                                       | 190   | 205   | 120   | 295   | 240   | 90  |
|                | 63-80            | 45 m6                                       | 100   |       | 80    | 45 m6         | 80    |       |       |                                                                           |       |       |       |       |       |     |
|                | 90-112           | 32 m6                                       | 80    |       | 60    | 32 m6         | 60    |       |       |                                                                           |       |       |       |       |       |     |
| <b>11</b>      | 25-45            | 70 m6                                       | 120   | 255   | 120   | 70 m6         | 100   | 275   | 330   | 218                                                                       | 220   | 255   | 150   | 325   | 280   | 100 |
|                | 50-63            | 50 m6                                       | 80    |       | 80    | 50 m6         | 80    | 255   |       |                                                                           |       |       |       |       |       |     |
|                | 71-90            | 42 m6                                       | 70    |       | 70    | 42 m6         | 70    |       |       |                                                                           |       |       |       |       |       |     |
| <b>12</b>      | 31.5-56          | 70 m6                                       | 120   | 255   | 120   | 70 m6         | 100   | 275   | 330   | 218                                                                       | 220   | 255   | 150   | 325   | 280   | 100 |
|                | 63-80            | 50 m6                                       | 80    |       | 80    | 50 m6         | 80    | 255   |       |                                                                           |       |       |       |       |       |     |
|                | 90-112           | 42 m6                                       | 70    |       | 70    | 42 m6         | 70    |       |       |                                                                           |       |       |       |       |       |     |

| Gear unit size | a    | b   | c  | $c_1$    | $D_5$ | E   | $e_2$ | g   | H   | $h^{1)}$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|------|-----|----|----------|-------|-----|-------|-----|-----|----------|-------|-------|-------|-------|-------|-------|-------|----|
| <b>9</b>       | 1000 | 370 | 40 | 45 ± 1.5 | 36 H9 | 580 | 300   | 140 | 662 | 320      | 185   | 710   | 320   | 145   | 155   | 660   | 245   | 28 |
| <b>10</b>      | 1100 | 370 | 40 | 45 ± 1.5 | 36 H9 | 630 | 350   | 140 | 662 | 320      | 185   | 810   | 320   | 145   | 205   | 710   | 245   | 28 |
| <b>11</b>      | 1200 | 430 | 50 | 54 ± 1.5 | 40 H9 | 705 | 345   | 161 | 782 | 380      | 180   | 870   | 370   | 165   | 180   | 805   | 300   | 35 |
| <b>12</b>      | 1355 | 430 | 50 | 54 ± 1.5 | 40 H9 | 775 | 430   | 161 | 790 | 380      | 170   | 1025  | 370   | 165   | 265   | 875   | 300   | 35 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

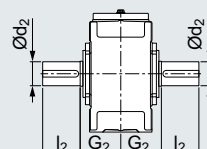
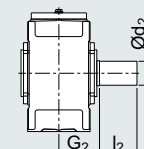
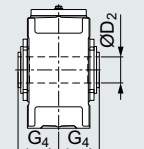
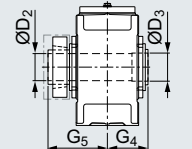
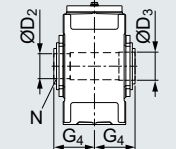
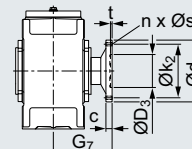
For details on the shafts, see Chapter 9.

# Helical gear units horizontal mounting position Type H3

## Gear unit dimensions, three-stage, gear unit sizes 9 to 12

### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                                                                                       |           |                  |                | Oil quantity <sup>1)</sup><br>H3.H | Weight <sup>1) 2)</sup><br>H3.H | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |         |                |    |      |         |
|---------------------------------------------------------------------------------------|-----------|------------------|----------------|------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------|---------|----------------|----|------|---------|
|                                                                                       |           |                  |                | Article No.: <b>2LP302</b>         |                                 | ■ - ■ ■ .50-....                                                                                                   |         |                |    |      |         |
| Type                                                                                  | Size      | d <sub>2</sub>   | l <sub>2</sub> | G <sub>2</sub>                     | l                               | kg                                                                                                                 |         |                |    |      |         |
| <b>H3SH</b>                                                                           | <b>9</b>  | 140 n6           | 250            | 235                                | 48                              | 875                                                                                                                | 0 - 8 A |                |    |      |         |
|                                                                                       | <b>10</b> | 160 n6           | 300            | 235                                | 49                              | 1020                                                                                                               | 1 - 0 A |                |    |      |         |
|                                                                                       | <b>11</b> | 170 n6           | 300            | 270                                | 85                              | 1400                                                                                                               | 1 - 1 A |                |    |      |         |
|                                                                                       | <b>12</b> | 180 n6           | 300            | 270                                | 90                              | 1675                                                                                                               | 1 - 2 A |                |    |      |         |
| <b>Solid shaft with parallel key <sup>3)</sup></b>                                    |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
|    |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
| Type                                                                                  | Size      | d <sub>2</sub>   | l <sub>2</sub> | G <sub>2</sub>                     | l                               | kg                                                                                                                 |         |                |    |      |         |
| <b>H3CH</b>                                                                           | <b>9</b>  | 140 h8           | 155            | 235                                | 48                              | 875                                                                                                                | 0 - 8 F |                |    |      |         |
|                                                                                       | <b>10</b> | 170 h8           | 155            | 235                                | 49                              | 1020                                                                                                               | 1 - 0 F |                |    |      |         |
|                                                                                       | <b>11</b> | 170 h8           | 155            | 270                                | 85                              | 1400                                                                                                               | 1 - 1 F |                |    |      |         |
|                                                                                       | <b>12</b> | 210 h8           | 170            | 270                                | 90                              | 1675                                                                                                               | 1 - 2 F |                |    |      |         |
| <b>Solid shaft without parallel key</b>                                               |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
|    |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
| Type                                                                                  | Size      | D <sub>2</sub>   | G <sub>4</sub> |                                    | l                               | kg                                                                                                                 |         |                |    |      |         |
| <b>H3HH</b>                                                                           | <b>9</b>  | 135 H7           | 235            |                                    | 48                              | 875                                                                                                                | 0 - 8 B |                |    |      |         |
|                                                                                       | <b>10</b> | 150 H7           | 235            |                                    | 49                              | 1020                                                                                                               | 1 - 0 B |                |    |      |         |
|                                                                                       | <b>11</b> | 165 H7           | 270            |                                    | 85                              | 1400                                                                                                               | 1 - 1 B |                |    |      |         |
|                                                                                       | <b>12</b> | 180 H7           | 270            |                                    | 90                              | 1675                                                                                                               | 1 - 2 B |                |    |      |         |
| <b>Hollow shaft with keyway</b>                                                       |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
|   |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
| Type                                                                                  | Size      | D <sub>2</sub>   | D <sub>3</sub> | G <sub>4</sub>                     | G <sub>5</sub>                  | l                                                                                                                  | kg      |                |    |      |         |
| <b>H3DH</b>                                                                           | <b>9</b>  | 140 H7           | 145            | 235                                | 330                             | 48                                                                                                                 | 875     |                |    |      |         |
|                                                                                       | <b>10</b> | 150 H7           | 155            | 235                                | 350                             | 49                                                                                                                 | 1020    |                |    |      |         |
|                                                                                       | <b>11</b> | 165 H7           | 170            | 270                                | 400                             | 85                                                                                                                 | 1400    |                |    |      |         |
|                                                                                       | <b>12</b> | 180 H7           | 185            | 270                                | 405                             | 90                                                                                                                 | 1675    |                |    |      |         |
| <b>Hollow shaft for shrink disk</b>                                                   |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
|  |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
| Type                                                                                  | Size      | N/DIN 5480       | D <sub>2</sub> | D <sub>3</sub>                     | G <sub>4</sub>                  | l                                                                                                                  | kg      |                |    |      |         |
| <b>H3KH</b>                                                                           | <b>9</b>  | N 140x3x30x45x9H | 134 H11        | 145                                | 235                             | 48                                                                                                                 | 875     |                |    |      |         |
|                                                                                       | <b>10</b> | N 140x3x30x45x9H | 134 H11        | 155                                | 235                             | 49                                                                                                                 | 1020    |                |    |      |         |
|                                                                                       | <b>11</b> | N 170x5x30x32x9H | 160 H11        | 170                                | 270                             | 85                                                                                                                 | 1400    |                |    |      |         |
|                                                                                       | <b>12</b> | N 170x5x30x32x9H | 160 H11        | 185                                | 270                             | 90                                                                                                                 | 1675    |                |    |      |         |
| <b>Hollow shaft with spline</b>                                                       |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
|  |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
| Type                                                                                  | Size      | c                | d <sub>2</sub> | D <sub>3</sub>                     | k <sub>2</sub>                  | n x s                                                                                                              | t       | G <sub>7</sub> | l  | kg   |         |
| <b>H3FH</b>                                                                           | <b>9</b>  | 38               | 430            | 220 H6                             | 380                             | 20x26                                                                                                              | 12      | 350            | 48 | 960  | 0 - 8 E |
|                                                                                       | <b>10</b> | 38               | 470            | 240 H6                             | 420                             | 22x26                                                                                                              | 12      | 350            | 49 | 1110 | 1 - 0 E |
|                                                                                       | <b>11</b> | 42               | 510            | 260 H6                             | 450                             | 18 x33                                                                                                             | 12      | 400            | 85 | 1530 | 1 - 1 E |
|                                                                                       | <b>12</b> | 42               | 540            | 280 H6                             | 480                             | 22x33                                                                                                              | 12      | 400            | 90 | 1815 | 1 - 2 E |
| <b>Flanged shaft</b>                                                                  |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |
|  |           |                  |                |                                    |                                 |                                                                                                                    |         |                |    |      |         |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, see page 9/7.



# Helical gear units horizontal mounting position

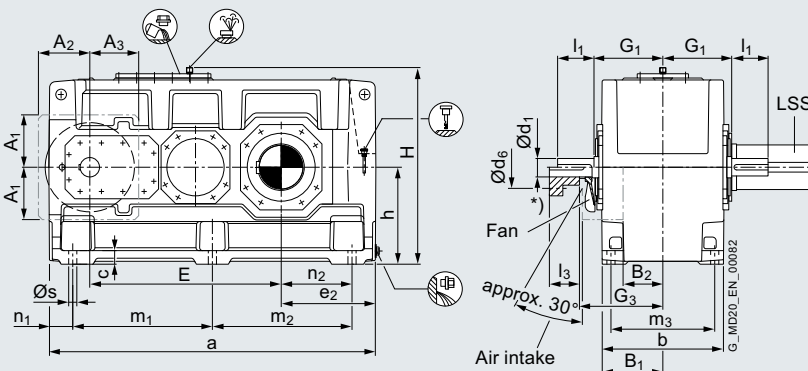
## Type H3

### Gear unit dimensions, three-stage, gear unit sizes 13 to 18

#### Selection and ordering data

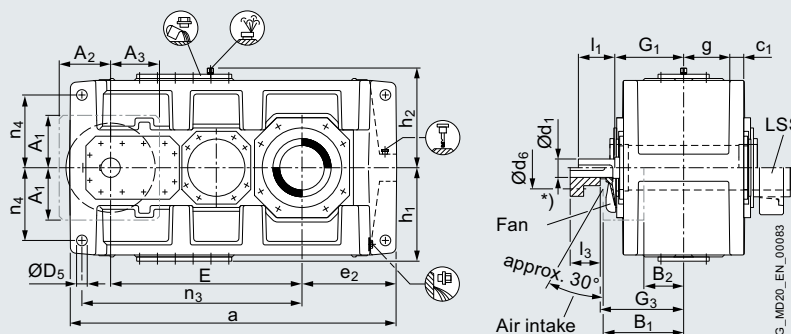
#### H3.H

2LP302-...50-....



#### H3.M

2LP302-...51-....



\*) For combinations of type H3 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | Dimensions in mm       |        |       |       |               |        |       |       |                                             |       |       |       |       |       |     |
|----------------|------------------------|--------|-------|-------|---------------|--------|-------|-------|---------------------------------------------|-------|-------|-------|-------|-------|-----|
|                | High speed shaft (HSS) |        |       |       |               |        |       |       | Fan with radial shaft seal                  |       |       |       |       |       |     |
|                | Radial shaft seal      |        |       |       | Taconite seal |        |       |       | (Dimensions with Taconite seal on request!) |       |       |       |       |       |     |
| $i_N$          | $d_1$                  | $l_1$  | $G_1$ | $l_3$ | $d_1$         | $l_1$  | $G_1$ | $G_3$ | $A_1$                                       | $A_2$ | $A_3$ | $B_1$ | $B_2$ | $d_6$ |     |
| 13             | 22.4-45                | 85 m6  | 160   | 310   | 130           | 85 m6  | 130   | 340   | 385                                         | 225   | 225   | 212   | 380   | 195   | 120 |
|                | 50-63                  | 60 m6  | 135   |       | 105           | 60 m6  | 105   |       |                                             |       |       |       |       |       |     |
|                | 71-90                  | 50 m6  | 110   |       | 80            | 50 m6  | 80    |       |                                             |       |       |       |       |       |     |
| 14             | 28-56                  | 85 m6  | 160   | 310   | 130           | 85 m6  | 130   | 340   | 385                                         | 225   | 225   | 212   | 380   | 195   | 120 |
|                | 63-80                  | 60 m6  | 135   |       | 105           | 60 m6  | 105   |       |                                             |       |       |       |       |       |     |
|                | 90-112                 | 50 m6  | 110   |       | 80            | 50 m6  | 80    |       |                                             |       |       |       |       |       |     |
| 15             | 22.4-45                | 100 m6 | 200   | 350   | 165           | 100 m6 | 165   | 385   | 420                                         | 270   | 265   | 252   | 415   | 205   | 150 |
|                | 50-63                  | 75 m6  | 140   |       | 105           | 75 m6  | 105   |       |                                             |       |       |       |       |       |     |
|                | 71-90                  | 60 m6  | 140   |       | 105           | 60 m6  | 105   |       |                                             |       |       |       |       |       |     |
| 16             | 25-50                  | 100 m6 | 200   | 350   | 165           | 100 m6 | 165   | 385   | 420                                         | 270   | 265   | 252   | 415   | 205   | 150 |
|                | 56-71                  | 75 m6  | 140   |       | 105           | 75 m6  | 105   |       |                                             |       |       |       |       |       |     |
|                | 80-100                 | 60 m6  | 140   |       | 105           | 60 m6  | 105   |       |                                             |       |       |       |       |       |     |
| 17             | 22.4-45                | 100 m6 | 200   | 380   | 165           | 100 m6 | 165   | 415   | 450                                         | 270   | 265   | 252   | 455   | 235   | 150 |
|                | 50-63                  | 75 m6  | 140   |       | 105           | 75 m6  | 105   |       |                                             |       |       |       |       |       |     |
|                | 71-90                  | 60 m6  | 140   |       | 105           | 60 m6  | 105   |       |                                             |       |       |       |       |       |     |
| 18             | 25-50                  | 100 m6 | 200   | 380   | 165           | 100 m6 | 165   | 415   | 450                                         | 270   | 265   | 252   | 455   | 235   | 150 |
|                | 56-71                  | 75 m6  | 140   |       | 105           | 75 m6  | 105   |       |                                             |       |       |       |       |       |     |
|                | 80-100                 | 60 m6  | 140   |       | 105           | 60 m6  | 105   |       |                                             |       |       |       |       |       |     |

| Gear unit size | a    | b   | c  | $c_1$ | $D_5$ | E    | $e_2$ | g     | H    | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|------|-----|----|-------|-------|------|-------|-------|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| 13             | 1395 | 550 | 60 | 61±2  | 48 H9 | 820  | 405   | 211.5 | 900  | 440      | 450   | 460   | 597.5 | 597.5 | 475   | 100   | 305   | 940   | 340   | 35 |
| 14             | 1535 | 550 | 60 | 61±2  | 48 H9 | 890  | 475   | 211.5 | 900  | 440      | 450   | 460   | 597.5 | 737.5 | 475   | 100   | 375   | 1010  | 340   | 35 |
| 15             | 1680 | 625 | 70 | 72±2  | 55 H9 | 987  | 485   | 238   | 1000 | 500      | 490   | 500   | 720   | 720   | 535   | 120   | 365   | 1135  | 375   | 42 |
| 16             | 1770 | 625 | 70 | 72±2  | 55 H9 | 1033 | 530   | 238   | 1000 | 500      | 490   | 500   | 720   | 810   | 535   | 120   | 410   | 1180  | 375   | 42 |
| 17             | 1770 | 690 | 80 | 81±2  | 55 H9 | 1035 | 525   | 259   | 1110 | 550      | 555   | 560   | 750   | 750   | 600   | 135   | 390   | 1175  | 425   | 42 |
| 18             | 1890 | 690 | 80 | 81±2  | 55 H9 | 1095 | 585   | 259   | 1110 | 550      | 555   | 560   | 750   | 870   | 600   | 135   | 450   | 1235  | 425   | 42 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Helical gear units horizontal mounting position Type H3

## Gear unit dimensions, three-stage, gear unit sizes 13 to 18

### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                                                   |      | Oil quantity <sup>1)</sup><br>H3.H | Oil quantity <sup>1)</sup><br>H3.M | Weight <sup>1) 2)</sup><br>H3.H | Weight <sup>1) 2)</sup><br>H3.M | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |      |      |       |       |      |      |       |   |
|---------------------------------------------------|------|------------------------------------|------------------------------------|---------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------|------|------|-------|-------|------|------|-------|---|
|                                                   |      | Article No.:                       |                                    | 2LP302                          |                                 | - .5-....                                                                                                          |      |      |       |       |      |      |       |   |
| Type                                              | Size | d <sub>2</sub>                     | l <sub>2</sub>                     | G <sub>2</sub>                  | l                               | l                                                                                                                  | kg   | kg   |       |       |      |      |       |   |
| <b>Solid shaft with parallel key<sup>3)</sup></b> |      |                                    |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| <b>H3SH</b>                                       | 13   | 200 n6                             | 350                                | 335                             | 160                             | -                                                                                                                  | 2295 | -    | 1 - 3 | A     |      |      |       |   |
|                                                   | 14   | 210 n6                             | 350                                | 335                             | 165                             | -                                                                                                                  | 2625 | -    | 1 - 4 | A     |      |      |       |   |
|                                                   | 15   | 230 n6                             | 410                                | 380                             | 235                             | -                                                                                                                  | 3475 | -    | 1 - 5 | A     |      |      |       |   |
|                                                   | 16   | 240 n6                             | 410                                | 380                             | 245                             | -                                                                                                                  | 3875 | -    | 1 - 6 | A     |      |      |       |   |
|                                                   | 17   | 250 n6                             | 410                                | 415                             | 305                             | -                                                                                                                  | 4560 | -    | 1 - 7 | A     |      |      |       |   |
|                                                   | 18   | 270 n6                             | 470                                | 415                             | 315                             | -                                                                                                                  | 5030 | -    | 1 - 8 | A     |      |      |       |   |
| <b>Solid shaft without parallel key</b>           |      |                                    |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| <b>H3CH/<br/>H3CM</b>                             | 13   | 210 h8                             | 170                                | 335                             | 160                             | 125                                                                                                                | 2295 | 2155 | 1 - 3 | F     |      |      |       |   |
|                                                   | 14   | 210 h8                             | 170                                | 335                             | 165                             | 130                                                                                                                | 2625 | 2490 | 1 - 4 | F     |      |      |       |   |
|                                                   | 15   | 250 h8                             | 190                                | 380                             | 235                             | 190                                                                                                                | 3475 | 3260 | 1 - 5 | F     |      |      |       |   |
|                                                   | 16   | 250 h8                             | 190                                | 380                             | 245                             | 195                                                                                                                | 3875 | 3625 | 1 - 6 | F     |      |      |       |   |
| <b>Hollow shaft with keyway</b>                   |      |                                    |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| <b>H3HH/<br/>H3HM</b>                             | 13   | 190 H7                             |                                    | 335                             | 160                             | 125                                                                                                                | 2295 | 2155 | 1 - 3 | B     |      |      |       |   |
|                                                   | 14   | 210 H7                             |                                    | 335                             | 165                             | 130                                                                                                                | 2625 | 2490 | 1 - 4 | B     |      |      |       |   |
|                                                   | 15   | 230 H7                             |                                    | 380                             | 235                             | 190                                                                                                                | 3475 | 3260 | 1 - 5 | B     |      |      |       |   |
|                                                   | 16   | 240 H7                             |                                    | 380                             | 245                             | 195                                                                                                                | 3875 | 3625 | 1 - 6 | B     |      |      |       |   |
|                                                   | 17   | 250 H7                             |                                    | 415                             | 305                             | 240                                                                                                                | 4560 | 4250 | 1 - 7 | B     |      |      |       |   |
|                                                   | 18   | 275 H7                             |                                    | 415                             | 315                             | 250                                                                                                                | 5030 | 4740 | 1 - 8 | B     |      |      |       |   |
| <b>Hollow shaft for shrink disk</b>               |      |                                    |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| <b>H3DH/<br/>H3DM</b>                             | 13   | 190 H7                             | 195                                | 335                             | 480                             | 160                                                                                                                | 125  | 2295 | 2155  | 1 - 3 | C    |      |       |   |
|                                                   | 14   | 210 H7                             | 215                                | 335                             | 480                             | 165                                                                                                                | 130  | 2625 | 2490  | 1 - 4 | C    |      |       |   |
|                                                   | 15   | 230 H7                             | 235                                | 380                             | 550                             | 235                                                                                                                | 190  | 3475 | 3260  | 1 - 5 | C    |      |       |   |
|                                                   | 16   | 240 H7                             | 245                                | 380                             | 550                             | 245                                                                                                                | 195  | 3875 | 3625  | 1 - 6 | C    |      |       |   |
|                                                   | 17   | 250 H7                             | 260                                | 415                             | 600                             | 305                                                                                                                | 240  | 4560 | 4250  | 1 - 7 | C    |      |       |   |
|                                                   | 18   | 280 H7                             | 285                                | 415                             | 600                             | 315                                                                                                                | 250  | 5030 | 4740  | 1 - 8 | C    |      |       |   |
| <b>Hollow shaft with spline</b>                   |      |                                    |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| <b>H3KH/<br/>H3KM</b>                             | 13   | N 190×5×30×36×9H                   | 180 H11                            | 195                             | 335                             | 160                                                                                                                | 125  | 2295 | 2155  | 1 - 3 | D    |      |       |   |
|                                                   | 14   | N 190×5×30×36×9H                   | 180 H11                            | 215                             | 335                             | 165                                                                                                                | 130  | 2625 | 2490  | 1 - 4 | D    |      |       |   |
|                                                   | 15   | N 220×5×30×42×9H                   | 210 H11                            | 235                             | 380                             | 235                                                                                                                | 190  | 3475 | 3260  | 1 - 5 | D    |      |       |   |
|                                                   | 16   | N 220×5×30×42×9H                   | 210 H11                            | 245                             | 380                             | 245                                                                                                                | 195  | 3875 | 3625  | 1 - 6 | D    |      |       |   |
|                                                   | 17   | N 250×5×30×48×9H                   | 240 H11                            | 260                             | 415                             | 305                                                                                                                | 240  | 4560 | 4250  | 1 - 7 | D    |      |       |   |
|                                                   | 18   | N 250×5×30×48×9H                   | 240 H11                            | 285                             | 415                             | 315                                                                                                                | 250  | 5030 | 4740  | 1 - 8 | D    |      |       |   |
| <b>Flanged shaft</b>                              |      |                                    |                                    |                                 |                                 |                                                                                                                    |      |      |       |       |      |      |       |   |
| <b>H3FH/<br/>H3FM</b>                             | 13   | 48                                 | 580                                | 310 H6                          | 500                             | 20×33                                                                                                              | 14   | 480  | 160   | 125   | 2455 | 2305 | 1 - 3 | E |
|                                                   | 14   | 48                                 | 620                                | 310 H6                          | 540                             | 24×33                                                                                                              | 14   | 480  | 165   | 130   | 2795 | 2660 | 1 - 4 | E |
|                                                   | 15   | 55                                 | 710                                | 360 H6                          | 630                             | 28×33                                                                                                              | 17   | 550  | 235   | 190   | 3715 | 3500 | 1 - 5 | E |
|                                                   | 16   | 55                                 | 740                                | 360 H6                          | 660                             | 30×33                                                                                                              | 17   | 550  | 245   | 195   | 4130 | 3880 | 1 - 6 | E |
|                                                   | 17   | 60                                 | 750                                | 410 H6                          | 660                             | 24×39                                                                                                              | 18   | 600  | 305   | 240   | 4860 | 4550 | 1 - 7 | E |
|                                                   | 18   | 60                                 | 800                                | 410 H6                          | 710                             | 26×39                                                                                                              | 18   | 600  | 315   | 250   | 5380 | 5090 | 1 - 8 | E |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, see page 9/7.



# Helical gear units horizontal mounting position

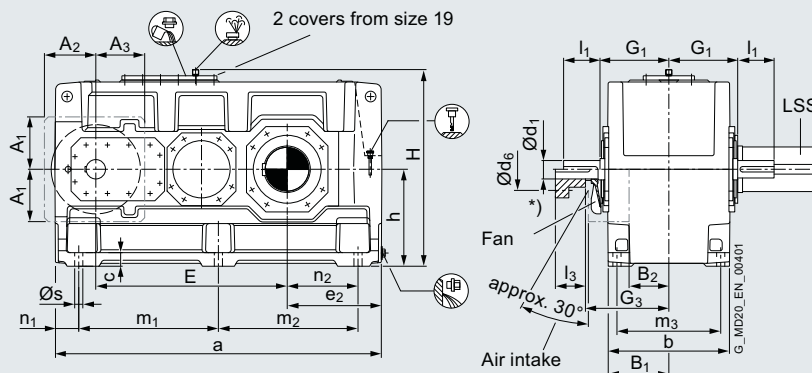
## Type H3

### Gear unit dimensions, three-stage, gear unit sizes 19 to 22

#### Selection and ordering data

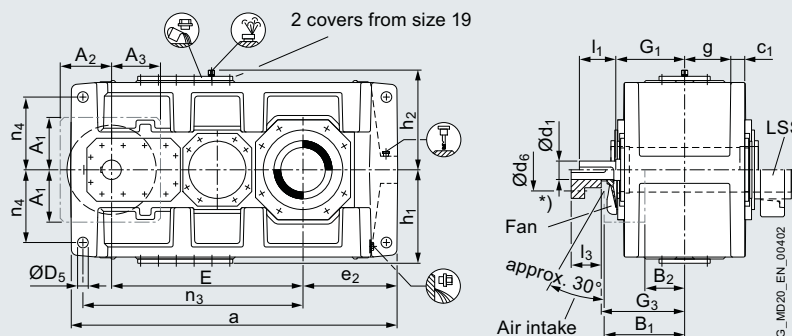
#### H3.H

2LP302-...50-....



#### H3.M

2LP302-...51-....



\*) For combinations of type H3 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | Dimensions in mm       |        |       |        |       |               |       |       |       |                                             |       |       |       |       |       |       |       |       |       |    |
|----------------|------------------------|--------|-------|--------|-------|---------------|-------|-------|-------|---------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
|                | High speed shaft (HSS) |        |       |        |       |               |       |       |       | Fan with radial shaft seal                  |       |       |       |       |       |       |       |       |       |    |
|                | Radial shaft seal      |        |       |        |       | Taconite seal |       |       |       | (Dimensions with Taconite seal on request!) |       |       |       |       |       |       |       |       |       |    |
| $i_N$          | $d_1$                  | $l_1$  | $G_1$ | $l_3$  | $d_1$ | $l_1$         | $G_1$ | $G_3$ | $A_1$ | $A_2$                                       | $A_3$ | $B_1$ | $B_2$ | $d_6$ |       |       |       |       |       |    |
| 19             | 22.4-45                | 110 n6 | 200   | 430    | 165   | On request    |       |       | 465   | 360                                         | 360   | 430   | 500   | 155   | 210   |       |       |       |       |    |
|                | 50-63                  | 90 m6  | 165   |        | 115   |               |       |       | 480   | 360                                         | 360   | 430   | 500   | 155   | 210   |       |       |       |       |    |
|                | 71-90                  | 75 m6  | 140   |        | 95    |               |       |       | 475   | 360                                         | 360   | 430   | 500   | 155   | 210   |       |       |       |       |    |
| 20             | 25-50                  | 110 n6 | 200   | 430    | 165   | On request    |       |       | 465   | 360                                         | 360   | 430   | 500   | 155   | 210   |       |       |       |       |    |
|                | 56-71                  | 90 m6  | 165   |        | 115   |               |       |       | 480   | 360                                         | 360   | 430   | 500   | 155   | 210   |       |       |       |       |    |
|                | 80-100                 | 75 m6  | 140   |        | 95    |               |       |       | 475   | 360                                         | 360   | 430   | 500   | 155   | 210   |       |       |       |       |    |
| 21             | 22.4-45                | 130 n6 | 240   | 470    | 190   | On request    |       |       | 520   | 400                                         | 360   | 360   | 550   | 365   | 270   |       |       |       |       |    |
|                | 50-63                  | 110 n6 | 205   |        | 190   |               |       |       | 520   | 400                                         | 360   | 360   | 550   | 365   | 250   |       |       |       |       |    |
|                | 71-90                  | 90 m6  | 170   |        | 135   |               |       |       | 505   | 400                                         | 360   | 360   | 550   | 365   | 250   |       |       |       |       |    |
| 22             | 25-50                  | 130 n6 | 240   | 470    | 190   | On request    |       |       | 520   | 400                                         | 360   | 360   | 550   | 365   | 270   |       |       |       |       |    |
|                | 56-71                  | 110 n6 | 205   |        | 190   |               |       |       | 520   | 400                                         | 360   | 360   | 550   | 365   | 250   |       |       |       |       |    |
|                | 80-100                 | 90 m6  | 170   |        | 135   |               |       |       | 505   | 400                                         | 360   | 360   | 550   | 365   | 250   |       |       |       |       |    |
| Gear unit size |                        |        |       |        |       |               |       |       |       |                                             |       |       |       |       |       |       |       |       |       |    |
|                | a                      | b      | c     | $c_1$  | $D_5$ | E             | $e_2$ | g     | H     | $h^{1)}$                                    | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
| 19             | 2030                   | 790    | 90    | 91 ±2  | 65 H9 | 1190          | 590   | 299   | 1240  | 620                                         | 615   | 620   | 860   | 860   | 690   | 155   | 435   | 1365  | 475   | 48 |
| 20             | 2150                   | 790    | 90    | 91 ±2  | 65 H9 | 1250          | 650   | 299   | 1240  | 620                                         | 615   | 620   | 860   | 980   | 690   | 155   | 495   | 1425  | 475   | 48 |
| 21             | 2340                   | 830    | 100   | 100 ±2 | 75 H9 | 1387          | 655   | 310   | 1390  | 700                                         | 685   | 690   | 1000  | 1000  | 720   | 170   | 485   | 1600  | 520   | 56 |
| 22             | 2450                   | 830    | 100   | 100 ±2 | 75 H9 | 1442          | 710   | 310   | 1390  | 700                                         | 685   | 690   | 1000  | 1110  | 720   | 170   | 540   | 1655  | 520   | 56 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Helical gear units horizontal mounting position Type H3

## Gear unit dimensions, three-stage, gear unit sizes 19 to 22

### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                       |           | Oil quantity <sup>1)</sup><br>H3.H | Oil quantity <sup>1)</sup><br>H3.M | Weight <sup>1)2)</sup><br>H3.H | Weight <sup>1)2)</sup><br>H3.M | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |      |                |                               |                              |            |       |               |
|-----------------------|-----------|------------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|------|----------------|-------------------------------|------------------------------|------------|-------|---------------|
|                       |           | Article No.:                       |                                    | 2LP302                         |                                | ■ - ■ ■ .5-....                                                                                                    |      |                |                               |                              |            |       |               |
| Type                  | Size      | d <sub>2</sub>                     | l <sub>2</sub>                     | G <sub>2</sub>                 | l                              | l                                                                                                                  | kg   | kg             | Solid shaft with parallel key |                              |            |       |               |
| <b>H3SH</b>           | <b>19</b> | 290 n6                             | 470                                | 465                            | 420                            | -                                                                                                                  | 6700 | -              | 2 - 0                         |                              |            |       |               |
|                       | <b>20</b> | 300 n6                             | 500                                | 465                            | 450                            | -                                                                                                                  | 8100 | -              | 2 - 1                         |                              |            |       |               |
|                       | <b>21</b> | 320 n6                             | 500                                | 490                            | 470                            | -                                                                                                                  | 9100 | -              | 2 - 2                         |                              |            |       |               |
|                       | <b>22</b> | 340 n6                             | 550                                | 490                            | 490                            | -                                                                                                                  | 9800 | -              | 2 - 3                         |                              |            |       |               |
| Type                  | Size      | D <sub>2</sub>                     | D <sub>3</sub>                     | G <sub>4</sub>                 | G <sub>5</sub>                 | l                                                                                                                  | l    | kg             | kg                            | Hollow shaft for shrink disk |            |       |               |
| <b>H3DH/<br/>H3DM</b> | <b>19</b> | 285 H7                             | 295                                | 465                            | 670                            | 420                                                                                                                | 390  | 6700           | 6200                          | 2 - 0                        |            |       |               |
|                       | <b>20</b> | 310 H7                             | 315                                | 465                            | 670                            | 450                                                                                                                | 415  | 8100           | 7600                          | 2 - 1                        |            |       |               |
|                       | <b>21</b> | 330 H7                             | 335                                | 490                            | 715                            | 470                                                                                                                | 515  | 9100           | 8500                          | 2 - 2                        |            |       |               |
|                       | <b>22</b> | 340 H7                             | 345                                | 490                            | 725                            | 490                                                                                                                | 540  | 9800           | 9300                          | 2 - 3                        |            |       |               |
| Type                  | Size      | N/DIN 5480                         | D <sub>2</sub>                     | D <sub>3</sub>                 | G <sub>4</sub>                 | l                                                                                                                  | l    | kg             | kg                            | Hollow shaft with spline     |            |       |               |
| <b>H3KH/<br/>H3KM</b> | <b>19</b> | On request                         |                                    |                                |                                |                                                                                                                    |      |                |                               | 2 - 0                        |            |       |               |
|                       | <b>20</b> | On request                         |                                    |                                |                                |                                                                                                                    |      |                |                               | 2 - 1                        |            |       |               |
|                       | <b>21</b> | On request                         |                                    |                                |                                |                                                                                                                    |      |                |                               | 2 - 2                        |            |       |               |
|                       | <b>22</b> | On request                         |                                    |                                |                                |                                                                                                                    |      |                |                               | 2 - 3                        |            |       |               |
| Type                  | Size      | c                                  | d <sub>2</sub>                     | D <sub>3</sub>                 | k <sub>2</sub>                 | n x s                                                                                                              | t    | G <sub>7</sub> | l                             | l                            | kg         | kg    | Flanged shaft |
| <b>H3FH/<br/>H3FM</b> | <b>19</b> | 65                                 | 860                                | 460 H6                         | 770                            | 30x39                                                                                                              | 18   | 670            | 420                           | 390                          | On request | 2 - 0 |               |
|                       | <b>20</b> | 65                                 | 930                                | 460 H6                         | 830                            | 32x39                                                                                                              | 18   | 670            | 450                           | 415                          | On request | 2 - 1 |               |
|                       | <b>21</b> | 75                                 | 950                                | 520 H6                         | 850                            | 28x45                                                                                                              | 20   | 710            | 470                           | 515                          | On request | 2 - 2 |               |
|                       | <b>22</b> | 75                                 | 1040                               | 520 H6                         | 940                            | 28x45                                                                                                              | 20   | 710            | 490                           | 540                          | On request | 2 - 3 |               |

4

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

## Helical gear units horizontal mounting position

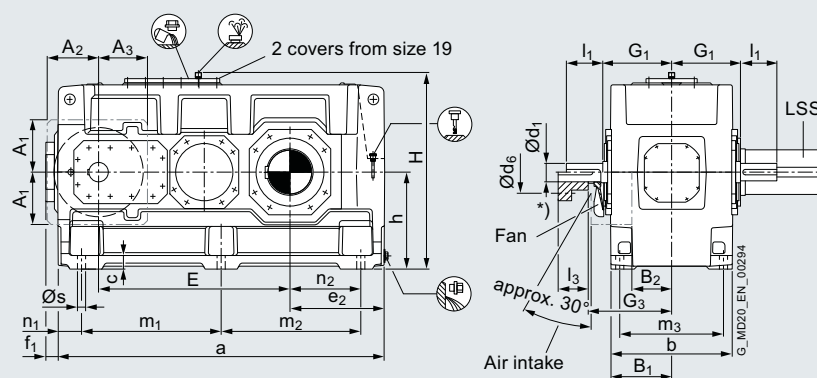
## Type H3

## Gear unit dimensions, three-stage, gear unit sizes 23 to 28

## Selection and ordering data

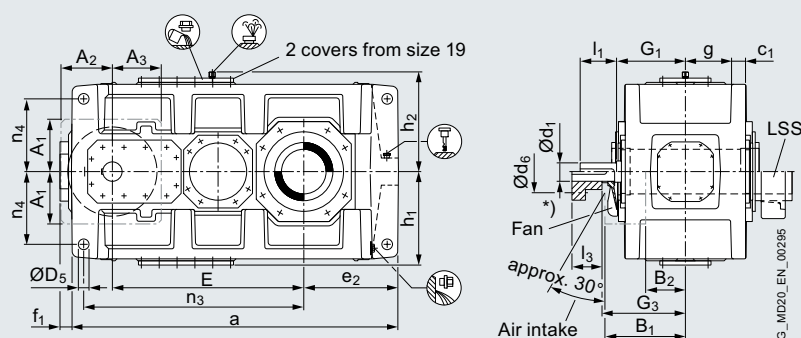
## H3.H

2LP302-...50-....



## H3.M

2LP302-...51-....



\*) For combinations of type H3 gear units with fan and coupling N-EUPEX-A on the high speed shaft, the coupling part 2/3 must be mounted on the motor side.

| Gear unit size | Dimensions in mm       |        |       |       |       |       |       |       |       |       |       |       |
|----------------|------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | High speed shaft (HSS) |        |       |       |       | Fan   |       |       |       |       |       |       |
|                | $l_N$                  | $d_1$  | $l_1$ | $G_1$ | $l_3$ | $G_3$ | $A_1$ | $A_2$ | $A_3$ | $B_1$ | $B_2$ | $d_6$ |
| 23             | 22.4-40                | 130 n6 | 255   | 515   | 200   | 570   | 415   | 415   | 415   | 590   | 305   | 350   |
|                | 45-56                  | 110 n6 | 220   |       | 165   |       |       |       |       |       |       |       |
|                | 63-90                  | 90 m6  | 185   |       | 130   |       |       |       |       |       |       |       |
| 24             | 25-45                  | 130 n6 | 255   | 515   | 200   | 570   | 415   | 415   | 415   | 590   | 305   | 350   |
|                | 50-63                  | 110 n6 | 220   |       | 165   |       |       |       |       |       |       |       |
|                | 71-100                 | 90 m6  | 185   |       | 130   |       |       |       |       |       |       |       |
| 25             | 22.4-40                | 150 n6 | 255   | 580   | 200   | 635   | 440   | 440   | 440   | 655   | 335   | 414   |
|                | 45-56                  | 130 n6 | 255   |       | 200   |       |       |       |       |       |       |       |
|                | 63-90                  | 100 m6 | 220   |       | 165   |       |       |       |       |       |       |       |
| 26             | 25-45                  | 150 n6 | 255   | 580   | 200   | 635   | 440   | 440   | 440   | 655   | 335   | 414   |
|                | 50-63                  | 130 n6 | 255   |       | 200   |       |       |       |       |       |       |       |
|                | 71-100                 | 100 m6 | 220   |       | 165   |       |       |       |       |       |       |       |
| 27             | 22.4-40                | 180 n6 | 295   | 650   | 240   | 705   | 510   | 510   | 510   | 725   | 380   | 446   |
|                | 45-56                  | 150 n6 | 255   |       | 200   |       |       |       |       |       |       |       |
|                | 63-90                  | 125 n6 | 255   |       | 200   |       |       |       |       |       |       |       |
| 28             | 25-45                  | 180 n6 | 295   | 650   | 240   | 705   | 510   | 510   | 510   | 725   | 380   | 446   |
|                | 50-63                  | 150 n6 | 255   |       | 200   |       |       |       |       |       |       |       |
|                | 71-100                 | 125 n6 | 255   |       | 200   |       |       |       |       |       |       |       |

| Gear unit size | Dimensions in mm |      |     |        |        |      |       |       |     |      |          |       |       |       |       |       |       |       |       |       |    |
|----------------|------------------|------|-----|--------|--------|------|-------|-------|-----|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
|                | a                | b    | c   | $c_1$  | $D_5$  | E    | $e_2$ | $f_1$ | g   | H    | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
| 23             | 2530             | 930  | 115 | 120 ±2 | 80 H9  | 1505 | 730   | 35    | 342 | 1565 | 780      | 765   | 785   | 1085  | 1085  | 810   | 180   | 550   | 1725  | 580   | 56 |
| 24             | 2660             | 930  | 115 | 120 ±2 | 80 H9  | 1570 | 795   | 35    | 342 | 1565 | 780      | 765   | 785   | 1085  | 1215  | 810   | 180   | 615   | 1790  | 580   | 56 |
| 25             | 2830             | 1045 | 130 | 120 ±2 | 90 H9  | 1695 | 790   | 35    | 400 | 1740 | 860      | 860   | 880   | 1215  | 1215  | 910   | 200   | 590   | 1965  | 660   | 66 |
| 26             | 3010             | 1045 | 130 | 120 ±2 | 90 H9  | 1785 | 880   | 35    | 400 | 1740 | 860      | 860   | 880   | 1215  | 1395  | 910   | 200   | 680   | 2055  | 660   | 66 |
| 27             | 3220             | 1170 | 150 | 145 ±2 | 100 H9 | 1927 | 880   | 40    | 440 | 1900 | 950      | 930   | 950   | 1390  | 1390  | 1030  | 220   | 660   | 2260  | 720   | 74 |
| 28             | 3410             | 1170 | 150 | 145 ±2 | 100 H9 | 2022 | 975   | 40    | 440 | 1900 | 950      | 930   | 950   | 1390  | 1580  | 1030  | 220   | 755   | 2355  | 720   | 74 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.



# Helical gear units horizontal mounting position

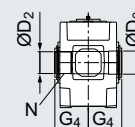
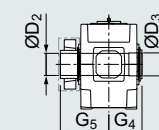
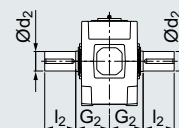
## Type H3

### Gear unit dimensions, three-stage, gear unit sizes 23 to 28

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                       |           | Oil quantity <sup>1)</sup><br>H3.H | Oil quantity <sup>1)</sup><br>H3.M | Weight <sup>1)2)</sup><br>H3.H | Weight <sup>1)2)</sup><br>H3.M | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |       |       |                               |                              |     |     |
|-----------------------|-----------|------------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|-------|-------|-------------------------------|------------------------------|-----|-----|
|                       |           | Article No.:                       |                                    | 2LP302                         |                                | ■ - ■ ■ .5-....                                                                                                    |       |       |                               |                              |     |     |
| Type                  | Size      | d <sub>2</sub>                     | l <sub>2</sub>                     | G <sub>2</sub>                 | l                              | l                                                                                                                  | kg    | kg    | Solid shaft with parallel key |                              |     |     |
| <b>H3SH</b>           | <b>23</b> | 360 n6                             | 590                                | 540                            | 620                            | -                                                                                                                  | 11800 | -     | 2                             | -                            | 4 A |     |
|                       | <b>24</b> | 380 n6                             | 590                                | 540                            | 650                            | -                                                                                                                  | 13200 | -     | 2                             | -                            | 5 A |     |
|                       | <b>25</b> | 400 n6                             | 650                                | 605                            | 880                            | -                                                                                                                  | 16100 | -     | 2                             | -                            | 6 A |     |
|                       | <b>26</b> | 420 n6                             | 650                                | 605                            | 935                            | -                                                                                                                  | 17700 | -     | 2                             | -                            | 7 A |     |
|                       | <b>27</b> | 440 n6                             | 690                                | 680                            | 1270                           | -                                                                                                                  | 22700 | -     | 2                             | -                            | 8 A |     |
|                       | <b>28</b> | 460 n6                             | 750                                | 680                            | 1345                           | -                                                                                                                  | 25500 | -     | 3                             | -                            | 0 A |     |
| Type                  | Size      | D <sub>2</sub>                     | D <sub>3</sub>                     | G <sub>4</sub>                 | G <sub>5</sub>                 | l                                                                                                                  | l     | kg    | kg                            | Hollow shaft for shrink disk |     |     |
| <b>H3DH/<br/>H3DM</b> | <b>23</b> | 370 H7                             | 375                                | 540                            | 800                            | 620                                                                                                                | 690   | 11800 | 11200                         | 2                            | -   | 4 C |
|                       | <b>24</b> | 390 H7                             | 395                                | 540                            | 825                            | 650                                                                                                                | 725   | 13200 | 12500                         | 2                            | -   | 5 C |
|                       | <b>25</b> | 410 H7                             | 415                                | 610                            | 895                            | 880                                                                                                                | 970   | 16100 | 15300                         | 2                            | -   | 6 C |
|                       | <b>26</b> | 430 H7                             | 435                                | 610                            | 925                            | 935                                                                                                                | 1030  | 17700 | 16800                         | 2                            | -   | 7 C |
|                       | <b>27</b> | 460 H7                             | 465                                | 680                            | 1000                           | 1270                                                                                                               | 1410  | 22700 | 21700                         | 2                            | -   | 8 C |
|                       | <b>28</b> | 470 H7                             | 475                                | 680                            | 1020                           | 1345                                                                                                               | 1490  | 25500 | 24200                         | 3                            | -   | 0 C |
| Type                  | Size      | N/DIN 5480                         | D <sub>2</sub>                     | D <sub>3</sub>                 | G <sub>4</sub>                 | l                                                                                                                  | l     | kg    | kg                            | Hollow shaft with spline     |     |     |
| <b>H3KH/<br/>H3KM</b> | <b>23</b> | On request                         |                                    |                                |                                |                                                                                                                    |       |       |                               | 2                            | -   | 4 D |
|                       | <b>24</b> | On request                         |                                    |                                |                                |                                                                                                                    |       |       |                               | 2                            | -   | 5 D |
|                       | <b>25</b> | On request                         |                                    |                                |                                |                                                                                                                    |       |       |                               | 2                            | -   | 6 D |
|                       | <b>26</b> | On request                         |                                    |                                |                                |                                                                                                                    |       |       |                               | 2                            | -   | 7 D |
|                       | <b>27</b> | On request                         |                                    |                                |                                |                                                                                                                    |       |       |                               | 2                            | -   | 8 D |
|                       | <b>28</b> | On request                         |                                    |                                |                                |                                                                                                                    |       |       |                               | 3                            | -   | 0 D |



Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

# Helical gear units horizontal mounting position

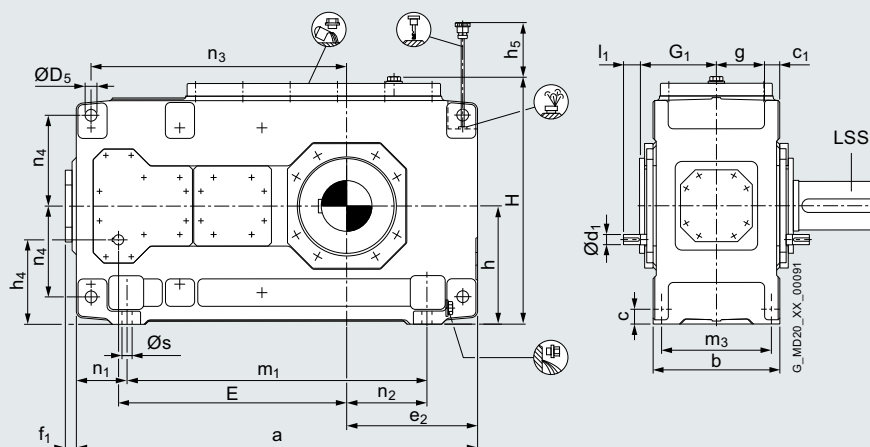
## Type H4

### Gear unit dimensions, four-stage, gear unit sizes 7 to 12

#### Selection and ordering data

**H4.H**

2LP302-...60-...



| Gear unit size | $i_N$   | Dimensions in mm                                 |       |       |                                                |       |       |
|----------------|---------|--------------------------------------------------|-------|-------|------------------------------------------------|-------|-------|
|                |         | High speed shaft (HSS)<br>with radial shaft seal |       |       | High speed shaft (HSS)<br>with Taconite E seal |       |       |
|                |         | $d_1$                                            | $l_1$ | $G_1$ | $d_1$                                          | $l_1$ | $G_1$ |
| <b>7</b>       | 100-180 | 30 m6                                            | 50    | 180   | 30 m6                                          | 50    | 180   |
|                | 200-355 | 24 k6                                            | 40    | 180   | 24 k6                                          | 40    | 180   |
| <b>8</b>       | 125-224 | 30 m6                                            | 50    | 180   | 30 m6                                          | 50    | 180   |
|                | 250-450 | 24 k6                                            | 40    | 180   | 24 k6                                          | 40    | 180   |
| <b>9</b>       | 100-180 | 35 m6                                            | 60    | 215   | 35 m6                                          | 60    | 215   |
|                | 200-355 | 28 m6                                            | 50    | 215   | 28 m6                                          | 50    | 215   |
| <b>10</b>      | 125-224 | 35 m6                                            | 60    | 215   | 35 m6                                          | 60    | 215   |
|                | 250-450 | 28 m6                                            | 50    | 215   | 28 m6                                          | 50    | 215   |
| <b>11</b>      | 100-180 | 45 m6                                            | 100   | 250   | 45 m6                                          | 80    | 270   |
|                | 200-355 | 32 m6                                            | 80    | 250   | 32 m6                                          | 60    | 270   |
| <b>12</b>      | 125-224 | 45 m6                                            | 100   | 250   | 45 m6                                          | 80    | 270   |
|                | 250-450 | 32 m6                                            | 80    | 250   | 32 m6                                          | 60    | 270   |

| Gear unit size | Dimensions in mm |     |    |              |       |     |       |       |     |     |          |       |       |       |       |       |       |       |       |    |
|----------------|------------------|-----|----|--------------|-------|-----|-------|-------|-----|-----|----------|-------|-------|-------|-------|-------|-------|-------|-------|----|
|                | a                | b   | c  | $c_1$        | $D_5$ | E   | $e_2$ | $f_1$ | g   | H   | $h^{1)}$ | $h_4$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
| <b>7</b>       | 845              | 300 | 35 | $36 \pm 1$   | 28 H9 | 495 | 250   | 37    | 114 | 572 | 280      | 200   | 140   | 605   | 260   | 120   | 130   | 560   | 215   | 24 |
| <b>8</b>       | 950              | 300 | 35 | $36 \pm 1$   | 28 H9 | 540 | 310   | 37    | 114 | 582 | 280      | 200   | 140   | 710   | 260   | 120   | 190   | 605   | 215   | 24 |
| <b>9</b>       | 1000             | 370 | 40 | $45 \pm 1.5$ | 36 H9 | 580 | 300   | 43    | 140 | 662 | 320      | 230   | 150   | 710   | 320   | 145   | 155   | 660   | 245   | 28 |
| <b>10</b>      | 1100             | 370 | 40 | $45 \pm 1.5$ | 36 H9 | 630 | 350   | 43    | 140 | 662 | 320      | 230   | 150   | 810   | 320   | 145   | 205   | 710   | 245   | 28 |
| <b>11</b>      | 1200             | 430 | 50 | $54 \pm 1.5$ | 40 H9 | 705 | 345   | 47    | 161 | 782 | 380      | 270   | 165   | 870   | 370   | 165   | 180   | 805   | 300   | 35 |
| <b>12</b>      | 1355             | 430 | 50 | $54 \pm 1.5$ | 40 H9 | 775 | 430   | 47    | 161 | 790 | 380      | 270   | 165   | 1025  | 370   | 165   | 265   | 875   | 300   | 35 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Helical gear units horizontal mounting position

## Type H4

### Gear unit dimensions, four-stage, gear unit sizes 7 to 12

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|             |      |                  |                | Oil quantity <sup>1)</sup><br>H4.H | Weight <sup>1)2)</sup><br>H4.H | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |         |                                             |    |      |         |               |
|-------------|------|------------------|----------------|------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------|----|------|---------|---------------|
|             |      |                  |                | Article No.:                       | 2LP302                         | - .60-....                                                                                                         |         |                                             |    |      |         |               |
| Type        | Size | d <sub>2</sub>   | l <sub>2</sub> | G <sub>2</sub>                     | l                              | kg                                                                                                                 |         | Solid shaft with parallel key <sup>3)</sup> |    |      |         |               |
| <b>H4SH</b> | 7    | 120 n6           | 210            | 195                                | 25                             | 550                                                                                                                | 0 - 6 A |                                             |    |      |         |               |
|             | 8    | 130 n6           | 250            | 195                                | 27                             | 645                                                                                                                | 0 - 7 A |                                             |    |      |         |               |
|             | 9    | 140 n6           | 250            | 235                                | 48                             | 875                                                                                                                | 0 - 8 A |                                             |    |      |         |               |
|             | 10   | 160 n6           | 300            | 235                                | 50                             | 1010                                                                                                               | 1 - 0 A |                                             |    |      |         |               |
|             | 11   | 170 n6           | 300            | 270                                | 80                             | 1460                                                                                                               | 1 - 1 A |                                             |    |      |         |               |
|             | 12   | 180 n6           | 300            | 270                                | 87                             | 1725                                                                                                               | 1 - 2 A |                                             |    |      |         |               |
| Type        | Size | d <sub>2</sub>   | l <sub>2</sub> | G <sub>2</sub>                     | l                              | kg                                                                                                                 |         | Solid shaft without parallel key            |    |      |         |               |
| <b>H4CH</b> | 7    | 140 h8           | 155            | 195                                | 25                             | 550                                                                                                                | 0 - 6 F |                                             |    |      |         |               |
|             | 8    | 140 h8           | 155            | 195                                | 27                             | 645                                                                                                                | 0 - 7 F |                                             |    |      |         |               |
|             | 9    | 140 h8           | 155            | 235                                | 48                             | 875                                                                                                                | 0 - 8 F |                                             |    |      |         |               |
|             | 10   | 170 h8           | 155            | 235                                | 50                             | 1010                                                                                                               | 1 - 0 F |                                             |    |      |         |               |
|             | 11   | 170 h8           | 155            | 270                                | 80                             | 1460                                                                                                               | 1 - 1 F |                                             |    |      |         |               |
|             | 12   | 210 h8           | 170            | 270                                | 87                             | 1725                                                                                                               | 1 - 2 F |                                             |    |      |         |               |
| Type        | Size | D <sub>2</sub>   | G <sub>4</sub> |                                    | l                              | kg                                                                                                                 |         | Hollow shaft with keyway                    |    |      |         |               |
| <b>H4HH</b> | 7    | 115 H7           | 195            |                                    | 25                             | 550                                                                                                                | 0 - 6 B |                                             |    |      |         |               |
|             | 8    | 125 H7           | 195            |                                    | 27                             | 645                                                                                                                | 0 - 7 B |                                             |    |      |         |               |
|             | 9    | 135 H7           | 235            |                                    | 48                             | 875                                                                                                                | 0 - 8 B |                                             |    |      |         |               |
|             | 10   | 150 H7           | 235            |                                    | 50                             | 1010                                                                                                               | 1 - 0 B |                                             |    |      |         |               |
|             | 11   | 165 H7           | 270            |                                    | 80                             | 1460                                                                                                               | 1 - 1 B |                                             |    |      |         |               |
|             | 12   | 180 H7           | 270            |                                    | 87                             | 1725                                                                                                               | 1 - 2 B |                                             |    |      |         |               |
| Type        | Size | D <sub>2</sub>   | D <sub>3</sub> | G <sub>4</sub>                     | G <sub>5</sub>                 | l                                                                                                                  | kg      | Hollow shaft for shrink disk                |    |      |         |               |
| <b>H4DH</b> | 7    | 120 H7           | 120            | 195                                | 280                            | 25                                                                                                                 | 550     | 0 - 6 C                                     |    |      |         |               |
|             | 8    | 130 H7           | 130            | 195                                | 285                            | 27                                                                                                                 | 645     | 0 - 7 C                                     |    |      |         |               |
|             | 9    | 140 H7           | 145            | 235                                | 330                            | 48                                                                                                                 | 875     | 0 - 8 C                                     |    |      |         |               |
|             | 10   | 150 H7           | 155            | 235                                | 350                            | 50                                                                                                                 | 1010    | 1 - 0 C                                     |    |      |         |               |
|             | 11   | 165 H7           | 170            | 270                                | 400                            | 80                                                                                                                 | 1460    | 1 - 1 C                                     |    |      |         |               |
|             | 12   | 180 H7           | 185            | 270                                | 405                            | 87                                                                                                                 | 1725    | 1 - 2 C                                     |    |      |         |               |
| Type        | Size | N/DIN 5480       | D <sub>2</sub> | D <sub>3</sub>                     | G <sub>4</sub>                 | l                                                                                                                  | kg      | Hollow shaft with spline                    |    |      |         |               |
| <b>H4KH</b> | 7    | N 120x3x30x38x9H | 114 H11        | 120                                | 195                            | 25                                                                                                                 | 550     | 0 - 6 D                                     |    |      |         |               |
|             | 8    | N 120x3x30x38x9H | 114 H11        | 130                                | 195                            | 27                                                                                                                 | 645     | 0 - 7 D                                     |    |      |         |               |
|             | 9    | N 140x3x30x45x9H | 134 H11        | 145                                | 235                            | 48                                                                                                                 | 875     | 0 - 8 D                                     |    |      |         |               |
|             | 10   | N 140x3x30x45x9H | 134 H11        | 155                                | 235                            | 50                                                                                                                 | 1010    | 1 - 0 D                                     |    |      |         |               |
|             | 11   | N 170x5x30x32x9H | 160 H11        | 170                                | 270                            | 80                                                                                                                 | 1460    | 1 - 1 D                                     |    |      |         |               |
|             | 12   | N 170x5x30x32x9H | 160 H11        | 185                                | 270                            | 87                                                                                                                 | 1725    | 1 - 2 D                                     |    |      |         |               |
| Type        | Size | c                | d <sub>2</sub> | D <sub>3</sub>                     | k <sub>2</sub>                 | n x s                                                                                                              | t       | G <sub>7</sub>                              | l  | kg   |         | Flanged shaft |
| <b>H4FH</b> | 7    | 30               | 370            | 180 H6                             | 320                            | 16 x 26                                                                                                            | 10      | 300                                         | 25 | 600  | 0 - 6 E |               |
|             | 8    | 30               | 390            | 190 H6                             | 340                            | 18 x 26                                                                                                            | 10      | 300                                         | 27 | 700  | 0 - 7 E |               |
|             | 9    | 38               | 430            | 220 H6                             | 380                            | 20 x 26                                                                                                            | 12      | 350                                         | 48 | 960  | 0 - 8 E |               |
|             | 10   | 38               | 470            | 240 H6                             | 420                            | 22 x 26                                                                                                            | 12      | 350                                         | 50 | 1100 | 1 - 0 E |               |
|             | 11   | 42               | 510            | 260 H6                             | 450                            | 18 x 33                                                                                                            | 12      | 400                                         | 80 | 1590 | 1 - 1 E |               |
|             | 12   | 42               | 540            | 280 H6                             | 480                            | 22 x 33                                                                                                            | 12      | 400                                         | 87 | 1865 | 1 - 2 E |               |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, see page 9/7.

## Helical gear units horizontal mounting position

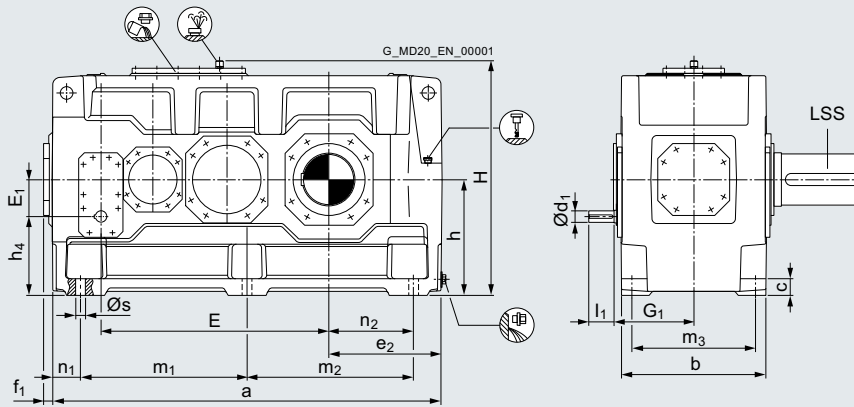
Type H4

Gear unit dimensions, four-stage, gear unit sizes 13 to 18

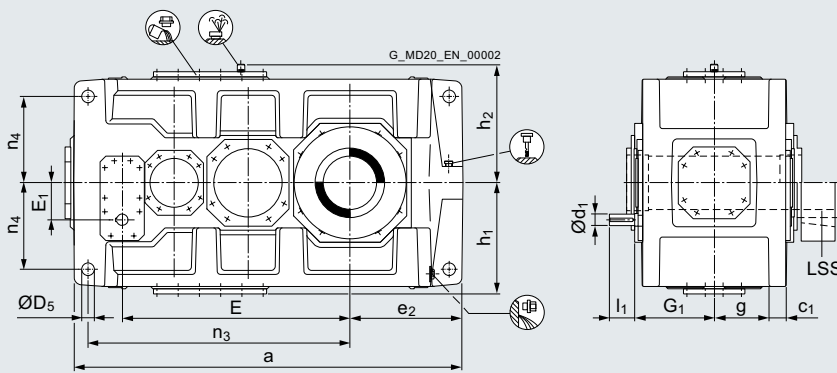
## Selection and ordering data

**H4.H**

2LP302-...60-....

**H4.M**

2LP302-...61-....



| Gear unit size | Dimensions in mm |                                               |       |       |                                             |            |            |
|----------------|------------------|-----------------------------------------------|-------|-------|---------------------------------------------|------------|------------|
|                | $i_N$            | High speed shaft (HSS) with radial shaft seal |       |       | High speed shaft (HSS) with Taconite E seal |            |            |
|                |                  | $d_1$                                         | $l_1$ | $G_1$ | $d_1$                                       | $l_1$      | $G_1$      |
| <b>13</b>      | 100-180          | 50 m6                                         | 100   | 305   | 50 m6                                       | 80         | 325        |
|                | 200-355          | 38 m6                                         | 80    | 305   | 38 m6                                       | 60         | 325        |
| <b>14</b>      | 125-224          | 50 m6                                         | 100   | 305   | 50 m6                                       | 80         | 325        |
|                | 250-450          | 38 m6                                         | 80    | 305   | 38 m6                                       | 60         | 325        |
| <b>15</b>      | 100-180          | 60 m6                                         | 135   | 345   | 60 m6                                       | 105        | 375        |
|                | 200-235          | 50 m6                                         | 110   | 345   | 50 m6                                       | 80         | 375        |
| <b>16</b>      | 112-200          | 60 m6                                         | 135   | 345   | 60 m6                                       | 105        | 375        |
|                | 224-400          | 50 m6                                         | 110   | 345   | 50 m6                                       | 80         | 375        |
| <b>17</b>      | 100-180          | 60 m6                                         | 105   | 380   | On request                                  | On request | On request |
|                | 200-355          | 50 m6                                         | 80    | 380   | On request                                  | On request | On request |
| <b>18</b>      | 112-200          | 60 m6                                         | 105   | 380   | On request                                  | On request | On request |
|                | 224-400          | 50 m6                                         | 80    | 380   | On request                                  | On request | On request |

| Gear unit size | a    | b   | c  | $c_1$  | $D_5$ | E    | $E_1$ | $e_2$ | $f_1$ | g     | H    | $h^{1)}$ | $n_1$ | $n_2$ | $n_4$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|------|-----|----|--------|-------|------|-------|-------|-------|-------|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| <b>13</b>      | 1395 | 550 | 60 | 61 ± 2 | 48 H9 | 820  | 130   | 405   | 47    | 211.5 | 900  | 440      | 450   | 460   | 310   | 597.5 | 597.5 | 475   | 100   | 305   | 940   | 340   | 35 |
| <b>14</b>      | 1535 | 550 | 60 | 61 ± 2 | 48 H9 | 890  | 130   | 475   | 47    | 211.5 | 900  | 440      | 450   | 460   | 310   | 597.5 | 737.5 | 475   | 100   | 375   | 1010  | 340   | 35 |
| <b>15</b>      | 1680 | 625 | 70 | 72 ± 2 | 55 H9 | 987  | 160   | 485   | 56    | 238   | 1000 | 500      | 490   | 500   | 340   | 720   | 720   | 535   | 120   | 365   | 1135  | 375   | 42 |
| <b>16</b>      | 1770 | 625 | 70 | 72 ± 2 | 55 H9 | 1033 | 160   | 530   | 56    | 238   | 1000 | 500      | 490   | 500   | 340   | 720   | 810   | 535   | 120   | 410   | 1180  | 375   | 42 |
| <b>17</b>      | 1770 | 690 | 80 | 81 ± 2 | 55 H9 | 1035 | 160   | 525   | 53    | 259   | 1110 | 550      | 555   | 560   | 390   | 750   | 750   | 600   | 135   | 390   | 1175  | 425   | 42 |
| <b>18</b>      | 1890 | 690 | 80 | 81 ± 2 | 55 H9 | 1095 | 160   | 585   | 53    | 259   | 1110 | 550      | 555   | 560   | 390   | 750   | 870   | 600   | 135   | 450   | 1235  | 425   | 42 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Helical gear units horizontal mounting position Type H4

## Gear unit dimensions, four-stage, gear unit sizes 13 to 18

### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                                                   |      | Oil quantity <sup>1)</sup><br>H4.H | Oil quantity <sup>1)</sup><br>H4.M | Weight <sup>1)2)</sup><br>H4.H | Weight <sup>1)2)</sup><br>H4.M | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |      |      |      |     |      |      |   |   |   |   |  |  |  |
|---------------------------------------------------|------|------------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|------|------|------|-----|------|------|---|---|---|---|--|--|--|
| Article No.: <b>2LP302</b> ■ - ■ ■ .6-....        |      |                                    |                                    |                                |                                |                                                                                                                    |      |      |      |     |      |      |   |   |   |   |  |  |  |
| Type                                              | Size | d <sub>2</sub>                     | l <sub>2</sub>                     | G <sub>2</sub>                 | l                              | l                                                                                                                  | kg   | kg   |      |     |      |      |   |   |   |   |  |  |  |
| <b>Solid shaft with parallel key<sup>3)</sup></b> |      |                                    |                                    |                                |                                |                                                                                                                    |      |      |      |     |      |      |   |   |   |   |  |  |  |
| <b>H4SH</b>                                       | 13   | 200 n6                             | 350                                | 335                            | 130                            | -                                                                                                                  | 2390 | -    | 1    | -   | 3    | A    |   |   |   |   |  |  |  |
|                                                   | 14   | 210 n6                             | 350                                | 335                            | 140                            | -                                                                                                                  | 2730 | -    | 1    | -   | 4    | A    |   |   |   |   |  |  |  |
|                                                   | 15   | 230 n6                             | 410                                | 380                            | 230                            | -                                                                                                                  | 3635 | -    | 1    | -   | 5    | A    |   |   |   |   |  |  |  |
|                                                   | 16   | 240 n6                             | 410                                | 380                            | 235                            | -                                                                                                                  | 3965 | -    | 1    | -   | 6    | A    |   |   |   |   |  |  |  |
|                                                   | 17   | 250 n6                             | 410                                | 415                            | 290                            | -                                                                                                                  | 4680 | -    | 1    | -   | 7    | A    |   |   |   |   |  |  |  |
|                                                   | 18   | 270 n6                             | 470                                | 415                            | 305                            | -                                                                                                                  | 5185 | -    | 1    | -   | 8    | A    |   |   |   |   |  |  |  |
| <b>Solid shaft without parallel key</b>           |      |                                    |                                    |                                |                                |                                                                                                                    |      |      |      |     |      |      |   |   |   |   |  |  |  |
| <b>H4CH/<br/>H4CM</b>                             | 13   | 210 h8                             | 170                                | 335                            | 130                            | 120                                                                                                                | 2390 | 2270 | 1    | -   | 3    | F    |   |   |   |   |  |  |  |
|                                                   | 14   | 210 h8                             | 170                                | 335                            | 140                            | 125                                                                                                                | 2730 | 2600 | 1    | -   | 4    | F    |   |   |   |   |  |  |  |
|                                                   | 15   | 250 h8                             | 190                                | 380                            | 230                            | 170                                                                                                                | 3635 | 3440 | 1    | -   | 5    | F    |   |   |   |   |  |  |  |
|                                                   | 16   | 250 h8                             | 190                                | 380                            | 235                            | 175                                                                                                                | 3965 | 3740 | 1    | -   | 6    | F    |   |   |   |   |  |  |  |
| <b>Hollow shaft with keyway</b>                   |      |                                    |                                    |                                |                                |                                                                                                                    |      |      |      |     |      |      |   |   |   |   |  |  |  |
| <b>H4HH/<br/>H4HM</b>                             | 13   | 190 H7                             |                                    | 335                            | 130                            | 120                                                                                                                | 2390 | 2270 | 1    | -   | 3    | B    |   |   |   |   |  |  |  |
|                                                   | 14   | 210 H7                             |                                    | 335                            | 140                            | 125                                                                                                                | 2730 | 2600 | 1    | -   | 4    | B    |   |   |   |   |  |  |  |
|                                                   | 15   | 230 H7                             |                                    | 380                            | 230                            | 170                                                                                                                | 3635 | 3440 | 1    | -   | 5    | B    |   |   |   |   |  |  |  |
|                                                   | 16   | 240 H7                             |                                    | 380                            | 235                            | 175                                                                                                                | 3965 | 3740 | 1    | -   | 6    | B    |   |   |   |   |  |  |  |
|                                                   | 17   | 250 H7                             |                                    | 415                            | 290                            | 225                                                                                                                | 4680 | 4445 | 1    | -   | 7    | B    |   |   |   |   |  |  |  |
|                                                   | 18   | 275 H7                             |                                    | 415                            | 305                            | 230                                                                                                                | 5185 | 4915 | 1    | -   | 8    | B    |   |   |   |   |  |  |  |
| <b>Hollow shaft for shrink disk</b>               |      |                                    |                                    |                                |                                |                                                                                                                    |      |      |      |     |      |      |   |   |   |   |  |  |  |
| <b>H4DH/<br/>H4DM</b>                             | 13   | 190 H7                             | 195                                | 335                            | 480                            | 130                                                                                                                | 120  | 2390 | 2270 | 1   | -    | 3    | C |   |   |   |  |  |  |
|                                                   | 14   | 210 H7                             | 215                                | 335                            | 480                            | 140                                                                                                                | 125  | 2730 | 2600 | 1   | -    | 4    | C |   |   |   |  |  |  |
|                                                   | 15   | 230 H7                             | 235                                | 380                            | 550                            | 230                                                                                                                | 170  | 3635 | 3440 | 1   | -    | 5    | C |   |   |   |  |  |  |
|                                                   | 16   | 240 H7                             | 245                                | 380                            | 550                            | 235                                                                                                                | 175  | 3965 | 3740 | 1   | -    | 6    | C |   |   |   |  |  |  |
|                                                   | 17   | 250 H7                             | 260                                | 415                            | 600                            | 290                                                                                                                | 225  | 4680 | 4445 | 1   | -    | 7    | C |   |   |   |  |  |  |
|                                                   | 18   | 280 H7                             | 285                                | 415                            | 600                            | 305                                                                                                                | 230  | 5185 | 4915 | 1   | -    | 8    | C |   |   |   |  |  |  |
| <b>Hollow shaft with spline</b>                   |      |                                    |                                    |                                |                                |                                                                                                                    |      |      |      |     |      |      |   |   |   |   |  |  |  |
| <b>H4KH/<br/>H4KM</b>                             | 13   | N190x5x30x36x9H                    | 180 H11                            | 195                            | 335                            | 130                                                                                                                | 120  | 2390 | 2270 | 1   | -    | 3    | D |   |   |   |  |  |  |
|                                                   | 14   | N190x5x30x36x9H                    | 180 H11                            | 215                            | 335                            | 140                                                                                                                | 125  | 2730 | 2600 | 1   | -    | 4    | D |   |   |   |  |  |  |
|                                                   | 15   | N220x5x30x42x9H                    | 210 H11                            | 235                            | 380                            | 230                                                                                                                | 170  | 3635 | 3440 | 1   | -    | 5    | D |   |   |   |  |  |  |
|                                                   | 16   | N220x5x30x42x9H                    | 210 H11                            | 245                            | 380                            | 235                                                                                                                | 175  | 3965 | 3740 | 1   | -    | 6    | D |   |   |   |  |  |  |
|                                                   | 17   | N250x5x30x48x9H                    | 240 H11                            | 260                            | 415                            | 290                                                                                                                | 225  | 4680 | 4445 | 1   | -    | 7    | D |   |   |   |  |  |  |
|                                                   | 18   | N250x5x30x48x9H                    | 240 H11                            | 285                            | 415                            | 305                                                                                                                | 230  | 5185 | 4915 | 1   | -    | 8    | D |   |   |   |  |  |  |
| <b>Flanged shaft</b>                              |      |                                    |                                    |                                |                                |                                                                                                                    |      |      |      |     |      |      |   |   |   |   |  |  |  |
| <b>H4FH/<br/>H4FM</b>                             | 13   | 48                                 | 580                                | 310 H6                         | 500                            | 20x33                                                                                                              | 14   | 480  | 130  | 120 | 2550 | 2430 | 1 | - | 3 | E |  |  |  |
|                                                   | 14   | 48                                 | 620                                | 310 H6                         | 540                            | 24x33                                                                                                              | 14   | 480  | 140  | 125 | 2900 | 2770 | 1 | - | 4 | E |  |  |  |
|                                                   | 15   | 55                                 | 710                                | 360 H6                         | 630                            | 28x33                                                                                                              | 17   | 550  | 230  | 170 | 3875 | 3680 | 1 | - | 5 | E |  |  |  |
|                                                   | 16   | 55                                 | 740                                | 360 H6                         | 660                            | 30x33                                                                                                              | 17   | 550  | 235  | 175 | 4220 | 3995 | 1 | - | 6 | E |  |  |  |
|                                                   | 17   | 60                                 | 750                                | 410 H6                         | 660                            | 24x39                                                                                                              | 18   | 600  | 290  | 225 | 4980 | 4745 | 1 | - | 7 | E |  |  |  |
|                                                   | 18   | 60                                 | 800                                | 410 H6                         | 710                            | 26x39                                                                                                              | 18   | 600  | 305  | 230 | 5535 | 5265 | 1 | - | 8 | E |  |  |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, see page 9/7.



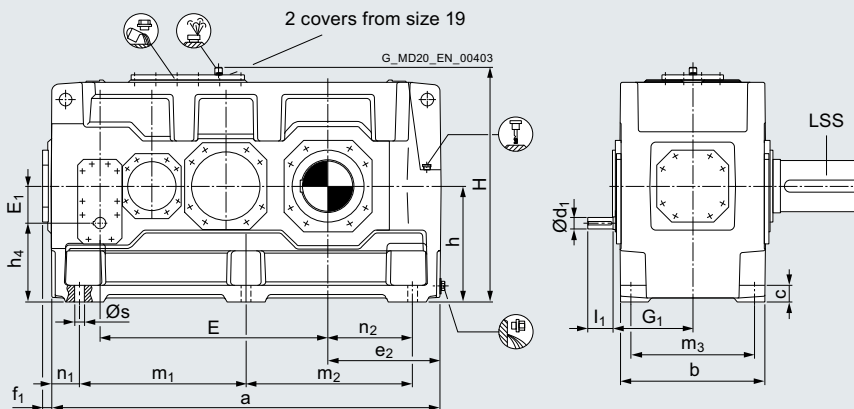
# Helical gear units horizontal mounting position

Type H4

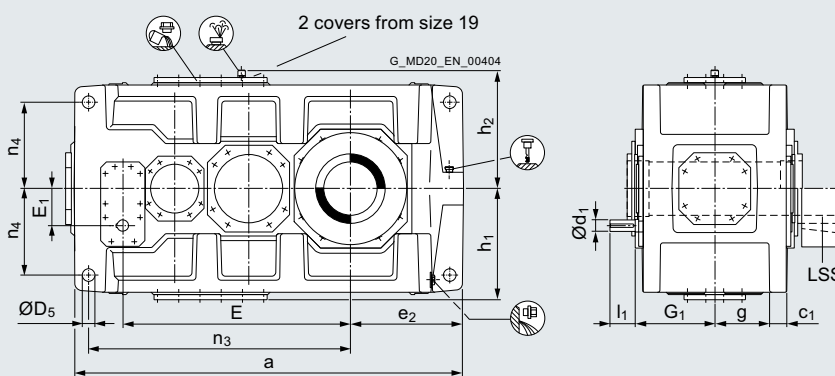
Gear unit dimensions, four-stage, gear unit sizes 19 to 24

## Selection and ordering data

**H4.H**  
2LP302-...60-....



**H4.M**  
2LP302-...61-....



| Gear unit size | Dimensions in mm |                                               |       |       |                                            |            |            |
|----------------|------------------|-----------------------------------------------|-------|-------|--------------------------------------------|------------|------------|
|                | $i_N$            | High speed shaft (HSS) with radial shaft seal |       |       | High speed shaft (HSS) with Tacnite E seal |            |            |
|                |                  | $d_1$                                         | $l_1$ | $G_1$ | $d_1$                                      | $l_1$      | $G_1$      |
| 19             | 100-180          | 75 m6                                         | 105   | 440   | On request                                 | On request | On request |
|                | 200-355          | 60 m6                                         | 105   | 440   | On request                                 | On request | On request |
| 20             | 112-200          | 75 m6                                         | 105   | 440   | On request                                 | On request | On request |
|                | 224-400          | 60 m6                                         | 105   | 440   | On request                                 | On request | On request |
| 21             | 100-180          | 90 m6                                         | 165   | 460   | On request                                 | On request | On request |
|                | 200-355          | 70 m6                                         | 140   | 460   | On request                                 | On request | On request |
| 22             | 112-200          | 90 m6                                         | 165   | 460   | On request                                 | On request | On request |
|                | 224-400          | 70 m6                                         | 140   | 460   | On request                                 | On request | On request |
| 23             | 100-160          | 90 m6                                         | 165   | 515   | 90 m6                                      | 165        | 515        |
|                | 180-355          | 70 m6                                         | 140   | 515   | 70 m6                                      | 140        | 515        |
| 24             | 112-180          | 90 m6                                         | 165   | 515   | 90 m6                                      | 165        | 515        |
|                | 200-400          | 70 m6                                         | 140   | 515   | 70 m6                                      | 140        | 515        |

| Gear unit size | Dimensions in mm |     |     |        |       |      |       |       |       |     |      |          |       |       |       |       |       |       |       |       |       |       |    |  |
|----------------|------------------|-----|-----|--------|-------|------|-------|-------|-------|-----|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|--|
|                | a                | b   | c   | $c_1$  | $D_5$ | E    | $E_1$ | $e_2$ | $f_1$ | g   | H    | $h^{1)}$ | $n_1$ | $n_2$ | $n_4$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |  |
| 19             | 2030             | 790 | 90  | 91 ±2  | 65 H9 | 1190 | 185   | 590   | 53    | 299 | 1240 | 620      | 615   | 620   | 435   | 860   | 860   | 690   | 155   | 435   | 1365  | 475   | 48 |  |
| 20             | 2150             | 790 | 90  | 91 ±2  | 65 H9 | 1250 | 185   | 650   | 53    | 299 | 1240 | 620      | 615   | 620   | 435   | 980   | 690   | 155   | 495   | 1425  | 475   | 48    |    |  |
| 21             | 2340             | 830 | 100 | 100 ±2 | 75 H9 | 1387 | 225   | 655   | 62    | 310 | 1390 | 700      | 685   | 690   | 475   | 1000  | 1000  | 720   | 170   | 485   | 1600  | 520   | 56 |  |
| 22             | 2450             | 830 | 100 | 100 ±2 | 75 H9 | 1442 | 225   | 710   | 62    | 310 | 1390 | 700      | 685   | 690   | 475   | 1000  | 1110  | 720   | 170   | 540   | 1655  | 520   | 56 |  |
| 23             | 2530             | 930 | 115 | 120 ±2 | 80 H9 | 1505 | 225   | 730   | 35    | 342 | 1565 | 780      | 765   | 785   | 555   | 1085  | 1085  | 810   | 180   | 550   | 1725  | 580   | 56 |  |
| 24             | 2660             | 930 | 115 | 120 ±2 | 80 H9 | 1570 | 225   | 795   | 35    | 342 | 1565 | 780      | 765   | 785   | 555   | 1085  | 1215  | 810   | 180   | 615   | 1790  | 580   | 56 |  |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

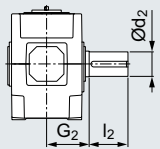
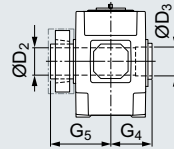
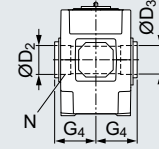
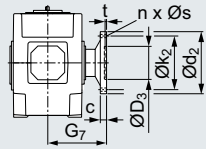
# Helical gear units horizontal mounting position

## Type H4

### Gear unit dimensions, four-stage, gear unit sizes 19 to 24

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                                      |      | Oil quantity <sup>1)</sup><br>H4.H | Oil quantity <sup>1)</sup><br>H4.M | Weight <sup>1)2)</sup><br>H4.H | Weight <sup>1)2)</sup><br>H4.M | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |       |                |         |                                                                                     |                                                                                      |    |         |                                                                                       |
|--------------------------------------|------|------------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|-------|----------------|---------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----|---------|---------------------------------------------------------------------------------------|
|                                      |      | Article No.:                       |                                    | 2LP302                         |                                | .6.-....                                                                                                           |       |                |         |                                                                                     |                                                                                      |    |         |                                                                                       |
| <b>Solid shaft with parallel key</b> |      |                                    |                                    |                                |                                |                                                                                                                    |       |                |         |                                                                                     |                                                                                      |    |         |                                                                                       |
| Type                                 | Size | d <sub>2</sub>                     | l <sub>2</sub>                     | G <sub>2</sub>                 | l                              | l                                                                                                                  | kg    | kg             |         |                                                                                     |                                                                                      |    |         |                                                                                       |
| <b>H4SH</b>                          | 19   | 290 n6                             | 470                                | 465                            | 360                            |                                                                                                                    | 6800  |                | 2 - 0 A |  |                                                                                      |    |         |                                                                                       |
|                                      | 20   | 300 n6                             | 500                                | 465                            | 380                            |                                                                                                                    | 8200  |                | 2 - 1 A |                                                                                     |                                                                                      |    |         |                                                                                       |
|                                      | 21   | 320 n6                             | 500                                | 490                            | 395                            |                                                                                                                    | 9200  |                | 2 - 2 A |                                                                                     |                                                                                      |    |         |                                                                                       |
|                                      | 22   | 340 n6                             | 550                                | 490                            | 420                            |                                                                                                                    | 9900  |                | 2 - 3 A |                                                                                     |                                                                                      |    |         |                                                                                       |
|                                      | 23   | 360 n6                             | 590                                | 540                            | 520                            |                                                                                                                    | 12000 |                | 2 - 4 A |                                                                                     |                                                                                      |    |         |                                                                                       |
|                                      | 24   | 380 n6                             | 590                                | 540                            | 550                            |                                                                                                                    | 13500 |                | 2 - 5 A |                                                                                     |                                                                                      |    |         |                                                                                       |
| <b>Hollow shaft for shrink disk</b>  |      |                                    |                                    |                                |                                |                                                                                                                    |       |                |         |                                                                                     |                                                                                      |    |         |                                                                                       |
| Type                                 | Size | D <sub>2</sub>                     | D <sub>3</sub>                     | G <sub>4</sub>                 | G <sub>5</sub>                 | l                                                                                                                  | l     | kg             | kg      |                                                                                     |                                                                                      |    |         |                                                                                       |
| <b>H4DH/<br/>H4DM</b>                | 19   | 285 H7                             | 295                                | 465                            | 670                            | 360                                                                                                                | 310   | 6800           | 6300    | 2 - 0 C                                                                             |   |    |         |                                                                                       |
|                                      | 20   | 310 H7                             | 315                                | 465                            | 670                            | 380                                                                                                                | 330   | 8200           | 7700    | 2 - 1 C                                                                             |                                                                                      |    |         |                                                                                       |
|                                      | 21   | 330 H7                             | 335                                | 490                            | 715                            | 395                                                                                                                | 430   | 9200           | 8600    | 2 - 2 C                                                                             |                                                                                      |    |         |                                                                                       |
|                                      | 22   | 340 H7                             | 345                                | 490                            | 725                            | 420                                                                                                                | 450   | 9900           | 9400    | 2 - 3 C                                                                             |                                                                                      |    |         |                                                                                       |
|                                      | 23   | 370 H7                             | 375                                | 540                            | 800                            | 520                                                                                                                | 565   | 12000          | 11400   | 2 - 4 C                                                                             |                                                                                      |    |         |                                                                                       |
|                                      | 24   | 390 H7                             | 395                                | 540                            | 825                            | 550                                                                                                                | 600   | 13500          | 12800   | 2 - 5 C                                                                             |                                                                                      |    |         |                                                                                       |
| <b>Hollow shaft with spline</b>      |      |                                    |                                    |                                |                                |                                                                                                                    |       |                |         |                                                                                     |                                                                                      |    |         |                                                                                       |
| Type                                 | Size | N/DIN 5480                         | D <sub>2</sub>                     | D <sub>3</sub>                 | G <sub>4</sub>                 | l                                                                                                                  | l     | kg             | kg      |                                                                                     |                                                                                      |    |         |                                                                                       |
| <b>H4KH/<br/>H4KM</b>                | 19   | On request                         |                                    |                                |                                | 360                                                                                                                | 310   | 6800           | 6300    | 2 - 0 D                                                                             |  |    |         |                                                                                       |
|                                      | 20   | On request                         |                                    |                                |                                | 380                                                                                                                | 330   | 8200           | 7700    | 2 - 1 D                                                                             |                                                                                      |    |         |                                                                                       |
|                                      | 21   | On request                         |                                    |                                |                                | 395                                                                                                                | 430   | 9200           | 8600    | 2 - 2 D                                                                             |                                                                                      |    |         |                                                                                       |
|                                      | 22   | On request                         |                                    |                                |                                | 420                                                                                                                | 450   | 9900           | 9400    | 2 - 3 D                                                                             |                                                                                      |    |         |                                                                                       |
|                                      | 23   | On request                         |                                    |                                |                                |                                                                                                                    |       |                |         | 2 - 4 D                                                                             |                                                                                      |    |         |                                                                                       |
|                                      | 24   | On request                         |                                    |                                |                                |                                                                                                                    |       |                |         | 2 - 5 D                                                                             |                                                                                      |    |         |                                                                                       |
| <b>Flanged shaft</b>                 |      |                                    |                                    |                                |                                |                                                                                                                    |       |                |         |                                                                                     |                                                                                      |    |         |                                                                                       |
| Type                                 | Size | c                                  | d <sub>2</sub>                     | D <sub>3</sub>                 | k <sub>2</sub>                 | n x s                                                                                                              | t     | G <sub>7</sub> | l       | l                                                                                   | kg                                                                                   | kg |         |                                                                                       |
| <b>H4FH/<br/>H4FM</b>                | 19   | 65                                 | 860                                | 460 H6                         | 770                            | 30x39                                                                                                              | 18    | 670            | 360     | 310                                                                                 | On request                                                                           |    | 2 - 0 E |  |
|                                      | 20   | 65                                 | 930                                | 460 H6                         | 830                            | 32x39                                                                                                              | 18    | 670            | 380     | 330                                                                                 | On request                                                                           |    | 2 - 1 E |                                                                                       |
|                                      | 21   | 75                                 | 950                                | 520 H6                         | 850                            | 28x45                                                                                                              | 20    | 710            | 395     | 430                                                                                 | On request                                                                           |    | 2 - 2 E |                                                                                       |
|                                      | 22   | 75                                 | 1040                               | 520 H6                         | 940                            | 28x45                                                                                                              | 20    | 710            | 420     | 450                                                                                 | On request                                                                           |    | 2 - 3 E |                                                                                       |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

# Helical gear units horizontal mounting position

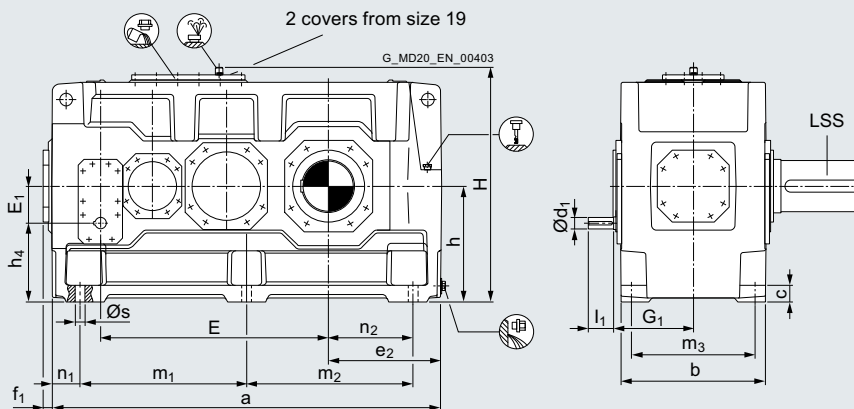
## Type H4

### Gear unit dimensions, four-stage, gear unit sizes 25 to 28

#### Selection and ordering data

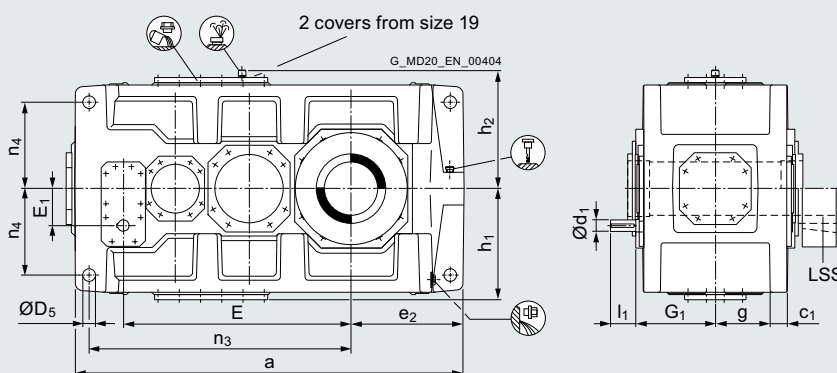
##### H4.H

2LP302-...60-....



##### H4.M

2LP302-...61-....



| Gear unit size |         | Dimensions in mm              |       |       |  |
|----------------|---------|-------------------------------|-------|-------|--|
|                |         | <b>High speed shaft (HSS)</b> |       |       |  |
|                | $i_N$   | $d_1$                         | $l_1$ | $G_1$ |  |
| <b>25</b>      | 100-160 | 100 m6                        | 205   | 575   |  |
|                | 180-355 | 85 m6                         | 170   | 575   |  |
| <b>26</b>      | 112-180 | 100 m6                        | 205   | 575   |  |
|                | 200-400 | 85 m6                         | 170   | 575   |  |
| <b>27</b>      | 100-160 | 120 n6                        | 210   | 645   |  |
|                | 180-355 | 100 m6                        | 210   | 645   |  |
| <b>28</b>      | 112-180 | 120 n6                        | 210   | 645   |  |
|                | 200-400 | 100 m6                        | 210   | 645   |  |

| Gear unit size | Dimensions in mm |      |     |        |        |      |       |       |       |     |      |          |       |       |       |       |       |       |       |       |       |       |    |  |
|----------------|------------------|------|-----|--------|--------|------|-------|-------|-------|-----|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|--|
|                | a                | b    | c   | $c_1$  | $D_5$  | E    | $E_1$ | $e_2$ | $f_1$ | g   | H    | $h^{1)}$ | $h_1$ | $h_2$ | $h_4$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |  |
| <b>25</b>      | 2830             | 1045 | 130 | 120 ±2 | 90 H9  | 1695 | 265   | 790   | 35    | 400 | 1740 | 860      | 860   | 880   | 595   | 1215  | 1215  | 910   | 200   | 590   | 1965  | 660   | 66 |  |
| <b>26</b>      | 3010             | 1045 | 130 | 120 ±2 | 90 H9  | 1785 | 265   | 880   | 35    | 400 | 1740 | 860      | 860   | 880   | 595   | 1215  | 1395  | 910   | 200   | 680   | 2055  | 660   | 66 |  |
| <b>27</b>      | 3220             | 1170 | 150 | 145 ±2 | 100 H9 | 1927 | 320   | 880   | 40    | 440 | 1900 | 950      | 930   | 950   | 630   | 1390  | 1390  | 1030  | 220   | 660   | 2260  | 720   | 74 |  |
| <b>28</b>      | 3410             | 1170 | 150 | 145 ±2 | 100 H9 | 2022 | 320   | 975   | 40    | 440 | 1900 | 950      | 930   | 950   | 630   | 1390  | 1580  | 1030  | 220   | 755   | 2355  | 720   | 74 |  |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.



# Helical gear units horizontal mounting position

## Type H4 / Types H1, H2, H3 and H4

### Gear unit dimensions, four-stage, gear unit sizes 25 to 28

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                       |           | Oil quantity 1) | Oil quantity 1) | Weight 1) 2)   | Weight 1) 2)   | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 4/33 to 4/37 |       |       |       |       |                               |  |
|-----------------------|-----------|-----------------|-----------------|----------------|----------------|--------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------------------------------|--|
|                       |           | H4.H            | H4.M            | H4.H           | H4.M           | Article No.: <b>2LP302</b> ■ - ■ ■ .6-....                                                                         |       |       |       |       |                               |  |
| Type                  | Size      | d <sub>2</sub>  | l <sub>2</sub>  | G <sub>2</sub> | l              | l                                                                                                                  | kg    | kg    |       |       | Solid shaft with parallel key |  |
| <b>H4SH</b>           | <b>25</b> | 400 n6          | 650             | 605            | 735            |                                                                                                                    | 16300 |       | 2     | - 6 A |                               |  |
|                       | <b>26</b> | 420 n6          | 650             | 605            | 780            |                                                                                                                    | 18000 |       | 2     | - 7 A |                               |  |
|                       | <b>27</b> | 440 n6          | 690             | 680            | 1055           |                                                                                                                    | 23000 |       | 2     | - 8 A |                               |  |
|                       | <b>28</b> | 460 n6          | 750             | 680            | 1110           |                                                                                                                    | 26200 |       | 3     | - 0 A |                               |  |
| Type                  | Size      | D <sub>2</sub>  | D <sub>3</sub>  | G <sub>4</sub> | G <sub>5</sub> | l                                                                                                                  | l     | kg    | kg    |       | Hollow shaft for shrink disk  |  |
| <b>H4DH/<br/>H4DM</b> | <b>25</b> | 410 H7          | 415             | 610            | 895            | 735                                                                                                                | 800   | 16300 | 15500 | 2     | - 6 C                         |  |
|                       | <b>26</b> | 430 H7          | 435             | 610            | 925            | 780                                                                                                                | 850   | 18000 | 17100 | 2     | - 7 C                         |  |
|                       | <b>27</b> | 460 H7          | 465             | 680            | 1000           | 1055                                                                                                               | 1150  | 23000 | 22000 | 2     | - 8 C                         |  |
|                       | <b>28</b> | 470 H7          | 475             | 680            | 1020           | 1110                                                                                                               | 1210  | 26200 | 25000 | 3     | - 0 C                         |  |
| Type                  | Size      | N/DIN 5480      | D <sub>2</sub>  | D <sub>3</sub> | G <sub>4</sub> | l                                                                                                                  | l     | kg    | kg    |       | Hollow shaft with spline      |  |
| <b>H4KH/<br/>H4KM</b> | <b>25</b> | On request      |                 |                |                |                                                                                                                    |       |       |       | 2     | - 6 D                         |  |
|                       | <b>26</b> | On request      |                 |                |                |                                                                                                                    |       |       |       | 2     | - 7 D                         |  |
|                       | <b>27</b> | On request      |                 |                |                |                                                                                                                    |       |       |       | 2     | - 8 D                         |  |
|                       | <b>28</b> | On request      |                 |                |                |                                                                                                                    |       |       |       | 3     | - 0 D                         |  |

Shaft seals, see page 10/2 onwards.  
For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.  
1) Approximate values; exact data acc. to order-related documentation.  
2) Without oil filling.

#### Article No. overview

#### Selection and ordering data

##### Article No., 10th to 12th position

|                          |      |      |      |      | Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11       | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|--------------------------|------|------|------|------|----------------------------------|---------------|---|---|---|----|----------|----|----|----|----|----|---------------------|
|                          |      |      |      |      | Article No.                      | <b>2LP302</b> | . | . | . | ■  | ■        | ■  | .  | .  | .  | .  | -Z . . . .          |
| <b>Ratio</b>             |      |      |      |      |                                  |               |   |   |   |    |          |    |    |    |    |    |                     |
| Type                     | H1.H | H2.H | H3.H | H4.H |                                  |               |   |   |   |    |          |    |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 1.25 | 6.3  | 22.4 | 100  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>A</b>            |
| <b>i<sub>N</sub></b>     | 1.4  | 7.1  | 25   | 112  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>B</b>            |
| <b>i<sub>N</sub></b>     | 1.6  | 8    | 28   | 125  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>C</b>            |
| <b>i<sub>N</sub></b>     | 1.8  | 9    | 31.5 | 140  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>D</b>            |
| <b>i<sub>N</sub></b>     | 2    | 10   | 35.5 | 160  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>E</b>            |
| <b>i<sub>N</sub></b>     | 2.24 | 11.2 | 40   | 180  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>F</b>            |
| <b>i<sub>N</sub></b>     | 2.5  | 12.5 | 45   | 200  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>G</b>            |
| <b>i<sub>N</sub></b>     | 2.8  | 14   | 50   | 224  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>H</b>            |
| <b>i<sub>N</sub></b>     | 3.15 | 16   | 56   | 250  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>J</b>            |
| <b>i<sub>N</sub></b>     | 3.55 | 18   | 63   | 280  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>K</b>            |
| <b>i<sub>N</sub></b>     | 4    | 20   | 71   | 315  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>L</b>            |
| <b>i<sub>N</sub></b>     | 4.5  | 22.4 | 80   | 355  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>M</b>            |
| <b>i<sub>N</sub></b>     | 5    | 25   | 90   | 400  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>N</b>            |
| <b>i<sub>N</sub></b>     | 5.6  | 28   | 100  | 450  |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>P</b>            |
| <b>i<sub>N</sub></b>     | -    | -    | 112  | -    |                                  |               |   |   |   |    |          |    |    |    |    |    | <b>Q</b>            |
| <b>Type designation</b>  |      |      |      |      |                                  |               |   |   |   |    |          |    |    |    |    |    |                     |
| Type H1                  |      |      |      |      |                                  |               |   |   |   |    | <b>3</b> |    |    |    |    |    |                     |
| Type H2                  |      |      |      |      |                                  |               |   |   |   |    | <b>4</b> |    |    |    |    |    |                     |
| Type H3                  |      |      |      |      |                                  |               |   |   |   |    | <b>5</b> |    |    |    |    |    |                     |
| Type H4                  |      |      |      |      |                                  |               |   |   |   |    | <b>6</b> |    |    |    |    |    |                     |
| <b>Mounting position</b> |      |      |      |      |                                  |               |   |   |   |    |          |    |    |    |    |    |                     |
| Mounting position H      |      |      |      |      |                                  |               |   |   |   |    | <b>0</b> |    |    |    |    |    |                     |
| Mounting position M      |      |      |      |      |                                  |               |   |   |   |    | <b>1</b> |    |    |    |    |    |                     |



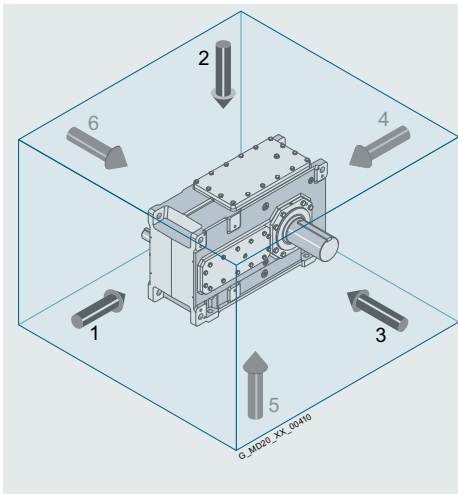
# Helical gear units horizontal mounting position

Types H1, H2, H3 and H4

## Article No. overview

### Overview

#### Article No., 13th position



Irrespective of the mounting position of the gear unit, the face designations "right" and "left" always refer to the horizontal mounting position with the view on side 1.  
 Side 2 is on top.  
 Mounting cover on top (2),  
 looking at drive front face (1):  
 Side 3 = right  
 Side 6 = left

|                                  |                  |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                    |
|----------------------------------|------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|--------------------|
| Data position of the Article No. | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "Z" and order code |
| Article No.                      | 2LP302 . . . . . |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | Z . . . . .        |

#### Variants/shaft arrangement (looking at side 2)

| Type | H1.H                | H2.H                | H3.H                | H4.H                |
|------|---------------------|---------------------|---------------------|---------------------|
| A    | <br>G_MD20_XX_00018 | <br>G_MD20_XX_00022 | <br>G_MD20_XX_00031 | <br>G_MD20_XX_00040 |
| B    | <br>G_MD20_XX_00019 | <br>G_MD20_XX_00023 | <br>G_MD20_XX_00032 | <br>G_MD20_XX_00041 |
| C    | ---                 | <br>G_MD20_XX_00024 | <br>G_MD20_XX_00033 | <br>G_MD20_XX_00042 |
| D    | ---                 | <br>G_MD20_XX_00025 | <br>G_MD20_XX_00034 | <br>G_MD20_XX_00043 |

0  
1  
2  
3

For details on the backstops  $G_8$ , see page 10/23 onwards.

□/■ Backstop

--- Extended version of the fan cover up to size 12

① Backstop size 7 – 10

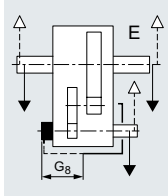
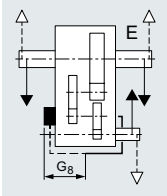
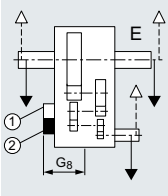
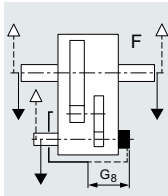
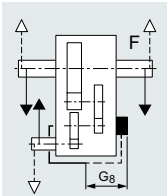
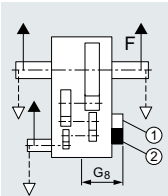
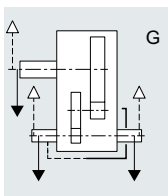
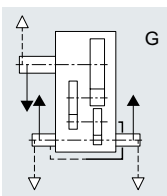
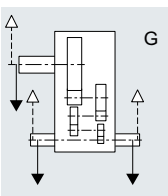
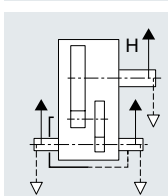
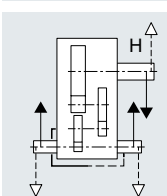
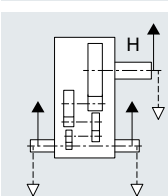
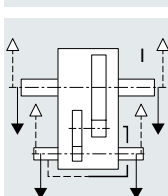
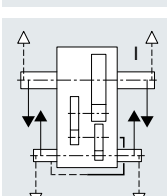
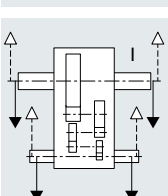
② Backstop size 11 or larger

# Helical gear units horizontal mounting position

Types H1, H2, H3 and H4

Article No. overview

**Selection and ordering data** (continued)

|                                                       |                                                                                                        |                                                                                                        |                                                                                                        | Data position of the Article No. | 1 to 6           | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |             |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------|------------------|---|---|---|----|----|----|----|----|----|----|---------------------|-------------|
|                                                       |                                                                                                        |                                                                                                        |                                                                                                        | Article No.                      | 2LP302 . . . . . |   |   |   |    |    |    |    |    |    |    |                     | Z . . . . . |
| <b>Variants/shaft arrangement (looking at side 2)</b> |                                                                                                        |                                                                                                        |                                                                                                        |                                  |                  |   |   |   |    |    |    |    |    |    |    |                     |             |
| Type                                                  | H1.H                                                                                                   | H2.H                                                                                                   | H3.H                                                                                                   | H4.H                             |                  |   |   |   |    |    |    |    |    |    |    |                     |             |
| E -                                                   | <br>G_MD20_XX_00026   | <br>G_MD20_XX_00035   | <br>G_MD20_XX_00044   |                                  |                  |   |   |   |    |    |    |    |    |    |    | 4                   |             |
| F -                                                   | <br>G_MD20_XX_00027   | <br>G_MD20_XX_00036   | <br>G_MD20_XX_00045   |                                  |                  |   |   |   |    |    |    |    |    |    |    | 5                   |             |
| G -                                                   | <br>G_MD20_XX_00028  | <br>G_MD20_XX_00037  | <br>G_MD20_XX_00046  |                                  |                  |   |   |   |    |    |    |    |    |    |    | 6                   |             |
| H -                                                   | <br>G_MD20_XX_00029 | <br>G_MD20_XX_00038 | <br>G_MD20_XX_00047 |                                  |                  |   |   |   |    |    |    |    |    |    |    | 7                   |             |
| I -                                                   | <br>G_MD20_XX_00030 | <br>G_MD20_XX_00039 | <br>G_MD20_XX_00048 |                                  |                  |   |   |   |    |    |    |    |    |    |    | 8                   |             |

4

Detailed information on the versions "high speed shaft both ends" G, H, I are available [on page 4/38](#).

The versions E and F with slow speed shaft at both ends are only relevant for the shaft variants

- "S" (solid shaft with parallel key acc. to DIN 6885/1)
- "V" (reinforced solid shaft with parallel key acc. to DIN 6885/1)
- "C" (solid shaft for zero-backlash taper clamping connection)

The solid shaft extension shown represents the driven machine shaft insertion side for hollow shafts.

The slow speed hollow shaft "H" (hollow shaft with keyway according to DIN 6885/1) is generally suitable for fitting on both ends.

For details on the backstops  $G_8$ , see [page 10/23 onwards](#).

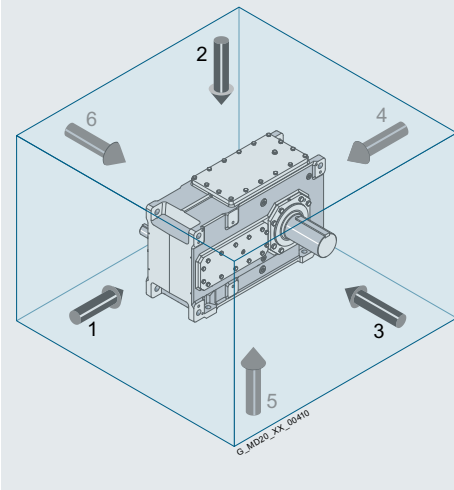
- /■ Backstop
- Extended version of the fan cover up to size 12
- ① Backstop size 7 – 10
- ② Backstop size 11 or larger

# Helical gear units horizontal mounting position

Types H1, H2, H3 and H4

## Article No. overview

### Selection and ordering data (continued)



Irrespective of the mounting position of the gear unit, the face designations "right" and "left" always refer to the horizontal mounting position with the view on side 1.

Side 2 is on top.

Mounting cover on top (2),

looking at drive front face (1):

Side 3 = right

Side 6 = left

### Article No. supplement, 14th position

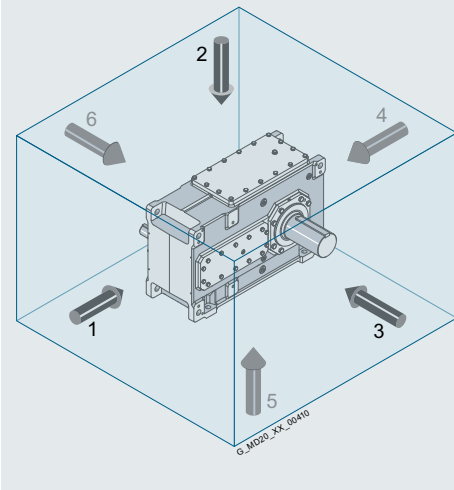
|                                                             | Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|-------------------------------------------------------------|----------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|---------------------|
| Article No.                                                 |                                  | <b>2LP302</b> | . | - | . | .  | .  | .  | .  | .  | ■  | .  | -Z ■ ■ ■            |
| <b>Sealing single-side high speed shaft (HSS)</b>           |                                  |               |   |   |   |    |    |    |    |    |    |    |                     |
| Radial shaft seal                                           |                                  |               |   |   |   |    |    |    |    |    |    |    | A                   |
| Labyrinth                                                   |                                  |               |   |   |   |    |    |    |    |    |    |    | C                   |
| Labyrinth with V-seal                                       |                                  |               |   |   |   |    |    |    |    |    |    |    | D                   |
| Taconite E                                                  |                                  |               |   |   |   |    |    |    |    |    |    |    | E                   |
| <b>Sealing double-extended high speed shaft (HSS)</b>       |                                  |               |   |   |   |    |    |    |    |    |    |    |                     |
| Side 3: Radial shaft seal/Side 6: Radial shaft seal         |                                  |               |   |   |   |    |    |    |    |    |    |    | Z P 0 A             |
| Side 3: Labyrinth/Side 6: Labyrinth                         |                                  |               |   |   |   |    |    |    |    |    |    |    | Z P 0 C             |
| Side 3: Labyrinth with V-seal/Side 6: Labyrinth with V-seal |                                  |               |   |   |   |    |    |    |    |    |    |    | Z P 0 D             |
| Side 3: Taconite E/Side 6: Taconite E                       |                                  |               |   |   |   |    |    |    |    |    |    |    | Z P 0 E             |
| Side 3: Radial shaft seal/Side 6: Taconite E                |                                  |               |   |   |   |    |    |    |    |    |    |    | Z P 1 A             |
| Side 3: Taconite E/Side 6: Radial shaft seal                |                                  |               |   |   |   |    |    |    |    |    |    |    | Z P 1 B             |

# Helical gear units horizontal mounting position

Types H1, H2, H3 and H4

Article No. overview

## Selection and ordering data (continued)



Irrespective of the mounting position of the gear unit, the face designations "right" and "left" always refer to the horizontal mounting position with the view on side 1.

Side 2 is on top.  
Mounting cover on top (2),  
looking at drive front face (1):  
Side 3 = right  
Side 6 = left

## Article No. supplement, 15th and 16th position

| Data position of the Article No.                                                                      | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code   |
|-------------------------------------------------------------------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------------|
| Article No.                                                                                           | <b>2LP302</b> | . | - | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b>             |
| <b>Sealing low speed shaft (LSS)</b>                                                                  |               |   |   |   |    |    |    |    |    |    |    |                       |
| Radial shaft seal                                                                                     |               |   |   |   |    |    |    |    |    |    |    | <b>A</b>              |
| Labyrinth                                                                                             |               |   |   |   |    |    |    |    |    |    |    | <b>C</b>              |
| Labyrinth with V-seal                                                                                 |               |   |   |   |    |    |    |    |    |    |    | <b>D</b>              |
| Taconite F                                                                                            |               |   |   |   |    |    |    |    |    |    |    | <b>E</b>              |
| Taconite F-F                                                                                          |               |   |   |   |    |    |    |    |    |    |    | <b>F</b>              |
| Taconite F-H                                                                                          |               |   |   |   |    |    |    |    |    |    |    | <b>G</b>              |
| Taconite F-K                                                                                          |               |   |   |   |    |    |    |    |    |    |    | <b>H</b>              |
| <b>Sealing double-extended low speed shaft (LSS)</b>                                                  |               |   |   |   |    |    |    |    |    |    |    |                       |
| Side 3: Radial shaft seal/Side 6: Radial shaft seal                                                   |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 0 A</b> |
| Side 3: Labyrinth/Side 6: Labyrinth                                                                   |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 0 C</b> |
| Side 3: Labyrinth with V-seal/Side 6: Labyrinth with V-seal                                           |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 0 D</b> |
| Side 3: Taconite F/Side 6: Taconite F                                                                 |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 0 E</b> |
| Side 3: Radial shaft seal/Side 6: Taconite F                                                          |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 1 A</b> |
| Side 3: Taconite F/Side 6: Radial shaft seal                                                          |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 1 B</b> |
| <b>Shaft version</b>                                                                                  |               |   |   |   |    |    |    |    |    |    |    |                       |
| High speed shaft (HSS) version: Catalog version,<br>low speed shaft (LSS) version: Catalog version    |               |   |   |   |    |    |    |    |    |    |    | <b>0</b>              |
| High speed shaft (HSS) version: Reinforced version,<br>low speed shaft (LSS) version: Catalog version |               |   |   |   |    |    |    |    |    |    |    | <b>1</b>              |



## Helical gear units horizontal mounting position

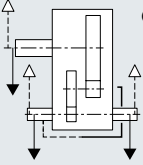
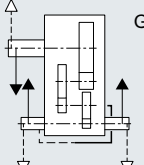
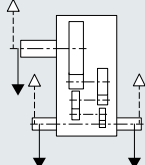
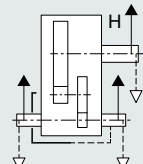
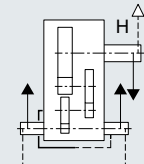
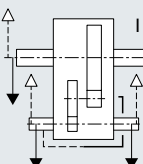
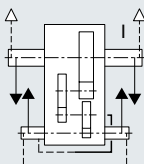
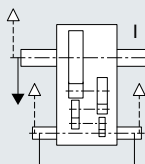
Types H1, H2, H3 and H4

### Shaft extension on both sides – Gear unit versions G, H and I

#### Overview

Types and ratio ranges for standardized shaft extension on both sides with identical dimensions of both shaft ends in the dimensions of high speed single-sided shafts (HSS).

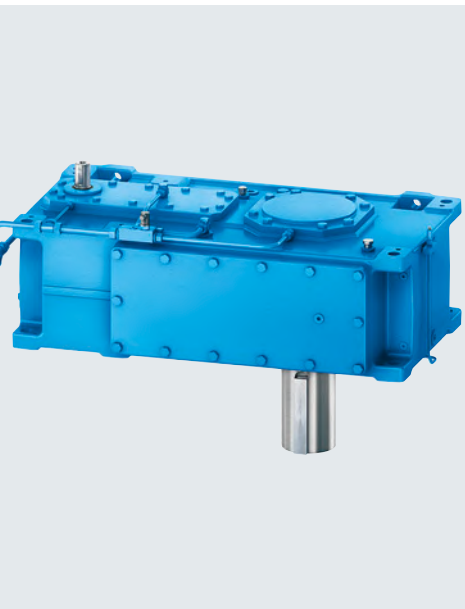
#### Versions G, H and I

| Type H2                                                                            |                |          | Type H3                                                                            |                |            | Type H4                                                                              |                |           |
|------------------------------------------------------------------------------------|----------------|----------|------------------------------------------------------------------------------------|----------------|------------|--------------------------------------------------------------------------------------|----------------|-----------|
| Version G                                                                          |                |          | Version G                                                                          |                |            | Version G                                                                            |                |           |
|   |                |          |   |                |            |   |                |           |
| G_MD20_XX_00028                                                                    |                |          | G_MD20_XX_00037                                                                    |                |            | G_MD20_XX_00046                                                                      |                |           |
| Version H                                                                          |                |          | Version H                                                                          |                |            | Version H                                                                            |                |           |
|   |                |          |   |                |            |   |                |           |
| G_MD20_XX_00029                                                                    |                |          | G_MD20_XX_00038                                                                    |                |            | G_MD20_XX_00047                                                                      |                |           |
| Version I                                                                          |                |          | Version I                                                                          |                |            | Version I                                                                            |                |           |
|  |                |          |  |                |            |  |                |           |
| G_MD20_XX_00030                                                                    |                |          | G_MD20_XX_00039                                                                    |                |            | G_MD20_XX_00048                                                                      |                |           |
| Type                                                                               | Gear unit size | Ratio    | Type                                                                               | Gear unit size | Ratio      | Type                                                                                 | Gear unit size | Ratio     |
| H2                                                                                 | 4              | 6.3 - 18 | –                                                                                  | –              | –          | –                                                                                    | –              | –         |
| H2                                                                                 | 5              | 6.3 - 18 | H3                                                                                 | 5              | 25 - 90    | –                                                                                    | –              | –         |
| H2                                                                                 | 6              | 8 - 22.4 | H3                                                                                 | 6              | 31.5 - 112 | –                                                                                    | –              | –         |
| H2                                                                                 | 7              | 6.3 - 16 | H3                                                                                 | 7              | 25 - 90    | H4                                                                                   | 7              | 100 - 224 |
| H2                                                                                 | 8              | 8 - 20   | H3                                                                                 | 8              | 31.5 - 112 | H4                                                                                   | 8              | 125 - 280 |
| H2                                                                                 | 9              | 6.3 - 16 | H3                                                                                 | 9              | 25 - 90    | H4                                                                                   | 9              | 100 - 250 |
| H2                                                                                 | 10             | 8 - 20   | H3                                                                                 | 10             | 31.5 - 112 | H4                                                                                   | 10             | 125 - 315 |
| H2                                                                                 | 11             | 6.3 - 18 | H3                                                                                 | 11             | 25 - 90    | H4                                                                                   | 11             | 100 - 250 |
| H2                                                                                 | 12             | 8 - 22.4 | H3                                                                                 | 12             | 31.5 - 112 | H4                                                                                   | 12             | 125 - 315 |
| H2                                                                                 | 13             | 6.3 - 16 | H3                                                                                 | 13             | 22.4 - 90  | H4                                                                                   | 13             | 100 - 250 |
| H2                                                                                 | 14             | 8 - 20   | H3                                                                                 | 14             | 28 - 112   | H4                                                                                   | 14             | 125 - 315 |
| H2                                                                                 | 15             | 6.3 - 16 | H3                                                                                 | 15             | 22.4 - 90  | H4                                                                                   | 15             | 100 - 250 |
| H2                                                                                 | 16             | 7.1 - 18 | H3                                                                                 | 16             | 25 - 100   | H4                                                                                   | 16             | 112 - 280 |
| H2                                                                                 | 17             | 6.3 - 16 | H3                                                                                 | 17             | 22.4 - 90  | –                                                                                    | –              | –         |
| H2                                                                                 | 18             | 7.1 - 18 | H3                                                                                 | 18             | 25 - 100   | –                                                                                    | –              | –         |

For other ratios for solutions with different diameters, please contact Flender.

Please contact Flender regarding types and sizes that are not listed.

## Helical gear units Vertical mounting position

**5/2****Type H2**Gear unit dimensions

|      |                                      |
|------|--------------------------------------|
| 5/2  | Two-stage, gear unit sizes 4 to 8    |
| 5/4  | Two-stage, gear unit sizes 9 to 18   |
| 5/6  | Two-stage, gear unit sizes 13 to 18  |
| 5/8  | Two-stage, gear unit sizes 19 to 24  |
| 5/10 | Two-stage, gear unit sizes 25 and 26 |

**5/12****Type H3**Gear unit dimensions

|      |                                        |
|------|----------------------------------------|
| 5/12 | Three-stage, gear unit sizes 5 to 8    |
| 5/14 | Three-stage, gear unit sizes 9 to 12   |
| 5/16 | Three-stage, gear unit sizes 13 to 16  |
| 5/18 | Three-stage, gear unit sizes 17 to 20  |
| 5/20 | Three-stage, gear unit sizes 21 to 24  |
| 5/22 | Three-stage, gear unit sizes 25 and 26 |

**5/24****Type H4**Gear unit dimensions

|      |                                      |
|------|--------------------------------------|
| 5/24 | Four-stage, gear unit sizes 7 to 12  |
| 5/26 | Four-stage, gear unit sizes 13 to 18 |
| 5/28 | Four-stage, gear unit sizes 19 to 22 |
| 5/30 | Four-stage, gear unit sizes 23 to 26 |

**5/31****Type H4 / Types H2, H3 and H4**Article No. overview

|      |                                                |
|------|------------------------------------------------|
| 5/31 | Article No., 10th to 12th position             |
| 5/32 | Article No., 13th position                     |
| 5/34 | Article No. supplement, 14th position          |
| 5/35 | Article No. supplement, 15th and 16th position |

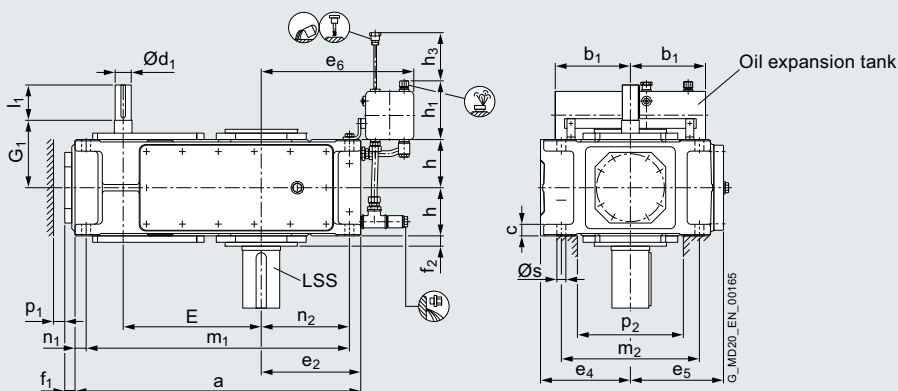
# Helical gear units vertical mounting position

Type H2

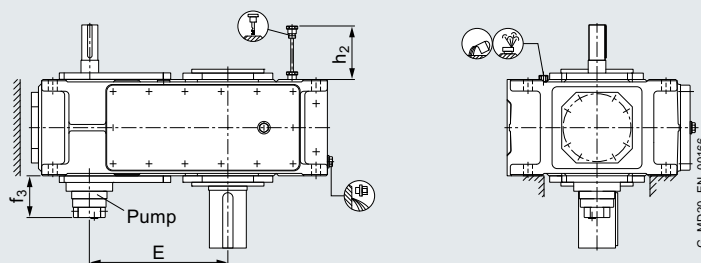
Gear unit dimensions, two-stage, gear unit sizes 4 to 8

## Selection and ordering data

**H2.V**  
Dip lubrication  
2LP302-...42-....



**H2.V**  
Forced lubrication  
by flange-mounted pump  
2LP302-...42-....



| Gear unit size |             | Dimensions in mm       |       |       |  |
|----------------|-------------|------------------------|-------|-------|--|
| Gear unit size |             | High speed shaft (HSS) |       |       |  |
|                | $l_N$       | $d_1$                  | $l_1$ | $G_1$ |  |
| 4              | 6.3 - 11.2  | 45 m6                  | 100   | 170   |  |
|                | 12.5 - 22.4 | 32 m6                  | 80    |       |  |
| 5              | 6.3 - 11.2  | 50 m6                  | 100   | 195   |  |
|                | 12.5 - 22.4 | 38 m6                  | 80    |       |  |
| 6              | 8 - 14      | 50 m6                  | 100   | 195   |  |
|                | 16 - 28     | 38 m6                  | 80    |       |  |
| 7              | 6.3 - 11.2  | 60 m6                  | 135   | 210   |  |
|                | 12.5 - 22.4 | 50 m6                  | 110   |       |  |
| 8              | 8 - 14      | 60 m6                  | 135   | 210   |  |
|                | 16 - 28     | 50 m6                  | 110   |       |  |

| Gear unit size | a   | $b_1$ | c          | $e_2$ | $e_4$ | $e_5$ | $e_6$ | E   | $f_1$ | $f_2$ | $f_3^{1)}$ | h     | $h_1$ | $h_2^{2)}$ | $h_3$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1$ | $p_2^{3)}$ | s     |
|----------------|-----|-------|------------|-------|-------|-------|-------|-----|-------|-------|------------|-------|-------|------------|-------|-------|-------|-------|-------|-------|------------|-------|
| 4              | 565 | 150   | $30 \pm 1$ | 190   | 200   | 215   | 320   | 270 | 28    | 22    | -          | 107.5 | 165   | -          | 180   | 505   | 300   | 30    | 160   | 35    | 220        | 24 H9 |
| 5              | 640 | 240   | $30 \pm 1$ | 205   | 230   | 252   | 385   | 315 | 38    | 28    | 150        | 127.5 | 205   | 190        | 240   | 580   | 360   | 30    | 175   | 35    | 270        | 24 H9 |
| 6              | 720 | 240   | $30 \pm 1$ | 250   | 230   | 252   | 425   | 350 | 38    | 28    | 150        | 127.5 | 205   | 190        | 240   | 660   | 360   | 30    | 220   | 35    | 270        | 24 H9 |
| 7              | 785 | 240   | $36 \pm 1$ | 250   | 280   | 292   | 425   | 385 | 42    | 30    | 145        | 150   | 205   | 165        | 250   | 715   | 430   | 35    | 215   | 35    | 330        | 28 H9 |
| 8              | 890 | 240   | $36 \pm 1$ | 310   | 280   | 302   | 485   | 430 | 42    | 32    | 145        | 150   | 205   | 165        | 250   | 820   | 430   | 35    | 275   | 35    | 330        | 28 H9 |

For details on the shafts, see Chapter 9.

- 1) Flange-mounted pump not in connection with versions G, H and I.
- 2) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.
- 3) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.



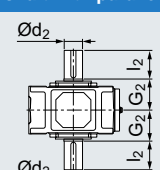
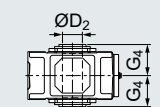
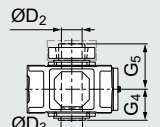
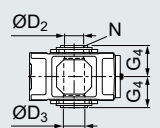
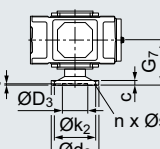
# Helical gear units vertical mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 4 to 8

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                              |          |                          |         | Oil quantity<br>1)                                   | Oil quantity<br>1)           | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 5/31 to 5/35 |       |       |                                                                                     |                                                                                       |       |   |                                                                                       |
|------------------------------|----------|--------------------------|---------|------------------------------------------------------|------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------|-------|-------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------|---|---------------------------------------------------------------------------------------|
|                              |          |                          |         | H2.V with dip lubrication                            | H2.V with forced lubrication | H2.V            |                                                                                                                    |       |       |                                                                                     |                                                                                       |       |   |                                                                                       |
|                              |          |                          |         | Article No.: <b>2LP302</b> - ■ - ■ ■ <b>.42-....</b> |                              |                 |                                                                                                                    |       |       |                                                                                     |                                                                                       |       |   |                                                                                       |
| Type                         | Size     | $d_2$                    | $l_2$   | $G_2$                                                | $l$                          | $l$             | kg                                                                                                                 |       |       | Solid shaft with parallel key <sup>4)</sup>                                         |                                                                                       |       |   |                                                                                       |
| <b>H2SV</b>                  | <b>4</b> | 80 m6                    | 170     | 140                                                  | 23                           | –               | 190                                                                                                                | 0 - 3 | A     |  |                                                                                       |       |   |                                                                                       |
|                              | <b>5</b> | 100 m6                   | 210     | 165                                                  | 35                           | 17.5            | 300                                                                                                                | 0 - 4 | A     |                                                                                     |                                                                                       |       |   |                                                                                       |
|                              | <b>6</b> | 110 n6                   | 210     | 165                                                  | 37                           | 18.5            | 355                                                                                                                | 0 - 5 | A     |                                                                                     |                                                                                       |       |   |                                                                                       |
|                              | <b>7</b> | 120 n6                   | 210     | 195                                                  | 62                           | 31              | 505                                                                                                                | 0 - 6 | A     |                                                                                     |                                                                                       |       |   |                                                                                       |
|                              | <b>8</b> | 130 n6                   | 250     | 195                                                  | 69                           | 35              | 590                                                                                                                | 0 - 7 | A     |                                                                                     |                                                                                       |       |   |                                                                                       |
| Type                         | Size     | $D_2$                    | $G_4$   |                                                      | $l$                          | $l$             | kg                                                                                                                 |       |       | Hollow shaft with keyway                                                            |                                                                                       |       |   |                                                                                       |
| <b>H2HV</b>                  | <b>4</b> | 80 H7                    | 140     |                                                      | 23                           | –               | 190                                                                                                                | 0 - 3 | B     |  |                                                                                       |       |   |                                                                                       |
|                              | <b>5</b> | 95 H7                    | 165     |                                                      | 35                           | 17.5            | 300                                                                                                                | 0 - 4 | B     |                                                                                     |                                                                                       |       |   |                                                                                       |
|                              | <b>6</b> | 105 H7                   | 165     |                                                      | 37                           | 18.5            | 355                                                                                                                | 0 - 5 | B     |                                                                                     |                                                                                       |       |   |                                                                                       |
|                              | <b>7</b> | 115 H7                   | 195     |                                                      | 62                           | 31              | 505                                                                                                                | 0 - 6 | B     |                                                                                     |                                                                                       |       |   |                                                                                       |
|                              | <b>8</b> | 125 H7                   | 195     |                                                      | 69                           | 35              | 590                                                                                                                | 0 - 7 | B     |                                                                                     |                                                                                       |       |   |                                                                                       |
| Type                         | Size     | $D_2$                    | $D_3$   | $G_4$                                                | $G_5$                        | $l$             | $l$                                                                                                                | kg    |       | Hollow shaft for shrink disk                                                        |                                                                                       |       |   |                                                                                       |
| <b>H2DV</b><br><sup>3)</sup> | <b>4</b> | 85 H7                    | 85      | 140                                                  | 205                          | 23              | –                                                                                                                  | 190   | 0 - 3 | C                                                                                   |  |       |   |                                                                                       |
|                              | <b>5</b> | 100 H7                   | 100     | 165                                                  | 240                          | 35              | 17.5                                                                                                               | 300   | 0 - 4 | C                                                                                   |                                                                                       |       |   |                                                                                       |
|                              | <b>6</b> | 110 H7                   | 110     | 165                                                  | 240                          | 37              | 18.5                                                                                                               | 355   | 0 - 5 | C                                                                                   |                                                                                       |       |   |                                                                                       |
|                              | <b>7</b> | 120 H7                   | 120     | 195                                                  | 280                          | 62              | 31                                                                                                                 | 505   | 0 - 6 | C                                                                                   |                                                                                       |       |   |                                                                                       |
|                              | <b>8</b> | 130 H7                   | 130     | 195                                                  | 285                          | 69              | 35                                                                                                                 | 590   | 0 - 7 | C                                                                                   |                                                                                       |       |   |                                                                                       |
| Type                         | Size     | N/DIN 5480               | $D_2$   | $D_3$                                                | $G_4$                        | $l$             | $l$                                                                                                                | kg    |       | Hollow shaft with spline                                                            |                                                                                       |       |   |                                                                                       |
| <b>H2KV</b>                  | <b>5</b> | N 95 x 3 x 30 x 30 x 9H  | 89 H11  | 100                                                  | 165                          | 35              | 17.5                                                                                                               | 300   | 0 - 4 | D                                                                                   |  |       |   |                                                                                       |
|                              | <b>6</b> | N 95 x 3 x 30 x 30 x 9H  | 89 H11  | 110                                                  | 165                          | 37              | 18.5                                                                                                               | 355   | 0 - 5 | D                                                                                   |                                                                                       |       |   |                                                                                       |
|                              | <b>7</b> | N 120 x 3 x 30 x 38 x 9H | 114 H11 | 120                                                  | 195                          | 62              | 31                                                                                                                 | 505   | 0 - 6 | D                                                                                   |                                                                                       |       |   |                                                                                       |
|                              | <b>8</b> | N 120 x 3 x 30 x 38 x 9H | 114 H11 | 130                                                  | 195                          | 69              | 35                                                                                                                 | 590   | 0 - 7 | D                                                                                   |                                                                                       |       |   |                                                                                       |
| Type                         | Size     | c                        | $d_2$   | $D_3$                                                | $k_2$                        | $n \times s$    | t                                                                                                                  | $G_7$ | $l$   | $l$                                                                                 | kg                                                                                    |       |   | Flanged shaft                                                                         |
| <b>H2FV</b>                  | <b>5</b> | 25                       | 300     | 150 H6                                               | 260                          | 16 x 22         | 10                                                                                                                 | 255   | 35    | 17.5                                                                                | 335                                                                                   | 0 - 4 | E |  |
|                              | <b>6</b> | 25                       | 320     | 160 H6                                               | 280                          | 18 x 22         | 10                                                                                                                 | 255   | 37    | 18.5                                                                                | 395                                                                                   | 0 - 5 | E |                                                                                       |
|                              | <b>7</b> | 30                       | 370     | 180 H6                                               | 320                          | 16 x 26         | 10                                                                                                                 | 300   | 62    | 31                                                                                  | 555                                                                                   | 0 - 6 | E |                                                                                       |
|                              | <b>8</b> | 30                       | 390     | 190 H6                                               | 340                          | 18 x 26         | 10                                                                                                                 | 300   | 69    | 35                                                                                  | 645                                                                                   | 0 - 7 | E |                                                                                       |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

<sup>4)</sup> Shaft version with reinforced bearing (size 7 or larger), see page 9/7.

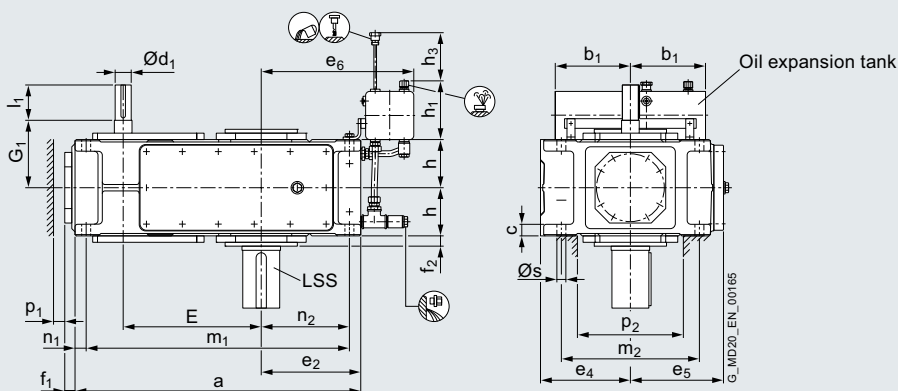
# Helical gear units vertical mounting position

Type H2

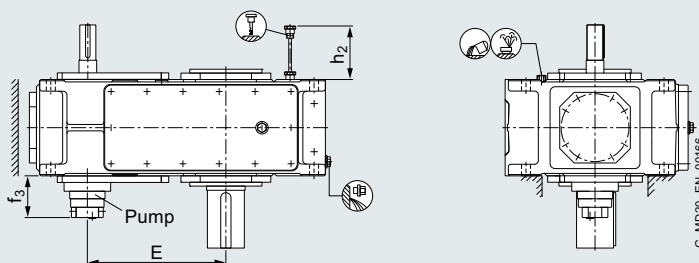
## Gear unit dimensions, two-stage, gear unit sizes 9 to 12

### Selection and ordering data

**H2.V**  
Dip lubrication  
2LP302-...42-...



**H2.V**  
Forced lubrication  
by flange-mounted pump  
2LP302-...42-...



| Gear unit size |             | Dimensions in mm       |       |       |  |
|----------------|-------------|------------------------|-------|-------|--|
| Gear unit size |             | High speed shaft (HSS) |       |       |  |
|                | $l_N$       | $d_1$                  | $l_1$ | $G_1$ |  |
| <b>9</b>       | 6.3 - 11.2  | 75 m6                  | 140   | 240   |  |
|                | 12.5 - 22.4 | 60 m6                  | 140   |       |  |
| <b>10</b>      | 8 - 14      | 75 m6                  | 140   | 240   |  |
|                | 16 - 28     | 60 m6                  | 140   |       |  |
| <b>11</b>      | 6.3 - 11.2  | 90 m6                  | 165   | 275   |  |
|                | 12.5 - 22.4 | 70 m6                  | 140   |       |  |
| <b>12</b>      | 8 - 14      | 90 m6                  | 165   | 275   |  |
|                | 16 - 28     | 70 m6                  | 140   |       |  |

| Gear unit size | a    | $b_1$ | c        | $e_2$ | $e_4$ | $e_5$ | $e_6$ | E   | $f_1$ | $f_2$ | $f_3^{1)}$ | h   | $h_1$ | $h_2^{2)}$ | $h_3$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1$ | $p_2^{3)}$ | s     |
|----------------|------|-------|----------|-------|-------|-------|-------|-----|-------|-------|------------|-----|-------|------------|-------|-------|-------|-------|-------|-------|------------|-------|
| <b>9</b>       | 925  | 330   | 45 ± 1.5 | 300   | 320   | 342   | 560   | 450 | 42    | 32    | 135        | 185 | 275   | 205        | 330   | 845   | 490   | 40    | 260   | 40    | 370        | 36 H9 |
| <b>10</b>      | 1025 | 330   | 45 ± 1.5 | 350   | 320   | 342   | 610   | 500 | 42    | 32    | 135        | 185 | 275   | 205        | 330   | 945   | 490   | 40    | 310   | 40    | 370        | 36 H9 |
| <b>11</b>      | 1105 | 330   | 54 ± 1.5 | 345   | 380   | 402   | 595   | 545 | 48    | 35    | 145        | 215 | 275   | 240        | 340   | 1005  | 600   | 50    | 295   | 50    | 440        | 40 H9 |
| <b>12</b>      | 1260 | 330   | 54 ± 1.5 | 430   | 380   | 410   | 680   | 615 | 48    | 35    | 145        | 215 | 275   | 240        | 340   | 1160  | 600   | 50    | 380   | 50    | 440        | 40 H9 |

For details on the shafts, see Chapter 9.

- 1) Flange-mounted pump not in connection with versions G, H and I.
- 2) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.
- 3) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

# Helical gear units vertical mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 9 to 12

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                              |           |                          |         |        | Oil quantity<br>1)                                 | Oil quantity<br>1)           | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 5/31 to 5/35 |                |                          |                                             |                |  |               |
|------------------------------|-----------|--------------------------|---------|--------|----------------------------------------------------|------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------|----------------|--------------------------|---------------------------------------------|----------------|--|---------------|
|                              |           |                          |         |        | H2.V with dip lubrication                          | H2.V with forced lubrication | H2.V            |                                                                                                                    |                |                          |                                             |                |  |               |
|                              |           |                          |         |        | Article No.: <b>2LP302</b> - - - - <b>.42-....</b> |                              |                 |                                                                                                                    |                |                          |                                             |                |  |               |
| Type                         | Size      | $d_2$                    | $l_2$   | $G_2$  | $l$                                                | $l$                          | kg              |                                                                                                                    |                |                          | Solid shaft with parallel key <sup>4)</sup> |                |  |               |
| <b>H2SV</b>                  | <b>9</b>  | 140 n6                   | 250     | 235    | 98                                                 | 49                           | 830             | <b>0 - 8 A</b>                                                                                                     |                |                          |                                             |                |  |               |
|                              | <b>10</b> | 160 n6                   | 300     | 235    | 110                                                | 55                           | 960             | <b>1 - 0 A</b>                                                                                                     |                |                          |                                             |                |  |               |
|                              | <b>11</b> | 170 n6                   | 300     | 270    | 160                                                | 80                           | 1335            | <b>1 - 1 A</b>                                                                                                     |                |                          |                                             |                |  |               |
|                              | <b>12</b> | 180 n6                   | 300     | 270    | 180                                                | 90                           | 1615            | <b>1 - 2 A</b>                                                                                                     |                |                          |                                             |                |  |               |
| Type                         | Size      | $D_2$                    | $G_4$   | $l$    | $l$                                                | kg                           |                 |                                                                                                                    |                | Hollow shaft with keyway |                                             |                |  |               |
| <b>H2HV</b>                  | <b>9</b>  | 135 H7                   | 235     | 98     | 49                                                 | 830                          | <b>0 - 8 B</b>  |                                                                                                                    |                |                          |                                             |                |  |               |
|                              | <b>10</b> | 150 H7                   | 235     | 110    | 55                                                 | 960                          | <b>1 - 0 B</b>  |                                                                                                                    |                |                          |                                             |                |  |               |
|                              | <b>11</b> | 165 H7                   | 270     | 160    | 80                                                 | 1335                         | <b>1 - 1 B</b>  |                                                                                                                    |                |                          |                                             |                |  |               |
|                              | <b>12</b> | 180 H7                   | 270     | 180    | 90                                                 | 1615                         | <b>1 - 2 B</b>  |                                                                                                                    |                |                          |                                             |                |  |               |
| Type                         | Size      | $D_2$                    | $D_3$   | $G_4$  | $G_5$                                              | $l$                          | $l$             | kg                                                                                                                 |                |                          | Hollow shaft for shrink disk                |                |  |               |
| <b>H2DV</b><br><sup>3)</sup> | <b>9</b>  | 140 H7                   | 145     | 235    | 330                                                | 98                           | 49              | 830                                                                                                                | <b>0 - 8 C</b> |                          |                                             |                |  |               |
|                              | <b>10</b> | 150 H7                   | 155     | 235    | 350                                                | 110                          | 55              | 960                                                                                                                | <b>1 - 0 C</b> |                          |                                             |                |  |               |
|                              | <b>11</b> | 165 H7                   | 170     | 270    | 400                                                | 160                          | 80              | 1335                                                                                                               | <b>1 - 1 C</b> |                          |                                             |                |  |               |
|                              | <b>12</b> | 180 H7                   | 185     | 270    | 405                                                | 180                          | 90              | 1615                                                                                                               | <b>1 - 2 C</b> |                          |                                             |                |  |               |
| Type                         | Size      | N/DIN 5480               | $D_2$   | $D_3$  | $G_4$                                              | $l$                          | $l$             | kg                                                                                                                 |                |                          | Hollow shaft with spline                    |                |  |               |
| <b>H2KV</b>                  | <b>9</b>  | N 140 × 3 × 30 × 45 × 9H | 134 H11 | 145    | 235                                                | 98                           | 49              | 830                                                                                                                | <b>0 - 8 D</b> |                          |                                             |                |  |               |
|                              | <b>10</b> | N 140 × 3 × 30 × 45 × 9H | 134 H11 | 155    | 235                                                | 110                          | 55              | 960                                                                                                                | <b>1 - 0 D</b> |                          |                                             |                |  |               |
|                              | <b>11</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11 | 170    | 270                                                | 160                          | 80              | 1335                                                                                                               | <b>1 - 1 D</b> |                          |                                             |                |  |               |
|                              | <b>12</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11 | 185    | 270                                                | 180                          | 90              | 1615                                                                                                               | <b>1 - 2 D</b> |                          |                                             |                |  |               |
| Type                         | Size      | c                        | $d_2$   | $D_3$  | $k_2$                                              | $n \times s$                 | t               | $G_7$                                                                                                              | $l$            | $l$                      | kg                                          |                |  | Flanged shaft |
| <b>H2FV</b>                  | <b>9</b>  | 38                       | 430     | 220 H6 | 380                                                | 20 × 26                      | 12              | 350                                                                                                                | 98             | 49                       | 915                                         | <b>0 - 8 E</b> |  |               |
|                              | <b>10</b> | 38                       | 470     | 240 H6 | 420                                                | 22 × 26                      | 12              | 350                                                                                                                | 110            | 55                       | 1050                                        | <b>1 - 0 E</b> |  |               |
|                              | <b>11</b> | 42                       | 510     | 260 H6 | 450                                                | 18 × 33                      | 12              | 400                                                                                                                | 160            | 80                       | 1465                                        | <b>1 - 1 E</b> |  |               |
|                              | <b>12</b> | 42                       | 540     | 280 H6 | 480                                                | 22 × 33                      | 12              | 400                                                                                                                | 180            | 90                       | 1755                                        | <b>1 - 2 E</b> |  |               |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

<sup>4)</sup> Shaft version with reinforced bearing, see page 9/7.

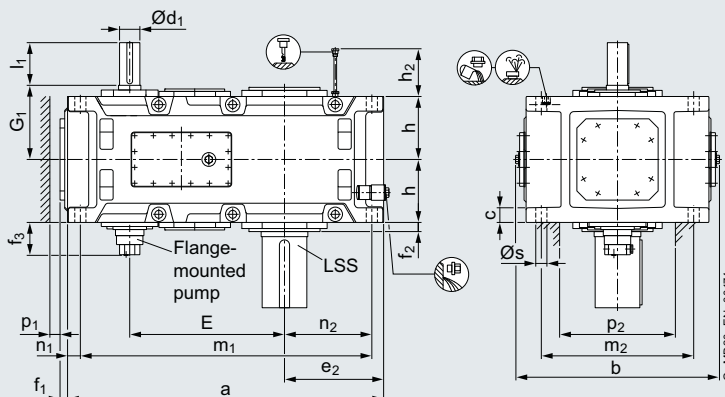
## Helical gear units vertical mounting position

Type H2

### Gear unit dimensions, two-stage, gear unit sizes 13 to 18

#### Selection and ordering data

**H2.V**  
Forced lubrication  
by flange-mounted pump  
2LP302-...42-....



| Gear unit size | Dimensions in mm |        |       |       |
|----------------|------------------|--------|-------|-------|
|                | $l_N$            | $d_1$  | $l_1$ | $G_1$ |
| <b>13</b>      | 6.3 - 11.2       | 100 m6 | 205   | 330   |
|                | 12.5 - 20        | 85 m6  | 170   |       |
| <b>14</b>      | 8 - 14           | 100 m6 | 205   | 330   |
|                | 16 - 25          | 85 m6  | 170   |       |
| <b>15</b>      | 6.3 - 11.2       | 120 n6 | 210   | 365   |
|                | 12.5 - 20        | 100 m6 | 210   |       |
| <b>16</b>      | 7.1 - 12.5       | 120 n6 | 210   | 365   |
|                | 14 - 22.5        | 100 m6 | 210   |       |
| <b>17</b>      | 6.3 - 11.2       | 125 n6 | 245   | 420   |
|                | 12.5 - 20        | 110 n6 | 210   |       |
| <b>18</b>      | 7.1 - 12.5       | 125 n6 | 245   | 420   |
|                | 14 - 22.5        | 110 n6 | 210   |       |

| Gear unit size | Dimensions in mm |      |        |       |     |       |       |            |       |            |       |       |       |       |       |            |    |
|----------------|------------------|------|--------|-------|-----|-------|-------|------------|-------|------------|-------|-------|-------|-------|-------|------------|----|
|                | a                | b    | c      | $e_2$ | E   | $f_1$ | $f_2$ | $f_3^{1)}$ | h     | $h_2^{2)}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1$ | $p_2^{3)}$ | s  |
| <b>13</b>      | 1290             | 900  | 61 ± 2 | 405   | 635 | 53    | 35    | 130        | 272.5 | 300        | 1195  | 680   | 50    | 360   | 50    | 500        | 48 |
| <b>14</b>      | 1430             | 900  | 61 ± 2 | 475   | 705 | 53    | 35    | 130        | 272.5 | 300        | 1335  | 680   | 50    | 430   | 50    | 500        | 48 |
| <b>15</b>      | 1550             | 980  | 72 ± 2 | 485   | 762 | 63    | 42    | 130        | 310   | 340        | 1435  | 750   | 60    | 430   | 50    | 570        | 55 |
| <b>16</b>      | 1640             | 980  | 72 ± 2 | 530   | 808 | 63    | 42    | 130        | 310   | 340        | 1525  | 750   | 60    | 475   | 50    | 570        | 55 |
| <b>17</b>      | 1740             | 1110 | 81 ± 2 | 525   | 860 | 60    | 42    | 170        | 340   | 374        | 1610  | 850   | 70    | 465   | 70    | 630        | 55 |
| <b>18</b>      | 1860             | 1110 | 81 ± 2 | 585   | 920 | 60    | 42    | 170        | 340   | 374        | 1730  | 850   | 70    | 525   | 70    | 630        | 55 |

For details on the shafts, see Chapter 9.

- 1) Flange-mounted pump not in connection with versions G, H and I.
- 2) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.
- 3) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

# Helical gear units vertical mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 13 to 18

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                                 |           |                          |         | Oil quantity <sup>1)</sup><br>H2.V<br>with forced<br>lubrication | Weight<br><sup>1) 2)</sup><br>H2.V | 10th to 13th position of Article<br>No. and Article No. supplement,<br>for 14th to 16th position, see<br>pages 5/31 to 5/35 |         |                                             |     |      |         |               |
|---------------------------------|-----------|--------------------------|---------|------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------|-----|------|---------|---------------|
|                                 |           |                          |         | Article No.: <b>2LP302</b> ■ - ■ ■ .42-....                      |                                    |                                                                                                                             |         |                                             |     |      |         |               |
| Type                            | Size      | $d_2$                    | $l_2$   | $G_2$                                                            | $l$                                | kg                                                                                                                          |         | Solid shaft with parallel key <sup>5)</sup> |     |      |         |               |
| <b>H2SV</b>                     | <b>13</b> | 200 n6                   | 350     | 335                                                              | 120                                | 1880                                                                                                                        | 1 - 3 A |                                             |     |      |         |               |
|                                 | <b>14</b> | 210 n6                   | 350     | 335                                                              | 135                                | 2430                                                                                                                        | 1 - 4 A |                                             |     |      |         |               |
|                                 | <b>15</b> | 230 n6                   | 410     | 380                                                              | 185                                | 3240                                                                                                                        | 1 - 5 A |                                             |     |      |         |               |
|                                 | <b>16</b> | 240 n6                   | 410     | 380                                                              | 200                                | 3465                                                                                                                        | 1 - 6 A |                                             |     |      |         |               |
|                                 | <b>17</b> | 250 n6                   | 410     | 415                                                              | 265                                | 4420                                                                                                                        | 1 - 7 A |                                             |     |      |         |               |
|                                 | <b>18</b> | 270 n6                   | 470     | 415                                                              | 285                                | 4870                                                                                                                        | 1 - 8 A |                                             |     |      |         |               |
| Type                            | Size      | $D_2$                    | $G_4$   | $l$                                                              | kg                                 |                                                                                                                             |         | Hollow shaft with keyway                    |     |      |         |               |
| <b>H2HV</b><br><sup>4)</sup>    | <b>13</b> | 190 H7                   | 335     | 120                                                              | 1880                               | 1 - 3 B                                                                                                                     |         |                                             |     |      |         |               |
|                                 | <b>14</b> | 210 H7                   | 335     | 135                                                              | 2430                               | 1 - 4 B                                                                                                                     |         |                                             |     |      |         |               |
|                                 | <b>15</b> | 230 H7                   | 380     | 185                                                              | 3240                               | 1 - 5 B                                                                                                                     |         |                                             |     |      |         |               |
|                                 | <b>16</b> | 240 H7                   | 380     | 200                                                              | 3465                               | 1 - 6 B                                                                                                                     |         |                                             |     |      |         |               |
|                                 | <b>17</b> | 250 H7                   | 415     | 265                                                              | 4420                               | 1 - 7 B                                                                                                                     |         |                                             |     |      |         |               |
|                                 | <b>18</b> | 275 H7                   | 415     | 285                                                              | 4870                               | 1 - 8 B                                                                                                                     |         |                                             |     |      |         |               |
| Type                            | Size      | $D_2$                    | $D_3$   | $G_4$                                                            | $G_5$                              | $l$                                                                                                                         | kg      | Hollow shaft for shrink disk                |     |      |         |               |
| <b>H2DV</b><br><sup>3) 4)</sup> | <b>13</b> | 190 H7                   | 195     | 335                                                              | 480                                | 120                                                                                                                         | 1880    | 1 - 3 C                                     |     |      |         |               |
|                                 | <b>14</b> | 210 H7                   | 215     | 335                                                              | 480                                | 135                                                                                                                         | 2430    | 1 - 4 C                                     |     |      |         |               |
|                                 | <b>15</b> | 230 H7                   | 235     | 380                                                              | 550                                | 185                                                                                                                         | 3240    | 1 - 5 C                                     |     |      |         |               |
|                                 | <b>16</b> | 240 H7                   | 245     | 380                                                              | 550                                | 200                                                                                                                         | 3465    | 1 - 6 C                                     |     |      |         |               |
|                                 | <b>17</b> | 250 H7                   | 260     | 415                                                              | 600                                | 265                                                                                                                         | 4420    | 1 - 7 C                                     |     |      |         |               |
|                                 | <b>18</b> | 280 H7                   | 285     | 415                                                              | 600                                | 285                                                                                                                         | 4870    | 1 - 8 C                                     |     |      |         |               |
| Type                            | Size      | N/DIN 5480               | $D_2$   | $D_3$                                                            | $G_4$                              | $l$                                                                                                                         | kg      | Hollow shaft with spline                    |     |      |         |               |
| <b>H2KV</b><br><sup>4)</sup>    | <b>13</b> | N 190 × 5 × 30 × 36 × 9H | 180 H11 | 195                                                              | 335                                | 120                                                                                                                         | 1880    | 1 - 3 D                                     |     |      |         |               |
|                                 | <b>14</b> | N 190 × 5 × 30 × 36 × 9H | 180 H11 | 215                                                              | 335                                | 135                                                                                                                         | 2430    | 1 - 4 D                                     |     |      |         |               |
|                                 | <b>15</b> | N 220 × 5 × 30 × 42 × 9H | 210 H11 | 235                                                              | 380                                | 185                                                                                                                         | 3240    | 1 - 5 D                                     |     |      |         |               |
|                                 | <b>16</b> | N 220 × 5 × 30 × 42 × 9H | 210 H11 | 245                                                              | 380                                | 200                                                                                                                         | 3465    | 1 - 6 D                                     |     |      |         |               |
|                                 | <b>17</b> | N 250 × 5 × 30 × 48 × 9H | 240 H11 | 260                                                              | 415                                | 265                                                                                                                         | 4420    | 1 - 7 D                                     |     |      |         |               |
|                                 | <b>18</b> | N 250 × 5 × 30 × 48 × 9H | 240 H11 | 285                                                              | 415                                | 285                                                                                                                         | 4870    | 1 - 8 D                                     |     |      |         |               |
| Type                            | Size      | c                        | $d_2$   | $D_3$                                                            | $k_2$                              | $n \times s$                                                                                                                | t       | $G_7$                                       | $l$ | kg   |         | Flanged shaft |
| <b>H2FV</b>                     | <b>13</b> | 48                       | 580     | 310 H6                                                           | 500                                | 20 × 33                                                                                                                     | 14      | 480                                         | 120 | 2040 | 1 - 3 E |               |
|                                 | <b>14</b> | 48                       | 620     | 310 H6                                                           | 540                                | 24 × 33                                                                                                                     | 14      | 480                                         | 135 | 2600 | 1 - 4 E |               |
|                                 | <b>15</b> | 55                       | 710     | 360 H6                                                           | 630                                | 28 × 33                                                                                                                     | 17      | 550                                         | 185 | 3480 | 1 - 5 E |               |
|                                 | <b>16</b> | 55                       | 740     | 360 H6                                                           | 660                                | 30 × 33                                                                                                                     | 17      | 550                                         | 200 | 3720 | 1 - 6 E |               |
|                                 | <b>17</b> | 60                       | 750     | 410 H6                                                           | 660                                | 24 × 39                                                                                                                     | 18      | 600                                         | 265 | 4720 | 1 - 7 E |               |
|                                 | <b>18</b> | 60                       | 800     | 410 H6                                                           | 710                                | 26 × 39                                                                                                                     | 18      | 600                                         | 285 | 5220 | 1 - 8 E |               |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

<sup>4)</sup> Sizes 13 and 15 only  $i_N = 6.3 - 18$   
Size 17 only  $i_N = 6.3 - 16$

<sup>5)</sup> Shaft version with reinforced bearing, see page 9/7  
(except size 13 with  $i_N = 20$  and size 17 with  $i_N = 18$  and 20)

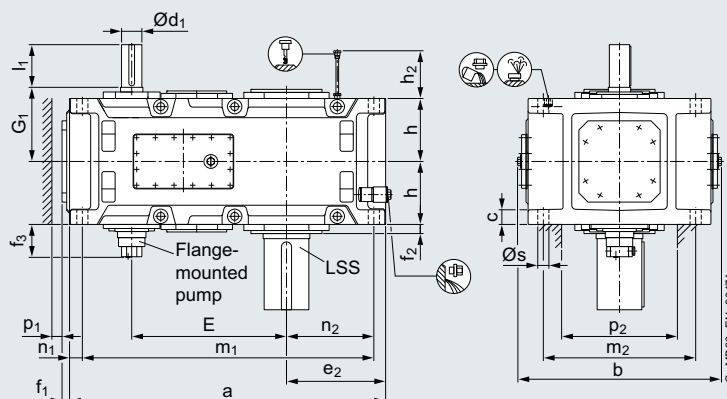
# Helical gear units vertical mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 19 to 24

#### Selection and ordering data

**H2.V**  
Forced lubrication  
by flange-mounted pump  
2LP302-...42-....



| Gear unit size | Dimensions in mm |        |       |       |
|----------------|------------------|--------|-------|-------|
|                | $l_N$            | $d_1$  | $l_1$ | $G_1$ |
| <b>19</b>      | 6.3 - 11.2       | 150 n6 | 245   | 475   |
|                | 12.5 - 20        | 120 n6 | 210   |       |
| <b>20</b>      | 7.1 - 12.5       | 150 n6 | 245   | 475   |
|                | 14 - 22.5        | 120 n6 | 210   |       |
| <b>21</b>      | 6.3 - 11.2       | 170 n6 | 290   | 495   |
|                | 12.5 - 20        | 140 n6 | 250   |       |
| <b>22</b>      | 7.1 - 12.5       | 170 n6 | 290   | 495   |
|                | 14 - 22.5        | 140 n6 | 250   |       |
| <b>23</b>      | 6.3 - 10         | 190 n6 | 330   | 560   |
|                | 11.2 - 20        | 150 n6 | 250   |       |
| <b>24</b>      | 7.1 - 11.2       | 190 n6 | 330   | 560   |
|                | 12.5 - 22.4      | 150 n6 | 250   |       |

| Gear unit size | Dimensions in mm |      |         |       |      |       |       |                     |     |                     |       |       |       |       |       |                     |    |  |
|----------------|------------------|------|---------|-------|------|-------|-------|---------------------|-----|---------------------|-------|-------|-------|-------|-------|---------------------|----|--|
|                | a                | b    | c       | $e_2$ | E    | $f_1$ | $f_2$ | $f_3$ <sup>1)</sup> | h   | $h_2$ <sup>2)</sup> | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1$ | $p_2$ <sup>3)</sup> | s  |  |
| <b>19</b>      | 2010             | 1222 | 91 ± 2  | 590   | 997  | 24    | 55    | O. r.               | 390 | 380                 | 1865  | 950   | 78    | 520   | 70    | 700                 | 65 |  |
| <b>20</b>      | 2130             | 1222 | 91 ± 2  | 650   | 1057 | 24    | 55    | O. r.               | 390 | 380                 | 1985  | 950   | 78    | 580   | 70    | 700                 | 65 |  |
| <b>21</b>      | 2140             | 1378 | 100 ± 2 | 655   | 1067 | 27    | 60    | O. r.               | 410 | 390                 | 1985  | 1040  | 90    | 585   | 70    | 720                 | 75 |  |
| <b>22</b>      | 2250             | 1378 | 100 ± 2 | 710   | 1122 | 27    | 60    | O. r.               | 410 | 390                 | 2095  | 1040  | 90    | 640   | 70    | 720                 | 75 |  |
| <b>23</b>      | On request       |      |         |       |      |       |       |                     |     |                     |       |       |       |       |       |                     |    |  |
| <b>24</b>      | On request       |      |         |       |      |       |       |                     |     |                     |       |       |       |       |       |                     |    |  |

For details on the shafts, see Chapter 9.

<sup>1)</sup> Values  $f_3$  for size 19 or larger on request; flange-mounted pump not in connection with versions G, H and I.

<sup>2)</sup> For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

<sup>3)</sup> Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

# Helical gear units vertical mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 19 to 24

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                                                  |           |            |       | Oil quantity<br>H2.V<br>with forced<br>lubrication | Weight<br>H2.V | 10th to 13th position of Article<br>No. and Article No. supplement,<br>for 14th to 16th position, see<br>pages 5/31 to 5/35 |    |                                                                |            |    |                                          |
|--------------------------------------------------|-----------|------------|-------|----------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------|----|----------------------------------------------------------------|------------|----|------------------------------------------|
| Article No.: <b>2LP302</b> - - - <b>.42-....</b> |           |            |       |                                                    |                |                                                                                                                             |    |                                                                |            |    |                                          |
| Type                                             | Size      | $d_2$      | $l_2$ | $G_2$                                              | $l$            | kg                                                                                                                          |    | Solid shaft with parallel key                                  |            |    |                                          |
| <b>H2SV</b>                                      | <b>19</b> | 290 n6     | 470   | 465                                                | On request     |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>20</b> | 300 n6     | 500   | 465                                                |                |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>21</b> | 320 n6     | 500   | 490                                                |                |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>22</b> | 340 n6     | 550   | 490                                                |                |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>23</b> | 360 n6     | 590   | 540                                                |                |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>24</b> | 380 n6     | 590   | 540                                                |                |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  |           |            |       |                                                    |                |                                                                                                                             |    | 2 - 0 A<br>2 - 1 A<br>2 - 2 A<br>2 - 3 A<br>2 - 4 A<br>2 - 5 A |            |    |                                          |
| Type                                             | Size      | $D_2$      | $D_3$ | $G_4$                                              | $G_5$          | $l$                                                                                                                         | kg | Hollow shaft for shrink disk                                   |            |    |                                          |
| <b>H2DV</b><br>1) 2)                             | <b>19</b> | 285 H7     | 295   | 465                                                | 670            | On request                                                                                                                  |    |                                                                |            |    |                                          |
|                                                  | <b>20</b> | 310 H7     | 315   | 465                                                | 670            |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>21</b> | 330 H7     | 335   | 490                                                | 715            |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>22</b> | 340 H7     | 345   | 490                                                | 725            |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>23</b> | 370 H7     | 375   | 540                                                | 800            |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>24</b> | 390 H7     | 395   | 540                                                | 825            |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  |           |            |       |                                                    |                |                                                                                                                             |    | 2 - 0 C<br>2 - 1 C<br>2 - 2 C<br>2 - 3 C<br>2 - 4 C<br>2 - 5 C |            |    |                                          |
| Type                                             | Size      | N/DIN 5480 | $D_2$ | $D_3$                                              | $G_4$          | $l$                                                                                                                         | kg | Hollow shaft with spline                                       |            |    |                                          |
| <b>H2KV</b><br>2)                                | <b>19</b> | On request |       |                                                    |                | On request                                                                                                                  |    |                                                                |            |    |                                          |
|                                                  | <b>20</b> |            |       |                                                    |                |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>21</b> |            |       |                                                    |                |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  | <b>22</b> |            |       |                                                    |                |                                                                                                                             |    |                                                                |            |    |                                          |
|                                                  |           |            |       |                                                    |                |                                                                                                                             |    | 2 - 0 D<br>2 - 1 D<br>2 - 2 D<br>2 - 3 D                       |            |    |                                          |
| Type                                             | Size      | c          | $d_2$ | $D_3$                                              | $k_2$          | $n \times s$                                                                                                                | t  | $G_7$                                                          | $l$        | kg | Flanged shaft                            |
| <b>H2FV</b>                                      | <b>19</b> | 65         | 860   | 460 H6                                             | 770            | 30 × 39                                                                                                                     | 18 | 670                                                            | On request |    |                                          |
|                                                  | <b>20</b> | 65         | 930   | 460 H6                                             | 830            | 32 × 39                                                                                                                     | 18 | 670                                                            |            |    |                                          |
|                                                  | <b>21</b> | 75         | 950   | 520 H6                                             | 850            | 28 × 45                                                                                                                     | 20 | 710                                                            |            |    |                                          |
|                                                  | <b>22</b> | 75         | 1040  | 520 H6                                             | 940            | 28 × 45                                                                                                                     | 20 | 710                                                            |            |    |                                          |
|                                                  |           |            |       |                                                    |                |                                                                                                                             |    |                                                                |            |    | 2 - 0 E<br>2 - 1 E<br>2 - 2 E<br>2 - 3 E |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

<sup>2)</sup> Size 19 only  $i_N = 6.3 - 16$

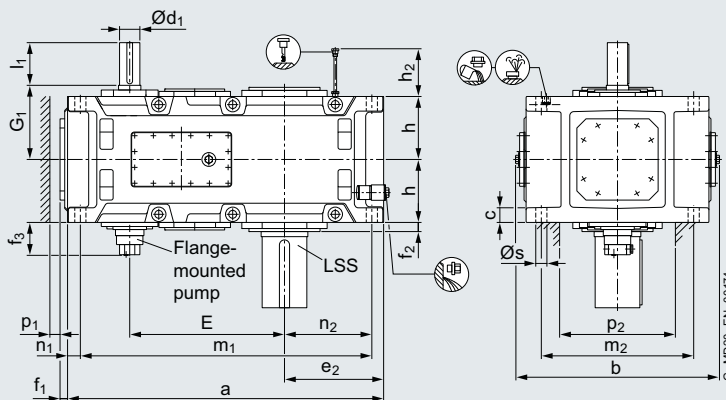
# Helical gear units vertical mounting position

Type H2

Gear unit dimensions, two-stage, gear unit sizes 25 and 26

## Selection and ordering data

**H2.V**  
Forced lubrication  
by flange-mounted pump  
2LP302-...42-....



G\_MD20\_EN\_00174

| Gear unit size |             | Dimensions in mm       |       |       |
|----------------|-------------|------------------------|-------|-------|
|                |             | High speed shaft (HSS) |       |       |
|                | $l_N$       | $d_1$                  | $l_1$ | $G_1$ |
| 25             | 6.3 - 10    | 200 n6                 | 340   | 600   |
|                | 11.2 - 20   | 170 n6                 | 300   |       |
| 26             | 7.1 - 11.2  | 200 n6                 | 340   | 600   |
|                | 12.5 - 22.4 | 170 n6                 | 300   |       |

| Gear unit size | Dimensions in mm |   |   |       |   |       |       |            |   |            |       |       |       |       |       |       |   |
|----------------|------------------|---|---|-------|---|-------|-------|------------|---|------------|-------|-------|-------|-------|-------|-------|---|
|                | a                | b | c | $e_2$ | E | $f_1$ | $f_2$ | $f_3^{1)}$ | h | $h_2^{2)}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1$ | $p_2$ | s |
| 25             | On request       |   |   |       |   |       |       |            |   |            |       |       |       |       |       |       |   |
| 26             | On request       |   |   |       |   |       |       |            |   |            |       |       |       |       |       |       |   |

For details on the shafts, see Chapter 9.

- 1) Flange-mounted pump not in connection with versions G, H and I.
- 2) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.



# Helical gear units vertical mounting position

## Type H2

### Gear unit dimensions, two-stage, gear unit sizes 25 and 26

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                   |           |                |                |                | Oil quantity<br>H2.V<br>with forced<br>lubrication | Weight<br>H2.V | 10th to 13th position of Article No.<br>and Article No. supplement,<br>for 14th to 16th position, see<br>pages 5/31 to 5/35 |                              |
|-------------------|-----------|----------------|----------------|----------------|----------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------|
|                   |           |                |                |                | Article No.: <b>2LP302</b>                         |                | ■ - ■ ■ .42-....                                                                                                            |                              |
| Type              | Size      | d <sub>2</sub> | l <sub>2</sub> | G <sub>2</sub> | l                                                  | kg             | Solid shaft with parallel key                                                                                               |                              |
| <b>H2SV</b>       | <b>25</b> | 400 n6         | 650            | 605            | On request                                         |                | 2 - 6 A                                                                                                                     |                              |
|                   | <b>26</b> | 420 n6         | 650            | 605            |                                                    |                | 2 - 7 A                                                                                                                     |                              |
| Type              | Size      | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub> | G <sub>5</sub>                                     | l              | kg                                                                                                                          | Hollow shaft for shrink disk |
| <b>H2DV</b><br>1) | <b>25</b> | 410 H7         | 415            | 610            | 895                                                | On request     |                                                                                                                             | 2 - 6 C                      |
|                   | <b>26</b> | 430 H7         | 435            | 610            | 925                                                |                |                                                                                                                             | 2 - 7 C                      |

Shaft seals, [see pages 10/2 onwards](#).

For details on the shafts, [see Chapter 9](#).

Cooling options, [see page 10/11 onwards](#).

<sup>1)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

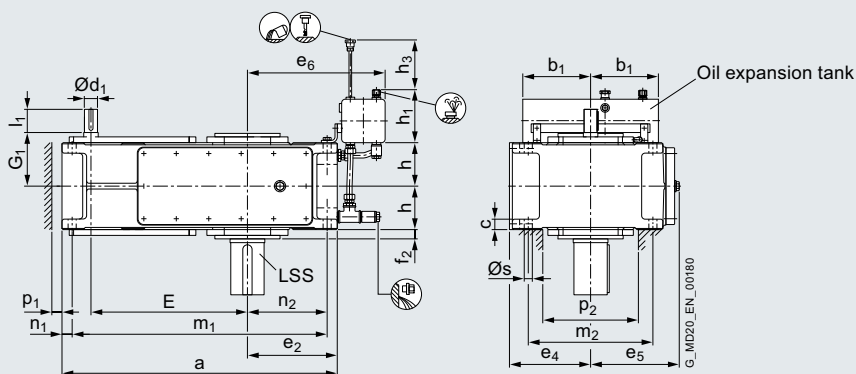
# Helical gear units vertical mounting position

Type H3

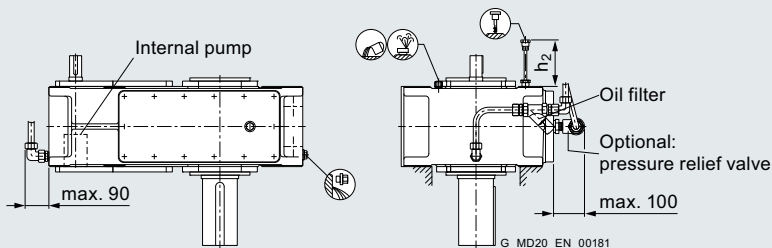
Gear unit dimensions, three-stage, gear unit sizes 5 to 8

## Selection and ordering data

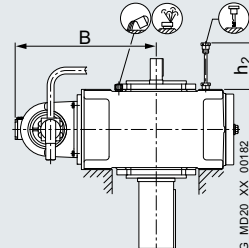
**H3.V**  
Dip lubrication  
2LP302-...52-....



**H3.V**  
Forced lubrication by flange-mounted pump  
2LP302-...52-....



**H3.V**  
Forced lubrication by motor pump  
2LP302-...52-....



| Gear unit size |           | Dimensions in mm       |       |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------|-----------|------------------------|-------|-------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Gear unit size |           | High speed shaft (HSS) |       |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                | $l_N$     | $d_1$                  | $l_1$ | $G_1$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5              | 25 - 45   | 40 m6                  | 70    | 160   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                | 50 - 63   | 30 m6                  | 50    |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                | 71 - 90   | 24 k6                  | 40    |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6              | 31.5 - 56 | 40 m6                  | 70    | 160   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                | 63 - 80   | 30 m6                  | 50    |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                | 90 - 112  | 24 k6                  | 40    |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7              | 25 - 45   | 45 m6                  | 80    | 185   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                | 50 - 63   | 35 m6                  | 60    |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                | 71 - 90   | 28 m6                  | 50    |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8              | 31.5 - 56 | 45 m6                  | 80    | 185   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                | 63 - 80   | 35 m6                  | 60    |       |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                | 90 - 112  | 28 m6                  | 50    |       |  |  |  |  |  |  |  |  |  |  |  |  |  |

| Gear unit size | a   | b <sub>1</sub> | c      | E   | e <sub>2</sub> | e <sub>4</sub> | e <sub>5</sub> | e <sub>6</sub> | f <sub>2</sub> | f <sub>3</sub> <sup>1)</sup> | h   | h <sub>1</sub> | h <sub>2</sub> <sup>2)</sup> | h <sub>3</sub> | m <sub>1</sub> | m <sub>2</sub> | m <sub>3</sub> | n <sub>1</sub> | n <sub>2</sub> | p <sub>1</sub> <sup>3)</sup> | p <sub>2</sub> <sup>3)</sup> | s     | B <sup>4)</sup> |
|----------------|-----|----------------|--------|-----|----------------|----------------|----------------|----------------|----------------|------------------------------|-----|----------------|------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------------------|------------------------------|-------|-----------------|
| 5              | 690 | 240            | 30 ± 1 | 405 | 205            | 230            | 252            | 385            | 28             | 190                          | 128 | 205            | 190                          | 240            | 630            | 360            | 220            | 30             | 175            | 35                           | 270                          | 24 H9 | 480             |
| 6              | 770 | 240            | 30 ± 1 | 440 | 250            | 230            | 252            | 425            | 28             | 190                          | 128 | 205            | 190                          | 240            | 710            | 360            | 220            | 30             | 220            | 35                           | 270                          | 24 H9 | 480             |
| 7              | 845 | 240            | 36 ± 1 | 495 | 250            | 280            | 292            | 425            | 30             | 185                          | 150 | 205            | 165                          | 250            | 775            | 430            | 260            | 35             | 215            | 35                           | 330                          | 28 H9 | 530             |
| 8              | 950 | 240            | 36 ± 1 | 540 | 310            | 280            | 302            | 485            | 32             | 185                          | 150 | 205            | 165                          | 250            | 880            | 430            | 260            | 35             | 275            | 35                           | 330                          | 28 H9 | 530             |

For details on the shafts, see Chapter 9.

1) Flange-mounted pump not in connection with versions G, H and I.  
2) For forced lubrication, approximately h<sub>2</sub> can be assumed as required space for piping and monitoring; details according to order-related documentation.

3) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.  
4) Max. dimensions; details acc. to order-related documentation.

# Helical gear units vertical mounting position

## Type H3

### Gear unit dimensions, three-stage, gear unit sizes 5 to 8

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                              |          |                          |         | Oil quantity<br>1)                                 | Oil quantity<br>1)           | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 5/31 to 5/35 |       |       |                                             |     |       |   |               |
|------------------------------|----------|--------------------------|---------|----------------------------------------------------|------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------|-------|-------|---------------------------------------------|-----|-------|---|---------------|
|                              |          |                          |         | H3.V with dip lubrication                          | H3.V with forced lubrication | H3.V            |                                                                                                                    |       |       |                                             |     |       |   |               |
|                              |          |                          |         | Article No.: <b>2LP302</b> - - - - <b>.52-....</b> |                              |                 |                                                                                                                    |       |       |                                             |     |       |   |               |
| Type                         | Size     | $d_2$                    | $l_2$   | $G_2$                                              | $l$                          | $l$             | kg                                                                                                                 |       |       | Solid shaft with parallel key <sup>4)</sup> |     |       |   |               |
| <b>H3SV</b>                  | <b>5</b> | 100 m6                   | 210     | 165                                                | 36                           | 24              | 320                                                                                                                | 0 - 4 | A     |                                             |     |       |   |               |
|                              | <b>6</b> | 110 n6                   | 210     | 165                                                | 40                           | 27              | 365                                                                                                                | 0 - 5 | A     |                                             |     |       |   |               |
|                              | <b>7</b> | 120 n6                   | 210     | 195                                                | 64                           | 42              | 540                                                                                                                | 0 - 6 | A     |                                             |     |       |   |               |
|                              | <b>8</b> | 130 n6                   | 250     | 195                                                | 70                           | 47              | 625                                                                                                                | 0 - 7 | A     |                                             |     |       |   |               |
| Type                         | Size     | $D_2$                    | $G_4$   |                                                    | $l$                          | $l$             | kg                                                                                                                 |       |       | Hollow shaft with keyway                    |     |       |   |               |
| <b>H3HV</b>                  | <b>5</b> | 95 H7                    | 165     |                                                    | 36                           | 24              | 320                                                                                                                | 0 - 4 | B     |                                             |     |       |   |               |
|                              | <b>6</b> | 105 H7                   | 165     |                                                    | 40                           | 27              | 365                                                                                                                | 0 - 5 | B     |                                             |     |       |   |               |
|                              | <b>7</b> | 115 H7                   | 195     |                                                    | 64                           | 42              | 540                                                                                                                | 0 - 6 | B     |                                             |     |       |   |               |
|                              | <b>8</b> | 125 H7                   | 195     |                                                    | 70                           | 47              | 625                                                                                                                | 0 - 7 | B     |                                             |     |       |   |               |
| Type                         | Size     | $D_2$                    | $D_3$   | $G_4$                                              | $G_5$                        | $l$             | $l$                                                                                                                | kg    |       | Hollow shaft for shrink disk                |     |       |   |               |
| <b>H3DV</b><br><sup>3)</sup> | <b>5</b> | 100 H7                   | 100     | 165                                                | 240                          | 36              | 24                                                                                                                 | 320   | 0 - 4 | C                                           |     |       |   |               |
|                              | <b>6</b> | 110 H7                   | 110     | 165                                                | 240                          | 40              | 27                                                                                                                 | 365   | 0 - 5 | C                                           |     |       |   |               |
|                              | <b>7</b> | 120 H7                   | 120     | 195                                                | 280                          | 64              | 42                                                                                                                 | 540   | 0 - 6 | C                                           |     |       |   |               |
|                              | <b>8</b> | 130 H7                   | 130     | 195                                                | 285                          | 70              | 47                                                                                                                 | 625   | 0 - 7 | C                                           |     |       |   |               |
| Type                         | Size     | N/DIN 5480               | $D_2$   | $D_3$                                              | $G_4$                        | $l$             | $l$                                                                                                                | kg    |       | Hollow shaft with spline                    |     |       |   |               |
| <b>H3KV</b>                  | <b>5</b> | N 95 × 3 × 30 × 30 × 9H  | 89 H11  | 100                                                | 165                          | 36              | 24                                                                                                                 | 320   | 0 - 4 | D                                           |     |       |   |               |
|                              | <b>6</b> | N 95 × 3 × 30 × 30 × 9H  | 89 H11  | 110                                                | 165                          | 40              | 27                                                                                                                 | 365   | 0 - 5 | D                                           |     |       |   |               |
|                              | <b>7</b> | N 120 × 3 × 30 × 38 × 9H | 114 H11 | 120                                                | 195                          | 64              | 42                                                                                                                 | 540   | 0 - 6 | D                                           |     |       |   |               |
|                              | <b>8</b> | N 120 × 3 × 30 × 38 × 9H | 114 H11 | 130                                                | 195                          | 70              | 47                                                                                                                 | 625   | 0 - 7 | D                                           |     |       |   |               |
| Type                         | Size     | c                        | $d_2$   | $D_3$                                              | $k_2$                        | n × s           | t                                                                                                                  | $G_7$ | $l$   | $l$                                         | kg  |       |   | Flanged shaft |
| <b>H3FV</b>                  | <b>5</b> | 25                       | 300     | 150 H6                                             | 260                          | 16 × 22         | 10                                                                                                                 | 255   | 36    | 24                                          | 355 | 0 - 4 | E |               |
|                              | <b>6</b> | 25                       | 320     | 160 H6                                             | 280                          | 18 × 22         | 10                                                                                                                 | 255   | 40    | 27                                          | 405 | 0 - 5 | E |               |
|                              | <b>7</b> | 30                       | 370     | 180 H6                                             | 320                          | 16 × 26         | 10                                                                                                                 | 300   | 64    | 42                                          | 590 | 0 - 6 | E |               |
|                              | <b>8</b> | 30                       | 390     | 190 H6                                             | 340                          | 18 × 26         | 10                                                                                                                 | 300   | 70    | 47                                          | 680 | 0 - 7 | E |               |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

<sup>4)</sup> Shaft version with reinforced bearing (size 7 or larger), see page 9/7.

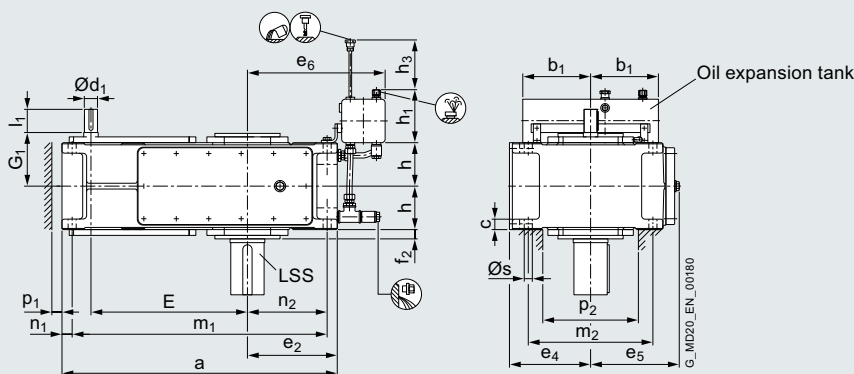
# Helical gear units vertical mounting position

Type H3

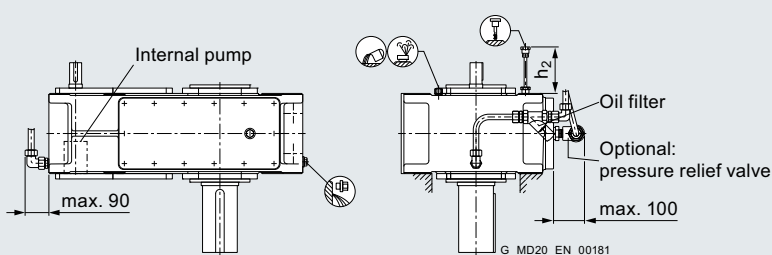
Gear unit dimensions, three-stage, gear unit sizes 9 to 12

## Selection and ordering data

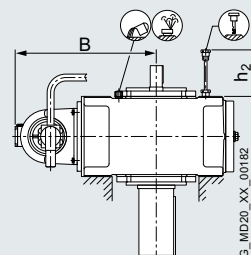
**H3.V**  
Dip lubrication  
2LP302-...52-....



**H3.V**  
Forced lubrication by flange-mounted pump  
2LP302-...52-....



**H3.V**  
Forced lubrication by motor pump  
2LP302-...52-....



| Gear unit size |           | Dimensions in mm       |       |       |  |
|----------------|-----------|------------------------|-------|-------|--|
|                |           | High speed shaft (HSS) |       |       |  |
|                | $l_N$     | $d_1$                  | $l_1$ | $G_1$ |  |
| <b>9</b>       | 25 - 45   | 60 m6                  | 125   | 230   |  |
|                | 50 - 63   | 45 m6                  | 100   |       |  |
|                | 71 - 90   | 32 m6                  | 80    |       |  |
| <b>10</b>      | 31.5 - 56 | 60 m6                  | 125   | 230   |  |
|                | 63 - 80   | 45 m6                  | 100   |       |  |
|                | 90 - 112  | 32 m6                  | 80    |       |  |
| <b>11</b>      | 25 - 45   | 70 m6                  | 120   | 255   |  |
|                | 50 - 63   | 50 m6                  | 80    |       |  |
|                | 71 - 90   | 42 m6                  | 70    |       |  |
| <b>12</b>      | 31.5 - 56 | 70 m6                  | 120   | 255   |  |
|                | 63 - 80   | 50 m6                  | 80    |       |  |
|                | 90 - 112  | 42 m6                  | 70    |       |  |

| Gear unit size | Dimensions in mm |       |          |     |       |       |       |       |       |            |     |       |            |       |       |       |       |       |       |            |            |       |          |
|----------------|------------------|-------|----------|-----|-------|-------|-------|-------|-------|------------|-----|-------|------------|-------|-------|-------|-------|-------|-------|------------|------------|-------|----------|
|                | a                | $b_1$ | c        | E   | $e_2$ | $e_4$ | $e_5$ | $e_6$ | $f_2$ | $f_3^{1)}$ | h   | $h_1$ | $h_2^{2)}$ | $h_3$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $p_1^{3)}$ | $p_2^{3)}$ | s     | $B^{4)}$ |
| <b>9</b>       | 1000             | 330   | 45 ± 1.5 | 580 | 300   | 320   | 342   | 560   | 32    | 170        | 185 | 275   | 205        | 330   | 920   | 490   | 320   | 40    | 260   | 40         | 370        | 36 H9 | 570      |
| <b>10</b>      | 1100             | 330   | 45 ± 1.5 | 630 | 350   | 320   | 342   | 610   | 32    | 170        | 185 | 275   | 205        | 330   | 1020  | 490   | 320   | 40    | 310   | 40         | 370        | 36 H9 | 570      |
| <b>11</b>      | 1200             | 330   | 54 ± 1.5 | 705 | 345   | 380   | 402   | 595   | 35    | 170        | 215 | 275   | 240        | 340   | 1100  | 600   | 370   | 50    | 295   | 50         | 440        | 40 H9 | 630      |
| <b>12</b>      | 1355             | 330   | 54 ± 1.5 | 775 | 430   | 380   | 410   | 680   | 35    | 170        | 215 | 275   | 240        | 340   | 1255  | 600   | 370   | 50    | 380   | 50         | 440        | 40 H9 | 630      |

For details on the shafts, see Chapter 9.

1) Flange-mounted pump not in connection with versions G, H and I.  
2) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

3) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.  
4) Max. dimensions; details acc. to order-related documentation.

# Helical gear units vertical mounting position

## Type H3

### Gear unit dimensions, three-stage, gear unit sizes 9 to 12

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                              |           |                          |         |        | Oil quantity<br>1)        | Oil quantity<br>1)           | Weight<br>1) 2)          | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 5/31 to 5/35 |                              |     |      |               |  |  |  |
|------------------------------|-----------|--------------------------|---------|--------|---------------------------|------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------|-----|------|---------------|--|--|--|
|                              |           |                          |         |        | H3.V with dip lubrication | H3.V with forced lubrication | H3.V                     |                                                                                                                    |                              |     |      |               |  |  |  |
|                              |           |                          |         |        | Article No.:              |                              | <b>2LP302</b>            | - - - .52-....                                                                                                     |                              |     |      |               |  |  |  |
| Type                         | Size      | $d_2$                    | $l_2$   | $G_2$  | $l$                       | $l$                          | kg                       | Solid shaft with parallel key <sup>4)</sup>                                                                        |                              |     |      |               |  |  |  |
| <b>H3SV</b>                  | <b>9</b>  | 140 n6                   | 250     | 235    | 110                       | 73                           | 875                      | 0 - 8 A                                                                                                            |                              |     |      |               |  |  |  |
|                              | <b>10</b> | 160 n6                   | 300     | 235    | 120                       | 80                           | 1020                     | 1 - 0 A                                                                                                            |                              |     |      |               |  |  |  |
|                              | <b>11</b> | 170 n6                   | 300     | 270    | 190                       | 110                          | 1400                     | 1 - 1 A                                                                                                            |                              |     |      |               |  |  |  |
|                              | <b>12</b> | 180 n6                   | 300     | 270    | 205                       | 120                          | 1675                     | 1 - 2 A                                                                                                            |                              |     |      |               |  |  |  |
| Type                         | Size      | $D_2$                    | $G_4$   | $l$    | $l$                       | kg                           | Hollow shaft with keyway |                                                                                                                    |                              |     |      |               |  |  |  |
| <b>H3HV</b>                  | <b>9</b>  | 135 H7                   | 235     | 110    | 73                        | 875                          | 0 - 8 B                  |                                                                                                                    |                              |     |      |               |  |  |  |
|                              | <b>10</b> | 150 H7                   | 235     | 120    | 80                        | 1020                         | 1 - 0 B                  |                                                                                                                    |                              |     |      |               |  |  |  |
|                              | <b>11</b> | 165 H7                   | 270     | 190    | 110                       | 1400                         | 1 - 1 B                  |                                                                                                                    |                              |     |      |               |  |  |  |
|                              | <b>12</b> | 180 H7                   | 270     | 205    | 120                       | 1675                         | 1 - 2 B                  |                                                                                                                    |                              |     |      |               |  |  |  |
| Type                         | Size      | $D_2$                    | $D_3$   | $G_4$  | $G_5$                     | $l$                          | $l$                      | kg                                                                                                                 | Hollow shaft for shrink disk |     |      |               |  |  |  |
| <b>H3DV</b><br><sup>3)</sup> | <b>9</b>  | 140 H7                   | 145     | 235    | 330                       | 110                          | 73                       | 875                                                                                                                | 0 - 8 C                      |     |      |               |  |  |  |
|                              | <b>10</b> | 150 H7                   | 155     | 235    | 350                       | 120                          | 80                       | 1020                                                                                                               | 1 - 0 C                      |     |      |               |  |  |  |
|                              | <b>11</b> | 165 H7                   | 170     | 270    | 400                       | 190                          | 110                      | 1400                                                                                                               | 1 - 1 C                      |     |      |               |  |  |  |
|                              | <b>12</b> | 180 H7                   | 185     | 270    | 405                       | 205                          | 120                      | 1675                                                                                                               | 1 - 2 C                      |     |      |               |  |  |  |
| Type                         | Size      | N/DIN 5480               | $D_2$   | $D_3$  | $G_4$                     | $l$                          | $l$                      | kg                                                                                                                 | Hollow shaft with spline     |     |      |               |  |  |  |
| <b>H3KV</b>                  | <b>9</b>  | N 140 × 3 × 30 × 45 × 9H | 134 H11 | 145    | 235                       | 110                          | 73                       | 875                                                                                                                | 0 - 8 D                      |     |      |               |  |  |  |
|                              | <b>10</b> | N 140 × 3 × 30 × 45 × 9H | 134 H11 | 155    | 235                       | 120                          | 80                       | 1020                                                                                                               | 1 - 0 D                      |     |      |               |  |  |  |
|                              | <b>11</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11 | 170    | 270                       | 190                          | 110                      | 1400                                                                                                               | 1 - 1 D                      |     |      |               |  |  |  |
|                              | <b>12</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11 | 185    | 270                       | 205                          | 120                      | 1675                                                                                                               | 1 - 2 D                      |     |      |               |  |  |  |
| Type                         | Size      | c                        | $d_2$   | $D_3$  | $k_2$                     | $n \times s$                 | t                        | $G_7$                                                                                                              | $l$                          | $l$ | kg   | Flanged shaft |  |  |  |
| <b>H3FV</b>                  | <b>9</b>  | 38                       | 430     | 220 H6 | 380                       | 20 × 26                      | 12                       | 350                                                                                                                | 110                          | 73  | 960  | 0 - 8 E       |  |  |  |
|                              | <b>10</b> | 38                       | 470     | 240 H6 | 420                       | 22 × 26                      | 12                       | 350                                                                                                                | 120                          | 80  | 1110 | 1 - 0 E       |  |  |  |
|                              | <b>11</b> | 42                       | 510     | 260 H6 | 450                       | 18 × 33                      | 12                       | 400                                                                                                                | 190                          | 110 | 1530 | 1 - 1 E       |  |  |  |
|                              | <b>12</b> | 42                       | 540     | 280 H6 | 480                       | 22 × 33                      | 12                       | 400                                                                                                                | 205                          | 120 | 1815 | 1 - 2 E       |  |  |  |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

<sup>4)</sup> Shaft version with reinforced bearing, see page 9/7.

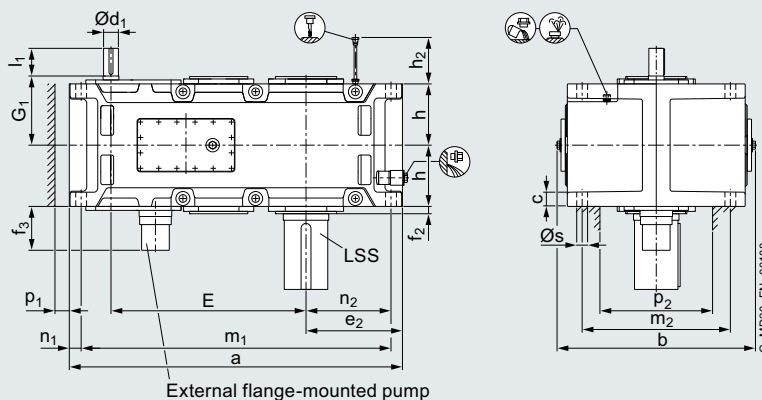
# Helical gear units vertical mounting position

Type H3

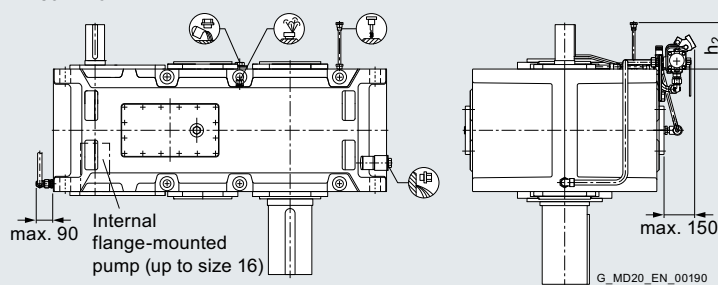
Gear unit dimensions, three-stage, gear unit sizes 13 to 16

## Selection and ordering data

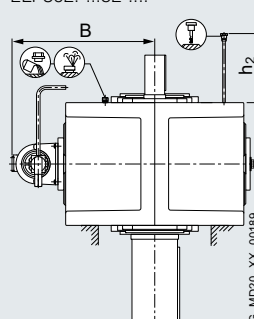
**H3.V**  
Forced lubrication by external flange-mounted pump  
2LP302-...52-....



**H3.V**  
Forced lubrication by internal flange-mounted pump  
2LP302-...52-....



**H3.V**  
Forced lubrication by motor pump  
2LP302-...52-....



| Gear unit size |           | Dimensions in mm       |       |       |  |
|----------------|-----------|------------------------|-------|-------|--|
|                |           | High speed shaft (HSS) |       |       |  |
|                | $l_N$     | $d_1$                  | $l_1$ | $G_1$ |  |
| 13             | 22.4 - 45 | 85 m6                  | 160   | 310   |  |
|                | 50 - 63   | 60 m6                  | 135   |       |  |
|                | 71 - 90   | 50 m6                  | 110   |       |  |
| 14             | 28 - 56   | 85 m6                  | 160   | 310   |  |
|                | 63 - 80   | 60 m6                  | 135   |       |  |
|                | 90 - 112  | 50 m6                  | 110   |       |  |
| 15             | 22.4 - 45 | 100 m6                 | 200   | 350   |  |
|                | 50 - 63   | 75 m6                  | 140   |       |  |
|                | 71 - 90   | 60 m6                  | 140   |       |  |
| 16             | 25 - 50   | 100 m6                 | 200   | 350   |  |
|                | 56 - 71   | 75 m6                  | 140   |       |  |
|                | 80 - 100  | 60 m6                  | 140   |       |  |

| Gear unit size | Dimensions in mm |     |        |      |       |       |            |       |            |       |       |       |       |            |            |    |                 |
|----------------|------------------|-----|--------|------|-------|-------|------------|-------|------------|-------|-------|-------|-------|------------|------------|----|-----------------|
|                | a                | b   | c      | E    | $e_2$ | $f_2$ | $f_3^{1)}$ | h     | $h_2^{2)}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1^{3)}$ | $p_2^{3)}$ | s  | B <sup>4)</sup> |
| 13             | 1395             | 900 | 61 ± 2 | 820  | 405   | 35    | 170        | 272.5 | 300        | 1300  | 680   | 50    | 360   | 50         | 500        | 48 | 685             |
| 14             | 1535             | 900 | 61 ± 2 | 890  | 475   | 35    | 170        | 272.5 | 300        | 1440  | 680   | 50    | 430   | 50         | 500        | 48 | 685             |
| 15             | 1680             | 980 | 72 ± 2 | 987  | 485   | 42    | 170        | 310   | 340        | 1565  | 750   | 60    | 430   | 50         | 570        | 55 | 730             |
| 16             | 1770             | 980 | 72 ± 2 | 1033 | 530   | 42    | 170        | 310   | 340        | 1655  | 750   | 60    | 475   | 50         | 570        | 55 | 730             |

For details on the shafts, see Chapter 9.

- 1) Flange-mounted pump not in connection with versions G, H and I.
- 2) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

- 3) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.
- 4) Max. dimensions; details acc. to order-related documentation.

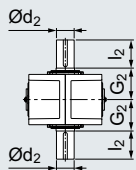
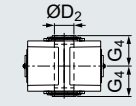
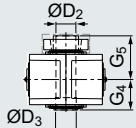
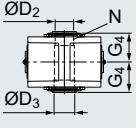
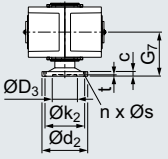
# Helical gear units vertical mounting position

## Type H3

### Gear unit dimensions, three-stage, gear unit sizes 13 to 16

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                                           |           |                          |                | Oil quantity <sup>1)</sup><br>H3.V<br>with forced<br>lubrication | Weight<br><sup>1) 2)</sup><br>H3.V | 10th to 13th position of Article<br>No. and Article No. supplement,<br>for 14th to 16th position, see<br>pages 5/31 to 5/35 |         |                                                                                     |                                                                                       |      |         |                                                                                       |
|-------------------------------------------|-----------|--------------------------|----------------|------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------|---------|---------------------------------------------------------------------------------------|
| Article No.: <b>2LP302</b> - - - .52-.... |           |                          |                |                                                                  |                                    |                                                                                                                             |         |                                                                                     |                                                                                       |      |         |                                                                                       |
| Type                                      | Size      | d <sub>2</sub>           | l <sub>2</sub> | G <sub>2</sub>                                                   | l                                  | kg                                                                                                                          |         | <b>Solid shaft with parallel key <sup>4)</sup></b>                                  |                                                                                       |      |         |                                                                                       |
| <b>H3SV</b>                               | <b>13</b> | 200 n6                   | 350            | 335                                                              | 160                                | 2155                                                                                                                        | 1 - 3 A |  |                                                                                       |      |         |                                                                                       |
|                                           | <b>14</b> | 210 n6                   | 350            | 335                                                              | 180                                | 2490                                                                                                                        | 1 - 4 A |                                                                                     |                                                                                       |      |         |                                                                                       |
|                                           | <b>15</b> | 230 n6                   | 410            | 380                                                              | 255                                | 3260                                                                                                                        | 1 - 5 A |                                                                                     |                                                                                       |      |         |                                                                                       |
|                                           | <b>16</b> | 240 n6                   | 410            | 380                                                              | 260                                | 3625                                                                                                                        | 1 - 6 A |                                                                                     |                                                                                       |      |         |                                                                                       |
| Type                                      | Size      | D <sub>2</sub>           | G <sub>4</sub> |                                                                  | l                                  | kg                                                                                                                          |         | <b>Hollow shaft with keyway</b>                                                     |                                                                                       |      |         |                                                                                       |
| <b>H3HV</b>                               | <b>13</b> | 190 H7                   | 335            |                                                                  | 160                                | 2155                                                                                                                        | 1 - 3 B |  |                                                                                       |      |         |                                                                                       |
|                                           | <b>14</b> | 210 H7                   | 335            |                                                                  | 180                                | 2490                                                                                                                        | 1 - 4 B |                                                                                     |                                                                                       |      |         |                                                                                       |
|                                           | <b>15</b> | 230 H7                   | 380            |                                                                  | 255                                | 3260                                                                                                                        | 1 - 5 B |                                                                                     |                                                                                       |      |         |                                                                                       |
|                                           | <b>16</b> | 240 H7                   | 380            |                                                                  | 260                                | 3625                                                                                                                        | 1 - 6 B |                                                                                     |                                                                                       |      |         |                                                                                       |
| Type                                      | Size      | D <sub>2</sub>           | D <sub>3</sub> | G <sub>4</sub>                                                   | G <sub>5</sub>                     | l                                                                                                                           | kg      | <b>Hollow shaft for shrink disk</b>                                                 |                                                                                       |      |         |                                                                                       |
| <b>H3DV</b><br><sup>3)</sup>              | <b>13</b> | 190 H7                   | 195            | 335                                                              | 480                                | 160                                                                                                                         | 2155    | 1 - 3 C                                                                             |   |      |         |                                                                                       |
|                                           | <b>14</b> | 210 H7                   | 215            | 335                                                              | 480                                | 180                                                                                                                         | 2490    | 1 - 4 C                                                                             |                                                                                       |      |         |                                                                                       |
|                                           | <b>15</b> | 230 H7                   | 235            | 380                                                              | 550                                | 255                                                                                                                         | 3260    | 1 - 5 C                                                                             |                                                                                       |      |         |                                                                                       |
|                                           | <b>16</b> | 240 H7                   | 245            | 380                                                              | 550                                | 260                                                                                                                         | 3625    | 1 - 6 C                                                                             |                                                                                       |      |         |                                                                                       |
| Type                                      | Size      | N/DIN 5480               | D <sub>2</sub> | D <sub>3</sub>                                                   | G <sub>4</sub>                     | l                                                                                                                           | kg      | <b>Hollow shaft with spline</b>                                                     |                                                                                       |      |         |                                                                                       |
| <b>H3KV</b>                               | <b>13</b> | N 190 × 5 × 30 × 36 × 9H | 180 H11        | 195                                                              | 335                                | 160                                                                                                                         | 2155    | 1 - 3 D                                                                             |  |      |         |                                                                                       |
|                                           | <b>14</b> | N 190 × 5 × 30 × 36 × 9H | 180 H11        | 215                                                              | 335                                | 180                                                                                                                         | 2490    | 1 - 4 D                                                                             |                                                                                       |      |         |                                                                                       |
|                                           | <b>15</b> | N 220 × 5 × 30 × 42 × 9H | 210 H11        | 235                                                              | 380                                | 255                                                                                                                         | 3260    | 1 - 5 D                                                                             |                                                                                       |      |         |                                                                                       |
|                                           | <b>16</b> | N 220 × 5 × 30 × 42 × 9H | 210 H11        | 245                                                              | 380                                | 260                                                                                                                         | 3625    | 1 - 6 D                                                                             |                                                                                       |      |         |                                                                                       |
| Type                                      | Size      | c                        | d <sub>2</sub> | D <sub>3</sub>                                                   | k <sub>2</sub>                     | n × s                                                                                                                       | t       | G <sub>7</sub>                                                                      | l                                                                                     | kg   |         | <b>Flanged shaft</b>                                                                  |
| <b>H3FV</b>                               | <b>13</b> | 48                       | 580            | 310 H6                                                           | 500                                | 20 × 33                                                                                                                     | 14      | 480                                                                                 | 160                                                                                   | 2315 | 1 - 3 E |  |
|                                           | <b>14</b> | 48                       | 620            | 310 H6                                                           | 540                                | 24 × 33                                                                                                                     | 14      | 480                                                                                 | 180                                                                                   | 2660 | 1 - 4 E |                                                                                       |
|                                           | <b>15</b> | 55                       | 710            | 360 H6                                                           | 630                                | 28 × 33                                                                                                                     | 17      | 550                                                                                 | 255                                                                                   | 3500 | 1 - 5 E |                                                                                       |
|                                           | <b>16</b> | 55                       | 740            | 360 H6                                                           | 660                                | 30 × 33                                                                                                                     | 17      | 550                                                                                 | 260                                                                                   | 3880 | 1 - 6 E |                                                                                       |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

<sup>4)</sup> Shaft version with reinforced bearing, see page 9/7.

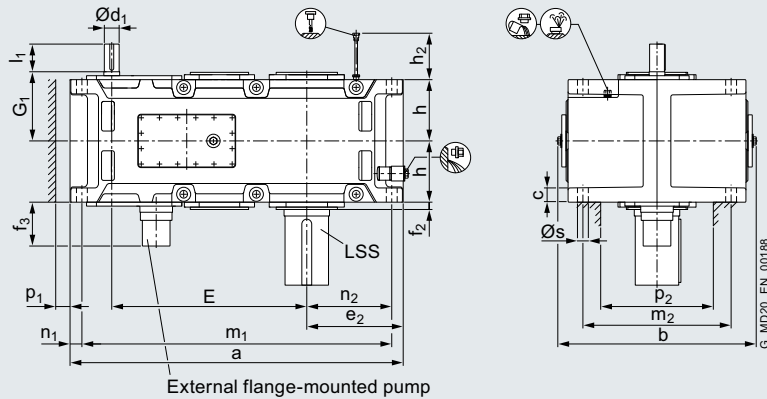
# Helical gear units vertical mounting position

Type H3

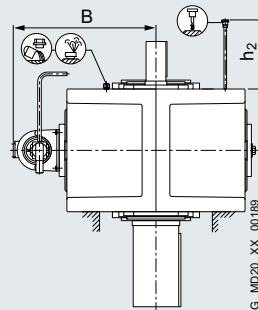
Gear unit dimensions, three-stage, gear unit sizes 17 to 20

## Selection and ordering data

**H3.V**  
Forced lubrication by  
external flange-  
mounted pump  
2LP302-...52-....



**H3.V**  
Forced lubrication  
by motor pump  
2LP302-...52-....



| Gear unit size |           | Dimensions in mm       |       |       |  |
|----------------|-----------|------------------------|-------|-------|--|
|                |           | High speed shaft (HSS) |       |       |  |
|                | $l_N$     | $d_1$                  | $l_1$ | $G_1$ |  |
| 17             | 22.4 - 45 | 100 m6                 | 200   | 380   |  |
|                | 50 - 63   | 75 m6                  | 140   |       |  |
|                | 71 - 90   | 60 m6                  | 140   |       |  |
| 18             | 25 - 50   | 100 m6                 | 200   | 380   |  |
|                | 56 - 71   | 75 m6                  | 140   |       |  |
|                | 80 - 100  | 60 m6                  | 140   |       |  |
| 19             | 22.4 - 45 | 100 m6                 | 200   | 430   |  |
|                | 50 - 63   | 90 m6                  | 165   |       |  |
|                | 71 - 90   | 75 m6                  | 140   |       |  |
| 20             | 25 - 50   | 100 m6                 | 200   | 430   |  |
|                | 56 - 71   | 90 m6                  | 165   |       |  |
|                | 80 - 100  | 75 m6                  | 140   |       |  |

| Gear unit size | Dimensions in mm |      |        |      |       |       |            |     |            |       |       |       |       |            |            |    |                 |
|----------------|------------------|------|--------|------|-------|-------|------------|-----|------------|-------|-------|-------|-------|------------|------------|----|-----------------|
|                | a                | b    | c      | E    | $e_2$ | $f_2$ | $f_3^{1)}$ | h   | $h_2^{2)}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1^{3)}$ | $p_2^{3)}$ | s  | B <sup>4)</sup> |
| 17             | 1770             | 1110 | 81 ± 2 | 1035 | 525   | 42    | 210        | 340 | 374        | 1640  | 850   | 70    | 465   | 70         | 630        | 55 | 790             |
| 18             | 1890             | 1110 | 81 ± 2 | 1095 | 585   | 42    | 210        | 340 | 374        | 1760  | 850   | 70    | 525   | 70         | 630        | 55 | 790             |
| 19             | 2030             | 1222 | 91 ± 2 | 1190 | 590   | 55    | O. r.      | 390 | 380        | 1885  | 950   | 78    | 520   | 70         | 700        | 65 | On request      |
| 20             | 2150             | 1222 | 91 ± 2 | 1250 | 650   | 55    | O. r.      | 390 | 380        | 2005  | 950   | 78    | 580   | 70         | 700        | 65 | On request      |

For details on the shafts, see Chapter 9.

<sup>1)</sup> Values  $f_3$  for size 19 or larger on request; flange-mounted pump not in connection with versions G, H and I.

<sup>2)</sup> For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

<sup>3)</sup> Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

<sup>4)</sup> Max. dimensions; details acc. to order-related documentation.



# Helical gear units vertical mounting position

## Type H3

### Gear unit dimensions, three-stage, gear unit sizes 17 to 20

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                              |           |                          |         | Oil quantity <sup>1)</sup><br>H3.V<br>with forced<br>lubrication | Weight<br><sup>1) 2)</sup><br>H3.V | 10th to 13th position of Article<br>No. and Article No. supplement,<br>for 14th to 16th position, see<br>pages 5/31 to 5/35 |                          |                                             |            |      |         |               |
|------------------------------|-----------|--------------------------|---------|------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------|------------|------|---------|---------------|
|                              |           |                          |         | Article No.: <b>2LP302</b> ■ - ■ ■ .52-....                      |                                    |                                                                                                                             |                          |                                             |            |      |         |               |
| Type                         | Size      | $d_2$                    | $l_2$   | $G_2$                                                            | $l$                                | kg                                                                                                                          |                          | Solid shaft with parallel key <sup>4)</sup> |            |      |         |               |
| <b>H3SV</b>                  | <b>17</b> | 250 n6                   | 410     | 415                                                              | 325                                | 4250                                                                                                                        | 1 - 7 A                  |                                             |            |      |         |               |
|                              | <b>18</b> | 270 n6                   | 470     | 415                                                              | 335                                | 4740                                                                                                                        | 1 - 8 A                  |                                             |            |      |         |               |
|                              | <b>19</b> | 290 n6                   | 470     | 465                                                              | On request                         |                                                                                                                             | 2 - 0 A                  |                                             |            |      |         |               |
|                              | <b>20</b> | 300 n6                   | 500     | 465                                                              |                                    |                                                                                                                             | 2 - 1 A                  |                                             |            |      |         |               |
| Type                         | Size      | $D_2$                    | $G_4$   | $l$                                                              | kg                                 |                                                                                                                             | Hollow shaft with keyway |                                             |            |      |         |               |
| <b>H3HV</b>                  | <b>17</b> | 250 H7                   | 415     | 325                                                              | 4250                               | 1 - 7 B                                                                                                                     |                          |                                             |            |      |         |               |
|                              | <b>18</b> | 275 H7                   | 415     | 335                                                              | 4740                               | 1 - 8 B                                                                                                                     |                          |                                             |            |      |         |               |
| Type                         | Size      | $D_2$                    | $D_3$   | $G_4$                                                            | $G_5$                              | $l$                                                                                                                         | kg                       | Hollow shaft for shrink disk                |            |      |         |               |
| <b>H3DV</b><br><sup>3)</sup> | <b>17</b> | 250 H7                   | 260     | 415                                                              | 600                                | 325                                                                                                                         | 4250                     | 1 - 7 C                                     |            |      |         |               |
|                              | <b>18</b> | 280 H7                   | 285     | 415                                                              | 600                                | 335                                                                                                                         | 4740                     | 1 - 8 C                                     |            |      |         |               |
|                              | <b>19</b> | 285 H7                   | 295     | 465                                                              | 670                                | On request                                                                                                                  |                          | 2 - 0 C                                     |            |      |         |               |
|                              | <b>20</b> | 310 H7                   | 315     | 465                                                              | 670                                |                                                                                                                             |                          | 2 - 1 C                                     |            |      |         |               |
| Type                         | Size      | N/DIN 5480               | $D_2$   | $D_3$                                                            | $G_4$                              | $l$                                                                                                                         | kg                       | Hollow shaft with spline                    |            |      |         |               |
| <b>H3KV</b>                  | <b>17</b> | N 250 × 5 × 30 × 48 × 9H | 240 H11 | 260                                                              | 415                                | 325                                                                                                                         | 4250                     | 1 - 7 D                                     |            |      |         |               |
|                              | <b>18</b> | N 250 × 5 × 30 × 48 × 9H | 240 H11 | 285                                                              | 415                                | 335                                                                                                                         | 4740                     | 1 - 8 D                                     |            |      |         |               |
|                              | <b>19</b> | On request               |         |                                                                  |                                    |                                                                                                                             |                          | 2 - 0 D                                     |            |      |         |               |
|                              | <b>20</b> |                          |         |                                                                  |                                    |                                                                                                                             |                          | 2 - 1 D                                     |            |      |         |               |
| Type                         | Size      | $c$                      | $d_2$   | $D_3$                                                            | $k_2$                              | $n \times s$                                                                                                                | $t$                      | $G_7$                                       | $l$        | kg   |         | Flanged shaft |
| <b>H3FV</b>                  | <b>17</b> | 60                       | 750     | 410 H6                                                           | 660                                | 24 × 39                                                                                                                     | 18                       | 600                                         | 325        | 4550 | 1 - 7 E |               |
|                              | <b>18</b> | 60                       | 800     | 410 H6                                                           | 710                                | 26 × 39                                                                                                                     | 18                       | 600                                         | 335        | 5090 | 1 - 8 E |               |
|                              | <b>19</b> | 65                       | 860     | 460 H6                                                           | 770                                | 30 × 39                                                                                                                     | 18                       | 670                                         | On request |      | 2 - 0 E |               |
|                              | <b>20</b> | 65                       | 930     | 460 H6                                                           | 830                                | 32 × 39                                                                                                                     | 18                       | 670                                         |            |      | 2 - 1 E |               |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

<sup>4)</sup> Shaft version with reinforced bearing (up to size 18), see page 9/7.

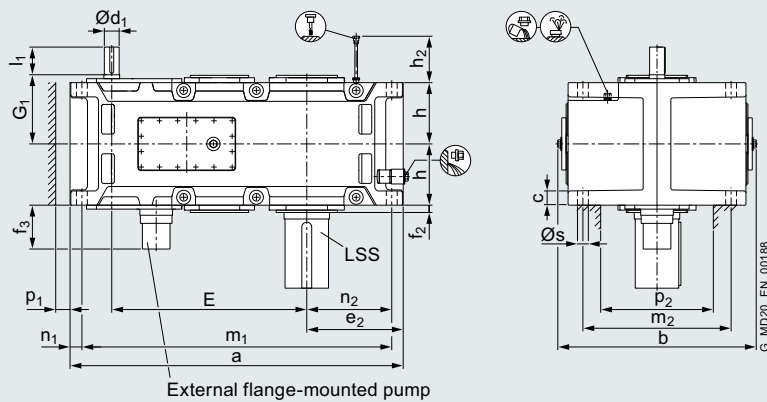
# Helical gear units vertical mounting position

Type H3

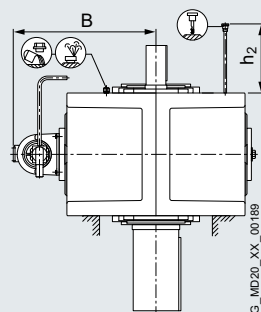
Gear unit dimensions, three-stage, gear unit sizes 21 to 24

## Selection and ordering data

**H3.V**  
Forced lubrication by  
external flange-  
mounted pump  
2LP302-...52-....



**H3.V**  
Forced lubrication  
by motor pump  
2LP302-...52-....



| Gear unit size |           | Dimensions in mm              |       |       |  |
|----------------|-----------|-------------------------------|-------|-------|--|
|                |           | <b>High speed shaft (HSS)</b> |       |       |  |
|                | $l_N$     | $d_1$                         | $l_1$ | $G_1$ |  |
| <b>21</b>      | 22.4 - 45 | 130 n6                        | 240   | 470   |  |
|                | 50 - 63   | 110 n6                        | 205   |       |  |
|                | 71 - 90   | 90 m6                         | 170   |       |  |
| <b>22</b>      | 25 - 50   | 130 n6                        | 240   | 470   |  |
|                | 56 - 71   | 110 n6                        | 205   |       |  |
|                | 80 - 100  | 90 m6                         | 170   |       |  |
| <b>23</b>      | 22.4 - 40 | 130 n6                        | 255   | 515   |  |
|                | 45 - 56   | 110 n6                        | 220   |       |  |
|                | 63 - 90   | 90 m6                         | 185   |       |  |
| <b>24</b>      | 25 - 45   | 130 n6                        | 255   | 515   |  |
|                | 50 - 63   | 110 n6                        | 220   |       |  |
|                | 71 - 100  | 90 m6                         | 185   |       |  |

| Gear unit size | Dimensions in mm |      |         |      |       |       |            |     |            |       |       |       |       |            |            |    |            |
|----------------|------------------|------|---------|------|-------|-------|------------|-----|------------|-------|-------|-------|-------|------------|------------|----|------------|
|                | a                | b    | c       | E    | $e_2$ | $f_2$ | $f_3^{1)}$ | h   | $h_2^{2)}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1^{3)}$ | $p_2^{3)}$ | s  | B          |
| <b>21</b>      | 2340             | 1378 | 100 ± 2 | 1387 | 655   | 60    | O. r.      | 410 | 390        | 2200  | 1040  | 90    | 585   | 70         | 720        | 75 | On request |
| <b>22</b>      | 2450             | 1378 | 100 ± 2 | 1442 | 710   | 60    | O. r.      | 410 | 390        | 2295  | 1040  | 90    | 640   | 70         | 720        | 75 |            |
| <b>23</b>      | On request       |      |         |      |       |       |            |     |            |       |       |       |       |            |            |    |            |
| <b>24</b>      | On request       |      |         |      |       |       |            |     |            |       |       |       |       |            |            |    |            |

For details on the shafts, see Chapter 9.

<sup>1)</sup> Values  $f_3$  for size 19 or larger on request; flange-mounted pump not in connection with versions G, H and I.

<sup>2)</sup> For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

<sup>3)</sup> Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

# Helical gear units vertical mounting position

## Type H3

### Gear unit dimensions, three-stage, gear unit sizes 21 to 24

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                                             |           |                  |       | Oil quantity<br>H3.V<br>with forced<br>lubrication | Weight<br>H3.V | 10th to 13th position of Article No.<br>and Article No. supplement,<br>for 14th to 16th position, see<br>pages 5/31 to 5/35 |    |                               |            |    |               |
|---------------------------------------------|-----------|------------------|-------|----------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------|----|-------------------------------|------------|----|---------------|
| Article No.: <b>2LP302</b> ■ - ■ ■ .52-.... |           |                  |       |                                                    |                |                                                                                                                             |    |                               |            |    |               |
| Type                                        | Size      | $d_2$            | $l_2$ | $G_2$                                              | l              | kg                                                                                                                          |    | Solid shaft with parallel key |            |    |               |
| <b>H3SV</b>                                 | <b>21</b> | 320 n6           | 500   | 490                                                | On request     |                                                                                                                             |    |                               |            |    |               |
|                                             | <b>22</b> | 340 n6           | 550   | 490                                                |                |                                                                                                                             |    |                               |            |    |               |
|                                             | <b>23</b> | 360 n6           | 590   | 540                                                |                |                                                                                                                             |    |                               |            |    |               |
|                                             | <b>24</b> | 380 n6           | 590   | 540                                                |                |                                                                                                                             |    |                               |            |    |               |
| Type                                        | Size      | $D_2$            | $D_3$ | $G_4$                                              | $G_5$          | l                                                                                                                           | kg | Hollow shaft for shrink disk  |            |    |               |
| <b>H3DV</b><br>1)                           | <b>21</b> | 330 H7           | 335   | 490                                                | 715            | On request                                                                                                                  |    |                               |            |    |               |
|                                             | <b>22</b> | 340 H7           | 345   | 490                                                | 725            |                                                                                                                             |    |                               |            |    |               |
|                                             | <b>23</b> | 370 H7           | 375   | 540                                                | 800            |                                                                                                                             |    |                               |            |    |               |
|                                             | <b>24</b> | 390 H7           | 395   | 540                                                | 825            |                                                                                                                             |    |                               |            |    |               |
| Type                                        | Size      | N/DIN 5480 $D_2$ | $D_3$ | $G_4$                                              |                | l                                                                                                                           | kg | Hollow shaft with spline      |            |    |               |
| <b>H3KV</b>                                 | <b>21</b> | On request       |       |                                                    |                | On request                                                                                                                  |    |                               |            |    |               |
|                                             | <b>22</b> |                  |       |                                                    |                |                                                                                                                             |    |                               |            |    |               |
| Type                                        | Size      | c                | $d_2$ | $D_3$                                              | $k_2$          | $n \times s$                                                                                                                | t  | $G_7$                         | l          | kg | Flanged shaft |
| <b>H3FV</b>                                 | <b>21</b> | 75               | 950   | 520 H6                                             | 850            | 28 × 45                                                                                                                     | 20 | 710                           | On request |    |               |
|                                             | <b>22</b> | 75               | 1040  | 520 H6                                             | 940            | 28 × 45                                                                                                                     | 20 | 710                           |            |    |               |

Shaft seals, [see pages 10/2 onwards](#).

For details on the shafts, [see Chapter 9](#).

Cooling options, [see page 10/11 onwards](#).

<sup>1)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

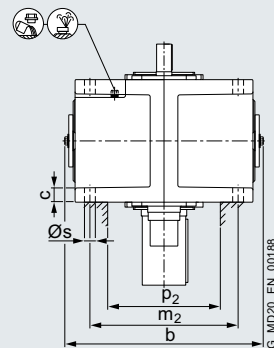
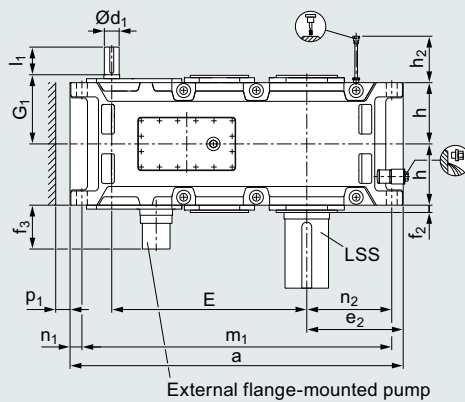
## Helical gear units vertical mounting position

Type H3

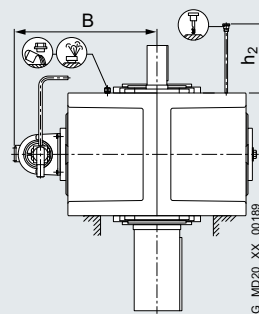
Gear unit dimensions, three-stage, gear unit sizes 25 and 26

### Selection and ordering data

**H3.V**  
Forced lubrication by  
external flange-  
mounted pump  
2LP302-...52-....



**H3.V**  
Forced lubrication  
by motor pump  
2LP302-...52-....



| Gear unit size |           | Dimensions in mm              |       |       |  |
|----------------|-----------|-------------------------------|-------|-------|--|
|                |           | <b>High speed shaft (HSS)</b> |       |       |  |
|                | $l_N$     | $d_1$                         | $l_1$ | $G_1$ |  |
| <b>25</b>      | 22.4 - 40 | 150 n6                        | 255   | 580   |  |
|                | 45 - 56   | 130 n6                        | 255   |       |  |
|                | 63 - 90   | 100 m6                        | 220   |       |  |
| <b>26</b>      | 25 - 45   | 150 n6                        | 255   | 580   |  |
|                | 50 - 63   | 130 n6                        | 255   |       |  |
|                | 71 - 100  | 100 m6                        | 220   |       |  |

| Gear unit size | Dimensions in mm |   |   |   |       |       |       |   |       |       |       |       |       |       |       |   |   |
|----------------|------------------|---|---|---|-------|-------|-------|---|-------|-------|-------|-------|-------|-------|-------|---|---|
|                | a                | b | c | E | $e_2$ | $f_2$ | $f_3$ | h | $h_2$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1$ | $p_2$ | s | B |
| <b>25</b>      | On request       |   |   |   |       |       |       |   |       |       |       |       |       |       |       |   |   |
| <b>26</b>      | On request       |   |   |   |       |       |       |   |       |       |       |       |       |       |       |   |   |

For details on the shafts, see Chapter 9.

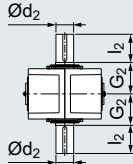
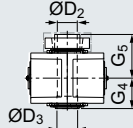
# Helical gear units vertical mounting position

## Type H3

### Gear unit dimensions, three-stage, gear unit sizes 25 and 26

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                   |           |        |       |       | Oil quantity<br>H3.V<br>with forced<br>lubrication | Weight<br>H3.V | 10th to 13th position of Article No.<br>and Article No. supplement,<br>for 14th to 16th position, see<br>pages 5/31 to 5/35 |                                                                                     |
|-------------------|-----------|--------|-------|-------|----------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                   |           |        |       |       | Article No.: <b>2LP302</b> ■ - ■ ■ .52-....        |                |                                                                                                                             |                                                                                     |
| Type              | Size      | $d_2$  | $l_2$ | $G_2$ | l                                                  | kg             | Solid shaft with parallel key                                                                                               |                                                                                     |
| <b>H3SV</b>       | <b>25</b> | 400 n6 | 650   | 605   | On request                                         |                | <b>2 - 6 A</b>                                                                                                              |  |
|                   | <b>26</b> | 420 n6 | 650   | 605   |                                                    |                | <b>2 - 7 A</b>                                                                                                              |                                                                                     |
|                   | <b>27</b> | 440 n6 | 690   | 680   |                                                    |                | <b>2 - 8 A</b>                                                                                                              |                                                                                     |
|                   | <b>28</b> | 460 n6 | 750   | 680   |                                                    |                | <b>3 - 0 A</b>                                                                                                              |                                                                                     |
| Type              | Size      | $D_2$  | $D_3$ | $G_4$ | $G_5$                                              | l              | kg                                                                                                                          | Hollow shaft for shrink disk                                                        |
| <b>H3DV</b><br>1) | <b>25</b> | 410 H7 | 415   | 610   | 895                                                | On request     |                                                                                                                             | <b>2 - 6 C</b>                                                                      |
|                   | <b>26</b> | 430 H7 | 435   | 610   | 925                                                |                |                                                                                                                             | <b>2 - 7 C</b>                                                                      |
|                   |           |        |       |       |                                                    |                |                                          |                                                                                     |

Shaft seals, [see pages 10/2 onwards](#).

For details on the shafts, [see Chapter 9](#).

Cooling options, [see page 10/11 onwards](#).

<sup>1)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

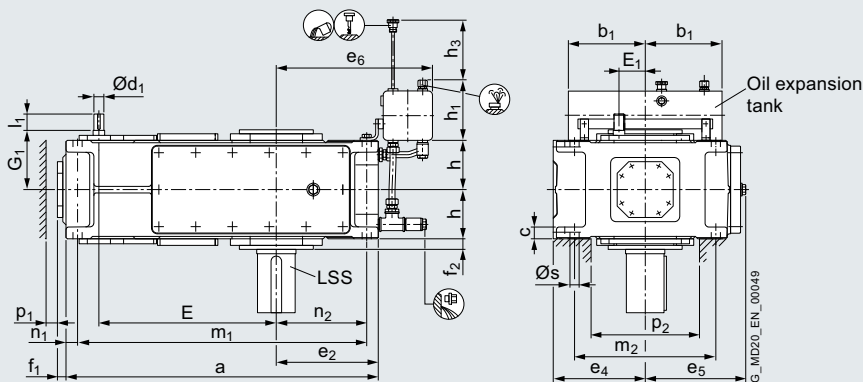
# Helical gear units vertical mounting position

Type H4

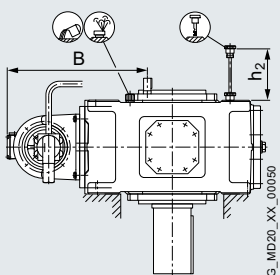
Gear unit dimensions, four-stage, gear unit sizes 7 to 12

## Selection and ordering data

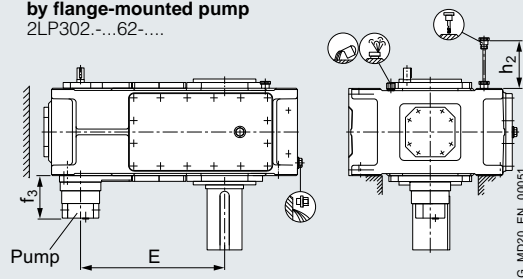
**H4.V**  
Dip lubrication  
2LP302-...62-....



**H4.V**  
Forced lubrication  
by motor pump  
2LP302-...62-....



**H4.V**  
Forced lubrication  
by flange-mounted pump  
2LP302-...62-....



| Gear unit size | Dimensions in mm |       |       |       |
|----------------|------------------|-------|-------|-------|
|                | $l_N$            | $d_1$ | $l_1$ | $G_1$ |
| 7              | 100 - 180        | 30 m6 | 50    | 180   |
|                | 200 - 355        | 24 k6 | 40    |       |
| 8              | 125 - 224        | 30 m6 | 50    | 180   |
|                | 250 - 450        | 24 k6 | 40    |       |
| 9              | 100 - 180        | 35 m6 | 60    | 215   |
|                | 200 - 355        | 28 m6 | 50    |       |
| 10             | 125 - 224        | 35 m6 | 60    | 215   |
|                | 250 - 450        | 28 m6 | 50    |       |
| 11             | 100 - 180        | 45 m6 | 100   | 250   |
|                | 200 - 355        | 32 m6 | 80    |       |
| 12             | 125 - 224        | 45 m6 | 100   | 250   |
|                | 250 - 450        | 32 m6 | 80    |       |

| Gear unit size | Dimensions in mm |       |              |     |       |       |       |       |       |       |       |          |     |       |          |       |       |       |       |       |          |          |       |       |
|----------------|------------------|-------|--------------|-----|-------|-------|-------|-------|-------|-------|-------|----------|-----|-------|----------|-------|-------|-------|-------|-------|----------|----------|-------|-------|
|                | a                | $b_1$ | c            | E   | $E_1$ | $e_2$ | $e_4$ | $e_5$ | $e_6$ | $f_1$ | $f_2$ | $f_{31}$ | h   | $h_1$ | $h_{22}$ | $h_3$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_{13}$ | $p_{23}$ | s     | $B^4$ |
| 7              | 845              | 240   | $36 \pm 1$   | 495 | 80    | 250   | 280   | 292   | 425   | 37    | 30    | 160      | 150 | 205   | 165      | 250   | 775   | 430   | 35    | 215   | 35       | 330      | 28 H9 | 540   |
| 8              | 950              | 240   | $36 \pm 1$   | 540 | 80    | 310   | 280   | 302   | 485   | 37    | 32    | 160      | 150 | 205   | 165      | 250   | 880   | 430   | 35    | 275   | 35       | 330      | 28 H9 | 540   |
| 9              | 1000             | 330   | $45 \pm 1.5$ | 580 | 90    | 300   | 320   | 342   | 560   | 43    | 32    | 170      | 185 | 275   | 205      | 330   | 920   | 490   | 40    | 260   | 40       | 370      | 36 H9 | 580   |
| 10             | 1100             | 330   | $45 \pm 1.5$ | 630 | 90    | 350   | 320   | 342   | 610   | 43    | 32    | 170      | 185 | 275   | 205      | 330   | 1020  | 490   | 40    | 310   | 40       | 370      | 36 H9 | 580   |
| 11             | 1200             | 330   | $54 \pm 1.5$ | 705 | 110   | 345   | 380   | 402   | 595   | 47    | 35    | 170      | 215 | 275   | 240      | 340   | 1100  | 600   | 50    | 295   | 50       | 440      | 40 H9 | 640   |
| 12             | 1355             | 330   | $54 \pm 1.5$ | 775 | 110   | 430   | 380   | 410   | 680   | 47    | 35    | 170      | 215 | 275   | 240      | 340   | 1255  | 600   | 50    | 380   | 50       | 440      | 40 H9 | 640   |

For details on the shafts, see Chapter 9.

- 1) Flange-mounted pump not in connection with versions G, H and I; free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.
- 2) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring. Details acc. to order-related documentation.
- 3) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.
- 4) Max. dimensions; details acc. to order-related documentation.

# Helical gear units vertical mounting position

## Type H4

### Gear unit dimensions, four-stage, gear unit sizes 7 to 12

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                   |           |                         |         | Oil quantity<br>1)        | Oil quantity<br>1)           | Weight<br>1) 2) |                |                | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 5/31 to 5/35 |                                  |      |                |  |
|-------------------|-----------|-------------------------|---------|---------------------------|------------------------------|-----------------|----------------|----------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------|------|----------------|--|
|                   |           |                         |         | H4.V with dip lubrication | H4.V with forced lubrication | H4.V            |                |                |                                                                                                                    |                                  |      |                |  |
|                   |           |                         |         | Article No.:              |                              | <b>2LP302</b>   | - -            |                | <b>.62-....</b>                                                                                                    |                                  |      |                |  |
| Type              | Size      | $d_2$                   | $l_2$   | $G_2$                     | $l$                          | $l$             | kg             |                |                                                                                                                    | Solid shaft with parallel key 4) |      |                |  |
| <b>H4SV</b>       | <b>7</b>  | 120 n6                  | 210     | 195                       | 60                           | 44              | 550            | <b>0 - 6 A</b> |                                                                                                                    |                                  |      |                |  |
|                   | <b>8</b>  | 130 n6                  | 250     | 195                       | 65                           | 48              | 645            | <b>0 - 7 A</b> |                                                                                                                    |                                  |      |                |  |
|                   | <b>9</b>  | 140 n6                  | 250     | 235                       | 105                          | 78              | 875            | <b>0 - 8 A</b> |                                                                                                                    |                                  |      |                |  |
|                   | <b>10</b> | 160 n6                  | 300     | 235                       | 110                          | 81              | 1010           | <b>1 - 0 A</b> |                                                                                                                    |                                  |      |                |  |
|                   | <b>11</b> | 170 n6                  | 300     | 270                       | 175                          | 113             | 1460           | <b>1 - 1 A</b> |                                                                                                                    |                                  |      |                |  |
|                   | <b>12</b> | 180 n6                  | 300     | 270                       | 200                          | 129             | 1725           | <b>1 - 2 A</b> |                                                                                                                    |                                  |      |                |  |
| Type              | Size      | $D_2$                   | $G_4$   | $l$                       | $l$                          | kg              |                |                | Hollow shaft with keyway                                                                                           |                                  |      |                |  |
| <b>H4HV</b>       | <b>7</b>  | 115 H7                  | 195     | 60                        | 44                           | 550             | <b>0 - 6 B</b> |                |                                                                                                                    |                                  |      |                |  |
|                   | <b>8</b>  | 125 H7                  | 195     | 65                        | 48                           | 645             | <b>0 - 7 B</b> |                |                                                                                                                    |                                  |      |                |  |
|                   | <b>9</b>  | 135 H7                  | 235     | 105                       | 78                           | 875             | <b>0 - 8 B</b> |                |                                                                                                                    |                                  |      |                |  |
|                   | <b>10</b> | 150 H7                  | 235     | 110                       | 81                           | 1010            | <b>1 - 0 B</b> |                |                                                                                                                    |                                  |      |                |  |
|                   | <b>11</b> | 165 H7                  | 270     | 175                       | 113                          | 1460            | <b>1 - 1 B</b> |                |                                                                                                                    |                                  |      |                |  |
|                   | <b>12</b> | 180 H7                  | 270     | 200                       | 129                          | 1725            | <b>1 - 2 B</b> |                |                                                                                                                    |                                  |      |                |  |
| Type              | Size      | $D_2$                   | $D_3$   | $G_4$                     | $G_5$                        | $l$             | $l$            | kg             | Hollow shaft for shrink disk                                                                                       |                                  |      |                |  |
| <b>H4DV</b><br>3) | <b>7</b>  | 120 H7                  | 120     | 195                       | 280                          | 60              | 44             | 550            | <b>0 - 6 C</b>                                                                                                     |                                  |      |                |  |
|                   | <b>8</b>  | 130 H7                  | 130     | 195                       | 285                          | 65              | 48             | 645            | <b>0 - 7 C</b>                                                                                                     |                                  |      |                |  |
|                   | <b>9</b>  | 140 H7                  | 145     | 235                       | 330                          | 105             | 78             | 875            | <b>0 - 8 C</b>                                                                                                     |                                  |      |                |  |
|                   | <b>10</b> | 150 H7                  | 155     | 235                       | 350                          | 110             | 81             | 1010           | <b>1 - 0 C</b>                                                                                                     |                                  |      |                |  |
|                   | <b>11</b> | 165 H7                  | 170     | 270                       | 400                          | 175             | 113            | 1460           | <b>1 - 1 C</b>                                                                                                     |                                  |      |                |  |
|                   | <b>12</b> | 180 H7                  | 185     | 270                       | 405                          | 200             | 129            | 1725           | <b>1 - 2 C</b>                                                                                                     |                                  |      |                |  |
| Type              | Size      | N/DIN 5480              | $D_2$   | $D_3$                     | $G_4$                        | $l$             | $l$            | kg             | Hollow shaft with spline                                                                                           |                                  |      |                |  |
| <b>H4KV</b>       | <b>7</b>  | N120 x 3 x 30 x 38 x 9H | 114 H11 | 120                       | 195                          | 60              | 44             | 550            | <b>0 - 6 D</b>                                                                                                     |                                  |      |                |  |
|                   | <b>8</b>  | N120 x 3 x 30 x 38 x 9H | 114 H11 | 130                       | 195                          | 65              | 48             | 645            | <b>0 - 7 D</b>                                                                                                     |                                  |      |                |  |
|                   | <b>9</b>  | N140 x 3 x 30 x 45 x 9H | 134 H11 | 145                       | 235                          | 105             | 78             | 875            | <b>0 - 8 D</b>                                                                                                     |                                  |      |                |  |
|                   | <b>10</b> | N140 x 3 x 30 x 45 x 9H | 134 H11 | 155                       | 235                          | 110             | 81             | 1010           | <b>1 - 0 D</b>                                                                                                     |                                  |      |                |  |
|                   | <b>11</b> | N170 x 5 x 30 x 32 x 9H | 160 H11 | 170                       | 270                          | 175             | 113            | 1460           | <b>1 - 1 D</b>                                                                                                     |                                  |      |                |  |
|                   | <b>12</b> | N170 x 5 x 30 x 32 x 9H | 160 H11 | 185                       | 270                          | 200             | 129            | 1725           | <b>1 - 2 D</b>                                                                                                     |                                  |      |                |  |
| Type              | Size      | c                       | $d_2$   | $D_3$                     | $k_2$                        | n x s           | t              | $G_7$          | $l$                                                                                                                | $l$                              | kg   | Flanged shaft  |  |
| <b>H4FV</b>       | <b>7</b>  | 30                      | 370     | 180 H6                    | 320                          | 16 x 26         | 10             | 300            | 60                                                                                                                 | 44                               | 600  | <b>0 - 6 E</b> |  |
|                   | <b>8</b>  | 30                      | 390     | 190 H6                    | 340                          | 18 x 26         | 10             | 300            | 65                                                                                                                 | 48                               | 700  | <b>0 - 7 E</b> |  |
|                   | <b>9</b>  | 38                      | 430     | 220 H6                    | 380                          | 20 x 26         | 12             | 350            | 105                                                                                                                | 78                               | 960  | <b>0 - 8 E</b> |  |
|                   | <b>10</b> | 38                      | 470     | 240 H6                    | 420                          | 22 x 26         | 12             | 350            | 110                                                                                                                | 81                               | 1100 | <b>1 - 0 E</b> |  |
|                   | <b>11</b> | 42                      | 510     | 260 H6                    | 450                          | 18 x 33         | 12             | 400            | 175                                                                                                                | 113                              | 1590 | <b>1 - 1 E</b> |  |
|                   | <b>12</b> | 42                      | 540     | 280 H6                    | 480                          | 22 x 33         | 12             | 400            | 200                                                                                                                | 129                              | 1865 | <b>1 - 2 E</b> |  |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

4) Shaft version with reinforced bearing, see page 9/7.

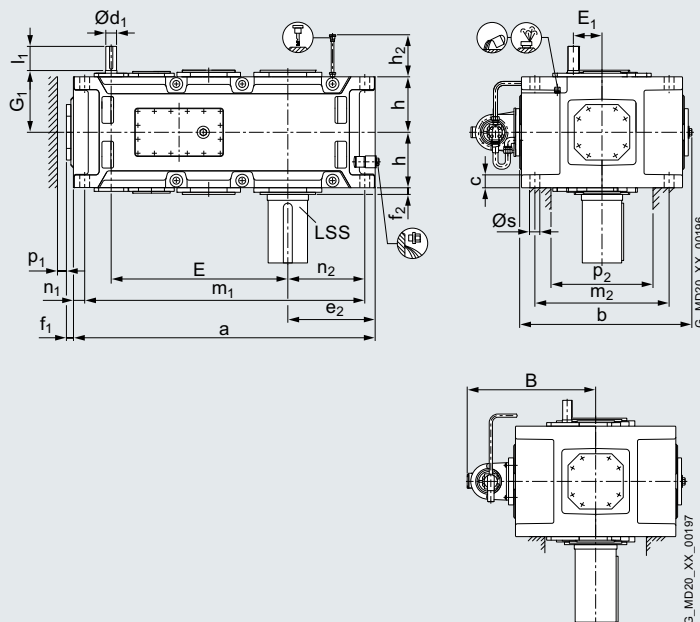
# Helical gear units vertical mounting position

Type H4

Gear unit dimensions, four-stage, gear unit sizes 13 to 18

## Selection and ordering data

**H4.V**  
Forced lubrication  
by motor pump  
2LP302-...62-...



| Gear unit size |           | Dimensions in mm       |       |       |
|----------------|-----------|------------------------|-------|-------|
|                |           | High speed shaft (HSS) |       |       |
|                | $l_N$     | $d_1$                  | $l_1$ | $G_1$ |
| 13             | 100 - 180 | 50 m6                  | 100   | 305   |
|                | 200 - 355 | 38 m6                  | 80    |       |
| 14             | 125 - 224 | 50 m6                  | 100   | 305   |
|                | 250 - 450 | 38 m6                  | 80    |       |
| 15             | 100 - 180 | 60 m6                  | 135   | 345   |
|                | 200 - 235 | 50 m6                  | 110   |       |
| 16             | 112 - 200 | 60 m6                  | 135   | 345   |
|                | 224 - 400 | 50 m6                  | 110   |       |
| 17             | 100 - 180 | 60 m6                  | 105   | 380   |
|                | 200 - 355 | 50 m6                  | 80    |       |
| 18             | 112 - 200 | 60 m6                  | 105   | 380   |
|                | 224 - 400 | 50 m6                  | 80    |       |

| Gear unit size | a    | b    | c      | E    | $E_1$ | $e_2$ | $f_1$ | $f_2$ | h     | $h_{21}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1^{2)}$ | $p_2^{2)}$ | s  | $B^3)$ |
|----------------|------|------|--------|------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|------------|------------|----|--------|
| 13             | 1395 | 900  | 61 ± 2 | 820  | 130   | 405   | 47    | 35    | 272.5 | 300      | 1300  | 680   | 50    | 360   | 50         | 500        | 48 | 690    |
| 14             | 1535 | 900  | 61 ± 2 | 890  | 130   | 475   | 47    | 35    | 272.5 | 300      | 1440  | 680   | 50    | 430   | 50         | 500        | 48 | 690    |
| 15             | 1680 | 980  | 72 ± 2 | 987  | 160   | 485   | 56    | 42    | 310   | 340      | 1565  | 750   | 60    | 430   | 60         | 570        | 55 | 730    |
| 16             | 1770 | 980  | 72 ± 2 | 1033 | 160   | 530   | 56    | 42    | 310   | 340      | 1655  | 750   | 60    | 475   | 60         | 570        | 55 | 730    |
| 17             | 1770 | 1110 | 81 ± 2 | 1035 | 160   | 525   | 53    | 42    | 340   | 374      | 1640  | 850   | 70    | 465   | 70         | 630        | 55 | 790    |
| 18             | 1890 | 1110 | 81 ± 2 | 1095 | 160   | 585   | 53    | 42    | 340   | 374      | 1760  | 850   | 70    | 525   | 70         | 630        | 55 | 790    |

For details on the shafts, see Chapter 9.

1) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring. Details acc. to order-related documentation.

2) Free space for cover; please contact us for exact dimensions, if applicable.

3) Max. dimensions; details acc. to order-related documentation.



# Helical gear units vertical mounting position

## Type H4

### Gear unit dimensions, four-stage, gear unit sizes 13 to 18

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                              |           |                          |                | Oil quantity <sup>1)</sup><br>H4.V<br>with forced<br>lubrication | Weight<br><sup>1) 2)</sup><br>H4.V | 10th to 13th position of Article No.<br>and Article No. supplement,<br>for 14th to 16th position, see<br>pages 5/31 to 5/35 |         |                                             |     |      |               |  |
|------------------------------|-----------|--------------------------|----------------|------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------|-----|------|---------------|--|
|                              |           |                          |                | Article No.:                                                     | 2LP302                             | .62-....                                                                                                                    |         |                                             |     |      |               |  |
| Type                         | Size      | d <sub>2</sub>           | l <sub>2</sub> | G <sub>2</sub>                                                   | l                                  | kg                                                                                                                          |         | Solid shaft with parallel key <sup>4)</sup> |     |      |               |  |
| <b>H4SV</b>                  | <b>13</b> | 200 n6                   | 350            | 335                                                              | 140                                | 2270                                                                                                                        | 1 - 3 A |                                             |     |      |               |  |
|                              | <b>14</b> | 210 n6                   | 350            | 335                                                              | 160                                | 2600                                                                                                                        | 1 - 4 A |                                             |     |      |               |  |
|                              | <b>15</b> | 230 n6                   | 410            | 380                                                              | 220                                | 3440                                                                                                                        | 1 - 5 A |                                             |     |      |               |  |
|                              | <b>16</b> | 240 n6                   | 410            | 380                                                              | 230                                | 3740                                                                                                                        | 1 - 6 A |                                             |     |      |               |  |
|                              | <b>17</b> | 250 n6                   | 410            | 415                                                              | 280                                | 4445                                                                                                                        | 1 - 7 A |                                             |     |      |               |  |
|                              | <b>18</b> | 270 n6                   | 470            | 415                                                              | 300                                | 4915                                                                                                                        | 1 - 8 A |                                             |     |      |               |  |
| Type                         | Size      | D <sub>2</sub>           | G <sub>4</sub> |                                                                  | l                                  | kg                                                                                                                          |         | Hollow shaft with keyway                    |     |      |               |  |
| <b>H4HV</b>                  | <b>13</b> | 190 H7                   | 335            |                                                                  | 140                                | 2270                                                                                                                        | 1 - 3 B |                                             |     |      |               |  |
|                              | <b>14</b> | 210 H7                   | 335            |                                                                  | 160                                | 2600                                                                                                                        | 1 - 4 B |                                             |     |      |               |  |
|                              | <b>15</b> | 230 H7                   | 380            |                                                                  | 220                                | 3440                                                                                                                        | 1 - 5 B |                                             |     |      |               |  |
|                              | <b>16</b> | 240 H7                   | 380            |                                                                  | 230                                | 3740                                                                                                                        | 1 - 6 B |                                             |     |      |               |  |
|                              | <b>17</b> | 250 H7                   | 415            |                                                                  | 280                                | 4445                                                                                                                        | 1 - 7 B |                                             |     |      |               |  |
|                              | <b>18</b> | 275 H7                   | 415            |                                                                  | 300                                | 4915                                                                                                                        | 1 - 8 B |                                             |     |      |               |  |
| Type                         | Size      | D <sub>2</sub>           | D <sub>3</sub> | G <sub>4</sub>                                                   | G <sub>5</sub>                     | l                                                                                                                           | kg      | Hollow shaft for shrink disk                |     |      |               |  |
| <b>H4DV</b><br><sup>3)</sup> | <b>13</b> | 190 H7                   | 195            | 335                                                              | 480                                | 140                                                                                                                         | 2270    | 1 - 3 C                                     |     |      |               |  |
|                              | <b>14</b> | 210 H7                   | 215            | 335                                                              | 480                                | 160                                                                                                                         | 2600    | 1 - 4 C                                     |     |      |               |  |
|                              | <b>15</b> | 230 H7                   | 235            | 380                                                              | 550                                | 220                                                                                                                         | 3440    | 1 - 5 C                                     |     |      |               |  |
|                              | <b>16</b> | 240 H7                   | 245            | 380                                                              | 550                                | 230                                                                                                                         | 3740    | 1 - 6 C                                     |     |      |               |  |
|                              | <b>17</b> | 250 H7                   | 260            | 415                                                              | 600                                | 280                                                                                                                         | 4445    | 1 - 7 C                                     |     |      |               |  |
|                              | <b>18</b> | 280 H7                   | 285            | 415                                                              | 600                                | 300                                                                                                                         | 4915    | 1 - 8 C                                     |     |      |               |  |
| Type                         | Size      | N/DIN 5480               | D <sub>2</sub> | D <sub>3</sub>                                                   | G <sub>4</sub>                     | l                                                                                                                           | kg      | Hollow shaft with spline                    |     |      |               |  |
| <b>H4KV</b>                  | <b>13</b> | N 190 × 5 × 30 × 36 × 9H | 180 H11        | 195                                                              | 335                                | 140                                                                                                                         | 2270    | 1 - 3 D                                     |     |      |               |  |
|                              | <b>14</b> | N 190 × 5 × 30 × 36 × 9H | 180 H11        | 215                                                              | 335                                | 160                                                                                                                         | 2600    | 1 - 4 D                                     |     |      |               |  |
|                              | <b>15</b> | N 220 × 5 × 30 × 42 × 9H | 210 H11        | 235                                                              | 380                                | 220                                                                                                                         | 3440    | 1 - 5 D                                     |     |      |               |  |
|                              | <b>16</b> | N 220 × 5 × 30 × 42 × 9H | 210 H11        | 245                                                              | 380                                | 230                                                                                                                         | 3740    | 1 - 6 D                                     |     |      |               |  |
|                              | <b>17</b> | N 250 × 5 × 30 × 48 × 9H | 240 H11        | 260                                                              | 415                                | 280                                                                                                                         | 4445    | 1 - 7 D                                     |     |      |               |  |
|                              | <b>18</b> | N 250 × 5 × 30 × 48 × 9H | 240 H11        | 285                                                              | 415                                | 300                                                                                                                         | 4915    | 1 - 8 D                                     |     |      |               |  |
| Type                         | Size      | c                        | d <sub>2</sub> | D <sub>3</sub>                                                   | k <sub>2</sub>                     | n × s                                                                                                                       | t       | G <sub>7</sub>                              | l   | kg   | Flanged shaft |  |
| <b>H4FV</b>                  | <b>13</b> | 48                       | 580            | 310 H6                                                           | 500                                | 20 × 33                                                                                                                     | 14      | 480                                         | 140 | 2430 | 1 - 3 E       |  |
|                              | <b>14</b> | 48                       | 620            | 310 H6                                                           | 540                                | 24 × 33                                                                                                                     | 14      | 480                                         | 160 | 2770 | 1 - 4 E       |  |
|                              | <b>15</b> | 55                       | 710            | 360 H6                                                           | 630                                | 28 × 33                                                                                                                     | 17      | 550                                         | 220 | 3680 | 1 - 5 E       |  |
|                              | <b>16</b> | 55                       | 740            | 360 H6                                                           | 660                                | 30 × 33                                                                                                                     | 17      | 550                                         | 230 | 3995 | 1 - 6 E       |  |
|                              | <b>17</b> | 60                       | 750            | 410 H6                                                           | 660                                | 24 × 39                                                                                                                     | 18      | 600                                         | 280 | 4745 | 1 - 7 E       |  |
|                              | <b>18</b> | 60                       | 800            | 410 H6                                                           | 710                                | 26 × 39                                                                                                                     | 18      | 600                                         | 300 | 5265 | 1 - 8 E       |  |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

<sup>4)</sup> Shaft version with reinforced bearing, see page 9/7.

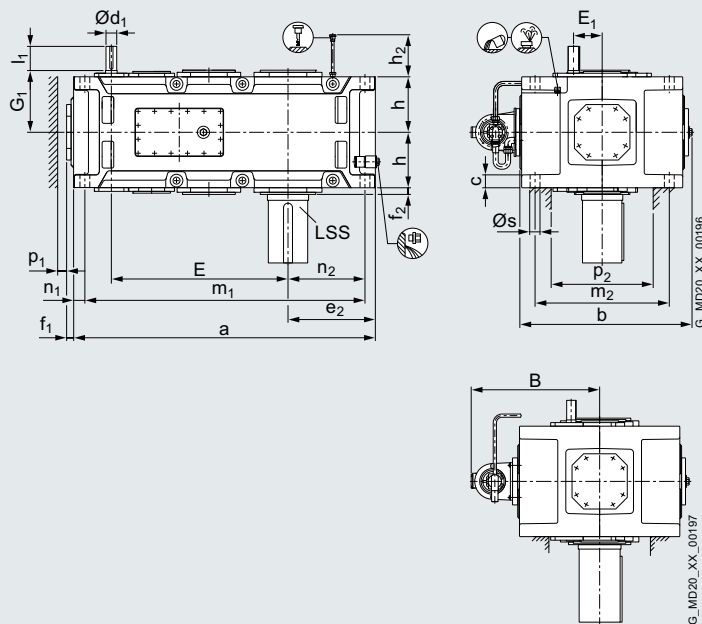
# Helical gear units vertical mounting position

Type H4

Gear unit dimensions, four-stage, gear unit sizes 19 to 22

## Selection and ordering data

**H4.V**  
Forced lubrication  
by motor pump  
2LP302-...62-....



| Gear unit size |           | Dimensions in mm              |       |       |  |
|----------------|-----------|-------------------------------|-------|-------|--|
|                |           | <b>High speed shaft (HSS)</b> |       |       |  |
|                | $l_N$     | $d_1$                         | $l_1$ | $G_1$ |  |
| <b>19</b>      | 100 - 180 | 75 m6                         | 105   | 440   |  |
|                | 200 - 355 | 60 m6                         | 105   |       |  |
| <b>20</b>      | 112 - 200 | 75 m6                         | 105   | 440   |  |
|                | 224 - 400 | 60 m6                         | 105   |       |  |
| <b>21</b>      | 100 - 180 | 90 m6                         | 165   | 460   |  |
|                | 200 - 355 | 70 m6                         | 140   |       |  |
| <b>22</b>      | 112 - 200 | 90 m6                         | 165   | 460   |  |
|                | 224 - 400 | 70 m6                         | 140   |       |  |

| Gear unit size |      |      |        |      |       |       |       |       |     |            |       |       |       |       |            |            |    |            |
|----------------|------|------|--------|------|-------|-------|-------|-------|-----|------------|-------|-------|-------|-------|------------|------------|----|------------|
|                | a    | b    | c      | E    | $E_1$ | $e_2$ | $f_1$ | $f_2$ | h   | $h_2^{1)}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1^{2)}$ | $p_2^{2)}$ | s  | B          |
| <b>19</b>      | 2030 | 1222 | 91 ±2  | 1190 | 185   | 590   | 53    | 55    | 390 | 380        | 1885  | 950   | 78    | 520   | 70         | 700        | 65 | On request |
| <b>20</b>      | 2150 | 1222 | 91 ±2  | 1250 | 185   | 650   | 53    | 55    | 390 | 380        | 2005  | 950   | 78    | 580   | 70         | 700        | 65 |            |
| <b>21</b>      | 2340 | 1378 | 100 ±2 | 1387 | 225   | 655   | 62    | 60    | 410 | 390        | 2185  | 1040  | 90    | 585   | 70         | 720        | 75 |            |
| <b>22</b>      | 2450 | 1378 | 100 ±2 | 1442 | 225   | 710   | 62    | 60    | 410 | 390        | 2295  | 1040  | 90    | 640   | 70         | 720        | 75 |            |

For details on the shafts, [see Chapter 9](#).

<sup>1)</sup> For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring. Details acc. to order-related documentation.

<sup>2)</sup> Free space for cover; please contact us for exact dimensions, if applicable.

# Helical gear units vertical mounting position Type H4

## Gear unit dimensions, four-stage, gear unit sizes 19 to 22

### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                   |           |                |                |                |                |         |    |                | Oil quantity<br>H4.V<br>with forced<br>lubrication | Weight<br>H4.V | 10th to 13th position of Article No.<br>and Article No. supplement,<br>for 14th to 16th position, see<br>pages 5/31 to 5/35 |                                          |  |
|-------------------|-----------|----------------|----------------|----------------|----------------|---------|----|----------------|----------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--|
|                   |           |                |                |                |                |         |    |                | Article No.: <b>2LP302</b> ■ - ■ ■ .62-....        |                |                                                                                                                             |                                          |  |
| Type              | Size      | d <sub>2</sub> | l <sub>2</sub> | G <sub>2</sub> |                |         |    |                | l                                                  | kg             | Solid shaft with parallel key                                                                                               |                                          |  |
| <b>H4SV</b>       | <b>19</b> | 290 n6         | 470            | 465            |                |         |    |                | On request                                         |                | 2 - 0 A<br>2 - 1 A<br>2 - 2 A<br>2 - 3 A                                                                                    |                                          |  |
|                   | <b>20</b> | 300 n6         | 500            | 465            |                |         |    |                |                                                    |                |                                                                                                                             |                                          |  |
|                   | <b>21</b> | 320 n6         | 500            | 490            |                |         |    |                |                                                    |                |                                                                                                                             |                                          |  |
|                   | <b>22</b> | 340 n6         | 550            | 490            |                |         |    |                |                                                    |                |                                                                                                                             |                                          |  |
| Type              | Size      | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub> | G <sub>5</sub> |         |    |                | l                                                  | kg             | Hollow shaft for shrink disk                                                                                                |                                          |  |
| <b>H4DV</b><br>1) | <b>19</b> | 285 H7         | 295            | 465            | 670            |         |    |                | On request                                         |                | 2 - 0 C<br>2 - 1 C<br>2 - 2 C<br>2 - 3 C                                                                                    |                                          |  |
|                   | <b>20</b> | 310 H7         | 315            | 465            | 670            |         |    |                |                                                    |                |                                                                                                                             |                                          |  |
|                   | <b>21</b> | 330 H7         | 335            | 490            | 715            |         |    |                |                                                    |                |                                                                                                                             |                                          |  |
|                   | <b>22</b> | 340 H7         | 345            | 490            | 725            |         |    |                |                                                    |                |                                                                                                                             |                                          |  |
| Type              | Size      | N/DIN 5480     | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub> |         |    |                | l                                                  | kg             | Hollow shaft with spline                                                                                                    |                                          |  |
| <b>H4KV</b>       | <b>19</b> | On request     |                |                |                |         |    |                |                                                    |                |                                                                                                                             | 2 - 0 D<br>2 - 1 D<br>2 - 2 D<br>2 - 3 D |  |
|                   | <b>20</b> |                |                |                |                |         |    |                |                                                    |                |                                                                                                                             |                                          |  |
|                   | <b>21</b> |                |                |                |                |         |    |                |                                                    |                |                                                                                                                             |                                          |  |
|                   | <b>22</b> |                |                |                |                |         |    |                |                                                    |                |                                                                                                                             |                                          |  |
| Type              | Size      | c              | d <sub>2</sub> | D <sub>3</sub> | k <sub>2</sub> | n x s   | t  | G <sub>7</sub> | l                                                  | kg             | Flanged shaft                                                                                                               |                                          |  |
| <b>H4FV</b>       | <b>19</b> | 65             | 860            | 460 H6         | 770            | 30 x 39 | 18 | 670            | On request                                         |                | 2 - 0 E<br>2 - 1 E<br>2 - 2 E<br>2 - 3 E                                                                                    |                                          |  |
|                   | <b>20</b> | 65             | 930            | 460 H6         | 830            | 32 x 39 | 18 | 670            |                                                    |                |                                                                                                                             |                                          |  |
|                   | <b>21</b> | 75             | 950            | 520 H6         | 850            | 28 x 45 | 20 | 710            |                                                    |                |                                                                                                                             |                                          |  |
|                   | <b>22</b> | 75             | 1040           | 520 H6         | 940            | 28 x 45 | 20 | 710            |                                                    |                |                                                                                                                             |                                          |  |



Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

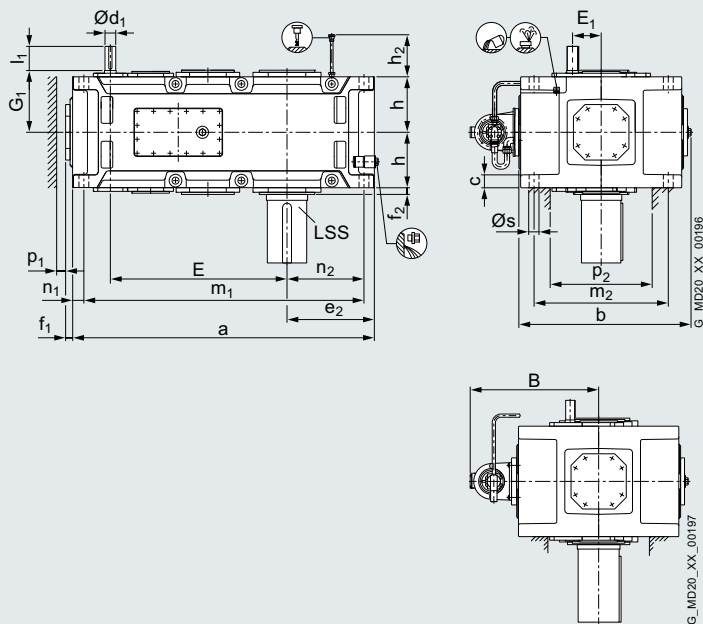
# Helical gear units vertical mounting position

Type H4

Gear unit dimensions, four-stage, gear unit sizes 23 to 26

## Selection and ordering data

**H4.V**  
Forced lubrication  
by motor pump  
2LP302-...62-....



| Gear unit size | Dimensions in mm |        |       |       |
|----------------|------------------|--------|-------|-------|
|                | $l_N$            | $d_1$  | $l_1$ | $G_1$ |
| <b>23</b>      | 100 - 160        | 90 m6  | 165   | 515   |
|                | 180 - 355        | 70 m6  | 140   |       |
| <b>24</b>      | 112 - 180        | 90 m6  | 165   | 515   |
|                | 200 - 400        | 70 m6  | 140   |       |
| <b>25</b>      | 100 - 160        | 100 m6 | 205   | 575   |
|                | 180 - 355        | 85 m6  | 170   |       |
| <b>26</b>      | 112 - 180        | 100 m6 | 205   | 575   |
|                | 200 - 400        | 85 m6  | 170   |       |

| Gear unit size | Dimensions in mm |   |   |   |       |       |       |       |   |       |       |       |       |       |       |       |   |
|----------------|------------------|---|---|---|-------|-------|-------|-------|---|-------|-------|-------|-------|-------|-------|-------|---|
|                | a                | b | c | E | $E_1$ | $e_2$ | $f_1$ | $f_2$ | h | $h_2$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_1$ | $p_2$ | s |
| <b>23</b>      | On request       |   |   |   |       |       |       |       |   |       |       |       |       |       |       |       |   |
| <b>24</b>      | On request       |   |   |   |       |       |       |       |   |       |       |       |       |       |       |       |   |
| <b>25</b>      | On request       |   |   |   |       |       |       |       |   |       |       |       |       |       |       |       |   |
| <b>26</b>      | On request       |   |   |   |       |       |       |       |   |       |       |       |       |       |       |       |   |

For details on the shafts, see Chapter 9.

## Helical gear units vertical mounting position Type H4 / Types H2, H3 and H4

### Gear unit dimensions, four-stage, gear unit sizes 23 to 26

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                    |      |                |                |                | Oil quantity H4.V with forced lubrication | Weight H4.V | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 5/31 to 5/35 |                              |   |  |  |
|--------------------|------|----------------|----------------|----------------|-------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------|------------------------------|---|--|--|
|                    |      |                |                |                | Article No.:                              | 2LP302      | - - - .62-....                                                                                                     |                              |   |  |  |
| Type               | Size | d <sub>2</sub> | l <sub>2</sub> | G <sub>2</sub> | l                                         | kg          | Solid shaft with parallel key                                                                                      |                              |   |  |  |
| H4SV               | 23   | 360 n6         | 590            | 540            | On request                                |             | 2 - 4                                                                                                              | A                            |   |  |  |
|                    | 24   | 380 n6         | 590            | 540            |                                           |             | 2 - 5                                                                                                              | A                            |   |  |  |
|                    | 25   | 400 n6         | 650            | 605            |                                           |             | 2 - 6                                                                                                              | A                            |   |  |  |
|                    | 26   | 420 n6         | 650            | 605            |                                           |             | 2 - 7                                                                                                              | A                            |   |  |  |
| Type               | Size | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub> | G <sub>5</sub>                            | l           | kg                                                                                                                 | Hollow shaft for shrink disk |   |  |  |
| H4DV <sup>1)</sup> | 23   | 370 H7         | 375            | 540            | 800                                       | On request  |                                                                                                                    | 2 - 4                        | C |  |  |
|                    | 24   | 390 H7         | 395            | 540            | 825                                       |             |                                                                                                                    | 2 - 5                        | C |  |  |
|                    | 25   | 410 H7         | 415            | 610            | 895                                       |             |                                                                                                                    | 2 - 6                        | C |  |  |
|                    | 26   | 430 H7         | 435            | 610            | 925                                       |             |                                                                                                                    | 2 - 7                        | C |  |  |

#### Article No. overview

##### Article No., 10th to 12th position

|                     |           |      |      | Data position of the Article No. | 1 to 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|---------------------|-----------|------|------|----------------------------------|--------|---|---|---|----|----|----|----|----|----|----|---------------------|
|                     |           |      |      | Article No.                      | 2LP302 | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z                  |
| Ratio               |           |      |      |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
|                     | Type H2.V | H3.V | H4.V |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 6.3       | 22.4 | 100  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 7.1       | 25   | 112  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 8         | 28   | 125  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 9         | 31.5 | 140  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 10        | 35.5 | 160  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 11.2      | 40   | 180  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 12.5      | 45   | 200  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 14        | 50   | 224  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 16        | 56   | 250  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 18        | 63   | 280  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 20        | 71   | 315  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 22.4      | 80   | 355  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 25        | 90   | 400  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 28        | 100  | 450  |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | -         | 112  | -    |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Type designation    |           |      |      |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Type H2             |           |      |      |                                  |        |   |   |   |    | 4  |    |    |    |    |    |                     |
| Type H3             |           |      |      |                                  |        |   |   |   |    | 5  |    |    |    |    |    |                     |
| Type H4             |           |      |      |                                  |        |   |   |   |    | 6  |    |    |    |    |    |                     |
| Mounting position   |           |      |      |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Mounting position V |           |      |      |                                  |        |   |   |   |    | 2  |    |    |    |    |    |                     |

Shaft seals, see pages 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.



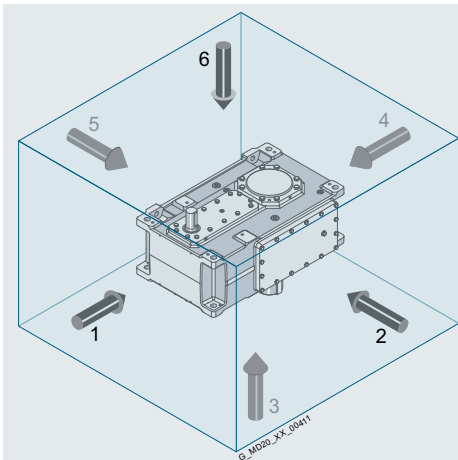
# Helical gear units vertical mounting position

Types H2, H3 and H4

## Article No. overview

### Selection and ordering data (continued)

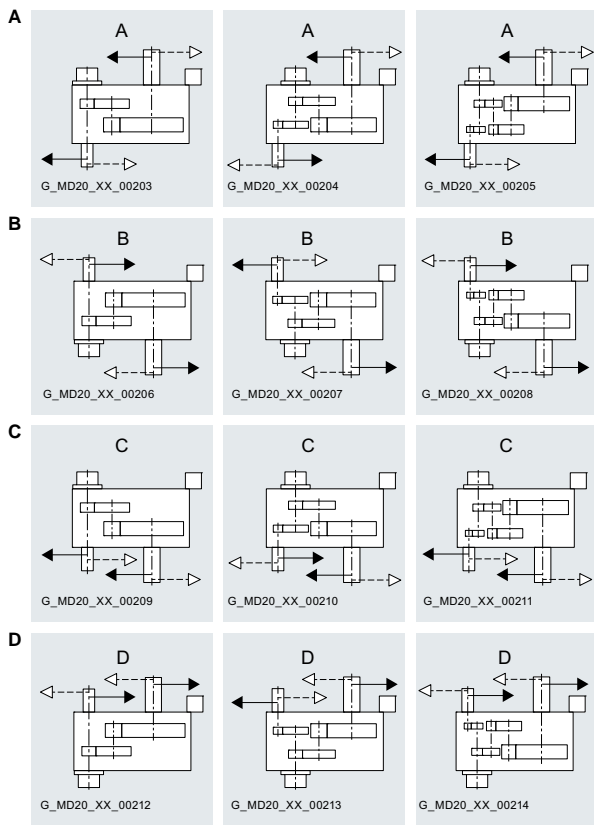
#### Article No., 13th position



|                              |   |   |   |   |   |   |               |   |   |    |    |    |    |    |    |    |                     |           |
|------------------------------|---|---|---|---|---|---|---------------|---|---|----|----|----|----|----|----|----|---------------------|-----------|
| Data position of Article No. | 1 | 2 | 3 | 4 | 5 | 6 | 7             | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |           |
| Article No.                  |   |   |   |   |   |   | <b>2LP302</b> | . | . | .  | .  | .  | .  | .  | .  | .  | .                   | - Z . . . |

#### Variants/shaft arrangement (looking at side 2)

|      |      |      |  |
|------|------|------|--|
| Type |      |      |  |
| H2.V | H3.V | H4.V |  |



0  
1  
2  
3

- Expansion tank
- Flange-mounted pump

#### Selection and ordering data (continued)

|                                                |      |      |      | Data position of the Article No. | 1 to 6           | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |   |
|------------------------------------------------|------|------|------|----------------------------------|------------------|---|---|---|----|----|----|----|----|----|----|---------------------|---|
|                                                |      |      |      | Article No.                      | 2LP302 . . . . . |   |   |   |    |    |    |    |    |    |    | Z . . . .           |   |
| Variants/shaft arrangement (looking at side 2) |      |      |      |                                  |                  |   |   |   |    |    |    |    |    |    |    |                     |   |
| Type                                           | H1.V | H2.V | H3.V | H4.V                             |                  |   |   |   |    |    |    |    |    |    |    |                     |   |
| E -                                            |      |      |      |                                  |                  |   |   |   |    |    |    |    |    |    |    |                     | 4 |
| F                                              |      |      |      |                                  |                  |   |   |   |    |    |    |    |    |    |    |                     | 5 |
| G                                              |      |      |      |                                  |                  |   |   |   |    |    |    |    |    |    |    |                     | 6 |
| H                                              |      |      |      |                                  |                  |   |   |   |    |    |    |    |    |    |    |                     | 7 |
| I                                              |      |      |      |                                  |                  |   |   |   |    |    |    |    |    |    |    |                     | 8 |

The versions E and F with slow speed shaft at both ends are only relevant for the shaft variants

- "S" (solid shaft with parallel key acc. to DIN 6885/1)
- "V" (reinforced solid shaft with parallel key acc. to DIN 6885/1)
- "C" (solid shaft for zero-backlash taper clamping connection)

- Expansion tank
- Flange-mounted pump

The solid shaft extension shown represents the driven machine shaft insertion side for hollow shafts.

The slow speed hollow shaft "H" (hollow shaft with keyway according to DIN 6885/1) is generally suitable for fitting on both ends.

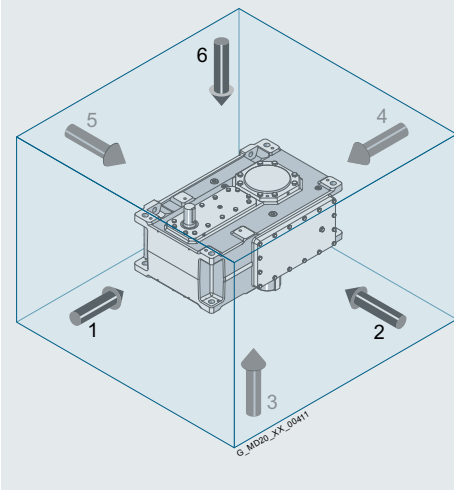


# Helical gear units vertical mounting position

Types H2, H3 and H4

## Article No. overview

### Selection and ordering data (continued)



### Article No. supplement, 14th position

|                                                                                     | Data position of the Article No. | 1 to 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|-------------------------------------------------------------------------------------|----------------------------------|--------|---|---|---|----|----|----|----|----|----|----|---------------------|
| Article No.                                                                         | 2LP302                           | .      | - | . | . | .  | .  | .  | .  | ■  | .  | .  | -Z ■ ■ ■            |
| <b>Sealing single-side high speed shaft (HSS)</b>                                   |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Radial shaft seal                                                                   |                                  |        |   |   |   |    |    |    |    |    |    |    | A                   |
| Taconite E                                                                          |                                  |        |   |   |   |    |    |    |    |    |    |    | E                   |
| Radial shaft seal with dry-running protection                                       |                                  |        |   |   |   |    |    |    |    |    |    |    | K                   |
| <b>Sealing double-extended high speed shaft (HSS)</b>                               |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Side 3: Radial shaft seal/Side 6: Radial shaft seal                                 |                                  |        |   |   |   |    |    |    |    | Z  |    |    | P 0 A               |
| Side 3: Dual radial shaft seal/Side 6: Dual radial shaft seal                       |                                  |        |   |   |   |    |    |    |    | Z  |    |    | P 0 B               |
| Side 3: Taconite E/Side 6: Taconite E                                               |                                  |        |   |   |   |    |    |    |    | Z  |    |    | P 0 E               |
| Side 3: Radial shaft seal/Side 6: Taconite E                                        |                                  |        |   |   |   |    |    |    |    | Z  |    |    | P 1 A               |
| Side 3: Taconite E/Side 6: Radial shaft seal                                        |                                  |        |   |   |   |    |    |    |    | Z  |    |    | P 1 B               |
| Side 3: Radial shaft seal/<br>Side 6: Radial shaft seal with dry-running protection |                                  |        |   |   |   |    |    |    |    | Z  |    |    | P 1 D               |
| Side 3: Taconite E/Side 6: Radial shaft seal with dry-running protection            |                                  |        |   |   |   |    |    |    |    | Z  |    |    | P 1 E               |

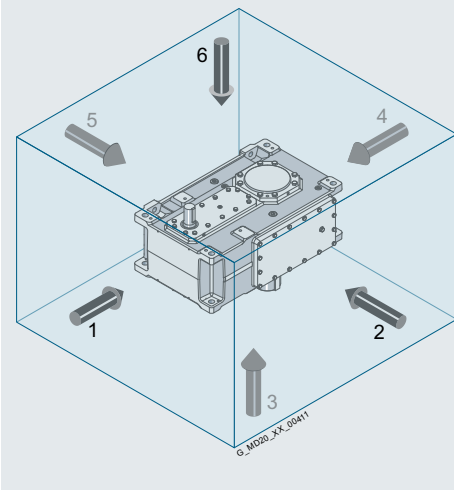


# Helical gear units vertical mounting position

Types H2, H3 and H4

Article No. overview

## Selection and ordering data (continued)



### Article No. supplement, 15th and 16th position

|                                                                                                       | Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code   |
|-------------------------------------------------------------------------------------------------------|----------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------------|
| Article No.                                                                                           |                                  | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b>             |
| <b>Sealing low speed shaft (LSS)</b>                                                                  |                                  |               |   |   |   |    |    |    |    |    |    |    |                       |
| Radial shaft seal                                                                                     |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>A</b>              |
| Dual radial shaft seal                                                                                |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>B</b>              |
| Taconite F                                                                                            |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>E</b>              |
| Taconite F-F                                                                                          |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>F</b>              |
| Taconite F-H                                                                                          |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>G</b>              |
| Taconite F-K                                                                                          |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>H</b>              |
| Radial shaft seal with dry-running protection                                                         |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>K</b>              |
| <b>Sealing double-extended low speed shaft (LSS)</b>                                                  |                                  |               |   |   |   |    |    |    |    |    |    |    |                       |
| Side 3: Radial shaft seal/Side 6: Radial shaft seal                                                   |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 0 A</b> |
| Side 3: Dual radial shaft seal/Side 6: Dual radial shaft seal                                         |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 0 B</b> |
| Side 3: Taconite F/Side 6: Taconite F                                                                 |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 0 E</b> |
| Side 3: Radial shaft seal/Side 6: Taconite F                                                          |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 1 A</b> |
| Side 3: Taconite F/Side 6: Radial shaft seal                                                          |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 1 B</b> |
| Side 3: Radial shaft seal/<br>Side 6: Radial shaft seal with dry-running protection                   |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>Z</b> <b>Q 1 D</b> |
| <b>Shaft version</b>                                                                                  |                                  |               |   |   |   |    |    |    |    |    |    |    |                       |
| High speed shaft (HSS) version: Catalog version,<br>low speed shaft (LSS) version: Catalog version    |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>0</b>              |
| High speed shaft (HSS) version: Reinforced version,<br>low speed shaft (LSS) version: Catalog version |                                  |               |   |   |   |    |    |    |    |    |    |    | <b>1</b>              |

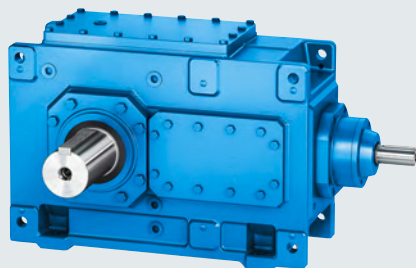


## Helical gear units vertical mounting position

### Notes

5

## Bevel helical gear units Horizontal mounting position



|             |                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------|
| <b>6/2</b>  | <b>Type B2</b><br><u>Gear unit dimensions</u><br>Two-stage, gear unit sizes 4 to 8              |
| 6/2         | Two-stage, gear unit sizes 9 to 12                                                              |
| 6/4         | Two-stage, gear unit sizes 13 to 18                                                             |
| 6/6         | Two-stage, gear unit sizes 13 to 18                                                             |
| <b>6/8</b>  | <b>Type B3</b><br><u>Gear unit dimensions</u><br>Three-stage, gear unit sizes 4 to 8            |
| 6/8         | Three-stage, gear unit sizes 9 to 12                                                            |
| 6/10        | Three-stage, gear unit sizes 9 to 12                                                            |
| 6/12        | Three-stage, gear unit sizes 13 to 18                                                           |
| 6/14        | Three-stage, gear unit sizes 19 to 24                                                           |
| 6/16        | Three-stage, gear unit sizes 25 to 28                                                           |
| <b>6/18</b> | <b>Type B4</b><br><u>Gear unit dimensions</u><br>Four-stage, gear unit sizes 5 to 8             |
| 6/18        | Four-stage, gear unit sizes 5 to 8                                                              |
| 6/20        | Four-stage, gear unit sizes 9 to 12                                                             |
| 6/22        | Four-stage, gear unit sizes 13 to 18                                                            |
| 6/24        | Four-stage, gear unit sizes 19 to 24                                                            |
| 6/26        | Four-stage, gear unit sizes 25 to 28                                                            |
| <b>6/27</b> | <b>Types B2, B3 and B4</b><br><u>Article No. overview</u><br>Article No., 10th to 12th position |
| 6/27        | Article No., 10th to 12th position                                                              |
| 6/28        | Article No., 13th position                                                                      |
| 6/30        | Article No. supplement, 14th position                                                           |
| 6/30        | Article No. supplement,<br>15th and 16th position                                               |

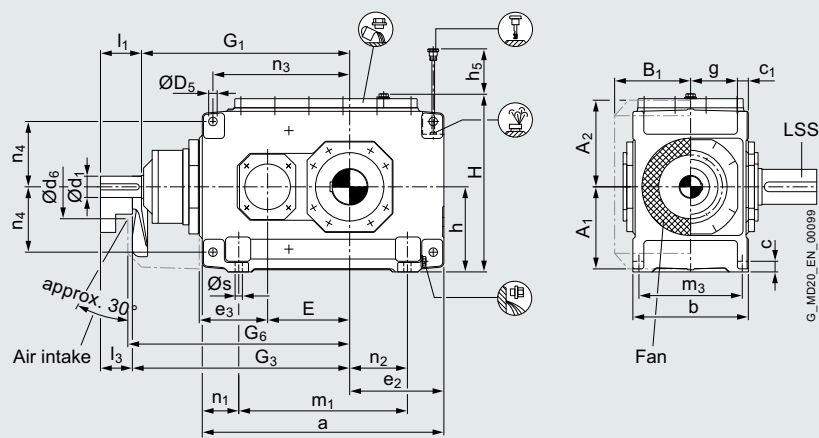
# Bevel helical gear units horizontal mounting position

## Type B2

### Gear unit dimensions, two-stage, gear unit sizes 4 to 8

#### Selection and ordering data

**B2.H**  
2LP302-...00-....



| Gear unit size | Dimensions in mm       |       |       |       |          |                  |       |       |       |       | Fan   |       |       |       |       |  |
|----------------|------------------------|-------|-------|-------|----------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                | High speed shaft (HSS) |       |       |       |          | Reinforced shaft |       |       |       |       |       |       |       |       |       |  |
|                | $i_N$                  | $d_1$ | $l_1$ | $l_3$ | $i_N$    | $d_1$            | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $B_1$ | $d_6$ | $G_6$ |  |
| 4              | 5 - 11.2               | 45 m6 | 100   | 80    | 8 - 12.5 | 50 m6            | 110   | 90    | 465   | 485   | 195   | 200   | 188   | 150   | 495   |  |
|                | 12.5 - 18              | 35 m6 | 80    | 60    | 14 - 16  | 40 m6            | 90    | 70    |       |       |       |       |       |       |       |  |
| 5              | 5 - 11.2               | 55 m6 | 110   | 80    | 8 - 12.5 | 60 m6            | 120   | 90    | 535   | 565   | 220   | 235   | 215   | 160   | 575   |  |
|                | 12.5 - 18              | 40 m6 | 100   | 70    | 14 - 16  | 50 m6            | 110   | 80    |       |       |       |       |       |       |       |  |
| 6              | 6.3 - 14               | 55 m6 | 110   | 80    | 10 - 16  | 60 m6            | 120   | 90    | 570   | 600   | 220   | 235   | 215   | 160   | 610   |  |
|                | 16 - 22.4              | 40 m6 | 100   | 70    | 18 - 20  | 50 m6            | 110   | 80    |       |       |       |       |       |       |       |  |
| 7              | 5 - 11.2               | 70 m6 | 135   | 105   | 12.5     | 70 m6            | 135   | 105   | 640   | 670   | 270   | 285   | 250   | 210   | 685   |  |
|                | 12.5 - 18              | 50 m6 | 110   | 80    | 14 - 16  | 60 m6            | 135   | 105   |       |       |       |       |       |       |       |  |
| 8              | 6.3 - 14               | 70 m6 | 135   | 105   | 16       | 70 m6            | 135   | 105   | 685   | 715   | 310   | 285   | 250   | 210   | 730   |  |
|                | 16 - 22.4              | 50 m6 | 110   | 80    | 18 - 20  | 60 m6            | 135   | 105   |       |       |       |       |       |       |       |  |

| Gear unit size | Dimensions in mm |     |    |            |       |     |       |       |     |     |          |       |       |       |       |       |       |       |    |
|----------------|------------------|-----|----|------------|-------|-----|-------|-------|-----|-----|----------|-------|-------|-------|-------|-------|-------|-------|----|
|                | a                | b   | c  | $c_1$      | $D_5$ | E   | $e_2$ | $e_3$ | H   | g   | $h^{1)}$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
| 4              | 505              | 270 | 28 | $30 \pm 1$ | 24 H9 | 160 | 190   | 160   | 415 | 105 | 200      | 80    | 295   | 235   | 105   | 85    | 285   | 150   | 19 |
| 5              | 565              | 320 | 28 | $30 \pm 1$ | 24 H9 | 185 | 205   | 185   | 482 | 130 | 230      | 150   | 355   | 285   | 105   | 100   | 330   | 180   | 19 |
| 6              | 645              | 320 | 28 | $30 \pm 1$ | 24 H9 | 220 | 250   | 185   | 482 | 130 | 230      | 150   | 435   | 285   | 105   | 145   | 365   | 180   | 19 |
| 7              | 690              | 380 | 35 | $36 \pm 1$ | 28 H9 | 225 | 250   | 225   | 582 | 154 | 280      | 180   | 450   | 340   | 120   | 130   | 405   | 215   | 24 |
| 8              | 795              | 380 | 35 | $36 \pm 1$ | 28 H9 | 270 | 310   | 225   | 582 | 154 | 280      | 190   | 555   | 340   | 120   | 190   | 450   | 215   | 24 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

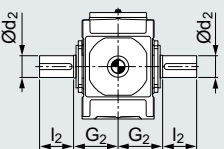
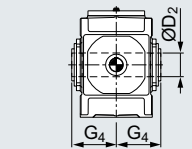
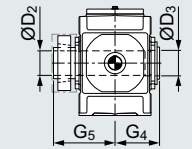
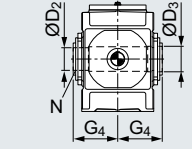
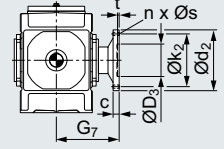
# Bevel helical gear units horizontal mounting position

## Type B2

### Gear unit dimensions, two-stage, gear unit sizes 4 to 8

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|             |        |                          |         | Oil quantity<br>1)         | Weight<br>1) 2) |                  |       | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |                                                                                     |                                                                                       |       |   |                                                                                       |
|-------------|--------|--------------------------|---------|----------------------------|-----------------|------------------|-------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------|---|---------------------------------------------------------------------------------------|
|             |        |                          |         | B2.H                       | B2.H            |                  |       |                                                                                                                    |                                                                                     |                                                                                       |       |   |                                                                                       |
|             |        |                          |         | Article No.: <b>2LP302</b> |                 | ■ - ■ ■ .00-.... |       |                                                                                                                    |                                                                                     |                                                                                       |       |   |                                                                                       |
| Type        | Size   | $d_2$                    | $l_2$   | $G_2$                      | $l$             | kg               |       |                                                                                                                    | Solid shaft with parallel key <sup>3)</sup>                                         |                                                                                       |       |   |                                                                                       |
| <b>B2SH</b> | 4      | 80 m6                    | 170     | 170                        | 10              | 235              | 0 - 3 | A                                                                                                                  |  |                                                                                       |       |   |                                                                                       |
|             | 5      | 100 m6                   | 210     | 200                        | 16              | 360              | 0 - 4 | A                                                                                                                  |                                                                                     |                                                                                       |       |   |                                                                                       |
|             | 6      | 110 n6                   | 210     | 200                        | 19              | 410              | 0 - 5 | A                                                                                                                  |                                                                                     |                                                                                       |       |   |                                                                                       |
|             | 7      | 120 n6                   | 210     | 235                        | 31              | 615              | 0 - 6 | A                                                                                                                  |                                                                                     |                                                                                       |       |   |                                                                                       |
| 8           | 130 n6 | 250                      | 235     | 34                         | 700             | 0 - 7            | A     |                                                                                                                    |                                                                                     |                                                                                       |       |   |                                                                                       |
| Type        | Size   | $D_2$                    | $G_4$   |                            | $l$             | kg               |       |                                                                                                                    | Hollow shaft with keyway                                                            |                                                                                       |       |   |                                                                                       |
| <b>B2HH</b> | 4      | 80 H7                    | 170     |                            | 10              | 235              | 0 - 3 | B                                                                                                                  |  |                                                                                       |       |   |                                                                                       |
|             | 5      | 100 H7                   | 200     |                            | 16              | 360              | 0 - 4 | B                                                                                                                  |                                                                                     |                                                                                       |       |   |                                                                                       |
|             | 6      | 110 H7                   | 200     |                            | 19              | 410              | 0 - 5 | B                                                                                                                  |                                                                                     |                                                                                       |       |   |                                                                                       |
|             | 7      | 120 H7                   | 235     |                            | 31              | 615              | 0 - 6 | B                                                                                                                  |                                                                                     |                                                                                       |       |   |                                                                                       |
| 8           | 130 H7 | 235                      |         | 34                         | 700             | 0 - 7            | B     |                                                                                                                    |                                                                                     |                                                                                       |       |   |                                                                                       |
| Type        | Size   | $D_2$                    | $D_3$   | $G_4$                      | $G_5$           | $l$              | kg    |                                                                                                                    | Hollow shaft for shrink disk                                                        |                                                                                       |       |   |                                                                                       |
| <b>B2DH</b> | 4      | 85                       | 85      | 170                        | 235             | 10               | 235   | 0 - 3                                                                                                              | C                                                                                   |   |       |   |                                                                                       |
|             | 5      | 100                      | 100     | 200                        | 275             | 16               | 360   | 0 - 4                                                                                                              | C                                                                                   |                                                                                       |       |   |                                                                                       |
|             | 6      | 110                      | 110     | 200                        | 275             | 19               | 410   | 0 - 5                                                                                                              | C                                                                                   |                                                                                       |       |   |                                                                                       |
|             | 7      | 120                      | 120     | 235                        | 320             | 31               | 615   | 0 - 6                                                                                                              | C                                                                                   |                                                                                       |       |   |                                                                                       |
| 8           | 130    | 130                      | 235     | 325                        | 34              | 700              | 0 - 7 | C                                                                                                                  |                                                                                     |                                                                                       |       |   |                                                                                       |
| Type        | Size   | N/DIN 5480               | $D_2$   | $D_3$                      | $G_4$           | $l$              | kg    |                                                                                                                    | Hollow shaft with spline                                                            |                                                                                       |       |   |                                                                                       |
| <b>B2KH</b> | 5      | N 95 x 3 x 30 x 30 x 9H  | 89 H11  | 100                        | 200             | 16               | 360   | 0 - 4                                                                                                              | D                                                                                   |  |       |   |                                                                                       |
|             | 6      | N 95 x 3 x 30 x 30 x 9H  | 89 H11  | 110                        | 200             | 19               | 410   | 0 - 5                                                                                                              | D                                                                                   |                                                                                       |       |   |                                                                                       |
|             | 7      | N 120 x 3 x 30 x 38 x 9H | 114 H11 | 120                        | 235             | 31               | 615   | 0 - 6                                                                                                              | D                                                                                   |                                                                                       |       |   |                                                                                       |
|             | 8      | N 120 x 3 x 30 x 38 x 9H | 114 H11 | 130                        | 235             | 34               | 700   | 0 - 7                                                                                                              | D                                                                                   |                                                                                       |       |   |                                                                                       |
| Type        | Size   | c                        | $d_2$   | $D_3$                      | $k_2$           | $n \times s$     | t     | $G_7$                                                                                                              | $l$                                                                                 | kg                                                                                    |       |   | Flanged shaft                                                                         |
| <b>B2FH</b> | 5      | 25                       | 300     | 150                        | 260             | 16 x 22          | 10    | 290                                                                                                                | 16                                                                                  | 400                                                                                   | 0 - 4 | E |  |
|             | 6      | 25                       | 320     | 160                        | 280             | 18 x 22          | 10    | 290                                                                                                                | 19                                                                                  | 455                                                                                   | 0 - 5 | E |                                                                                       |
|             | 7      | 30                       | 370     | 180                        | 320             | 16 x 26          | 10    | 340                                                                                                                | 31                                                                                  | 670                                                                                   | 0 - 6 | E |                                                                                       |
|             | 8      | 30                       | 390     | 190                        | 340             | 18 x 26          | 10    | 340                                                                                                                | 34                                                                                  | 760                                                                                   | 0 - 7 | E |                                                                                       |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Shaft version with reinforced bearing, see page 9/7.

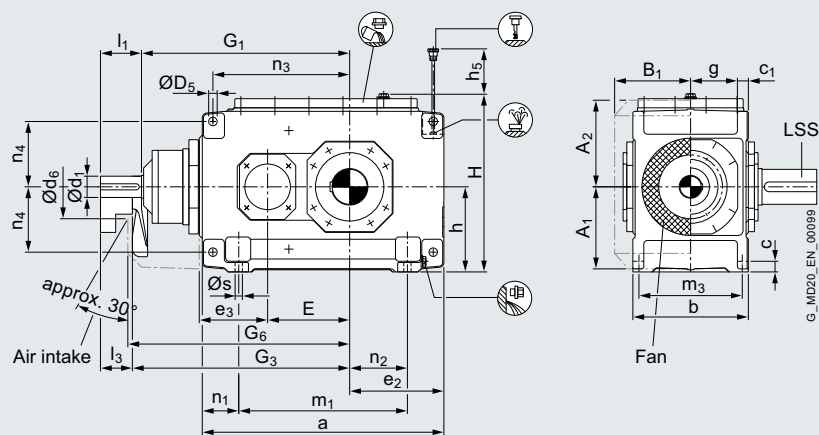
# Bevel helical gear units horizontal mounting position

## Type B2

### Gear unit dimensions, two-stage, gear unit sizes 9 to 12

#### Selection and ordering data

**B2.H**  
2LP302-...00-....



| Gear unit size | Dimensions in mm       |       |       |       |         |                  |       |       |       |       | Fan   |       |       |       |       |  |
|----------------|------------------------|-------|-------|-------|---------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                | High speed shaft (HSS) |       |       |       |         | Reinforced shaft |       |       |       |       |       |       |       |       |       |  |
|                | $i_N$                  | $d_1$ | $l_1$ | $l_3$ | $i_N$   | $d_1$            | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $B_1$ | $d_6$ | $G_6$ |  |
| <b>9</b>       | 5 - 11.2               | 80 m6 | 165   | 130   | 12.5    | 80 m6            | 165   | 130   | 755   | 790   | 370   | 325   | 270   | 195   | 805   |  |
|                | 12.5 - 18              | 60 m6 | 140   | 105   | 14 - 16 | 70 m6            | 140   | 105   |       |       |       |       |       |       |       |  |
| <b>10</b>      | 6.3 - 14               | 80 m6 | 165   | 130   | 16      | 80 m6            | 165   | 130   | 805   | 840   | 370   | 325   | 270   | 195   | 855   |  |
|                | 16 - 22.4              | 60 m6 | 140   | 105   | 18 - 20 | 70 m6            | 140   | 105   |       |       |       |       |       |       |       |  |
| <b>11</b>      | 5 - 11.2               | 90 m6 | 165   | 130   | -       | -                | -     | -     | 925   | 960   | 540   | 385   | 328   | 210   | 980   |  |
|                | 12.5 - 18              | 70 m6 | 140   | 105   | -       | -                | -     | -     |       |       |       |       |       |       |       |  |
| <b>12</b>      | 6.3 - 14               | 90 m6 | 165   | 130   | -       | -                | -     | -     | 995   | 1030  | 540   | 385   | 328   | 210   | 1050  |  |
|                | 16 - 22.4              | 70 m6 | 140   | 105   | -       | -                | -     | -     |       |       |       |       |       |       |       |  |

| Gear unit size | a    | b   | c  | $c_1$        | $D_5$ | E   | $e_2$ | $e_3$ | H   | g   | $h^{1)}$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|------|-----|----|--------------|-------|-----|-------|-------|-----|-----|----------|-------|-------|-------|-------|-------|-------|-------|----|
| <b>9</b>       | 820  | 440 | 40 | $48 \pm 1.5$ | 36 H9 | 265 | 300   | 265   | 662 | 172 | 320      | 205   | 530   | 390   | 145   | 155   | 480   | 245   | 28 |
| <b>10</b>      | 920  | 440 | 40 | $48 \pm 1.5$ | 36 H9 | 315 | 350   | 265   | 662 | 172 | 320      | 215   | 630   | 390   | 145   | 205   | 530   | 245   | 28 |
| <b>11</b>      | 975  | 530 | 50 | $54 \pm 1.5$ | 40 H9 | 320 | 345   | 320   | 790 | 211 | 380      | 240   | 645   | 470   | 165   | 180   | 580   | 300   | 35 |
| <b>12</b>      | 1130 | 530 | 50 | $54 \pm 1.5$ | 40 H9 | 390 | 430   | 320   | 790 | 211 | 380      | 250   | 800   | 470   | 165   | 265   | 650   | 300   | 35 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

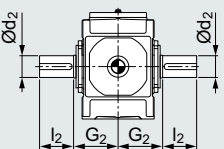
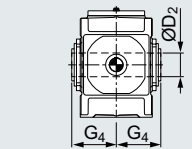
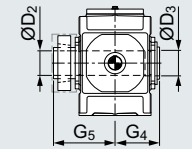
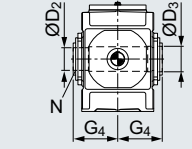
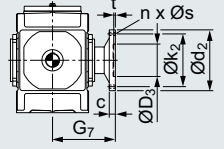
# Bevel helical gear units horizontal mounting position

## Type B2

### Gear unit dimensions, two-stage, gear unit sizes 9 to 12

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|             |           |                          |         | Oil quantity<br>1)         | Weight<br>1) 2) |                  |         | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |                                                                                       |      |         |                                                                                       |               |
|-------------|-----------|--------------------------|---------|----------------------------|-----------------|------------------|---------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------|---------|---------------------------------------------------------------------------------------|---------------|
|             |           |                          |         | B2.H                       | B2.H            |                  |         |                                                                                                                    |                                                                                       |      |         |                                                                                       |               |
|             |           |                          |         | Article No.: <b>2LP302</b> |                 | ■ - ■ ■ .00-.... |         |                                                                                                                    |                                                                                       |      |         |                                                                                       |               |
| Type        | Size      | $d_2$                    | $l_2$   | $G_2$                      | $l$             | kg               |         |                                                                                                                    | Solid shaft with parallel key <sup>3)</sup>                                           |      |         |                                                                                       |               |
| <b>B2SH</b> | <b>9</b>  | 140 n6                   | 250     | 270                        | 48              | 1000             | 0 - 8 A |                                                                                                                    |    |      |         |                                                                                       |               |
|             | <b>10</b> | 160 n6                   | 300     | 270                        | 50              | 1155             | 1 - 0 A |                                                                                                                    |                                                                                       |      |         |                                                                                       |               |
|             | <b>11</b> | 170 n6                   | 300     | 320                        | 80              | 1640             | 1 - 1 A |                                                                                                                    |                                                                                       |      |         |                                                                                       |               |
|             | <b>12</b> | 180 n6                   | 300     | 320                        | 95              | 1910             | 1 - 2 A |                                                                                                                    |                                                                                       |      |         |                                                                                       |               |
| Type        | Size      | $D_2$                    | $G_4$   |                            | $l$             | kg               |         |                                                                                                                    | Hollow shaft with keyway                                                              |      |         |                                                                                       |               |
| <b>B2HH</b> | <b>9</b>  | 140 H7                   | 270     |                            | 48              | 1000             | 0 - 8 B |                                                                                                                    |    |      |         |                                                                                       |               |
|             | <b>10</b> | 160 H7                   | 270     |                            | 50              | 1155             | 1 - 0 B |                                                                                                                    |                                                                                       |      |         |                                                                                       |               |
|             | <b>11</b> | 170 H7                   | 320     |                            | 80              | 1640             | 1 - 1 B |                                                                                                                    |                                                                                       |      |         |                                                                                       |               |
|             | <b>12</b> | 180 H7                   | 320     |                            | 95              | 1910             | 1 - 2 B |                                                                                                                    |                                                                                       |      |         |                                                                                       |               |
| Type        | Size      | $D_2$                    | $D_3$   | $G_4$                      | $G_5$           | $l$              | kg      |                                                                                                                    | Hollow shaft for shrink disk                                                          |      |         |                                                                                       |               |
| <b>B2DH</b> | <b>9</b>  | 140                      | 145     | 270                        | 365             | 48               | 1000    | 0 - 8 C                                                                                                            |   |      |         |                                                                                       |               |
|             | <b>10</b> | 150                      | 155     | 270                        | 385             | 50               | 1155    | 1 - 0 C                                                                                                            |                                                                                       |      |         |                                                                                       |               |
|             | <b>11</b> | 165                      | 170     | 320                        | 450             | 80               | 1640    | 1 - 1 C                                                                                                            |                                                                                       |      |         |                                                                                       |               |
|             | <b>12</b> | 180                      | 185     | 320                        | 455             | 95               | 1910    | 1 - 2 C                                                                                                            |                                                                                       |      |         |                                                                                       |               |
| Type        | Size      | N/DIN 5480               | $D_2$   | $D_3$                      | $G_4$           | $l$              | kg      |                                                                                                                    | Hollow shaft with spline                                                              |      |         |                                                                                       |               |
| <b>B2KH</b> | <b>9</b>  | N 140 x 3 x 30 x 45 x 9H | 134 H11 | 145                        | 270             | 48               | 1000    | 0 - 8 D                                                                                                            |  |      |         |                                                                                       |               |
|             | <b>10</b> | N 140 x 3 x 30 x 45 x 9H | 134 H11 | 155                        | 270             | 50               | 1155    | 1 - 0 D                                                                                                            |                                                                                       |      |         |                                                                                       |               |
|             | <b>11</b> | N 170 x 5 x 30 x 32 x 9H | 160 H11 | 170                        | 320             | 80               | 1640    | 1 - 1 D                                                                                                            |                                                                                       |      |         |                                                                                       |               |
|             | <b>12</b> | N 170 x 5 x 30 x 32 x 9H | 160 H11 | 185                        | 320             | 95               | 1910    | 1 - 2 D                                                                                                            |                                                                                       |      |         |                                                                                       |               |
| Type        | Size      | c                        | $d_2$   | $D_3$                      | $k_2$           | $n \times s$     | t       | $G_7$                                                                                                              | $l$                                                                                   | kg   |         |                                                                                       | Flanged shaft |
| <b>B2FH</b> | <b>9</b>  | 38                       | 430     | 220                        | 380             | 20 x 26          | 12      | 385                                                                                                                | 48                                                                                    | 1090 | 0 - 8 E |  |               |
|             | <b>10</b> | 38                       | 470     | 240                        | 420             | 22 x 26          | 12      | 385                                                                                                                | 50                                                                                    | 1250 | 1 - 0 E |                                                                                       |               |
|             | <b>11</b> | 42                       | 510     | 260                        | 450             | 18 x 33          | 12      | 450                                                                                                                | 80                                                                                    | 1775 | 1 - 1 E |                                                                                       |               |
|             | <b>12</b> | 42                       | 540     | 280                        | 480             | 22 x 33          | 12      | 450                                                                                                                | 95                                                                                    | 2060 | 1 - 2 E |                                                                                       |               |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Shaft version with reinforced bearing, see page 9/7.

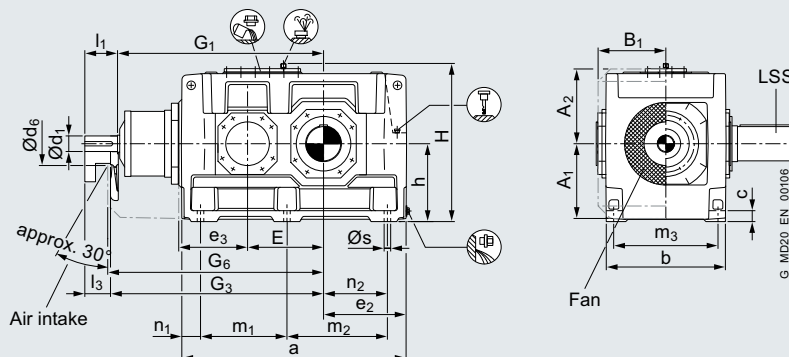
# Bevel helical gear units horizontal mounting position

Type B2

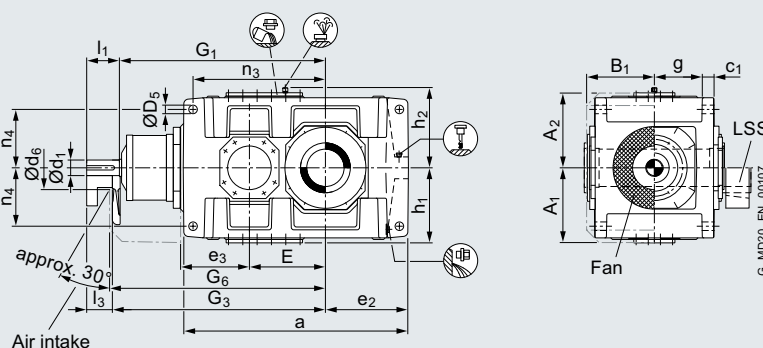
Gear unit dimensions, two-stage, gear unit sizes 13 to 18

## Selection and ordering data

**B2.H**  
2LP302-...00-....



**B2.M**  
2LP302-...01-....



| Gear unit size | Dimensions in mm       |        |       |       |       |       |       |       |       |       |       |
|----------------|------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | High speed shaft (HSS) |        |       |       |       |       | Fan   |       |       |       |       |
|                | $i_N$                  | $d_1$  | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $B_1$ | $d_6$ | $G_6$ |
| 13             | 5 - 11.2               | 110 n6 | 205   | 165   | 1070  | 1110  | 435   | 425   | 385   | 245   | 1130  |
|                | 12.5 - 18              | 80 m6  | 170   | 130   |       |       |       |       |       |       |       |
| 14             | 6.3 - 14               | 110 n6 | 205   | 165   | 1070  | 1110  | 435   | 425   | 385   | 245   | 1200  |
|                | 16 - 22.4              | 80 m6  | 170   | 130   |       |       |       |       |       |       |       |
| 15             | 5 - 11.2               | 130 n6 | 245   | 200   | 1277  | 1322  | 480   | 480   | 435   | 280   | 1340  |
|                | 12.5 - 18              | 100 m6 | 210   | 165   |       |       |       |       |       |       |       |
| 16             | 5.6 - 12.5             | 130 n6 | 245   | 200   | 1323  | 1368  | 480   | 480   | 435   | 280   | 1385  |
|                | 14 - 20                | 100 m6 | 210   | 165   |       |       |       |       |       |       |       |
| 17             | 5.6 - 11.2             | 150 n6 | 245   | 200   | 1435  | 1480  | 535   | 535   | 505   | 380   | 1500  |
|                | 12.5 - 18              | 110 n6 | 210   | 165   |       |       |       |       |       |       |       |
| 18             | 7.1 - 12.5             | 150 n6 | 245   | 200   | 1495  | 1540  | 535   | 535   | 505   | 380   | 1560  |
|                | 14 - 20                | 110 n6 | 210   | 165   |       |       |       |       |       |       |       |

| Gear unit size | Dimensions in mm |     |    |        |       |     |       |       |      |     |          |       |       |       |       |       |       |       |       |       |    |
|----------------|------------------|-----|----|--------|-------|-----|-------|-------|------|-----|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
|                | a                | b   | c  | $c_1$  | $D_5$ | E   | $e_2$ | $e_3$ | H    | g   | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
| 13             | 1130             | 655 | 60 | 61 ± 2 | 48 H9 | 370 | 405   | 370   | 900  | 264 | 460      | 450   | 460   | 465   | 465   | 580   | 100   | 305   | 675   | 340   | 35 |
| 14             | 1270             | 655 | 60 | 61 ± 2 | 48 H9 | 440 | 475   | 370   | 900  | 264 | 460      | 450   | 460   | 465   | 605   | 580   | 100   | 375   | 745   | 340   | 35 |
| 15             | 1350             | 765 | 70 | 72 ± 2 | 55 H9 | 442 | 485   | 442   | 1000 | 308 | 500      | 490   | 500   | 555   | 555   | 670   | 120   | 365   | 805   | 375   | 42 |
| 16             | 1440             | 765 | 70 | 72 ± 2 | 55 H9 | 488 | 530   | 442   | 1000 | 308 | 500      | 490   | 500   | 555   | 645   | 670   | 120   | 410   | 850   | 375   | 42 |
| 17             | 1490             | 885 | 80 | 81 ± 2 | 65 H9 | 490 | 525   | 490   | 1110 | 356 | 560      | 555   | 560   | 610   | 610   | 780   | 135   | 390   | 895   | 420   | 48 |
| 18             | 1610             | 885 | 80 | 81 ± 2 | 65 H9 | 550 | 585   | 490   | 1110 | 356 | 560      | 555   | 560   | 610   | 730   | 780   | 135   | 450   | 955   | 420   | 48 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

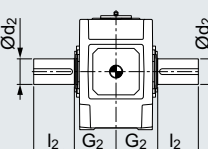
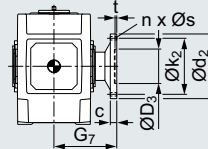


## Bevel helical gear units horizontal mounting position Type B2

### Gear unit dimensions, two-stage, gear unit sizes 13 to 18

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                       |      | Oil quantity <sup>1)</sup><br>B2.H | Oil quantity <sup>1)</sup><br>B2.M | Weight <sup>1)2)</sup><br>B2.H | Weight <sup>1)2)</sup><br>B2.M | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |      |                |      |                                                                                     |                                                                                     |                                                                                       |   |               |                                                                                       |
|-----------------------|------|------------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|------|----------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---|---------------|---------------------------------------------------------------------------------------|
|                       |      | Article No.: <b>2LP302</b>         |                                    |                                |                                | ■ - ■ ■ .0-....                                                                                                    |      |                |      |                                                                                     |                                                                                     |                                                                                       |   |               |                                                                                       |
| Type                  | Size | d <sub>2</sub>                     | l <sub>2</sub>                     | G <sub>2</sub>                 | l                              | l                                                                                                                  | kg   | kg             |      |                                                                                     | Solid shaft with parallel key <sup>3)</sup>                                         |                                                                                       |   |               |                                                                                       |
| <b>B2SH</b>           | 13   | 200 n6                             | 350                                | 390                            | 140                            | -                                                                                                                  | 2450 | -              | 1    | 3                                                                                   |  |                                                                                       |   |               |                                                                                       |
|                       | 14   | 210 n6                             | 350                                | 390                            | 155                            | -                                                                                                                  | 2825 | -              | 1    | 4                                                                                   |                                                                                     |                                                                                       |   |               |                                                                                       |
|                       | 15   | 230 n6                             | 410                                | 460                            | 220                            | -                                                                                                                  | 3990 | -              | 1    | 5                                                                                   |                                                                                     |                                                                                       |   |               |                                                                                       |
|                       | 16   | 240 n6                             | 410                                | 460                            | 230                            | -                                                                                                                  | 4345 | -              | 1    | 6                                                                                   |                                                                                     |                                                                                       |   |               |                                                                                       |
|                       | 17   | 250 n6                             | 410                                | 540                            | 320                            | -                                                                                                                  | 5620 | -              | 1    | 7                                                                                   |                                                                                     |                                                                                       |   |               |                                                                                       |
|                       | 18   | 270 n6                             | 470                                | 540                            | 335                            | -                                                                                                                  | 6150 | -              | 1    | 8                                                                                   |                                                                                     |                                                                                       |   |               |                                                                                       |
| Type                  | Size | D <sub>2</sub>                     | G <sub>4</sub>                     | l                              | l                              | kg                                                                                                                 | kg   |                |      | Hollow shaft with keyway                                                            |                                                                                     |                                                                                       |   |               |                                                                                       |
| <b>B2HH/<br/>B2HM</b> | 14   | 210 H7                             | 390                                | 155                            | 130                            | 2825                                                                                                               | 2725 | 1              | 4    |  |                                                                                     |                                                                                       |   |               |                                                                                       |
|                       | 16   | 240 H7                             | 450                                | 230                            | 190                            | 4345                                                                                                               | 4160 | 1              | 6    |                                                                                     |                                                                                     |                                                                                       |   |               |                                                                                       |
|                       | 18   | 275 H7                             | 510                                | 335                            | 275                            | 6150                                                                                                               | 5860 | 1              | 8    |                                                                                     |                                                                                     |                                                                                       |   |               |                                                                                       |
| Type                  | Size | D <sub>2</sub>                     | D <sub>3</sub>                     | G <sub>4</sub>                 | G <sub>5</sub>                 | l                                                                                                                  | l    | kg             | kg   |                                                                                     | Hollow shaft for shrink disk                                                        |                                                                                       |   |               |                                                                                       |
| <b>B2DH/<br/>B2DM</b> | 14   | 210                                | 215                                | 390                            | 535                            | 155                                                                                                                | 130  | 2825           | 2725 | 1                                                                                   | 4                                                                                   |   |   |               |                                                                                       |
|                       | 16   | 240                                | 245                                | 450                            | 620                            | 230                                                                                                                | 190  | 4345           | 4160 | 1                                                                                   | 6                                                                                   |                                                                                       |   |               |                                                                                       |
|                       | 18   | 280                                | 285                                | 510                            | 700                            | 335                                                                                                                | 275  | 6150           | 5860 | 1                                                                                   | 8                                                                                   |                                                                                       |   |               |                                                                                       |
| Type                  | Size | N/DIN 5480                         | D <sub>2</sub>                     | D <sub>3</sub>                 | G <sub>4</sub>                 | l                                                                                                                  | l    | kg             | kg   |                                                                                     | Hollow shaft with spline                                                            |                                                                                       |   |               |                                                                                       |
| <b>B2KH/<br/>B2KM</b> | 14   | N 190 × 5 × 30 × 36 × 9H           | 180 H11                            | 215                            | 390                            | 155                                                                                                                | 130  | 2825           | 2725 | 1                                                                                   | 4                                                                                   |  |   |               |                                                                                       |
|                       | 16   | N 220 × 5 × 30 × 42 × 9H           | 210 H11                            | 245                            | 450                            | 230                                                                                                                | 190  | 4345           | 4160 | 1                                                                                   | 6                                                                                   |                                                                                       |   |               |                                                                                       |
|                       | 18   | N 250 × 5 × 30 × 48 × 9H           | 240 H11                            | 285                            | 510                            | 335                                                                                                                | 275  | 6150           | 5860 | 1                                                                                   | 8                                                                                   |                                                                                       |   |               |                                                                                       |
| Type                  | Size | c                                  | d <sub>2</sub>                     | D <sub>3</sub>                 | k <sub>2</sub>                 | n × s                                                                                                              | t    | G <sub>7</sub> | l    | l                                                                                   | kg                                                                                  | kg                                                                                    |   | Flanged shaft |                                                                                       |
| <b>B2FH/<br/>B2FM</b> | 13   | 48                                 | 580                                | 310                            | 500                            | 20 × 33                                                                                                            | 14   | 525            | 140  | 120                                                                                 | 2620                                                                                | 2520                                                                                  | 1 | 3             |  |
|                       | 14   | 48                                 | 620                                | 310                            | 540                            | 24 × 33                                                                                                            | 14   | 525            | 155  | 130                                                                                 | 3005                                                                                | 2905                                                                                  | 1 | 4             |                                                                                       |
|                       | 15   | 55                                 | 710                                | 360                            | 630                            | 28 × 33                                                                                                            | 17   | 625            | 220  | 180                                                                                 | 4245                                                                                | 4050                                                                                  | 1 | 5             |                                                                                       |
|                       | 16   | 55                                 | 740                                | 360                            | 660                            | 30 × 33                                                                                                            | 17   | 625            | 230  | 190                                                                                 | 4615                                                                                | 4430                                                                                  | 1 | 6             |                                                                                       |
|                       | 17   | 60                                 | 750                                | 410                            | 660                            | 24 × 39                                                                                                            | 18   | 695            | 320  | 260                                                                                 | 5940                                                                                | 5640                                                                                  | 1 | 7             |                                                                                       |
|                       | 18   | 60                                 | 800                                | 410                            | 710                            | 26 × 39                                                                                                            | 18   | 695            | 335  | 275                                                                                 | 6520                                                                                | 6230                                                                                  | 1 | 8             |                                                                                       |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, see page 9/7.

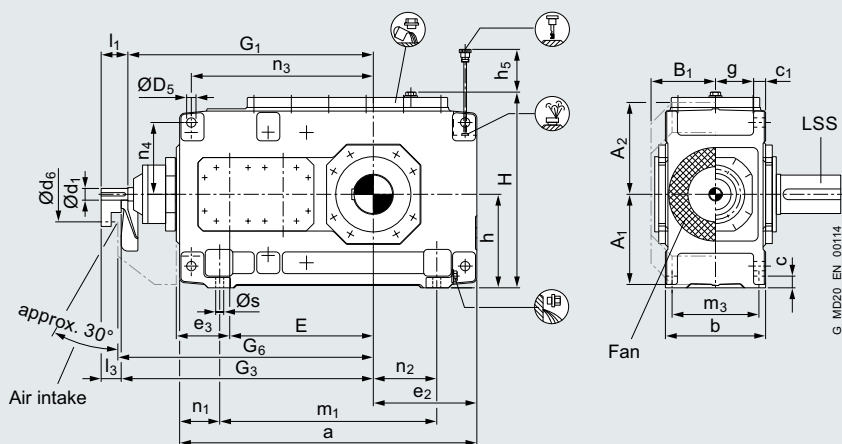
# Bevel helical gear units horizontal mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 4 to 8

#### Selection and ordering data

**B3.H**  
2LP302-...10-....



| Gear unit size | Dimensions in mm       |       |       |       |                  |       |     |    |       |       |       |       |       |       |       |
|----------------|------------------------|-------|-------|-------|------------------|-------|-----|----|-------|-------|-------|-------|-------|-------|-------|
|                | High speed shaft (HSS) |       |       |       |                  |       |     |    |       | Fan   |       |       |       |       |       |
|                | $i_N$                  | $d_1$ | $l_1$ | $l_3$ | Reinforced shaft |       |     |    | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $B_1$ | $d_6$ | $G_6$ |
| 4              | 12.5 - 45              | 30 m6 | 70    | 50    | 40 - 50          | 35 m6 | 80  | 50 | 500   | 520   | 195   | 200   | 143   | 110   | 530   |
|                | 50 - 71                | 25 m6 | 60    | 40    | 56 - 63          | 32 m6 | 70  | 50 |       |       |       |       |       |       |       |
| 5              | 12.5 - 45              | 35 m6 | 80    | 60    | 31.5 - 50        | 40 m6 | 90  | 70 | 575   | 595   | 220   | 235   | 168   | 130   | 605   |
|                | 50 - 71                | 28 m6 | 60    | 40    | 56 - 63          | 35 m6 | 80  | 60 |       |       |       |       |       |       |       |
| 6              | 16 - 56                | 35 m6 | 80    | 60    | 40 - 63          | 40 m6 | 90  | 70 | 610   | 630   | 220   | 235   | 168   | 130   | 640   |
|                | 63 - 90                | 28 m6 | 60    | 40    | 71 - 80          | 35 m6 | 80  | 60 |       |       |       |       |       |       |       |
| 7              | 12.5 - 45              | 45 m6 | 100   | 80    | 31.5 - 50        | 50 m6 | 110 | 90 | 690   | 710   | 275   | 275   | 193   | 165   | 720   |
|                | 50 - 71                | 35 m6 | 80    | 60    | 56 - 63          | 40 m6 | 90  | 70 |       |       |       |       |       |       |       |
| 8              | 16 - 56                | 45 m6 | 100   | 80    | 40 - 63          | 50 m6 | 110 | 90 | 735   | 755   | 275   | 275   | 193   | 165   | 765   |
|                | 63 - 90                | 35 m6 | 80    | 60    | 71 - 80          | 40 m6 | 90  | 70 |       |       |       |       |       |       |       |

| Gear unit size | a   | b   | c  | $c_1$      | $D_5$ | E   | $e_2$ | $e_3$ | H   | g    | $h^{1)}$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|-----|-----|----|------------|-------|-----|-------|-------|-----|------|----------|-------|-------|-------|-------|-------|-------|-------|----|
| 4              | 565 | 215 | 28 | $30 \pm 1$ | 24 H9 | 270 | 190   | 110   | 415 | 77.5 | 200      | 100   | 355   | 180   | 105   | 85    | 345   | 150   | 19 |
| 5              | 640 | 255 | 28 | $30 \pm 1$ | 24 H9 | 315 | 205   | 130   | 482 | 97.5 | 230      | 130   | 430   | 220   | 105   | 100   | 405   | 180   | 19 |
| 6              | 720 | 255 | 28 | $30 \pm 1$ | 24 H9 | 350 | 250   | 130   | 482 | 97.5 | 230      | 130   | 510   | 220   | 105   | 145   | 440   | 180   | 19 |
| 7              | 785 | 300 | 35 | $36 \pm 1$ | 28 H9 | 385 | 250   | 160   | 572 | 114  | 280      | 170   | 545   | 260   | 120   | 130   | 500   | 215   | 24 |
| 8              | 890 | 300 | 35 | $36 \pm 1$ | 28 H9 | 430 | 310   | 160   | 582 | 114  | 280      | 160   | 650   | 260   | 120   | 190   | 545   | 215   | 24 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Bevel helical gear units horizontal mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 4 to 8

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|             |        |                          |         | Oil quantity<br>1)         | Weight<br>1) 2) |                  |       | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |                                             |     |       |   |               |
|-------------|--------|--------------------------|---------|----------------------------|-----------------|------------------|-------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----|-------|---|---------------|
|             |        |                          |         | B3.H                       | B3.H            |                  |       |                                                                                                                    |                                             |     |       |   |               |
|             |        |                          |         | Article No.: <b>2LP302</b> |                 | ■ - ■ ■ .10-.... |       |                                                                                                                    |                                             |     |       |   |               |
| Type        | Size   | $d_2$                    | $l_2$   | $G_2$                      | $l$             | kg               |       |                                                                                                                    | Solid shaft with parallel key <sup>3)</sup> |     |       |   |               |
| <b>B3SH</b> | 4      | 80 m6                    | 170     | 140                        | 9               | 210              | 0 - 3 | A                                                                                                                  |                                             |     |       |   |               |
|             | 5      | 100 m6                   | 210     | 165                        | 15              | 325              | 0 - 4 | A                                                                                                                  |                                             |     |       |   |               |
|             | 6      | 110 n6                   | 210     | 165                        | 16              | 380              | 0 - 5 | A                                                                                                                  |                                             |     |       |   |               |
|             | 7      | 120 n6                   | 210     | 195                        | 27              | 550              | 0 - 6 | A                                                                                                                  |                                             |     |       |   |               |
| 8           | 130 n6 | 250                      | 195     | 30                         | 635             | 0 - 7            | A     |                                                                                                                    |                                             |     |       |   |               |
| Type        | Size   | $d_2$                    | $l_2$   | $G_2$                      | $l$             | kg               |       |                                                                                                                    | Solid shaft without parallel key            |     |       |   |               |
| <b>B3CH</b> | 4      | 95 h8                    | 125     | 140                        | 9               | 210              | 0 - 3 | F                                                                                                                  |                                             |     |       |   |               |
|             | 5      | 115 h8                   | 125     | 165                        | 15              | 325              | 0 - 4 | F                                                                                                                  |                                             |     |       |   |               |
|             | 6      | 115 h8                   | 125     | 165                        | 16              | 380              | 0 - 5 | F                                                                                                                  |                                             |     |       |   |               |
|             | 7      | 140 h8                   | 155     | 195                        | 27              | 550              | 0 - 6 | F                                                                                                                  |                                             |     |       |   |               |
| 8           | 140 h8 | 155                      | 195     | 30                         | 635             | 0 - 7            | F     |                                                                                                                    |                                             |     |       |   |               |
| Type        | Size   | $D_2$                    | $G_4$   |                            | $l$             | kg               |       |                                                                                                                    | Hollow shaft with keyway                    |     |       |   |               |
| <b>B3HH</b> | 4      | 80 H7                    | 140     |                            | 9               | 210              | 0 - 3 | B                                                                                                                  |                                             |     |       |   |               |
|             | 5      | 95 H7                    | 165     |                            | 15              | 325              | 0 - 4 | B                                                                                                                  |                                             |     |       |   |               |
|             | 6      | 105 H7                   | 165     |                            | 16              | 380              | 0 - 5 | B                                                                                                                  |                                             |     |       |   |               |
|             | 7      | 115 H7                   | 195     |                            | 27              | 550              | 0 - 6 | B                                                                                                                  |                                             |     |       |   |               |
| 8           | 125 H7 | 195                      |         | 30                         | 635             | 0 - 7            | B     |                                                                                                                    |                                             |     |       |   |               |
| Type        | Size   | $D_2$                    | $D_3$   | $G_4$                      | $G_5$           | $l$              | kg    |                                                                                                                    | Hollow shaft for shrink disk                |     |       |   |               |
| <b>B3DH</b> | 4      | 85 H7                    | 85      | 140                        | 205             | 9                | 210   | 0 - 3                                                                                                              | C                                           |     |       |   |               |
|             | 5      | 100 H7                   | 100     | 165                        | 240             | 15               | 325   | 0 - 4                                                                                                              | C                                           |     |       |   |               |
|             | 6      | 110 H7                   | 110     | 165                        | 240             | 16               | 380   | 0 - 5                                                                                                              | C                                           |     |       |   |               |
|             | 7      | 120 H7                   | 120     | 195                        | 280             | 27               | 550   | 0 - 6                                                                                                              | C                                           |     |       |   |               |
| 8           | 130 H7 | 130                      | 195     | 285                        | 30              | 635              | 0 - 7 | C                                                                                                                  |                                             |     |       |   |               |
| Type        | Size   | N/DIN 5480               | $D_2$   | $D_3$                      | $G_4$           | $l$              | kg    |                                                                                                                    | Hollow shaft with spline                    |     |       |   |               |
| <b>B3KH</b> | 5      | N 95 × 3 × 30 × 30 × 9H  | 89 H11  | 100                        | 165             | 15               | 325   | 0 - 4                                                                                                              | D                                           |     |       |   |               |
|             | 6      | N 95 × 3 × 30 × 30 × 9H  | 89 H11  | 110                        | 165             | 16               | 380   | 0 - 5                                                                                                              | D                                           |     |       |   |               |
|             | 7      | N 120 × 3 × 30 × 38 × 9H | 114 H11 | 120                        | 195             | 27               | 550   | 0 - 6                                                                                                              | D                                           |     |       |   |               |
|             | 8      | N 120 × 3 × 30 × 38 × 9H | 114 H11 | 130                        | 195             | 30               | 635   | 0 - 7                                                                                                              | D                                           |     |       |   |               |
| Type        | Size   | c                        | $d_2$   | $D_3$                      | $k_2$           | $n \times s$     | t     | $G_7$                                                                                                              | $l$                                         | kg  |       |   | Flanged shaft |
| <b>B3FH</b> | 5      | 25                       | 300     | 150                        | 260             | 16 × 22          | 10    | 255                                                                                                                | 15                                          | 360 | 0 - 4 | E |               |
|             | 6      | 25                       | 320     | 160                        | 280             | 18 × 22          | 10    | 255                                                                                                                | 16                                          | 420 | 0 - 5 | E |               |
|             | 7      | 30                       | 370     | 180                        | 320             | 16 × 26          | 10    | 300                                                                                                                | 27                                          | 600 | 0 - 6 | E |               |
|             | 8      | 30                       | 390     | 190                        | 340             | 18 × 26          | 10    | 300                                                                                                                | 30                                          | 690 | 0 - 7 | E |               |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Shaft version with reinforced bearing, see page 9/7.

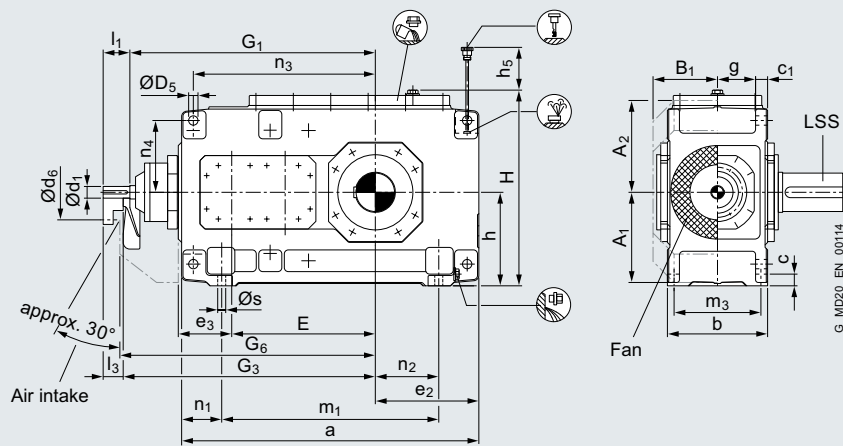
# Bevel helical gear units horizontal mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 9 to 12

#### Selection and ordering data

**B3.H**  
2LP302-...10-....



| Gear unit size | Dimensions in mm       |       |       |       |         |                  |       |       |       |       | Fan   |       |       |       |      |  |  |  |  |
|----------------|------------------------|-------|-------|-------|---------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|--|--|--|--|
|                | High speed shaft (HSS) |       |       |       |         | Reinforced shaft |       |       |       |       |       |       |       |       |      |  |  |  |  |
| $i_N$          | $d_1$                  | $l_1$ | $l_3$ | $i_N$ | $d_1$   | $l_1$            | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $B_1$ | $d_6$ | $G_6$ |      |  |  |  |  |
| <b>9</b>       | 12.5 - 45              | 55 m6 | 110   | 80    | 40 - 50 | 60               | 120   | 90    | 800   | 830   | 315   | 325   | 231   | 175   | 845  |  |  |  |  |
|                | 50 - 71                | 40 m6 | 100   | 70    | 56 - 63 | 50               | 110   | 80    |       |       |       |       |       |       |      |  |  |  |  |
| <b>10</b>      | 16 - 56                | 55 m6 | 110   | 80    | 40 - 63 | 60               | 120   | 90    | 850   | 880   | 315   | 325   | 231   | 175   | 895  |  |  |  |  |
|                | 63 - 90                | 40 m6 | 100   | 70    | 71 - 80 | 50               | 110   | 80    |       |       |       |       |       |       |      |  |  |  |  |
| <b>11</b>      | 12.5 - 45              | 70 m6 | 135   | 105   | 50      | 70               | 135   | 105   | 960   | 990   | 370   | 385   | 263   | 190   | 1010 |  |  |  |  |
|                | 50 - 71                | 50 m6 | 110   | 80    | 56 - 63 | 60               | 135   | 105   |       |       |       |       |       |       |      |  |  |  |  |
| <b>12</b>      | 16 - 56                | 70 m6 | 135   | 105   | 63      | 70               | 135   | 105   | 1030  | 1060  | 370   | 385   | 263   | 190   | 1080 |  |  |  |  |
|                | 63 - 90                | 50 m6 | 110   | 80    | 71 - 80 | 60               | 135   | 105   |       |       |       |       |       |       |      |  |  |  |  |

| Gear unit size | a    | b   | c  | $c_1$        | $D_5$ | E   | $e_2$ | $e_3$ | H   | g   | $h^{1)}$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|------|-----|----|--------------|-------|-----|-------|-------|-----|-----|----------|-------|-------|-------|-------|-------|-------|-------|----|
| <b>9</b>       | 925  | 370 | 40 | $45 \pm 1.5$ | 36 H9 | 450 | 300   | 185   | 662 | 140 | 320      | 175   | 635   | 320   | 145   | 155   | 585   | 245   | 28 |
| <b>10</b>      | 1025 | 370 | 40 | $45 \pm 1.5$ | 36 H9 | 500 | 350   | 185   | 662 | 140 | 320      | 175   | 735   | 320   | 145   | 205   | 635   | 245   | 28 |
| <b>11</b>      | 1105 | 430 | 50 | $54 \pm 1.5$ | 40 H9 | 545 | 345   | 225   | 782 | 161 | 380      | 220   | 775   | 370   | 165   | 180   | 710   | 300   | 35 |
| <b>12</b>      | 1260 | 430 | 50 | $54 \pm 1.5$ | 40 H9 | 615 | 430   | 225   | 790 | 161 | 380      | 210   | 930   | 370   | 165   | 265   | 780   | 300   | 35 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Bevel helical gear units horizontal mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 9 to 12

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|             |           |                          |                | Oil quantity<br>1)         | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |         |                                             |    |      |         |               |
|-------------|-----------|--------------------------|----------------|----------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------|----|------|---------|---------------|
|             |           |                          |                | B3.H                       | B3.H            |                                                                                                                    |         |                                             |    |      |         |               |
|             |           |                          |                | Article No.: <b>2LP302</b> |                 | ■ - ■ ■ .10-....                                                                                                   |         |                                             |    |      |         |               |
| Type        | Size      | d <sub>2</sub>           | l <sub>2</sub> | G <sub>2</sub>             | l               | kg                                                                                                                 |         | Solid shaft with parallel key <sup>3)</sup> |    |      |         |               |
| <b>B3SH</b> | <b>9</b>  | 140 n6                   | 250            | 235                        | 42              | 890                                                                                                                | 0 - 8 A |                                             |    |      |         |               |
|             | <b>10</b> | 160 n6                   | 300            | 235                        | 45              | 1020                                                                                                               | 1 - 0 A |                                             |    |      |         |               |
|             | <b>11</b> | 170 n6                   | 300            | 270                        | 71              | 1455                                                                                                               | 1 - 1 A |                                             |    |      |         |               |
|             | <b>12</b> | 180 n6                   | 300            | 270                        | 76              | 1730                                                                                                               | 1 - 2 A |                                             |    |      |         |               |
| Type        | Size      | d <sub>2</sub>           | l <sub>2</sub> | G <sub>2</sub>             | l               | kg                                                                                                                 |         | Solid shaft without parallel key            |    |      |         |               |
| <b>B3CH</b> | <b>9</b>  | 140 h8                   | 155            | 235                        | 42              | 890                                                                                                                | 0 - 8 F |                                             |    |      |         |               |
|             | <b>10</b> | 170 h8                   | 155            | 235                        | 45              | 1020                                                                                                               | 1 - 0 F |                                             |    |      |         |               |
|             | <b>11</b> | 170 h8                   | 155            | 270                        | 71              | 1455                                                                                                               | 1 - 1 F |                                             |    |      |         |               |
|             | <b>12</b> | 210 h8                   | 170            | 270                        | 76              | 1730                                                                                                               | 1 - 2 F |                                             |    |      |         |               |
| Type        | Size      | D <sub>2</sub>           | G <sub>4</sub> |                            | l               | kg                                                                                                                 |         | Hollow shaft with keyway                    |    |      |         |               |
| <b>B3HH</b> | <b>9</b>  | 135 H7                   | 235            |                            | 42              | 890                                                                                                                | 0 - 8 B |                                             |    |      |         |               |
|             | <b>10</b> | 150 H7                   | 235            |                            | 45              | 1020                                                                                                               | 1 - 0 B |                                             |    |      |         |               |
|             | <b>11</b> | 165 H7                   | 270            |                            | 71              | 1455                                                                                                               | 1 - 1 B |                                             |    |      |         |               |
|             | <b>12</b> | 180 H7                   | 270            |                            | 76              | 1730                                                                                                               | 1 - 2 B |                                             |    |      |         |               |
| Type        | Size      | D <sub>2</sub>           | D <sub>3</sub> | G <sub>4</sub>             | G <sub>5</sub>  | l                                                                                                                  | kg      | Hollow shaft for shrink disk                |    |      |         |               |
| <b>B3DH</b> | <b>9</b>  | 140 H7                   | 145            | 235                        | 330             | 42                                                                                                                 | 890     | 0 - 8 C                                     |    |      |         |               |
|             | <b>10</b> | 150 H7                   | 155            | 235                        | 350             | 45                                                                                                                 | 1020    | 1 - 0 C                                     |    |      |         |               |
|             | <b>11</b> | 165 H7                   | 170            | 270                        | 400             | 71                                                                                                                 | 1455    | 1 - 1 C                                     |    |      |         |               |
|             | <b>12</b> | 180 H7                   | 185            | 270                        | 405             | 76                                                                                                                 | 1730    | 1 - 2 C                                     |    |      |         |               |
| Type        | Size      | N/DIN 5480               | D <sub>2</sub> | D <sub>3</sub>             | G <sub>4</sub>  | l                                                                                                                  | kg      | Hollow shaft with spline                    |    |      |         |               |
| <b>B3KH</b> | <b>9</b>  | N 140 × 3 × 30 × 45 × 9H | 134 H11        | 145                        | 235             | 42                                                                                                                 | 890     | 0 - 8 D                                     |    |      |         |               |
|             | <b>10</b> | N 140 × 3 × 30 × 45 × 9H | 134 H11        | 155                        | 235             | 45                                                                                                                 | 1020    | 1 - 0 D                                     |    |      |         |               |
|             | <b>11</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11        | 170                        | 270             | 71                                                                                                                 | 1455    | 1 - 1 D                                     |    |      |         |               |
|             | <b>12</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11        | 185                        | 270             | 76                                                                                                                 | 1730    | 1 - 2 D                                     |    |      |         |               |
| Type        | Size      | c                        | d <sub>2</sub> | D <sub>3</sub>             | k <sub>2</sub>  | n × s                                                                                                              | t       | G <sub>7</sub>                              | l  | kg   |         | Flanged shaft |
| <b>B3FH</b> | <b>9</b>  | 38                       | 430            | 220                        | 380             | 20 × 26                                                                                                            | 12      | 350                                         | 42 | 975  | 0 - 8 E |               |
|             | <b>10</b> | 38                       | 470            | 240                        | 420             | 22 × 26                                                                                                            | 12      | 350                                         | 45 | 1110 | 1 - 0 E |               |
|             | <b>11</b> | 42                       | 510            | 260                        | 450             | 18 × 33                                                                                                            | 12      | 400                                         | 71 | 1585 | 1 - 1 E |               |
|             | <b>12</b> | 42                       | 540            | 280                        | 480             | 22 × 33                                                                                                            | 12      | 400                                         | 76 | 1870 | 1 - 2 E |               |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Shaft version with reinforced bearing, see page 9/7.

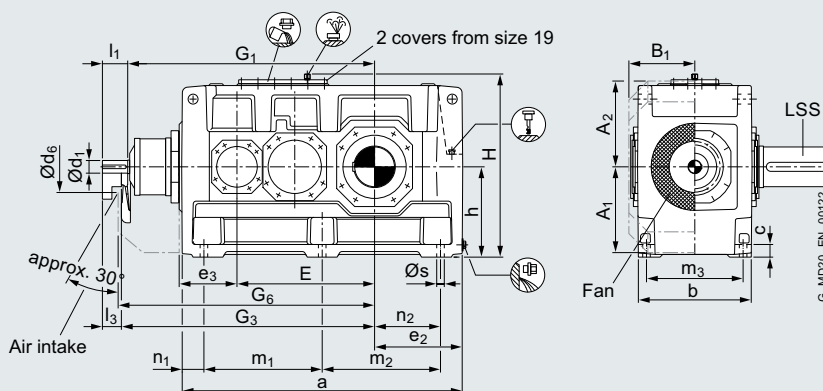
# Bevel helical gear units horizontal mounting position

Type B3

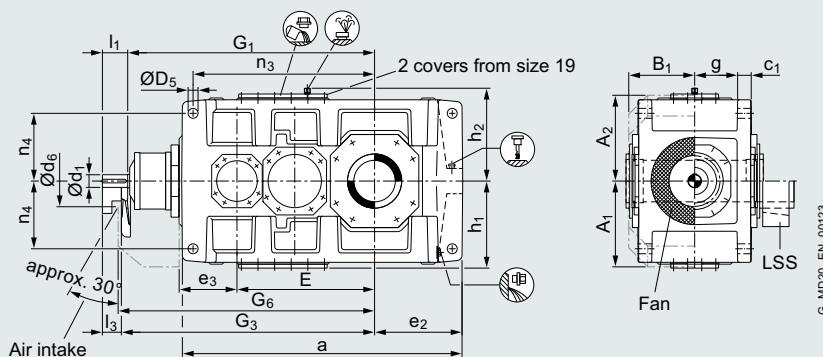
## Gear unit dimensions, three-stage, gear unit sizes 13 to 18

### Selection and ordering data

**B3.H**  
2LP302-...10-....



**B3.M**  
2LP302-...11-....



| Gear unit size | Dimensions in mm       |        |       |       |         |       |       |       |       |       |       |       |       |       |      |  |  |
|----------------|------------------------|--------|-------|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|--|--|
|                | High speed shaft (HSS) |        |       |       |         |       |       |       |       | Fan   |       |       |       |       |      |  |  |
|                | Reinforced shaft       |        |       |       |         |       |       |       |       |       |       |       |       |       |      |  |  |
| $i_N$          | $d_1$                  | $l_1$  | $l_3$ | $i_N$ | $d_1$   | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $B_1$ | $d_6$ | $G_6$ |      |  |  |
| 13             | 12.5 - 45              | 80 m6  | 165   | 130   | 50      | 80 m6 | 165   | 130   | 1125  | 1160  | 425   | 435   | 325   | 210   | 1080 |  |  |
|                | 50 - 71                | 60 m6  | 140   | 105   | 56 - 63 | 70 m6 | 140   | 105   |       |       |       |       |       |       |      |  |  |
| 14             | 16 - 56                | 80 m6  | 165   | 130   | 63      | 80 m6 | 165   | 130   | 1195  | 1230  | 425   | 435   | 325   | 210   | 1250 |  |  |
|                | 63 - 90                | 60 m6  | 140   | 105   | 71 - 80 | 70 m6 | 140   | 105   |       |       |       |       |       |       |      |  |  |
| 15             | 12.5 - 45              | 90 m6  | 165   | 130   | -       | -     | -     | -     | 1367  | 1402  | 475   | 475   | 365   | 210   | 1420 |  |  |
|                | 50 - 71                | 70 m6  | 140   | 105   | -       | -     | -     | -     |       |       |       |       |       |       |      |  |  |
| 16             | 14 - 50                | 90 m6  | 165   | 130   | -       | -     | -     | -     | 1413  | 1448  | 475   | 475   | 365   | 210   | 1470 |  |  |
|                | 56 - 80                | 70 m6  | 140   | 105   | -       | -     | -     | -     |       |       |       |       |       |       |      |  |  |
| 17             | 12.5 - 45              | 110 n6 | 205   | 165   | -       | -     | -     | -     | 1560  | 1600  | 535   | 535   | 395   | 230   | 1620 |  |  |
|                | 50 - 71                | 80 m6  | 170   | 130   | -       | -     | -     | -     |       |       |       |       |       |       |      |  |  |
| 18             | 14 - 50                | 110 n6 | 205   | 165   | -       | -     | -     | -     | 1620  | 1660  | 535   | 535   | 395   | 230   | 1680 |  |  |
|                | 56 - 80                | 80 m6  | 170   | 130   | -       | -     | -     | -     |       |       |       |       |       |       |      |  |  |

| Gear unit size | a    | b   | c  | $c_1$  | $D_5$ | E   | $e_2$ | $e_3$ | H    | g     | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|------|-----|----|--------|-------|-----|-------|-------|------|-------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| 13             | 1290 | 550 | 60 | 61 ± 2 | 48 H9 | 635 | 405   | 265   | 900  | 211.5 | 440      | 450   | 460   | 545   | 545   | 475   | 100   | 305   | 835   | 340   | 35 |
| 14             | 1430 | 550 | 60 | 61 ± 2 | 48 H9 | 705 | 475   | 265   | 900  | 211.5 | 440      | 450   | 460   | 545   | 685   | 475   | 100   | 375   | 905   | 340   | 35 |
| 15             | 1550 | 625 | 70 | 72 ± 2 | 55 H9 | 762 | 485   | 320   | 1000 | 238   | 500      | 490   | 500   | 655   | 655   | 535   | 120   | 365   | 1005  | 375   | 42 |
| 16             | 1640 | 625 | 70 | 72 ± 2 | 55 H9 | 808 | 530   | 320   | 1000 | 238   | 500      | 490   | 500   | 655   | 745   | 535   | 120   | 410   | 1050  | 375   | 42 |
| 17             | 1740 | 690 | 80 | 81 ± 2 | 55 H9 | 860 | 525   | 370   | 1110 | 259   | 550      | 555   | 560   | 735   | 735   | 600   | 135   | 390   | 1145  | 425   | 42 |
| 18             | 1860 | 690 | 80 | 81 ± 2 | 55 H9 | 920 | 585   | 370   | 1110 | 259   | 550      | 555   | 560   | 735   | 855   | 600   | 135   | 450   | 1205  | 425   | 42 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Bevel helical gear units horizontal mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 13 to 18

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                       |      | Oil quantity <sup>1)</sup><br>B3.H | Oil quantity <sup>1)</sup><br>B3.M | Weight <sup>1)2)</sup><br>B3.H | Weight <sup>1)2)</sup><br>B3.M | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |      |                |       |       |                          |                                  |                                             |               |  |
|-----------------------|------|------------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|------|----------------|-------|-------|--------------------------|----------------------------------|---------------------------------------------|---------------|--|
|                       |      | Article No.:                       |                                    | 2LP302                         |                                | 1.-....                                                                                                            |      |                |       |       |                          |                                  |                                             |               |  |
| Type                  | Size | d <sub>2</sub>                     | l <sub>2</sub>                     | G <sub>2</sub>                 | l                              | l                                                                                                                  | kg   | kg             |       |       |                          |                                  | Solid shaft with parallel key <sup>3)</sup> |               |  |
| <b>B3SH</b>           | 13   | 200 n6                             | 350                                | 335                            | 130                            | -                                                                                                                  | 2380 | -              | 1 - 3 | A     |                          |                                  |                                             |               |  |
|                       | 14   | 210 n6                             | 350                                | 335                            | 140                            | -                                                                                                                  | 2750 | -              | 1 - 4 | A     |                          |                                  |                                             |               |  |
|                       | 15   | 230 n6                             | 410                                | 380                            | 210                            | -                                                                                                                  | 3730 | -              | 1 - 5 | A     |                          |                                  |                                             |               |  |
|                       | 16   | 240 n6                             | 410                                | 380                            | 220                            | -                                                                                                                  | 3955 | -              | 1 - 6 | A     |                          |                                  |                                             |               |  |
|                       | 17   | 250 n6                             | 410                                | 415                            | 290                            | -                                                                                                                  | 4990 | -              | 1 - 7 | A     |                          |                                  |                                             |               |  |
|                       | 18   | 270 n6                             | 470                                | 415                            | 300                            | -                                                                                                                  | 5495 | -              | 1 - 8 | A     |                          |                                  |                                             |               |  |
| Type                  | Size | d <sub>2</sub>                     | l <sub>2</sub>                     | G <sub>2</sub>                 | l                              | l                                                                                                                  | kg   | kg             |       |       |                          | Solid shaft without parallel key |                                             |               |  |
| <b>B3CH/<br/>B3CM</b> | 13   | 210 h8                             | 170                                | 335                            | 130                            | 110                                                                                                                | 2380 | 2265           | 1 - 3 | F     |                          |                                  |                                             |               |  |
|                       | 14   | 210 h8                             | 170                                | 335                            | 140                            | 115                                                                                                                | 2750 | 2620           | 1 - 4 | F     |                          |                                  |                                             |               |  |
|                       | 15   | 250 h8                             | 190                                | 380                            | 210                            | 160                                                                                                                | 3730 | 3535           | 1 - 5 | F     |                          |                                  |                                             |               |  |
|                       | 16   | 250 h8                             | 190                                | 380                            | 220                            | 165                                                                                                                | 3955 | 3735           | 1 - 6 | F     |                          |                                  |                                             |               |  |
| Type                  | Size | D <sub>2</sub>                     | G <sub>4</sub>                     | l                              | l                              | kg                                                                                                                 | kg   |                |       |       | Hollow shaft with keyway |                                  |                                             |               |  |
| <b>B3HH/<br/>B3HM</b> | 13   | 190 H7                             | 335                                | 130                            | 110                            | 2380                                                                                                               | 2260 | 1 - 3          | B     |       |                          |                                  |                                             |               |  |
|                       | 14   | 210 H7                             | 335                                | 140                            | 115                            | 2750                                                                                                               | 2615 | 1 - 4          | B     |       |                          |                                  |                                             |               |  |
|                       | 15   | 230 H7                             | 380                                | 210                            | 160                            | 3730                                                                                                               | 3540 | 1 - 5          | B     |       |                          |                                  |                                             |               |  |
|                       | 16   | 240 H7                             | 380                                | 220                            | 165                            | 3955                                                                                                               | 3765 | 1 - 6          | B     |       |                          |                                  |                                             |               |  |
|                       | 17   | 250 H7                             | 415                                | 290                            | 230                            | 4990                                                                                                               | 4760 | 1 - 7          | B     |       |                          |                                  |                                             |               |  |
|                       | 18   | 275 H7                             | 415                                | 300                            | 235                            | 5495                                                                                                               | 5240 | 1 - 8          | B     |       |                          |                                  |                                             |               |  |
| Type                  | Size | D <sub>2</sub>                     | D <sub>3</sub>                     | G <sub>4</sub>                 | G <sub>5</sub>                 | l                                                                                                                  | l    | kg             | kg    |       |                          | Hollow shaft for shrink disk     |                                             |               |  |
| <b>B3DH/<br/>B3DM</b> | 13   | 190 H7                             | 195                                | 335                            | 480                            | 130                                                                                                                | 110  | 2380           | 2260  | 1 - 3 | C                        |                                  |                                             |               |  |
|                       | 14   | 210 H7                             | 215                                | 335                            | 480                            | 140                                                                                                                | 115  | 2750           | 2615  | 1 - 4 | C                        |                                  |                                             |               |  |
|                       | 15   | 230 H7                             | 235                                | 380                            | 550                            | 210                                                                                                                | 160  | 3730           | 3540  | 1 - 5 | C                        |                                  |                                             |               |  |
|                       | 16   | 240 H7                             | 245                                | 380                            | 550                            | 220                                                                                                                | 165  | 3955           | 3765  | 1 - 6 | C                        |                                  |                                             |               |  |
|                       | 17   | 250 H7                             | 260                                | 415                            | 600                            | 290                                                                                                                | 230  | 4990           | 4760  | 1 - 7 | C                        |                                  |                                             |               |  |
|                       | 18   | 280 H7                             | 285                                | 415                            | 600                            | 300                                                                                                                | 235  | 5495           | 5240  | 1 - 8 | C                        |                                  |                                             |               |  |
| Type                  | Size | N/DIN 5480                         | D <sub>2</sub>                     | D <sub>3</sub>                 | G <sub>4</sub>                 | l                                                                                                                  | l    | kg             | kg    |       |                          |                                  | Hollow shaft with spline                    |               |  |
| <b>B3KH/<br/>B3KM</b> | 13   | N 190 × 5 × 30 × 36 × 9H           | 180 H11                            | 195                            | 335                            | 130                                                                                                                | 110  | 2380           | 2260  | 1 - 3 | D                        |                                  |                                             |               |  |
|                       | 14   | N 190 × 5 × 30 × 36 × 9H           | 180 H11                            | 215                            | 335                            | 140                                                                                                                | 115  | 2750           | 2615  | 1 - 4 | D                        |                                  |                                             |               |  |
|                       | 15   | N 220 × 5 × 30 × 42 × 9H           | 210 H11                            | 235                            | 380                            | 210                                                                                                                | 160  | 3730           | 3540  | 1 - 5 | D                        |                                  |                                             |               |  |
|                       | 16   | N 220 × 5 × 30 × 42 × 9H           | 210 H11                            | 245                            | 380                            | 220                                                                                                                | 165  | 3955           | 3765  | 1 - 6 | D                        |                                  |                                             |               |  |
|                       | 17   | N 250 × 5 × 30 × 48 × 9H           | 240 H11                            | 260                            | 415                            | 290                                                                                                                | 230  | 4990           | 4760  | 1 - 7 | D                        |                                  |                                             |               |  |
|                       | 18   | N 250 × 5 × 30 × 48 × 9H           | 240 H11                            | 285                            | 415                            | 300                                                                                                                | 235  | 5495           | 5240  | 1 - 8 | D                        |                                  |                                             |               |  |
| Type                  | Size | c                                  | d <sub>2</sub>                     | D <sub>3</sub>                 | k <sub>2</sub>                 | n × s                                                                                                              | t    | G <sub>7</sub> | l     | l     | kg                       | kg                               |                                             | Flanged shaft |  |
| <b>B3FH/<br/>B3FM</b> | 13   | 48                                 | 580                                | 310                            | 500                            | 20 × 33                                                                                                            | 14   | 480            | 130   | 110   | 2540                     | 2420                             | 1 - 3                                       | E             |  |
|                       | 14   | 48                                 | 620                                | 310                            | 540                            | 24 × 33                                                                                                            | 14   | 480            | 140   | 115   | 2920                     | 2785                             | 1 - 4                                       | E             |  |
|                       | 15   | 55                                 | 710                                | 360                            | 630                            | 28 × 33                                                                                                            | 17   | 550            | 210   | 160   | 3970                     | 3780                             | 1 - 5                                       | E             |  |
|                       | 16   | 55                                 | 740                                | 360                            | 660                            | 30 × 33                                                                                                            | 17   | 550            | 220   | 165   | 4250                     | 4020                             | 1 - 6                                       | E             |  |
|                       | 17   | 60                                 | 750                                | 410                            | 660                            | 24 × 39                                                                                                            | 18   | 600            | 290   | 230   | 5290                     | 5060                             | 1 - 7                                       | E             |  |
|                       | 18   | 60                                 | 800                                | 410                            | 710                            | 26 × 39                                                                                                            | 18   | 600            | 300   | 235   | 6045                     | 5590                             | 1 - 8                                       | E             |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, see page 9/7.

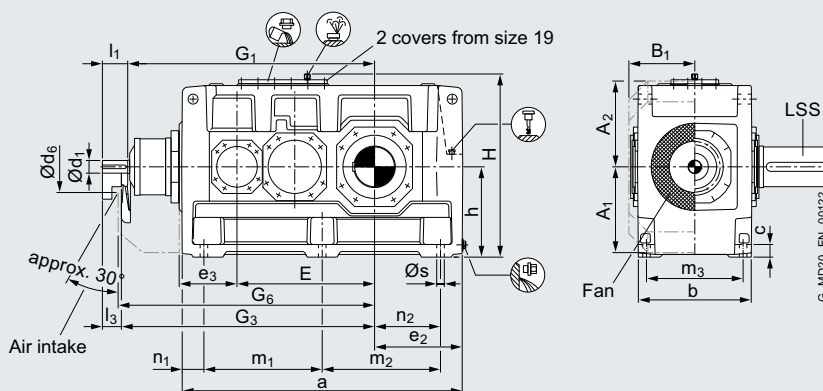
# Bevel helical gear units horizontal mounting position

Type B3

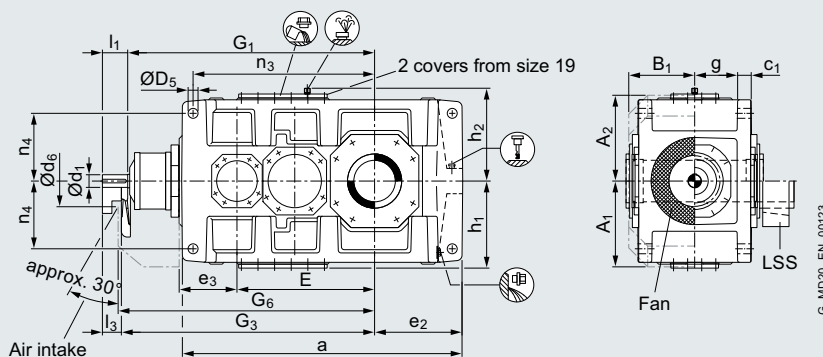
Gear unit dimensions, three-stage, gear unit sizes 19 to 24

## Selection and ordering data

**B3.H**  
2LP302-...10-....



**B3.M**  
2LP302-...11-....



| Gear unit size | Dimensions in mm |        |       |       |       |       | Fan   |       |       |       |       |
|----------------|------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | $i_N$            | $d_1$  | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $A_2$ | $B_1$ | $d_6$ | $G_6$ |
| <b>19</b>      | 12.5 - 45        | 130 n6 | 245   | 200   | 1832  | 1877  | 610   | 630   | 448   | 245   | 1900  |
|                | 50 - 71          | 100 m6 | 210   | 165   |       |       |       |       |       |       |       |
| <b>20</b>      | 14 - 50          | 130 n6 | 245   | 200   | 1892  | 1937  | 610   | 630   | 448   | 245   | 1960  |
|                | 56 - 80          | 100 m6 | 210   | 165   |       |       |       |       |       |       |       |
| <b>21</b>      | 12.5 - 45        | 130 n6 | 245   | 200   | 1902  | 1947  | 690   | 690   | 473   | 280   | 1970  |
|                | 50 - 71          | 100 m6 | 210   | 165   |       |       |       |       |       |       |       |
| <b>22</b>      | 14 - 50          | 130 n6 | 245   | 200   | 1957  | 2002  | 690   | 690   | 473   | 280   | 2025  |
|                | 56 - 80          | 100 m6 | 210   | 165   |       |       |       |       |       |       |       |
| <b>23</b>      | 20 - 45          | 150 n6 | 245   | 200   | 2130  | 2175  | 720   | 720   | 515   | 382   | 2208  |
|                | 50 - 71          | 110 n6 | 210   | 165   |       |       |       |       |       |       |       |
| <b>24</b>      | 22.4 - 50        | 150 n6 | 245   | 200   | 2195  | 2240  | 720   | 720   | 515   | 382   | 2273  |
|                | 56 - 80          | 110 n6 | 210   | 165   |       |       |       |       |       |       |       |

| Gear unit size | Dimensions in mm |     |     |        |       |      |       |       |      |     |          |       |       |       |       |       |       |       |       |       |    |  |  |  |
|----------------|------------------|-----|-----|--------|-------|------|-------|-------|------|-----|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|--|--|--|
|                | a                | b   | c   | $c_1$  | $D_5$ | E    | $e_2$ | $e_3$ | H    | g   | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |  |  |  |
| <b>19</b>      | 2010             | 790 | 90  | 91 ±2  | 65 H9 | 997  | 590   | 420   | 1240 | 299 | 620      | 615   | 620   | 850   | 850   | 690   | 155   | 435   | 1345  | 475   | 48 |  |  |  |
| <b>20</b>      | 2130             | 790 | 90  | 91 ±2  | 65 H9 | 1057 | 650   | 420   | 1240 | 299 | 620      | 615   | 620   | 850   | 970   | 690   | 155   | 495   | 1405  | 475   | 48 |  |  |  |
| <b>21</b>      | 2140             | 830 | 100 | 100 ±2 | 75 H9 | 1067 | 655   | 450   | 1390 | 310 | 700      | 685   | 690   | 900   | 900   | 720   | 170   | 485   | 1400  | 520   | 56 |  |  |  |
| <b>22</b>      | 2250             | 830 | 100 | 100 ±2 | 75 H9 | 1122 | 710   | 450   | 1390 | 310 | 700      | 685   | 690   | 900   | 1010  | 720   | 170   | 540   | 1455  | 520   | 56 |  |  |  |
| <b>23</b>      | 2380             | 930 | 115 | 120 ±2 | 80 H9 | 1185 | 730   | 490   | 1565 | 342 | 780      | 765   | 785   | 1010  | 1010  | 810   | 180   | 550   | 1560  | 580   | 56 |  |  |  |
| <b>24</b>      | 2510             | 930 | 115 | 120 ±2 | 80 H9 | 1250 | 795   | 490   | 1565 | 342 | 780      | 765   | 785   | 1010  | 1140  | 810   | 180   | 615   | 1625  | 580   | 56 |  |  |  |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.



# Bevel helical gear units horizontal mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 19 to 24

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                       |      | Oil quantity<br>1) | Oil quantity<br>1) | Weight<br>1) 2) | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |       |       |       |       |            |    |       |   |  |
|-----------------------|------|--------------------|--------------------|-----------------|-----------------|--------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|------------|----|-------|---|--|
|                       |      | B3.H               | B3.M               | B3.H            | B3.M            |                                                                                                                    |       |       |       |       |            |    |       |   |  |
|                       |      | Article No.:       |                    | 2LP302          |                 | .1-....                                                                                                            |       |       |       |       |            |    |       |   |  |
| Type                  | Size | $d_2$              | $l_2$              | $G_2$           | $l$             | $l$                                                                                                                | kg    | kg    |       |       |            |    |       |   |  |
| <b>B3SH</b>           | 19   | 290 n6             | 470                | 465             | 380             | –                                                                                                                  | 7000  | –     | 2 - 0 | A     |            |    |       |   |  |
|                       | 20   | 300 n6             | 500                | 465             | 440             | –                                                                                                                  | 8100  | –     | 2 - 1 | A     |            |    |       |   |  |
|                       | 21   | 320 n6             | 500                | 490             | 370             | –                                                                                                                  | 9200  | –     | 2 - 2 | A     |            |    |       |   |  |
|                       | 22   | 340 n6             | 550                | 490             | 430             | –                                                                                                                  | 9900  | –     | 2 - 3 | A     |            |    |       |   |  |
|                       | 23   | 360 n6             | 590                | 540             | 520             | –                                                                                                                  | 12000 | –     | 2 - 4 | A     |            |    |       |   |  |
|                       | 24   | 380 n6             | 590                | 540             | 600             | –                                                                                                                  | 13400 | –     | 2 - 5 | A     |            |    |       |   |  |
| Type                  | Size | $D_2$              | $D_3$              | $G_4$           | $G_5$           | $l$                                                                                                                | $l$   | kg    | kg    |       |            |    |       |   |  |
| <b>B3DH/<br/>B3DM</b> | 19   | 285 H7             | 295                | 465             | 670             | 380                                                                                                                | 360   | 7000  | 6500  | 2 - 0 | C          |    |       |   |  |
|                       | 20   | 310 H7             | 315                | 465             | 670             | 440                                                                                                                | 420   | 8100  | 7600  | 2 - 1 | C          |    |       |   |  |
|                       | 21   | 330 H7             | 335                | 490             | 715             | 370                                                                                                                | 420   | 9200  | 8600  | 2 - 2 | C          |    |       |   |  |
|                       | 22   | 340 H7             | 345                | 490             | 725             | 430                                                                                                                | 490   | 9900  | 9400  | 2 - 3 | C          |    |       |   |  |
|                       | 23   | 370 H7             | 375                | 540             | 800             | 520                                                                                                                | 560   | 12000 | 11400 | 2 - 4 | C          |    |       |   |  |
|                       | 24   | 390 H7             | 395                | 540             | 820             | 600                                                                                                                | 650   | 13400 | 12700 | 2 - 5 | C          |    |       |   |  |
| Type                  | Size | c                  | $d_2$              | $D_3$           | $k_2$           | $n \times s$                                                                                                       | t     | $G_7$ | $l$   | $l$   | kg         | kg |       |   |  |
| <b>B3FH/<br/>B3FM</b> | 19   | 65                 | 860                | 460             | 770             | 30 × 39                                                                                                            | 18    | 670   | 380   | 360   | On request |    | 2 - 0 | E |  |
|                       | 20   | 65                 | 930                | 460             | 830             | 32 × 39                                                                                                            | 18    | 670   | 440   | 420   |            |    | 2 - 1 | E |  |
|                       | 21   | 75                 | 950                | 520             | 850             | 28 × 45                                                                                                            | 20    | 710   | 370   | 420   |            |    | 2 - 2 | E |  |
|                       | 22   | 75                 | 1040               | 520             | 940             | 28 × 45                                                                                                            | 20    | 710   | 430   | 490   |            |    | 2 - 3 | E |  |
|                       | 23   | On request         |                    |                 |                 |                                                                                                                    |       |       |       |       |            |    |       |   |  |
|                       | 24   | On request         |                    |                 |                 |                                                                                                                    |       |       |       |       |            |    |       |   |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

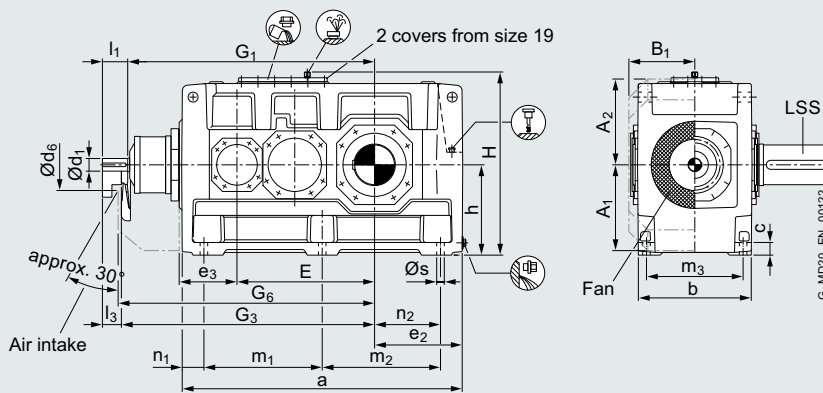
# Bevel helical gear units horizontal mounting position

Type B3

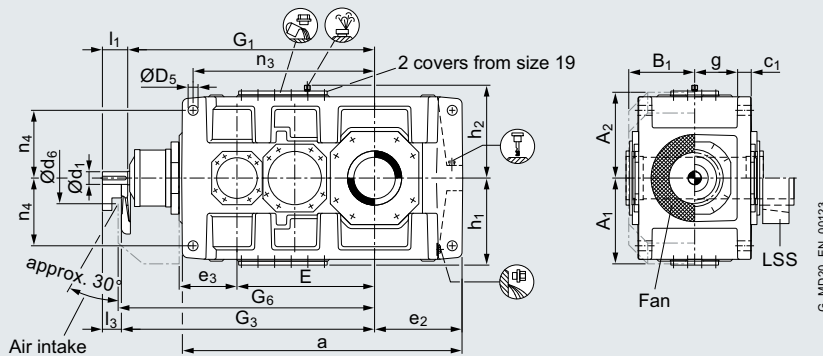
## Gear unit dimensions, three-stage, gear unit sizes 25 to 28

### Selection and ordering data

**B3.H**  
2LP302-...10-....



**B3.M**  
2LP302-...11-....



| Gear unit size | Dimensions in mm       |        |       |       |       |       |       |       |       |       |       |
|----------------|------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | High speed shaft (HSS) |        |       |       |       |       |       | Fan   |       |       |       |
| $i_N$          | $d_1$                  | $l_1$  | $l_3$ | $G_1$ | $G_3$ | $G_6$ | $A_1$ | $A_2$ | $B_1$ | $d_6$ | $G_6$ |
| <b>25</b>      | 20 - 40                | 160 n6 | 295   | 240   | 2375  | 2430  | 790   | 790   | 575   | 414   | 2435  |
|                | 45 - 71                | 120 n6 | 220   | 165   |       |       |       |       |       |       |       |
| <b>26</b>      | 22.4 - 45              | 160 n6 | 295   | 240   | 2465  | 2520  | 790   | 790   | 575   | 414   | 2525  |
|                | 50 - 80                | 120 n6 | 220   | 165   |       |       |       |       |       |       |       |
| <b>27</b>      | 20 - 40                | 180 n6 | 295   | 240   | 2625  | 2680  | 870   | 870   | 640   | 446   | 2688  |
|                | 45 - 71                | 130 n6 | 255   | 200   |       |       |       |       |       |       |       |
| <b>28</b>      | 22.4 - 45              | 180 n6 | 295   | 240   | 2720  | 2775  | 870   | 870   | 640   | 446   | 2783  |
|                | 50 - 80                | 130 n6 | 255   | 200   |       |       |       |       |       |       |       |

| Gear unit size | Dimensions in mm |      |     |         |        |      |       |       |      |     |          |       |       |       |       |       |       |       |       |       |    |
|----------------|------------------|------|-----|---------|--------|------|-------|-------|------|-----|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
|                | a                | b    | c   | $c_1$   | $D_5$  | E    | $e_2$ | $e_3$ | H    | g   | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
| <b>25</b>      | 2645             | 1045 | 130 | 120 ± 2 | 90 H9  | 1325 | 790   | 555   | 1740 | 400 | 860      | 860   | 880   | 1155  | 1090  | 910   | 200   | 590   | 1750  | 660   | 66 |
| <b>26</b>      | 2825             | 1045 | 130 | 120 ± 2 | 90 H9  | 1415 | 880   | 555   | 1740 | 400 | 860      | 860   | 880   | 1155  | 1270  | 910   | 200   | 680   | 1840  | 660   | 66 |
| <b>27</b>      | 2960             | 1170 | 150 | 145 ± 2 | 100 H9 | 1485 | 880   | 625   | 1900 | 440 | 950      | 930   | 950   | 1260  | 1260  | 1030  | 220   | 660   | 2000  | 720   | 74 |
| <b>28</b>      | 3150             | 1170 | 150 | 145 ± 2 | 100 H9 | 1580 | 975   | 625   | 1900 | 440 | 950      | 930   | 950   | 1260  | 1450  | 1030  | 220   | 755   | 2095  | 720   | 74 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Bevel helical gear units horizontal mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 25 to 28

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                       |           | Oil quantity<br>1) | Oil quantity<br>1) | Weight<br>1) 2) | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |       |       |       |     |    |    |   |   |   |   |  |  |  |  |  |  |  |
|-----------------------|-----------|--------------------|--------------------|-----------------|-----------------|--------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-----|----|----|---|---|---|---|--|--|--|--|--|--|--|
|                       |           | B3.H               | B3.M               | B3.H            | B3.M            |                                                                                                                    |       |       |       |     |    |    |   |   |   |   |  |  |  |  |  |  |  |
|                       |           | Article No.:       |                    | 2LP302          |                 | .1-....                                                                                                            |       |       |       |     |    |    |   |   |   |   |  |  |  |  |  |  |  |
| Type                  | Size      | $d_2$              | $l_2$              | $G_2$           | $l$             | $l$                                                                                                                | kg    | kg    |       |     |    |    |   |   |   |   |  |  |  |  |  |  |  |
| <b>B3SH</b>           | <b>25</b> | 400 n6             | 650                | 605             | 760             | –                                                                                                                  | 16100 | –     | 2     | –   | 6  | A  |   |   |   |   |  |  |  |  |  |  |  |
|                       | <b>26</b> | 420 n6             | 650                | 605             | 880             | –                                                                                                                  | 18000 | –     | 2     | –   | 7  | A  |   |   |   |   |  |  |  |  |  |  |  |
|                       | <b>27</b> | 440 n6             | 690                | 680             | 1050            | –                                                                                                                  | 22700 | –     | 2     | –   | 8  | A  |   |   |   |   |  |  |  |  |  |  |  |
|                       | <b>28</b> | 460 n6             | 750                | 680             | 1220            | –                                                                                                                  | 25700 | –     | 3     | –   | 0  | A  |   |   |   |   |  |  |  |  |  |  |  |
| Type                  | Size      | $D_2$              | $D_3$              | $G_4$           | $G_5$           | $l$                                                                                                                | $l$   | kg    | kg    |     |    |    |   |   |   |   |  |  |  |  |  |  |  |
| <b>B3DH/<br/>B3DM</b> | <b>25</b> | 410 H7             | 415                | 610             | 895             | 760                                                                                                                | 830   | 16100 | 15300 | 2   | –  | 6  | C |   |   |   |  |  |  |  |  |  |  |
|                       | <b>26</b> | 430 H7             | 435                | 610             | 925             | 880                                                                                                                | 960   | 18000 | 17000 | 2   | –  | 7  | C |   |   |   |  |  |  |  |  |  |  |
|                       | <b>27</b> | 460 H7             | 465                | 680             | 1000            | 1050                                                                                                               | 1150  | 22700 | 21700 | 2   | –  | 8  | C |   |   |   |  |  |  |  |  |  |  |
|                       | <b>28</b> | 470 H7             | 475                | 680             | 1020            | 1220                                                                                                               | 1340  | 25700 | 24400 | 3   | –  | 0  | C |   |   |   |  |  |  |  |  |  |  |
| Type                  | Size      | c                  | $d_2$              | $D_3$           | $k_2$           | $n \times s$                                                                                                       | t     | $G_7$ | $l$   | $l$ | kg | kg |   |   |   |   |  |  |  |  |  |  |  |
| <b>B3FH/<br/>B3FM</b> | <b>25</b> | On request         |                    |                 |                 |                                                                                                                    |       |       |       |     |    |    | 2 | – | 6 | E |  |  |  |  |  |  |  |
|                       | <b>26</b> |                    |                    |                 |                 |                                                                                                                    |       |       |       |     |    |    | 2 | – | 7 | E |  |  |  |  |  |  |  |
|                       | <b>27</b> |                    |                    |                 |                 |                                                                                                                    |       |       |       |     |    |    | 2 | – | 8 | E |  |  |  |  |  |  |  |
|                       | <b>28</b> |                    |                    |                 |                 |                                                                                                                    |       |       |       |     |    |    | 3 | – | 0 | E |  |  |  |  |  |  |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

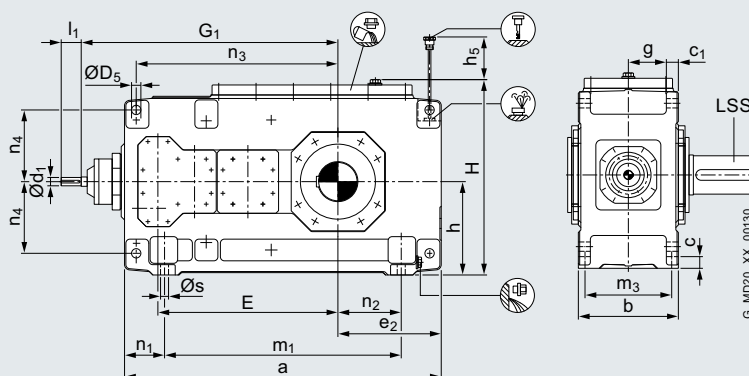
# Bevel helical gear units horizontal mounting position

## Type B4

### Gear unit dimensions, four-stage, gear unit sizes 5 to 8

#### Selection and ordering data

**B4.H**  
2LP302-...20-....



| Gear unit size | Dimensions in mm       |       |       |                  |       |       |       |
|----------------|------------------------|-------|-------|------------------|-------|-------|-------|
|                | High speed shaft (HSS) |       |       | Reinforced shaft |       |       |       |
|                | $i_N$                  | $d_1$ | $l_1$ | $i_N$            | $d_1$ | $l_1$ | $G_1$ |
| 5              | 80 - 180               | 28 m6 | 55    | -                | -     | -     | 615   |
|                | 200 - 315              | 20 k6 | 50    | -                | -     | -     |       |
| 6              | 100 - 224              | 28 m6 | 55    | -                | -     | -     | 650   |
|                | 250 - 400              | 20 k6 | 50    | -                | -     | -     |       |
| 7              | 80 - 180               | 30 m6 | 70    | 160 - 200        | 35 m6 | 80    | 725   |
|                | 200 - 315              | 25 k6 | 60    | 224 - 250        | 32 m6 | 70    |       |
| 8              | 100 - 224              | 30 m6 | 70    | 200 - 250        | 35 m6 | 80    | 770   |
|                | 250 - 400              | 25 k6 | 60    | 280 - 315        | 32 m6 | 70    |       |

| Gear unit size | a   | b   | c  | $c_1$      | $D_5$ | E   | $e_2$ | g    | H   | $h^{1)}$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|-----|-----|----|------------|-------|-----|-------|------|-----|----------|-------|-------|-------|-------|-------|-------|-------|----|
| 5              | 690 | 255 | 28 | $30 \pm 1$ | 24 H9 | 405 | 205   | 97.5 | 482 | 230      | 100   | 480   | 220   | 105   | 100   | 455   | 180   | 19 |
| 6              | 770 | 255 | 28 | $30 \pm 1$ | 24 H9 | 440 | 250   | 97.5 | 482 | 230      | 100   | 560   | 220   | 105   | 145   | 490   | 180   | 19 |
| 7              | 845 | 300 | 35 | $36 \pm 1$ | 28 H9 | 495 | 250   | 114  | 572 | 280      | 140   | 605   | 260   | 120   | 130   | 560   | 215   | 24 |
| 8              | 950 | 300 | 35 | $36 \pm 1$ | 28 H9 | 540 | 310   | 114  | 582 | 280      | 130   | 710   | 260   | 120   | 190   | 605   | 215   | 24 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

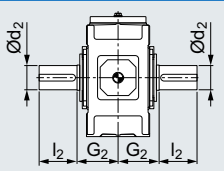
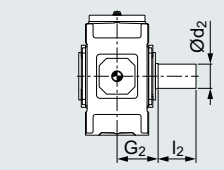
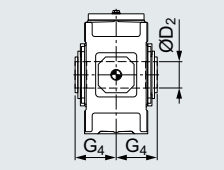
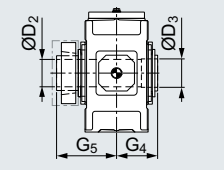
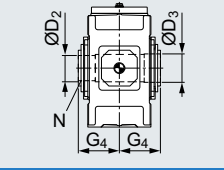
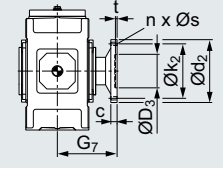
For details on the shafts, see Chapter 9.

# Bevel helical gear units horizontal mounting position Type B4

## Gear unit dimensions, four-stage, gear unit sizes 5 to 8

### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                                                                                       |      |                          |                | Oil quantity<br>1)<br>B4.H | Weight<br>1) 2)<br>B4.H | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |         |                |    |     |         |
|---------------------------------------------------------------------------------------|------|--------------------------|----------------|----------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------|---------|----------------|----|-----|---------|
|                                                                                       |      |                          |                | Article No.: <b>2LP302</b> |                         | ■ - ■ ■ .20-....                                                                                                   |         |                |    |     |         |
| Type                                                                                  | Size | d <sub>2</sub>           | l <sub>2</sub> | G <sub>2</sub>             | l                       | kg                                                                                                                 |         |                |    |     |         |
| <b>B4SH</b>                                                                           | 5    | 100 m6                   | 210            | 165                        | 16                      | 335                                                                                                                | 0 - 4 A |                |    |     |         |
|                                                                                       | 6    | 110 n6                   | 210            | 165                        | 18                      | 385                                                                                                                | 0 - 5 A |                |    |     |         |
|                                                                                       | 7    | 120 n6                   | 210            | 195                        | 30                      | 555                                                                                                                | 0 - 6 A |                |    |     |         |
|                                                                                       | 8    | 130 n6                   | 250            | 195                        | 33                      | 655                                                                                                                | 0 - 7 A |                |    |     |         |
| <b>Solid shaft with parallel key <sup>3)</sup></b>                                    |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
|    |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
| Type                                                                                  | Size | d <sub>2</sub>           | l <sub>2</sub> | G <sub>2</sub>             | l                       | kg                                                                                                                 |         |                |    |     |         |
| <b>B4CH</b>                                                                           | 5    | 115 h8                   | 125            | 165                        | 16                      | 335                                                                                                                | 0 - 4 F |                |    |     |         |
|                                                                                       | 6    | 115 h8                   | 125            | 165                        | 18                      | 385                                                                                                                | 0 - 5 F |                |    |     |         |
|                                                                                       | 7    | 140 h8                   | 155            | 195                        | 30                      | 555                                                                                                                | 0 - 6 F |                |    |     |         |
|                                                                                       | 8    | 140 h8                   | 155            | 195                        | 33                      | 655                                                                                                                | 0 - 7 F |                |    |     |         |
| <b>Solid shaft without parallel key</b>                                               |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
|    |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
| Type                                                                                  | Size | D <sub>2</sub>           | G <sub>4</sub> | l                          | kg                      |                                                                                                                    |         |                |    |     |         |
| <b>B4HH</b>                                                                           | 5    | 95 H7                    | 165            | 16                         | 335                     | 0 - 4 B                                                                                                            |         |                |    |     |         |
|                                                                                       | 6    | 105 H7                   | 165            | 18                         | 385                     | 0 - 5 B                                                                                                            |         |                |    |     |         |
|                                                                                       | 7    | 115 H7                   | 195            | 30                         | 555                     | 0 - 6 B                                                                                                            |         |                |    |     |         |
|                                                                                       | 8    | 125 H7                   | 195            | 33                         | 655                     | 0 - 7 B                                                                                                            |         |                |    |     |         |
| <b>Hollow shaft with keyway</b>                                                       |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
|   |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
| Type                                                                                  | Size | D <sub>2</sub>           | D <sub>3</sub> | G <sub>4</sub>             | G <sub>5</sub>          | l                                                                                                                  | kg      |                |    |     |         |
| <b>B4DH</b>                                                                           | 5    | 100 H7                   | 100            | 165                        | 240                     | 16                                                                                                                 | 335     |                |    |     |         |
|                                                                                       | 6    | 110 H7                   | 110            | 165                        | 240                     | 18                                                                                                                 | 385     |                |    |     |         |
|                                                                                       | 7    | 120 H7                   | 120            | 195                        | 280                     | 30                                                                                                                 | 555     |                |    |     |         |
|                                                                                       | 8    | 130 H7                   | 130            | 195                        | 285                     | 33                                                                                                                 | 655     |                |    |     |         |
| <b>Hollow shaft for shrink disk</b>                                                   |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
|  |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
| Type                                                                                  | Size | N/DIN 5480               | D <sub>2</sub> | D <sub>3</sub>             | G <sub>4</sub>          | l                                                                                                                  | kg      |                |    |     |         |
| <b>B4KH</b>                                                                           | 5    | N 95 × 3 × 30 × 30 × 9H  | 89 H11         | 100                        | 165                     | 16                                                                                                                 | 335     |                |    |     |         |
|                                                                                       | 6    | N 95 × 3 × 30 × 30 × 9H  | 89 H11         | 110                        | 165                     | 18                                                                                                                 | 385     |                |    |     |         |
|                                                                                       | 7    | N 120 × 3 × 30 × 38 × 9H | 114 H11        | 120                        | 195                     | 30                                                                                                                 | 555     |                |    |     |         |
|                                                                                       | 8    | N 120 × 3 × 30 × 38 × 9H | 114 H11        | 130                        | 195                     | 33                                                                                                                 | 655     |                |    |     |         |
| <b>Hollow shaft with spline</b>                                                       |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
|  |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
| Type                                                                                  | Size | c                        | d <sub>2</sub> | D <sub>3</sub>             | k <sub>2</sub>          | n × s                                                                                                              | t       | G <sub>7</sub> | l  | kg  |         |
| <b>B4FH</b>                                                                           | 5    | 25                       | 300            | 150                        | 260                     | 16 × 22                                                                                                            | 10      | 255            | 16 | 370 | 0 - 4 E |
|                                                                                       | 6    | 25                       | 320            | 160                        | 280                     | 18 × 22                                                                                                            | 10      | 255            | 18 | 425 | 0 - 5 E |
|                                                                                       | 7    | 30                       | 370            | 180                        | 320                     | 16 × 26                                                                                                            | 10      | 300            | 30 | 605 | 0 - 6 E |
|                                                                                       | 8    | 30                       | 390            | 190                        | 340                     | 18 × 26                                                                                                            | 10      | 300            | 33 | 710 | 0 - 7 E |
| <b>Flanged shaft</b>                                                                  |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |
|  |      |                          |                |                            |                         |                                                                                                                    |         |                |    |     |         |



Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Shaft version with reinforced bearing, see page 9/7.

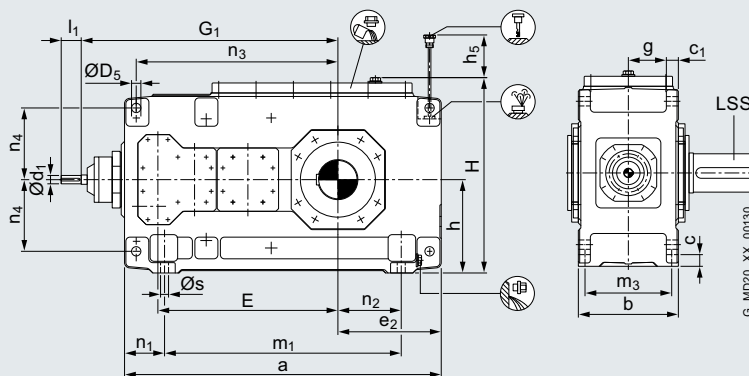
# Bevel helical gear units horizontal mounting position

## Type B4

### Gear unit dimensions, four-stage, gear unit sizes 9 to 12

#### Selection and ordering data

**B4.H**  
2LP302-...20-....



| Gear unit size | Dimensions in mm       |       |       |                  |       |       |       |
|----------------|------------------------|-------|-------|------------------|-------|-------|-------|
|                | High speed shaft (HSS) |       |       | Reinforced shaft |       |       |       |
|                | $i_N$                  | $d_1$ | $l_1$ | $i_N$            | $d_1$ | $l_1$ | $G_1$ |
| <b>9</b>       | 80 - 180               | 35 m6 | 80    | 125 - 200        | 40 m6 | 90    | 840   |
|                | 200 - 315              | 28 m6 | 60    | 224 - 250        | 35 m6 | 80    |       |
| <b>10</b>      | 100 - 224              | 35 m6 | 80    | 160 - 250        | 40 m6 | 90    | 890   |
|                | 250 - 400              | 28 m6 | 60    | 280 - 315        | 35 m6 | 80    |       |
| <b>11</b>      | 80 - 180               | 45 m6 | 100   | 125 - 200        | 50 m6 | 110   | 1010  |
|                | 200 - 315              | 35 m6 | 80    | 224 - 250        | 40 m6 | 90    |       |
| <b>12</b>      | 100 - 224              | 45 m6 | 100   | 160 - 250        | 50 m6 | 110   | 1080  |
|                | 250 - 400              | 35 m6 | 80    | 280 - 315        | 40 m6 | 90    |       |

| Gear unit size | Dimensions in mm |     |    |              |       |     |       |     |     |          |       |       |       |       |       |       |       |    |
|----------------|------------------|-----|----|--------------|-------|-----|-------|-----|-----|----------|-------|-------|-------|-------|-------|-------|-------|----|
|                | a                | b   | c  | $c_1$        | $D_5$ | E   | $e_2$ | g   | H   | $h^{1)}$ | $h_5$ | $m_1$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
| <b>9</b>       | 1000             | 370 | 40 | $45 \pm 1.5$ | 36 H9 | 580 | 300   | 140 | 662 | 320      | 135   | 710   | 320   | 145   | 155   | 660   | 245   | 28 |
| <b>10</b>      | 1100             | 370 | 40 | $45 \pm 1.5$ | 36 H9 | 630 | 350   | 140 | 662 | 320      | 135   | 810   | 320   | 145   | 205   | 710   | 245   | 28 |
| <b>11</b>      | 1200             | 430 | 50 | $54 \pm 1.5$ | 40 H9 | 705 | 345   | 161 | 782 | 380      | 170   | 870   | 370   | 165   | 180   | 805   | 300   | 35 |
| <b>12</b>      | 1355             | 430 | 50 | $54 \pm 1.5$ | 40 H9 | 775 | 430   | 161 | 790 | 380      | 160   | 1025  | 370   | 165   | 265   | 875   | 300   | 35 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Bevel helical gear units horizontal mounting position

## Type B4

### Gear unit dimensions, four-stage, gear unit sizes 9 to 12

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|             |           |                          |         | Oil quantity<br>1)                          | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |         |                                             |                              |      |         |  |               |
|-------------|-----------|--------------------------|---------|---------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------|------------------------------|------|---------|--|---------------|
|             |           |                          |         | B4.H                                        | B4.H            |                                                                                                                    |         |                                             |                              |      |         |  |               |
|             |           |                          |         | Article No.: <b>2LP302</b> ■ - ■ ■ .20-.... |                 |                                                                                                                    |         |                                             |                              |      |         |  |               |
| Type        | Size      | $d_2$                    | $l_2$   | $G_2$                                       | $l$             | kg                                                                                                                 |         | Solid shaft with parallel key <sup>3)</sup> |                              |      |         |  |               |
| <b>B4SH</b> | <b>9</b>  | 140 n6                   | 250     | 235                                         | 48              | 890                                                                                                                | 0 - 8 A |                                             |                              |      |         |  |               |
|             | <b>10</b> | 160 n6                   | 300     | 235                                         | 50              | 1025                                                                                                               | 1 - 0 A |                                             |                              |      |         |  |               |
|             | <b>11</b> | 170 n6                   | 300     | 270                                         | 80              | 1485                                                                                                               | 1 - 1 A |                                             |                              |      |         |  |               |
|             | <b>12</b> | 180 n6                   | 300     | 270                                         | 90              | 1750                                                                                                               | 1 - 2 A |                                             |                              |      |         |  |               |
| Type        | Size      | $d_2$                    | $l_2$   | $G_2$                                       | $l$             | kg                                                                                                                 |         | Solid shaft without parallel key            |                              |      |         |  |               |
| <b>B4CH</b> | <b>9</b>  | 140 h8                   | 155     | 235                                         | 48              | 890                                                                                                                | 0 - 8 F |                                             |                              |      |         |  |               |
|             | <b>10</b> | 170 h8                   | 155     | 235                                         | 50              | 1025                                                                                                               | 1 - 0 F |                                             |                              |      |         |  |               |
|             | <b>11</b> | 170 h8                   | 155     | 270                                         | 80              | 1485                                                                                                               | 1 - 1 F |                                             |                              |      |         |  |               |
|             | <b>12</b> | 210 h8                   | 170     | 270                                         | 90              | 1750                                                                                                               | 1 - 2 F |                                             |                              |      |         |  |               |
| Type        | Size      | $D_2$                    | $G_4$   | $l$                                         | kg              |                                                                                                                    |         | Hollow shaft with keyway                    |                              |      |         |  |               |
| <b>B4HH</b> | <b>9</b>  | 135 H7                   | 235     | 48                                          | 890             | 0 - 8 B                                                                                                            |         |                                             |                              |      |         |  |               |
|             | <b>10</b> | 150 H7                   | 235     | 50                                          | 1025            | 1 - 0 B                                                                                                            |         |                                             |                              |      |         |  |               |
|             | <b>11</b> | 165 H7                   | 270     | 80                                          | 1485            | 1 - 1 B                                                                                                            |         |                                             |                              |      |         |  |               |
|             | <b>12</b> | 180 H7                   | 270     | 90                                          | 1750            | 1 - 2 B                                                                                                            |         |                                             |                              |      |         |  |               |
| Type        | Size      | $D_2$                    | $D_3$   | $G_4$                                       | $G_5$           | $l$                                                                                                                | kg      |                                             | Hollow shaft for shrink disk |      |         |  |               |
| <b>B4DH</b> | <b>9</b>  | 140 H7                   | 145     | 235                                         | 330             | 48                                                                                                                 | 890     | 0 - 8 C                                     |                              |      |         |  |               |
|             | <b>10</b> | 150 H7                   | 155     | 235                                         | 350             | 50                                                                                                                 | 1025    | 1 - 0 C                                     |                              |      |         |  |               |
|             | <b>11</b> | 165 H7                   | 170     | 270                                         | 400             | 80                                                                                                                 | 1485    | 1 - 1 C                                     |                              |      |         |  |               |
|             | <b>12</b> | 180 H7                   | 185     | 270                                         | 405             | 90                                                                                                                 | 1750    | 1 - 2 C                                     |                              |      |         |  |               |
| Type        | Size      | N/DIN 5480               | $D_2$   | $D_3$                                       | $G_4$           | $l$                                                                                                                | kg      |                                             | Hollow shaft with spline     |      |         |  |               |
| <b>B4KH</b> | <b>9</b>  | N 140 x 3 x 30 x 45 x 9H | 134 H11 | 145                                         | 235             | 48                                                                                                                 | 890     | 0 - 8 D                                     |                              |      |         |  |               |
|             | <b>10</b> | N 140 x 3 x 30 x 45 x 9H | 134 H11 | 155                                         | 235             | 50                                                                                                                 | 1025    | 1 - 0 D                                     |                              |      |         |  |               |
|             | <b>11</b> | N 170 x 5 x 30 x 32 x 9H | 160 H11 | 170                                         | 270             | 80                                                                                                                 | 1485    | 1 - 1 D                                     |                              |      |         |  |               |
|             | <b>12</b> | N 170 x 5 x 30 x 32 x 9H | 160 H11 | 185                                         | 270             | 90                                                                                                                 | 1750    | 1 - 2 D                                     |                              |      |         |  |               |
| Type        | Size      | c                        | $d_2$   | $D_3$                                       | $k_2$           | $n \times s$                                                                                                       | t       | $G_7$                                       | $l$                          | kg   |         |  | Flanged shaft |
| <b>B4FH</b> | <b>9</b>  | 38                       | 430     | 220                                         | 380             | 20 x 26                                                                                                            | 12      | 350                                         | 48                           | 975  | 0 - 8 E |  |               |
|             | <b>10</b> | 38                       | 470     | 240                                         | 420             | 22 x 26                                                                                                            | 12      | 350                                         | 50                           | 1115 | 1 - 0 E |  |               |
|             | <b>11</b> | 42                       | 510     | 260                                         | 450             | 18 x 33                                                                                                            | 12      | 400                                         | 80                           | 1615 | 1 - 1 E |  |               |
|             | <b>12</b> | 42                       | 540     | 280                                         | 480             | 22 x 33                                                                                                            | 12      | 400                                         | 90                           | 1890 | 1 - 2 E |  |               |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, see page 9/7.

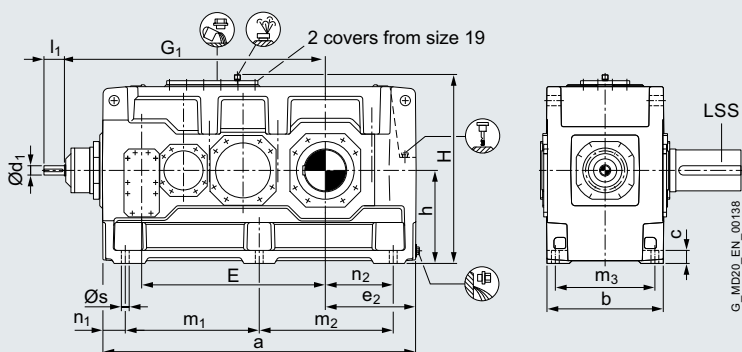
# Bevel helical gear units horizontal mounting position

Type B4

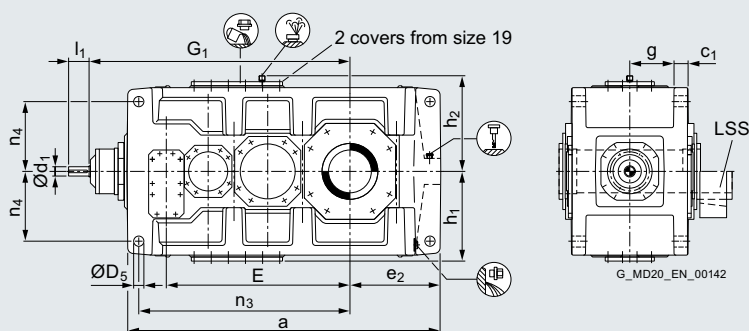
Gear unit dimensions, four-stage, gear unit sizes 13 to 18

## Selection and ordering data

**B4.H**  
2LP302-...20-....



**B4.M**  
2LP302-...21-....



| Gear unit size | Dimensions in mm       |       |       |                  |       |       |       |
|----------------|------------------------|-------|-------|------------------|-------|-------|-------|
|                | High speed shaft (HSS) |       |       | Reinforced shaft |       |       |       |
|                | $i_N$                  | $d_1$ | $l_1$ | $i_N$            | $d_1$ | $l_1$ | $G_1$ |
| 13             | 80 - 180               | 55 m6 | 110   | 125 - 200        | 60    | 120   | 1170  |
|                | 200 - 315              | 40 m6 | 100   | 224 - 250        | 50    | 110   |       |
| 14             | 100 - 224              | 55 m6 | 110   | 160 - 250        | 60    | 120   | 1240  |
|                | 250 - 400              | 40 m6 | 100   | 280 - 315        | 50    | 110   |       |
| 15             | 80 - 180               | 70 m6 | 135   | 200              | 70    | 135   | 1402  |
|                | 200 - 315              | 50 m6 | 110   | 224 - 250        | 60    | 135   |       |
| 16             | 90 - 200               | 70 m6 | 135   | 224              | 70    | 135   | 1448  |
|                | 224 - 355              | 50 m6 | 110   | 250 - 280        | 60    | 135   |       |
| 17             | 80 - 180               | 70 m6 | 135   | 200              | 70    | 135   | 1450  |
|                | 200 - 315              | 50 m6 | 110   | 224 - 250        | 60    | 135   |       |
| 18             | 90 - 200               | 70 m6 | 135   | 224              | 70    | 135   | 1510  |
|                | 224 - 355              | 50 m6 | 110   | 250 - 280        | 60    | 135   |       |

| Gear unit size | Dimensions in mm |     |    |            |       |      |       |     |      |          |       |       |       |       |       |       |       |       |       |    |
|----------------|------------------|-----|----|------------|-------|------|-------|-----|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
|                | a                | b   | c  | $c_1$      | $D_5$ | E    | $e_2$ | g   | H    | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
| 13             | 1395             | 550 | 60 | $61 \pm 2$ | 48 H9 | 820  | 405   | 212 | 900  | 450      | 450   | 460   | 597.5 | 597.5 | 475   | 100   | 305   | 940   | 340   | 35 |
| 14             | 1535             | 550 | 60 | $61 \pm 2$ | 48 H9 | 890  | 475   | 212 | 900  | 450      | 450   | 460   | 597.5 | 737.5 | 475   | 100   | 375   | 1010  | 340   | 35 |
| 15             | 1680             | 625 | 70 | $72 \pm 2$ | 55 H9 | 987  | 485   | 238 | 1000 | 490      | 490   | 500   | 720   | 720   | 535   | 120   | 365   | 1135  | 375   | 42 |
| 16             | 1770             | 625 | 70 | $72 \pm 2$ | 55 H9 | 1033 | 530   | 238 | 1000 | 490      | 490   | 500   | 720   | 810   | 535   | 120   | 410   | 1180  | 375   | 42 |
| 17             | 1770             | 690 | 80 | $81 \pm 2$ | 55 H9 | 1035 | 525   | 259 | 1110 | 555      | 555   | 560   | 750   | 750   | 600   | 135   | 390   | 1175  | 425   | 42 |
| 18             | 1890             | 690 | 80 | $81 \pm 2$ | 55 H9 | 1095 | 585   | 259 | 1110 | 555      | 555   | 560   | 750   | 870   | 600   | 135   | 450   | 1235  | 425   | 42 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.



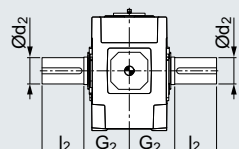
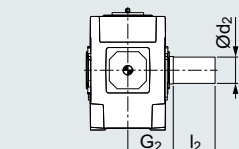
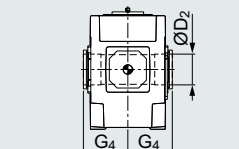
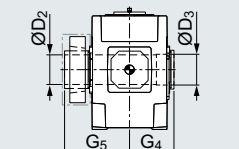
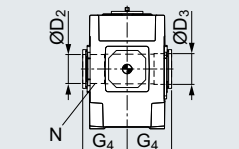
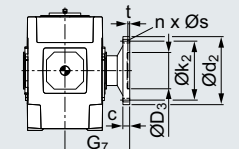
# Bevel helical gear units horizontal mounting position

## Type B4

### Gear unit dimensions, four-stage, gear unit sizes 13 to 18

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                       |      | Oil quantity <sup>1)</sup><br>B4.H | Oil quantity <sup>1)</sup><br>B4.M | Weight <sup>1)2)</sup><br>B4.H | Weight <sup>1)2)</sup><br>B4.M | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |      |                |       |       |                                                                                      |                                                                                       |       |   |                                                                                       |
|-----------------------|------|------------------------------------|------------------------------------|--------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|------|----------------|-------|-------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------|---|---------------------------------------------------------------------------------------|
|                       |      | Article No.:                       |                                    | 2LP302                         |                                | - 2-....                                                                                                           |      |                |       |       |                                                                                      |                                                                                       |       |   |                                                                                       |
| Type                  | Size | d <sub>2</sub>                     | l <sub>2</sub>                     | G <sub>2</sub>                 | l                              | l                                                                                                                  | kg   | kg             |       |       |                                                                                      |                                                                                       |       |   |                                                                                       |
| <b>B4SH</b>           | 13   | 200 n6                             | 350                                | 335                            | 145                            | -                                                                                                                  | 2395 | -              | 1 - 3 | A     |   |                                                                                       |       |   |                                                                                       |
|                       | 14   | 210 n6                             | 350                                | 335                            | 150                            | -                                                                                                                  | 2735 | -              | 1 - 4 | A     |                                                                                      |                                                                                       |       |   |                                                                                       |
|                       | 15   | 230 n6                             | 410                                | 380                            | 230                            | -                                                                                                                  | 3630 | -              | 1 - 5 | A     |                                                                                      |                                                                                       |       |   |                                                                                       |
|                       | 16   | 240 n6                             | 410                                | 380                            | 235                            | -                                                                                                                  | 3985 | -              | 1 - 6 | A     |                                                                                      |                                                                                       |       |   |                                                                                       |
|                       | 17   | 250 n6                             | 410                                | 415                            | 295                            | -                                                                                                                  | 4695 | -              | 1 - 7 | A     |                                                                                      |                                                                                       |       |   |                                                                                       |
|                       | 18   | 270 n6                             | 470                                | 415                            | 305                            | -                                                                                                                  | 5200 | -              | 1 - 8 | A     |                                                                                      |                                                                                       |       |   |                                                                                       |
| Type                  | Size | d <sub>2</sub>                     | l <sub>2</sub>                     | G <sub>2</sub>                 | l                              | l                                                                                                                  | kg   | kg             |       |       |                                                                                      |                                                                                       |       |   |                                                                                       |
| <b>B4CH/<br/>B4CM</b> | 13   | 210 h8                             | 170                                | 335                            | 145                            | 120                                                                                                                | 2395 | 2280           | 1 - 3 | F     |   |                                                                                       |       |   |                                                                                       |
|                       | 14   | 210 h8                             | 170                                | 335                            | 150                            | 125                                                                                                                | 2735 | 2605           | 1 - 4 | F     |                                                                                      |                                                                                       |       |   |                                                                                       |
|                       | 15   | 250 h8                             | 190                                | 380                            | 230                            | 170                                                                                                                | 3630 | 3435           | 1 - 5 | F     |                                                                                      |                                                                                       |       |   |                                                                                       |
|                       | 16   | 250 h8                             | 190                                | 380                            | 235                            | 175                                                                                                                | 3985 | 3765           | 1 - 6 | F     |                                                                                      |                                                                                       |       |   |                                                                                       |
| Type                  | Size | D <sub>2</sub>                     |                                    | G <sub>4</sub>                 | l                              | l                                                                                                                  | kg   | kg             |       |       |                                                                                      |                                                                                       |       |   |                                                                                       |
| <b>B4HH/<br/>B4HM</b> | 13   | 190 H7                             |                                    | 335                            | 145                            | 120                                                                                                                | 2395 | 2280           | 1 - 3 | B     |  |                                                                                       |       |   |                                                                                       |
|                       | 14   | 210 H7                             |                                    | 335                            | 150                            | 125                                                                                                                | 2735 | 2605           | 1 - 4 | B     |                                                                                      |                                                                                       |       |   |                                                                                       |
|                       | 15   | 230 H7                             |                                    | 380                            | 230                            | 170                                                                                                                | 3630 | 3435           | 1 - 5 | B     |                                                                                      |                                                                                       |       |   |                                                                                       |
|                       | 16   | 240 H7                             |                                    | 380                            | 235                            | 175                                                                                                                | 3985 | 3765           | 1 - 6 | B     |                                                                                      |                                                                                       |       |   |                                                                                       |
|                       | 17   | 250 H7                             |                                    | 415                            | 295                            | 230                                                                                                                | 4695 | 4460           | 1 - 7 | B     |                                                                                      |                                                                                       |       |   |                                                                                       |
|                       | 18   | 275 H7                             |                                    | 415                            | 305                            | 235                                                                                                                | 5200 | 4930           | 1 - 8 | B     |                                                                                      |                                                                                       |       |   |                                                                                       |
| Type                  | Size | D <sub>2</sub>                     | D <sub>3</sub>                     | G <sub>4</sub>                 | G <sub>5</sub>                 | l                                                                                                                  | l    | kg             | kg    |       |                                                                                      |                                                                                       |       |   |                                                                                       |
| <b>B4DH/<br/>B4DM</b> | 13   | 190 H7                             | 195                                | 335                            | 480                            | 145                                                                                                                | 120  | 2395           | 2280  | 1 - 3 | C                                                                                    |  |       |   |                                                                                       |
|                       | 14   | 210 H7                             | 215                                | 335                            | 480                            | 150                                                                                                                | 125  | 2735           | 2605  | 1 - 4 | C                                                                                    |                                                                                       |       |   |                                                                                       |
|                       | 15   | 230 H7                             | 235                                | 380                            | 550                            | 230                                                                                                                | 170  | 3630           | 3435  | 1 - 5 | C                                                                                    |                                                                                       |       |   |                                                                                       |
|                       | 16   | 240 H7                             | 245                                | 380                            | 550                            | 235                                                                                                                | 175  | 3985           | 3765  | 1 - 6 | C                                                                                    |                                                                                       |       |   |                                                                                       |
|                       | 17   | 250 H7                             | 260                                | 415                            | 600                            | 295                                                                                                                | 230  | 4695           | 4460  | 1 - 7 | C                                                                                    |                                                                                       |       |   |                                                                                       |
|                       | 18   | 280 H7                             | 285                                | 415                            | 600                            | 305                                                                                                                | 235  | 5200           | 4930  | 1 - 8 | C                                                                                    |                                                                                       |       |   |                                                                                       |
| Type                  | Size | N/DIN 5480                         | D <sub>2</sub>                     | D <sub>3</sub>                 | G <sub>4</sub>                 | l                                                                                                                  | l    | kg             | kg    |       |                                                                                      |                                                                                       |       |   |                                                                                       |
| <b>B4KH/<br/>B4KM</b> | 13   | N 190 × 5 × 30 × 36 × 9H           | 180 H11                            | 195                            | 335                            | 145                                                                                                                | 120  | 2395           | 2280  | 1 - 3 | D                                                                                    |  |       |   |                                                                                       |
|                       | 14   | N 190 × 5 × 30 × 36 × 9H           | 180 H11                            | 215                            | 335                            | 150                                                                                                                | 125  | 2735           | 2605  | 1 - 4 | D                                                                                    |                                                                                       |       |   |                                                                                       |
|                       | 15   | N 220 × 5 × 30 × 42 × 9H           | 210 H11                            | 235                            | 380                            | 230                                                                                                                | 170  | 3630           | 3435  | 1 - 5 | D                                                                                    |                                                                                       |       |   |                                                                                       |
|                       | 16   | N 220 × 5 × 30 × 42 × 9H           | 210 H11                            | 245                            | 380                            | 235                                                                                                                | 175  | 3985           | 3765  | 1 - 6 | D                                                                                    |                                                                                       |       |   |                                                                                       |
|                       | 17   | N 250 × 5 × 30 × 48 × 9H           | 240 H11                            | 260                            | 415                            | 295                                                                                                                | 230  | 4695           | 4460  | 1 - 7 | D                                                                                    |                                                                                       |       |   |                                                                                       |
|                       | 18   | N 250 × 5 × 30 × 48 × 9H           | 240 H11                            | 285                            | 415                            | 305                                                                                                                | 235  | 5200           | 4930  | 1 - 8 | D                                                                                    |                                                                                       |       |   |                                                                                       |
| Type                  | Size | c                                  | d <sub>2</sub>                     | D <sub>3</sub>                 | k <sub>2</sub>                 | n × s                                                                                                              | t    | G <sub>7</sub> | l     | l     | kg                                                                                   | kg                                                                                    |       |   |                                                                                       |
| <b>B4FH/<br/>B4FM</b> | 13   | 48                                 | 580                                | 310                            | 500                            | 20 × 33                                                                                                            | 14   | 480            | 145   | 120   | 2555                                                                                 | 2440                                                                                  | 1 - 3 | E |  |
|                       | 14   | 48                                 | 620                                | 310                            | 540                            | 24 × 33                                                                                                            | 14   | 480            | 150   | 125   | 2905                                                                                 | 2775                                                                                  | 1 - 4 | E |                                                                                       |
|                       | 15   | 55                                 | 710                                | 360                            | 630                            | 28 × 33                                                                                                            | 17   | 550            | 230   | 170   | 3870                                                                                 | 3675                                                                                  | 1 - 5 | E |                                                                                       |
|                       | 16   | 55                                 | 740                                | 360                            | 660                            | 30 × 33                                                                                                            | 17   | 550            | 235   | 175   | 4240                                                                                 | 4020                                                                                  | 1 - 6 | E |                                                                                       |
|                       | 17   | 60                                 | 750                                | 410                            | 660                            | 24 × 39                                                                                                            | 18   | 600            | 295   | 230   | 4995                                                                                 | 4760                                                                                  | 1 - 7 | E |                                                                                       |
|                       | 18   | 60                                 | 800                                | 410                            | 710                            | 26 × 39                                                                                                            | 18   | 600            | 305   | 235   | 5550                                                                                 | 5280                                                                                  | 1 - 8 | E |                                                                                       |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft version with reinforced bearing, see page 9/7.

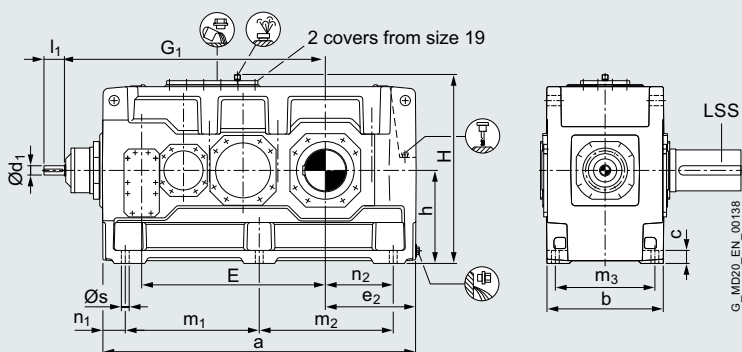
# Bevel helical gear units horizontal mounting position

Type B4

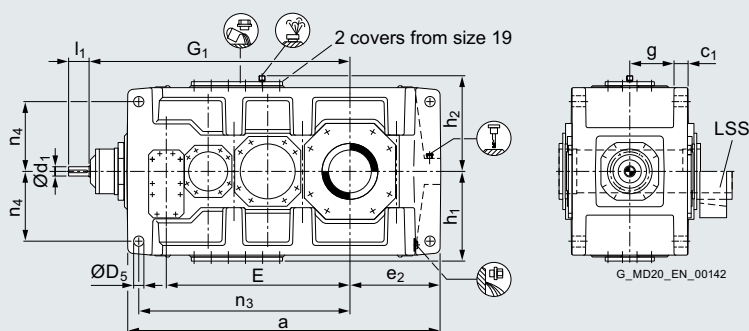
Gear unit dimensions, four-stage, gear unit sizes 19 to 24

## Selection and ordering data

**B4.H**  
2LP302-...20-....



**B4.M**  
2LP302-...21-....



| Gear unit size | Dimensions in mm       |       |       |                  |       |       |       |
|----------------|------------------------|-------|-------|------------------|-------|-------|-------|
|                | High speed shaft (HSS) |       |       | Reinforced shaft |       |       |       |
|                | $i_N$                  | $d_1$ | $l_1$ | $i_N$            | $d_1$ | $l_1$ | $G_1$ |
| <b>19</b>      | 80 - 180               | 80 m6 | 165   | 200              | 80 m6 | 165   | 1680  |
|                | 200 - 315              | 60 m6 | 140   | 224 - 250        | 70 m6 | 140   |       |
| <b>20</b>      | 90 - 200               | 80 m6 | 165   | 224              | 80 m6 | 165   | 1740  |
|                | 224 - 355              | 60 m6 | 140   | 250 - 280        | 70 m6 | 140   |       |
| <b>21</b>      | 80 - 180               | 90 m6 | 165   | -                | -     | -     | 1992  |
|                | 200 - 315              | 70 m6 | 140   | -                | -     | -     |       |
| <b>22</b>      | 90 - 200               | 90 m6 | 165   | -                | -     | -     | 2047  |
|                | 224 - 355              | 70 m6 | 140   | -                | -     | -     |       |
| <b>23</b>      | 80 - 160               | 90 m6 | 165   | -                | -     | -     | 2110  |
|                | 180 - 315              | 70 m6 | 140   | -                | -     | -     |       |
| <b>24</b>      | 90 - 180               | 90 m6 | 165   | -                | -     | -     | 2175  |
|                | 200 - 355              | 70 m6 | 140   | -                | -     | -     |       |

| Gear unit size | Dimensions in mm |     |     |         |       |      |       |     |      |          |       |       |       |       |       |       |       |       |       |    |
|----------------|------------------|-----|-----|---------|-------|------|-------|-----|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
|                | a                | b   | c   | $c_1$   | $D_5$ | E    | $e_2$ | g   | H    | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
| <b>19</b>      | 2030             | 790 | 90  | 91 ± 2  | 65 H9 | 1190 | 590   | 299 | 1240 | 615      | 615   | 620   | 860   | 860   | 690   | 155   | 435   | 1365  | 475   | 48 |
|                | 2150             | 790 | 90  | 91 ± 2  | 65 H9 | 1250 | 650   | 299 | 1240 | 615      | 615   | 620   | 860   | 980   | 690   | 155   | 495   | 1425  | 475   | 48 |
| <b>21</b>      | 2340             | 830 | 100 | 100 ± 2 | 75 H9 | 1387 | 655   | 310 | 1390 | 685      | 685   | 690   | 1000  | 1000  | 720   | 170   | 485   | 1600  | 520   | 56 |
|                | 2450             | 830 | 100 | 100 ± 2 | 75 H9 | 1442 | 710   | 310 | 1390 | 685      | 685   | 690   | 1000  | 1110  | 720   | 170   | 540   | 1655  | 520   | 56 |
| <b>23</b>      | 2530             | 930 | 115 | 120 ± 2 | 80 H9 | 1505 | 730   | 342 | 1565 | 780      | 765   | 785   | 1085  | 1085  | 810   | 180   | 550   | 1725  | 580   | 56 |
|                | 2660             | 930 | 115 | 120 ± 2 | 80 H9 | 1570 | 795   | 342 | 1565 | 780      | 765   | 785   | 1085  | 1215  | 810   | 180   | 615   | 1790  | 580   | 56 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

# Bevel helical gear units horizontal mounting position

## Type B4

### Gear unit dimensions, four-stage, gear unit sizes 19 to 24

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                       |           | Oil quantity<br>1) | Oil quantity<br>1) | Weight<br>1) 2) | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |       |       |       |     |            |            |   |   |   |   |  |  |  |  |  |  |
|-----------------------|-----------|--------------------|--------------------|-----------------|-----------------|--------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-----|------------|------------|---|---|---|---|--|--|--|--|--|--|
|                       |           | B4.H               | B4.M               | B4.H            | B4.M            |                                                                                                                    |       |       |       |     |            |            |   |   |   |   |  |  |  |  |  |  |
|                       |           | Article No.:       |                    | 2LP302          |                 | - .2-....                                                                                                          |       |       |       |     |            |            |   |   |   |   |  |  |  |  |  |  |
| Type                  | Size      | $d_2$              | $l_2$              | $G_2$           | $l$             | $l$                                                                                                                | kg    | kg    |       |     |            |            |   |   |   |   |  |  |  |  |  |  |
| <b>B4SH</b>           | <b>19</b> | 290 n6             | 470                | 465             | 480             | –                                                                                                                  | 6800  | –     | 2     | –   | 0          | A          |   |   |   |   |  |  |  |  |  |  |
|                       | <b>20</b> | 300 n6             | 500                | 465             | 550             | –                                                                                                                  | 8200  | –     | 2     | –   | 1          | A          |   |   |   |   |  |  |  |  |  |  |
|                       | <b>21</b> | 320 n6             | 500                | 490             | 540             | –                                                                                                                  | 9200  | –     | 2     | –   | 2          | A          |   |   |   |   |  |  |  |  |  |  |
|                       | <b>22</b> | 340 n6             | 550                | 490             | 620             | –                                                                                                                  | 9900  | –     | 2     | –   | 3          | A          |   |   |   |   |  |  |  |  |  |  |
|                       | <b>23</b> | 360 n6             | 590                | 540             | 710             | –                                                                                                                  | 12000 | –     | 2     | –   | 4          | A          |   |   |   |   |  |  |  |  |  |  |
|                       | <b>24</b> | 380 n6             | 590                | 540             | 810             | –                                                                                                                  | 13500 | –     | 2     | –   | 5          | A          |   |   |   |   |  |  |  |  |  |  |
| Type                  | Size      | $D_2$              | $D_3$              | $G_4$           | $G_5$           | $l$                                                                                                                | $l$   | kg    | kg    |     |            |            |   |   |   |   |  |  |  |  |  |  |
| <b>B4DH/<br/>B4DM</b> | <b>19</b> | 285 H7             | 295                | 465             | 670             | 480                                                                                                                | 440   | 6800  | 6300  | 2   | –          | 0          | C |   |   |   |  |  |  |  |  |  |
|                       | <b>20</b> | 310 H7             | 315                | 465             | 670             | 550                                                                                                                | 510   | 8200  | 7700  | 2   | –          | 1          | C |   |   |   |  |  |  |  |  |  |
|                       | <b>21</b> | 330 H7             | 335                | 490             | 715             | 540                                                                                                                | 590   | 9200  | 8600  | 2   | –          | 2          | C |   |   |   |  |  |  |  |  |  |
|                       | <b>22</b> | 340 H7             | 345                | 490             | 725             | 620                                                                                                                | 680   | 9900  | 9400  | 2   | –          | 3          | C |   |   |   |  |  |  |  |  |  |
|                       | <b>23</b> | 370 H7             | 375                | 540             | 800             | 710                                                                                                                | 790   | 12000 | 11400 | 2   | –          | 4          | C |   |   |   |  |  |  |  |  |  |
|                       | <b>24</b> | 390 H7             | 395                | 540             | 820             | 810                                                                                                                | 910   | 13500 | 12800 | 2   | –          | 5          | C |   |   |   |  |  |  |  |  |  |
| Type                  | Size      | $c$                | $d_2$              | $D_3$           | $k_2$           | $n \times s$                                                                                                       | $t$   | $G_7$ | $l$   | $l$ | kg         | kg         |   |   |   |   |  |  |  |  |  |  |
| <b>B4FH/<br/>B4FM</b> | <b>19</b> | 65                 | 860                | 460             | 770             | 30 × 39                                                                                                            | 18    | 670   | 480   | 440 | On request |            | 2 | – | 0 | E |  |  |  |  |  |  |
|                       | <b>20</b> | 65                 | 930                | 460             | 830             | 32 × 39                                                                                                            | 18    | 670   | 550   | 510 | On request |            | 2 | – | 1 | E |  |  |  |  |  |  |
|                       | <b>21</b> | 75                 | 950                | 520             | 850             | 28 × 45                                                                                                            | 20    | 710   | 540   | 590 | On request |            | 2 | – | 2 | E |  |  |  |  |  |  |
|                       | <b>22</b> | 75                 | 1040               | 520             | 940             | 28 × 45                                                                                                            | 20    | 710   | 620   | 680 | On request |            | 2 | – | 3 | E |  |  |  |  |  |  |
|                       | <b>23</b> | On request         |                    |                 |                 |                                                                                                                    |       |       |       |     |            | On request |   |   |   |   |  |  |  |  |  |  |
|                       | <b>24</b> | On request         |                    |                 |                 |                                                                                                                    |       |       |       |     |            | On request |   |   |   |   |  |  |  |  |  |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

# Bevel helical gear units horizontal mounting position

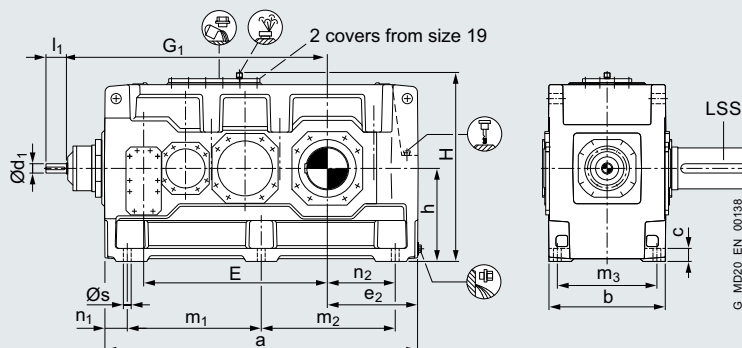
## Type B4

### Gear unit dimensions, four-stage, gear unit sizes 25 to 28

#### Selection and ordering data

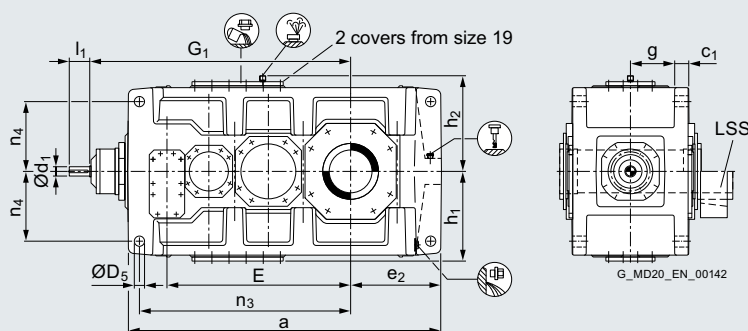
##### B4.H

2LP302-...20-....



##### B4.M

2LP302-...21-....



Dimensions in mm

#### High speed shaft (HSS)

| Gear unit size | $l_N$     | $d_1$  | $l_1$ | $G_1$ |
|----------------|-----------|--------|-------|-------|
| 25             | 80 - 160  | 110 n6 | 205   | 2395  |
|                | 180 - 315 | 80 m6  | 170   |       |
| 26             | 90 - 180  | 110 n6 | 205   | 2485  |
|                | 200 - 355 | 80 m6  | 170   |       |
| 27             | 80 - 160  | 130 n6 | 245   | 2762  |
|                | 180 - 315 | 100 m6 | 210   |       |
| 28             | 90 - 180  | 130 n6 | 245   | 2857  |
|                | 200 - 355 | 100 m6 | 210   |       |

| Gear unit size | a    | b    | c   | $c_1$  | $D_5$  | E    | $e_2$ | g   | H    | $h^{1)}$ | $h_1$ | $h_2$ | $m_1$ | $m_2$ | $m_3$ | $n_1$ | $n_2$ | $n_3$ | $n_4$ | s  |
|----------------|------|------|-----|--------|--------|------|-------|-----|------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| 25             | 2830 | 1045 | 130 | 120 ±2 | 90 H9  | 1695 | 790   | 400 | 1740 | 860      | 860   | 880   | 1215  | 1215  | 910   | 200   | 590   | 1965  | 660   | 66 |
| 26             | 3010 | 1045 | 130 | 120 ±2 | 90 H9  | 1785 | 880   | 400 | 1740 | 860      | 860   | 880   | 1215  | 1395  | 910   | 200   | 680   | 2055  | 660   | 66 |
| 27             | 3220 | 1170 | 150 | 145 ±2 | 100 H9 | 1927 | 880   | 440 | 1900 | 950      | 930   | 950   | 1390  | 1390  | 1030  | 220   | 660   | 2260  | 720   | 74 |
| 28             | 3410 | 1170 | 150 | 145 ±2 | 100 H9 | 2022 | 975   | 440 | 1900 | 950      | 930   | 950   | 1390  | 1580  | 1030  | 220   | 755   | 2355  | 720   | 74 |

Shaft seals, see page 10/2 onwards.

<sup>1)</sup> Permissible tolerance: -1 mm.

For details on the shafts, see Chapter 9.

## Bevel helical gear units horizontal mounting position

Type B4 / Types B2, B3 and B4

### Gear unit dimensions, four-stage, gear unit sizes 25 to 28

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                       |           |                |                |                |                | Oil quantity<br>1)         | Oil quantity<br>1) | Weight<br>1) 2) | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 6/27 to 6/30 |    |    |               |  |  |
|-----------------------|-----------|----------------|----------------|----------------|----------------|----------------------------|--------------------|-----------------|-----------------|--------------------------------------------------------------------------------------------------------------------|----|----|---------------|--|--|
|                       |           |                |                |                |                | B4.H                       | B4.M               | B4.H            | B4.M            |                                                                                                                    |    |    |               |  |  |
|                       |           |                |                |                |                | Article No.: <b>2LP302</b> |                    |                 |                 | <b>2 - 6 A</b>                                                                                                     |    |    |               |  |  |
| Type                  | Size      | d <sub>2</sub> | l <sub>2</sub> | G <sub>2</sub> |                | l                          | l                  | kg              | kg              | Solid shaft with parallel key                                                                                      |    |    |               |  |  |
| <b>B4SH</b>           | <b>25</b> | 400 n6         | 650            | 605            |                | 1000                       | –                  | 16300           | –               | 2 - 6 A                                                                                                            |    |    |               |  |  |
|                       | <b>26</b> | 420 n6         | 650            | 605            |                | 1150                       | –                  | 18000           | –               | 2 - 7 A                                                                                                            |    |    |               |  |  |
|                       | <b>27</b> | 440 n6         | 690            | 680            |                | 1430                       | –                  | 23000           | –               | 2 - 8 A                                                                                                            |    |    |               |  |  |
|                       | <b>28</b> | 460 n6         | 750            | 680            |                | 1580                       | –                  | 26200           | –               | 3 - 0 A                                                                                                            |    |    |               |  |  |
| Type                  | Size      | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub> | G <sub>5</sub> | l                          | l                  | kg              | kg              | Hollow shaft for shrink disk                                                                                       |    |    |               |  |  |
| <b>B4DH/<br/>B4DM</b> | <b>25</b> | 410 H7         | 415            | 610            | 895            | 1000                       | 1110               | 16300           | 15500           | 2 - 6 C                                                                                                            |    |    |               |  |  |
|                       | <b>26</b> | 430 H7         | 435            | 610            | 925            | 1150                       | 1280               | 18000           | 17100           | 2 - 7 C                                                                                                            |    |    |               |  |  |
|                       | <b>27</b> | 460 H7         | 465            | 680            | 1000           | 1430                       | 1590               | 23000           | 22000           | 2 - 8 C                                                                                                            |    |    |               |  |  |
|                       | <b>28</b> | 470 H7         | 475            | 680            | 1020           | 1580                       | 1750               | 26200           | 25000           | 3 - 0 C                                                                                                            |    |    |               |  |  |
| Type                  | Size      | c              | d <sub>2</sub> | D <sub>3</sub> | k <sub>2</sub> | n x s                      | t                  | G <sub>7</sub>  | l               | l                                                                                                                  | kg | kg | Flanged shaft |  |  |
| <b>B4FH/<br/>B4FM</b> | <b>25</b> | On request     |                |                |                |                            |                    |                 |                 |                                                                                                                    |    |    |               |  |  |
|                       | <b>26</b> |                |                |                |                |                            |                    |                 |                 |                                                                                                                    |    |    |               |  |  |
|                       | <b>27</b> |                |                |                |                |                            |                    |                 |                 |                                                                                                                    |    |    |               |  |  |
|                       | <b>28</b> |                |                |                |                |                            |                    |                 |                 |                                                                                                                    |    |    |               |  |  |

#### Article No. overview

##### Article No., 10th to 12th position

|                          |      |      |      | Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12       | 13 | 14 | 15 | 16 | "-Z" and order code |
|--------------------------|------|------|------|----------------------------------|---------------|---|---|---|----|----|----------|----|----|----|----|---------------------|
|                          |      |      |      | Article No.                      | <b>2LP302</b> |   |   |   |    |    |          |    |    |    |    | <b>-Z</b>           |
| <b>Ratio</b>             |      |      |      |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| Type                     | B2.H | B3.H | B4.H |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 5    | 12.5 | 80   |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 5.6  | 14   | 90   |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 6.3  | 16   | 100  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 7.1  | 18   | 112  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 8    | 20   | 125  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 9    | 22.4 | 140  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 10   | 25   | 160  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 11.2 | 28   | 180  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 12.5 | 31.5 | 200  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 14   | 35.5 | 224  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 16   | 40   | 250  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 18   | 45   | 280  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 20   | 50   | 315  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | 22.4 | 56   | 355  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | –    | 63   | 400  |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | –    | 71   | –    |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | –    | 80   | –    |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>i<sub>N</sub></b>     | –    | 90   | –    |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| <b>Type designation</b>  |      |      |      |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| Type B2                  |      |      |      |                                  |               |   |   |   |    |    | <b>0</b> |    |    |    |    |                     |
| Type B3                  |      |      |      |                                  |               |   |   |   |    |    | <b>1</b> |    |    |    |    |                     |
| Type B4                  |      |      |      |                                  |               |   |   |   |    |    | <b>2</b> |    |    |    |    |                     |
| <b>Mounting position</b> |      |      |      |                                  |               |   |   |   |    |    |          |    |    |    |    |                     |
| Mounting position H      |      |      |      |                                  |               |   |   |   |    |    | <b>0</b> |    |    |    |    |                     |
| Mounting position M      |      |      |      |                                  |               |   |   |   |    |    | <b>1</b> |    |    |    |    |                     |

Shaft seal see page 10/2 onwards.  
For details on the shafts, see Chapter 9.  
Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.  
2) Without oil filling.



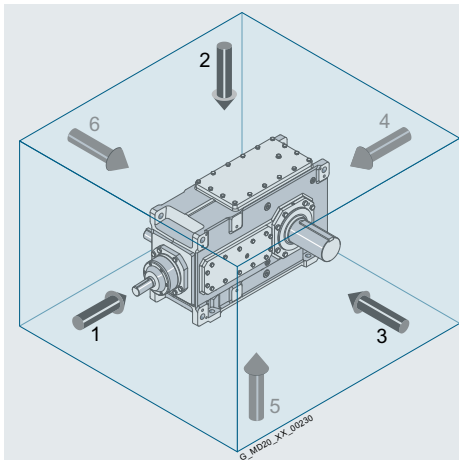
# Bevel helical gear units horizontal mounting position

Types B2, B3 and B4

## Article No. overview

### Selection and ordering data (continued)

#### Article No., 13th position



Irrespective of the mounting position of the gear unit, the face designations "right" and "left" always refer to the horizontal mounting position with the view on side 1.

Side 2 is on top.

Mounting cover on top (2),  
looking at drive front face (1):

Side 3 = right

Side 6 = left

|                                  |                  |   |   |   |    |    |    |    |    |    |    |                     |
|----------------------------------|------------------|---|---|---|----|----|----|----|----|----|----|---------------------|
| Data position of the Article No. | 1 to 6           | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
| Article No.                      | 2LP302 . . . . . |   |   |   |    |    |    |    |    |    |    | Z . . . . .         |

#### Variants/shaft arrangement (looking at side 2)

| Type | B2.H | B3.H | B4.H |   |
|------|------|------|------|---|
| A    |      |      |      | 0 |
| B    |      |      |      | 1 |
| C    |      |      |      | 2 |
| D    |      |      |      | 3 |

For details on the backstops and dimension  $G_8$ , see page 10/23 onwards.

□/■ Backstop

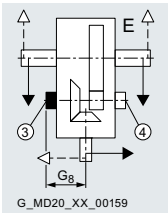
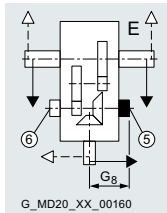
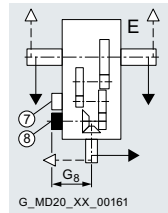
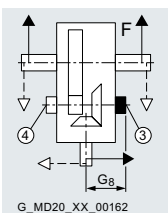
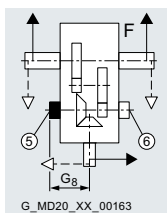
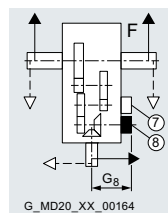
- ③ Backstop Sz. 4–14
- ⑥ Backstop Sz. 19–22
- ④ Backstop Sz. 15–18
- ⑦ Backstop Sz. 5–10
- ⑤ Backstop Sz. 4–18
- ⑧ Backstop Sz. 11–22

# Bevel helical gear units horizontal mounting position

## Types B2, B3 and B4

Article No. overview

### Selection and ordering data (continued)

|                                                |                                                                                   |                                                                                   | Data position of the Article No.                                                  | 1                                      | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|---------------------|
|                                                |                                                                                   |                                                                                   | Article No.                                                                       | 2LP302 . . . . . ■ . . . . - Z . . . . |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     |
| Variants/shaft arrangement (looking at side 2) |                                                                                   |                                                                                   |                                                                                   |                                        |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     |
| Type                                           | B2.H                                                                              | B3.H                                                                              | B4.H                                                                              |                                        |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     |
| E                                              |  |  |  |                                        |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     |
|                                                | G_MD20_XX_00159                                                                   | G_MD20_XX_00160                                                                   | G_MD20_XX_00161                                                                   |                                        |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     |
| F                                              |  |  |  |                                        |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     |
|                                                | G_MD20_XX_00162                                                                   | G_MD20_XX_00163                                                                   | G_MD20_XX_00164                                                                   |                                        |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     |



The versions E and F with slow speed shaft at both ends are only relevant for the shaft variants

- "S" (solid shaft with parallel key acc. to DIN 6885/1)
- "V" (reinforced solid shaft with parallel key acc. to DIN 6885/1)
- "C" (solid shaft for zero-backlash taper clamping connection)

The solid shaft extension shown represents the driven machine shaft insertion side for hollow shafts.

The slow speed hollow shaft "H" (hollow shaft with keyway according to DIN 6885/1) is generally suitable for fitting on both ends.

For details on the seals, [see page 10/2 onwards](#).

For details on the backstops and dimension G<sub>8</sub>, [see page 10/23 onwards](#).

□/■ Backstop

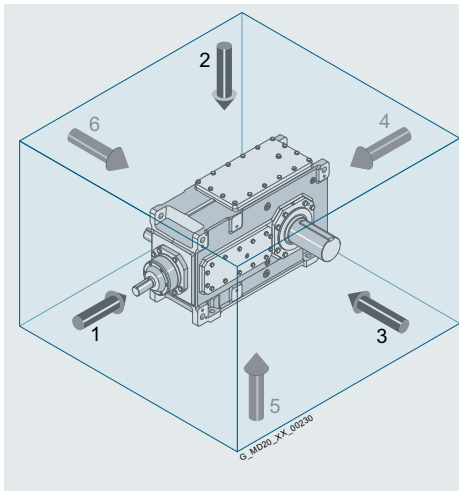
- |                        |                        |
|------------------------|------------------------|
| ③ Backstop Sz. 4 – 14  | ⑥ Backstop Sz. 19 – 22 |
| ④ Backstop Sz. 15 – 18 | ⑦ Backstop Sz. 5 – 10  |
| ⑤ Backstop Sz. 4 – 18  | ⑧ Backstop Sz. 11 – 22 |

# Bevel helical gear units horizontal mounting position

Types B2, B3 and B4

## Article No. overview

### Selection and ordering data (continued)



Irrespective of the mounting position of the gear unit, the face designations "right" and "left" always refer to the horizontal mounting position with the view on side 1.

Side 2 is on top.

Mounting cover on top (2),

looking at drive front face (1):

Side 3 = right

Side 6 = left

### Article No. supplement, 14th position

|                                                   | Data position of the Article No. | 1 to 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|---------------------------------------------------|----------------------------------|--------|---|---|---|----|----|----|----|----|----|----|---------------------|
| Article No.                                       |                                  | 2      | L | P | 3 | 0  | 2  |    |    |    |    |    | -Z . . . .          |
| <b>Sealing single-side high speed shaft (HSS)</b> |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Radial shaft seal                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | A                   |
| Taconite E                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | E                   |

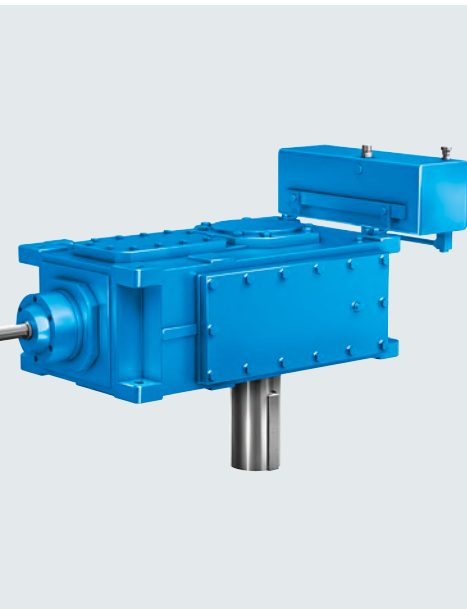
### Article No. supplement, 15th and 16th position

|                                                                                                    | Data position of the Article No. | 1 to 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|----------------------------------------------------------------------------------------------------|----------------------------------|--------|---|---|---|----|----|----|----|----|----|----|---------------------|
| Article No.                                                                                        |                                  | 2      | L | P | 3 | 0  | 2  |    |    |    |    |    | -Z ■ ■ ■ ■          |
| <b>Sealing low speed shaft (LSS)</b>                                                               |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Radial shaft seal                                                                                  |                                  |        |   |   |   |    |    |    |    |    |    |    | A                   |
| Dual radial shaft seal                                                                             |                                  |        |   |   |   |    |    |    |    |    |    |    | B                   |
| Taconite F                                                                                         |                                  |        |   |   |   |    |    |    |    |    |    |    | E                   |
| Taconite F-F                                                                                       |                                  |        |   |   |   |    |    |    |    |    |    |    | F                   |
| Taconite F-H                                                                                       |                                  |        |   |   |   |    |    |    |    |    |    |    | G                   |
| Taconite F-K                                                                                       |                                  |        |   |   |   |    |    |    |    |    |    |    | H                   |
| <b>Sealing double-extended low speed shaft (LSS)</b>                                               |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Side 3: Radial shaft seal/Side 6: Radial shaft seal                                                |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 0 A             |
| Side 3: Dual radial shaft seal/Side 6: Dual radial shaft seal                                      |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 0 B             |
| Side 3: Taconite F/Side 6: Taconite F                                                              |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 0 E             |
| Side 3: Radial shaft seal/Side 6: Taconite F                                                       |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 1 A             |
| Side 3: Taconite F/Side 6: Radial shaft seal                                                       |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 1 B             |
| <b>Shaft version</b>                                                                               |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| High speed shaft (HSS) version: Catalog version, low speed shaft (LSS) version: Catalog version    |                                  |        |   |   |   |    |    |    |    |    |    |    | 0                   |
| High speed shaft (HSS) version: Reinforced version, low speed shaft (LSS) version: Catalog version |                                  |        |   |   |   |    |    |    |    |    |    |    | 1                   |



## Bevel helical gear units Vertical mounting position

7



|             |                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------|
| <b>7/2</b>  | <b>Type B2</b><br><u>Gear unit dimensions</u><br>Two-stage, gear unit sizes 4 to 8                        |
| 7/2         | Two-stage, gear unit sizes 9 to 12                                                                        |
| 7/4         | Two-stage, gear unit sizes 13 to 18                                                                       |
| 7/6         | Two-stage, gear unit sizes 13 to 18                                                                       |
| <b>7/8</b>  | <b>Type B3</b><br><u>Gear unit dimensions</u><br>Three-stage, gear unit sizes 4 to 8                      |
| 7/8         | Three-stage, gear unit sizes 9 to 12                                                                      |
| 7/10        | Three-stage, gear unit sizes 9 to 12                                                                      |
| 7/12        | Three-stage, gear unit sizes 13 to 18                                                                     |
| 7/14        | Three-stage, gear unit sizes 19 to 24                                                                     |
| 7/16        | Three-stage, gear unit sizes 25 and 26                                                                    |
| <b>7/18</b> | <b>Type B4</b><br><u>Gear unit dimensions</u><br>Four-stage, gear unit sizes 5 to 8                       |
| 7/18        | Four-stage, gear unit sizes 5 to 8                                                                        |
| 7/20        | Four-stage, gear unit sizes 9 to 12                                                                       |
| 7/22        | Four-stage, gear unit sizes 13 to 18                                                                      |
| 7/24        | Four-stage, gear unit sizes 19 to 24                                                                      |
| 7/26        | Four-stage, gear unit sizes 25 and 26                                                                     |
| <b>7/27</b> | <b>Type B4 / Types B2, B3 and B4</b><br><u>Article No. overview</u><br>Article No., 10th to 12th position |
| 7/27        | Article No., 10th to 12th position                                                                        |
| 7/28        | Article No., 13th position                                                                                |
| 7/30        | Article No. supplement, 14th position                                                                     |
| 7/30        | Article No. supplement,<br>15th and 16th position                                                         |

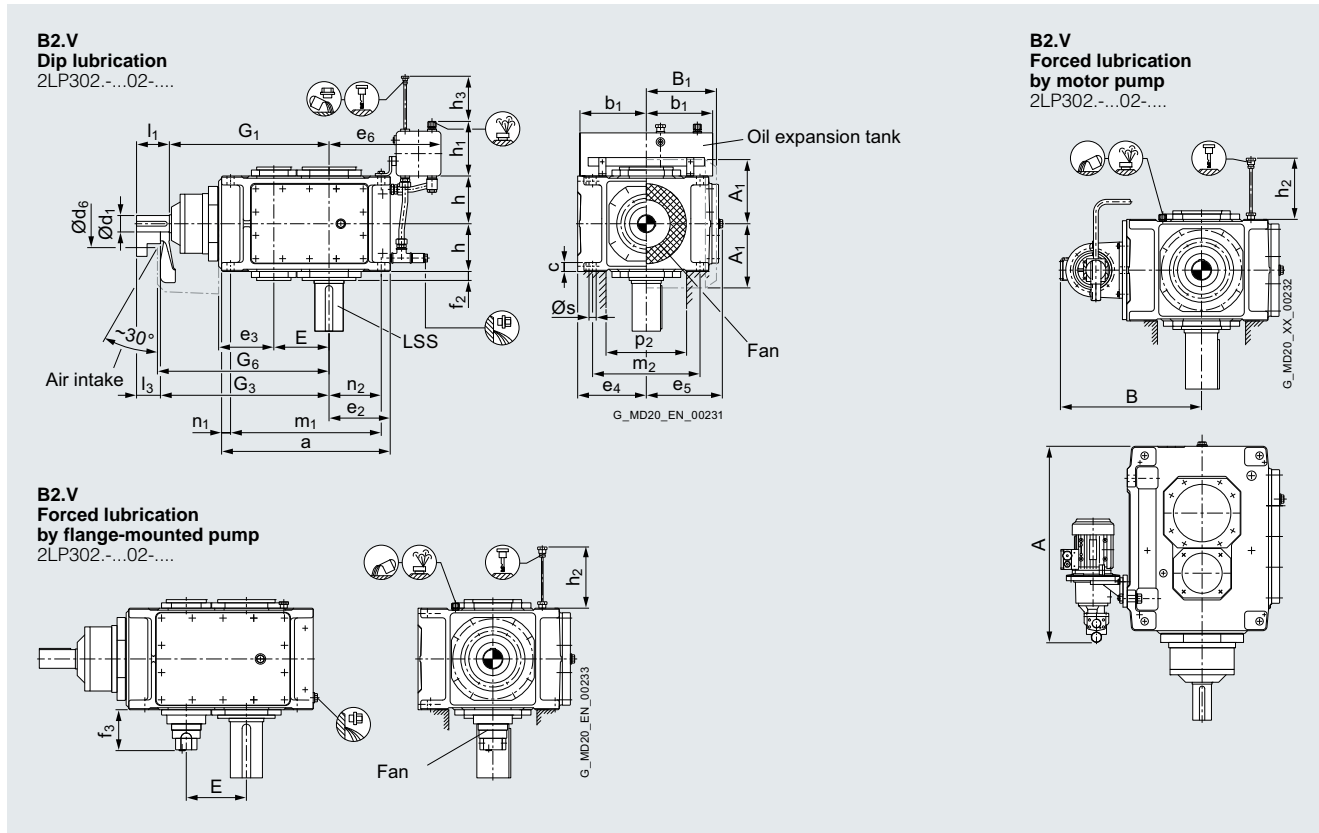
7

# Bevel helical gear units vertical mounting position

Type B2

## Gear unit dimensions, two-stage, gear unit sizes 4 to 8

### Selection and ordering data



| Gear unit size | Dimensions in mm       |                |                |                |                |                  |                |                |                |     |                |                |                |                |
|----------------|------------------------|----------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|-----|----------------|----------------|----------------|----------------|
|                | High speed shaft (HSS) |                |                |                |                |                  |                |                |                |     | Fan            |                |                |                |
|                | Standard shaft         |                |                |                |                | Reinforced shaft |                |                |                |     | A <sub>1</sub> | B <sub>1</sub> | d <sub>6</sub> | G <sub>6</sub> |
| i <sub>N</sub> | d <sub>1</sub>         | l <sub>1</sub> | l <sub>3</sub> | i <sub>N</sub> | d <sub>1</sub> | l <sub>1</sub>   | l <sub>3</sub> | G <sub>1</sub> | G <sub>3</sub> |     |                |                |                |                |
| 4              | 5 - 11.2               | 45 m6          | 100            | 80             | 8 - 12.5       | 50 m6            | 110            | 90             | 465            | 485 | 188            | 200            | 150            | 495            |
|                | 12.5 - 18              | 35 m6          | 80             | 60             | 14 - 16        | 40 m6            | 90             | 70             |                |     |                |                |                |                |
| 5              | 5 - 11.2               | 55 m6          | 110            | 80             | 8 - 12.5       | 60 m6            | 120            | 90             | 535            | 565 | 215            | 235            | 160            | 575            |
|                | 12.5 - 18              | 40 m6          | 100            | 70             | 14 - 16        | 50 m6            | 110            | 80             |                |     |                |                |                |                |
| 6              | 6.3 - 14               | 55 m6          | 110            | 80             | 10 - 16        | 60 m6            | 120            | 90             | 570            | 600 | 215            | 235            | 160            | 610            |
|                | 16 - 22.4              | 40 m6          | 100            | 70             | 18 - 20        | 50 m6            | 110            | 80             |                |     |                |                |                |                |
| 7              | 5 - 11.2               | 70 m6          | 135            | 105            | 12.5           | 70 m6            | 135            | 105            | 640            | 670 | 250            | 285            | 210            | 685            |
|                | 12.5 - 18              | 50 m6          | 110            | 80             | 14 - 16        | 60 m6            | 135            | 105            |                |     |                |                |                |                |
| 8              | 6.3 - 14               | 70 m6          | 135            | 105            | 16             | 70 m6            | 135            | 105            | 685            | 715 | 250            | 285            | 210            | 730            |
|                | 16 - 22.4              | 50 m6          | 110            | 80             | 18 - 20        | 60 m6            | 135            | 105            |                |     |                |                |                |                |

| Gear unit size | Dimensions in mm |                |        |     |                |                |                |                |                |                |                |     |                |                              |                |                |                |                |                |                              |       |                 |                 |
|----------------|------------------|----------------|--------|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----|----------------|------------------------------|----------------|----------------|----------------|----------------|----------------|------------------------------|-------|-----------------|-----------------|
|                | a                | b <sub>1</sub> | c      | E   | e <sub>2</sub> | e <sub>3</sub> | e <sub>4</sub> | e <sub>5</sub> | e <sub>6</sub> | f <sub>2</sub> | f <sub>3</sub> | h   | h <sub>1</sub> | h <sub>2</sub> <sup>1)</sup> | h <sub>3</sub> | m <sub>1</sub> | m <sub>2</sub> | n <sub>1</sub> | n <sub>2</sub> | p <sub>2</sub> <sup>2)</sup> | s     | A <sup>3)</sup> | B <sup>3)</sup> |
| 4              | 505              | 150            | 30 ± 1 | 160 | 190            | 100            | 200            | 215            | 320            | 26             | -              | 135 | 165            | -                            | 180            | 445            | 300            | 30             | 160            | 220                          | 24 H9 | -               | -               |
| 5              | 565              | 240            | 30 ± 1 | 185 | 205            | 185            | 230            | 252            | 385            | 30             | 190            | 160 | 205            | 245                          | 240            | 505            | 360            | 30             | 175            | 270                          | 24 H9 | 565             | 480             |
| 6              | 645              | 240            | 30 ± 1 | 220 | 250            | 185            | 230            | 252            | 425            | 30             | 190            | 160 | 205            | 245                          | 240            | 585            | 360            | 30             | 220            | 270                          | 24 H9 | 650             | 480             |
| 7              | 690              | 240            | 36 ± 1 | 225 | 250            | 225            | 280            | 302            | 425            | 32             | 200            | 190 | 205            | 220                          | 250            | 620            | 430            | 35             | 215            | 330                          | 28 H9 | 740             | 530             |
| 8              | 795              | 240            | 36 ± 1 | 270 | 310            | 225            | 280            | 302            | 485            | 32             | 200            | 190 | 205            | 220                          | 250            | 725            | 430            | 35             | 275            | 330                          | 28 H9 | 845             | 530             |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

- For forced lubrication, approximately h<sub>2</sub> can be assumed as required space for piping and monitoring; details according to order-related documentation.
- Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.
- Max. dimensions; details acc. to order-related documentation.

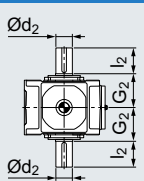
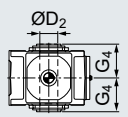
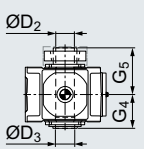
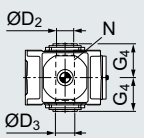
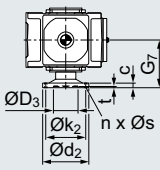
# Bevel helical gear units vertical mounting position

## Type B2

### Gear unit dimensions, two-stage, gear unit sizes 4 to 8

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                              |      |                          |         | Oil quantity<br>1)      | Oil quantity<br>1)         | Weight<br>1)2) |     |         | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |                                                                                       |     |         |                                                                                       |
|------------------------------|------|--------------------------|---------|-------------------------|----------------------------|----------------|-----|---------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----|---------|---------------------------------------------------------------------------------------|
|                              |      |                          |         | B2.V<br>Dip lubrication | B2.V<br>Forced lubrication | B2.V           |     |         |                                                                                                                    |                                                                                       |     |         |                                                                                       |
|                              |      |                          |         | Article No.:            |                            | 2LP302         | -   | 02-.... |                                                                                                                    |                                                                                       |     |         |                                                                                       |
| Type                         | Size | $d_2$                    | $l_2$   | $G_2$                   | $l$                        | $l$            | kg  |         | Solid shaft with parallel key <sup>4)</sup>                                                                        |                                                                                       |     |         |                                                                                       |
| <b>B2SV</b>                  | 4    | 80 m6                    | 170     | 170                     | 23.5                       | –              | 235 | 0 - 3 A |                                 |                                                                                       |     |         |                                                                                       |
|                              | 5    | 100 m6                   | 210     | 200                     | 38                         | 19             | 360 | 0 - 4 A |                                                                                                                    |                                                                                       |     |         |                                                                                       |
|                              | 6    | 110 n6                   | 210     | 200                     | 46                         | 23             | 410 | 0 - 5 A |                                                                                                                    |                                                                                       |     |         |                                                                                       |
|                              | 7    | 120 n6                   | 210     | 235                     | 74                         | 37             | 615 | 0 - 6 A |                                                                                                                    |                                                                                       |     |         |                                                                                       |
|                              | 8    | 130 n6                   | 250     | 235                     | 81                         | 40             | 700 | 0 - 7 A |                                                                                                                    |                                                                                       |     |         |                                                                                       |
| Type                         | Size | $D_2$                    | $G_4$   |                         | $l$                        | $l$            | kg  |         | Hollow shaft with keyway                                                                                           |                                                                                       |     |         |                                                                                       |
| <b>B2HV</b>                  | 4    | 80 H7                    | 170     |                         | 23.5                       | –              | 235 | 0 - 3 B |                                 |                                                                                       |     |         |                                                                                       |
|                              | 5    | 100 H7                   | 200     |                         | 38                         | 19             | 360 | 0 - 4 B |                                                                                                                    |                                                                                       |     |         |                                                                                       |
|                              | 6    | 110 H7                   | 200     |                         | 46                         | 23             | 410 | 0 - 5 B |                                                                                                                    |                                                                                       |     |         |                                                                                       |
|                              | 7    | 120 H7                   | 235     |                         | 74                         | 37             | 615 | 0 - 6 B |                                                                                                                    |                                                                                       |     |         |                                                                                       |
|                              | 8    | 130 H7                   | 235     |                         | 81                         | 40             | 700 | 0 - 7 B |                                                                                                                    |                                                                                       |     |         |                                                                                       |
| Type                         | Size | $D_2$                    | $D_3$   | $G_4$                   | $G_5$                      | $l$            | $l$ | kg      | Hollow shaft for shrink disk                                                                                       |                                                                                       |     |         |                                                                                       |
| <b>B2DV</b><br><sup>3)</sup> | 4    | 85 H7                    | 85      | 170                     | 235                        | 23.5           | –   | 235     | 0 - 3 C                                                                                                            |   |     |         |                                                                                       |
|                              | 5    | 100 H7                   | 100     | 200                     | 275                        | 38             | 19  | 360     | 0 - 4 C                                                                                                            |                                                                                       |     |         |                                                                                       |
|                              | 6    | 110 H7                   | 110     | 200                     | 275                        | 46             | 23  | 410     | 0 - 5 C                                                                                                            |                                                                                       |     |         |                                                                                       |
|                              | 7    | 120 H7                   | 120     | 235                     | 320                        | 74             | 37  | 615     | 0 - 6 C                                                                                                            |                                                                                       |     |         |                                                                                       |
|                              | 8    | 130 H7                   | 130     | 235                     | 325                        | 81             | 40  | 700     | 0 - 7 C                                                                                                            |                                                                                       |     |         |                                                                                       |
| Type                         | Size | N/DIN 5480               | $D_2$   | $D_3$                   | $G_4$                      | $l$            | $l$ | kg      | Hollow shaft with spline                                                                                           |                                                                                       |     |         |                                                                                       |
| <b>B2KV</b>                  | 5    | N 95 × 3 × 30 × 30 × 9H  | 89 H11  | 100                     | 200                        | 38             | 19  | 360     | 0 - 4 D                                                                                                            |  |     |         |                                                                                       |
|                              | 6    | N 95 × 3 × 30 × 30 × 9H  | 89 H11  | 110                     | 200                        | 46             | 23  | 410     | 0 - 5 D                                                                                                            |                                                                                       |     |         |                                                                                       |
|                              | 7    | N 120 × 3 × 30 × 38 × 9H | 114 H11 | 120                     | 235                        | 74             | 37  | 615     | 0 - 6 D                                                                                                            |                                                                                       |     |         |                                                                                       |
|                              | 8    | N 120 × 3 × 30 × 38 × 9H | 114 H11 | 130                     | 235                        | 81             | 40  | 700     | 0 - 7 D                                                                                                            |                                                                                       |     |         |                                                                                       |
| Type                         | Size | c                        | $d_2$   | $D_3$                   | $k_2$                      | $n \times s$   | t   | $G_7$   | $l$                                                                                                                | $l$                                                                                   | kg  |         | Flanged shaft                                                                         |
| <b>B2FV</b>                  | 5    | 25                       | 300     | 150                     | 260                        | 16 × 22        | 10  | 290     | 38                                                                                                                 | 19                                                                                    | 400 | 0 - 4 E |  |
|                              | 6    | 25                       | 320     | 160                     | 280                        | 18 × 22        | 10  | 290     | 46                                                                                                                 | 23                                                                                    | 455 | 0 - 5 E |                                                                                       |
|                              | 7    | 30                       | 370     | 180                     | 320                        | 16 × 26        | 10  | 340     | 74                                                                                                                 | 37                                                                                    | 670 | 0 - 6 E |                                                                                       |
|                              | 8    | 30                       | 390     | 190                     | 340                        | 18 × 26        | 10  | 340     | 81                                                                                                                 | 40                                                                                    | 760 | 0 - 7 E |                                                                                       |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

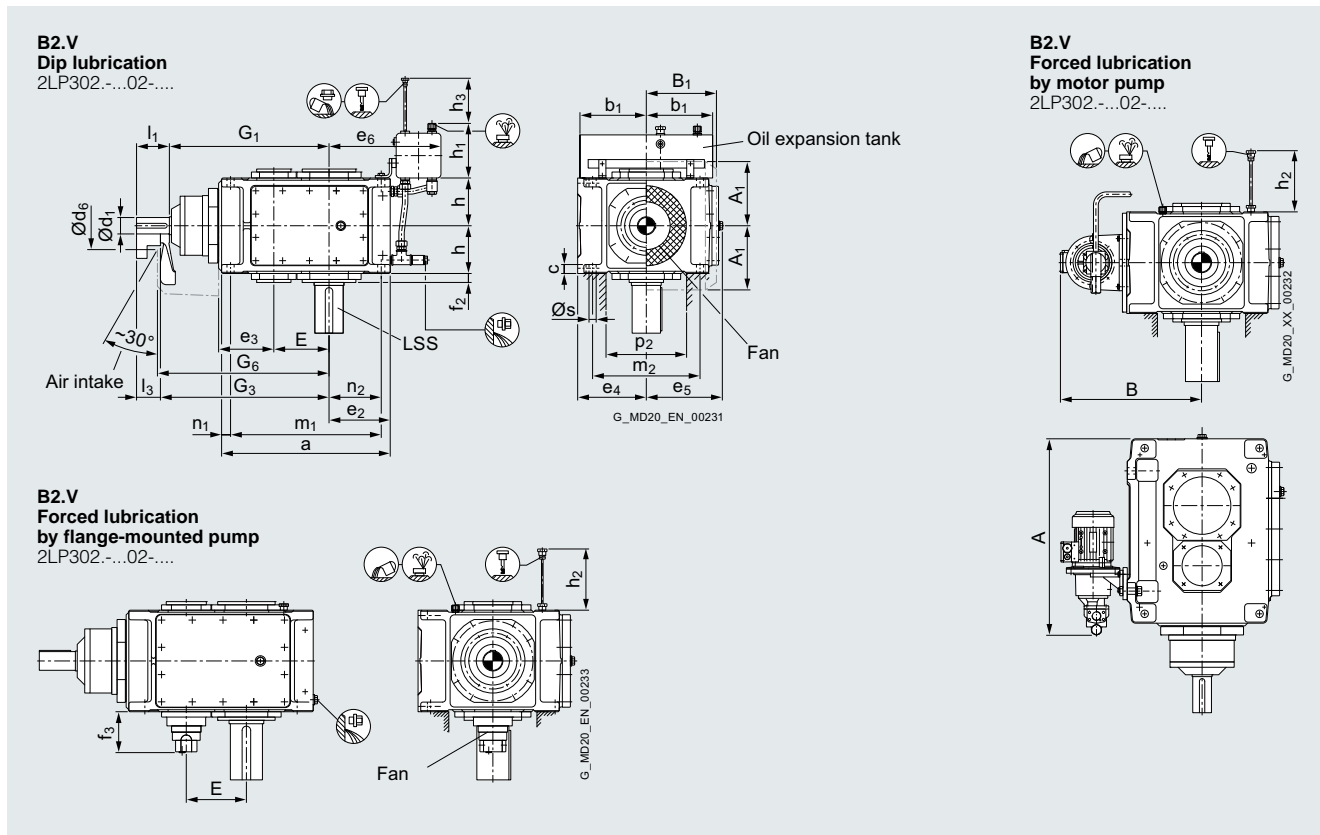
<sup>4)</sup> Shaft version with reinforced bearing, see page 9/7.

# Bevel helical gear units vertical mounting position

Type B2

## Gear unit dimensions, two-stage, gear unit sizes 9 to 12

### Selection and ordering data



| Gear unit size | Dimensions in mm       |       |       |       |         |       |       |       |       |       |       |       |       |       |  |
|----------------|------------------------|-------|-------|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                | High speed shaft (HSS) |       |       |       |         |       |       |       |       |       | Fan   |       |       |       |  |
|                | Reinforced shaft       |       |       |       |         |       |       |       |       |       |       |       |       |       |  |
|                | $l_N$                  | $d_1$ | $l_1$ | $l_3$ | $l_N$   | $d_1$ | $l_1$ | $l_2$ | $G_1$ | $G_3$ | $A_1$ | $B_1$ | $d_6$ | $G_6$ |  |
| <b>9</b>       | 5 - 11.2               | 80 m6 | 165   | 130   | 12.5    | 80 m6 | 165   | 130   | 755   | 790   | 270   | 325   | 195   | 805   |  |
|                | 12.5 - 18              | 60 m6 | 140   | 105   | 14 - 16 | 70 m6 | 140   | 105   |       |       |       |       |       |       |  |
| <b>10</b>      | 6.3 - 14               | 80 m6 | 165   | 130   | 16      | 80 m6 | 165   | 130   | 805   | 840   | 270   | 325   | 195   | 855   |  |
|                | 16 - 22.4              | 60 m6 | 140   | 105   | 18 - 20 | 70 m6 | 140   | 105   |       |       |       |       |       |       |  |
| <b>11</b>      | 5 - 11.2               | 90 m6 | 165   | 130   | -       | -     | -     | -     | 925   | 960   | 328   | 385   | 210   | 980   |  |
|                | 12.5 - 18              | 70 m6 | 140   | 105   | -       | -     | -     | -     |       |       |       |       |       |       |  |
| <b>12</b>      | 6.3 - 14               | 90 m6 | 165   | 130   | -       | -     | -     | -     | 995   | 1030  | 328   | 385   | 210   | 1050  |  |
|                | 16 - 22.4              | 70 m6 | 140   | 105   | -       | -     | -     | -     |       |       |       |       |       |       |  |

| Gear unit size | Dimensions in mm |       |          |     |       |       |       |       |       |       |       |     |       |            |       |       |       |       |       |            |       |                 |                 |  |  |  |  |  |
|----------------|------------------|-------|----------|-----|-------|-------|-------|-------|-------|-------|-------|-----|-------|------------|-------|-------|-------|-------|-------|------------|-------|-----------------|-----------------|--|--|--|--|--|
|                | a                | $b_1$ | c        | E   | $e_2$ | $e_3$ | $e_4$ | $e_5$ | $e_6$ | $f_2$ | $f_3$ | h   | $h_1$ | $h_2^{1)}$ | $h_3$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_2^{2)}$ | s     | A <sup>3)</sup> | B <sup>3)</sup> |  |  |  |  |  |
| <b>9</b>       | 820              | 330   | 48 ± 1.5 | 265 | 300   | 265   | 320   | 342   | 560   | 45    | 200   | 220 | 275   | 250        | 330   | 740   | 490   | 40    | 260   | 370        | 36 H9 | 795             | 570             |  |  |  |  |  |
| <b>10</b>      | 920              | 330   | 48 ± 1.5 | 315 | 350   | 265   | 320   | 342   | 610   | 45    | 200   | 220 | 275   | 250        | 330   | 840   | 490   | 40    | 310   | 370        | 36 H9 | 895             | 570             |  |  |  |  |  |
| <b>11</b>      | 975              | 330   | 54 ± 1.5 | 320 | 345   | 320   | 380   | 410   | 595   | 47    | 200   | 265 | 275   | 300        | 340   | 875   | 600   | 50    | 295   | 440        | 40 H9 | 979             | 630             |  |  |  |  |  |
| <b>12</b>      | 1130             | 330   | 54 ± 1.5 | 390 | 430   | 320   | 380   | 410   | 680   | 47    | 200   | 265 | 275   | 300        | 340   | 1030  | 600   | 50    | 380   | 440        | 40 H9 | 1135            | 630             |  |  |  |  |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

1) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

2) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

3) Max. dimensions; details acc. to order-related documentation.

# Bevel helical gear units vertical mounting position

## Type B2

### Gear unit dimensions, two-stage, gear unit sizes 9 to 12

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                              |           | Oil quantity<br>1)       | Oil quantity<br>1)         | Weight<br>1) 2) |                |         |          |                | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |                              |      |         |               |
|------------------------------|-----------|--------------------------|----------------------------|-----------------|----------------|---------|----------|----------------|--------------------------------------------------------------------------------------------------------------------|------------------------------|------|---------|---------------|
|                              |           | B2.V<br>Dip lubrication  | B2.V<br>Forced lubrication | B2.V            |                |         |          |                |                                                                                                                    |                              |      |         |               |
|                              |           | Article No.:             |                            | 2LP302          | -              |         | .02-.... |                |                                                                                                                    |                              |      |         |               |
| Type                         | Size      | d <sub>2</sub>           | l <sub>2</sub>             | G <sub>2</sub>  | l              | l       | kg       |                | Solid shaft with parallel key <sup>4)</sup>                                                                        |                              |      |         |               |
| <b>B2SV</b>                  | <b>9</b>  | 140 n6                   | 250                        | 270             | 115            | 57      | 1000     | 0 - 8 A        |                                                                                                                    |                              |      |         |               |
|                              | <b>10</b> | 160 n6                   | 300                        | 270             | 120            | 60      | 1155     | 1 - 0 A        |                                                                                                                    |                              |      |         |               |
|                              | <b>11</b> | 170 n6                   | 300                        | 320             | 190            | 95      | 1640     | 1 - 1 A        |                                                                                                                    |                              |      |         |               |
|                              | <b>12</b> | 180 n6                   | 300                        | 320             | 225            | 114     | 1910     | 1 - 2 A        |                                                                                                                    |                              |      |         |               |
| Type                         | Size      | D <sub>2</sub>           | G <sub>4</sub>             |                 | l              | l       | kg       |                | Hollow shaft with keyway                                                                                           |                              |      |         |               |
| <b>B2HV</b>                  | <b>9</b>  | 140 H7                   | 270                        |                 | 115            | 57      | 1000     | 0 - 8 B        |                                                                                                                    |                              |      |         |               |
|                              | <b>10</b> | 160 H7                   | 270                        |                 | 120            | 60      | 1155     | 1 - 0 B        |                                                                                                                    |                              |      |         |               |
|                              | <b>11</b> | 170 H7                   | 320                        |                 | 190            | 95      | 1640     | 1 - 1 B        |                                                                                                                    |                              |      |         |               |
|                              | <b>12</b> | 180 H7                   | 320                        |                 | 225            | 114     | 1910     | 1 - 2 B        |                                                                                                                    |                              |      |         |               |
| Type                         | Size      | D <sub>2</sub>           | D <sub>3</sub>             | G <sub>4</sub>  | G <sub>5</sub> | l       | l        | kg             |                                                                                                                    | Hollow shaft for shrink disk |      |         |               |
| <b>B2DV</b><br><sup>3)</sup> | <b>9</b>  | 140 H7                   | 145                        | 270             | 365            | 115     | 57       | 1000           | 0 - 8 C                                                                                                            |                              |      |         |               |
|                              | <b>10</b> | 150 H7                   | 155                        | 270             | 385            | 120     | 60       | 1155           | 1 - 0 C                                                                                                            |                              |      |         |               |
|                              | <b>11</b> | 165 H7                   | 170                        | 320             | 450            | 190     | 95       | 1640           | 1 - 1 C                                                                                                            |                              |      |         |               |
|                              | <b>12</b> | 180 H7                   | 185                        | 320             | 455            | 225     | 114      | 1910           | 1 - 2 C                                                                                                            |                              |      |         |               |
| Type                         | Size      | N/DIN 5480               | D <sub>2</sub>             | D <sub>3</sub>  | G <sub>4</sub> | l       | l        | kg             |                                                                                                                    | Hollow shaft with spline     |      |         |               |
| <b>B2KV</b>                  | <b>9</b>  | N 140 × 3 × 30 × 45 × 9H | 134 H11                    | 145             | 270            | 115     | 57       | 1000           | 0 - 8 D                                                                                                            |                              |      |         |               |
|                              | <b>10</b> | N 140 × 3 × 30 × 45 × 9H | 134 H11                    | 155             | 270            | 120     | 60       | 1155           | 1 - 0 D                                                                                                            |                              |      |         |               |
|                              | <b>11</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11                    | 170             | 320            | 190     | 95       | 1640           | 1 - 1 D                                                                                                            |                              |      |         |               |
|                              | <b>12</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11                    | 185             | 320            | 225     | 114      | 1910           | 1 - 2 D                                                                                                            |                              |      |         |               |
| Type                         | Size      | c                        | d <sub>2</sub>             | D <sub>3</sub>  | k <sub>2</sub> | n × s   | t        | G <sub>7</sub> | l                                                                                                                  | l                            | kg   |         | Flanged shaft |
| <b>B2FV</b>                  | <b>9</b>  | 38                       | 430                        | 220             | 380            | 20 × 26 | 12       | 385            | 115                                                                                                                | 57                           | 1090 | 0 - 8 E |               |
|                              | <b>10</b> | 38                       | 470                        | 240             | 420            | 22 × 26 | 12       | 385            | 120                                                                                                                | 60                           | 1250 | 1 - 0 E |               |
|                              | <b>11</b> | 42                       | 510                        | 260             | 450            | 18 × 33 | 12       | 450            | 190                                                                                                                | 95                           | 1775 | 1 - 1 E |               |
|                              | <b>12</b> | 42                       | 540                        | 280             | 480            | 22 × 33 | 12       | 450            | 225                                                                                                                | 114                          | 2060 | 1 - 2 E |               |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

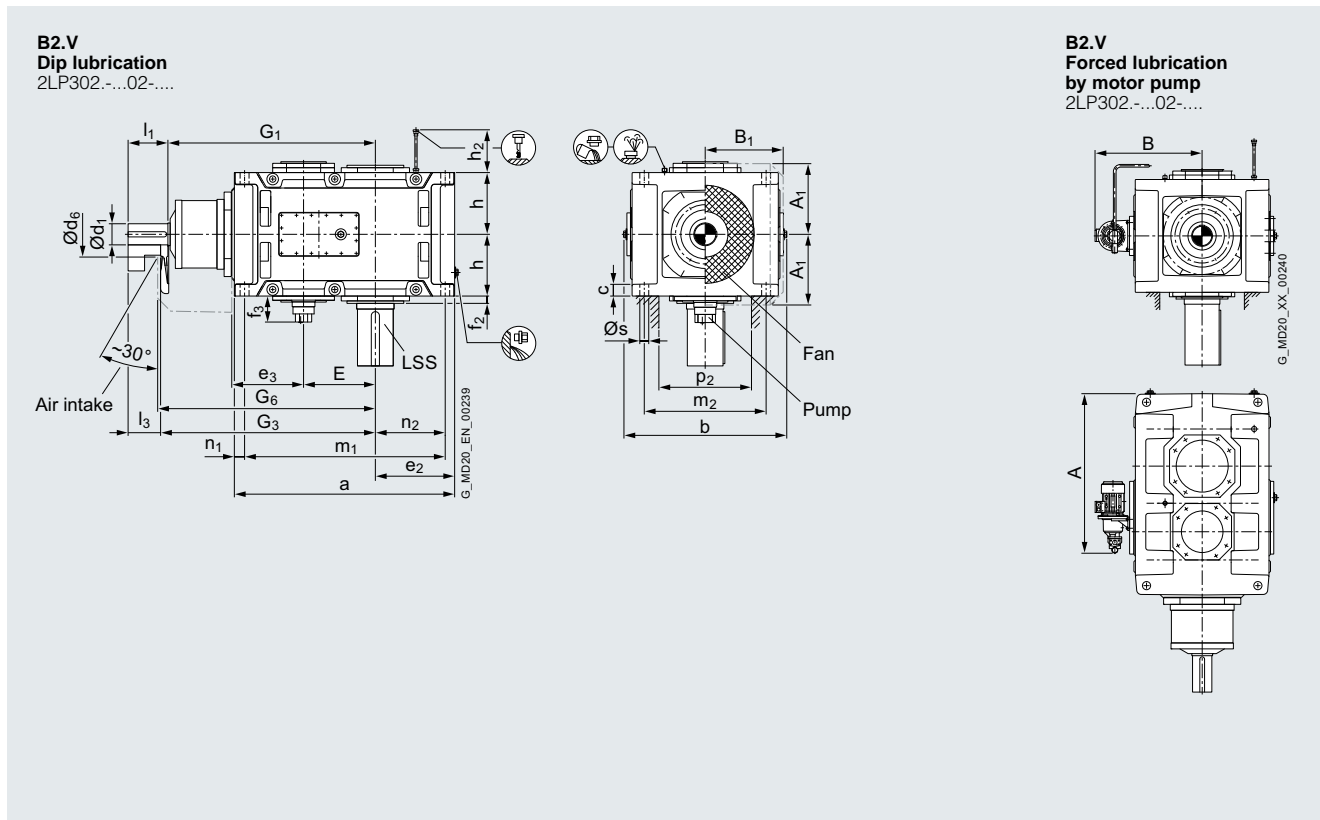
<sup>4)</sup> Shaft version with reinforced bearing, see page 9/7.

# Bevel helical gear units vertical mounting position

Type B2

## Gear unit dimensions, two-stage, gear unit sizes 13 to 18

### Selection and ordering data



| Gear unit size | Dimensions in mm       |        |       |       |       |       |       |       |       |       |
|----------------|------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | High speed shaft (HSS) |        |       |       |       |       | Fan   |       |       |       |
|                | $l_N$                  | $d_1$  | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $B_1$ | $d_6$ | $G_6$ |
| 13             | 5 - 11.2               | 110 n6 | 205   | 165   | 1070  | 1110  | 375   | 450   | 245   | 1130  |
|                | 12.5 - 18              | 80 m6  | 170   | 130   |       |       |       |       |       |       |
| 14             | 6.3 - 14               | 110 n6 | 205   | 165   | 1070  | 1110  | 375   | 450   | 245   | 1200  |
|                | 16 - 22.4              | 80 m6  | 170   | 130   |       |       |       |       |       |       |
| 15             | 5 - 11.2               | 130 n6 | 245   | 200   | 1277  | 1322  | 435   | 495   | 280   | 1340  |
|                | 12.5 - 18              | 100 m6 | 210   | 165   |       |       |       |       |       |       |
| 16             | 5.6 - 12.5             | 130 n6 | 245   | 200   | 1323  | 1368  | 435   | 495   | 280   | 1385  |
|                | 14 - 20                | 100 m6 | 210   | 165   |       |       |       |       |       |       |
| 17             | 5.6 - 11.2             | 150 n6 | 245   | 200   | 1435  | 1480  | 505   | 555   | 380   | 1500  |
|                | 12.5 - 18              | 110 n6 | 210   | 165   |       |       |       |       |       |       |
| 18             | 7.1 - 12.5             | 150 n6 | 245   | 200   | 1495  | 1540  | 505   | 555   | 380   | 1560  |
|                | 14 - 20                | 110 n6 | 210   | 165   |       |       |       |       |       |       |

| Gear unit size | Dimensions in mm |      |        |     |       |       |       |       |       |            |       |       |       |       |            |    |                 |                 |
|----------------|------------------|------|--------|-----|-------|-------|-------|-------|-------|------------|-------|-------|-------|-------|------------|----|-----------------|-----------------|
|                | a                | b    | c      | E   | $e_2$ | $e_3$ | $f_2$ | $f_3$ | h     | $h_2^{1)}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_2^{2)}$ | s  | A <sup>3)</sup> | B <sup>3)</sup> |
| 13             | 1130             | 900  | 61 ± 2 | 370 | 405   | 370   | 38    | 200   | 325   | 350        | 1035  | 680   | 50    | 360   | 500        | 48 | 785             | 680             |
| 14             | 1270             | 900  | 61 ± 2 | 370 | 475   | 370   | 45    | 200   | 325   | 350        | 1175  | 680   | 50    | 430   | 500        | 48 | 925             | 680             |
| 15             | 1350             | 980  | 72 ± 2 | 442 | 485   | 442   | 75    | 200   | 380   | 430        | 1235  | 750   | 60    | 430   | 570        | 55 | 975             | 730             |
| 16             | 1440             | 980  | 72 ± 2 | 442 | 530   | 442   | 75    | 200   | 380   | 430        | 1325  | 750   | 60    | 475   | 570        | 55 | 1065            | 730             |
| 17             | 1490             | 1110 | 81 ± 2 | 490 | 525   | 490   | 98    | 200   | 437.5 | 480        | 1360  | 840   | 70    | 465   | 630        | 65 | 995             | 780             |
| 18             | 1610             | 1110 | 81 ± 2 | 490 | 585   | 490   | 98    | 200   | 437.5 | 480        | 1480  | 840   | 70    | 525   | 630        | 65 | 1115            | 780             |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

1) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

2) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

3) Max. dimensions; details acc. to order-related documentation.

# Bevel helical gear units vertical mounting position

## Type B2

### Gear unit dimensions, two-stage, gear unit sizes 13 to 18

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                   |      |                          |         |       |       |              |    |       | Oil quantity<br>1)<br>B2.V<br>Forced<br>lubrication | Weight<br>1) 2)<br>B2.V | 10th to 13th position of Article<br>No. and Article No. supplement,<br>for 14th to 16th position, see<br>pages 7/27 to 7/30 |                                  |                              |  |  |
|-------------------|------|--------------------------|---------|-------|-------|--------------|----|-------|-----------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------|--|--|
|                   |      |                          |         |       |       |              |    |       | Article No.:                                        | 2LP302                  | -                                                                                                                           | 02-....                          |                              |  |  |
| Type              | Size | $d_2$                    | $l_2$   | $G_2$ | $l$   |              |    |       | kg                                                  |                         |                                                                                                                             | Solid shaft with parallel key 4) |                              |  |  |
| <b>B2SV</b>       | 13   | 200 n6                   | 350     | 390   | 125   |              |    |       | 2450                                                | 1                       | - 3 A                                                                                                                       |                                  |                              |  |  |
|                   | 14   | 210 n6                   | 350     | 390   | 140   |              |    |       | 2825                                                | 1                       | - 4 A                                                                                                                       |                                  |                              |  |  |
|                   | 15   | 230 n6                   | 410     | 460   | 190   |              |    |       | 3990                                                | 1                       | - 5 A                                                                                                                       |                                  |                              |  |  |
|                   | 16   | 240 n6                   | 410     | 460   | 200   |              |    |       | 4345                                                | 1                       | - 6 A                                                                                                                       |                                  |                              |  |  |
|                   | 17   | 250 n6                   | 410     | 540   | 270   |              |    |       | 5620                                                | 1                       | - 7 A                                                                                                                       |                                  |                              |  |  |
|                   | 18   | 270 n6                   | 470     | 540   | 295   |              |    |       | 6150                                                | 1                       | - 8 A                                                                                                                       |                                  |                              |  |  |
| Type              | Size | $D_2$                    | $G_4$   |       |       | $l$          |    |       |                                                     | kg                      |                                                                                                                             |                                  | Hollow shaft with keyway     |  |  |
| <b>B2HV</b>       | 13   | -                        | -       |       |       | 125          |    |       |                                                     | 2450                    | 1                                                                                                                           | - 3 B                            |                              |  |  |
|                   | 14   | 210 H7                   | 390     |       |       | 140          |    |       |                                                     | 2825                    | 1                                                                                                                           | - 4 B                            |                              |  |  |
|                   | 15   | -                        | -       |       |       | 190          |    |       |                                                     | 3990                    | 1                                                                                                                           | - 5 B                            |                              |  |  |
|                   | 16   | 240 H7                   | 450     |       |       | 200          |    |       |                                                     | 4345                    | 1                                                                                                                           | - 6 B                            |                              |  |  |
|                   | 17   | -                        | -       |       |       | 270          |    |       |                                                     | 5620                    | 1                                                                                                                           | - 7 B                            |                              |  |  |
|                   | 18   | 275 H7                   | 510     |       |       | 295          |    |       |                                                     | 6150                    | 1                                                                                                                           | - 8 B                            |                              |  |  |
| Type              | Size | $D_2$                    | $D_3$   | $G_4$ | $G_5$ | $l$          |    |       |                                                     | kg                      |                                                                                                                             |                                  | Hollow shaft for shrink disk |  |  |
| <b>B2DV</b><br>3) | 13   | -                        | -       | -     | -     | 125          |    |       |                                                     | 2450                    | 1                                                                                                                           | - 3 C                            |                              |  |  |
|                   | 14   | 210 H7                   | 215     | 390   | 535   | 140          |    |       |                                                     | 2825                    | 1                                                                                                                           | - 4 C                            |                              |  |  |
|                   | 15   | -                        | -       | -     | -     | 190          |    |       |                                                     | 3990                    | 1                                                                                                                           | - 5 C                            |                              |  |  |
|                   | 16   | 240 H7                   | 245     | 450   | 620   | 200          |    |       |                                                     | 4345                    | 1                                                                                                                           | - 6 C                            |                              |  |  |
|                   | 17   | -                        | -       | -     | -     | 270          |    |       |                                                     | 5620                    | 1                                                                                                                           | - 7 C                            |                              |  |  |
|                   | 18   | 280 H7                   | 285     | 510   | 700   | 295          |    |       |                                                     | 6150                    | 1                                                                                                                           | - 8 C                            |                              |  |  |
| Type              | Size | N/DIN 5480               | $D_2$   | $D_3$ | $G_4$ | $l$          |    |       |                                                     | kg                      |                                                                                                                             |                                  | Hollow shaft with spline     |  |  |
| <b>B2KV</b>       | 13   | -                        | -       | -     | -     | 125          |    |       |                                                     | 2450                    | 1                                                                                                                           | - 3 D                            |                              |  |  |
|                   | 14   | N 190 x 5 x 30 x 36 x 9H | 180 H11 | 215   | 390   | 140          |    |       |                                                     | 2825                    | 1                                                                                                                           | - 4 D                            |                              |  |  |
|                   | 15   | -                        | -       | -     | -     | 190          |    |       |                                                     | 3990                    | 1                                                                                                                           | - 5 D                            |                              |  |  |
|                   | 16   | N 220 x 5 x 30 x 42 x 9H | 210 H11 | 245   | 450   | 200          |    |       |                                                     | 4345                    | 1                                                                                                                           | - 6 D                            |                              |  |  |
|                   | 17   | -                        | -       | -     | -     | 270          |    |       |                                                     | 5620                    | 1                                                                                                                           | - 7 D                            |                              |  |  |
|                   | 18   | N 250 x 5 x 30 x 48 x 9H | 240 H11 | 285   | 510   | 295          |    |       |                                                     | 6150                    | 1                                                                                                                           | - 8 D                            |                              |  |  |
| Type              | Size | c                        | $d_2$   | $D_3$ | $k_2$ | $n \times s$ | t  | $G_7$ | $l$                                                 | kg                      |                                                                                                                             |                                  | Flanged shaft                |  |  |
| <b>B2FV</b>       | 13   | 48                       | 580     | 310   | 500   | 20 x 33      | 14 | 525   | 125                                                 | 2620                    | 1                                                                                                                           | - 3 E                            |                              |  |  |
|                   | 14   | 48                       | 620     | 310   | 540   | 24 x 33      | 14 | 525   | 140                                                 | 3005                    | 1                                                                                                                           | - 4 E                            |                              |  |  |
|                   | 15   | 55                       | 710     | 360   | 630   | 28 x 33      | 17 | 625   | 190                                                 | 4245                    | 1                                                                                                                           | - 5 E                            |                              |  |  |
|                   | 16   | 55                       | 740     | 360   | 660   | 30 x 33      | 17 | 625   | 200                                                 | 4615                    | 1                                                                                                                           | - 6 E                            |                              |  |  |
|                   | 17   | 60                       | 750     | 410   | 660   | 24 x 39      | 18 | 695   | 270                                                 | 5940                    | 1                                                                                                                           | - 7 E                            |                              |  |  |
|                   | 18   | 60                       | 800     | 410   | 710   | 26 x 39      | 18 | 695   | 295                                                 | 6520                    | 1                                                                                                                           | - 8 E                            |                              |  |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

4) Shaft version with reinforced bearing, see page 9/7.

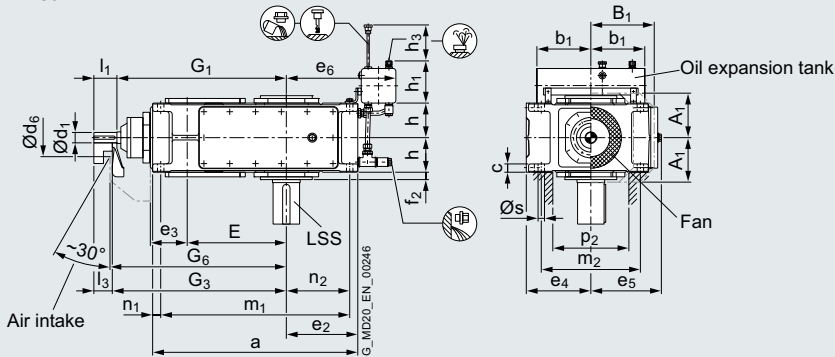
# Bevel helical gear units vertical mounting position

Type B3

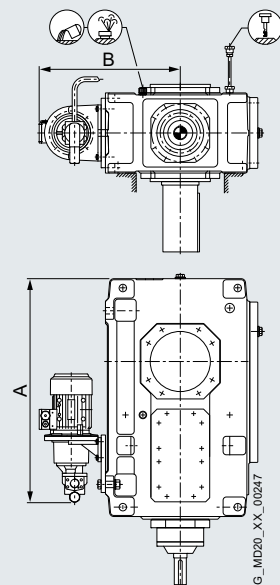
Gear unit dimensions, three-stage, gear unit sizes 4 to 8

## Selection and ordering data

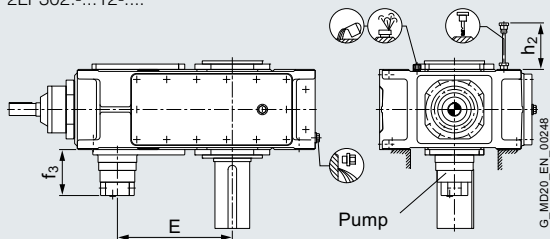
**B3.V**  
Dip lubrication  
2LP302-...12-....



**B3.V**  
Forced lubrication  
by motor pump  
2LP302-...12-....



**B3.V**  
Forced lubrication  
by flange-mounted pump  
2LP302-...12-....



| Gear unit size | Dimensions in mm       |                |                |                |                |                |                |                |                |                |                |                |                |                |
|----------------|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                | High speed shaft (HSS) |                |                |                |                |                |                |                |                |                | Fan            |                |                |                |
|                | Reinforced shaft       |                |                |                |                |                |                |                |                |                | A <sub>1</sub> | B <sub>1</sub> | d <sub>6</sub> | G <sub>6</sub> |
|                | i <sub>N</sub>         | d <sub>1</sub> | l <sub>1</sub> | l <sub>3</sub> | i <sub>N</sub> | d <sub>1</sub> | l <sub>1</sub> | l <sub>3</sub> | G <sub>1</sub> | G <sub>3</sub> | A <sub>1</sub> | B <sub>1</sub> | d <sub>6</sub> | G <sub>6</sub> |
| 4              | 12.5 - 45              | 30 m6          | 70             | 50             | 40 - 50        | 35 m6          | 80             | 60             | 500            | 520            | 143            | 200            | 110            | 530            |
|                | 50 - 71                | 25 k6          | 60             | 40             | 56 - 63        | 32 m6          | 70             | 50             |                |                |                |                |                |                |
| 5              | 12.5 - 45              | 35 m6          | 80             | 60             | 31.5 - 50      | 40 m6          | 90             | 70             | 575            | 595            | 168            | 235            | 130            | 605            |
|                | 50 - 71                | 28 m6          | 60             | 40             | 56 - 63        | 35 m6          | 80             | 60             |                |                |                |                |                |                |
| 6              | 16 - 56                | 35 m6          | 80             | 60             | 40 - 63        | 40 m6          | 90             | 70             | 610            | 630            | 168            | 235            | 130            | 640            |
|                | 63 - 90                | 28 m6          | 60             | 40             | 71 - 80        | 35 m6          | 80             | 60             |                |                |                |                |                |                |
| 7              | 12.5 - 45              | 45 m6          | 100            | 80             | 31.5 - 50      | 50 m6          | 110            | 90             | 690            | 710            | 193            | 275            | 165            | 720            |
|                | 50 - 71                | 35 m6          | 80             | 60             | 56 - 63        | 40 m6          | 90             | 70             |                |                |                |                |                |                |
| 8              | 16 - 56                | 45 m6          | 100            | 80             | 40 - 63        | 50 m6          | 110            | 90             | 735            | 755            | 193            | 275            | 165            | 765            |
|                | 63 - 90                | 35 m6          | 80             | 60             | 71 - 80        | 40 m6          | 90             | 70             |                |                |                |                |                |                |

| Gear unit size | a   | b <sub>1</sub> | c      | E   | e <sub>2</sub> | e <sub>3</sub> | e <sub>4</sub> | e <sub>5</sub> | e <sub>6</sub> | f <sub>2</sub> | f <sub>3</sub> | h     | h <sub>1</sub> | h <sub>2</sub> <sup>1)</sup> | h <sub>3</sub> | m <sub>1</sub> | n <sub>1</sub> | n <sub>2</sub> | p <sub>2</sub> <sup>2)</sup> | s     | A <sup>3)</sup> | B <sup>3)</sup> |
|----------------|-----|----------------|--------|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|----------------|------------------------------|----------------|----------------|----------------|----------------|------------------------------|-------|-----------------|-----------------|
| 4              | 565 | 150            | 30 ± 1 | 270 | 190            | 110            | 200            | 215            | 320            | 22             | -              | 107.5 | 165            | -                            | 180            | 505            | 30             | 160            | 220                          | 24 H9 | -               | -               |
| 5              | 640 | 240            | 30 ± 1 | 315 | 205            | 130            | 230            | 252            | 385            | 28             | 190            | 127.5 | 205            | 180                          | 240            | 580            | 30             | 175            | 270                          | 24 H9 | 610             | 480             |
| 6              | 720 | 240            | 30 ± 1 | 350 | 250            | 130            | 230            | 252            | 425            | 28             | 190            | 127.5 | 205            | 180                          | 240            | 660            | 30             | 220            | 270                          | 24 H9 | 690             | 480             |
| 7              | 785 | 240            | 36 ± 1 | 385 | 250            | 160            | 280            | 292            | 425            | 30             | 190            | 150   | 205            | 165                          | 250            | 715            | 35             | 215            | 330                          | 28 H9 | 740             | 530             |
| 8              | 890 | 240            | 36 ± 1 | 430 | 310            | 160            | 280            | 302            | 485            | 32             | 190            | 150   | 205            | 165                          | 250            | 820            | 35             | 275            | 330                          | 28 H9 | 845             | 530             |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

<sup>1)</sup> For forced lubrication, approximately h<sub>2</sub> can be assumed as required space for piping and monitoring; details according to order-related documentation.

<sup>2)</sup> Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

<sup>3)</sup> Max. dimensions; details acc. to order-related documentation.



# Bevel helical gear units vertical mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 4 to 8

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                   |        |                          |         | Oil quantity<br>1)      | Oil quantity<br>1)         | Weight<br>1)2) |     |            | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |                                  |                              |               |     |   |  |
|-------------------|--------|--------------------------|---------|-------------------------|----------------------------|----------------|-----|------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------|---------------|-----|---|--|
|                   |        |                          |         | B3.V<br>Dip lubrication | B3.V<br>Forced lubrication | B3.V           |     |            |                                                                                                                    |                                  |                              |               |     |   |  |
|                   |        |                          |         | Article No.:            |                            | 2LP302         |     | - .12-.... |                                                                                                                    |                                  |                              |               |     |   |  |
| Type              | Size   | $d_2$                    | $l_2$   | $G_2$                   | $l$                        | $l$            | kg  |            |                                                                                                                    | Solid shaft with parallel key 4) |                              |               |     |   |  |
| <b>B3SV</b>       | 4      | 80 m6                    | 170     | 140                     | 20                         | –              | 210 | 0          | - 3                                                                                                                | A                                |                              |               |     |   |  |
|                   | 5      | 100 m6                   | 210     | 165                     | 34                         | 17             | 325 | 0          | - 4                                                                                                                | A                                |                              |               |     |   |  |
|                   | 6      | 110 n6                   | 210     | 165                     | 36                         | 18             | 380 | 0          | - 5                                                                                                                | A                                |                              |               |     |   |  |
|                   | 7      | 120 n6                   | 210     | 195                     | 60                         | 30             | 550 | 0          | - 6                                                                                                                | A                                |                              |               |     |   |  |
| 8                 | 130 n6 | 250                      | 195     | 68                      | 34                         | 635            | 0   | - 7        | A                                                                                                                  |                                  |                              |               |     |   |  |
| Type              | Size   | $D_2$                    | $G_4$   |                         | $l$                        | $l$            | kg  |            |                                                                                                                    | Hollow shaft with keyway         |                              |               |     |   |  |
| <b>B3HV</b>       | 4      | 80 H7                    | 140     |                         | 20                         | –              | 210 | 0          | - 3                                                                                                                | B                                |                              |               |     |   |  |
|                   | 5      | 95 H7                    | 165     |                         | 34                         | 17             | 325 | 0          | - 4                                                                                                                | B                                |                              |               |     |   |  |
|                   | 6      | 105 H7                   | 165     |                         | 36                         | 18             | 380 | 0          | - 5                                                                                                                | B                                |                              |               |     |   |  |
|                   | 7      | 115 H7                   | 195     |                         | 60                         | 30             | 550 | 0          | - 6                                                                                                                | B                                |                              |               |     |   |  |
| 8                 | 125 H7 | 195                      |         | 68                      | 34                         | 635            | 0   | - 7        | B                                                                                                                  |                                  |                              |               |     |   |  |
| Type              | Size   | $D_2$                    | $D_3$   | $G_4$                   | $G_5$                      | $l$            | $l$ | kg         |                                                                                                                    |                                  | Hollow shaft for shrink disk |               |     |   |  |
| <b>B3DV</b><br>3) | 4      | 85 H7                    | 85      | 140                     | 205                        | 20             | –   | 210        | 0                                                                                                                  | - 3                              | C                            |               |     |   |  |
|                   | 5      | 100 H7                   | 100     | 165                     | 240                        | 34             | 17  | 325        | 0                                                                                                                  | - 4                              | C                            |               |     |   |  |
|                   | 6      | 110 H7                   | 110     | 165                     | 240                        | 36             | 18  | 380        | 0                                                                                                                  | - 5                              | C                            |               |     |   |  |
|                   | 7      | 120 H7                   | 120     | 195                     | 280                        | 60             | 30  | 550        | 0                                                                                                                  | - 6                              | C                            |               |     |   |  |
| 8                 | 130 H7 | 130                      | 195     | 285                     | 68                         | 34             | 635 | 0          | - 7                                                                                                                | C                                |                              |               |     |   |  |
| Type              | Size   | N/DIN 5480               | $D_2$   | $D_3$                   | $G_4$                      | $l$            | $l$ | kg         |                                                                                                                    |                                  | Hollow shaft with spline     |               |     |   |  |
| <b>B3KV</b>       | 5      | N 95 × 3 × 30 × 30 × 9H  | 89 H11  | 100                     | 165                        | 34             | 17  | 325        | 0                                                                                                                  | - 4                              | D                            |               |     |   |  |
|                   | 6      | N 95 × 3 × 30 × 30 × 9H  | 89 H11  | 110                     | 165                        | 36             | 18  | 380        | 0                                                                                                                  | - 5                              | D                            |               |     |   |  |
|                   | 7      | N 120 × 3 × 30 × 38 × 9H | 114 H11 | 120                     | 195                        | 60             | 30  | 550        | 0                                                                                                                  | - 6                              | D                            |               |     |   |  |
|                   | 8      | N 120 × 3 × 30 × 38 × 9H | 114 H11 | 130                     | 195                        | 68             | 34  | 635        | 0                                                                                                                  | - 7                              | D                            |               |     |   |  |
| Type              | Size   | c                        | $d_2$   | $D_3$                   | $k_2$                      | $n \times s$   | t   | $G_7$      | $l$                                                                                                                | $l$                              | kg                           | Flanged shaft |     |   |  |
| <b>B3FV</b>       | 5      | 25                       | 300     | 150                     | 260                        | 16 × 22        | 10  | 255        | 34                                                                                                                 | 17                               | 360                          | 0             | - 4 | E |  |
|                   | 6      | 25                       | 320     | 160                     | 280                        | 18 × 22        | 10  | 255        | 36                                                                                                                 | 18                               | 420                          | 0             | - 5 | E |  |
|                   | 7      | 30                       | 370     | 180                     | 320                        | 16 × 26        | 10  | 300        | 60                                                                                                                 | 30                               | 600                          | 0             | - 6 | E |  |
|                   | 8      | 30                       | 390     | 190                     | 340                        | 18 × 26        | 10  | 300        | 68                                                                                                                 | 34                               | 690                          | 0             | - 7 | E |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

4) Shaft version with reinforced bearing, see page 9/7.

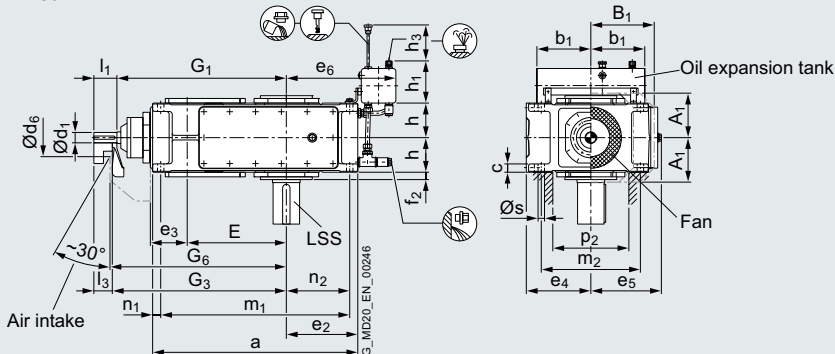
# Bevel helical gear units vertical mounting position

## Type B3

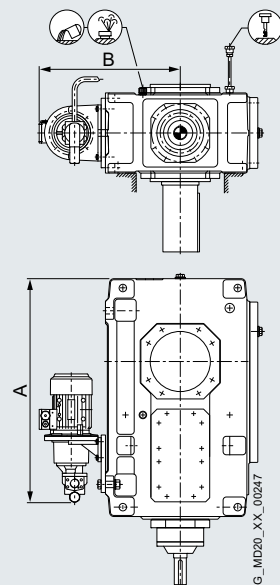
### Gear unit dimensions, three-stage, gear unit sizes 9 to 12

#### Selection and ordering data

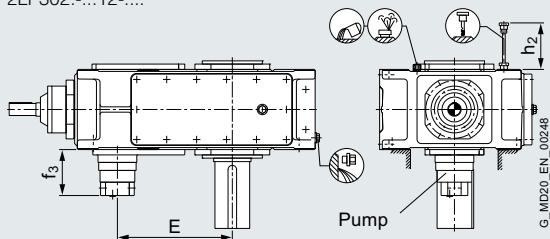
**B3.V**  
Dip lubrication  
2LP302-...12-....



**B3.V**  
Forced lubrication  
by motor pump  
2LP302-...12-....



**B3.V**  
Forced lubrication  
by flange-mounted pump  
2LP302-...12-....



| Gear unit size | Dimensions in mm       |       |       |       |         |       |       |       |       |       |       |       |       |       |  |
|----------------|------------------------|-------|-------|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                | High speed shaft (HSS) |       |       |       |         |       |       |       |       |       | Fan   |       |       |       |  |
|                | Reinforced shaft       |       |       |       |         |       |       |       |       |       |       |       |       |       |  |
|                | $l_N$                  | $d_1$ | $l_1$ | $l_3$ | $l_N$   | $d_1$ | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$ | $B_1$ | $d_6$ | $G_6$ |  |
| <b>9</b>       | 12.5 - 45              | 55 m6 | 110   | 80    | 40 - 50 | 60 m6 | 120   | 90    | 800   | 830   | 231   | 325   | 175   | 845   |  |
|                | 50 - 71                | 40 m6 | 100   | 70    | 56 - 63 | 50 m6 | 110   | 80    |       |       |       |       |       |       |  |
| <b>10</b>      | 16 - 56                | 55 m6 | 110   | 80    | 40 - 63 | 60 m6 | 120   | 90    | 850   | 880   | 231   | 325   | 175   | 895   |  |
|                | 63 - 90                | 40 m6 | 100   | 70    | 71 - 80 | 50 m6 | 110   | 80    |       |       |       |       |       |       |  |
| <b>11</b>      | 12.5 - 45              | 70 m6 | 135   | 105   | 50      | 70 m6 | 135   | 105   | 960   | 990   | 263   | 385   | 190   | 1010  |  |
|                | 50 - 71                | 50 m6 | 110   | 80    | 56 - 63 | 60 m6 | 135   | 105   |       |       |       |       |       |       |  |
| <b>12</b>      | 16 - 56                | 70 m6 | 135   | 105   | 63      | 70 m6 | 135   | 105   | 1030  | 1060  | 263   | 385   | 190   | 1080  |  |
|                | 63 - 90                | 50 m6 | 110   | 80    | 70 - 80 | 60 m6 | 135   | 105   |       |       |       |       |       |       |  |

| Gear unit size |      |       |          |     |       |       |       |       |       |       |       |     |       |            |       |       |       |       |            |       |                 |                 |
|----------------|------|-------|----------|-----|-------|-------|-------|-------|-------|-------|-------|-----|-------|------------|-------|-------|-------|-------|------------|-------|-----------------|-----------------|
|                | a    | $b_1$ | c        | E   | $e_2$ | $e_3$ | $e_4$ | $e_5$ | $e_6$ | $f_2$ | $f_3$ | h   | $h_1$ | $h_2^{1)}$ | $h_3$ | $m_1$ | $n_1$ | $n_2$ | $p_2^{2)}$ | s     | A <sup>3)</sup> | B <sup>3)</sup> |
| <b>9</b>       | 925  | 330   | 45 ± 1.5 | 450 | 300   | 185   | 320   | 342   | 560   | 32    | 180   | 185 | 275   | 205        | 330   | 845   | 40    | 260   | 370        | 36 H9 | 710             | 570             |
| <b>10</b>      | 1025 | 330   | 45 ± 1.5 | 500 | 350   | 185   | 320   | 342   | 610   | 32    | 180   | 185 | 275   | 205        | 330   | 945   | 40    | 310   | 370        | 36 H9 | 810             | 570             |
| <b>11</b>      | 1105 | 330   | 54 ± 1.5 | 545 | 345   | 225   | 380   | 402   | 595   | 35    | 180   | 215 | 275   | 240        | 340   | 1005  | 50    | 295   | 440        | 40 H9 | 820             | 630             |
| <b>12</b>      | 1260 | 330   | 54 ± 1.5 | 615 | 430   | 225   | 380   | 410   | 680   | 35    | 180   | 215 | 275   | 240        | 340   | 1160  | 50    | 380   | 440        | 40 H9 | 975             | 630             |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

1) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

2) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

3) Max. dimensions; details acc. to order-related documentation.

# Bevel helical gear units vertical mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 9 to 12

#### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                              |           | Oil quantity<br>1)       | Oil quantity<br>1)         | Weight<br>1)2) |               |         |      | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |                |     |                                             |                |  |
|------------------------------|-----------|--------------------------|----------------------------|----------------|---------------|---------|------|--------------------------------------------------------------------------------------------------------------------|----------------|-----|---------------------------------------------|----------------|--|
|                              |           | B3.V<br>Dip lubrication  | B3.V<br>Forced lubrication | B3.V           |               |         |      |                                                                                                                    |                |     |                                             |                |  |
|                              |           | Article No.:             |                            |                | <b>2LP302</b> |         |      | <b>.12-....</b>                                                                                                    |                |     |                                             |                |  |
| Type                         | Size      | $d_2$                    | $l_2$                      | $G_2$          | $l$           | $l$     | kg   |                                                                                                                    |                |     | Solid shaft with parallel key <sup>4)</sup> |                |  |
| <b>B3SV</b>                  | <b>9</b>  | 140 n6                   | 250                        | 235            | 96            | 48      | 890  | <b>0 - 8 A</b>                                                                                                     |                |     |                                             |                |  |
|                              | <b>10</b> | 160 n6                   | 300                        | 235            | 105           | 52      | 1020 | <b>1 - 0 A</b>                                                                                                     |                |     |                                             |                |  |
|                              | <b>11</b> | 170 n6                   | 300                        | 270            | 155           | 77      | 1455 | <b>1 - 1 A</b>                                                                                                     |                |     |                                             |                |  |
|                              | <b>12</b> | 180 n6                   | 300                        | 270            | 175           | 87      | 1730 | <b>1 - 2 A</b>                                                                                                     |                |     |                                             |                |  |
| Type                         | Size      | $D_2$                    | $G_4$                      |                | $l$           | $l$     | kg   |                                                                                                                    |                |     | Hollow shaft with keyway                    |                |  |
| <b>B3HV</b>                  | <b>9</b>  | 135 H7                   | 235                        |                | 96            | 48      | 890  | <b>0 - 8 B</b>                                                                                                     |                |     |                                             |                |  |
|                              | <b>10</b> | 150 H7                   | 235                        |                | 105           | 52      | 1020 | <b>1 - 0 B</b>                                                                                                     |                |     |                                             |                |  |
|                              | <b>11</b> | 165 H7                   | 270                        |                | 155           | 77      | 1455 | <b>1 - 1 B</b>                                                                                                     |                |     |                                             |                |  |
|                              | <b>12</b> | 180 H7                   | 270                        |                | 175           | 87      | 1730 | <b>1 - 2 B</b>                                                                                                     |                |     |                                             |                |  |
| Type                         | Size      | $D_2$                    | $D_3$                      | $G_4$          | $G_5$         | $l$     | $l$  | kg                                                                                                                 |                |     | Hollow shaft for shrink disk                |                |  |
| <b>B3DV</b><br><sup>3)</sup> | <b>9</b>  | 140 H7                   | 145                        | 235            | 330           | 96      | 48   | 890                                                                                                                | <b>0 - 8 C</b> |     |                                             |                |  |
|                              | <b>10</b> | 150 H7                   | 155                        | 235            | 350           | 105     | 52   | 1020                                                                                                               | <b>1 - 0 C</b> |     |                                             |                |  |
|                              | <b>11</b> | 165 H7                   | 170                        | 270            | 400           | 155     | 77   | 1455                                                                                                               | <b>1 - 1 C</b> |     |                                             |                |  |
|                              | <b>12</b> | 180 H7                   | 185                        | 270            | 405           | 175     | 87   | 1730                                                                                                               | <b>1 - 2 C</b> |     |                                             |                |  |
| Type                         | Size      | N/DIN 5480               | $D_2$                      | $D_3$          | $G_4$         | $l$     | $l$  | kg                                                                                                                 |                |     | Hollow shaft with spline                    |                |  |
| <b>B3KV</b>                  | <b>9</b>  | N 140 × 3 × 30 × 45 × 9H | 134 H11                    | 145            | 235           | 96      | 48   | 890                                                                                                                | <b>0 - 8 D</b> |     |                                             |                |  |
|                              | <b>10</b> | N 140 × 3 × 30 × 45 × 9H | 134 H11                    | 155            | 235           | 105     | 52   | 1020                                                                                                               | <b>1 - 0 D</b> |     |                                             |                |  |
|                              | <b>11</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11                    | 170            | 270           | 155     | 77   | 1455                                                                                                               | <b>1 - 1 D</b> |     |                                             |                |  |
|                              | <b>12</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11                    | 185            | 270           | 175     | 87   | 1730                                                                                                               | <b>1 - 2 D</b> |     |                                             |                |  |
| Type                         | Size      | c                        | $d_2$                      | $D_3$          | $k_2$         | n × s   | t    | $G_7$                                                                                                              | $l$            | $l$ | kg                                          | Flanged shaft  |  |
| <b>B3FV</b>                  | <b>9</b>  | 38                       | 430                        | 220            | 380           | 20 × 26 | 12   | 350                                                                                                                | 96             | 48  | 975                                         | <b>0 - 8 E</b> |  |
|                              | <b>10</b> | 38                       | 470                        | 240            | 420           | 22 × 26 | 12   | 350                                                                                                                | 105            | 52  | 1110                                        | <b>1 - 0 E</b> |  |
|                              | <b>11</b> | 42                       | 510                        | 260            | 450           | 18 × 33 | 12   | 400                                                                                                                | 155            | 77  | 1585                                        | <b>1 - 1 E</b> |  |
|                              | <b>12</b> | 42                       | 540                        | 280            | 480           | 22 × 33 | 12   | 400                                                                                                                | 175            | 87  | 1870                                        | <b>1 - 2 E</b> |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

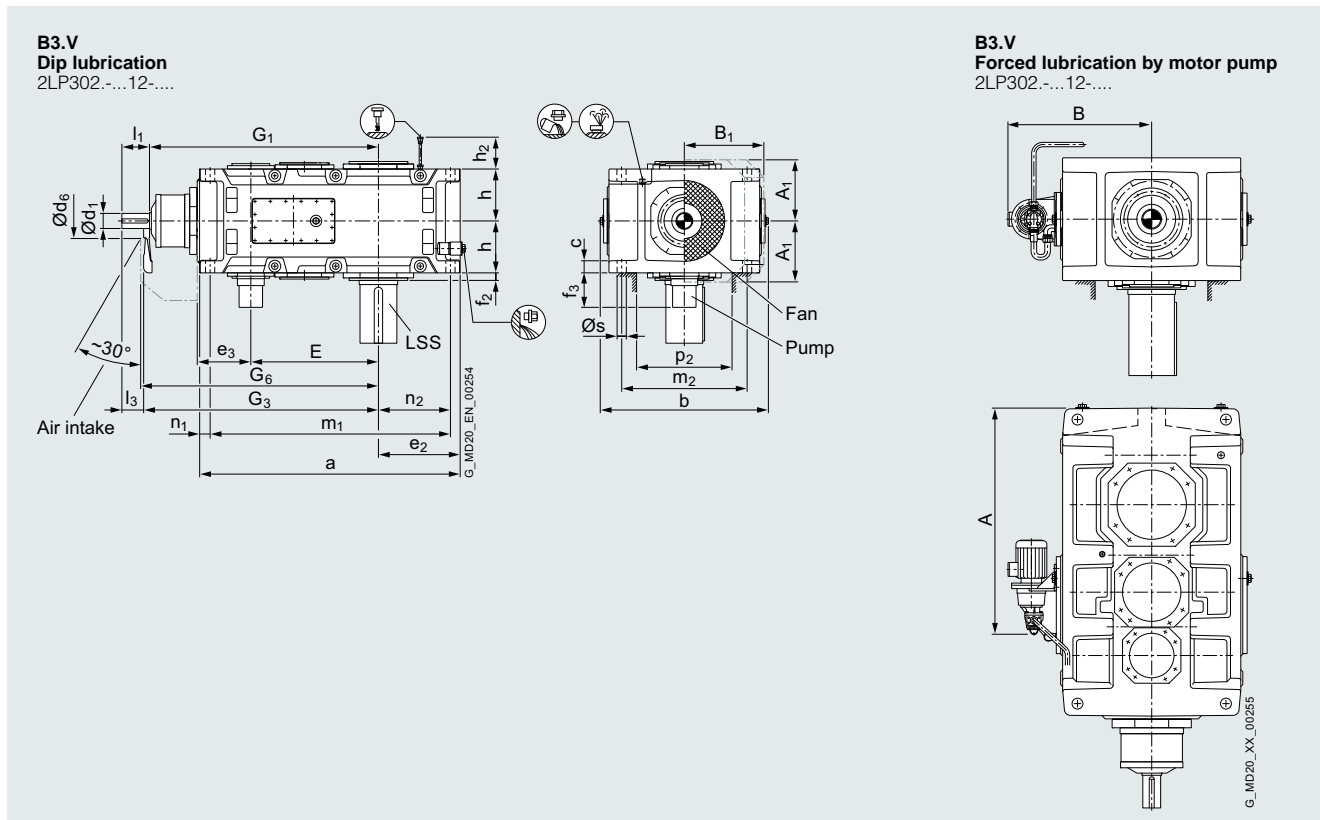
<sup>4)</sup> Shaft version with reinforced bearing, see page 9/7.

# Bevel helical gear units vertical mounting position

Type B3

Gear unit dimensions, three-stage, gear unit sizes 13 to 18

## Selection and ordering data



| Gear unit size | Dimensions in mm       |        |       |       |                  |       |       |       |       |       |       |       |       |       |
|----------------|------------------------|--------|-------|-------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                | High speed shaft (HSS) |        |       |       |                  |       |       |       |       | Fan   |       |       |       |       |
|                | $i_N$                  | $d_1$  | $l_1$ | $l_3$ | Reinforced shaft |       |       |       | $G_1$ | $G_3$ | $A_1$ | $B_1$ | $d_6$ | $G_6$ |
|                |                        |        |       |       | $i_N$            | $d_1$ | $l_1$ | $l_3$ |       |       |       |       |       |       |
| 13             | 12.5 - 45              | 80 m6  | 165   | 130   | 50               | 80 m6 | 165   | 130   | 1125  | 1160  | 325   | 475   | 210   | 1080  |
|                | 50 - 71                | 60 m6  | 140   | 105   | 56 - 63          | 70 m6 | 140   | 105   |       |       |       |       |       |       |
| 14             | 16 - 56                | 80 m6  | 165   | 130   | 63               | 80 m6 | 165   | 130   | 1195  | 1230  | 325   | 475   | 210   | 1250  |
|                | 63 - 90                | 60 m6  | 140   | 105   | 70 - 80          | 70 m6 | 140   | 105   |       |       |       |       |       |       |
| 15             | 12.5 - 45              | 90 m6  | 165   | 130   | -                | -     | -     | -     | 1367  | 1402  | 365   | 520   | 210   | 1420  |
|                | 50 - 71                | 70 m6  | 140   | 105   | -                | -     | -     | -     |       |       |       |       |       |       |
| 16             | 14 - 50                | 90 m6  | 165   | 130   | -                | -     | -     | -     | 1413  | 1448  | 365   | 520   | 210   | 1470  |
|                | 56 - 80                | 70 m6  | 140   | 105   | -                | -     | -     | -     |       |       |       |       |       |       |
| 17             | 12.5 - 45              | 110 n6 | 205   | 165   | -                | -     | -     | -     | 1560  | 1600  | 395   | 570   | 230   | 1620  |
|                | 50 - 71                | 80 m6  | 170   | 130   | -                | -     | -     | -     |       |       |       |       |       |       |
| 18             | 14 - 50                | 110 n6 | 205   | 165   | -                | -     | -     | -     | 1620  | 1660  | 395   | 570   | 230   | 1680  |
|                | 56 - 80                | 80 m6  | 170   | 130   | -                | -     | -     | -     |       |       |       |       |       |       |

| Gear unit size | a    | b    | c      | E   | $e_2$ | $e_3$ | $f_2$ | $f_3$ | h     | $h_2^{1)}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_2^{2)}$ | s  | A <sup>3)</sup> | B <sup>3)</sup> |
|----------------|------|------|--------|-----|-------|-------|-------|-------|-------|------------|-------|-------|-------|-------|------------|----|-----------------|-----------------|
| 13             | 1290 | 900  | 61 ± 2 | 635 | 405   | 265   | 35    | 170   | 272.5 | 300        | 1195  | 680   | 50    | 360   | 500        | 48 | 990             | 690             |
| 14             | 1430 | 900  | 61 ± 2 | 705 | 475   | 265   | 35    | 170   | 272.5 | 300        | 1335  | 680   | 50    | 430   | 500        | 48 | 1130            | 690             |
| 15             | 1550 | 980  | 72 ± 2 | 762 | 485   | 320   | 42    | 170   | 310   | 340        | 1435  | 750   | 60    | 430   | 570        | 55 | 1175            | 730             |
| 16             | 1640 | 980  | 72 ± 2 | 808 | 530   | 320   | 42    | 170   | 310   | 340        | 1525  | 750   | 60    | 475   | 570        | 55 | 1270            | 730             |
| 17             | 1740 | 1110 | 81 ± 2 | 860 | 525   | 370   | 42    | 170   | 340   | 380        | 1610  | 850   | 70    | 465   | 630        | 55 | 1265            | 790             |
| 18             | 1860 | 1110 | 81 ± 2 | 920 | 585   | 370   | 42    | 170   | 340   | 380        | 1730  | 850   | 70    | 525   | 630        | 55 | 1385            | 790             |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

1) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

2) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

3) Max. dimensions; details acc. to order-related documentation.

# Bevel helical gear units vertical mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 13 to 18

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                              |           |                          |         | Oil quantity<br>1) 2)                       | Weight<br>1) 2) | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |         |                                             |                              |      |         |  |               |
|------------------------------|-----------|--------------------------|---------|---------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------|------------------------------|------|---------|--|---------------|
|                              |           |                          |         | B3.V<br>Forced<br>lubrication               | B3.V            |                                                                                                                    |         |                                             |                              |      |         |  |               |
|                              |           |                          |         | Article No.: <b>2LP302</b> ■ - ■ ■ .12-.... |                 |                                                                                                                    |         |                                             |                              |      |         |  |               |
| Type                         | Size      | $d_2$                    | $l_2$   | $G_2$                                       | $l$             | kg                                                                                                                 |         | Solid shaft with parallel key <sup>4)</sup> |                              |      |         |  |               |
| <b>B3SV</b>                  | <b>13</b> | 200 n6                   | 350     | 335                                         | 115             | 2260                                                                                                               | 1 - 3 A |                                             |                              |      |         |  |               |
|                              | <b>14</b> | 210 n6                   | 350     | 335                                         | 130             | 2615                                                                                                               | 1 - 4 A |                                             |                              |      |         |  |               |
|                              | <b>15</b> | 230 n6                   | 410     | 380                                         | 180             | 3540                                                                                                               | 1 - 5 A |                                             |                              |      |         |  |               |
|                              | <b>16</b> | 240 n6                   | 410     | 380                                         | 190             | 3765                                                                                                               | 1 - 6 A |                                             |                              |      |         |  |               |
|                              | <b>17</b> | 250 n6                   | 410     | 415                                         | 260             | 4760                                                                                                               | 1 - 7 A |                                             |                              |      |         |  |               |
|                              | <b>18</b> | 270 n6                   | 470     | 415                                         | 275             | 5240                                                                                                               | 1 - 8 A |                                             |                              |      |         |  |               |
| Type                         | Size      | $D_2$                    | $G_4$   | $l$                                         | kg              |                                                                                                                    |         | Hollow shaft with keyway                    |                              |      |         |  |               |
| <b>B3HV</b>                  | <b>13</b> | 190 H7                   | 335     | 115                                         | 2260            | 1 - 3 B                                                                                                            |         |                                             |                              |      |         |  |               |
|                              | <b>14</b> | 210 H7                   | 335     | 130                                         | 2615            | 1 - 4 B                                                                                                            |         |                                             |                              |      |         |  |               |
|                              | <b>15</b> | 230 H7                   | 380     | 180                                         | 3540            | 1 - 5 B                                                                                                            |         |                                             |                              |      |         |  |               |
|                              | <b>16</b> | 240 H7                   | 380     | 190                                         | 3765            | 1 - 6 B                                                                                                            |         |                                             |                              |      |         |  |               |
|                              | <b>17</b> | 250 H7                   | 415     | 260                                         | 4760            | 1 - 7 B                                                                                                            |         |                                             |                              |      |         |  |               |
|                              | <b>18</b> | 275 H7                   | 415     | 275                                         | 5240            | 1 - 8 B                                                                                                            |         |                                             |                              |      |         |  |               |
| Type                         | Size      | $D_2$                    | $D_3$   | $G_4$                                       | $G_5$           | $l$                                                                                                                | kg      |                                             | Hollow shaft for shrink disk |      |         |  |               |
| <b>B3DV</b><br><sup>3)</sup> | <b>13</b> | 190 H7                   | 195     | 335                                         | 480             | 115                                                                                                                | 2260    | 1 - 3 C                                     |                              |      |         |  |               |
|                              | <b>14</b> | 210 H7                   | 215     | 335                                         | 480             | 130                                                                                                                | 2615    | 1 - 4 C                                     |                              |      |         |  |               |
|                              | <b>15</b> | 230 H7                   | 235     | 380                                         | 550             | 180                                                                                                                | 3540    | 1 - 5 C                                     |                              |      |         |  |               |
|                              | <b>16</b> | 240 H7                   | 245     | 380                                         | 550             | 190                                                                                                                | 3765    | 1 - 6 C                                     |                              |      |         |  |               |
|                              | <b>17</b> | 250 H7                   | 260     | 415                                         | 600             | 260                                                                                                                | 4760    | 1 - 7 C                                     |                              |      |         |  |               |
|                              | <b>18</b> | 280 H7                   | 285     | 415                                         | 600             | 275                                                                                                                | 5240    | 1 - 8 C                                     |                              |      |         |  |               |
| Type                         | Size      | N/DIN 5480               | $D_2$   | $D_3$                                       | $G_4$           | $l$                                                                                                                | kg      |                                             | Hollow shaft with spline     |      |         |  |               |
| <b>B3KV</b>                  | <b>13</b> | N 190 × 5 × 30 × 36 × 9H | 180 H11 | 195                                         | 335             | 115                                                                                                                | 2260    | 1 - 3 D                                     |                              |      |         |  |               |
|                              | <b>14</b> | N 190 × 5 × 30 × 36 × 9H | 180 H11 | 215                                         | 335             | 130                                                                                                                | 2615    | 1 - 4 D                                     |                              |      |         |  |               |
|                              | <b>15</b> | N 220 × 5 × 30 × 42 × 9H | 210 H11 | 235                                         | 380             | 180                                                                                                                | 3540    | 1 - 5 D                                     |                              |      |         |  |               |
|                              | <b>16</b> | N 220 × 5 × 30 × 42 × 9H | 210 H11 | 245                                         | 380             | 190                                                                                                                | 3765    | 1 - 6 D                                     |                              |      |         |  |               |
|                              | <b>17</b> | N 250 × 5 × 30 × 48 × 9H | 240 H11 | 260                                         | 415             | 260                                                                                                                | 4760    | 1 - 7 D                                     |                              |      |         |  |               |
|                              | <b>18</b> | N 250 × 5 × 30 × 48 × 9H | 240 H11 | 285                                         | 415             | 275                                                                                                                | 5240    | 1 - 8 D                                     |                              |      |         |  |               |
| Type                         | Size      | c                        | $d_2$   | $D_3$                                       | $k_2$           | $n \times s$                                                                                                       | t       | $G_7$                                       | $l$                          | kg   |         |  | Flanged shaft |
| <b>B3FV</b>                  | <b>13</b> | 48                       | 580     | 310                                         | 500             | 20 × 33                                                                                                            | 14      | 480                                         | 115                          | 2420 | 1 - 3 E |  |               |
|                              | <b>14</b> | 48                       | 620     | 310                                         | 540             | 24 × 33                                                                                                            | 14      | 480                                         | 130                          | 2785 | 1 - 4 E |  |               |
|                              | <b>15</b> | 55                       | 710     | 360                                         | 630             | 28 × 33                                                                                                            | 17      | 550                                         | 180                          | 3780 | 1 - 5 E |  |               |
|                              | <b>16</b> | 55                       | 740     | 360                                         | 660             | 30 × 33                                                                                                            | 17      | 550                                         | 190                          | 4020 | 1 - 6 E |  |               |
|                              | <b>17</b> | 60                       | 750     | 410                                         | 660             | 24 × 39                                                                                                            | 18      | 600                                         | 260                          | 5060 | 1 - 7 E |  |               |
|                              | <b>18</b> | 60                       | 800     | 410                                         | 710             | 26 × 39                                                                                                            | 18      | 600                                         | 275                          | 5590 | 1 - 8 E |  |               |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

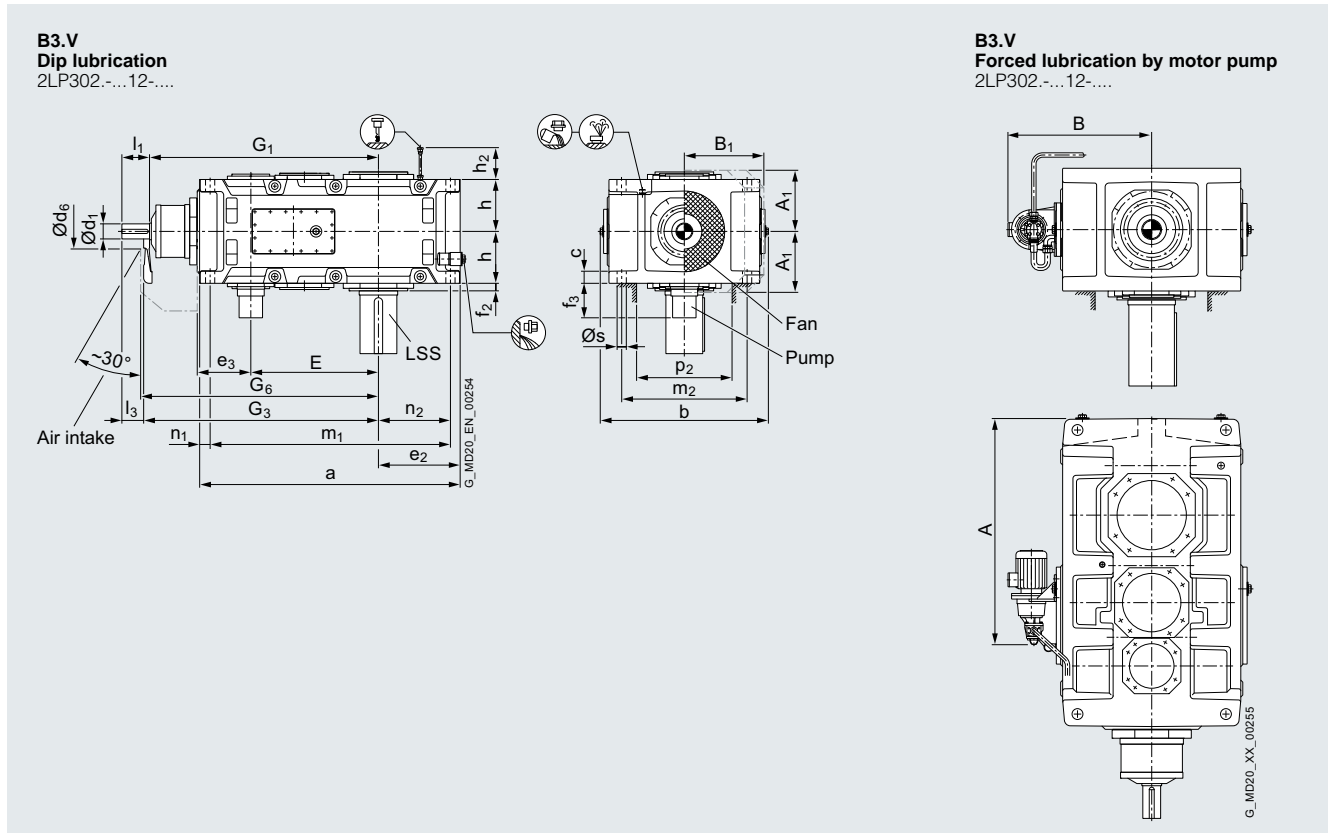
<sup>4)</sup> Shaft version with reinforced bearing, see page 9/7.

# Bevel helical gear units vertical mounting position

## Type B3

### Gear unit dimensions, three-stage, gear unit sizes 19 to 24

#### Selection and ordering data



| Gear unit size | Dimensions in mm       |                |                |                |                |                | Fan            |                |                |                |
|----------------|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                | High speed shaft (HSS) |                |                |                |                |                | A <sub>1</sub> | B <sub>1</sub> | d <sub>6</sub> | G <sub>6</sub> |
|                | i <sub>N</sub>         | d <sub>1</sub> | l <sub>1</sub> | l <sub>3</sub> | G <sub>1</sub> | G <sub>3</sub> |                |                |                |                |
| 19             | 12.5 - 45              | 130 n6         | 245            | 200            | 1832           | 1877           | On request     |                |                |                |
|                | 50 - 71                | 100 m6         | 210            | 165            |                |                |                |                |                |                |
| 20             | 14 - 50                | 130 n6         | 245            | 200            | 1892           | 1937           |                |                |                |                |
|                | 56 - 80                | 100 m6         | 210            | 165            |                |                |                |                |                |                |
| 21             | 12.5 - 45              | 130 n6         | 245            | 200            | 1902           | 1947           |                |                |                |                |
|                | 50 - 71                | 100 m6         | 210            | 165            |                |                |                |                |                |                |
| 22             | 14 - 50                | 130 n6         | 245            | 200            | 1957           | 2002           |                |                |                |                |
|                | 56 - 80                | 100 m6         | 210            | 165            |                |                |                |                |                |                |
| 23             | 20 - 45                | 150 n6         | 245            | 200            | 2130           | 2175           |                |                |                |                |
|                | 50 - 71                | 110 n6         | 210            | 165            |                |                |                |                |                |                |
| 24             | 22.4 - 50              | 150 n6         | 245            | 200            | 2195           | 2240           |                |                |                |                |
|                | 56 - 80                | 110 n6         | 210            | 165            |                |                |                |                |                |                |

| Gear unit size | Dimensions in mm |      |        |      |                |                |                |                |     |                              |                |                |                |                |                              |    |            |   |
|----------------|------------------|------|--------|------|----------------|----------------|----------------|----------------|-----|------------------------------|----------------|----------------|----------------|----------------|------------------------------|----|------------|---|
|                | a                | b    | c      | E    | e <sub>2</sub> | e <sub>3</sub> | f <sub>2</sub> | f <sub>3</sub> | h   | h <sub>2</sub> <sup>1)</sup> | m <sub>1</sub> | m <sub>2</sub> | n <sub>1</sub> | n <sub>2</sub> | p <sub>2</sub> <sup>1)</sup> | s  | A          | B |
| 19             | 2010             | 1222 | 91 ±2  | 997  | 590            | 420            | 55             | On request     | 390 | 380                          | 1865           | 950            | On request     | 520            | 700                          | 65 | On request |   |
| 20             | 2130             | 1222 | 91 ±2  | 1057 | 650            | 420            | 55             | 390            | 380 | 1985                         | 950            | 580            | 700            | 65             |                              |    |            |   |
| 21             | 2140             | 1378 | 100 ±2 | 1067 | 655            | 450            | 60             | 410            | 390 | 1985                         | 1040           | 585            | 720            | 75             |                              |    |            |   |
| 22             | 2250             | 1378 | 100 ±2 | 1122 | 710            | 450            | 60             | 410            | 390 | 2095                         | 1040           | 640            | 720            | 75             |                              |    |            |   |
| 23             | On request       |      |        |      |                |                |                |                |     |                              |                |                |                |                |                              |    |            |   |
| 24             |                  |      |        |      |                |                |                |                |     |                              |                |                |                |                |                              |    |            |   |

Shaft seals, [see page 10/2 onwards](#).

For details on the shafts, [see Chapter 9](#).

<sup>1)</sup> Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

## Bevel helical gear units vertical mounting position Type B3

### Gear unit dimensions, three-stage, gear unit sizes 19 to 24

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                   |      |                |                | Oil quantity B3.V Dip lubrication | Oil quantity B3.V Forced lubrication | Weight B3.V   | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |                 |   |   |    |         |
|-------------------|------|----------------|----------------|-----------------------------------|--------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------|-----------------|---|---|----|---------|
|                   |      |                |                | Article No.:                      |                                      | <b>2LP302</b> | -                                                                                                                  | <b>.12-....</b> |   |   |    |         |
| Type              | Size | d <sub>2</sub> | l <sub>2</sub> | G <sub>2</sub>                    | l                                    | l             | kg                                                                                                                 |                 |   |   |    |         |
| <b>B3SV</b>       | 19   | On request     |                |                                   |                                      |               |                                                                                                                    | 2 - 0 A         |   |   |    |         |
|                   | 20   |                |                |                                   |                                      |               |                                                                                                                    | 2 - 1 A         |   |   |    |         |
|                   | 21   |                |                |                                   |                                      |               |                                                                                                                    | 2 - 2 A         |   |   |    |         |
|                   | 22   |                |                |                                   |                                      |               |                                                                                                                    | 2 - 3 A         |   |   |    |         |
|                   | 23   |                |                |                                   |                                      |               |                                                                                                                    | 2 - 4 A         |   |   |    |         |
|                   | 24   |                |                |                                   |                                      |               |                                                                                                                    | 2 - 5 A         |   |   |    |         |
|                   |      |                |                |                                   |                                      |               |                                                                                                                    |                 |   |   |    |         |
| Type              | Size | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub>                    | G <sub>5</sub>                       | l             | l                                                                                                                  | kg              |   |   |    |         |
| <b>B3DV</b><br>1) | 19   | 285 H7         | 295            | 465                               | 670                                  | On request    |                                                                                                                    | 2 - 0 C         |   |   |    |         |
|                   | 20   | 310 H7         | 315            | 465                               | 670                                  |               |                                                                                                                    | 2 - 1 C         |   |   |    |         |
|                   | 21   | 330 H7         | 335            | 490                               | 715                                  |               |                                                                                                                    | 2 - 2 C         |   |   |    |         |
|                   | 22   | 340 H7         | 345            | 490                               | 725                                  |               |                                                                                                                    | 2 - 3 C         |   |   |    |         |
|                   | 23   | 370 H7         | 375            | 540                               | 800                                  |               |                                                                                                                    | 2 - 4 C         |   |   |    |         |
|                   | 24   | 390 H7         | 395            | 540                               | 820                                  |               |                                                                                                                    | 2 - 5 C         |   |   |    |         |
|                   |      |                |                |                                   |                                      |               |                                                                                                                    |                 |   |   |    |         |
| Type              | Size | N/DIN 5480     | D <sub>2</sub> | D <sub>3</sub>                    | G <sub>4</sub>                       | l             | l                                                                                                                  | kg              |   |   |    |         |
| <b>B3KV</b>       | 19   | On request     |                |                                   |                                      |               |                                                                                                                    | 2 - 0 D         |   |   |    |         |
|                   | 20   |                |                |                                   |                                      |               |                                                                                                                    | 2 - 1 D         |   |   |    |         |
|                   | 21   |                |                |                                   |                                      |               |                                                                                                                    | 2 - 2 D         |   |   |    |         |
|                   | 22   |                |                |                                   |                                      |               |                                                                                                                    | 2 - 3 D         |   |   |    |         |
|                   |      |                |                |                                   |                                      |               |                                                                                                                    |                 |   |   |    |         |
| Type              | Size | c              | d <sub>2</sub> | D <sub>3</sub>                    | k <sub>2</sub>                       | n x s         | t                                                                                                                  | G <sub>7</sub>  | l | l | kg |         |
| <b>B3FV</b>       | 19   | On request     |                |                                   |                                      |               |                                                                                                                    |                 |   |   |    | 2 - 0 E |
|                   | 20   |                |                |                                   |                                      |               |                                                                                                                    |                 |   |   |    | 2 - 1 E |
|                   | 21   |                |                |                                   |                                      |               |                                                                                                                    |                 |   |   |    | 2 - 2 E |
|                   | 22   |                |                |                                   |                                      |               |                                                                                                                    |                 |   |   |    | 2 - 3 E |
|                   |      |                |                |                                   |                                      |               |                                                                                                                    |                 |   |   |    |         |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

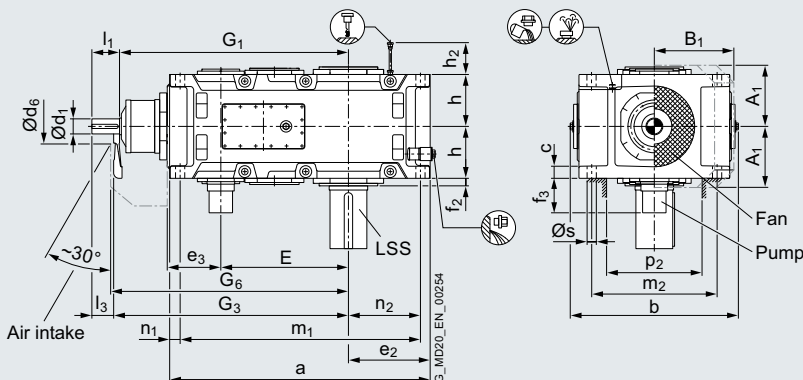
# Bevel helical gear units vertical mounting position

Type B3

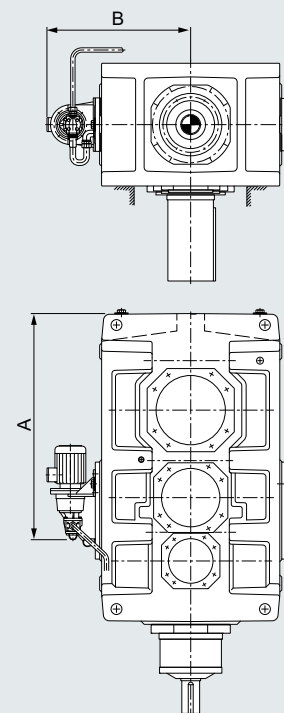
Gear unit dimensions, three-stage, gear unit sizes 25 and 26

## Selection and ordering data

**B3.V**  
Dip lubrication  
2LP302-...12-...



**B3.V**  
Forced lubrication by motor pump  
2LP302-...12-...



| Gear unit size | Dimensions in mm |        |       |       |       |       | Fan        |       |       |       |            |  |  |  |
|----------------|------------------|--------|-------|-------|-------|-------|------------|-------|-------|-------|------------|--|--|--|
|                | $i_N$            | $d_1$  | $l_1$ | $l_3$ | $G_1$ | $G_3$ | $A_1$      | $B_1$ | $d_6$ | $G_6$ |            |  |  |  |
| 25             | 20 - 40          | 160 n6 | 295   | 240   | 2375  | 2430  | On request |       |       |       |            |  |  |  |
|                | 45 - 71          | 120 n6 | 220   | 165   |       |       |            |       |       |       |            |  |  |  |
| 26             | 22.4 - 45        | 160 n6 | 295   | 240   | 2465  | 2520  |            |       |       |       | On request |  |  |  |
|                | 50 - 80          | 120 n6 | 220   | 165   |       |       |            |       |       |       |            |  |  |  |

| Gear unit size | Dimensions in mm |   |   |   |       |       |       |   |       |       |       |       |       |   |   |   |
|----------------|------------------|---|---|---|-------|-------|-------|---|-------|-------|-------|-------|-------|---|---|---|
|                | a                | b | c | E | $e_2$ | $e_3$ | $f_2$ | h | $h_2$ | $m_1$ | $m_2$ | $n_2$ | $p_2$ | s | A | B |
| 25             | On request       |   |   |   |       |       |       |   |       |       |       |       |       |   |   |   |
| 26             | On request       |   |   |   |       |       |       |   |       |       |       |       |       |   |   |   |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.



## Bevel helical gear units vertical mounting position Type B3

### Gear unit dimensions, three-stage, gear unit sizes 25 and 26

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                   |           |            |       | Oil quantity B3.V Dip lubrication | Oil quantity B3.V Forced lubrication | Weight B3.V  | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |         |                               |
|-------------------|-----------|------------|-------|-----------------------------------|--------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------|---------|-------------------------------|
|                   |           |            |       |                                   |                                      | Article No.: | <b>2LP302</b> ■ - ■ ■ .12-....                                                                                     |         |                               |
| Type              | Size      | $d_2$      | $l_2$ | $G_2$                             |                                      | kg           |                                                                                                                    |         | Solid shaft with parallel key |
| <b>B3SV</b>       | <b>25</b> | On request |       |                                   |                                      |              | 2 - 6 A                                                                                                            |         |                               |
|                   | <b>26</b> |            |       |                                   |                                      |              | 2 - 7 A                                                                                                            |         |                               |
| Type              | Size      | $D_2$      | $D_3$ | $G_4$                             | $G_5$                                |              | kg                                                                                                                 |         | Hollow shaft for shrink disk  |
| <b>B3DV</b><br>1) | <b>25</b> | 410 H7     | 415   | 610                               | 895                                  | On request   |                                                                                                                    | 2 - 6 C |                               |
|                   | <b>26</b> | 430 H7     | 435   | 610                               | 925                                  |              |                                                                                                                    | 2 - 7 C |                               |



Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

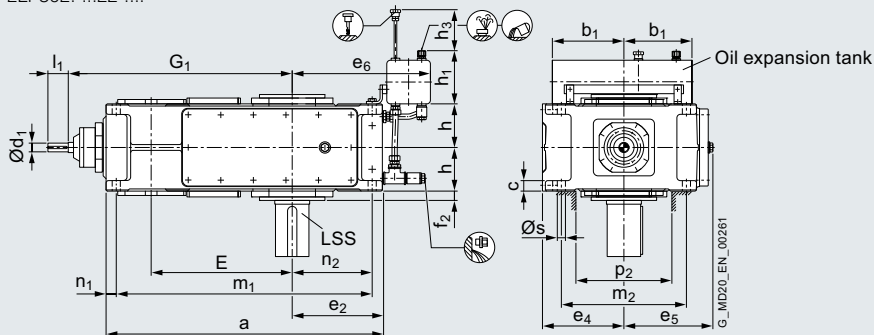
# Bevel helical gear units vertical mounting position

Type B4

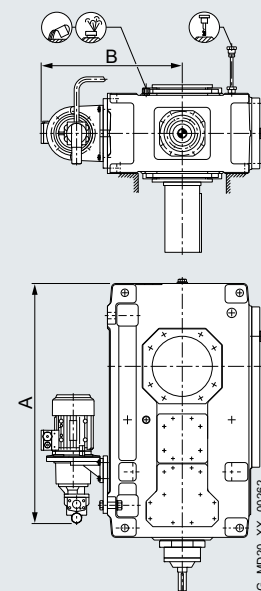
Gear unit dimensions, four-stage, gear unit sizes 5 to 8

## Selection and ordering data

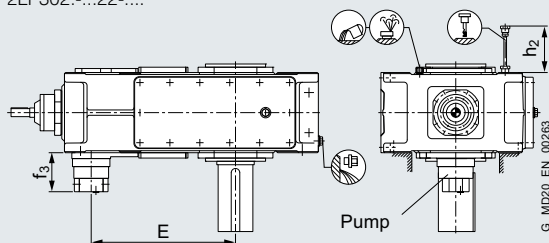
**B4.V**  
Dip lubrication  
2LP302-...22-....



**B4.V**  
Forced lubrication  
by motor pump  
2LP302-...22-....



**B4.V**  
Forced lubrication  
by flange-mounted pump  
2LP302-...22-....



| Gear unit size | Dimensions in mm       |       |       |                  |       |       |       |
|----------------|------------------------|-------|-------|------------------|-------|-------|-------|
|                | High speed shaft (HSS) |       |       | Reinforced shaft |       |       |       |
|                | $i_N$                  | $d_1$ | $l_1$ | $i_N$            | $d_1$ | $l_1$ | $G_1$ |
| 5              | 80 - 180               | 28 m6 | 55    | -                | -     | -     | 615   |
|                | 200 - 315              | 20 k6 | 50    | -                | -     | -     |       |
| 6              | 100 - 224              | 28 m6 | 55    | -                | -     | -     | 650   |
|                | 250 - 400              | 20 k6 | 50    | -                | -     | -     |       |
| 7              | 80 - 180               | 30 m6 | 70    | 160 - 200        | 35 m6 | 80    | 725   |
|                | 200 - 315              | 25 k6 | 60    | 224 - 250        | 32 m6 | 70    |       |
| 8              | 100 - 224              | 30 m6 | 70    | 200 - 250        | 35 m6 | 80    | 770   |
|                | 250 - 400              | 25 k6 | 60    | 280 - 315        | 32 m6 | 70    |       |

| Gear unit size | Dimensions in mm |       |        |     |       |       |       |       |       |       |       |       |            |       |       |       |       |       |            |       |                 |                 |
|----------------|------------------|-------|--------|-----|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|-------|-------|-------|------------|-------|-----------------|-----------------|
|                | a                | $b_1$ | c      | E   | $e_2$ | $e_4$ | $e_5$ | $e_6$ | $f_2$ | $f_3$ | h     | $h_1$ | $h_2^{1)}$ | $h_3$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_2^{2)}$ | s     | A <sup>3)</sup> | B <sup>3)</sup> |
| 5              | 690              | 240   | 30 ± 1 | 405 | 205   | 230   | 252   | 385   | 28    | 200   | 127.5 | 205   | 190        | 240   | 630   | 360   | 30    | 175   | 270        | 24 H9 | 660             | 480             |
| 6              | 770              | 240   | 30 ± 1 | 440 | 250   | 230   | 252   | 425   | 28    | 200   | 127.5 | 205   | 190        | 240   | 710   | 360   | 30    | 220   | 270        | 24 H9 | 740             | 480             |
| 7              | 845              | 240   | 36 ± 1 | 495 | 250   | 280   | 292   | 425   | 30    | 120   | 150   | 205   | 165        | 250   | 775   | 430   | 35    | 215   | 330        | 28 H9 | 800             | 530             |
| 8              | 950              | 240   | 36 ± 1 | 540 | 310   | 280   | 302   | 485   | 32    | 120   | 150   | 205   | 165        | 250   | 880   | 430   | 35    | 275   | 330        | 28 H9 | 905             | 530             |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

1) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

2) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

3) Max. dimensions; details acc. to order-related documentation.

# Bevel helical gear units vertical mounting position

## Type B4

### Gear unit dimensions, four-stage, gear unit sizes 5 to 8

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                              |      |                          |         | Oil quantity<br>1)      | Oil quantity<br>1)         | Weight<br>1)2) |     |       | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |                                             |     |   |       |               |
|------------------------------|------|--------------------------|---------|-------------------------|----------------------------|----------------|-----|-------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----|---|-------|---------------|
|                              |      |                          |         | B4.V<br>Dip lubrication | B4.V<br>Forced lubrication | B4.V           |     |       |                                                                                                                    |                                             |     |   |       |               |
|                              |      |                          |         | Article No.:            |                            | 2LP302         | -   | ■     | ■                                                                                                                  | .22-....                                    |     |   |       |               |
| Type                         | Size | $d_2$                    | $l_2$   | $G_2$                   | $l$                        | $l$            | kg  |       |                                                                                                                    | Solid shaft with parallel key <sup>4)</sup> |     |   |       |               |
| <b>B4SV</b>                  | 5    | 100 m6                   | 210     | 165                     | 36                         | 18             | 335 | 0     | - 4 A                                                                                                              |                                             |     |   |       |               |
|                              | 6    | 110 n6                   | 210     | 165                     | 40                         | 20             | 385 | 0     | - 5 A                                                                                                              |                                             |     |   |       |               |
|                              | 7    | 120 n6                   | 210     | 195                     | 65                         | 32             | 555 | 0     | - 6 A                                                                                                              |                                             |     |   |       |               |
|                              | 8    | 130 n6                   | 250     | 195                     | 73                         | 36             | 655 | 0     | - 7 A                                                                                                              |                                             |     |   |       |               |
| Type                         | Size | $D_2$                    | $G_4$   |                         | $l$                        | $l$            | kg  |       |                                                                                                                    | Hollow shaft with keyway                    |     |   |       |               |
| <b>B4HV</b>                  | 5    | 95 H7                    | 165     |                         | 36                         | 18             | 335 | 0     | - 4 B                                                                                                              |                                             |     |   |       |               |
|                              | 6    | 105 H7                   | 165     |                         | 40                         | 20             | 385 | 0     | - 5 B                                                                                                              |                                             |     |   |       |               |
|                              | 7    | 115 H7                   | 195     |                         | 65                         | 32             | 555 | 0     | - 6 B                                                                                                              |                                             |     |   |       |               |
|                              | 8    | 125 H7                   | 195     |                         | 73                         | 36             | 655 | 0     | - 7 B                                                                                                              |                                             |     |   |       |               |
| Type                         | Size | $D_2$                    | $D_3$   | $G_4$                   | $G_5$                      | $l$            | $l$ | kg    |                                                                                                                    | Hollow shaft for shrink disk                |     |   |       |               |
| <b>B4DV</b><br><sup>3)</sup> | 5    | 100 H7                   | 100     | 165                     | 240                        | 36             | 18  | 335   | 0                                                                                                                  | - 4 C                                       |     |   |       |               |
|                              | 6    | 110 H7                   | 110     | 165                     | 240                        | 40             | 20  | 385   | 0                                                                                                                  | - 5 C                                       |     |   |       |               |
|                              | 7    | 120 H7                   | 120     | 195                     | 280                        | 65             | 32  | 555   | 0                                                                                                                  | - 6 C                                       |     |   |       |               |
|                              | 8    | 130 H7                   | 130     | 195                     | 285                        | 73             | 36  | 655   | 0                                                                                                                  | - 7 C                                       |     |   |       |               |
| Type                         | Size | N/DIN 5480               | $D_2$   | $D_3$                   | $G_4$                      | $l$            | $l$ | kg    |                                                                                                                    | Hollow shaft with spline                    |     |   |       |               |
| <b>B4KV</b>                  | 5    | N 95 × 3 × 30 × 30 × 9H  | 89 H11  | 100                     | 165                        | 36             | 18  | 335   | 0                                                                                                                  | - 4 D                                       |     |   |       |               |
|                              | 6    | N 95 × 3 × 30 × 30 × 9H  | 89 H11  | 110                     | 165                        | 40             | 20  | 385   | 0                                                                                                                  | - 5 D                                       |     |   |       |               |
|                              | 7    | N 120 × 3 × 30 × 38 × 9H | 114 H11 | 120                     | 195                        | 65             | 32  | 555   | 0                                                                                                                  | - 6 D                                       |     |   |       |               |
|                              | 8    | N 120 × 3 × 30 × 38 × 9H | 114 H11 | 130                     | 195                        | 73             | 36  | 655   | 0                                                                                                                  | - 7 D                                       |     |   |       |               |
| Type                         | Size | c                        | $d_2$   | $D_3$                   | $k_2$                      | $n \times s$   | t   | $G_7$ | $l$                                                                                                                | $l$                                         | kg  |   |       | Flanged shaft |
| <b>B4FV</b>                  | 5    | 25                       | 300     | 150                     | 260                        | 16 × 22        | 10  | 255   | 36                                                                                                                 | 18                                          | 335 | 0 | - 4 E |               |
|                              | 6    | 25                       | 320     | 160                     | 280                        | 18 × 22        | 10  | 255   | 40                                                                                                                 | 20                                          | 385 | 0 | - 5 E |               |
|                              | 7    | 30                       | 370     | 180                     | 320                        | 16 × 26        | 10  | 300   | 65                                                                                                                 | 32                                          | 555 | 0 | - 6 E |               |
|                              | 8    | 30                       | 390     | 190                     | 340                        | 18 × 26        | 10  | 300   | 73                                                                                                                 | 36                                          | 655 | 0 | - 7 E |               |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Approximate values; exact data acc. to order-related documentation.

<sup>2)</sup> Without oil filling.

<sup>3)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

<sup>4)</sup> Shaft version with reinforced bearing, see page 9/7.

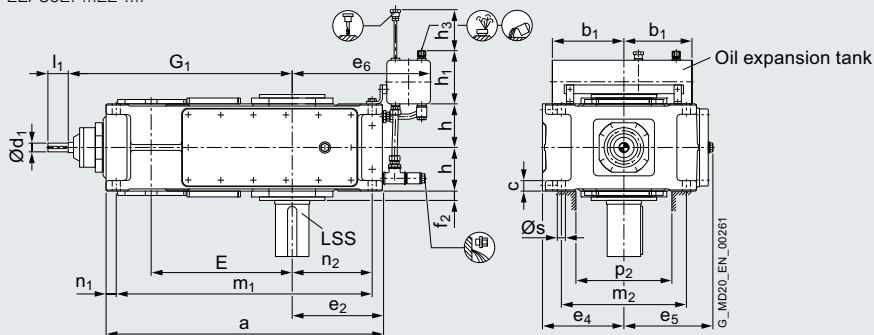
# Bevel helical gear units vertical mounting position

Type B4

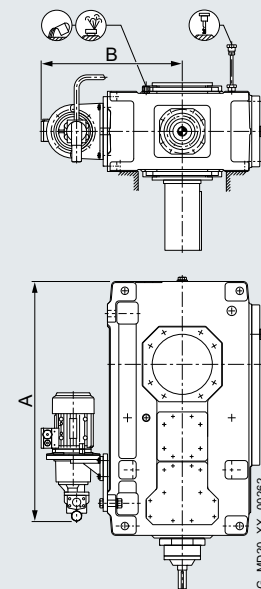
## Gear unit dimensions, four-stage, gear unit sizes 9 to 12

### Selection and ordering data

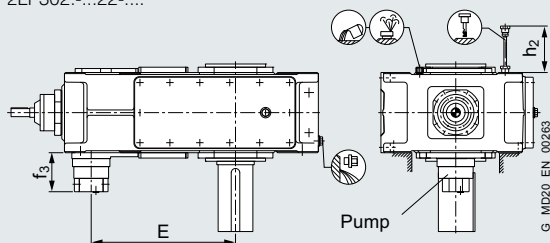
**B4.V**  
Dip lubrication  
2LP302-...22-....



**B4.V**  
Forced lubrication  
by motor pump  
2LP302-...22-....



**B4.V**  
Forced lubrication  
by flange-mounted pump  
2LP302-...22-....



| Gear unit size | Dimensions in mm       |       |       |           |       |       |       |  |                  |  |  |  |  |  |  |  |
|----------------|------------------------|-------|-------|-----------|-------|-------|-------|--|------------------|--|--|--|--|--|--|--|
|                | High speed shaft (HSS) |       |       |           |       |       |       |  | Reinforced shaft |  |  |  |  |  |  |  |
|                | $i_N$                  | $d_1$ | $l_1$ | $i_N$     | $d_1$ | $l_1$ | $G_1$ |  |                  |  |  |  |  |  |  |  |
| 9              | 80 - 180               | 35 m6 | 80    | 125 - 200 | 40 m6 | 90    | 840   |  |                  |  |  |  |  |  |  |  |
|                | 200 - 315              | 28 m6 | 60    | 224 - 250 | 35 m6 | 80    |       |  |                  |  |  |  |  |  |  |  |
| 10             | 100 - 224              | 35 m6 | 80    | 160 - 250 | 40 m6 | 90    | 890   |  |                  |  |  |  |  |  |  |  |
|                | 250 - 400              | 28 m6 | 60    | 280 - 315 | 35 m6 | 80    |       |  |                  |  |  |  |  |  |  |  |
| 11             | 80 - 180               | 45 m6 | 100   | 125 - 200 | 50 m6 | 110   | 1010  |  |                  |  |  |  |  |  |  |  |
|                | 200 - 315              | 35 m6 | 80    | 224 - 250 | 40 m6 | 90    |       |  |                  |  |  |  |  |  |  |  |
| 12             | 100 - 224              | 45 m6 | 100   | 160 - 250 | 50 m6 | 110   | 1080  |  |                  |  |  |  |  |  |  |  |
|                | 250 - 400              | 35 m6 | 80    | 280 - 315 | 40 m6 | 90    |       |  |                  |  |  |  |  |  |  |  |

| Gear unit size | Dimensions in mm |       |          |     |       |       |       |       |       |       |     |       |             |       |       |       |       |       |             |       |                  |                  |
|----------------|------------------|-------|----------|-----|-------|-------|-------|-------|-------|-------|-----|-------|-------------|-------|-------|-------|-------|-------|-------------|-------|------------------|------------------|
|                | a                | $b_1$ | c        | E   | $e_2$ | $e_4$ | $e_5$ | $e_6$ | $f_2$ | $f_3$ | h   | $h_1$ | $h_2^{(1)}$ | $h_3$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_2^{(2)}$ | s     | A <sup>(3)</sup> | B <sup>(3)</sup> |
| 9              | 1000             | 330   | 45 ± 1.5 | 580 | 300   | 320   | 342   | 560   | 32    | 120   | 185 | 275   | 205         | 330   | 920   | 490   | 40    | 260   | 370         | 36 H9 | 785              | 570              |
| 10             | 1100             | 330   | 45 ± 1.5 | 630 | 350   | 320   | 342   | 610   | 32    | 120   | 185 | 275   | 205         | 330   | 1020  | 490   | 40    | 310   | 370         | 36 H9 | 885              | 570              |
| 11             | 1200             | 330   | 54 ± 1.5 | 705 | 345   | 380   | 402   | 595   | 35    | 130   | 215 | 275   | 240         | 340   | 1100  | 600   | 50    | 295   | 440         | 40 H9 | 915              | 630              |
| 12             | 1355             | 330   | 54 ± 1.5 | 775 | 430   | 380   | 410   | 680   | 35    | 130   | 215 | 275   | 240         | 340   | 1255  | 600   | 50    | 380   | 440         | 40 H9 | 1070             | 630              |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

1) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

2) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

3) Max. dimensions; details acc. to order-related documentation.

# Bevel helical gear units vertical mounting position

## Type B4

### Gear unit dimensions, four-stage, gear unit sizes 9 to 12

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                   |           |                          |         | Oil quantity<br>1)      | Oil quantity<br>1)         | Weight<br>1)2) |      |          | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |                                  |      |   |       |               |
|-------------------|-----------|--------------------------|---------|-------------------------|----------------------------|----------------|------|----------|--------------------------------------------------------------------------------------------------------------------|----------------------------------|------|---|-------|---------------|
|                   |           |                          |         | B4.V<br>Dip lubrication | B4.V<br>Forced lubrication | B4.V           |      |          |                                                                                                                    |                                  |      |   |       |               |
|                   |           |                          |         | Article No.:            |                            | 2LP302         | -    | .22-.... |                                                                                                                    |                                  |      |   |       |               |
| Type              | Size      | $d_2$                    | $l_2$   | $G_2$                   | $l$                        | $l$            | kg   |          |                                                                                                                    | Solid shaft with parallel key 4) |      |   |       |               |
| <b>B4SV</b>       | <b>9</b>  | 140 n6                   | 250     | 235                     | 105                        | 52             | 890  | 0        | - 8 A                                                                                                              |                                  |      |   |       |               |
|                   | <b>10</b> | 160 n6                   | 300     | 235                     | 110                        | 55             | 1025 | 1        | - 0 A                                                                                                              |                                  |      |   |       |               |
|                   | <b>11</b> | 170 n6                   | 300     | 270                     | 175                        | 87             | 1485 | 1        | - 1 A                                                                                                              |                                  |      |   |       |               |
|                   | <b>12</b> | 180 n6                   | 300     | 270                     | 200                        | 100            | 1750 | 1        | - 2 A                                                                                                              |                                  |      |   |       |               |
| Type              | Size      | $D_2$                    | $G_4$   |                         | $l$                        | $l$            | kg   |          |                                                                                                                    | Hollow shaft with keyway         |      |   |       |               |
| <b>B4HV</b>       | <b>9</b>  | 135 H7                   | 235     |                         | 105                        | 52             | 890  | 0        | - 8 B                                                                                                              |                                  |      |   |       |               |
|                   | <b>10</b> | 150 H7                   | 235     |                         | 110                        | 55             | 1025 | 1        | - 0 B                                                                                                              |                                  |      |   |       |               |
|                   | <b>11</b> | 165 H7                   | 270     |                         | 175                        | 87             | 1485 | 1        | - 1 B                                                                                                              |                                  |      |   |       |               |
|                   | <b>12</b> | 180 H7                   | 270     |                         | 200                        | 100            | 1750 | 1        | - 2 B                                                                                                              |                                  |      |   |       |               |
| Type              | Size      | $D_2$                    | $D_3$   | $G_4$                   | $G_5$                      | $l$            | $l$  | kg       |                                                                                                                    | Hollow shaft for shrink disk     |      |   |       |               |
| <b>B4DV</b><br>3) | <b>9</b>  | 140 H7                   | 145     | 235                     | 330                        | 105            | 52   | 890      | 0                                                                                                                  | - 8 C                            |      |   |       |               |
|                   | <b>10</b> | 150 H7                   | 155     | 235                     | 350                        | 110            | 55   | 1025     | 1                                                                                                                  | - 0 C                            |      |   |       |               |
|                   | <b>11</b> | 165 H7                   | 170     | 270                     | 400                        | 175            | 87   | 1485     | 1                                                                                                                  | - 1 C                            |      |   |       |               |
|                   | <b>12</b> | 180 H7                   | 185     | 270                     | 405                        | 200            | 100  | 1750     | 1                                                                                                                  | - 2 C                            |      |   |       |               |
| Type              | Size      | N/DIN 5480               | $D_2$   | $D_3$                   | $G_4$                      | $l$            | $l$  | kg       |                                                                                                                    | Hollow shaft with spline         |      |   |       |               |
| <b>B4KV</b>       | <b>9</b>  | N 140 × 3 × 30 × 45 × 9H | 134 H11 | 145                     | 235                        | 105            | 52   | 890      | 0                                                                                                                  | - 8 D                            |      |   |       |               |
|                   | <b>10</b> | N 140 × 3 × 30 × 45 × 9H | 134 H11 | 155                     | 235                        | 110            | 55   | 1025     | 1                                                                                                                  | - 0 D                            |      |   |       |               |
|                   | <b>11</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11 | 170                     | 270                        | 175            | 87   | 1485     | 1                                                                                                                  | - 1 D                            |      |   |       |               |
|                   | <b>12</b> | N 170 × 5 × 30 × 32 × 9H | 160 H11 | 185                     | 270                        | 200            | 100  | 1750     | 1                                                                                                                  | - 2 D                            |      |   |       |               |
| Type              | Size      | c                        | $d_2$   | $D_3$                   | $k_2$                      | $n \times s$   | t    | $G_7$    | $l$                                                                                                                | $l$                              | kg   |   |       | Flanged shaft |
| <b>B4FV</b>       | <b>9</b>  | 38                       | 430     | 220                     | 380                        | 20 × 26        | 12   | 350      | 105                                                                                                                | 52                               | 890  | 0 | - 8 E |               |
|                   | <b>10</b> | 38                       | 470     | 240                     | 420                        | 22 × 26        | 12   | 350      | 110                                                                                                                | 55                               | 1025 | 1 | - 0 E |               |
|                   | <b>11</b> | 42                       | 510     | 260                     | 450                        | 18 × 33        | 12   | 400      | 175                                                                                                                | 87                               | 1485 | 1 | - 1 E |               |
|                   | <b>12</b> | 42                       | 540     | 280                     | 480                        | 22 × 33        | 12   | 400      | 200                                                                                                                | 100                              | 1750 | 1 | - 2 E |               |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

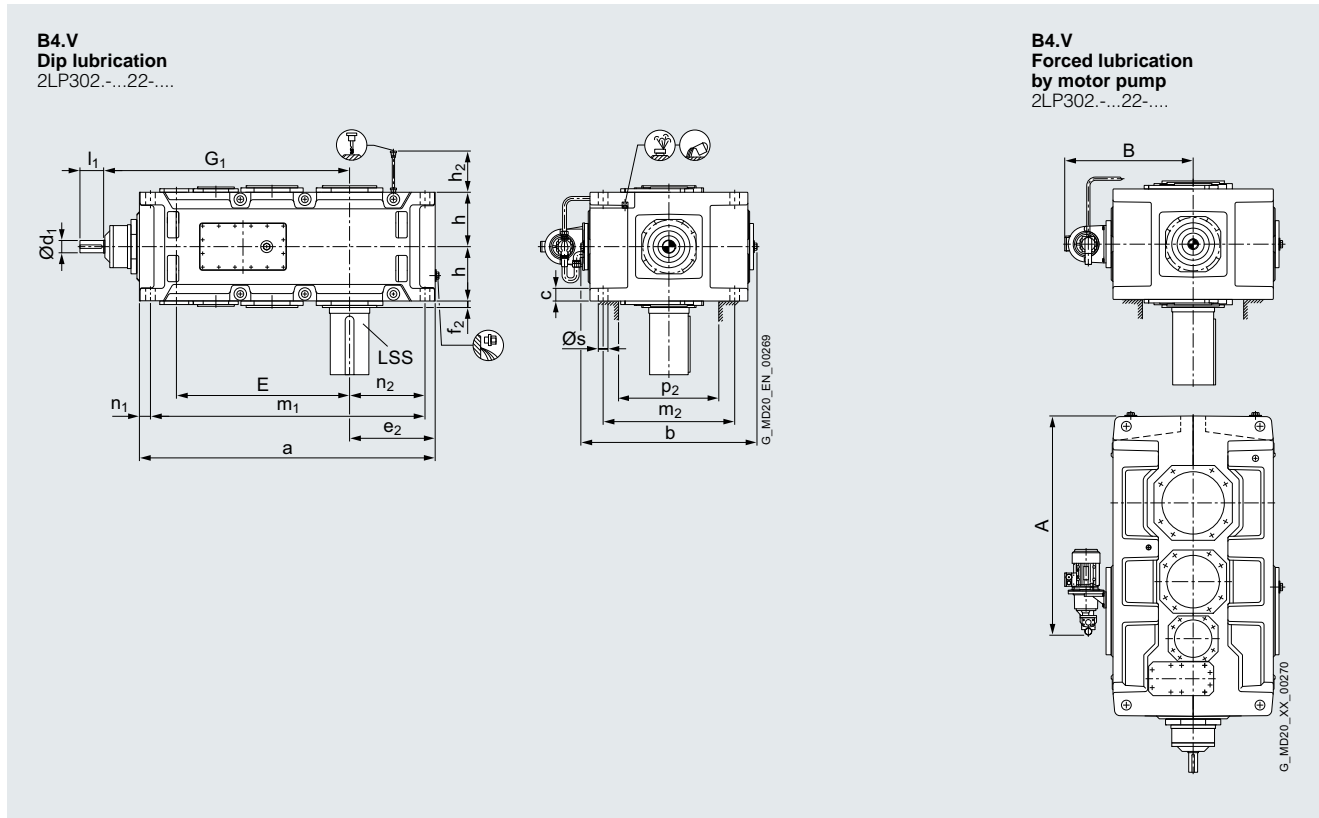
4) Shaft version with reinforced bearing, see page 9/7.

# Bevel helical gear units vertical mounting position

Type B4

Gear unit dimensions, four-stage, gear unit sizes 13 to 18

## Selection and ordering data



| Gear unit size | Dimensions in mm       |       |       |                  |       |       |       |
|----------------|------------------------|-------|-------|------------------|-------|-------|-------|
|                | High speed shaft (HSS) |       |       | Reinforced shaft |       |       |       |
|                | $i_N$                  | $d_1$ | $l_1$ | $i_N$            | $d_1$ | $l_1$ | $G_1$ |
| 13             | 80 - 180               | 55 m6 | 110   | 125 - 200        | 60 m6 | 120   | 1170  |
|                | 200 - 315              | 40 m6 | 100   | 224 - 250        | 50 m6 | 110   |       |
| 14             | 100 - 224              | 55 m6 | 110   | 160 - 250        | 60 m6 | 120   | 1240  |
|                | 250 - 400              | 40 m6 | 100   | 280 - 315        | 50 m6 | 110   |       |
| 15             | 80 - 180               | 70 m6 | 135   | 200              | 70 m6 | 135   | 1402  |
|                | 200 - 315              | 50 m6 | 110   | 224 - 250        | 60 m6 | 135   |       |
| 16             | 90 - 200               | 70 m6 | 135   | 224              | 70 m6 | 135   | 1448  |
|                | 224 - 355              | 50 m6 | 110   | 250 - 280        | 60 m6 | 135   |       |
| 17             | 80 - 180               | 70 m6 | 135   | 200              | 70 m6 | 135   | 1450  |
|                | 200 - 315              | 50 m6 | 110   | 224 - 250        | 60 m6 | 135   |       |
| 18             | 90 - 200               | 70 m6 | 135   | 224              | 70 m6 | 135   | 1510  |
|                | 224 - 355              | 50 m6 | 110   | 250 - 280        | 60 m6 | 135   |       |

| Gear unit size | Dimensions in mm |      |        |      |       |       |       |            |       |       |       |       |            |    |                 |                 |
|----------------|------------------|------|--------|------|-------|-------|-------|------------|-------|-------|-------|-------|------------|----|-----------------|-----------------|
|                | a                | b    | c      | E    | $e_2$ | $f_2$ | h     | $h_2^{1)}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_2^{2)}$ | s  | A <sup>3)</sup> | B <sup>3)</sup> |
| 13             | 1395             | 900  | 61 ± 2 | 820  | 405   | 35    | 272.5 | 300        | 1300  | 680   | 50    | 360   | 500        | 48 | 1055            | 690             |
| 14             | 1535             | 900  | 61 ± 2 | 890  | 475   | 35    | 272.5 | 300        | 1440  | 680   | 50    | 430   | 500        | 48 | 1195            | 690             |
| 15             | 1680             | 980  | 72 ± 2 | 987  | 485   | 42    | 310   | 340        | 1565  | 750   | 60    | 430   | 570        | 55 | 1275            | 730             |
| 16             | 1770             | 980  | 72 ± 2 | 1033 | 530   | 42    | 310   | 340        | 1655  | 750   | 60    | 475   | 570        | 55 | 1370            | 730             |
| 17             | 1770             | 1110 | 81 ± 2 | 1035 | 525   | 42    | 340   | 374        | 1640  | 850   | 70    | 465   | 630        | 55 | 1295            | 790             |
| 18             | 1890             | 1110 | 81 ± 2 | 1095 | 585   | 42    | 340   | 374        | 1760  | 850   | 70    | 525   | 630        | 55 | 1415            | 790             |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

1) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

2) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.

3) Max. dimensions; details acc. to order-related documentation.

# Bevel helical gear units vertical mounting position

## Type B4

### Gear unit dimensions, four-stage, gear unit sizes 13 to 18

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                   |           |                          |         |       |       |              |    |       |      | Oil quantity<br>1) 2)<br>B4.V<br>Forced<br>lubrication | Weight<br>1) 2)<br>B4.V | 10th to 13th position of Article<br>No. and Article No. supplement,<br>for 14th to 16th position, see<br>pages 7/27 to 7/30 |                              |               |
|-------------------|-----------|--------------------------|---------|-------|-------|--------------|----|-------|------|--------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------|
|                   |           |                          |         |       |       |              |    |       |      | Article No.:                                           | 2LP302                  | -                                                                                                                           | -                            | 22-....       |
| Type              | Size      | $d_2$                    | $l_2$   | $G_2$ | $l$   |              |    | kg    |      |                                                        |                         | Solid shaft with parallel key 4)                                                                                            |                              |               |
| <b>B4SV</b>       | <b>13</b> | 200 n6                   | 350     | 335   | 135   |              |    | 2280  | 1    | -                                                      | 3                       | A                                                                                                                           |                              |               |
|                   | <b>14</b> | 210 n6                   | 350     | 335   | 150   |              |    | 2605  | 1    | -                                                      | 4                       | A                                                                                                                           |                              |               |
|                   | <b>15</b> | 230 n6                   | 410     | 380   | 210   |              |    | 3435  | 1    | -                                                      | 5                       | A                                                                                                                           |                              |               |
|                   | <b>16</b> | 240 n6                   | 410     | 380   | 220   |              |    | 3765  | 1    | -                                                      | 6                       | A                                                                                                                           |                              |               |
|                   | <b>17</b> | 250 n6                   | 410     | 415   | 270   |              |    | 4460  | 1    | -                                                      | 7                       | A                                                                                                                           |                              |               |
|                   | <b>18</b> | 270 n6                   | 470     | 415   | 285   |              |    | 4930  | 1    | -                                                      | 8                       | A                                                                                                                           |                              |               |
|                   |           |                          |         |       |       |              |    |       |      |                                                        |                         |                                                                                                                             |                              |               |
| Type              | Size      | $D_2$                    | $G_4$   |       | $l$   |              |    | kg    |      |                                                        |                         | Hollow shaft with keyway                                                                                                    |                              |               |
| <b>B4HV</b>       | <b>13</b> | 190 H7                   | 335     |       | 135   |              |    | 2280  | 1    | -                                                      | 3                       | B                                                                                                                           |                              |               |
|                   | <b>14</b> | 210 H7                   | 335     |       | 150   |              |    | 2605  | 1    | -                                                      | 4                       | B                                                                                                                           |                              |               |
|                   | <b>15</b> | 230 H7                   | 380     |       | 210   |              |    | 3435  | 1    | -                                                      | 5                       | B                                                                                                                           |                              |               |
|                   | <b>16</b> | 240 H7                   | 380     |       | 220   |              |    | 3765  | 1    | -                                                      | 6                       | B                                                                                                                           |                              |               |
|                   | <b>17</b> | 250 H7                   | 415     |       | 270   |              |    | 4460  | 1    | -                                                      | 7                       | B                                                                                                                           |                              |               |
|                   | <b>18</b> | 275 H7                   | 415     |       | 285   |              |    | 4930  | 1    | -                                                      | 8                       | B                                                                                                                           |                              |               |
|                   |           |                          |         |       |       |              |    |       |      |                                                        |                         |                                                                                                                             |                              |               |
| Type              | Size      | $D_2$                    | $D_3$   | $G_4$ | $G_5$ | $l$          |    |       | kg   |                                                        |                         |                                                                                                                             | Hollow shaft for shrink disk |               |
| <b>B4DV</b><br>3) | <b>13</b> | 190 H7                   | 195     | 335   | 480   | 135          |    |       | 2280 | 1                                                      | -                       | 3                                                                                                                           | C                            |               |
|                   | <b>14</b> | 210 H7                   | 215     | 335   | 480   | 150          |    |       | 2605 | 1                                                      | -                       | 4                                                                                                                           | C                            |               |
|                   | <b>15</b> | 230 H7                   | 235     | 380   | 550   | 210          |    |       | 3435 | 1                                                      | -                       | 5                                                                                                                           | C                            |               |
|                   | <b>16</b> | 240 H7                   | 245     | 380   | 550   | 220          |    |       | 3765 | 1                                                      | -                       | 6                                                                                                                           | C                            |               |
|                   | <b>17</b> | 250 H7                   | 260     | 415   | 600   | 270          |    |       | 4460 | 1                                                      | -                       | 7                                                                                                                           | C                            |               |
|                   | <b>18</b> | 280 H7                   | 285     | 415   | 600   | 285          |    |       | 4930 | 1                                                      | -                       | 8                                                                                                                           | C                            |               |
|                   |           |                          |         |       |       |              |    |       |      |                                                        |                         |                                                                                                                             |                              |               |
| Type              | Size      | N/DIN 5480               | $D_2$   | $D_3$ | $G_4$ | $l$          |    |       | kg   |                                                        |                         |                                                                                                                             | Hollow shaft with spline     |               |
| <b>B4KV</b>       | <b>13</b> | N 190 × 5 × 30 × 36 × 9H | 180 H11 | 195   | 335   | 135          |    |       | 2280 | 1                                                      | -                       | 3                                                                                                                           | D                            |               |
|                   | <b>14</b> | N 190 × 5 × 30 × 36 × 9H | 180 H11 | 215   | 335   | 150          |    |       | 2605 | 1                                                      | -                       | 4                                                                                                                           | D                            |               |
|                   | <b>15</b> | N 220 × 5 × 30 × 42 × 9H | 210 H11 | 235   | 380   | 210          |    |       | 3435 | 1                                                      | -                       | 5                                                                                                                           | D                            |               |
|                   | <b>16</b> | N 220 × 5 × 30 × 42 × 9H | 210 H11 | 245   | 380   | 220          |    |       | 3765 | 1                                                      | -                       | 6                                                                                                                           | D                            |               |
|                   | <b>17</b> | N 250 × 5 × 30 × 48 × 9H | 240 H11 | 260   | 415   | 270          |    |       | 4460 | 1                                                      | -                       | 7                                                                                                                           | D                            |               |
|                   | <b>18</b> | N 250 × 5 × 30 × 48 × 9H | 240 H11 | 285   | 415   | 285          |    |       | 4930 | 1                                                      | -                       | 8                                                                                                                           | D                            |               |
|                   |           |                          |         |       |       |              |    |       |      |                                                        |                         |                                                                                                                             |                              |               |
| Type              | Size      | c                        | $d_2$   | $D_3$ | $k_2$ | $n \times s$ | t  | $G_7$ | $l$  | kg                                                     |                         |                                                                                                                             |                              | Flanged shaft |
| <b>B4FV</b>       | <b>13</b> | 48                       | 580     | 310   | 500   | 20 × 33      | 14 | 480   | 135  | 2440                                                   | 1                       | -                                                                                                                           | 3                            | E             |
|                   | <b>14</b> | 48                       | 620     | 310   | 540   | 24 × 33      | 14 | 480   | 150  | 2775                                                   | 1                       | -                                                                                                                           | 4                            | E             |
|                   | <b>15</b> | 55                       | 710     | 360   | 630   | 28 × 33      | 17 | 550   | 210  | 3675                                                   | 1                       | -                                                                                                                           | 5                            | E             |
|                   | <b>16</b> | 55                       | 740     | 360   | 660   | 30 × 33      | 17 | 550   | 220  | 4020                                                   | 1                       | -                                                                                                                           | 6                            | E             |
|                   | <b>17</b> | 60                       | 750     | 410   | 660   | 24 × 39      | 18 | 600   | 270  | 4760                                                   | 1                       | -                                                                                                                           | 7                            | E             |
|                   | <b>18</b> | 60                       | 800     | 410   | 710   | 26 × 39      | 18 | 600   | 285  | 5280                                                   | 1                       | -                                                                                                                           | 8                            | E             |
|                   |           |                          |         |       |       |              |    |       |      |                                                        |                         |                                                                                                                             |                              |               |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Approximate values; exact data acc. to order-related documentation.

2) Without oil filling.

3) Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

4) Shaft version with reinforced bearing, see page 9/7.

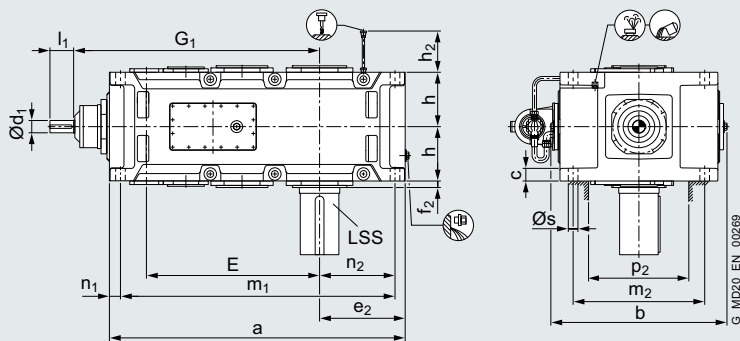
# Bevel helical gear units vertical mounting position

Type B4

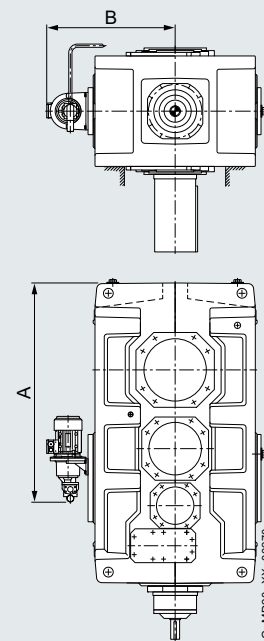
Gear unit dimensions, four-stage, gear unit sizes 19 to 24

## Selection and ordering data

**B4.V**  
Dip lubrication  
2LP302-...22-....



**B4.V**  
Forced lubrication  
by motor pump  
2LP302-...22-....



| Gear unit size | Dimensions in mm       |       |       |                  |       |       |       |
|----------------|------------------------|-------|-------|------------------|-------|-------|-------|
|                | High speed shaft (HSS) |       |       | Reinforced shaft |       |       |       |
|                | $i_N$                  | $d_1$ | $l_1$ | $i_N$            | $d_1$ | $l_1$ | $G_1$ |
| 19             | 80 - 180               | 80 m6 | 165   | 200              | 80 m6 | 165   | 1680  |
|                | 200 - 315              | 60 m6 | 140   | 224 - 250        | 70 m6 | 140   |       |
| 20             | 90 - 200               | 80 m6 | 165   | 224              | 80 m6 | 165   | 1740  |
|                | 224 - 355              | 60 m6 | 140   | 250 - 280        | 70 m6 | 140   |       |
| 21             | 80 - 180               | 90 m6 | 165   | -                | -     | -     | 1992  |
|                | 200 - 315              | 70 m6 | 140   | -                | -     | -     |       |
| 22             | 90 - 200               | 90 m6 | 165   | -                | -     | -     | 2047  |
|                | 224 - 355              | 70 m6 | 140   | -                | -     | -     |       |
| 23             | 80 - 160               | 90 m6 | 165   | -                | -     | -     | 2110  |
|                | 180 - 315              | 70 m6 | 140   | -                | -     | -     |       |
| 24             | 90 - 180               | 90 m6 | 165   | -                | -     | -     | 2175  |
|                | 200 - 355              | 70 m6 | 140   | -                | -     | -     |       |

| Gear unit size | Dimensions in mm |      |         |      |       |       |     |            |       |       |       |       |            |    |            |   |
|----------------|------------------|------|---------|------|-------|-------|-----|------------|-------|-------|-------|-------|------------|----|------------|---|
|                | a                | b    | c       | E    | $e_2$ | $f_2$ | h   | $h_2^{1)}$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_2^{2)}$ | s  | A          | B |
| 19             | 2030             | 1222 | 91 ± 2  | 1190 | 590   | 55    | 390 | 380        | 1885  | 950   | 78    | 520   | 700        | 65 | On request |   |
| 20             | 2150             | 1222 | 91 ± 2  | 1250 | 650   | 55    | 390 | 380        | 2005  | 950   | 78    | 580   | 700        | 65 | On request |   |
| 21             | 2340             | 1378 | 100 ± 2 | 1387 | 655   | 60    | 410 | 390        | 2185  | 1040  | 90    | 585   | 720        | 75 | On request |   |
|                | 2450             | 1378 | 100 ± 2 | 1442 | 710   | 60    | 410 | 390        | 2295  | 1040  | 90    | 640   | 720        | 75 | On request |   |
| 23             | On request       |      |         |      |       |       |     |            |       |       |       |       |            |    |            |   |
| 24             | On request       |      |         |      |       |       |     |            |       |       |       |       |            |    |            |   |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

1) For forced lubrication, approximately  $h_2$  can be assumed as required space for piping and monitoring; details according to order-related documentation.

2) Free space for pump, pipes and cover; please contact us for exact dimensions, if applicable.





# Bevel helical gear units vertical mounting position Type B4

## Gear unit dimensions, four-stage, gear unit sizes 19 to 24

### Selection and ordering data (continued)

#### Low speed shaft (LSS)

|                   |           |                |                | Oil quantity<br>B4.V<br>Dip lubrication | Oil quantity<br>B4.V<br>Forced lubrication | Weight<br>B4.V | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |                |            |                                       |                               |                              |   |   |               |   |  |
|-------------------|-----------|----------------|----------------|-----------------------------------------|--------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------|----------------|------------|---------------------------------------|-------------------------------|------------------------------|---|---|---------------|---|--|
| Article No.:      |           |                |                |                                         |                                            |                |                                                                                                                    |                |            | <b>2LP302</b> ■ - ■ ■ <b>.22-....</b> |                               |                              |   |   |               |   |  |
| Type              | Size      | d <sub>2</sub> | l <sub>2</sub> | G <sub>2</sub>                          | l                                          | l              | kg                                                                                                                 |                |            |                                       | Solid shaft with parallel key |                              |   |   |               |   |  |
| <b>B4SV</b>       | <b>19</b> | 290 n6         | 470            | 465                                     | On request                                 |                |                                                                                                                    | 2              | -          | 0                                     | A                             |                              |   |   |               |   |  |
|                   | <b>20</b> | 300 n6         | 500            | 465                                     |                                            |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>21</b> | 320 n6         | 500            | 490                                     |                                            |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>22</b> | 340 n6         | 550            | 490                                     |                                            |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>23</b> | 360 n6         | 590            | 540                                     |                                            |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>24</b> | 380 n6         | 590            | 540                                     |                                            |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
| Type              | Size      | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub>                          | G <sub>5</sub>                             | l              | l                                                                                                                  | kg             |            |                                       |                               | Hollow shaft for shrink disk |   |   |               |   |  |
| <b>B4DV</b><br>1) | <b>19</b> | 285 H7         | 295            | 465                                     | 670                                        | On request     |                                                                                                                    |                | 2          | -                                     | 0                             | C                            |   |   |               |   |  |
|                   | <b>20</b> | 310 H7         | 315            | 465                                     | 670                                        |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>21</b> | 330 H7         | 335            | 490                                     | 715                                        |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>22</b> | 340 H7         | 345            | 490                                     | 725                                        |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>23</b> | 370 H7         | 375            | 540                                     | 800                                        |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>24</b> | 390 H7         | 395            | 540                                     | 820                                        |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
| Type              | Size      | N/DIN 5480     | D <sub>2</sub> | D <sub>3</sub>                          | G <sub>4</sub>                             | l              | l                                                                                                                  | kg             |            |                                       |                               | Hollow shaft with spline     |   |   |               |   |  |
| <b>B4KV</b>       | <b>19</b> | On request     |                |                                         |                                            |                |                                                                                                                    |                | 2          | -                                     | 0                             | D                            |   |   |               |   |  |
|                   | <b>20</b> |                |                |                                         |                                            |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>21</b> |                |                |                                         |                                            |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>22</b> |                |                |                                         |                                            |                |                                                                                                                    |                |            |                                       |                               |                              |   |   |               |   |  |
| Type              | Size      | c              | d <sub>2</sub> | D <sub>3</sub>                          | k <sub>2</sub>                             | n x s          | t                                                                                                                  | G <sub>7</sub> | l          | l                                     | kg                            |                              |   |   | Flanged shaft |   |  |
| <b>B4FV</b>       | <b>19</b> | 65             | 860            | 460                                     | 770                                        | 30 x 39        | 18                                                                                                                 | 670            | On request |                                       |                               |                              | 2 | - | 0             | E |  |
|                   | <b>20</b> | 65             | 930            | 460                                     | 830                                        | 32 x 39        | 18                                                                                                                 | 670            |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>21</b> | 75             | 950            | 520                                     | 850                                        | 28 x 45        | 20                                                                                                                 | 710            |            |                                       |                               |                              |   |   |               |   |  |
|                   | <b>22</b> | 75             | 1040           | 520                                     | 940                                        | 28 x 45        | 20                                                                                                                 | 710            |            |                                       |                               |                              |   |   |               |   |  |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

1) Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

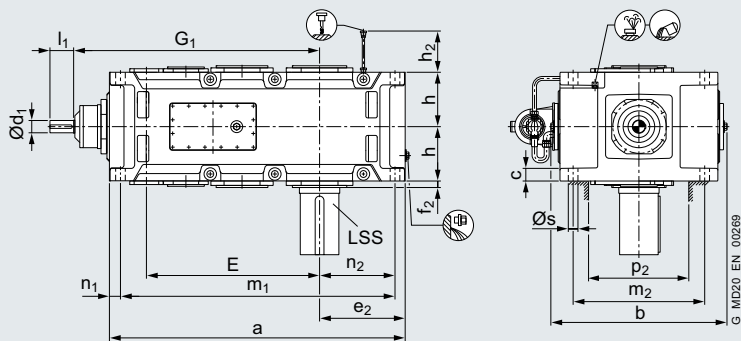
# Bevel helical gear units vertical mounting position

Type B4

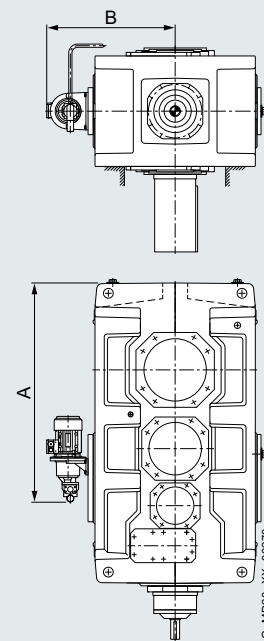
Gear unit dimensions, four-stage, gear unit sizes 25 and 26

## Selection and ordering data

**B4.V**  
Dip lubrication  
2LP302-...22-....



**B4.V**  
Forced lubrication  
by motor pump  
2LP302-...22-....



| Gear unit size | Dimensions in mm |        |       |       |
|----------------|------------------|--------|-------|-------|
|                | $i_N$            | $d_1$  | $l_1$ | $G_1$ |
| 25             | 80 - 160         | 110 n6 | 205   | 2395  |
|                | 180 - 315        | 80 m6  | 170   |       |
| 26             | 90 - 180         | 110 n6 | 205   | 2485  |
|                | 200 - 355        | 80 m6  | 170   |       |

| Gear unit size | Dimensions in mm |   |   |   |       |       |   |       |       |       |       |       |       |   |   |   |
|----------------|------------------|---|---|---|-------|-------|---|-------|-------|-------|-------|-------|-------|---|---|---|
|                | a                | b | c | E | $e_2$ | $f_2$ | h | $h_2$ | $m_1$ | $m_2$ | $n_1$ | $n_2$ | $p_2$ | s | A | B |
| 25             | On request       |   |   |   |       |       |   |       |       |       |       |       |       |   |   |   |
| 26             | On request       |   |   |   |       |       |   |       |       |       |       |       |       |   |   |   |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.



## Bevel helical gear units vertical mounting position

Type B4 / Types B2, B3 and B4

### Gear unit dimensions, four-stage, gear unit sizes 25 and 26

#### Selection and ordering data (continued)

##### Low speed shaft (LSS)

|                    |      |                |                |                |                | Oil quantity B4.V Dip lubrication | Oil quantity B4.V Forced lubrication | Weight B4.V       | 10th to 13th position of Article No. and Article No. supplement, for 14th to 16th position, see pages 7/27 to 7/30 |  |  |  |
|--------------------|------|----------------|----------------|----------------|----------------|-----------------------------------|--------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------|--|--|--|
|                    |      |                |                |                |                | Article No.:                      |                                      | 2LP302 - .22-.... |                                                                                                                    |  |  |  |
| Type               | Size | d <sub>2</sub> | l <sub>2</sub> | G <sub>2</sub> |                | l                                 | l                                    | kg                | Solid shaft with parallel key                                                                                      |  |  |  |
| B4SV               | 25   | 400 n6         | 650            | 605            |                | On request                        |                                      | 2 - 6 A           |                                                                                                                    |  |  |  |
|                    | 26   | 420 n6         | 650            | 605            |                |                                   |                                      | 2 - 7 A           |                                                                                                                    |  |  |  |
| Type               | Size | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub> | G <sub>5</sub> | l                                 | l                                    | kg                | Hollow shaft for shrink disk                                                                                       |  |  |  |
| B4DV <sup>1)</sup> | 25   | 410 H7         | 415            | 610            | 895            | On request                        |                                      | 2 - 6 C           |                                                                                                                    |  |  |  |
|                    | 26   | 430 H7         | 435            | 610            | 925            |                                   |                                      | 2 - 7 C           |                                                                                                                    |  |  |  |

#### Article No. overview

##### Article No., 10th to 12th position

|                     |           |      |      | Data position of the Article No. | 1 to 6                      | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|---------------------|-----------|------|------|----------------------------------|-----------------------------|---|---|---|----|----|----|----|----|----|----|---------------------|
|                     |           |      |      | Article No.                      | 2LP302 . . . . . -Z . . . . |   |   |   |    |    |    |    |    |    |    |                     |
| Ratio               |           |      |      |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
|                     | Type B2.V | B3.V | B4.V |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 5         | 12.5 | 80   |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 5.6       | 14   | 90   |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 6.3       | 16   | 100  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 7.1       | 18   | 112  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 8         | 20   | 125  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 9         | 22.4 | 140  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 10        | 25   | 160  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 11.2      | 28   | 180  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 12.5      | 31.5 | 200  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 14        | 35.5 | 224  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 16        | 40   | 250  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 18        | 45   | 280  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 20        | 50   | 315  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | 22.4      | 56   | 355  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | -         | 63   | 400  |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | -         | 71   | -    |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | -         | 80   | -    |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| i <sub>N</sub>      | -         | 90   | -    |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| Type designation    |           |      |      |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| Type B2             |           |      |      |                                  |                             |   |   |   |    | 0  |    |    |    |    |    |                     |
| Type B3             |           |      |      |                                  |                             |   |   |   |    | 1  |    |    |    |    |    |                     |
| Type B4             |           |      |      |                                  |                             |   |   |   |    | 2  |    |    |    |    |    |                     |
| Mounting position   |           |      |      |                                  |                             |   |   |   |    |    |    |    |    |    |    |                     |
| Mounting position V |           |      |      |                                  |                             |   |   |   |    | 2  |    |    |    |    |    |                     |

Shaft seals, see page 10/2 onwards.

For details on the shafts, see Chapter 9.

Cooling options, see page 10/11 onwards.

<sup>1)</sup> Shaft variant designed to withstand axial forces (including those caused by weight of gear unit) on request.

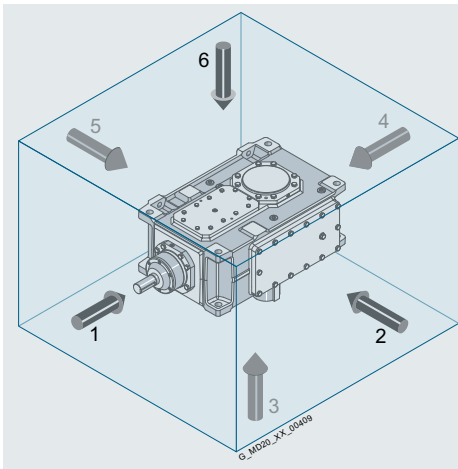
# Bevel helical gear units vertical mounting position

Types B2, B3 and B4

## Article No. overview

### Selection and ordering data (continued)

#### Article No., 13th position



|                                  |                  |   |   |   |   |   |   |   |   |    |    |    |    |                         |    |    |                     |
|----------------------------------|------------------|---|---|---|---|---|---|---|---|----|----|----|----|-------------------------|----|----|---------------------|
| Data position of the Article No. | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14                      | 15 | 16 | "-Z" and order code |
| Article No.                      | 2LP302 . . . . . |   |   |   |   |   |   |   |   |    |    |    | ■  | . . . . . - Z . . . . . |    |    |                     |

#### Variants/shaft arrangement (looking at side 2)

| Type     | B2.V                | B3.V                | B4.V                |   |
|----------|---------------------|---------------------|---------------------|---|
| <b>A</b> | <br>G_MD20_XX_00276 | <br>G_MD20_XX_00277 | <br>G_MD20_XX_00278 | 0 |
| <b>B</b> | <br>G_MD20_XX_00279 | <br>G_MD20_XX_00280 | <br>G_MD20_XX_00281 | 1 |
| <b>C</b> | <br>G_MD20_XX_00282 | <br>G_MD20_XX_00283 | <br>G_MD20_XX_00284 | 2 |
| <b>D</b> | <br>G_MD20_XX_00285 | <br>G_MD20_XX_00286 | <br>G_MD20_XX_00287 | 3 |

# Bevel helical gear units vertical mounting position

Types B2, B3 and B4

Article No. overview

## Selection and ordering data (continued)

|                                                |                 |                 | Data position of the Article No. | 1 to 6           | 7 | 8    | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |           |  |
|------------------------------------------------|-----------------|-----------------|----------------------------------|------------------|---|------|---|----|----|----|----|----|----|----|---------------------|-----------|--|
|                                                |                 |                 | Article No.                      | 2LP302 . . . . . |   |      |   |    |    |    |    |    |    |    |                     | Z . . . . |  |
| Variants/shaft arrangement (looking at side 2) |                 |                 |                                  |                  |   |      |   |    |    |    |    |    |    |    |                     |           |  |
| Type                                           |                 |                 |                                  |                  |   |      |   |    |    |    |    |    |    |    |                     |           |  |
| B2.V                                           |                 |                 | B3.V                             |                  |   | B4.V |   |    |    |    |    |    |    |    |                     |           |  |
| E                                              |                 |                 |                                  |                  |   |      |   |    |    |    |    |    |    |    |                     |           |  |
|                                                | G_MD20_XX_00288 | G_MD20_XX_00289 | G_MD20_XX_00290                  |                  |   |      |   |    |    |    |    |    |    |    |                     |           |  |
|                                                |                 |                 |                                  |                  |   |      |   |    |    |    |    |    |    |    |                     | 4         |  |
| F                                              |                 |                 |                                  |                  |   |      |   |    |    |    |    |    |    |    |                     |           |  |
|                                                | G_MD20_XX_00291 | G_MD20_XX_00292 | G_MD20_XX_00293                  |                  |   |      |   |    |    |    |    |    |    |    |                     |           |  |
|                                                |                 |                 |                                  |                  |   |      |   |    |    |    |    |    |    |    |                     | 5         |  |

The versions E and F with slow speed shaft at both ends are only relevant for the shaft variants

- "S" (solid shaft with parallel key acc. to DIN 6885/1)
- "V" (reinforced solid shaft with parallel key acc. to DIN 6885/1)
- "C" (solid shaft for play-free taper clamping connection)

The solid shaft extension shown represents the driven machine shaft insertion side for hollow shafts.

The slow speed hollow shaft "H" (hollow shaft with keyway according to DIN 6885/1) is generally suitable for fitting on both ends.

For details on the seals, [see page 10/2 onwards](#).

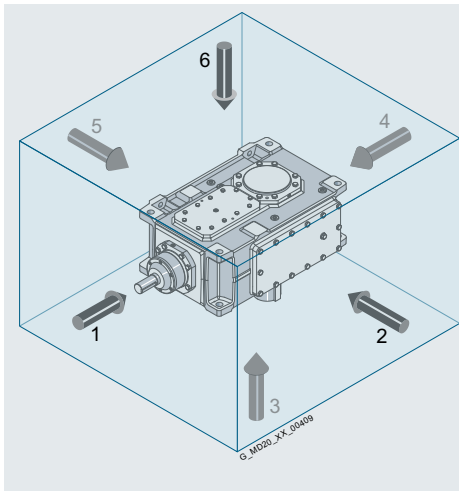


# Bevel helical gear units vertical mounting position

Types B2, B3 and B4

## Article No. overview

### Selection and ordering data (continued)



#### Article No. supplement, 14th position

| Data position of the Article No.                  | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|---------------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|---------------------|
| Article No.                                       | <b>2LP302</b> | . | - | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■            |
| <b>Sealing single-side high speed shaft (HSS)</b> |               |   |   |   |    |    |    |    |    |    |    |                     |
| Radial shaft seal                                 |               |   |   |   |    |    |    |    |    |    |    | A                   |
| Dual radial shaft seal                            |               |   |   |   |    |    |    |    |    |    |    | B                   |
| Taconite E                                        |               |   |   |   |    |    |    |    |    |    |    | E                   |

#### Article No. supplement, 15th and 16th position

| Data position of the Article No.                                                                      | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |       |
|-------------------------------------------------------------------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|---------------------|-------|
| Article No.                                                                                           | <b>2LP302</b> | . | - | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■            |       |
| <b>Sealing low speed shaft (LSS)</b>                                                                  |               |   |   |   |    |    |    |    |    |    |    |                     |       |
| Radial shaft seal                                                                                     |               |   |   |   |    |    |    |    |    |    |    | A                   |       |
| Dual radial shaft seal                                                                                |               |   |   |   |    |    |    |    |    |    |    | B                   |       |
| Taconite F                                                                                            |               |   |   |   |    |    |    |    |    |    |    | E                   |       |
| Taconite F-F                                                                                          |               |   |   |   |    |    |    |    |    |    |    | F                   |       |
| Taconite F-H                                                                                          |               |   |   |   |    |    |    |    |    |    |    | G                   |       |
| Taconite F-K                                                                                          |               |   |   |   |    |    |    |    |    |    |    | H                   |       |
| Radial shaft seal with dry-running protection                                                         |               |   |   |   |    |    |    |    |    |    |    | K                   |       |
| <b>Sealing double-extended low speed shaft (LSS)</b>                                                  |               |   |   |   |    |    |    |    |    |    |    |                     |       |
| Side 3: Radial shaft seal/Side 6: Radial shaft seal                                                   |               |   |   |   |    |    |    |    |    |    |    | Z                   | Q 0 A |
| Side 3: Dual radial shaft seal/Side 6: Dual radial shaft seal                                         |               |   |   |   |    |    |    |    |    |    |    | Z                   | Q 0 B |
| Side 3: Taconite F/Side 6: Taconite F                                                                 |               |   |   |   |    |    |    |    |    |    |    | Z                   | Q 0 E |
| Side 3: Radial shaft seal/Side 6: Taconite F                                                          |               |   |   |   |    |    |    |    |    |    |    | Z                   | Q 1 A |
| Side 3: Taconite F/Side 6: Radial shaft seal                                                          |               |   |   |   |    |    |    |    |    |    |    | Z                   | Q 1 B |
| Side 3: Radial shaft seal/<br>Side 6: Radial shaft seal with dry-running protection                   |               |   |   |   |    |    |    |    |    |    |    | Z                   | Q 1 D |
| <b>Shaft version</b>                                                                                  |               |   |   |   |    |    |    |    |    |    |    |                     |       |
| High speed shaft (HSS) version: Catalog version,<br>low speed shaft (LSS) version: Catalog version    |               |   |   |   |    |    |    |    |    |    |    | 0                   |       |
| High speed shaft (HSS) version: Reinforced version,<br>low speed shaft (LSS) version: Catalog version |               |   |   |   |    |    |    |    |    |    |    | 1                   |       |

7

## Special mounting positions



8/2

**Upright installation,  
gear unit sizes 4 – 18**

8/4

**Water screw (pump) gear units**

8/6

Water screw generator drives

## Special mounting positions

### Upright installation, gear unit sizes 4 – 18

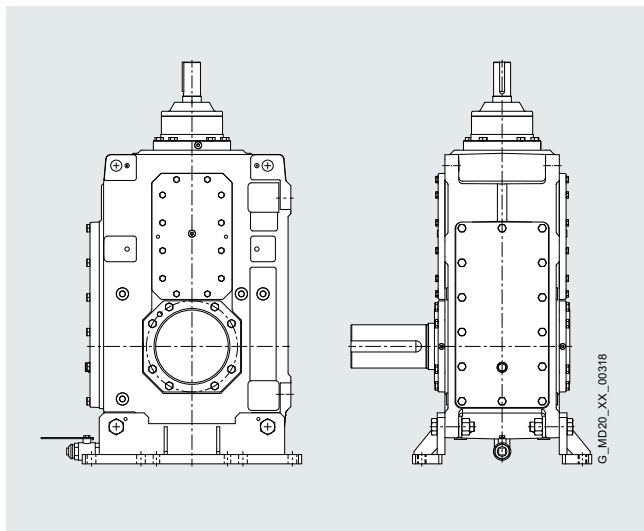
#### Overview

Flender gear units of the types H2, H3, H4, B2, B3 and B4 are also available for an upright mounting position with low speed shaft (LSS) at the top or at the bottom.

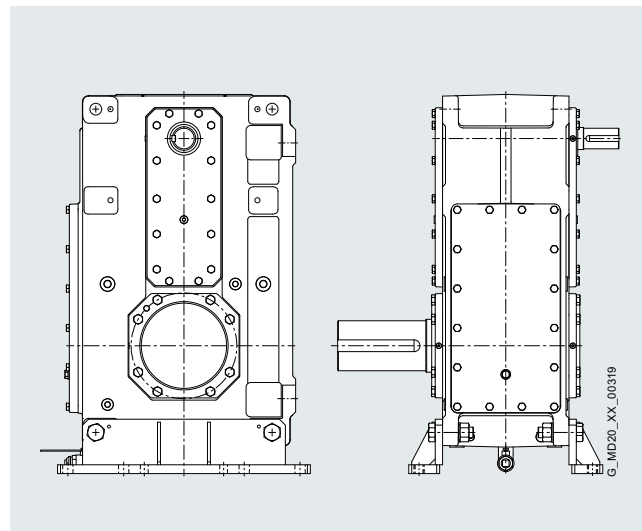
The setup can be implemented, for example, as a slip-on gear unit with torque reaction arm (not shown) or using rails/feet.

For oil supply, see Table 2.

#### Mounting position: low speed shaft at bottom

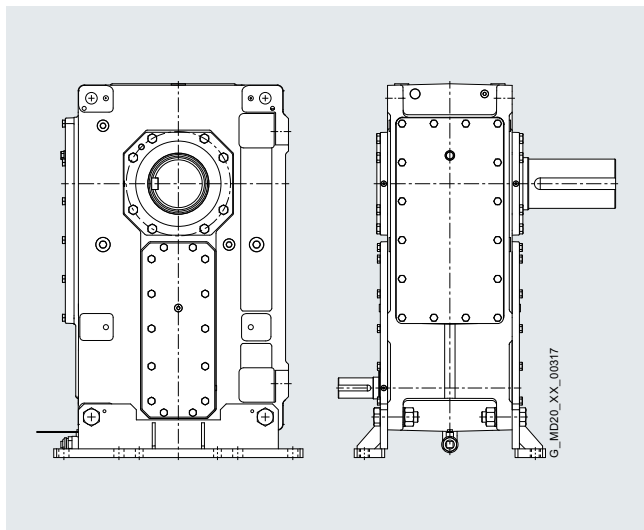


Type B3



Type H3

#### Mounting position: low speed shaft at top



Type H3



## Overview (continued)

## Dimensions

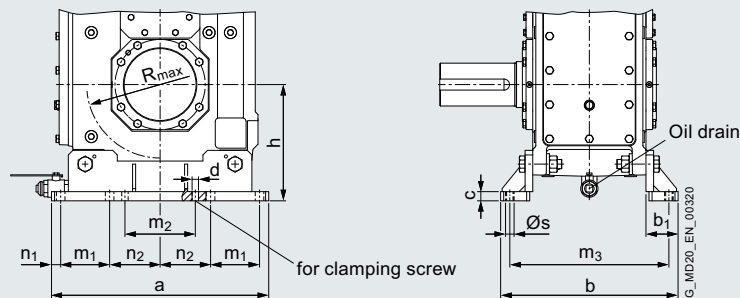


Table 1

| Gear unit size | Dimensions in mm |                |    |       |                 |                |                |                |                |         |                                |     | H2, H3, H4, B3, B4 |      | B2             |  |
|----------------|------------------|----------------|----|-------|-----------------|----------------|----------------|----------------|----------------|---------|--------------------------------|-----|--------------------|------|----------------|--|
|                | a                | b <sub>1</sub> | c  | 4 × d | h <sup>1)</sup> | m <sub>1</sub> | m <sub>2</sub> | n <sub>1</sub> | n <sub>2</sub> | 8 × Ø s | R <sub>max</sub> <sup>1)</sup> | b   | m <sub>3</sub>     | b    | m <sub>3</sub> |  |
| 4              | 450              | 68             | 20 | M 16  | 255             | 110            | 300            | 20             | 95             | 19      | 120                            | 351 | 315                | 406  | 370            |  |
| 5              | 510              | 68             | 20 | M 16  | 270             | 110            | 360            | 20             | 125            | 19      | 130                            | 391 | 355                | 456  | 420            |  |
| 6              |                  |                |    |       | 315             |                |                |                |                |         | 180                            |     |                    |      |                |  |
| 7              | 610              | 85             | 30 | M 20  | 325             | 130            | 200            | 25             | 150            | 24      | 170                            | 470 | 420                | 550  | 500            |  |
| 8              |                  |                |    |       | 385             |                |                |                |                |         | 230                            |     |                    |      |                |  |
| 9              | 710              | 105            | 30 | M 24  | 380             | 160            | 230            | 30             | 165            | 28      | 240                            | 580 | 520                | 650  | 590            |  |
| 10             |                  |                |    |       | 430             |                |                |                |                |         | 290                            |     |                    |      |                |  |
| 11             | 860              | 115            | 30 | M 30  | 435             | 190            | 270            | 35             | 205            | 35      | 240                            | 660 | 590                | 760  | 690            |  |
| 12             |                  |                |    |       | 520             |                |                |                |                |         | 330                            |     |                    |      |                |  |
| 13             | 965              | 100            | 60 | M 36  | 430             | 260            | 230            | 37.5           | 185            | 35      | 360                            | 750 | 670                | 855  | 775            |  |
| 14             |                  |                |    |       | 500             |                |                |                |                |         | 430                            |     |                    |      |                |  |
| 15             | 1060             | 110            | 70 | M 36  | 505             | 300            | 190            | 45             | 185            | 42      | 430                            | 845 | 755                | 985  | 895            |  |
| 16             |                  |                |    |       | 550             |                |                |                |                |         | 470                            |     |                    |      |                |  |
| 17             | 1210             | 125            | 80 | M 42  | 550             | 340            | 250            | 55             | 210            | 48      | 460                            | 940 | 830                | 1135 | 1025           |  |
| 18             |                  |                |    |       | 610             |                |                |                |                |         | 520                            |     |                    |      |                |  |

Table 2

| Gear unit size | Types                               |                                         |                                         |                                                                |                                                                |                                                                |
|----------------|-------------------------------------|-----------------------------------------|-----------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|
|                | H2                                  | H3                                      | H4                                      | B2                                                             | B3                                                             | B4                                                             |
| 4 – 12         | Dip lubrication                     | Dip lubrication with oil expansion tank | Dip lubrication with oil expansion tank | Dip lubrication with oil expansion tank, also in motor lantern | Dip lubrication with oil expansion tank, also in motor lantern | Dip lubrication with oil expansion tank, also in motor lantern |
| 13 – 18        | Forced lubrication with flange pump | Forced lubrication with flange pump     | Forced lubrication with motor pump      | Forced lubrication with flange pump or motor pump              | Forced lubrication with flange pump or motor pump              | Forced lubrication with flange pump or motor pump              |

Sizes 19 to 28 on request.

Observe free space for elements of the oil supply (pump, pipes, etc.)! Dimensions on request

<sup>1)</sup> Applies for low speed shaft at bottom. Values for low speed shaft at top on request.

## Special mounting positions

### Water screw (pump) gear units

#### Overview

Water screws are used to lift water.

The screw operates according to the "Archimedean principle". The slow speed shaft is tilted downwards between 30 and 38°. Water screw pumps are also suitable for pumping heavily contaminated liquids, even those containing small solid particles. The delivery head is normally only a few meters and the flow rate relatively high.

The output shaft of the gear unit, whose mounting position corresponds to the inclination angle of the screw, does not absorb any additional loads and transmits the torque to the screw shaft by means of a flexible coupling.

Flender gear units are specially designed to operate in these conditions. Here, a gear unit with adapted oil level, a corresponding shaft seal, an oil drain, and a special breather is required.

Each gear unit is fitted with a backstop to prevent the screw from accelerating backwards by the water that is forced back when the motor is switched off.

#### Advantages

- Low-noise
- Low-vibration
- High efficiency

#### Complete solution

- Set up on base frame
- Backstop
- Coupling protection through protective cover
- Condition monitoring possible

#### Application areas

- Municipal sewage treatment plants
- Drainage
- Irrigation systems
- Pumping of water from a low level to a higher level



Water screw (pump) gear units

#### Technical specifications

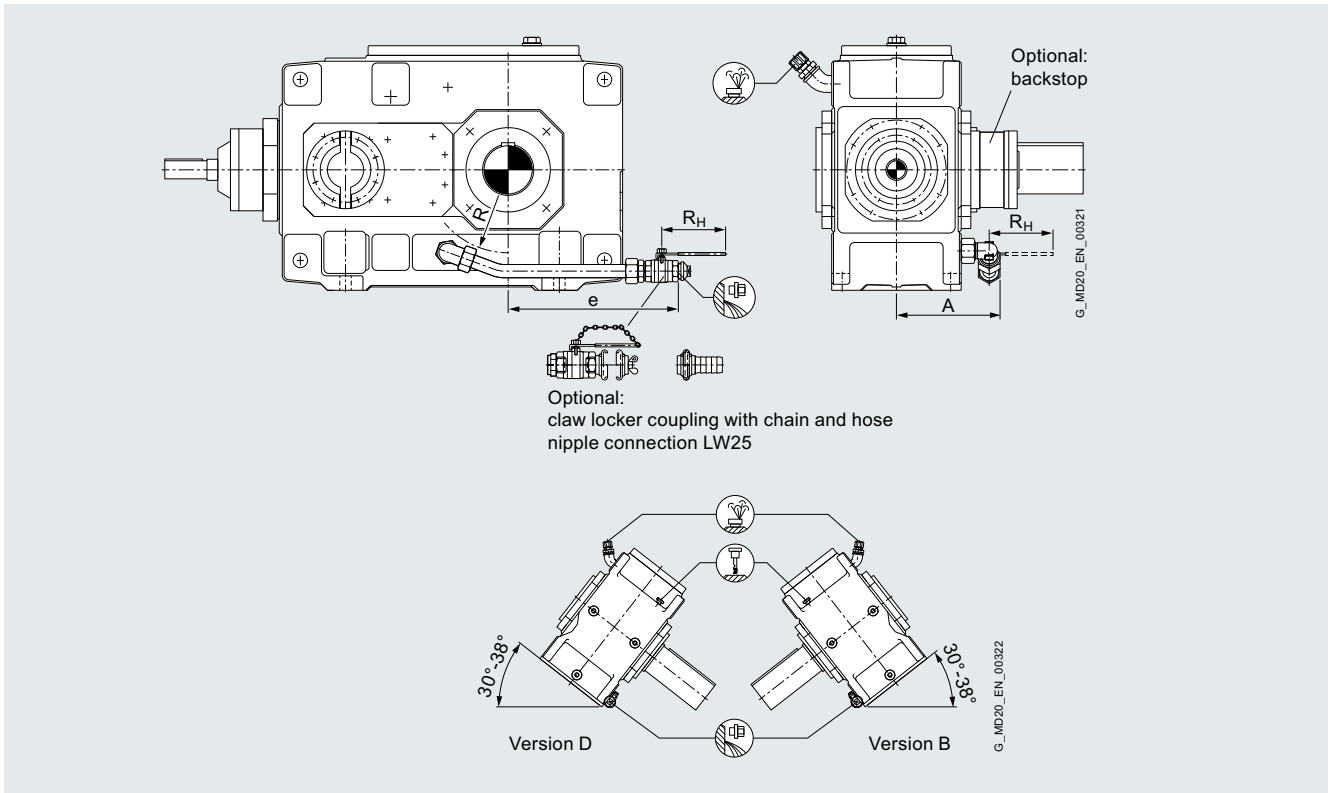
|                               |                                                                   |
|-------------------------------|-------------------------------------------------------------------|
| <b>Types</b>                  | Helical and bevel helical gear units                              |
| <b>Sizes</b>                  | 4 ... 18                                                          |
| <b>Number of stages</b>       | 3-stage                                                           |
| <b>Ratios</b>                 | $i = 12 \dots 80$                                                 |
| <b>Nominal output torques</b> | 5 800 ... 240 000 Nm                                              |
| <b>Mounting positions</b>     | Inclined position, slow speed shaft<br>Tilted downwards 30 to 38° |

Please contact Flender regarding different versions.

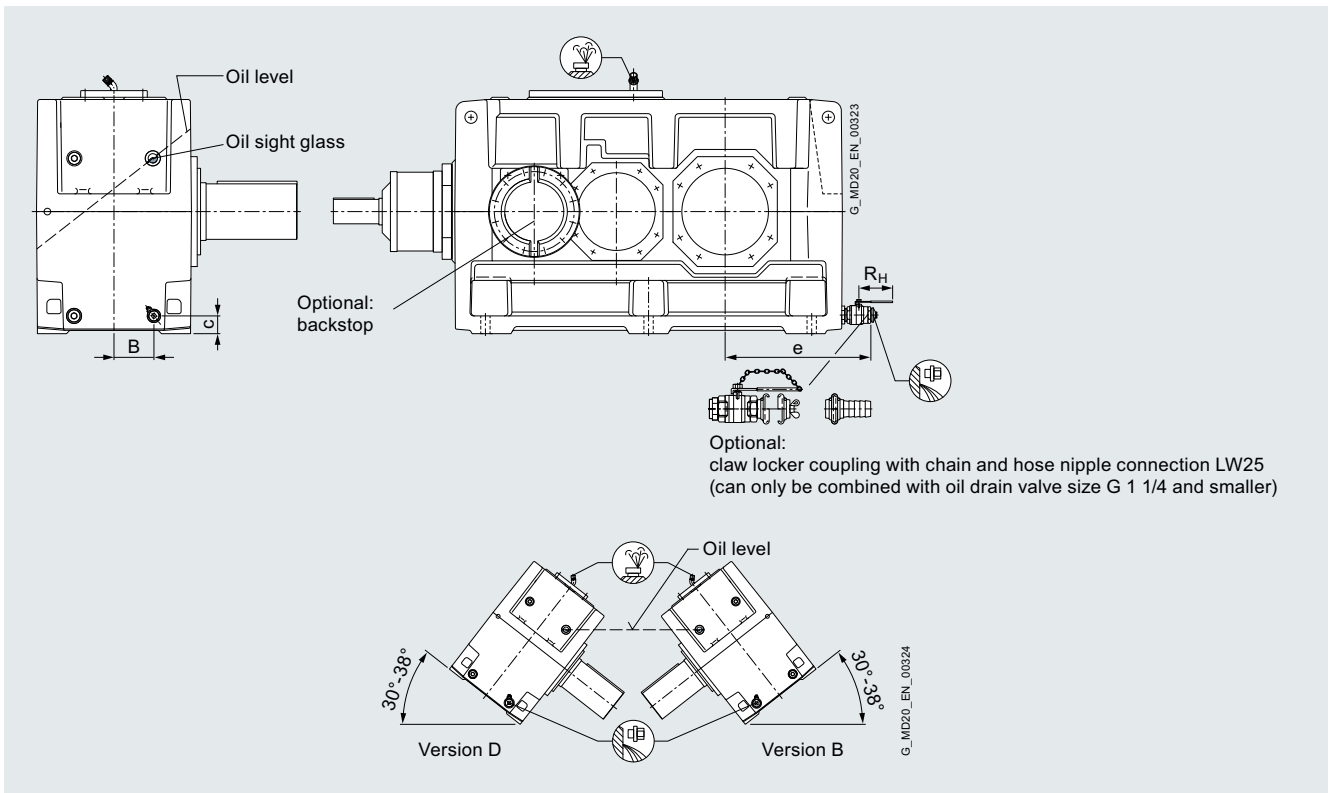
|                                               |               |   |   |   |    |    |    |    |    |    |    |                                     |                                     |                                     |
|-----------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-------------------------------------|-------------------------------------|-------------------------------------|
| Position of the Article No.                   | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code                          |                                     |                                     |
| Article No.:                                  | <b>2LP302</b> |   |   |   |    |    |    |    |    |    |    | <b>-Z</b>                           |                                     |                                     |
| <b>Water screw design</b>                     |               |   |   |   |    |    |    |    |    |    |    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Water screw                                   |               |   |   |   |    |    |    |    |    |    |    | <b>K</b>                            | <b>2</b>                            | <b>5</b>                            |
| Oil drain valve in water screw design         |               |   |   |   |    |    |    |    |    |    |    | <b>K</b>                            | <b>3</b>                            | <b>2</b>                            |
| Standard air filter for water screw gear unit |               |   |   |   |    |    |    |    |    |    |    | <b>K</b>                            | <b>7</b>                            | <b>5</b>                            |

Dimension drawings

Water screw bevel helical gear unit, type B3



Water screw design up to gear size 12



Water screw design from gear size 13

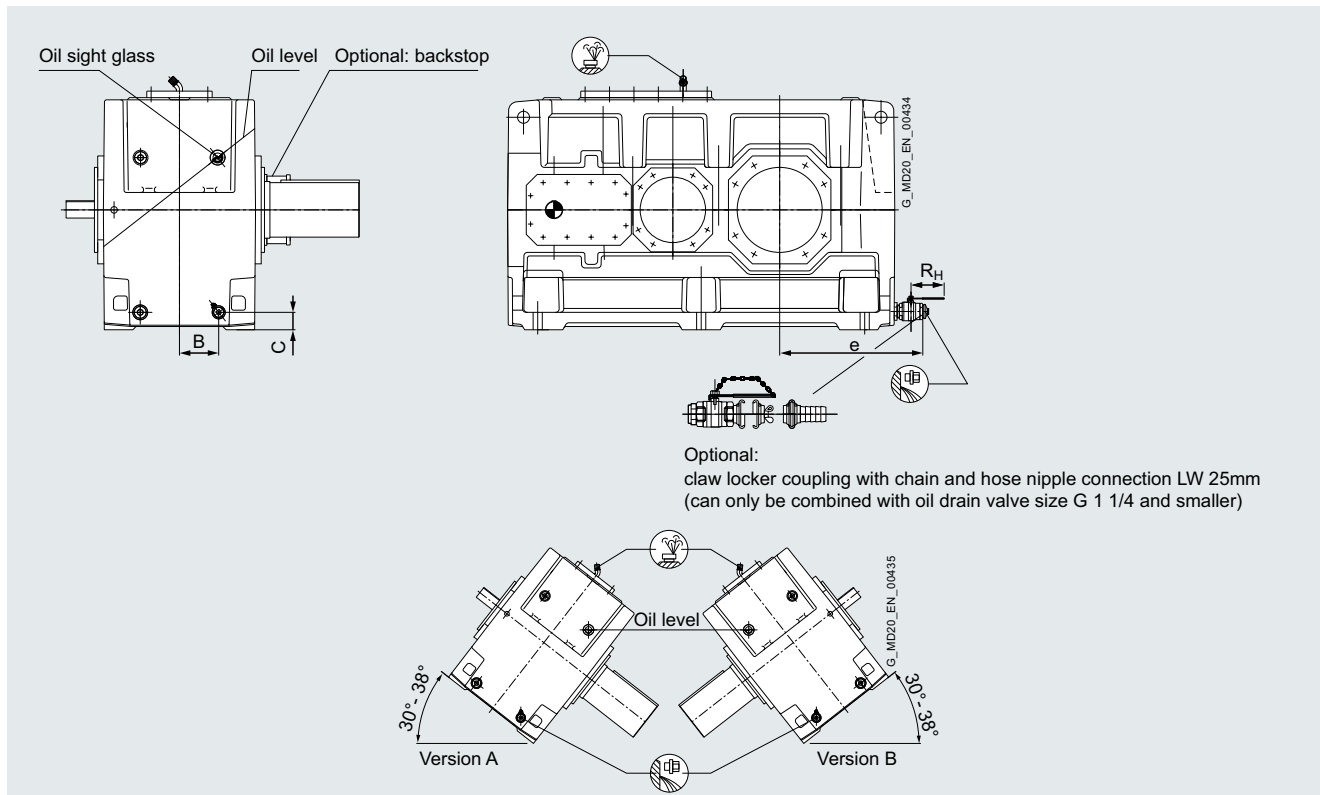


## Special mounting positions

### Water screw (pump) gear units, water screw generator drives

#### Dimensional drawings (continued)

#### Water screw helical gear unit, type H3SH (size 5 or larger)



#### Water screw bevel helical gear unit, type B3 and H3

Water screw design / oil drain valves

| Type                               | Size | Dimensions in mm |     |     |     |    |     | Assigned oil drain valve |                   |
|------------------------------------|------|------------------|-----|-----|-----|----|-----|--------------------------|-------------------|
|                                    |      | A                | e   | R   | B   | C  | R   | Threaded connection "    | R <sub>H</sub> mm |
| <b>B3SH and H3SH (from size 5)</b> | 4    | 180              | 285 | 125 | –   | –  | 125 | G3/4                     | 102               |
|                                    | 5    | 195              | 305 | –   | –   | –  | –   |                          |                   |
|                                    | 6    | 195              | 345 | –   | –   | –  | –   |                          |                   |
|                                    | 7    | 225              | 360 | –   | –   | –  | –   |                          |                   |
|                                    | 8    | 225              | 420 | –   | –   | –  | –   |                          |                   |
|                                    | 9    | 235              | 410 | –   | –   | –  | –   | G1 1/4                   | 121               |
|                                    | 10   | 235              | 460 | –   | –   | –  | –   |                          |                   |
|                                    | 11   | 300              | 465 | –   | –   | –  | –   |                          |                   |
|                                    | 12   | 300              | 550 | –   | –   | –  | –   | G2                       | 158               |
|                                    | 13   | –                | 500 | –   | 135 | 67 | –   |                          |                   |
| 14                                 | –    | 570              | –   | 135 | 67  | –  |     |                          |                   |
| 15                                 | –    | 610              | –   | 150 | 80  | –  |     |                          |                   |
| 16                                 | –    | 655              | –   | 150 | 80  | –  |     |                          |                   |
| 17                                 | –    | 650              | –   | 180 | 85  | –  |     |                          |                   |
| 18                                 | –    | 710              | –   | 180 | 85  | –  |     |                          |                   |

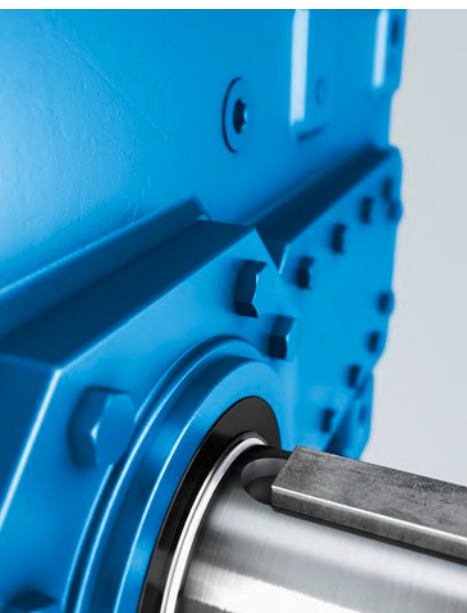
#### Water screw generator drives

The technology described under "Water screw (pump) gear units" (page 8/4 onwards) is also used for the conversion of hydropower into electrical energy.

Here, the drive on the gear unit is performed via the slow speed shaft and the speed is converted to "high speed".

The dimensions and the further setup are comparable to those of the water screw pump.

## Connection dimensions



|      |                                                                                     |
|------|-------------------------------------------------------------------------------------|
| 9/2  | <b>Cylindrical shaft extensions</b>                                                 |
| 9/2  | Central holes, form DS                                                              |
| 9/3  | in shaft extensions DIN 332/1                                                       |
| 9/3  | Selection of fit                                                                    |
| 9/4  | <b>Parallel keys, keyways and hollow shafts with keyway</b>                         |
| 9/5  | <b>Protective cover for second shaft extension for shaft extension at both ends</b> |
| 9/5  | Types H2S., H3S., H4S., B2S., B3S., B4S., H2C., H3C., H4C., B3C., B4C.              |
| 9/6  | <b>Solid shaft with parallel key</b>                                                |
| 9/6  | Types H1S., H2S., H3S., H4S., B2S., B3S. and B4S., sizes 4 to 28                    |
| 9/7  | <b>Solid shaft with parallel key and reinforced bearing</b>                         |
| 9/7  | Types H2V., H3V., H4V., B2V., B3V. and B4V., sizes 7 to 18                          |
| 9/8  | <b>Permissible additional radial forces at low speed shaft (LSS)</b>                |
| 9/8  | Types H1 to H4, B2 to B4                                                            |
| 9/10 | <b>Solid shaft without parallel key</b>                                             |
| 9/10 | Types H2C., H3C., H4C., B3C., B4C.                                                  |
| 9/11 | Flange coupling with zero-backlash dual taper clamping connection (RFK)             |
| 9/12 | <b>Hollow shaft with shrink disk</b>                                                |
| 9/12 | Types H2D., H3D., H4D., B3D. and B4D.                                               |
| 9/14 | Type B2D.                                                                           |
| 9/15 | <b>Hollow shaft with spline according to DIN 5480</b>                               |
| 9/15 | Types H2K., H3K., H4K., B3K. and B4K.                                               |
| 9/16 | Type B2K.                                                                           |
| 9/17 | <b>Hollow shaft with keyway according to DIN 6885/1</b>                             |
| 9/17 | Types H2H., H3H., H4H., B3H. and B4H.                                               |
| 9/18 | Type B2H.                                                                           |
| 9/19 | <b>Counter flanges for flanged shaft</b>                                            |
| 9/19 | Types H2F., H3F., H4F., B2F., B3F. and B4F.                                         |

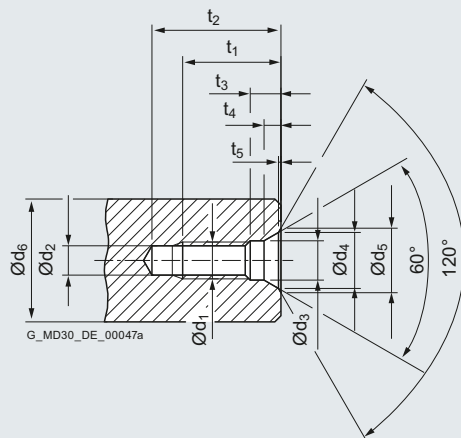
## Connection dimensions

### Cylindrical shaft extensions

#### Central holes, form DS in shaft extensions DIN 332/1

#### Dimensional drawings

#### Form DS with thread, straight running surface and protective counterbore



| Recommended diameter ranges $d_6^{1)}$ |     | Form DS<br>Central hole DS | $d_1$ | $d_2^{2)}$ | $d_3$ | $d_4$ | $d_5$ | $t_1$ | $t_2$ | min. | max. | $t_3$ | $t_4$ | $t_5$ |
|----------------------------------------|-----|----------------------------|-------|------------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|
| via                                    | to  |                            |       |            |       |       |       |       |       |      |      |       |       |       |
| mm                                     | mm  |                            | mm    | mm         | mm    | mm    | mm    | mm    | mm    | mm   | mm   | mm    | mm    | mm    |
| 16                                     | 21  | DS 6                       | M 6   | 5.0        | 6.4   | 9.6   | 10.5  | 16.0  | 21    | 23   |      | 5.0   | 2.8   | 0.4   |
| 21                                     | 24  | DS 8                       | M 8   | 6.8        | 8.4   | 12.2  | 13.2  | 19.0  | 25    | 28   |      | 6.0   | 3.3   | 0.4   |
| 24                                     | 30  | DS 10                      | M10   | 8.5        | 10.5  | 14.9  | 16.3  | 22.0  | 30    | 34   |      | 7.5   | 3.8   | 0.6   |
| 30                                     | 38  | DS 12                      | M 12  | 10.2       | 13.0  | 18.1  | 19.8  | 28.0  | 37    | 42   |      | 9.5   | 4.4   | 0.7   |
| 38                                     | 50  | DS 16                      | M 16  | 14.0       | 17.0  | 23.0  | 25.3  | 36.0  | 45    | 50   |      | 12.0  | 5.2   | 1.0   |
| 50                                     | 85  | DS 20                      | M 20  | 17.5       | 21.0  | 28.4  | 31.3  | 42.0  | 53    | 59   |      | 15.0  | 6.4   | 1.3   |
| 85                                     | 130 | DS 24                      | M 24  | 21.0       | 25.0  | 34.2  | 38.0  | 50.0  | 63    | 68   |      | 18.0  | 8.0   | 1.6   |
| 130                                    | 225 | DS 30 <sup>3)</sup>        | M 30  | 26.5       | 31.0  | 40.2  | 44.6  | 60.0  | 77    | 83   |      | 17.0  | 8.0   | 1.9   |
| 225                                    | 320 | DS 36 <sup>3)</sup>        | M 36  | 32.0       | 37.0  | 49.7  | 55.0  | 74.0  | 93    | 99   |      | 22.0  | 11.0  | 2.3   |
| 320                                    | 500 | DS 42 <sup>3)</sup>        | M 42  | 37.5       | 43.0  | 60.3  | 66.6  | 84.0  | 105   | 111  |      | 26.0  | 15.0  | 2.7   |

1) Diameter refers to the finished workpiece

2) Tap hole drill diameter acc. to DIN 336 Part 1

3) Dimensions not acc. to DIN 332

### Overview

#### Selection of fit for solid shaft studs with keyway

| Selection of fit                         | Shaft d |     | Shaft tolerance | Bore tolerance |
|------------------------------------------|---------|-----|-----------------|----------------|
|                                          | via     | to  |                 |                |
|                                          | mm      | mm  |                 |                |
| Shaft tolerance acc. to Flender standard |         | 25  | k6              | H7             |
|                                          | 25      | 100 | m6              |                |
|                                          | 100     |     | n6              |                |

For heavy-duty operating conditions, e.g. reversing under load, it is recommended that a tighter fit and for the hub keyway width the ISO tolerance P9 is selected (special design).

In this case, the customer should provide the relevant information.

## Connection dimensions

Parallel keys, keyways and hollow shafts with keyway

### Selection of fit

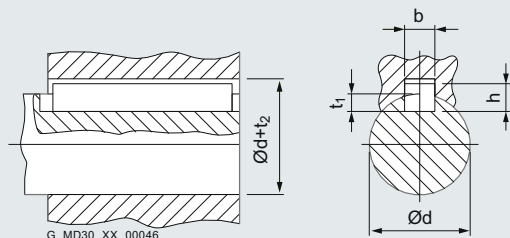
#### Dimensional drawings

##### Parallel keys and keyways

Drive type fastening without taper action

Parallel key and keyway according to DIN 6885/1

Parallel key form B



| Diameter |     | Width           | Height | Depth of keyway<br>in shaft | Depth of keyway<br>in hub        |
|----------|-----|-----------------|--------|-----------------------------|----------------------------------|
| d<br>via | to  | b <sup>1)</sup> | h      | t <sub>1</sub>              | d + t <sub>2</sub><br>DIN 6885/1 |
| mm       | mm  | mm              | mm     | mm                          | mm                               |
| 17       | 22  | 6               | 6      | 3.5                         | d + 2.8                          |
| 22       | 30  | 8               | 7      | 4                           | d + 3.3                          |
| 30       | 38  | 10              | 8      | 5                           | d + 3.3                          |
| 38       | 44  | 12              | 8      | 5                           | d + 3.3                          |
| 44       | 50  | 14              | 9      | 5.5                         | d + 3.8                          |
| 50       | 58  | 16              | 10     | 6                           | d + 4.3                          |
| 58       | 65  | 18              | 11     | 7                           | d + 4.4                          |
| 65       | 75  | 20              | 12     | 7.5                         | d + 4.9                          |
| 75       | 85  | 22              | 14     | 9                           | d + 5.4                          |
| 85       | 95  | 25              | 14     | 9                           | d + 5.4                          |
| 95       | 110 | 28              | 16     | 10                          | d + 6.4                          |
| 110      | 130 | 32              | 18     | 11                          | d + 7.4                          |
| 130      | 150 | 36              | 20     | 12                          | d + 8.4                          |
| 150      | 170 | 40              | 22     | 13                          | d + 9.4                          |
| 170      | 200 | 45              | 25     | 15                          | d + 10.4                         |
| 200      | 230 | 50              | 28     | 17                          | d + 11.4                         |
| 230      | 260 | 56              | 32     | 20                          | d + 12.4                         |
| 260      | 290 | 63              | 32     | 20                          | d + 12.4                         |
| 290      | 330 | 70              | 36     | 22                          | d + 14.4                         |
| 330      | 390 | 80              | 40     | 25                          | d + 15.4                         |
| 390      | 440 | 90              | 45     | 28                          | d + 17.4                         |

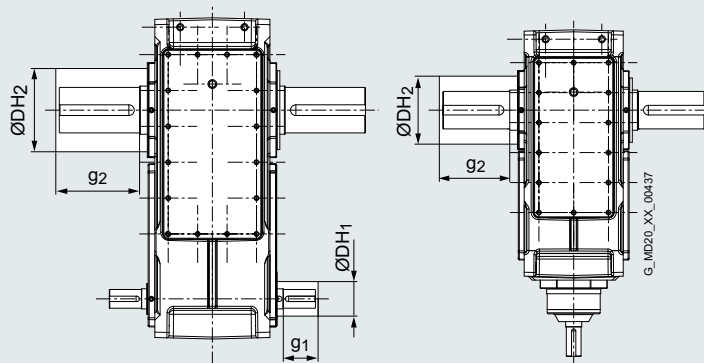
For heavy-duty operating conditions, e.g. reversing under load, it is recommended that a tighter fit and for the hub keyway width the ISO tolerance P9 is selected (special design). In this case, the customer should provide the relevant information.

<sup>1)</sup> The tolerance zone for the hub keyway width b is ISO JS9, or ISO P9 for heavy-duty operating conditions (P9 special design).



Dimensional drawings

H2S., H3S., H4S., B2S., B3S., B4S., H2C., H3C., H4C., B3C., B4C.



| Gear unit size | Dimensions in mm                        |                |                 |                |                 |                |                                        |                |                 |                |                 |                |
|----------------|-----------------------------------------|----------------|-----------------|----------------|-----------------|----------------|----------------------------------------|----------------|-----------------|----------------|-----------------|----------------|
|                | Protective cover high speed shaft (HSS) |                |                 |                |                 |                | Protective cover low speed shaft (LSS) |                |                 |                |                 |                |
|                | Type H2..                               |                | H3..            |                | H4..            |                | H2/3/4S, H2/3/4C                       |                | B3/4S, B3/4C    |                | B2S             |                |
|                | DH <sub>1</sub>                         | g <sub>1</sub> | DH <sub>1</sub> | g <sub>1</sub> | DH <sub>1</sub> | g <sub>1</sub> | DH <sub>2</sub>                        | g <sub>2</sub> | DH <sub>2</sub> | g <sub>2</sub> | DH <sub>2</sub> | g <sub>2</sub> |
| 4              | 99                                      | 118.5          | -               | -              | -               | -              | 158                                    | 183.5          | 158             | 183.5          | 158             | 181            |
| 5              | 114                                     | 117.5          | 101             | 87.5           | -               | -              | 190                                    | 227.5          | 190             | 227.5          | 190             | 225            |
| 6              | 114                                     | 117.5          | 101             | 87.5           | -               | -              | 200                                    | 227.5          | 200             | 227.5          | 200             | 225            |
| 7              | 129                                     | 155            | 104             | 100            | 79              | 60             | 227                                    | 225            | 227             | 225            | 227             | 225            |
| 8              | 129                                     | 155            | 104             | 100            | 79              | 60             | 237                                    | 265            | 237             | 265            | 237             | 265            |
| 9              | 144                                     | 162            | 119             | 142            | 89              | 70             | 254                                    | 267            | 254             | 267            | 254             | 267            |
| 10             | 144                                     | 162            | 119             | 142            | 89              | 70             | 286                                    | 317            | 286             | 317            | 286             | 317            |
| 11             | 169                                     | 185            | 129             | 140            | 99              | 115            | 311                                    | 315            | 311             | 315            | 311             | 315            |
| 12             | 169                                     | 185            | 129             | 140            | 99              | 115            | 326                                    | 315            | 326             | 315            | 326             | 315            |
| 13             | 204                                     | 220            | 154             | 175            | 109             | 120            | 351                                    | 375            | 351             | 375            | 351             | 372.5          |
| 14             | 204                                     | 220            | 154             | 175            | 109             | 120            | 351                                    | 375            | 351             | 375            | 351             | 372.5          |
| 15             | 239                                     | 232.5          | 184             | 217.5          | 124             | 157.5          | 366                                    | 437.5          | 366             | 437.5          | 366             | 427.5          |
| 16             | 239                                     | 232.5          | 184             | 217.5          | 124             | 157.5          | 406                                    | 442.5          | 406             | 442.5          | 406             | 432.5          |
| 17             | 269                                     | 272            | 184             | 220            | -               | -              | 406                                    | 440            | 406             | 440            | 406             | 412.5          |
| 18             | 269                                     | 272            | 184             | 220            | -               | -              | 426                                    | 515            | 426             | 515            | 426             | 487.5          |
| 19-28          | On request                              |                |                 |                |                 |                |                                        |                |                 |                |                 |                |

Selection and ordering data

Ordering information

When ordering a protective cover at the second shaft extension, the letter **-Z** and the following order codes must be added to the Article No.

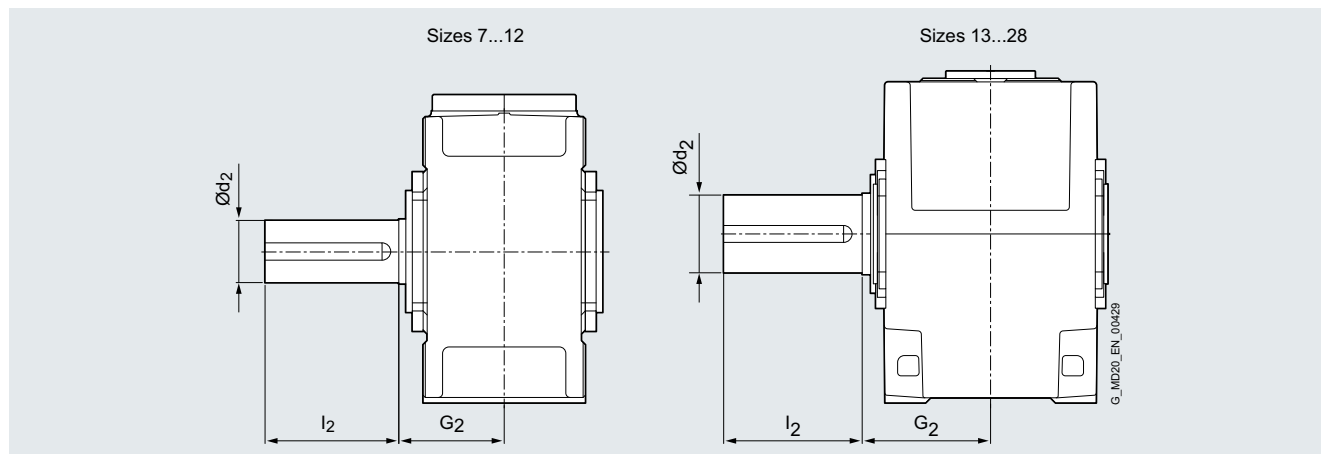
| Position of the Article No.                                                        | 1 to 6                    | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code |
|------------------------------------------------------------------------------------|---------------------------|---|---|---|----|----|----|----|----|----|----|------------|
| Article No.                                                                        | 2LP302 . . . . . -Z ■ ■ ■ |   |   |   |    |    |    |    |    |    |    |            |
| <b>Protective cover at second shaft extension for shaft extension at both ends</b> |                           |   |   |   |    |    |    |    |    |    |    |            |
| Protective cover at high speed shaft (HSS), mounting on gear unit side 6 (left)    |                           |   |   |   |    |    |    |    |    |    |    | G 1 0      |
| Protective cover at high speed shaft (HSS), mounting on gear unit side 3 (right)   |                           |   |   |   |    |    |    |    |    |    |    | G 1 1      |
| Protective cover at low speed shaft (LSS), mounting on gear unit side 6 (left)     |                           |   |   |   |    |    |    |    |    |    |    | G 2 0      |
| Protective cover at low speed shaft (LSS), mounting on gear unit side 3 (right)    |                           |   |   |   |    |    |    |    |    |    |    | G 2 1      |

## Connection dimensions

Solid shaft with parallel key

Types H1S., H2S., H3S., H4S., B2S., B3S. and B4S., sizes 4 to 28

### Overview



| Gear unit size | Dimensions in mm |                              |       |            |       |       |            |       |       |
|----------------|------------------|------------------------------|-------|------------|-------|-------|------------|-------|-------|
|                | Type H1S.        | H2S., H3S., H4S., B3S., B4S. |       |            |       |       | B2S.       |       |       |
|                | $d_2^{1)}$       | $l_2$                        | $G_2$ | $d_2^{1)}$ | $l_2$ | $G_2$ | $d_2^{1)}$ | $l_2$ | $G_2$ |
| 3              | 60               | 125                          | 170   | -          | -     | -     | -          | -     | -     |
| 4              |                  |                              |       | 80         | 170   | 140   | 80         | 170   | 170   |
| 5              | 85               | 160                          | 210   | 100        | 210   | 165   | 100        | 210   | 200   |
| 6              |                  |                              |       | 110        | 210   | 165   | 110        | 210   | 200   |
| 7              | 105              | 200                          | 250   | 120        | 210   | 195   | 120        | 210   | 235   |
| 8              |                  |                              |       | 130        | 250   | 195   | 130        | 250   | 235   |
| 9              | 125              | 210                          | 270   | 140        | 250   | 235   | 140        | 250   | 270   |
| 10             |                  |                              |       | 160        | 300   | 235   | 160        | 300   | 270   |
| 11             | 150              | 240                          | 320   | 170        | 300   | 270   | 170        | 300   | 320   |
| 12             |                  |                              |       | 180        | 300   | 270   | 180        | 300   | 320   |
| 13             | 180              | 310                          | 360   | 200        | 350   | 335   | 200        | 350   | 390   |
| 14             |                  |                              |       | 210        | 350   | 335   | 210        | 350   | 390   |
| 15             | 220              | 350                          | 360   | 230        | 410   | 380   | 230        | 410   | 460   |
| 16             |                  |                              |       | 240        | 410   | 380   | 240        | 410   | 460   |
| 17             | 240              | 400                          | 400   | 250        | 410   | 415   | 250        | 410   | 540   |
| 18             |                  |                              |       | 270        | 470   | 415   | 270        | 470   | 540   |
| 19             | 270              | 450                          | 440   | 290        | 470   | 465   | -          | -     | -     |
| 20             | -                | -                            | -     | 300        | 500   | 465   | -          | -     | -     |
| 21             | -                | -                            | -     | 320        | 500   | 490   | -          | -     | -     |
| 22             | -                | -                            | -     | 340        | 550   | 490   | -          | -     | -     |
| 23             | -                | -                            | -     | 360        | 590   | 540   | -          | -     | -     |
| 24             | -                | -                            | -     | 380        | 590   | 540   | -          | -     | -     |
| 25             | -                | -                            | -     | 400        | 650   | 605   | -          | -     | -     |
| 26             | -                | -                            | -     | 420        | 650   | 605   | -          | -     | -     |
| 27             | -                | -                            | -     | 440        | 690   | 680   | -          | -     | -     |
| 28             | -                | -                            | -     | 460        | 750   | 680   | -          | -     | -     |

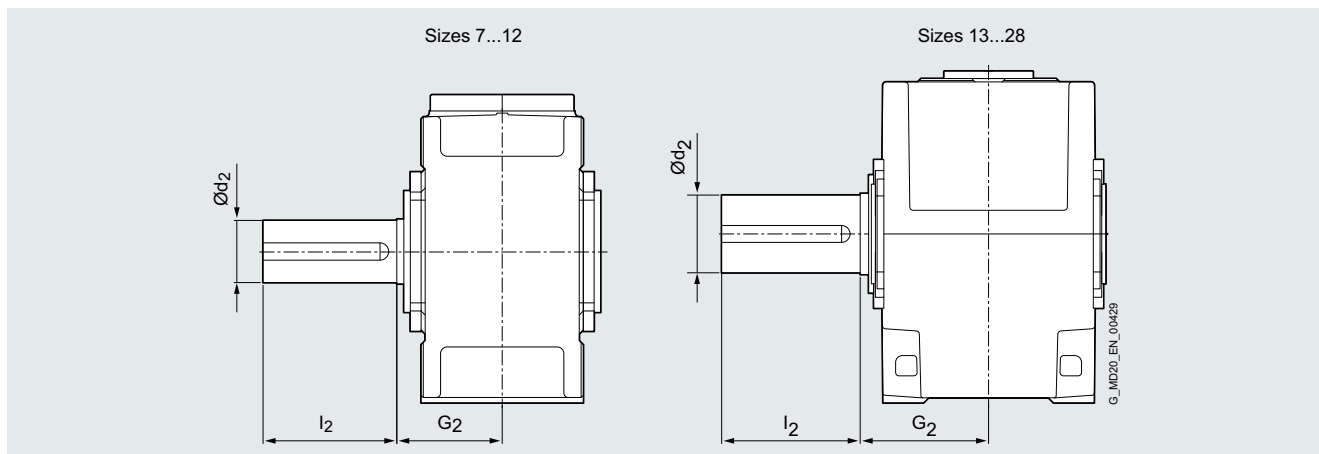
<sup>1)</sup> Selection of fit, see page 9/3.

## Connection dimensions

### Solid shaft with parallel key and reinforced bearing

Types H2V., H3V., H4V., B2V., B3V. and B4V., sizes 7 to 18

#### Overview



| Gear unit size | Dimensions in mm                                  |       |       | Add. weight in kg | Dimensions in mm          |       |       | Add. weight in kg |
|----------------|---------------------------------------------------|-------|-------|-------------------|---------------------------|-------|-------|-------------------|
|                | Type<br><b>H.VH, H.VV, B3VH, B3VV, B4VH, B4VV</b> |       |       |                   | Type<br><b>B2VH, B2VV</b> |       |       |                   |
|                | $d_2$                                             | $l_2$ | $G_2$ |                   | $d_2$                     | $l_2$ | $G_2$ |                   |
| <b>7</b>       | 130 n6                                            | 250   | 205   | 40                | 130 n6                    | 250   | 245   | 45                |
| <b>8</b>       | 130 n6                                            | 250   | 205   | 40                | 130 n6                    | 250   | 245   | 45                |
| <b>9</b>       | 150 n6                                            | 250   | 245   | 60                | 150 n6                    | 250   | 280   | 65                |
| <b>10</b>      | 170 n6                                            | 300   | 245   | 60                | 170 n6                    | 300   | 280   | 65                |
| <b>11</b>      | 180 n6                                            | 300   | 270   | 95                | 180 n6                    | 300   | 320   | 100               |
| <b>12</b>      | 180 n6                                            | 300   | 270   | 110               | 180 n6                    | 300   | 320   | 120               |
| <b>13</b>      | 220 n6                                            | 350   | 335   | 120               | –                         | –     | –     | –                 |
| <b>14</b>      | 230 n6                                            | 410   | 335   | 135               | 230 n6                    | 410   | 390   | 145               |
| <b>15</b>      | 260 n6                                            | 410   | 380   | 170               | –                         | –     | –     | –                 |
| <b>16</b>      | 270 n6                                            | 470   | 380   | 195               | 270 n6                    | 470   | 460   | 210               |
| <b>17</b>      | 290 n6                                            | 470   | 415   | 240               | –                         | –     | –     | –                 |
| <b>18</b>      | 310 n6                                            | 470   | 415   | 360               | 310 n6                    | 470   | 540   | 380               |

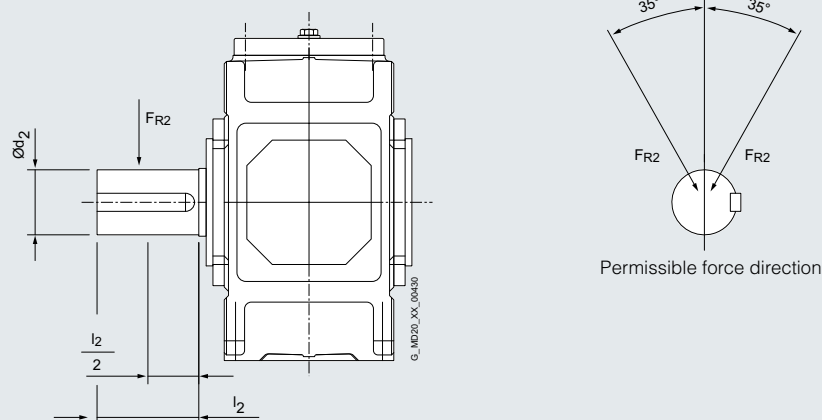
Versions E, F and I on request

## Connection dimensions

Permissible additional radial forces at low speed shaft (LSS)

### Types H1 to H4, B2 to B4

#### Overview



Permissible additional radial forces  $F_{R2}$  in kN with force application on center of shaft extension, solid shaft (S) <sup>1) 2)</sup>

| Gear unit size | Type          | H2S     |     | B2S |     | H3S     |     | H4S |     | B3S |     | B4S |     |
|----------------|---------------|---------|-----|-----|-----|---------|-----|-----|-----|-----|-----|-----|-----|
|                | Version A/B   | A/B/G/H | C/D | A/C | B/D | A/B/G/H | C/D | A/B | C/D | A/C | B/D | A/C | B/D |
| 4              | –             | 10      | 10  | 13  | 12  | –       | –   | –   | –   | 14  | 9   | –   | –   |
| 5              | <sup>3)</sup> | 22      | 13  | 27  | 15  | 29      | 18  | –   | –   | 29  | 18  | 29  | 18  |
| 6              | –             | 22      | 13  | 27  | 15  | 29      | 18  | –   | –   | 29  | 18  | 29  | 18  |
| 7              | <sup>3)</sup> | 30      | 18  | 37  | 17  | 40      | 26  | 26  | 40  | 40  | 26  | 40  | 26  |
| 8              | –             | 30      | 18  | 37  | 17  | 40      | 26  | 26  | 40  | 40  | 26  | 40  | 26  |
| 9              | <sup>3)</sup> | 30      | 10  | 38  | 10  | 40      | 18  | 18  | 40  | 40  | 18  | 40  | 18  |
| 10             | –             | 45      | 28  | 55  | 30  | 60      | 40  | 40  | 60  | 60  | 40  | 60  | 40  |
| 11             | <sup>3)</sup> | 64      | 35  | 78  | 35  | 85      | 50  | 50  | 85  | 85  | 50  | 85  | 50  |
| 12             | –             | 64      | 35  | 78  | 38  | 85      | 50  | 50  | 85  | 85  | 50  | 85  | 50  |
| 13             | <sup>3)</sup> | 150     | 112 | 160 | 110 | 190     | 150 | 150 | 190 | 190 | 150 | 190 | 150 |
| 14             | –             | 150     | 112 | 160 | 110 | 190     | 150 | 150 | 190 | 190 | 150 | 190 | 150 |
| 15             | <sup>3)</sup> | 140     | 85  | 150 | 75  | 185     | 120 | 120 | 185 | 185 | 120 | 185 | 120 |
| 16             | –             | 205     | 135 | 210 | 145 | 265     | 185 | 185 | 265 | 265 | 185 | 265 | 185 |
| 17             | <sup>3)</sup> | 205     | 135 | 210 | 100 | 265     | 185 | 185 | 265 | 265 | 185 | 265 | 185 |
| 18             | –             | 205     | 135 | 210 | 100 | 265     | 190 | 190 | 265 | 265 | 190 | 265 | 190 |

Sizes 19 to 26 on request

Permissible additional radial forces  $F_{R2}$  in kN with force application on center of shaft extension, solid shaft with reinforced bearing (V) <sup>1) 2)</sup>

| Gear unit size | Type            | B2VH, B2VV |     | H3VH, H3VV, H4VH, H4VV<br>B3VH, B3VV, B4VH, B4VV |                        | H3VH, H3VV, H4VH, H4VV<br>B3VH, B3VV, B4VH, B4VV |  |
|----------------|-----------------|------------|-----|--------------------------------------------------|------------------------|--------------------------------------------------|--|
|                | Version A/B/G/H | C/D        | A/C | B/D                                              | A/B/G/H, C/D, A/C, A/C | A/B/G/H, C/D, A/C, A/C                           |  |
| 7              | 55              | 45         | 65  | 45                                               | 65                     | 55                                               |  |
| 8              | 55              | 45         | 65  | 45                                               | 65                     | 55                                               |  |
| 9              | 70              | 50         | 80  | 50                                               | 80                     | 65                                               |  |
| 10             | 90              | 65         | 100 | 65                                               | 95                     | 75                                               |  |
| 11             | 110             | 80         | 120 | 80                                               | 135                    | 110                                              |  |
| 12             | 110             | 80         | 120 | 80                                               | 135                    | 110                                              |  |
| 13             | 155             | 120        | –   | –                                                | 210                    | 170                                              |  |
| 14             | 155             | 120        | 170 | 115                                              | 210                    | 170                                              |  |
| 15             | 220             | 165        | –   | –                                                | 280                    | 220                                              |  |
| 16             | 220             | 165        | 230 | 160                                              | 280                    | 220                                              |  |
| 17             | 280             | 200        | –   | –                                                | 360                    | 290                                              |  |
| 18             | 280             | 210        | 310 | 200                                              | 370                    | 300                                              |  |

Sizes 19 to 26 on request

<sup>1)</sup> Table values are minimum values, they apply to  $f_1 \geq 1.2$ . By specifying the angle of application and the direction of rotation, usually significantly higher additional forces can be allowed. Consultation is required.

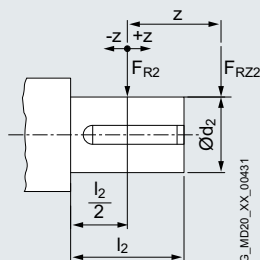
<sup>2)</sup> For force application outside of center of shaft extension, see table on next page.

<sup>3)</sup> On request.

## Connection dimensions

### Permissible additional radial forces at low speed shaft (LSS)

Types H1 to H4, B2 to B4

**Overview** (continued)**Force application outside of center of shaft extension**

$F_{RZ2}$  Permissible external radial force  
 $F_{R2}$  For permissible additional radial force, see table  
 $k$  Force application factor according to table

$$F_{RZ2} = F_{R2} \times k$$

Force application factor  $k$ 

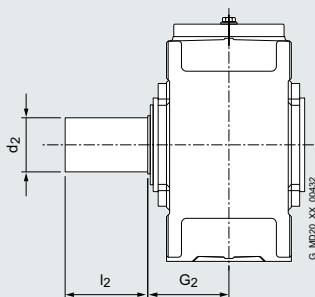
| Gear unit size | Distance $z$ in mm |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |
|----------------|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|
|                | -200               | -150 | -100 | -75  | -50  | -25  | 0    | 25   | 50   | 75   | 100  | 150  | 200  | 250  | 300  |  |
| <b>4</b>       | –                  | –    | –    | –    | 1.17 | 1.08 | 1.00 | 0.86 | 0.76 | 0.68 | 0.62 | 0.52 | 0.44 | –    | –    |  |
| <b>5+6</b>     | –                  | –    | –    | 1.22 | 1.14 | 1.06 | 1.00 | 0.88 | 0.79 | 0.72 | 0.66 | 0.56 | 0.49 | 0.43 | –    |  |
| <b>7+8</b>     | –                  | –    | –    | 1.19 | 1.12 | 1.06 | 1.00 | 0.89 | 0.81 | 0.74 | 0.68 | 0.58 | 0.51 | 0.46 | 0.41 |  |
| <b>9+10</b>    | –                  | –    | 1.22 | 1.15 | 1.10 | 1.05 | 1.00 | 0.90 | 0.82 | 0.76 | 0.70 | 0.61 | 0.54 | 0.48 | 0.44 |  |
| <b>11+12</b>   | –                  | –    | 1.18 | 1.13 | 1.08 | 1.04 | 1.00 | 0.91 | 0.84 | 0.78 | 0.73 | 0.64 | 0.57 | 0.51 | 0.47 |  |
| <b>13+14</b>   | –                  | 1.24 | 1.15 | 1.11 | 1.07 | 1.03 | 1.00 | 0.92 | 0.86 | 0.80 | 0.75 | 0.67 | 0.60 | 0.55 | 0.50 |  |
| <b>15+16</b>   | –                  | 1.20 | 1.12 | 1.09 | 1.06 | 1.03 | 1.00 | 0.93 | 0.87 | 0.82 | 0.77 | 0.69 | 0.63 | 0.58 | 0.53 |  |
| <b>17+18</b>   | 1.25               | 1.17 | 1.11 | 1.08 | 1.05 | 1.03 | 1.00 | 0.94 | 0.88 | 0.84 | 0.79 | 0.72 | 0.66 | 0.60 | 0.56 |  |

## Connection dimensions

Solid shaft without parallel key

Types H2C., H3C., H4C., B3C., B4C.

### Overview



| Gear unit size | Types H2C., H3C., H4C., B3C., B4C. |       |       |                   |
|----------------|------------------------------------|-------|-------|-------------------|
|                | $d_2$                              | $l_2$ | $G_2$ | Coupling size RFK |
| 4              | 95 h8                              | 125   | 140   | 115               |
| 5              | 115 h8                             | 125   | 165   | 115 <sup>*)</sup> |
|                |                                    |       |       | 140               |
| 6              | 115 h8                             | 125   | 165   | 115 <sup>*)</sup> |
|                |                                    |       |       | 140               |
| 7              | 140 h8                             | 155   | 195   | 140 <sup>*)</sup> |
|                |                                    |       |       | 170               |
| 8              | 140 h8                             | 155   | 195   | 140 <sup>*)</sup> |
|                |                                    |       |       | 170               |
| 9              | 140 h8                             | 155   | 235   | 140 <sup>*)</sup> |
|                |                                    |       |       | 170               |
| 10             | 170 h8                             | 155   | 235   | 170 <sup>*)</sup> |
|                |                                    |       |       | 210               |
|                |                                    |       |       | 211               |
| 11             | 170 h8                             | 155   | 270   | 170 <sup>*)</sup> |
|                |                                    |       |       | 210               |
|                |                                    |       |       | 211               |
| 12             | 210 h8                             | 170   | 270   | 210 <sup>*)</sup> |
|                |                                    |       |       | 211               |
|                |                                    |       |       | 250               |
| 13             | 210 h8                             | 170   | 335   | 210 <sup>*)</sup> |
|                |                                    |       |       | 211               |
|                |                                    |       |       | 250               |
| 14             | 210 h8                             | 170   | 335   | 210 <sup>*)</sup> |
|                |                                    |       |       | 211               |
|                |                                    |       |       | 250               |
| 15             | 250 h8                             | 190   | 380   | 250 <sup>*)</sup> |
|                |                                    |       |       | 270               |
| 16             | 250 h8                             | 190   | 380   | 250 <sup>*)</sup> |
|                |                                    |       |       | 270               |

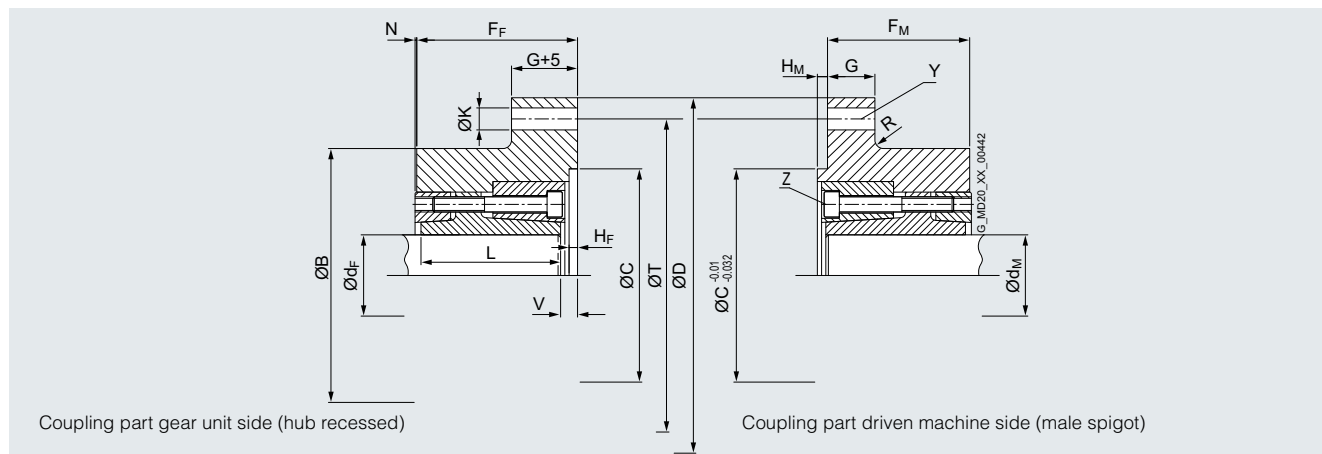
<sup>\*)</sup> Design of the coupling to  $1.5 \times T_{2N}$  when connecting the motor via motor lantern and supporting the drive train on the gear unit housing (dimension  $n_3$  from Chapter 4). This also applies to the drive train mounted on the rocker, as long as the support distance does not fall below  $1.7 \times n_3$ . Otherwise, the coupling design applies to twice the nominal output torque  $T_{2N}$ .

With identical flange connection dimensions, different coupling half sizes can be combined with each other. The maximum restrictions of the smaller coupling part then apply. Additionally occurring reaction forces in the coupling must be checked for admissibility in individual cases.

**Connection dimensions**  
Solid shaft without parallel key

**Flange coupling with zero-backlash dual taper clamping connection (RFK)**

**Overview**



| Tru-Line flange coupling RFK | Shaft d <sub>p</sub> or d <sub>M</sub> | Max. transferable torque M | Dimensions in mm      |              |             |     |     |     |    |                |                |    |                |                |    |     |         |         | Connecting screws Y <sup>1)</sup> | Tightening torque Nm | Clamping bolts Z | Tightening torque Nm | Weight kg  |
|------------------------------|----------------------------------------|----------------------------|-----------------------|--------------|-------------|-----|-----|-----|----|----------------|----------------|----|----------------|----------------|----|-----|---------|---------|-----------------------------------|----------------------|------------------|----------------------|------------|
|                              |                                        |                            | Size of coupling part | Hub recessed | Male spigot | mm  | B   | C   | D  | F <sub>F</sub> | F <sub>M</sub> | G  | H <sub>F</sub> | H <sub>M</sub> | K  | L   | N       | R       |                                   |                      |                  |                      |            |
| 115 F                        | 115 M                                  | min. 95<br>max. 115        | 28000<br>35500        | 230          | 300         | 400 | 115 | 105 | 30 | 10             | 6              | 25 | 100            | 8              | 40 | 350 | 17.5    | 16      | 8×M24×100                         | 1020                 | 7×M14            | 229                  | 47<br>45   |
| 140 F                        | 140 M                                  | min. 115<br>max. 140       | 45000<br>56000        | 270          | 300         | 400 | 115 | 105 | 30 | 10             | 6              | 25 | 100            | 8              | 20 | 350 | 17.5    | 15.3    | 8×M24×100                         | 1020                 | 10×M14           | 229                  | 55<br>51   |
| 170 F                        | 170 M                                  | min. 140<br>max. 170       | 90000<br>112000       | 330          | 300         | 560 | 145 | 135 | 35 | 12             | 8              | 32 | 128            | 10             | 30 | 480 | 20      | 17.9    | 18×M30×120                        | 2030                 | 11×M16           | 354                  | 112<br>105 |
| 210 F                        | 210 M                                  | min. 170<br>max. 210       | 160000<br>200000      | 390          | 300         | 560 | 145 | 135 | 35 | 12             | 8              | 32 | 128            | 10             | 20 | 480 | 20      | 16.6    | 18×M30×120                        | 2030                 | 16×M16           | 354                  | 137<br>125 |
| 211 F                        | 211 M                                  | min. 170<br>max. 210       | 160000<br>200000      | 430          | 350         | 630 | 145 | 135 | 40 | 12             | 8              | 32 | 128            | 10             | 20 | 550 | On req. | On req. | 18×M30×130                        | 2030                 | 16×M16           | 354                  | 160<br>148 |
| 250 F                        | 250 M                                  | min. 210<br>max. 250       | 265000<br>315000      | 470          | 350         | 630 | 160 | 150 | 40 | 12             | 8              | 32 | 140            | 10             | 10 | 550 | 18      | 13.8    | 18×M30×130                        | 2030                 | 14×M20           | 692                  | 199<br>183 |
| 270 F                        | 270 M                                  | min. 250<br>max. 270       | 375000<br>400000      | 510          | 550         | 710 | 180 | 170 | 40 | 12             | 8              | 32 | 158            | 10             | 30 | 630 | On req. | On req. | 24×M30×130                        | 2030                 | 16×M20           | 692                  | 259<br>249 |
| 290 F                        | 290 M                                  | min. 270<br>max. 290       | 450000<br>490000      | 550          | 550         | 710 | 180 | 170 | 40 | 12             | 8              | 32 | 158            | 10             | 15 | 630 | On req. | On req. | 24×M30×130                        | 2030                 | 18×M20           | 692                  | 286<br>275 |

**Ordering information**

|                                                                                |                     |   |   |   |   |    |    |    |    |    |    |    |                     |
|--------------------------------------------------------------------------------|---------------------|---|---|---|---|----|----|----|----|----|----|----|---------------------|
| Position of the Article No.                                                    | 1 to 5              | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
| Article No.                                                                    | 2LA06 . 0 . . . . . |   |   |   |   |    |    |    |    |    |    |    | -Z                  |
| <b>Flange coupling with zero-backlash dual taper clamping connection (RFK)</b> |                     |   |   |   |   |    |    |    |    |    |    |    |                     |
| Hub recessed (F)                                                               | 3                   |   |   |   |   |    |    |    |    |    |    |    |                     |
| Male spigot (M)                                                                | 4                   |   |   |   |   |    |    |    |    |    |    |    |                     |
| Both coupling parts with the same size                                         | 7                   |   |   |   |   |    |    |    |    |    |    |    |                     |
| Size 115                                                                       |                     | 0 | A | A | 0 | 0  | 0  | A  | A  | 0  |    |    |                     |
| Size 140                                                                       |                     | 1 | D | W | 6 | 5  | 4  | G  | D  | 2  |    |    |                     |
| Size 170                                                                       |                     | 2 | H | U | 4 | 1  | 8  | N  | G  | 4  |    |    |                     |
| Size 210                                                                       |                     | 3 | M | S | 1 | 7  | 3  | U  | K  | 6  |    |    |                     |
| Size 211                                                                       |                     | 3 | M | S | 2 | 1  | 4  | H  | Q  | 2  |    |    |                     |
| Size 250                                                                       |                     | 4 | R | P | 8 | 3  | 8  | B  | N  | 8  |    |    |                     |
| Size 270                                                                       |                     | 5 | V | M | 6 | 0  | 3  | H  | S  | 1  |    |    |                     |
| Size 290                                                                       |                     | 7 | A | K | 3 | 5  | 7  | P  | V  | 3  |    |    |                     |
| For use at low temperatures down to -45 °C                                     |                     |   |   |   |   |    |    |    |    |    |    |    | G 3 9               |
| 1 set of connecting screws                                                     |                     |   |   |   |   |    |    |    |    |    |    |    | G 5 0               |
| Bore diameter coupling part driven machine shaft (male spigot)                 |                     |   |   |   |   |    |    |    |    |    |    |    | Y 4 0               |
| Bore diameter coupling part gear unit side (hub recessed)                      |                     |   |   |   |   |    |    |    |    |    |    |    | Y 4 1               |

The following coupling parts are combinable:  
115 ↔ 140    211 ↔ 250  
170 ↔ 210    270 ↔ 290

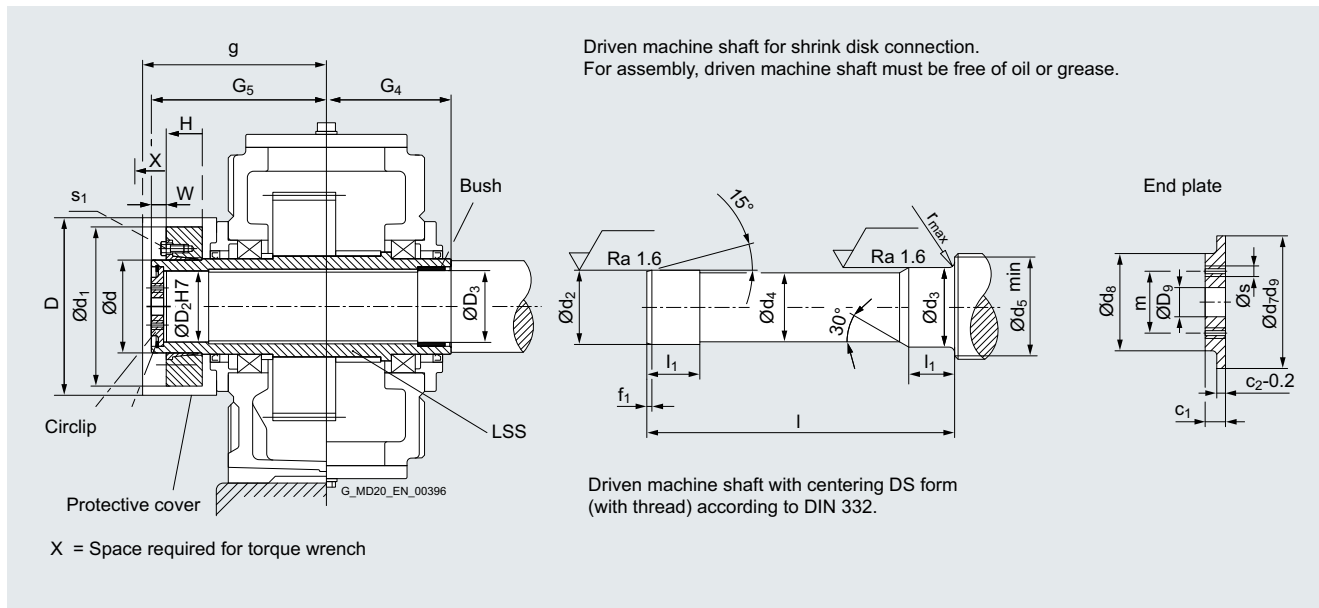
- 1) Connecting screws Y according to EN ISO 4014 strength class 10.9 or 12.9 for RFK 50 on reference diameter T.
- 2) not mounted
- 3) mounted

## Connection dimensions

Hollow shaft with shrink disk

Types H2D., H3D., H4D., B3D. and B4D.

### Overview



| Gear unit size | Driven machine shaft <sup>1)</sup> |                |                |                |                |      |                |   |                |                |                |                |                |     |      | End plate |         |  | Circlip |
|----------------|------------------------------------|----------------|----------------|----------------|----------------|------|----------------|---|----------------|----------------|----------------|----------------|----------------|-----|------|-----------|---------|--|---------|
|                | Dimensions in mm                   |                |                |                |                |      |                |   |                |                |                |                |                |     |      |           |         |  |         |
|                | d <sub>2</sub>                     | d <sub>3</sub> | d <sub>4</sub> | d <sub>5</sub> | f <sub>1</sub> | l    | l <sub>1</sub> | r | c <sub>1</sub> | c <sub>2</sub> | d <sub>7</sub> | d <sub>8</sub> | D <sub>9</sub> | m   | s    | Quantity  | DIN 472 |  |         |
| 4              | 85 g6                              | 85 h6          | 84.5           | 95             | 4              | 326  | 48             | 2 | 17             | 7              | 90             | 70             | 22             | 50  | M 8  | 2         | 90 × 3  |  |         |
| 5              | 100 g6                             | 100 h6         | 99.5           | 114            | 5              | 383  | 53             | 2 | 20             | 8              | 105            | 80             | 26             | 55  | M 10 | 2         | 105 × 4 |  |         |
| 6              | 110 g6                             | 110 h6         | 109.5          | 124            | 5              | 383  | 58             | 3 | 20             | 8              | 115            | 85             | 26             | 60  | M 10 | 2         | 115 × 4 |  |         |
| 7              | 120 g6                             | 120 h6         | 119.5          | 134            | 5              | 453  | 68             | 3 | 20             | 8              | 125            | 90             | 26             | 65  | M 12 | 2         | 125 × 4 |  |         |
| 8              | 130 g6                             | 130 h6         | 129.5          | 145            | 6              | 458  | 73             | 3 | 20             | 8              | 135            | 100            | 26             | 70  | M 12 | 2         | 135 × 4 |  |         |
| 9              | 140 g6                             | 145 m6         | 139.5          | 160            | 6              | 539  | 82             | 4 | 23             | 10             | 150            | 110            | 33             | 80  | M 12 | 2         | 150 × 4 |  |         |
| 10             | 150 g6                             | 155 m6         | 149.5          | 170            | 6              | 559  | 92             | 4 | 23             | 10             | 160            | 120            | 33             | 90  | M 12 | 2         | 160 × 4 |  |         |
| 11             | 165 f6                             | 170 m6         | 164.5          | 185            | 7              | 644  | 112            | 4 | 23             | 10             | 175            | 130            | 33             | 90  | M 12 | 2         | 175 × 4 |  |         |
| 12             | 180 f6                             | 185 m6         | 179.5          | 200            | 7              | 649  | 122            | 4 | 23             | 10             | 190            | 140            | 33             | 100 | M 16 | 2         | 190 × 4 |  |         |
| 13             | 190 f6                             | 195 m6         | 189.5          | 213            | 7              | 789  | 137            | 5 | 23             | 10             | 200            | 150            | 33             | 110 | M 16 | 2         | 200 × 4 |  |         |
| 14             | 210 f6                             | 215 m6         | 209.5          | 233            | 8              | 784  | 147            | 5 | 28             | 14             | 220            | 170            | 33             | 130 | M 16 | 2         | 220 × 5 |  |         |
| 15             | 230 f6                             | 235 m6         | 229.5          | 253            | 8              | 899  | 157            | 5 | 28             | 14             | 240            | 180            | 39             | 140 | M 16 | 2         | 240 × 5 |  |         |
| 16             | 240 f6                             | 245 m6         | 239.5          | 263            | 8              | 899  | 157            | 5 | 28             | 14             | 250            | 190            | 39             | 150 | M 20 | 2         | 250 × 5 |  |         |
| 17             | 250 f6                             | 260 m6         | 249.5          | 278            | 8              | 982  | 177            | 5 | 30             | 14             | 265            | 200            | 39             | 150 | M 20 | 2         | 265 × 5 |  |         |
| 18             | 280 f6                             | 285 m6         | 279.5          | 306            | 9              | 982  | 177            | 5 | 30             | 14             | 290            | 210            | 39             | 160 | M 20 | 2         | 290 × 5 |  |         |
| 19             | 285 f6                             | 295 m6         | 284.5          | 316            | 9              | 1100 | 187            | 5 | 32             | 15             | 300            | 220            | 39             | 170 | M 24 | 2         | 300 × 5 |  |         |
| 20             | 310 f6                             | 315 m6         | 309.5          | 336            | 9              | 1100 | 187            | 5 | 32             | 15             | 320            | 230            | 39             | 180 | M 24 | 2         | 320 × 6 |  |         |
| 21             | 330 f6                             | 335 m6         | 329            | 358            | 9              | 1160 | 205            | 5 | 40             | 20             | 340            | 250            | 45             | 190 | M 24 | 2         | 340 × 6 |  |         |
| 22             | 340 f6                             | 345 m6         | 339            | 368            | 9              | 1170 | 215            | 5 | 40             | 20             | 350            | 260            | 45             | 200 | M 24 | 2         | 350 × 6 |  |         |
| 23             | 370 f6                             | 375 m6         | 369            | 405            | 10             | 1294 | 215            | 6 | 40             | 20             | 380            | 280            | 45             | 210 | M 30 | 2         | 380 × 6 |  |         |
| 24             | 390 f6                             | 395 m6         | 389            | 425            | 10             | 1314 | 235            | 6 | 40             | 20             | 400            | 300            | 45             | 220 | M 30 | 2         | 400 × 6 |  |         |
| 25             | 410 f6                             | 415 m6         | 409            | 445            | 10             | 1455 | 235            | 6 | 45             | 20             | 420            | 320            | 45             | 240 | M 30 | 2         | 420 × 7 |  |         |
| 26             | 430 f6                             | 435 m6         | 429            | 465            | 10             | 1485 | 260            | 6 | 45             | 20             | 440            | 340            | 45             | 250 | M 30 | 2         | 440 × 7 |  |         |
| 27             | 460 f6                             | 465 m6         | 459            | 495            | 10             | 1630 | 260            | 6 | 45             | 20             | 470            | 360            | 45             | 260 | M 30 | 2         | 470 × 7 |  |         |
| 28             | 470 f6                             | 475 m6         | 469            | 505            | 10             | 1650 | 270            | 6 | 45             | 20             | 480            | 380            | 45             | 270 | M 30 | 2         | 480 × 7 |  |         |

<sup>1)</sup> Material of driven machine shaft C60N or higher strength. Shrink disk on machine side on request.



## Connection dimensions

### Hollow shaft with shrink disk

Types H2D., H3D., H4D., B3D. and B4D.

#### Overview (continued)

| Gear unit size | Hollow shaft     |                |                |                | Shrink disk <sup>1)</sup> |                |     |    | Screw | Protective cover |      |
|----------------|------------------|----------------|----------------|----------------|---------------------------|----------------|-----|----|-------|------------------|------|
|                | Dimensions in mm |                |                |                |                           |                |     |    |       | D                | g    |
|                | D <sub>2</sub>   | D <sub>3</sub> | G <sub>4</sub> | G <sub>5</sub> | d                         | d <sub>1</sub> | H   | W  |       |                  |      |
| 4              | 85               | 85             | 140            | 205            | 110                       | 185            | 51  | 20 | M 12  | 235              | 225  |
| 5              | 100              | 100            | 165            | 240            | 125                       | 215            | 55  | 20 | M 12  | 275              | 260  |
| 6              | 110              | 110            | 165            | 240            | 140                       | 230            | 61  | 20 | M 14  | 285              | 255  |
| 7              | 120              | 120            | 195            | 280            | 155                       | 263            | 64  | 23 | M 14  | 330              | 305  |
| 8              | 130              | 130            | 195            | 285            | 165                       | 290            | 70  | 23 | M 16  | 340              | 305  |
| 9              | 140              | 145            | 235            | 330            | 175                       | 300            | 71  | 28 | M 16  | 360              | 355  |
| 10             | 150              | 155            | 235            | 350            | 200                       | 340            | 87  | 28 | M 16  | 395              | 365  |
| 11             | 165              | 170            | 270            | 400            | 220                       | 370            | 103 | 30 | M 20  | 435              | 420  |
| 12             | 180              | 185            | 270            | 405            | 240                       | 405            | 107 | 30 | M 20  | 450              | 420  |
| 13             | 190              | 195            | 335            | 480            | 260                       | 430            | 119 | 30 | M 20  | 500              | 505  |
| 14             | 210              | 215            | 335            | 480            | 280                       | 460            | 132 | 30 | M 20  | 525              | 505  |
| 15             | 230              | 235            | 380            | 550            | 300                       | 485            | 140 | 35 | M 24  | 575              | 575  |
| 16             | 240              | 245            | 380            | 550            | 320                       | 520            | 140 | 35 | M 24  | 595              | 575  |
| 17             | 250              | 260            | 415            | 600            | 340                       | 570            | 155 | 35 | M 24  | 615              | 630  |
| 18             | 280              | 285            | 415            | 600            | 360                       | 590            | 162 | 35 | M 24  | 635              | 625  |
| 19             | 285              | 295            | 465            | 670            | 380                       | 640            | 166 | 40 | M 27  | 685              | 695  |
| 20             | 310              | 315            | 465            | 670            | 390                       | 650            | 166 | 40 | M 27  | 705              | 695  |
| 21             | 330              | 335            | 490            | 715            | 420                       | 670            | 186 | 45 | M 27  | 760              | 750  |
| 22             | 340              | 345            | 490            | 725            | 440                       | 720            | 196 | 45 | M 27  | 800              | 760  |
| 23             | 370              | 375            | 540            | 800            | 460                       | 760            | 200 | 65 | M 27  | 820              | 835  |
| 24             | 390              | 395            | 540            | 820            | 480                       | 800            | 218 | 65 | M 30  | 850              | 855  |
| 25             | 410              | 415            | 610            | 895            | 500                       | 835            | 218 | 75 | M 30  | 870              | 930  |
| 26             | 430              | 435            | 610            | 925            | 530                       | 865            | 245 | 76 | M 30  | 920              | 960  |
| 27             | 460              | 465            | 680            | 1000           | 560                       | 920            | 245 | 76 | M 30  | 960              | 1035 |
| 28             | 470              | 475            | 680            | 1020           | 590                       | 960            | 265 | 78 | M 30  | 1010             | 1060 |

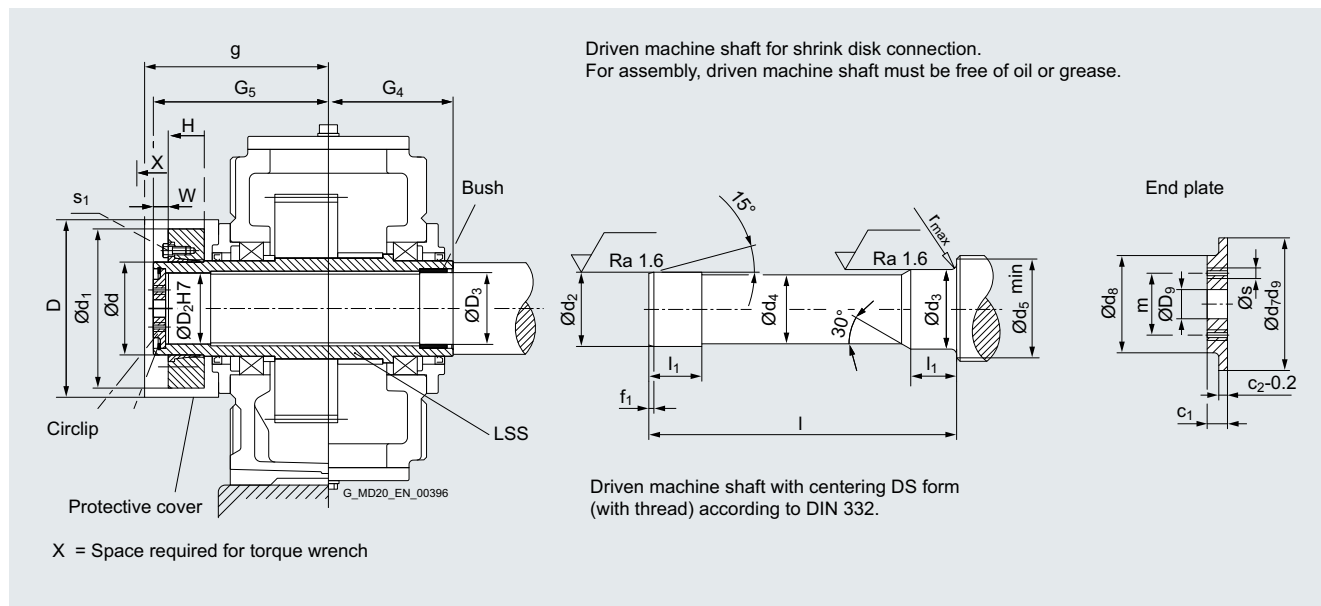
<sup>1)</sup> Shrink disk is not included in scope of supply. Please order separately, if required. In case of order, shrink disk is supplied loose.

## Connection dimensions

### Hollow shaft with shrink disk

#### Type B2D.

#### Overview



| Gear unit size | Driven machine shaft <sup>1)</sup> |                |                |                |                |      |                |   |                |                |                |                |                |     |      | End plate |         |  | Circlip |
|----------------|------------------------------------|----------------|----------------|----------------|----------------|------|----------------|---|----------------|----------------|----------------|----------------|----------------|-----|------|-----------|---------|--|---------|
|                | Dimensions in mm                   |                |                |                |                |      |                |   |                |                |                |                |                |     |      |           |         |  |         |
|                | d <sub>2</sub>                     | d <sub>3</sub> | d <sub>4</sub> | d <sub>5</sub> | f <sub>1</sub> | l    | l <sub>1</sub> | r | c <sub>1</sub> | c <sub>2</sub> | d <sub>7</sub> | d <sub>8</sub> | D <sub>9</sub> | m   | s    | Quantity  | DIN 472 |  |         |
| 4              | 85 g6                              | 85 h6          | 84.5           | 95             | 4              | 386  | 48             | 2 | 17             | 7              | 90             | 70             | 22             | 50  | M 8  | 2         | 90 × 3  |  |         |
| 5              | 100 g6                             | 100 h6         | 99.5           | 114            | 5              | 453  | 53             | 2 | 20             | 8              | 105            | 80             | 26             | 55  | M 10 | 2         | 105 × 4 |  |         |
| 6              | 110 g6                             | 110 h6         | 109.5          | 124            | 5              | 453  | 58             | 3 | 20             | 8              | 115            | 85             | 26             | 60  | M 10 | 2         | 115 × 4 |  |         |
| 7              | 120 g6                             | 120 h6         | 119.5          | 134            | 5              | 533  | 68             | 3 | 20             | 8              | 125            | 90             | 26             | 65  | M 12 | 2         | 125 × 4 |  |         |
| 8              | 130 g6                             | 130 h6         | 129.5          | 145            | 6              | 538  | 73             | 3 | 20             | 8              | 135            | 100            | 26             | 70  | M 12 | 2         | 135 × 4 |  |         |
| 9              | 140 g6                             | 145 m6         | 139.5          | 160            | 6              | 609  | 82             | 4 | 23             | 10             | 150            | 110            | 33             | 80  | M 12 | 2         | 150 × 4 |  |         |
| 10             | 150 g6                             | 155 m6         | 149.5          | 170            | 6              | 629  | 92             | 4 | 23             | 10             | 160            | 120            | 33             | 90  | M 12 | 2         | 160 × 4 |  |         |
| 11             | 165 f6                             | 170 m6         | 164.5          | 185            | 7              | 744  | 112            | 4 | 23             | 10             | 175            | 130            | 33             | 90  | M 12 | 2         | 175 × 4 |  |         |
| 12             | 180 f6                             | 185 m6         | 179.5          | 200            | 7              | 749  | 122            | 4 | 23             | 10             | 190            | 140            | 33             | 100 | M 16 | 2         | 190 × 4 |  |         |
| 14             | 210 f6                             | 215 m6         | 209.5          | 233            | 8              | 894  | 147            | 5 | 28             | 14             | 220            | 170            | 33             | 130 | M 16 | 2         | 220 × 5 |  |         |
| 16             | 240 f6                             | 245 m6         | 239.5          | 263            | 8              | 1039 | 157            | 5 | 28             | 14             | 250            | 190            | 39             | 150 | M 20 | 2         | 250 × 5 |  |         |
| 18             | 280 f6                             | 285 m6         | 279.5          | 306            | 9              | 1177 | 177            | 5 | 30             | 14             | 290            | 210            | 39             | 160 | M 20 | 2         | 290 × 5 |  |         |

| Gear unit size | Hollow shaft     |                |                |                | Shrink disk <sup>2)</sup> |                |     |    |      | Screw | Protective cover |  |
|----------------|------------------|----------------|----------------|----------------|---------------------------|----------------|-----|----|------|-------|------------------|--|
|                | Dimensions in mm |                |                |                |                           |                |     |    |      |       |                  |  |
|                | D <sub>2</sub>   | D <sub>3</sub> | G <sub>4</sub> | G <sub>5</sub> | d                         | d <sub>1</sub> | H   | W  |      | D     | g                |  |
| 4              | 85               | 85             | 170            | 235            | 110                       | 185            | 51  | 20 | M 12 | 235   | 255              |  |
| 5              | 100              | 100            | 200            | 275            | 125                       | 215            | 55  | 20 | M 12 | 275   | 290              |  |
| 6              | 110              | 110            | 200            | 275            | 140                       | 230            | 61  | 20 | M 14 | 285   | 285              |  |
| 7              | 120              | 120            | 235            | 320            | 155                       | 263            | 64  | 23 | M 14 | 330   | 345              |  |
| 8              | 130              | 130            | 235            | 325            | 165                       | 290            | 70  | 23 | M 16 | 340   | 345              |  |
| 9              | 140              | 145            | 270            | 365            | 175                       | 300            | 71  | 28 | M 16 | 360   | 390              |  |
| 10             | 150              | 155            | 270            | 385            | 200                       | 340            | 87  | 28 | M 16 | 395   | 400              |  |
| 11             | 165              | 170            | 320            | 450            | 220                       | 370            | 103 | 30 | M 20 | 435   | 470              |  |
| 12             | 180              | 185            | 320            | 455            | 240                       | 405            | 107 | 30 | M 20 | 450   | 470              |  |
| 14             | 210              | 215            | 390            | 535            | 280                       | 460            | 132 | 30 | M 20 | 525   | 555              |  |
| 16             | 240              | 245            | 450            | 620            | 320                       | 520            | 140 | 35 | M 24 | 595   | 645              |  |
| 18             | 280              | 285            | 510            | 700            | 360                       | 590            | 162 | 35 | M 24 | 635   | 725              |  |

<sup>1)</sup> Material of driven machine shaft C60N or higher strength. Shrink disk on machine side on request.

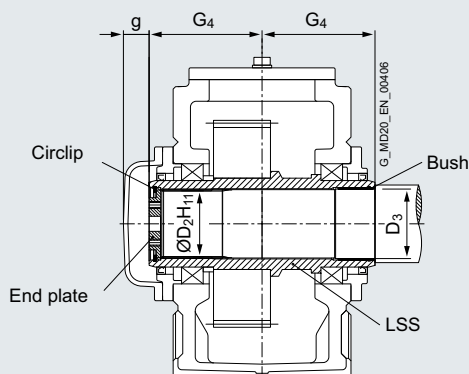
<sup>2)</sup> Shrink disk is not included in scope of supply. Please order separately, if required. In case of order, shrink disk is supplied loose.

## Connection dimensions

### Hollow shaft with spline according to DIN 5480

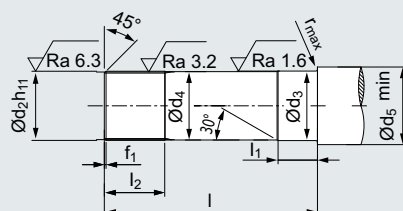
Types H2K., H3K., H4K., B3K. and B4K.

#### Overview

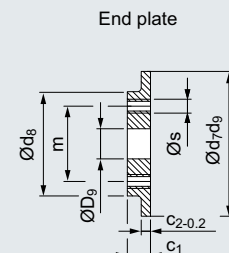


End plate and circclip are supplied by us

Driven machine shaft for connection via involute splines, to be greased on assembly



Driven machine shaft with central hole DS form (with thread) according to DIN 332



| Gear unit size | External spline DIN 5480 | Driven machine shaft <sup>1)</sup> |                |                |                |                |     |                |                |   |
|----------------|--------------------------|------------------------------------|----------------|----------------|----------------|----------------|-----|----------------|----------------|---|
|                |                          | Dimensions in mm                   |                |                |                |                |     |                |                |   |
|                |                          | d <sub>2</sub>                     | d <sub>3</sub> | d <sub>4</sub> | d <sub>5</sub> | f <sub>1</sub> | l   | l <sub>1</sub> | l <sub>2</sub> | r |
| 5              | W 95 × 3 × 30 × 8f       | 94.4                               | 100 h6         | 93             | 114            | 3              | 308 | 53             | 90             | 2 |
| 6              | W 95 × 3 × 30 × 8f       | 94.4                               | 110 h6         | 93             | 124            | 3              | 308 | 58             | 90             | 3 |
| 7              | W120 × 3 × 38 × 8f       | 119.4                              | 120 h6         | 118            | 134            | 3              | 368 | 68             | 105            | 3 |
| 8              | W120 × 3 × 38 × 8f       | 119.4                              | 130 h6         | 118            | 145            | 3              | 368 | 73             | 105            | 3 |
| 9              | W140 × 3 × 45 × 8f       | 139.4                              | 145 m6         | 138            | 160            | 3              | 444 | 82             | 125            | 4 |
| 10             | W140 × 3 × 45 × 8f       | 139.4                              | 155 m6         | 138            | 170            | 3              | 444 | 92             | 125            | 4 |
| 11             | W170 × 5 × 32 × 8f       | 169                                | 170 m6         | 168            | 185            | 5              | 514 | 112            | 150            | 4 |
| 12             | W170 × 5 × 32 × 8f       | 169                                | 185 m6         | 168            | 200            | 5              | 514 | 122            | 150            | 4 |
| 13             | W190 × 5 × 36 × 8f       | 189                                | 195 m6         | 188            | 213            | 5              | 644 | 137            | 180            | 5 |
| 14             | W190 × 5 × 36 × 8f       | 189                                | 215 m6         | 188            | 233            | 5              | 644 | 147            | 180            | 5 |
| 15             | W220 × 5 × 42 × 8f       | 219                                | 235 m6         | 218            | 253            | 5              | 728 | 157            | 200            | 5 |
| 16             | W220 × 5 × 42 × 8f       | 219                                | 245 m6         | 218            | 263            | 5              | 728 | 157            | 200            | 5 |
| 17             | W250 × 5 × 48 × 8f       | 249                                | 260 m6         | 248            | 278            | 5              | 796 | 177            | 215            | 5 |
| 18             | W250 × 5 × 48 × 8f       | 249                                | 285 m6         | 248            | 306            | 5              | 796 | 177            | 215            | 5 |
| 19 – 22        | On request               |                                    |                |                |                |                |     |                |                |   |

| Gear unit size | End plate        |                |                |                |                |     |     |          | Circclip DIN 472 | Hollow shaft   |                |                |    | Screw |
|----------------|------------------|----------------|----------------|----------------|----------------|-----|-----|----------|------------------|----------------|----------------|----------------|----|-------|
|                | Dimensions in mm |                |                |                |                |     |     |          |                  | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub> | g  |       |
|                | c <sub>1</sub>   | c <sub>2</sub> | d <sub>7</sub> | d <sub>8</sub> | D <sub>9</sub> | m   | s   | Quantity |                  |                |                |                |    |       |
| 5              | 20               | 8              | 105            | 80             | 26             | 55  | M10 | 2        | 105 × 4          | 89             | 100            | 165            | 40 | M24   |
| 6              | 20               | 8              | 105            | 80             | 26             | 55  | M10 | 2        | 105 × 4          | 89             | 110            | 165            | 40 | M24   |
| 7              | 20               | 8              | 125            | 90             | 26             | 65  | M12 | 2        | 125 × 4          | 114            | 120            | 195            | 40 | M24   |
| 8              | 20               | 8              | 125            | 90             | 26             | 65  | M12 | 2        | 125 × 4          | 114            | 130            | 195            | 40 | M24   |
| 9              | 23               | 10             | 150            | 110            | 33             | 80  | M12 | 2        | 150 × 4          | 134            | 145            | 235            | 45 | M30   |
| 10             | 23               | 10             | 150            | 110            | 33             | 80  | M12 | 2        | 150 × 4          | 134            | 155            | 235            | 45 | M30   |
| 11             | 23               | 10             | 175            | 130            | 33             | 90  | M12 | 2        | 175 × 4          | 160            | 170            | 270            | 45 | M30   |
| 12             | 23               | 10             | 175            | 130            | 33             | 90  | M12 | 2        | 175 × 4          | 160            | 185            | 270            | 45 | M30   |
| 13             | 23               | 10             | 200            | 150            | 33             | 110 | M16 | 2        | 200 × 4          | 180            | 195            | 335            | 45 | M30   |
| 14             | 23               | 10             | 200            | 150            | 33             | 110 | M16 | 2        | 200 × 4          | 180            | 215            | 335            | 45 | M30   |
| 15             | 28               | 14             | 240            | 180            | 39             | 140 | M16 | 2        | 240 × 5          | 210            | 235            | 380            | 60 | M36   |
| 16             | 28               | 14             | 240            | 180            | 39             | 140 | M16 | 2        | 240 × 5          | 210            | 245            | 380            | 60 | M36   |
| 17             | 30               | 14             | 265            | 200            | 39             | 150 | M20 | 2        | 265 × 5          | 240            | 260            | 415            | 60 | M36   |
| 18             | 30               | 14             | 265            | 200            | 39             | 150 | M20 | 2        | 265 × 5          | 240            | 285            | 415            | 60 | M36   |
| 19 – 22        | On request       |                |                |                |                |     |     |          |                  |                |                |                |    |       |

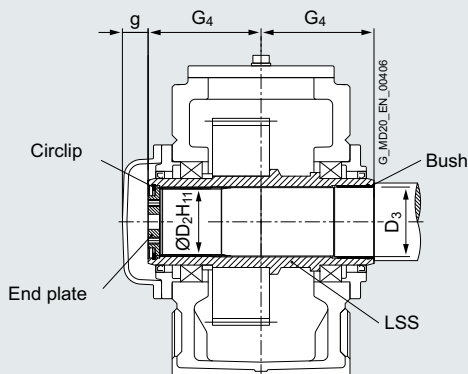
<sup>1)</sup> Material of driven machine shaft C60N or higher strength.

## Connection dimensions

Hollow shaft with spline according to DIN 5480

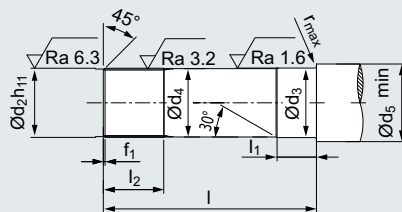
### Type B2K.

#### Overview



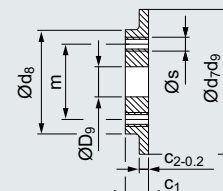
End plate and circclip are supplied by us

Driven machine shaft for connection via involute splines, to be greased on assembly



Driven machine shaft with central hole DS form (with thread) according to DIN 332

End plate



| Gear unit size | External spline DIN 5480 | Driven machine shaft <sup>1)</sup> |                |                |                |                |     |                |                |   |
|----------------|--------------------------|------------------------------------|----------------|----------------|----------------|----------------|-----|----------------|----------------|---|
|                |                          | Dimensions in mm                   |                |                |                |                |     |                |                |   |
|                |                          | d <sub>2</sub>                     | d <sub>3</sub> | d <sub>4</sub> | d <sub>5</sub> | f <sub>1</sub> | l   | l <sub>1</sub> | l <sub>2</sub> | r |
| 5              | W 95 × 3 × 30 × 8f       | 94.4                               | 100 h6         | 93             | 114            | 3              | 378 | 53             | 90             | 2 |
| 6              | W 95 × 3 × 30 × 8f       | 94.4                               | 110 h6         | 93             | 124            | 3              | 378 | 58             | 90             | 3 |
| 7              | W120 × 3 × 38 × 8f       | 119.4                              | 120 h6         | 118            | 134            | 3              | 448 | 68             | 105            | 3 |
| 8              | W120 × 3 × 38 × 8f       | 119.4                              | 130 h6         | 118            | 145            | 3              | 448 | 73             | 105            | 3 |
| 9              | W140 × 3 × 45 × 8f       | 139.4                              | 145 m6         | 138            | 160            | 3              | 514 | 82             | 125            | 4 |
| 10             | W140 × 3 × 45 × 8f       | 139.4                              | 155 m6         | 138            | 170            | 3              | 514 | 92             | 125            | 4 |
| 11             | W170 × 5 × 32 × 8f       | 169                                | 170 m6         | 168            | 185            | 5              | 614 | 112            | 150            | 4 |
| 12             | W170 × 5 × 32 × 8f       | 169                                | 185 m6         | 168            | 200            | 5              | 614 | 122            | 150            | 4 |
| 14             | W190 × 5 × 36 × 8f       | 189                                | 215 m6         | 188            | 233            | 5              | 754 | 147            | 180            | 5 |
| 16             | W220 × 5 × 42 × 8f       | 219                                | 245 m6         | 218            | 263            | 5              | 868 | 157            | 200            | 5 |
| 18             | W250 × 5 × 48 × 8f       | 249                                | 285 m6         | 248            | 306            | 5              | 986 | 177            | 215            | 5 |

| Gear unit size | End plate        |                |                |                |                |     |     |          | Circclip DIN 472 | Hollow shaft   |                |                |    | Screw |
|----------------|------------------|----------------|----------------|----------------|----------------|-----|-----|----------|------------------|----------------|----------------|----------------|----|-------|
|                | Dimensions in mm |                |                |                |                |     |     |          |                  | D <sub>2</sub> | D <sub>3</sub> | G <sub>4</sub> | g  |       |
|                | c <sub>1</sub>   | c <sub>2</sub> | d <sub>7</sub> | d <sub>8</sub> | D <sub>9</sub> | m   | s   | Quantity |                  |                |                |                |    |       |
| 5              | 20               | 8              | 105            | 80             | 26             | 55  | M10 | 2        | 105 × 4          | 89             | 100            | 200            | 40 | M24   |
| 6              | 20               | 8              | 105            | 80             | 26             | 55  | M10 | 2        | 105 × 4          | 89             | 110            | 200            | 40 | M24   |
| 7              | 20               | 8              | 125            | 90             | 26             | 65  | M12 | 2        | 125 × 4          | 114            | 120            | 235            | 40 | M24   |
| 8              | 20               | 8              | 125            | 90             | 26             | 65  | M12 | 2        | 125 × 4          | 114            | 130            | 235            | 40 | M24   |
| 9              | 23               | 10             | 150            | 110            | 33             | 80  | M12 | 2        | 150 × 4          | 134            | 145            | 270            | 45 | M30   |
| 10             | 23               | 10             | 150            | 110            | 33             | 80  | M12 | 2        | 150 × 4          | 134            | 155            | 270            | 45 | M30   |
| 11             | 23               | 10             | 175            | 130            | 33             | 90  | M12 | 2        | 175 × 4          | 160            | 170            | 320            | 45 | M30   |
| 12             | 23               | 10             | 175            | 130            | 33             | 90  | M12 | 2        | 175 × 4          | 160            | 185            | 320            | 45 | M30   |
| 14             | 23               | 10             | 200            | 150            | 33             | 110 | M16 | 2        | 200 × 4          | 180            | 215            | 390            | 45 | M30   |
| 16             | 28               | 14             | 240            | 180            | 39             | 140 | M16 | 2        | 240 × 5          | 210            | 245            | 450            | 60 | M36   |
| 18             | 30               | 14             | 265            | 200            | 39             | 150 | M20 | 2        | 265 × 5          | 240            | 285            | 510            | 60 | M36   |

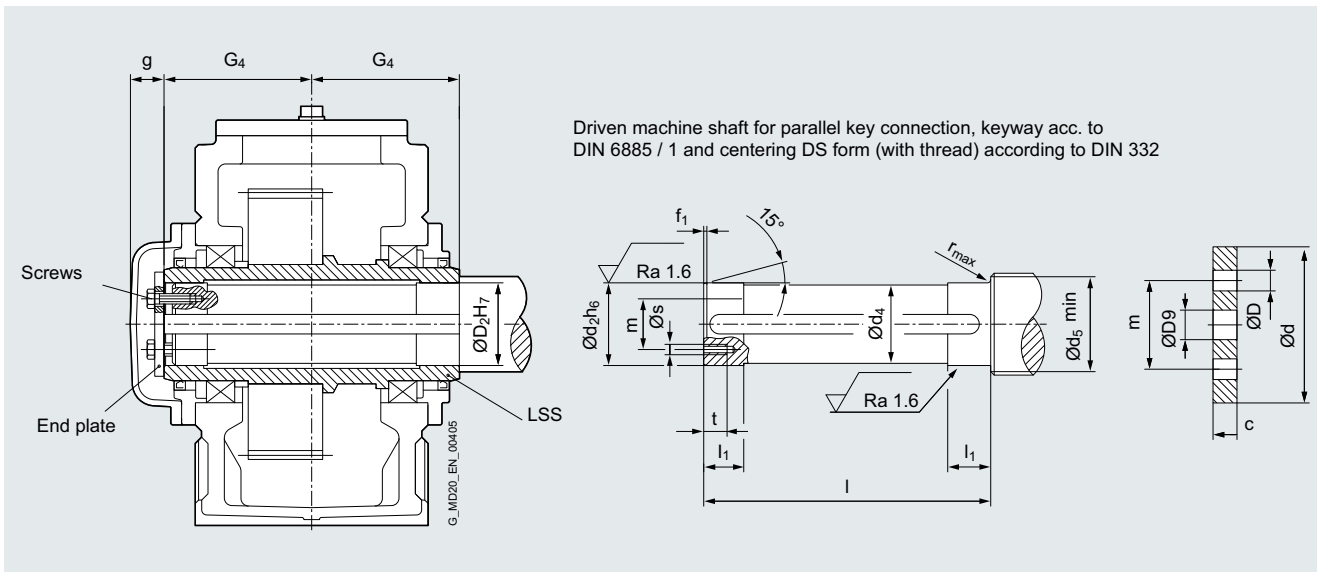
<sup>1)</sup> Material of driven machine shaft C60N or higher strength.

## Connection dimensions

Hollow shaft with keyway according to DIN 6885/1

Types H2H., H3H., H4H., B3H. and B4H.

### Overview



| Gear unit size | Driven machine shaft <sup>1)</sup> |                |                |                |     |                |     |     |    |  |
|----------------|------------------------------------|----------------|----------------|----------------|-----|----------------|-----|-----|----|--|
|                | Dimensions in mm                   |                |                |                |     |                |     |     |    |  |
|                | d <sub>2</sub>                     | d <sub>4</sub> | d <sub>5</sub> | f <sub>1</sub> | l   | l <sub>1</sub> | r   | s   | t  |  |
| 4              | 80                                 | 79.5           | 88             | 4              | 278 | 35             | 1.2 | M10 | 18 |  |
| 5              | 95                                 | 94.5           | 105            | 5              | 328 | 40             | 1.6 | M10 | 18 |  |
| 6              | 105                                | 104.5          | 116            | 5              | 328 | 45             | 1.6 | M10 | 18 |  |
| 7              | 115                                | 114.5          | 126            | 5              | 388 | 50             | 2.5 | M12 | 20 |  |
| 8              | 125                                | 124.5          | 136            | 6              | 388 | 55             | 2.5 | M12 | 20 |  |
| 9              | 135                                | 134.5          | 147            | 6              | 467 | 60             | 2.5 | M12 | 20 |  |
| 10             | 150                                | 149.5          | 162            | 6              | 467 | 65             | 2.5 | M12 | 20 |  |
| 11             | 165                                | 164.5          | 177            | 7              | 537 | 70             | 2.5 | M16 | 28 |  |
| 12             | 180                                | 179.5          | 192            | 7              | 537 | 75             | 2.5 | M16 | 28 |  |
| 13             | 190                                | 189.5          | 206            | 7              | 667 | 80             | 3   | M16 | 28 |  |
| 14             | 210                                | 209.5          | 226            | 8              | 667 | 85             | 3   | M16 | 28 |  |
| 15             | 230                                | 229.5          | 248            | 8              | 756 | 100            | 3   | M20 | 38 |  |
| 16             | 240                                | 239.5          | 258            | 8              | 756 | 100            | 3   | M20 | 38 |  |
| 17             | 250                                | 249.5          | 270            | 8              | 826 | 110            | 4   | M20 | 38 |  |
| 18             | 275                                | 274.5          | 295            | 9              | 826 | 120            | 4   | M20 | 38 |  |

| Gear unit size | End plate        |      |                |     |     | Screw    |          | Hollow shaft   |                |    |
|----------------|------------------|------|----------------|-----|-----|----------|----------|----------------|----------------|----|
|                | Dimensions in mm |      |                |     |     | Size     | Quantity | D <sub>2</sub> | G <sub>4</sub> | g  |
|                | c                | D    | D <sub>9</sub> | d   | m   |          |          |                |                |    |
| 4              | 10               | 11   | 22             | 100 | 60  | M10 × 25 | 2        | 80             | 140            | 35 |
| 5              | 10               | 11   | 26             | 120 | 70  | M10 × 25 | 2        | 95             | 165            | 40 |
| 6              | 10               | 11   | 26             | 120 | 70  | M10 × 25 | 2        | 105            | 165            | 40 |
| 7              | 12               | 13.5 | 26             | 140 | 80  | M12 × 30 | 2        | 115            | 195            | 40 |
| 8              | 12               | 13.5 | 26             | 150 | 85  | M12 × 30 | 2        | 125            | 195            | 40 |
| 9              | 12               | 13.5 | 33             | 160 | 90  | M12 × 30 | 2        | 135            | 235            | 45 |
| 10             | 12               | 13.5 | 33             | 185 | 110 | M12 × 30 | 2        | 150            | 235            | 45 |
| 11             | 15               | 17.5 | 33             | 195 | 120 | M16 × 40 | 2        | 165            | 270            | 45 |
| 12             | 15               | 17.5 | 33             | 220 | 130 | M16 × 40 | 2        | 180            | 270            | 45 |
| 13             | 18               | 17.5 | 33             | 230 | 140 | M16 × 40 | 2        | 190            | 335            | 45 |
| 14             | 18               | 17.5 | 33             | 250 | 160 | M16 × 40 | 2        | 210            | 335            | 45 |
| 15             | 25               | 22   | 39             | 270 | 180 | M20 × 55 | 4        | 230            | 380            | 60 |
| 16             | 25               | 22   | 39             | 280 | 180 | M20 × 55 | 4        | 240            | 380            | 60 |
| 17             | 25               | 22   | 39             | 300 | 190 | M20 × 55 | 4        | 250            | 415            | 60 |
| 18             | 25               | 22   | 39             | 330 | 210 | M20 × 55 | 4        | 275            | 415            | 60 |

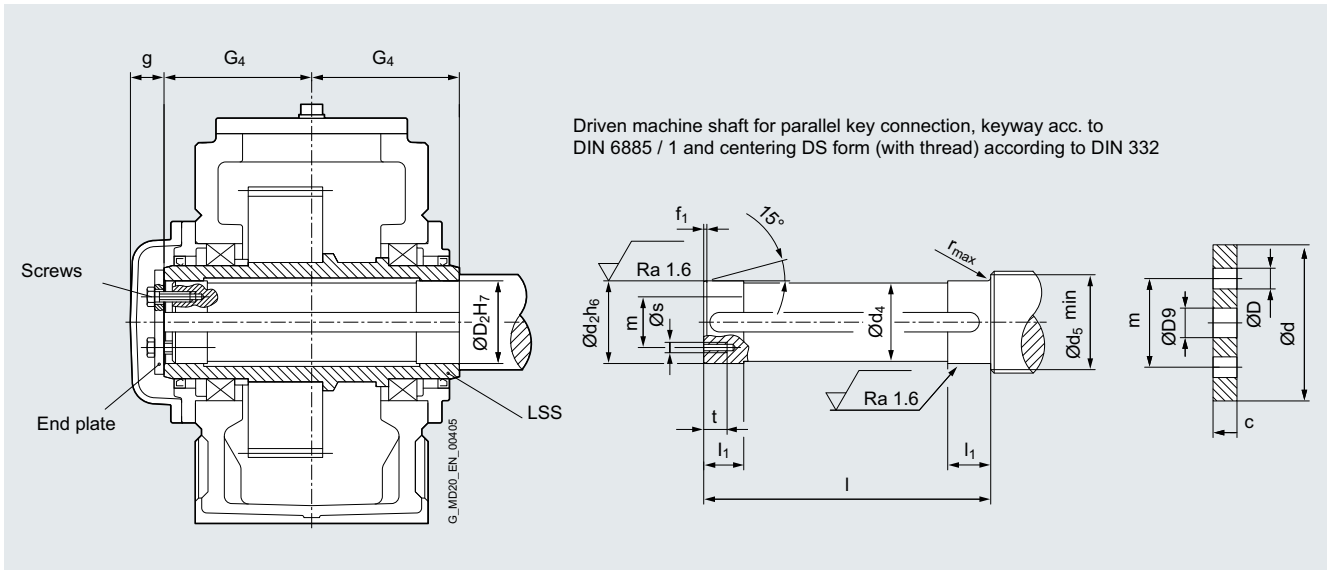
<sup>1)</sup> Material of driven machine shaft C60N or higher strength. Parallel key is not included in scope of supply. Please order separately, if required.

## Connection dimensions

Hollow shaft with keyway according to DIN 6885/1

### Type B2H.

#### Overview



| Gear unit size | Driven machine shaft <sup>1)</sup> |       |       |       |      |       |     |     |     |  |
|----------------|------------------------------------|-------|-------|-------|------|-------|-----|-----|-----|--|
|                | Dimensions in mm                   |       |       |       |      |       |     |     |     |  |
|                | $d_2$                              | $d_4$ | $d_5$ | $f_1$ | $l$  | $l_1$ | $r$ | $s$ | $t$ |  |
| 4              | 80                                 | 79.5  | 88    | 4     | 338  | 35    | 1.2 | M10 | 18  |  |
| 5              | 95                                 | 94.5  | 105   | 5     | 398  | 40    | 1.6 | M10 | 18  |  |
| 6              | 105                                | 104.5 | 116   | 5     | 398  | 45    | 1.6 | M10 | 18  |  |
| 7              | 115                                | 114.5 | 126   | 5     | 468  | 50    | 1.6 | M12 | 20  |  |
| 8              | 125                                | 124.5 | 136   | 6     | 468  | 55    | 2.5 | M12 | 20  |  |
| 9              | 135                                | 134.5 | 147   | 6     | 537  | 60    | 2.5 | M12 | 20  |  |
| 10             | 150                                | 149.5 | 162   | 6     | 537  | 65    | 2.5 | M12 | 20  |  |
| 11             | 165                                | 164.5 | 177   | 7     | 637  | 70    | 2.5 | M16 | 28  |  |
| 12             | 180                                | 179.5 | 192   | 7     | 637  | 75    | 2.5 | M16 | 28  |  |
| 14             | 210                                | 209.5 | 226   | 8     | 777  | 85    | 3   | M16 | 28  |  |
| 16             | 240                                | 239.5 | 258   | 8     | 896  | 100   | 3   | M20 | 38  |  |
| 18             | 275                                | 274.5 | 295   | 9     | 1016 | 120   | 4   | M20 | 38  |  |

| Gear unit size | End plate        |      |       |     |     | Screw    |          | Hollow shaft |       |     |
|----------------|------------------|------|-------|-----|-----|----------|----------|--------------|-------|-----|
|                | Dimensions in mm |      |       |     |     | Size     | Quantity | $D_2$        | $G_4$ | $g$ |
|                | $c$              | $D$  | $D_9$ | $d$ | $m$ |          |          |              |       |     |
| 4              | 10               | 11   | 22    | 100 | 60  | M10 × 25 | 2        | 80           | 170   | 35  |
| 5              | 10               | 11   | 26    | 120 | 70  | M10 × 25 | 2        | 95           | 200   | 40  |
| 6              | 10               | 11   | 26    | 120 | 70  | M10 × 25 | 2        | 105          | 200   | 40  |
| 7              | 12               | 13.5 | 26    | 140 | 80  | M12 × 30 | 2        | 115          | 235   | 40  |
| 8              | 12               | 13.5 | 26    | 150 | 85  | M12 × 30 | 2        | 125          | 235   | 40  |
| 9              | 12               | 13.5 | 33    | 160 | 90  | M12 × 30 | 2        | 135          | 270   | 45  |
| 10             | 12               | 13.5 | 33    | 185 | 110 | M12 × 30 | 2        | 150          | 270   | 45  |
| 11             | 15               | 17.5 | 33    | 195 | 120 | M16 × 40 | 2        | 165          | 320   | 45  |
| 12             | 15               | 17.5 | 33    | 220 | 130 | M16 × 40 | 2        | 180          | 320   | 45  |
| 14             | 18               | 17.5 | 33    | 250 | 160 | M16 × 40 | 2        | 210          | 390   | 45  |
| 16             | 25               | 22   | 39    | 280 | 180 | M20 × 55 | 4        | 240          | 450   | 60  |
| 18             | 25               | 22   | 39    | 330 | 210 | M20 × 55 | 4        | 275          | 510   | 60  |

<sup>1)</sup> Material of driven machine shaft C60N or higher strength. Parallel key is not included in scope of supply. Please order separately, if required.

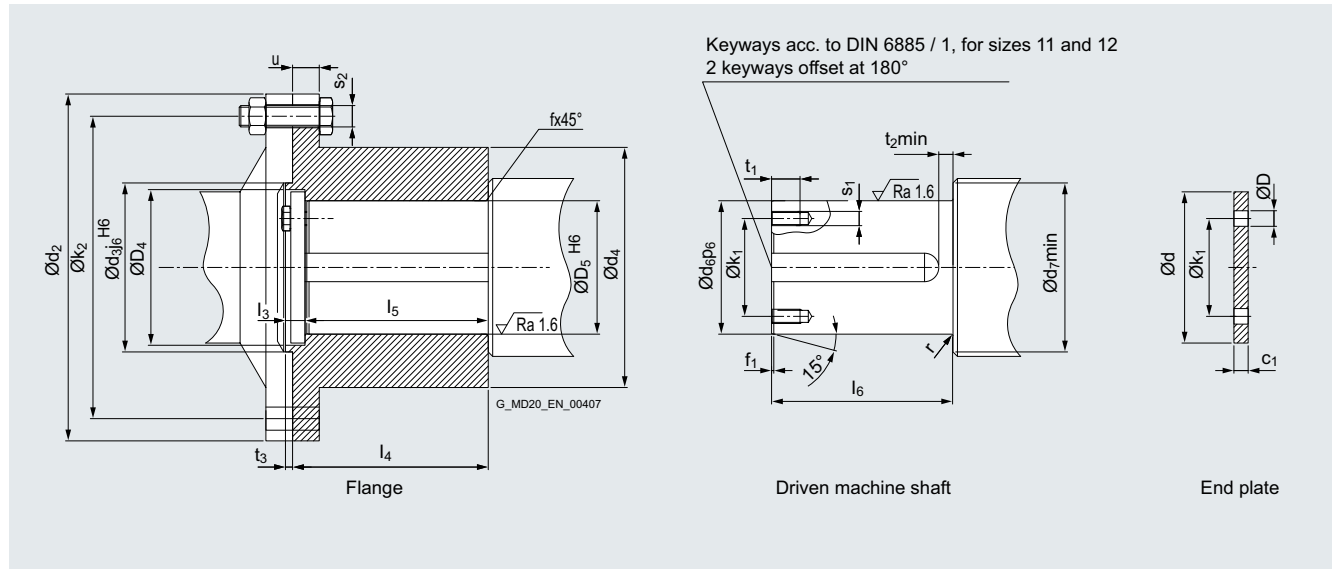
## Connection dimensions

### Counter flanges for flanged shaft

Types H2F., H3F., H4F., B2F., B3F. and B4F.

#### Overview

#### Sizes 5 to 12



| Gear unit size | Flange           |                |                |                |                |     |                |                |                |                |                |                |    |           | Screw <sup>1)</sup> |          |    |
|----------------|------------------|----------------|----------------|----------------|----------------|-----|----------------|----------------|----------------|----------------|----------------|----------------|----|-----------|---------------------|----------|----|
|                | Dimensions in mm |                |                |                |                |     |                |                |                |                |                |                |    |           | Size                | Quantity | Nm |
|                | d <sub>2</sub>   | d <sub>3</sub> | d <sub>4</sub> | D <sub>4</sub> | D <sub>5</sub> | f   | k <sub>2</sub> | l <sub>3</sub> | l <sub>4</sub> | l <sub>5</sub> | s <sub>2</sub> | t <sub>3</sub> | u  |           |                     |          |    |
| 5              | 300              | 150            | 190            | 135            | 110            | 2.5 | 260            | 16             | 175            | 167            | M20            | 8              | 25 | M20 × 70  | 16                  | 610      |    |
| 6              | 320              | 160            | 210            | 145            | 120            | 2.5 | 280            | 22             | 185            | 171            | M20            | 8              | 25 | M20 × 70  | 18                  | 610      |    |
| 7              | 370              | 180            | 230            | 160            | 135            | 2.5 | 320            | 21             | 220            | 207            | M24            | 8              | 30 | M24 × 90  | 16                  | 1050     |    |
| 8              | 390              | 190            | 270            | 175            | 150            | 2.5 | 340            | 22             | 220            | 206            | M24            | 8              | 30 | M24 × 90  | 18                  | 1050     |    |
| 9              | 430              | 220            | 290            | 195            | 160            | 4.0 | 380            | 22             | 250            | 238            | M24            | 10             | 38 | M24 × 100 | 20                  | 1050     |    |
| 10             | 470              | 240            | 210            | 220            | 180            | 4.0 | 420            | 22             | 250            | 238            | M24            | 10             | 38 | M24 × 100 | 22                  | 1050     |    |
| 11             | 510              | 260            | 340            | 235            | 200            | 4.0 | 450            | 22             | 290            | 278            | M30            | 10             | 42 | M30 × 120 | 18                  | 2100     |    |
| 12             | 540              | 280            | 360            | 255            | 210            | 4.0 | 480            | 22             | 290            | 278            | M30            | 10             | 42 | M30 × 120 | 22                  | 2100     |    |

| Gear unit size | Driven machine shaft |                |                |                |                |   |                |                |                |                | End plate |          |                | Screw    |          |        |
|----------------|----------------------|----------------|----------------|----------------|----------------|---|----------------|----------------|----------------|----------------|-----------|----------|----------------|----------|----------|--------|
|                | Dimensions in mm     |                |                |                |                |   |                |                |                |                | Size      | Quantity | kg             |          |          |        |
|                | d <sub>6</sub>       | d <sub>7</sub> | f <sub>1</sub> | k <sub>1</sub> | l <sub>6</sub> | r | s <sub>1</sub> | t <sub>1</sub> | t <sub>2</sub> | c <sub>1</sub> | d         | D        | k <sub>1</sub> | Size     | Quantity | Weight |
| 5              | 110                  | 122            | 2.5            | 80             | 165            | 2 | M12            | 28             | 7.5            | 10             | 130       | 13.5     | 80             | M12 × 35 | 4        | 35     |
| 6              | 120                  | 132            | 2.5            | 95             | 169            | 2 | M16            | 32             | 7.5            | 14             | 140       | 17.5     | 95             | M16 × 45 | 4        | 45     |
| 7              | 135                  | 147            | 2.5            | 95             | 205            | 2 | M16            | 32             | 16             | 14             | 155       | 17.5     | 95             | M16 × 45 | 4        | 65     |
| 8              | 150                  | 162            | 2.5            | 110            | 204            | 2 | M16            | 32             | 16             | 16             | 170       | 17.5     | 110            | M16 × 45 | 4        | 85     |
| 9              | 160                  | 176            | 4.0            | 110            | 235            | 3 | M16            | 32             | 16             | 16             | 190       | 17.5     | 110            | M16 × 45 | 4        | 115    |
| 10             | 180                  | 196            | 4.0            | 145            | 235            | 3 | M20            | 38             | 16             | 18             | 215       | 22       | 145            | M20 × 55 | 4        | 130    |
| 11             | 200                  | 216            | 4.0            | 145            | 275            | 3 | M20            | 38             | 16             | 18             | 230       | 22       | 145            | M20 × 55 | 4        | 175    |
| 12             | 210                  | 230            | 4.0            | 160            | 275            | 3 | M20            | 38             | 16             | 18             | 250       | 22       | 160            | M20 × 55 | 4        | 200    |

The parallel key is not included in scope of supply.  
Please order separately, if required.

<sup>1)</sup> Screws according to DIN 931, material 10.9; nuts according to DIN 934, material 10.

<sup>2)</sup> Tightening torque of the flange connection screw. Materials of flanges and driven machine shafts C60N or higher strength.

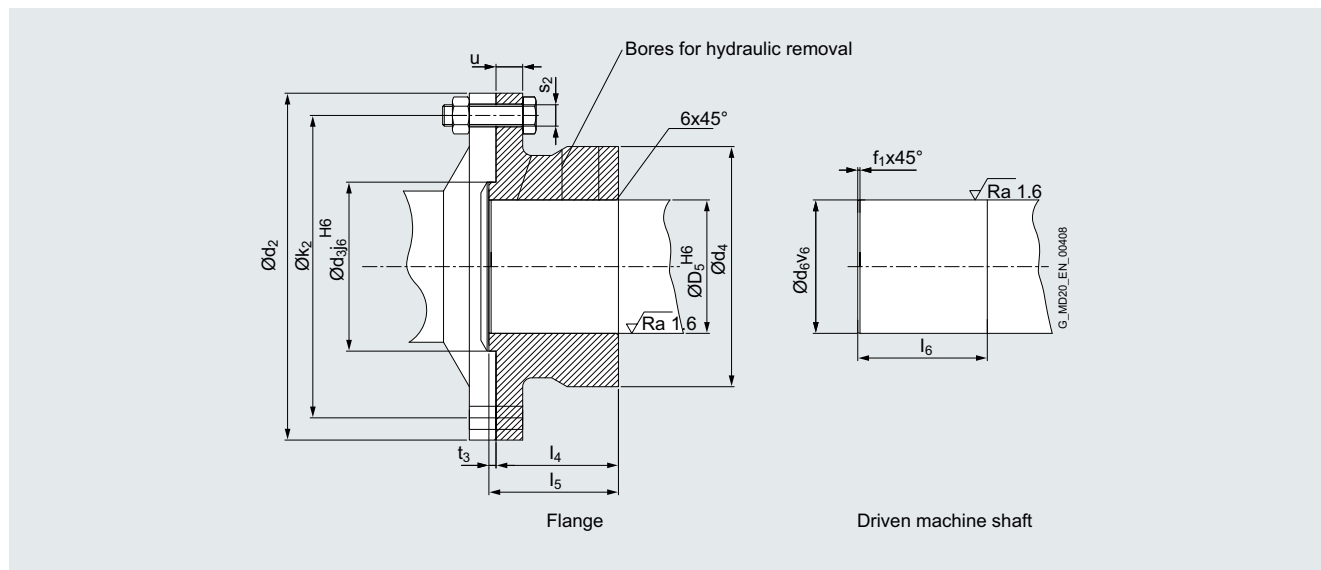
## Connection dimensions

### Counter flanges for flanged shaft

Types H2F., H3F., H4F., B2F., B3F. and B4F.

#### Overview

Sizes 13 to 22



| Gear unit size | Flange           |       |       |            |       |       |       |       |       |     |  |
|----------------|------------------|-------|-------|------------|-------|-------|-------|-------|-------|-----|--|
|                | Dimensions in mm |       |       |            |       |       |       |       |       |     |  |
|                | $d_2$            | $d_3$ | $d_4$ | $D_5^{2)}$ | $k_2$ | $l_4$ | $l_5$ | $s_2$ | $t_3$ | $u$ |  |
| 13             | 580              | 310   | 390   | 240        | 500   | 310   | 322   | M30   | 12    | 48  |  |
| 14             | 620              | 310   | 425   | 260        | 540   | 345   | 357   | M30   | 12    | 48  |  |
| 15             | 710              | 360   | 460   | 280        | 630   | 365   | 380   | M30   | 15    | 55  |  |
| 16             | 740              | 360   | 480   | 300        | 660   | 395   | 410   | M30   | 15    | 55  |  |
| 17             | 750              | 410   | 520   | 320        | 660   | 420   | 436   | M36   | 16    | 60  |  |
| 18             | 800              | 410   | 520   | 340        | 710   | 450   | 466   | M36   | 16    | 60  |  |
| 19 – 22        | On request       |       |       |            |       |       |       |       |       |     |  |

| Gear unit size | Screw <sup>1)</sup> |          |          | Driven machine shaft |       |       | Weight<br>kg |
|----------------|---------------------|----------|----------|----------------------|-------|-------|--------------|
|                | Size                | Quantity | Nm<br>TA | Dimensions in mm     |       |       |              |
|                |                     |          |          | $d_6$                | $f_1$ | $l_6$ |              |
| 13             | M30 × 130           | 20       | 2100     | 240                  | 3     | 322   | 235          |
| 14             | M30 × 130           | 24       | 2100     | 260                  | 3     | 357   | 300          |
| 15             | M30 × 140           | 28       | 2100     | 280                  | 3     | 380   | 400          |
| 16             | M30 × 140           | 30       | 2100     | 300                  | 4     | 410   | 450          |
| 17             | M36 × 160           | 24       | 3560     | 320                  | 4     | 436   | 540          |
| 18             | M36 × 160           | 26       | 3560     | 340                  | 4     | 466   | 650          |
| 19 – 22        | On request          |          |          |                      |       |       |              |

Flange connections with keyway on request.

Materials of flanges and driven machine shafts C60N or higher strengths.

When fitting, heat counter flange to 190 °C, driven machine shaft to 20 °C.

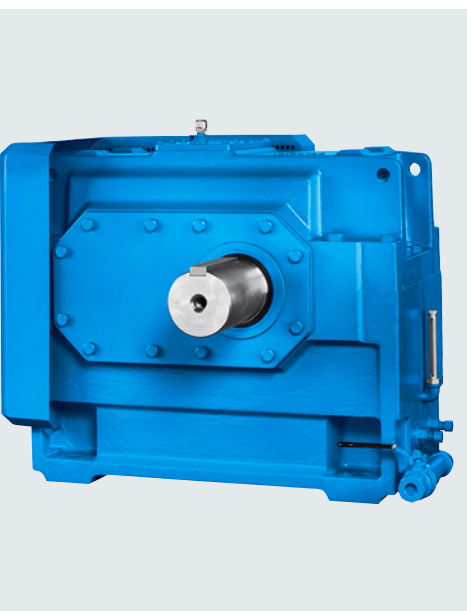
<sup>1)</sup> Screws according to DIN 931, material 10.9; nuts according to DIN 934, material 10.

<sup>2)</sup> Other diameters on request. (Smaller drilled holes D5 are possible for foot-mounted design.)

<sup>3)</sup> Dimension  $d_3 j_6$  after shrink fitting.



## Options for operation



|              |                                                                         |
|--------------|-------------------------------------------------------------------------|
| <b>10/2</b>  | <b>Shaft seals</b>                                                      |
| 10/2         | Radial shaft seal                                                       |
| 10/2         | Taconite seal                                                           |
| 10/5         | Labyrinth seal                                                          |
| 10/5         | TacoLab seal                                                            |
| 10/5         | Special seals                                                           |
| <b>10/8</b>  | <b>Oil circulation lubrication</b>                                      |
| 10/8         | Forced lubrication                                                      |
| <b>10/11</b> | <b>Cooling</b>                                                          |
| 10/11        | Fan and cooling coil                                                    |
| 10/12        | Cooling coil                                                            |
| 10/16        | Additional cooling options                                              |
| <b>10/19</b> | <b>Heating</b>                                                          |
| 10/19        | Heating elements                                                        |
| <b>10/23</b> | <b>Backstop</b>                                                         |
| <b>10/26</b> | <b>Information about oil, information about installation</b>            |
| <b>10/27</b> | <b>Oil level indicator, housing material, oil drain valve, breather</b> |
| <b>10/28</b> | <b>Explosion protection ATEX</b>                                        |
| <b>10/30</b> | <b>Corrosion protection</b>                                             |
| <b>10/31</b> | <b>Coating system</b>                                                   |
| <b>10/31</b> | <b>Color selection</b>                                                  |
| <b>10/32</b> | <b>Test reports, further information</b>                                |
| <b>10/33</b> | <b>Test run, acceptances</b>                                            |
| <b>10/34</b> | <b>Devices and filters</b>                                              |

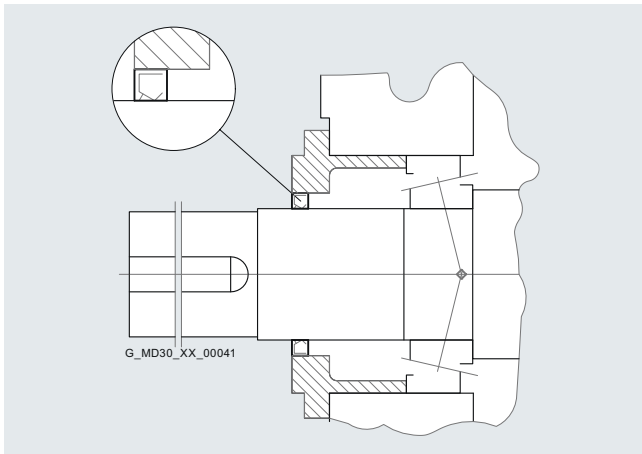
## Options for operation

### Shaft seals

#### Radial shaft seal, Taconite seal

##### Overview

##### Radial shaft seal



Radial shaft seals are suitable for low to average operating speeds. They can be used for all types and sizes.

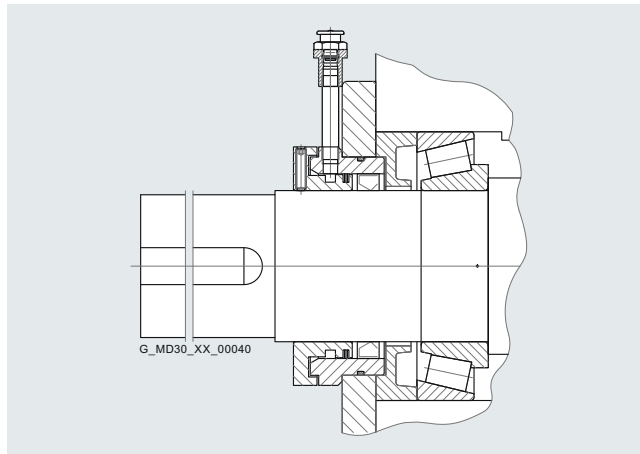
In a normal scenario, only one radial shaft seal is installed at each sealing point. At the hollow shaft sealing point on the driven machine side and on the bottom low speed shaft for a vertical mounting position, a second, back-up radial shaft seal is installed as a standard measure.

Upon request by the customer, a 2nd radial shaft seal can be installed at other sealing points.

Other features are:

- Wearing seal, however, easy to maintain
- Local heat development on sealing lip; therefore, adequate lubrication (cooling) required
- Commercially available product with the highest qualification requirements for suppliers
- Radial shaft seal material FKM - fluororubber (commercial name VITON), NBR for very low ambient temperatures
- Design with low oil level on request
- Optionally, a hardened bushing can be installed under the radial shaft seal. This can alternatively be switched to the entire shaft if run-in grooves have formed due to the radial shaft seal.
- Optionally, dry-running protection can be provided for vertically mounted gear units if shaft extensions are located at the top. For gear units that are vertically mounted in explosive atmospheres, either a Taconite seal or dry-running protection must be installed on shaft journals that are located on the top.

##### Taconite seal

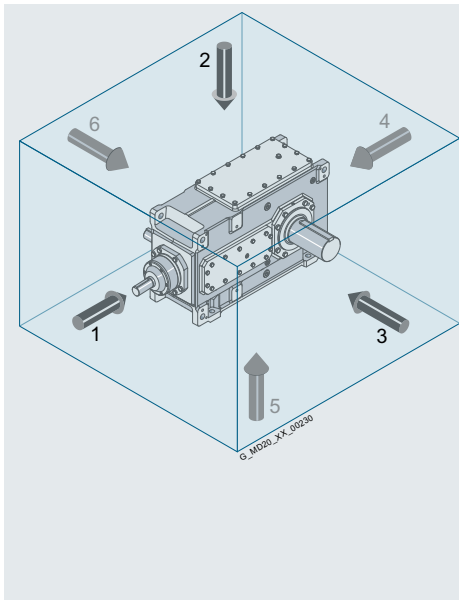


With the Taconite seal, the desired level of operational safety in dirty or dusty environments can be achieved. A labyrinth system filled with special grease protects the radial shaft seal against harmful environmental influences such as dust and solar irradiation.

The attaching of motor lanterns can be considered as quasi dust-proof. B-gear units can nevertheless be designed with an optional, additional Taconite seal on the high speed shaft. No Taconite seal is offered for H gear units with motor lanterns due to the quasi dust-proof design.

| Variants of Taconite seals | Application area                                                                                                                                      | Remarks                                                                                                                                                                         |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>E</b>                   | All high speed shafts, with or without fans                                                                                                           | <ul style="list-style-type: none"> <li>• Labyrinth that can be regreased</li> <li>• Observe dimensions for H3 and H4</li> </ul>                                                 |
| <b>F</b>                   | Low speed shaft<br>Type S: Solid shaft<br>Type V: Reinforced solid shaft<br>Type F: Flanged shaft<br>Type C: Solid shaft without keyway               | <ul style="list-style-type: none"> <li>• Labyrinth that can be regreased</li> </ul> <p>For flanged shaft only size 8 or larger</p>                                              |
| <b>F-F</b>                 | Low speed shaft<br>Type H: Hollow shaft with keyway<br>Type K: Hollow shaft with spline according to DIN 5480<br>Type D: Hollow shaft for shrink disk | <ul style="list-style-type: none"> <li>• Labyrinth that can be regreased on both sides, including protective cover as touch protection on non-drive end of gear unit</li> </ul> |
| <b>F-H</b>                 | Low speed shaft<br>Type H: Hollow shaft with keyway<br>Type K: Hollow shaft with spline according to DIN 5480                                         | <ul style="list-style-type: none"> <li>• Labyrinth that can be regreased on drive end, dust-proof protective cover on opposite side</li> </ul>                                  |
| <b>F-K</b>                 | Low speed shaft<br>Type D: Hollow shaft for shrink disk                                                                                               | <ul style="list-style-type: none"> <li>• Labyrinth that can be regreased on drive end, dust-proof protective cover on opposite side</li> </ul>                                  |

Selection and ordering data



Irrespective of the mounting position of the gear unit, the face designations "right" and "left" always refer to the horizontal mounting position with the view on side 1.  
Side 2 is on top.  
Mounting cover on top (2),  
looking at drive front face (1):  
Side 3 = right  
Side 6 = left

Article No. supplement, 14th position

|                                                                                                            | Data position of the Article No. | 1 to 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|------------------------------------------------------------------------------------------------------------|----------------------------------|--------|---|---|---|----|----|----|----|----|----|----|---------------------|
| Article No.                                                                                                | 2LP302                           | .      | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z                  |
| <b>Sealing single-side high speed shaft (HSS)</b>                                                          |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Radial shaft seal                                                                                          |                                  |        |   |   |   |    |    |    |    |    |    |    | A                   |
| Dual radial shaft seal                                                                                     |                                  |        |   |   |   |    |    |    |    |    |    |    | B                   |
| Taconite E                                                                                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | E                   |
| Radial shaft seal on hardened bushing                                                                      |                                  |        |   |   |   |    |    |    |    |    |    |    | J                   |
| Radial shaft seal with dry-running protection                                                              |                                  |        |   |   |   |    |    |    |    |    |    |    | K                   |
| <b>Sealing double-extended high speed shaft (HSS)</b>                                                      |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Side 3: Radial shaft seal/Side 6: Radial shaft seal                                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 0 A             |
| Side 3: Dual radial shaft seal/Side 6: Dual radial shaft seal                                              |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 0 B             |
| Side 3: Taconite E/Side 6: Taconite E                                                                      |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 0 E             |
| Side 3: Radial shaft seal/Side 6: Taconite E                                                               |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 1 A             |
| Side 3: Taconite E/Side 6: Radial shaft seal                                                               |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 1 B             |
| Side 3: Radial shaft seal on hardened bushing/<br>Side 6: Radial shaft seal with dry-running protection    |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 1 C             |
| Side 3: Radial shaft seal/Side 6: Radial shaft seal with dry-running protection                            |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 1 D             |
| Side 3: Taconite E/Side 6: Radial shaft seal with dry-running protection                                   |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 1 E             |
| Side 3: Radial shaft seal on hardened bearing bushing/Side 6: Taconite E                                   |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 1 F             |
| Side 3: Special seal, order via order code "Y99"/Side 6: Radial shaft seal                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 B             |
| Side 3: Radial shaft seal/Side 6: Special seal, order via order code "Y99"                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 C             |
| Side 3: Special seal, order via order code "Y99"/Side 6: Dual radial shaft seal                            |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 D             |
| Side 3: Dual radial shaft seal/Side 6: Special seal, order via order code "Y99"                            |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 E             |
| Side 3: Special seal, order via order code "Y99"/Side 6: Taconite E                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 F             |
| Side 3: Taconite E/Side 6: Special seal, order via order code "Y99"                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 G             |
| Side 3: Special seal, order via order code "Y99"/<br>Side 6: Radial shaft seal with dry-running protection |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 H             |
| Side 3: Radial shaft seal on hardened bushing/<br>Side 6: Special seal, order via order code "Y99"         |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 J             |
| Side 3: Special seal, order via order code "Y99"/<br>Side 6: Special seal, order via order code "Y99"      |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 K             |

## Options for operation

## Shaft seals

## Radial shaft seal, Taconite seal

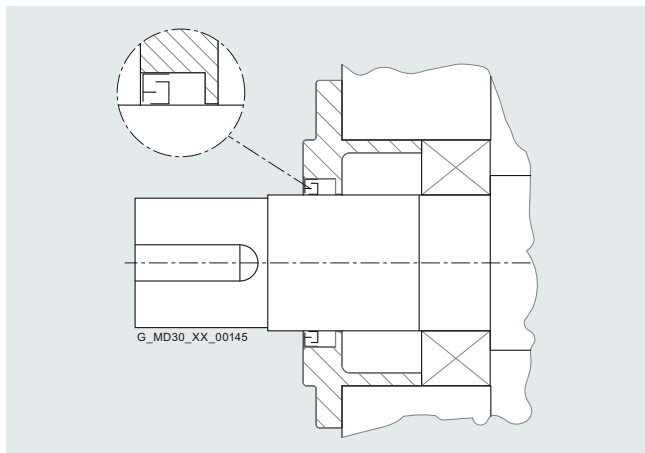
## Selection and ordering data

## Article No. supplement, 15th and 16th position

|                                                                                                            | Data position of the Article No. | 1 to 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |       |
|------------------------------------------------------------------------------------------------------------|----------------------------------|--------|---|---|---|----|----|----|----|----|----|----|---------------------|-------|
|                                                                                                            | Article No.                      | 2LP302 | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■ ■          |       |
| <b>Sealing low speed shaft (LSS)</b>                                                                       |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |       |
| Radial shaft seal                                                                                          |                                  |        |   |   |   |    |    |    |    |    |    |    | A                   |       |
| Dual radial shaft seal                                                                                     |                                  |        |   |   |   |    |    |    |    |    |    |    | B                   |       |
| Taconite F                                                                                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | E                   |       |
| Taconite F-F                                                                                               |                                  |        |   |   |   |    |    |    |    |    |    |    | F                   |       |
| Taconite F-H                                                                                               |                                  |        |   |   |   |    |    |    |    |    |    |    | G                   |       |
| Taconite F-K                                                                                               |                                  |        |   |   |   |    |    |    |    |    |    |    | H                   |       |
| Radial shaft seal on hardened bushing                                                                      |                                  |        |   |   |   |    |    |    |    |    |    |    | J                   |       |
| Radial shaft seal with dry-running protection                                                              |                                  |        |   |   |   |    |    |    |    |    |    |    | K                   |       |
| <b>Sealing double-extended low speed shaft (LSS)</b>                                                       |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |       |
| Side 3: Radial shaft seal/Side 6: Radial shaft seal                                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 0 A |
| Side 3: Dual radial shaft seal/Side 6: Dual radial shaft seal                                              |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 0 B |
| Side 3: Labyrinth/Side 6: Labyrinth                                                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 0 C |
| Side 3: Labyrinth with V-seal/Side 6: Labyrinth with V-seal                                                |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 0 D |
| Side 3: Taconite F/Side 6: Taconite F                                                                      |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 0 E |
| Side 3: Radial shaft seal/Side 6: Taconite F                                                               |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 1 A |
| Side 3: Taconite F/Side 6: Radial shaft seal                                                               |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 1 B |
| Side 3: Radial shaft seal on hardened bushing/<br>Side 6: Radial shaft seal with dry-running protection    |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 1 C |
| Side 3: Radial shaft seal/Side 6: Radial shaft seal with dry-running protection                            |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 1 D |
| Side 3: Special seal, order via order code "Y99"/Side 6: Radial shaft seal                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 8 B |
| Side 3: Radial shaft seal/Side 6: Special seal, order via order code "Y99"                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 8 C |
| Side 3: Special seal, order via order code "Y99"/Side 6: Dual radial shaft seal                            |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 8 D |
| Side 3: Dual radial shaft seal/Side 6: Special seal, order via order code "Y99"                            |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 8 E |
| Side 3: Special seal, order via order code "Y99"/Side 6: Taconite F                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 8 F |
| Side 3: Taconite F/Side 6: Special seal, order via order code "Y99"                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 8 G |
| Side 3: Special seal, order via order code "Y99"/<br>Side 6: Radial shaft seal with dry-running protection |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 8 H |
| Side 3: Radial shaft seal on hardened bushing/<br>Side 6: Special seal, order via order code "Y99"         |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 8 J |
| Side 3: Special seal, order via order code "Y99"/<br>Side 6: Special seal, order via order code "Y99"      |                                  |        |   |   |   |    |    |    |    |    |    |    | Z                   | Q 8 K |

Overview

**Labyrinth seal**



Labyrinth seals are especially suitable for higher operating speeds. They can only be used with gear units of type H1SH and H2SH.

For special protection when the gear unit does not run, the labyrinth seal can be combined with a V-ring seal.

Other features are:

- Contact-free and therefore wear-free
- No heat generated locally, so maintenance-free
- Small installation space

The following criteria must be taken into account when selecting labyrinth seals:

- For use with stationary drives only (e.g. not for traveling gears)
- With dip lubrication or oil circulation lubrication only (other lubrication variants available on request)
- Extremely dusty installation locations or those subject to polluted water hazards must be avoided
- Shaft planes must be horizontal
- Refer to table for minimum input speed  $n_1$  required for dip lubrication see table, page 10/6. If the input speed is lower than the minimum input speed  $n_1$ , it may be possible to use the labyrinth seal in combination with oil circulation lubrication. Radial shaft seals must otherwise be provided.
- To achieve a preservation life in excess of 6 months, the combination of labyrinth seal with additional V-ring seal must be used.
- Use of the combination of labyrinth seal with additional V-ring seal is recommended for applications with frequent down-times.

**TacoLab seal**

The combination seal made up of an oil and dust labyrinth is a combination of Taconite and labyrinth seals. A labyrinth seal is installed in place of the radial shaft seal ring of the Taconite seal.

The advantages of the labyrinth seal are supplemented here by usability in very dusty environments.

**Oil retaining tube**

The oil retaining tube is a seal which keeps the shaft outlet of the low speed shaft (LSS) absolutely free of oil. Forced lubrication is absolutely required for this seal. There are further limitations regarding ratios and design. The low speed shaft (LSS) for the

oil retaining tube that is vertically brought out downward is designed with an internal, contact-free and wear-free shaft seal. A radial shaft seal makes up the outside end of the seal.

Ordering information:

When ordering forced lubrication with an oil retaining tube, the Article No. must be supplemented with **-Z**.

|                                             |               |   |   |   |    |    |    |    |    |    |    |                 |
|---------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Data position of the Article No.            | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
| Article No.:                                | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b> ■ ■ ■ |
| <b>Oil supply</b>                           |               |   |   |   |    |    |    |    |    |    |    | <b>H 2 9</b>    |
| Forced lubrication, with oil retaining tube |               |   |   |   |    |    |    |    |    |    |    |                 |

**Special seals (please contact Flender)**

In addition to the sealing solutions shown in the tables, other solutions are offered in the selection tool for direct selection. Many other types of seals are possible upon request, e.g. Taconite seal on a hardened bushing, sliding ring seals, radial shaft seals for increased internal gear unit pressure (e.g. during inerting). "Special seal" must be selected for this and the seal must be described with "Z" at the 14th or 15th position of the Article No. with the corresponding order code "P8A" or "Q8A" and order code "Y99" with plain text.

Double-extended shafts can also be implemented with different seals on the respective shaft journals. The selection of seals can be defined in the configurator.

**Shaft seals H1 - H4, B2 - B4**

| Type        | Size    | Radial shaft seal |       | Labyrinth seal <sup>3)</sup> |     | Taconite seal         |       |
|-------------|---------|-------------------|-------|------------------------------|-----|-----------------------|-------|
|             |         | HSS               | LSS   | HSS <sup>2)</sup>            | LSS | HSS                   | LSS   |
| <b>H1SH</b> | 3 - 17  | H                 | H     | H                            | H   | H <sup>2)</sup>       | H     |
| <b>H2..</b> | 4 - 18  | H / V             | H / V | H                            | -   | H / V <sup>2)</sup>   | H / V |
| <b>H3..</b> | 5 - 18  | H / V             | H / V | -                            | -   | H / V <sup>1)2)</sup> | H / V |
| <b>H4..</b> | 7 - 18  | H / V             | H / V | -                            | -   | H / V <sup>1)2)</sup> | H / V |
| <b>B2..</b> | 4 - 18  | H / V             | H / V | -                            | -   | H / V                 | H / V |
| <b>B3..</b> | 4 - 18  | H / V             | H / V | -                            | -   | H / V                 | H / V |
| <b>B4..</b> | 5 - 18  | H / V             | H / V | -                            | -   | H / V                 | H / V |
| <b>All</b>  | 19 - 28 | On request        |       |                              |     |                       |       |

H = Horizontal  
V = Vertical  
HSS = High speed shaft  
LSS = Low speed shaft

1) Observe changed dimensions, see Chapter 4.  
2) Not in combination with motor lantern.  
3) Optionally with V-ring seal.

## Options for operation

## Shaft seals

## Labyrinth seal/TacoLab seal/Special seals

## Overview (continued)

## Minimum speeds for labyrinth seals

| $i_N$ | Gear unit size            |      |      |      |      |      |      |      |      |      |     |     |     |     |     |     |         | Type |    |
|-------|---------------------------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|---------|------|----|
|       | 3                         | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13  | 14  | 15  | 16  | 17  | 18  | 19 - 28 |      |    |
|       | Input speeds $n_1$ in rpm |      |      |      |      |      |      |      |      |      |     |     |     |     |     |     |         |      |    |
| 1.25  | x                         | -    | x    | -    | x    | -    | x    | -    | -    | -    | -   | -   | -   | -   | -   | -   | -       | -    | H1 |
| 1.4   | x                         | -    | x    | -    | x    | -    | x    | -    | -    | -    | -   | -   | -   | -   | -   | -   | -       | -    |    |
| 1.6   | 740                       | -    | 515  | -    | 425  | -    | 370  | -    | 305  | -    | 260 | -   | -   | -   | -   | -   | -       | -    |    |
| 1.8   | 810                       | -    | 570  | -    | 460  | -    | 395  | -    | 325  | -    | 285 | -   | -   | -   | -   | -   | -       | -    |    |
| 2     | 860                       | -    | 610  | -    | 490  | -    | 420  | -    | 350  | -    | 305 | -   | 255 | -   | -   | -   | -       | -    |    |
| 2.24  | 920                       | -    | 660  | -    | 550  | -    | 455  | -    | 375  | -    | 330 | -   | 275 | -   | -   | -   | -       | -    |    |
| 2.5   | 1020                      | -    | 710  | -    | 595  | -    | 495  | -    | 405  | -    | 355 | -   | 295 | -   | -   | -   | -       | -    |    |
| 2.8   | 1100                      | -    | 775  | -    | 635  | -    | 530  | -    | 445  | -    | 390 | -   | 320 | -   | 290 | -   | -       | -    |    |
| 3.15  | 1190                      | -    | 850  | -    | 690  | -    | 600  | -    | 480  | -    | 430 | -   | 350 | -   | 315 | -   | -       | -    |    |
| 3.55  | 1300                      | -    | 935  | -    | 755  | -    | 650  | -    | 530  | -    | 470 | -   | 380 | -   | 345 | -   | O. r.   | -    |    |
| 4     | 1430                      | -    | 1025 | -    | 835  | -    | 720  | -    | 580  | -    | 515 | -   | 420 | -   | 380 | -   | O. r.   | -    |    |
| 4.5   | 1575                      | -    | 1145 | -    | 905  | -    | 770  | -    | 640  | -    | 575 | -   | 475 | -   | 425 | -   | O. r.   | -    |    |
| 5     | 1730                      | -    | 1205 | -    | 990  | -    | 850  | -    | 730  | -    | 605 | -   | 525 | -   | 455 | -   | O. r.   | -    |    |
| 5.6   | 1910                      | -    | 1340 | -    | 1095 | -    | 955  | -    | 765  | -    | 670 | -   | 580 | -   | 505 | -   | O. r.   | -    |    |
| 6.3   | -                         | x    | x    | -    | x    | -    | 515  | -    | x    | -    | 370 | -   | 305 | -   | 260 | -   | O. r.   | -    |    |
| 7.1   | -                         | x    | 810  | -    | 660  | -    | 570  | -    | 460  | -    | 395 | -   | 325 | 305 | 385 | 260 | O. r.   | -    |    |
| 8     | -                         | 1020 | 860  | x    | 705  | x    | 610  | x    | 490  | x    | 420 | 370 | 350 | 325 | 305 | 385 | O. r.   | -    |    |
| 9     | -                         | 1080 | 920  | x    | 760  | 660  | 660  | x    | 550  | x    | 455 | 395 | 375 | 350 | 330 | 305 | O. r.   | -    |    |
| 10    | -                         | 1190 | 1020 | 860  | 820  | 705  | 710  | 610  | 595  | x    | 495 | 420 | 405 | 375 | 355 | 330 | O. r.   | -    |    |
| 11.2  | -                         | 1280 | 1100 | 920  | 885  | 760  | 775  | 660  | 635  | 550  | 530 | 455 | 445 | 405 | 390 | 355 | O. r.   | -    |    |
| 12.5  | -                         | 1435 | 1190 | 1020 | 955  | 820  | 850  | 710  | 690  | 595  | 600 | 495 | 480 | 445 | 430 | 390 | O. r.   | -    |    |
| 14    | -                         | 1560 | 1300 | 1100 | 1090 | 885  | 935  | 775  | 755  | 635  | 650 | 530 | 530 | 480 | 470 | 430 | O. r.   | -    |    |
| 16    | -                         | 1715 | 1430 | 1190 | 1200 | 955  | 1025 | 850  | 835  | 690  | 720 | 600 | 580 | 530 | 515 | 470 | O. r.   | -    |    |
| 18    | -                         | 1890 | 1575 | 1300 | 1320 | 1090 | 1145 | 935  | 905  | 755  | 770 | 650 | 640 | 580 | 575 | 515 | O. r.   | -    |    |
| 20    | -                         | -    | 1730 | 1430 | 1450 | 1200 | 1205 | 1025 | 990  | 835  | 850 | 720 | 730 | 640 | 605 | 575 | O. r.   | -    |    |
| 22.4  | -                         | -    | 1910 | 1575 | 1530 | 1320 | 1340 | 1145 | 1095 | 905  | -   | 770 | -   | 730 | -   | 605 | O. r.   | -    |    |
| 25    | -                         | -    | -    | 1730 | -    | 1450 | -    | 1205 | -    | 990  | -   | 850 | -   | -   | -   | -   | O. r.   | -    |    |
| 28    | -                         | -    | -    | 1910 | -    | 1530 | -    | 1340 | -    | 1095 | -   | -   | -   | -   | -   | -   | O. r.   | -    |    |

x Labyrinths not possible

O. r. On request

When the minimum input speed  $n_1$  is undershot, radial shaft seals must be provided.

## Selection and ordering data

## Article No. supplement, 14th position

|                                                                                                            | Data position of the Article No. | 1 to 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|------------------------------------------------------------------------------------------------------------|----------------------------------|--------|---|---|---|----|----|----|----|----|----|----|---------------------|
|                                                                                                            | Article No.                      | 2LP302 | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■            |
| <b>Sealing single-side high speed shaft (HSS)</b>                                                          |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Labyrinth                                                                                                  |                                  |        |   |   |   |    |    |    |    |    |    |    | C                   |
| Labyrinth with V-seal                                                                                      |                                  |        |   |   |   |    |    |    |    |    |    |    | D                   |
| Special seal, order via order code "Y99"                                                                   |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 A             |
| <b>Sealing double-extended high speed shaft (HSS)</b>                                                      |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Side 3: Labyrinth/Side 6: Labyrinth                                                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 0 C             |
| Side 3: Labyrinth with V-seal/Side 6: Labyrinth with V-seal                                                |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 0 D             |
| Side 3: Special seal, order via order code "Y99"/Side 6: Radial shaft seal                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 B             |
| Side 3: Radial shaft seal/Side 6: Special seal, order via order code "Y99"                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 C             |
| Side 3: Special seal, order via order code "Y99"/Side 6: Dual radial shaft seal                            |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 D             |
| Side 3: Dual radial shaft seal/Side 6: Special seal, order via order code "Y99"                            |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 E             |
| Side 3: Special seal, order via order code "Y99"/Side 6: Taconite E                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 F             |
| Side 3: Taconite E/Side 6: Special seal, order via order code "Y99"                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 G             |
| Side 3: Special seal, order via order code "Y99"/<br>Side 6: Radial shaft seal with dry-running protection |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 H             |
| Side 3: Radial shaft seal on hardened bushing/<br>Side 6: Special seal, order via order code "Y99"         |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 J             |
| Side 3: Special seal, order via order code "Y99"/<br>Side 6: Special seal, order via order code "Y99"      |                                  |        |   |   |   |    |    |    |    |    |    |    | Z P 8 K             |

## Article No. supplement, 15th and 16th position

|                                                                                                            | Data position of the Article No. | 1 to 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|------------------------------------------------------------------------------------------------------------|----------------------------------|--------|---|---|---|----|----|----|----|----|----|----|---------------------|
|                                                                                                            | Article No.                      | 2LP302 | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■            |
| <b>Sealing low speed shaft (LSS)</b>                                                                       |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Labyrinth                                                                                                  |                                  |        |   |   |   |    |    |    |    |    |    |    | C                   |
| Labyrinth with V-seal                                                                                      |                                  |        |   |   |   |    |    |    |    |    |    |    | D                   |
| Special seal, order via order code "Y99"                                                                   |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 8 A             |
| <b>Sealing double-extended low speed shaft (LSS)</b>                                                       |                                  |        |   |   |   |    |    |    |    |    |    |    |                     |
| Side 3: Labyrinth/Side 6: Labyrinth                                                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 0 C             |
| Side 3: Labyrinth with V-seal/Side 6: Labyrinth with V-seal                                                |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 0 D             |
| Side 3: Special seal, order via order code "Y99"/Side 6: Radial shaft seal                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 8 B             |
| Side 3: Radial shaft seal/Side 6: Special seal, order via order code "Y99"                                 |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 8 C             |
| Side 3: Special seal, order via order code "Y99"/Side 6: Dual radial shaft seal                            |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 8 D             |
| Side 3: Dual radial shaft seal/Side 6: Special seal, order via order code "Y99"                            |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 8 E             |
| Side 3: Special seal, order via order code "Y99"/Side 6: Taconite F                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 8 F             |
| Side 3: Taconite F/Side 6: Special seal, order via order code "Y99"                                        |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 8 G             |
| Side 3: Special seal, order via order code "Y99"/<br>Side 6: Radial shaft seal with dry-running protection |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 8 H             |
| Side 3: Radial shaft seal on hardened bushing/<br>Side 6: Special seal, order via order code "Y99"         |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 8 J             |
| Side 3: Special seal, order via order code "Y99"/<br>Side 6: Special seal, order via order code "Y99"      |                                  |        |   |   |   |    |    |    |    |    |    |    | Z Q 8 K             |

## Options for operation

### Oil circulation lubrication

#### Forced lubrication

##### Overview

In the case of higher speeds, forced lubrications may be required to ensure the oil supply.

The oil can be filtered during this. Various filters and filter meshes are available. The filter can positively influence the purity of the oil and thus the suitability of the oil for lubrication and heat dissipation.

Forced lubrication is implemented for monitoring and ensuring the function with a pressure monitor, which outputs a signal when the minimum oil pressure in the pipe system is undershot, so that the drive can be shut down for safety reasons.

Pressure monitor  
e.g. 0.5 bar falling

Option: double changeover filter  
(standard from size 13)

Coarse filter

Pump

Option: double changeover filter  
(standard from size 13)

The foundation must be horizontal and level.  
Inclined on request.  
For technical specifications about filters and devices, [see page 10/34 onwards](#).  
Double changeover filter: Standard from gear unit size 13, for details [see page 10/46](#) <sup>3)</sup>.

Forced lubrication  
Type H1.H, gear unit size 5 to 17

| Gear unit size         | 5   | 7   | 9   | 11  | 13  | 15  | 17  |
|------------------------|-----|-----|-----|-----|-----|-----|-----|
| Pump <sup>1)</sup> KSW | 1   | 2   | 2   | 2   | 3   | 3   | 3   |
| E                      | 283 | 337 | 400 | 430 | 474 | 479 | 525 |

Coarse filter

Pressure monitor  
e.g. 0.5 bar falling

Option: double changeover filter  
(standard from size 13)

Option: double changeover filter  
(standard from size 13)

The foundation must be horizontal and level.  
Inclined on request.  
For technical specifications about filters and devices, [see page 10/34 onwards](#).  
Double changeover filter: Standard from gear unit size 13, for details [see page 10/46](#) <sup>3)</sup>.

Forced lubrication  
Type H2.H, gear unit size 5 to 18

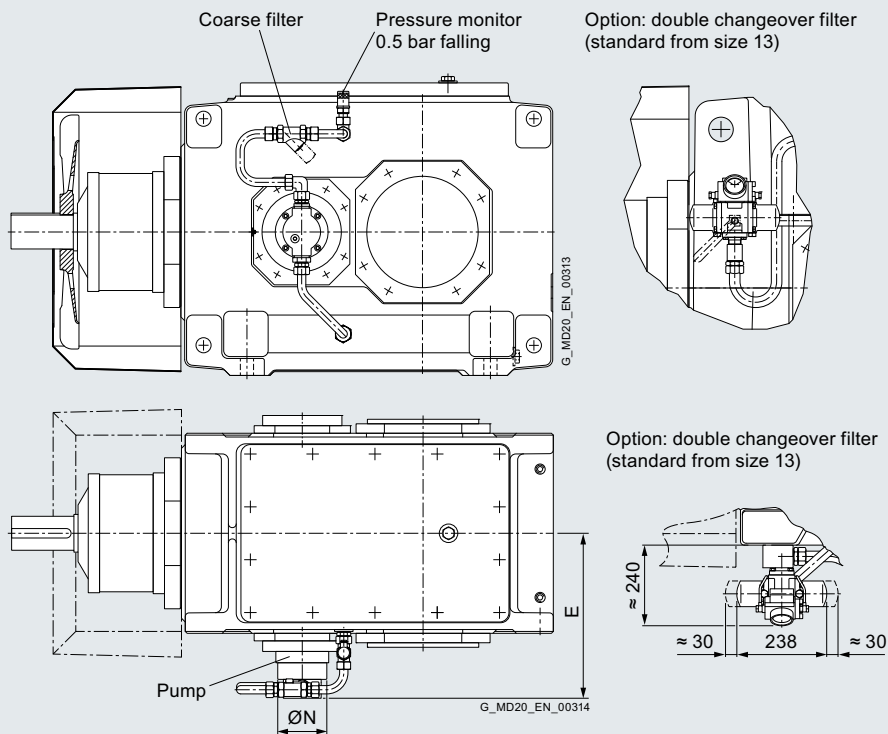
| Gear unit size         | 5   | 6 | 7   | 8 | 9   | 10 | 11  | 12 | 13  | 14 | 15  | 16 | 17  | 18 |
|------------------------|-----|---|-----|---|-----|----|-----|----|-----|----|-----|----|-----|----|
| Pump <sup>2)</sup> KSW | 1   |   |     |   |     |    |     |    | 2   |    |     |    |     |    |
| E                      | 264 |   | 285 |   | 308 |    | 344 |    | 440 |    | 475 |    | 500 |    |

<sup>1)</sup> Applies to speeds  $n \geq 900$  to 1800 rpm  
<sup>2)</sup> Applies to speeds  $n \geq 1500$  to 1800 rpm

<sup>3)</sup> Line filter alternatively possible, [see page 10/10 and 10/45](#).



**Overview (continued)**



The foundation must be horizontal and level.  
Inclined on request.  
For technical specifications about filters and devices, [see page 10/34 onwards](#).  
Double changeover filter: Standard from gear unit size 13, for details [see page 10/46<sup>2\)</sup>](#).

Forced lubrication  
Type B2.H, gear unit size 5 to 18

| Gear unit size            | 5/6 |     |     | 7/8 |     |     | 9/10 |     |     | 11/12 |     |     | 13/14 |     | 15/16 |     | 17/18 |     |
|---------------------------|-----|-----|-----|-----|-----|-----|------|-----|-----|-------|-----|-----|-------|-----|-------|-----|-------|-----|
| Pump <sup>1)</sup><br>KSW | 1   | 2   | 3   | 1   | 2   | 3   | 1    | 2   | 3   | 1     | 2   | 3   | 2     | 3   | 2     | 3   | 2     | 3   |
| Ø N                       | 110 | 110 | 140 | 110 | 110 | 140 | 110  | 110 | 140 | 110   | 110 | 140 | 110   | 140 | 110   | 140 | 110   | 140 |
| E                         | 342 | 342 | 342 | 372 | 372 | 372 | 401  | 401 | 401 | 442   | 442 | 442 | 489   | 489 | 545   | 545 | 606   | 606 |

<sup>1)</sup> Valid for the following speeds  
 Sizes 1 and 2  $n_1 \geq 1500$  to 1800 rpm  
 Sizes 3  $n_1 \geq 1200$  to 1800 rpm

<sup>2)</sup> Line filter alternatively possible, [see page 10/10 and 10/45](#).

## Options for operation

### Oil circulation lubrication

#### Forced lubrication

##### Overview (continued)

##### **Line filter option** (for details see page 10/45)

The standard design of the forced lubrication for gear units up to size 12 is provided with a coarse filter.

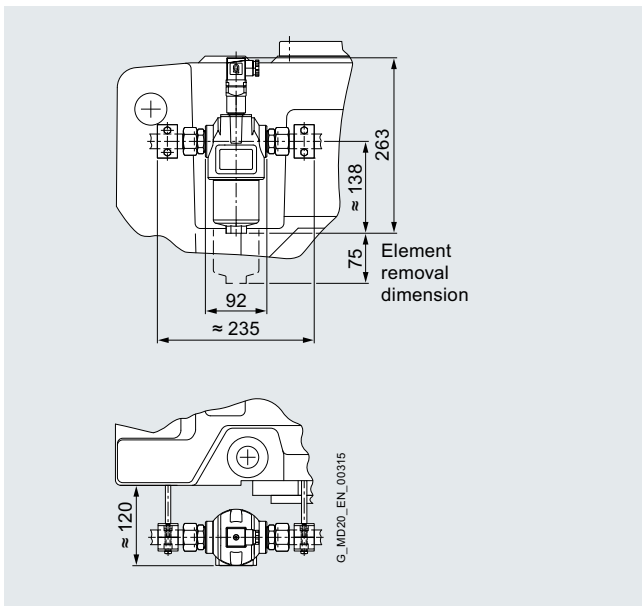
Upon request, the design can have a filter with a filter chamber (line filter) or also with 2 filter chambers (dual changeover filter). These two filters have an electronic contamination indicator.

With a dual changeover filter, the operator can "switch over" from a dirty filter element to a clean one during operation, which makes the gear unit 100% available. In contrast to this, the gear

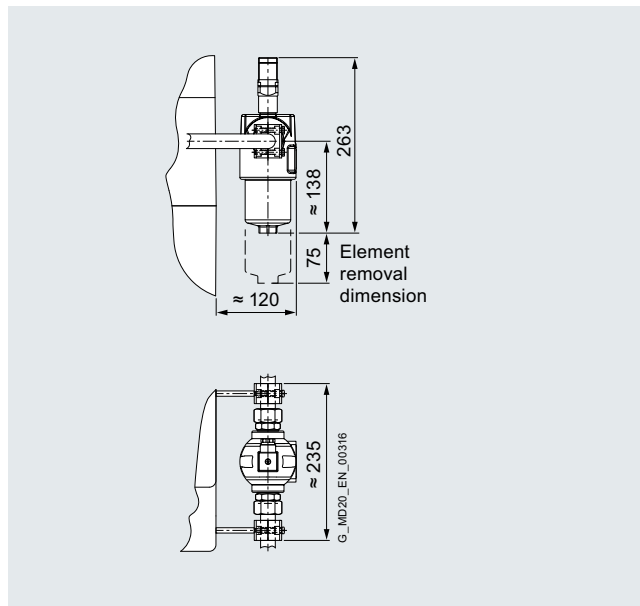
unit must be taken out of operation to clean the coarse filter or line filter.

With size 13 or larger, dual changeover filters are provided as the standard because they can be "manually" switched during operation when they become dirty.

If the availability does not play a role, a single line filter can also be provided here.



Line filter for types H2 and B2



Line filter for type H1

**Overview****Fan and cooling coil**

Fans and/or cooling coils can be used for auxiliary cooling.

**Fan:**

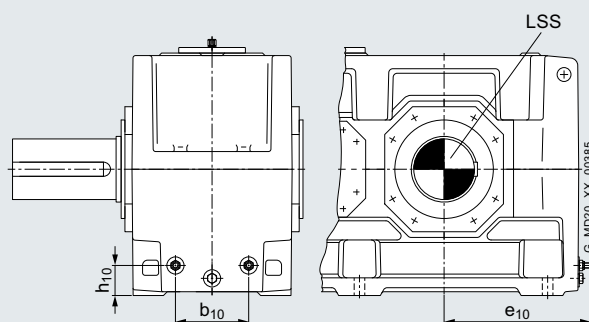
- The standard fan is designed as a radial fan and is mounted on the high speed shaft (HSS). On designs with shaft extensions at both ends (designs **G, H, I**), the fan is mounted either at gear unit side 3 (right) or gear unit side 6 (left).
- An adapted air guide cover ensures optimized air flow on the gear unit and therefore high-performance cooling
- It is possible to attach a fan later  
Please note: For types H3 and H4, the corresponding dimensions for the high speed shaft (HSS) with fan must be specified in advance according to Chapter 4!
- The connection dimensions at the input shaft are changed if a fan is mounted

**Cooling coil:**

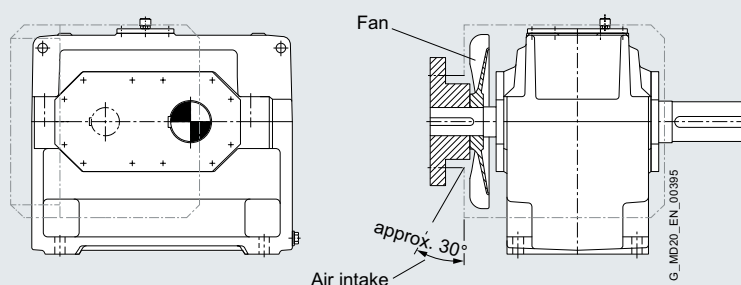
- The cooling coil is connected on gear unit side 4 (front side of low speed shaft (LSS))
- The cooling coil is suitable for freshwater, seawater and brackish water
- See table for connection dimensions
- Water connection: G 1/2"

**Parameters for attainment of the specified thermal capacities:**

- Volumetric flow of the cooling water in l/min, see tables on page 10/13 on the right. The flow rate can exceed the specified values, but this might result in elevated noise levels.
- Max. permissible cooling water pressure: 8 bar
- See tables on page 10/13.



Cooling coil, connection gear unit side 4 (front side, low speed shaft (LSS))



Fan

**Ordering information:**

| Article No.:                                       | 2LP302.-.....-0.A | -Z | Order code   |
|----------------------------------------------------|-------------------|----|--------------|
| <b>Auxiliary cooling</b>                           |                   |    |              |
| Oil cooling: Radial fan, standard version, side 1  |                   |    | <b>H 6 0</b> |
| Oil cooling: Radial fan, standard version, side 3  |                   |    | <b>H 6 1</b> |
| Oil cooling: Radial fan, standard version, side 6  |                   |    | <b>H 6 2</b> |
| Oil cooling: Radial fan, ATEX design, side 1       |                   |    | <b>H 6 3</b> |
| Oil cooling: Radial fan, ATEX design, side 3       |                   |    | <b>H 6 4</b> |
| Oil cooling: Radial fan, ATEX design, side 6       |                   |    | <b>H 6 5</b> |
| Oil cooling: Cooling coil, catalog version, side 4 |                   |    | <b>H 6 6</b> |

| Article No.:                                                                               | 2LP302.-.....-0.A | -Z | Order code   |
|--------------------------------------------------------------------------------------------|-------------------|----|--------------|
| <b>Auxiliary cooling</b>                                                                   |                   |    |              |
| Radial fan, standard version, with dual-side high speed shaft (HSS) opposite drive, side 3 |                   |    | <b>H 6 7</b> |
| Radial fan, standard version, with dual-side high speed shaft (HSS) opposite drive, side 6 |                   |    | <b>H 6 8</b> |
| Radial fan, ATEX design, with dual-side high speed shaft (HSS) opposite drive, side 3      |                   |    | <b>H 6 9</b> |
| Radial fan, ATEX design, with dual-side high speed shaft (HSS) opposite drive, side 6      |                   |    | <b>H 7 0</b> |

## Options for operation

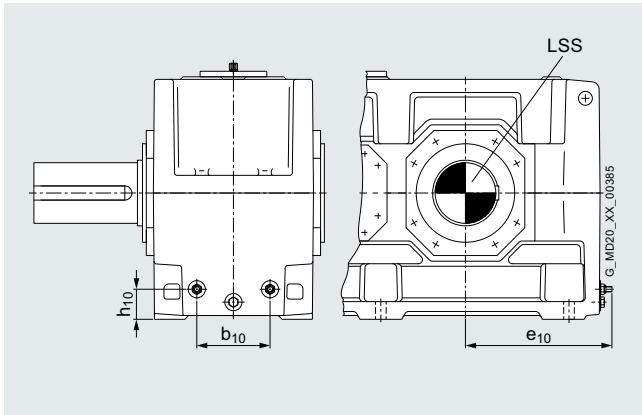
### Cooling

#### Cooling coil

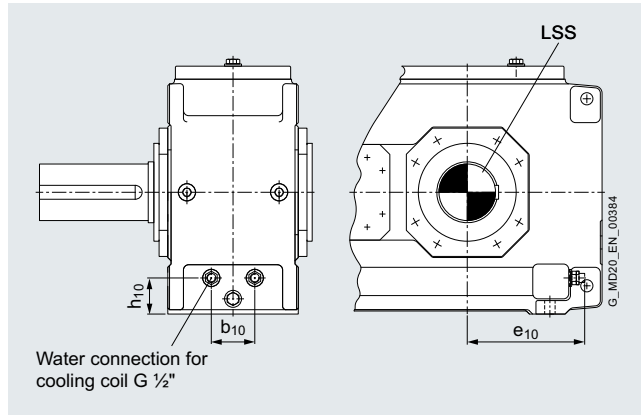
#### Overview

#### Cooling coil suitable for fresh water, seawater and brackish water

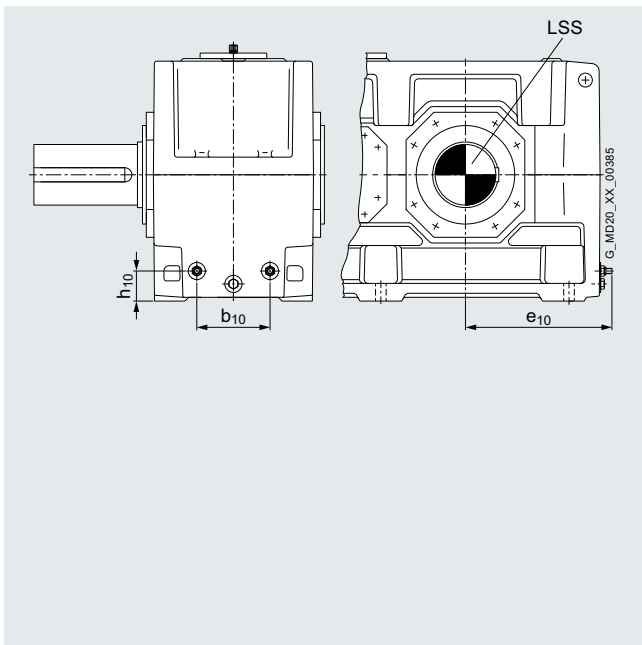
#### Cooling coil for horizontal types



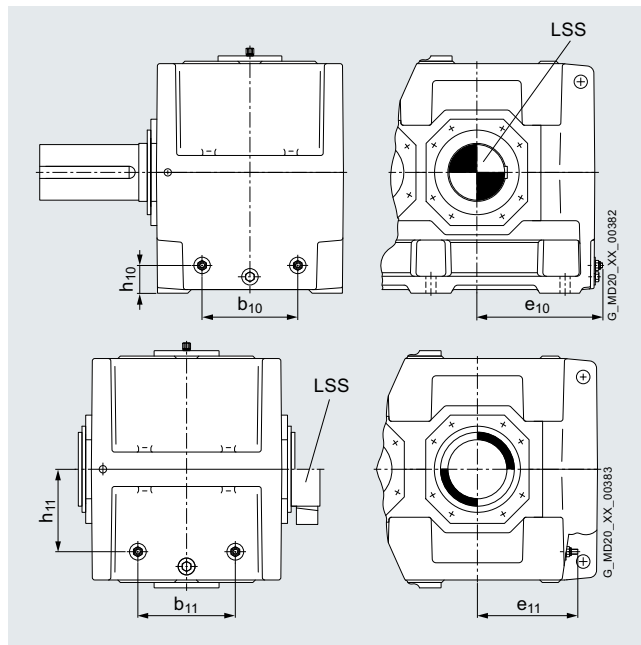
Cooling coil for type H1



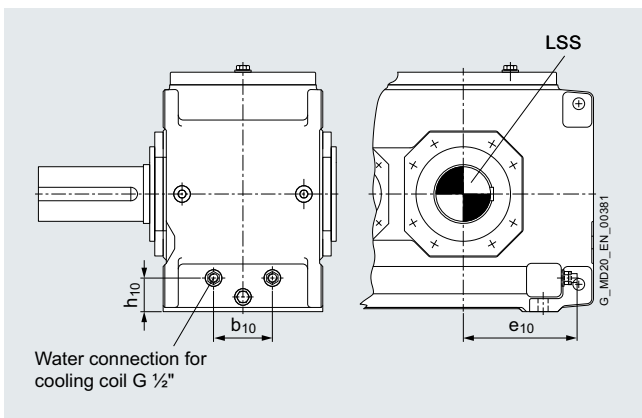
Cooling coil for types H2.H, H3.H, B3.H up to gear unit size 12



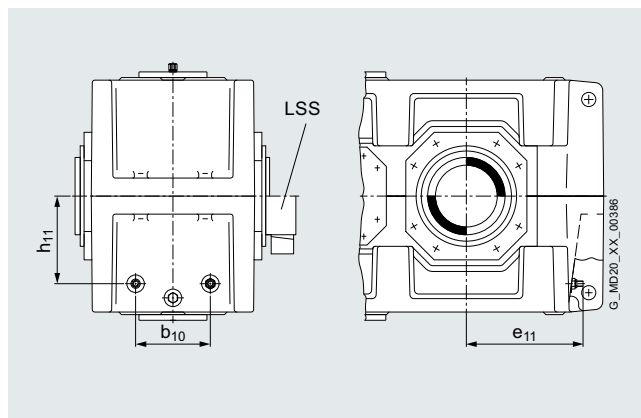
Cooling coil for type H2.H, H3.H, B3.H from gear unit size 13



Cooling coil for type B2 from gear unit size 13 (top B2.H, bottom B2.M)



Cooling coil for type B2 up to gear unit size 12



Cooling coil for type H2.M, H3.M, H4.M from gear unit size 13

## Overview (continued)

## Type H1.H

| Size | b <sub>10</sub> | e <sub>10</sub> | h <sub>10</sub> | l/min <sup>1)</sup> |
|------|-----------------|-----------------|-----------------|---------------------|
| 3    | 48              | 205             | 74              | 4                   |
| 5    | 88              | 270             | 90              | 4                   |
| 7    | 124             | 310             | 135             | 4                   |
| 9    | 116             | 365             | 110             | 8                   |
| 11   | 146             | 425             | 130             | 8                   |
| 13   | 152             | 480             | 150             | 8                   |
| 15   | 172             | 560             | 130             | 8                   |
| 17   | 202             | 600             | 145             | 8                   |
| 19   | On request      |                 |                 |                     |

## Type H2.H, H2.M

| Size    | b <sub>10</sub> | e <sub>10</sub> | e <sub>11</sub> | h <sub>10</sub> | h <sub>11</sub> | l/min <sup>1)</sup> |
|---------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------|
| 4       | 34              | 155             | –               | 60              | –               | 4                   |
| 5       | 68              | 170             | –               | 64              | –               | 4                   |
| 6       | 70              | 215             | –               | 68              | –               | 4                   |
| 7       | 100             | 210             | –               | 83              | –               | 4                   |
| 8       | 100             | 270             | –               | 83              | –               | 4                   |
| 9       | 140             | 245             | –               | 110             | –               | 8                   |
| 10      | 100             | 295             | –               | 95              | –               | 8                   |
| 11      | 110             | 275             | –               | 95              | –               | 8                   |
| 12      | 200             | 360             | –               | 109             | –               | 8                   |
| 13      | 252             | 455             | 335             | 116             | 300             | 8                   |
| 14      | 252             | 525             | 405             | 116             | 300             | 8                   |
| 15      | 290             | 535             | 395             | 119             | 335             | 8                   |
| 16      | 290             | 580             | 440             | 119             | 335             | 8                   |
| 17      | 340             | 575             | 425             | 134             | 380             | 8                   |
| 18      | 340             | 635             | 485             | 134             | 380             | 8                   |
| from 19 | On request      |                 |                 |                 |                 |                     |

## Type H3.H, H3.M

| Size    | b <sub>10</sub> | e <sub>10</sub> | e <sub>11</sub> | h <sub>10</sub> | h <sub>11</sub> | l/min <sup>1)</sup> |
|---------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------|
| 5       | 70              | 175             | –               | 60              | –               | 4                   |
| 6       | 70              | 220             | –               | 69              | –               | 4                   |
| 7       | 80              | 210             | –               | 83              | –               | 4                   |
| 8       | 80              | 270             | –               | 83              | –               | 4                   |
| 9       | 150             | 245             | –               | 107             | –               | 4                   |
| 10      | 90              | 295             | –               | 95              | –               | 4                   |
| 11      | 200             | 275             | –               | 115             | –               | 8                   |
| 12      | 200             | 360             | –               | 115             | –               | 8                   |
| 13      | 252             | 460             | 335             | 116             | 300             | 8                   |
| 14      | 252             | 530             | 405             | 116             | 300             | 8                   |
| 15      | 290             | 540             | 395             | 119             | 335             | 8                   |
| 16      | 290             | 585             | 440             | 119             | 335             | 8                   |
| 17      | 300             | 580             | 425             | 134             | 380             | 8                   |
| 18      | 300             | 640             | 485             | 134             | 380             | 8                   |
| from 19 | On request      |                 |                 |                 |                 |                     |

## Type B2.H, B2.M

| Size | b <sub>10</sub> | b <sub>11</sub> | e <sub>10</sub> | e <sub>11</sub> | h <sub>10</sub> | h <sub>11</sub> | l/min <sup>1)</sup> |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------|
| 4    | 74              | –               | 160             | –               | 54              | –               | 4                   |
| 5    | 130             | –               | 175             | –               | 62              | –               | 8                   |
| 6    | 120             | –               | 220             | –               | 68              | –               | 4                   |
| 7    | 140             | –               | 210             | –               | 80              | –               | 8                   |
| 8    | 140             | –               | 270             | –               | 80              | –               | 4                   |
| 9    | 232             | –               | 245             | –               | 110             | –               | 8                   |
| 10   | 150             | –               | 295             | –               | 90              | –               | 8                   |
| 11   | 312             | –               | 275             | –               | 115             | –               | 8                   |
| 12   | 300             | –               | 360             | –               | 115             | –               | 8                   |
| 13   | 324             | 324             | 460             | 335             | 116             | 300             | 8                   |
| 14   | 324             | 324             | 530             | 405             | 116             | 300             | 8                   |
| 15   | 396             | 396             | 540             | 395             | 119             | 335             | 8                   |
| 16   | 396             | 396             | 585             | 440             | 119             | 335             | 8                   |
| 17   | 468             | 324             | 580             | 425             | 134             | 380             | 8                   |
| 18   | 468             | 324             | 640             | 485             | 134             | 380             | 8                   |

## Type B3.H, B3.M

| Size    | b <sub>10</sub> | e <sub>10</sub> | e <sub>11</sub> | h <sub>10</sub> | h <sub>11</sub> | l/min <sup>1)</sup> |
|---------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------|
| 4       | 34              | 155             | –               | 60              | –               | 4                   |
| 5       | 68              | 170             | –               | 64              | –               | 4                   |
| 6       | 70              | 215             | –               | 69              | –               | 4                   |
| 7       | 100             | 210             | –               | 83              | –               | 4                   |
| 8       | 100             | 270             | –               | 83              | –               | 4                   |
| 9       | 140             | 245             | –               | 110             | –               | 8                   |
| 10      | 100             | 295             | –               | 95              | –               | 8                   |
| 11      | 110             | 275             | –               | 95              | –               | 8                   |
| 12      | 200             | 360             | –               | 109             | –               | 8                   |
| 13      | 252             | 455             | 335             | 116             | 300             | 8                   |
| 14      | 252             | 525             | 405             | 116             | 300             | 8                   |
| 15      | 290             | 535             | 395             | 119             | 335             | 8                   |
| 16      | 290             | 580             | 440             | 119             | 335             | 8                   |
| 17      | 340             | 575             | 425             | 134             | 380             | 8                   |
| 18      | 340             | 635             | 485             | 134             | 380             | 8                   |
| from 19 | On request      |                 |                 |                 |                 |                     |

LSS: Low speed shaft

1) Required volume of cooling water, maximum cooling water pressure 8 bar.

## Options for operation

### Cooling

#### Cooling coil

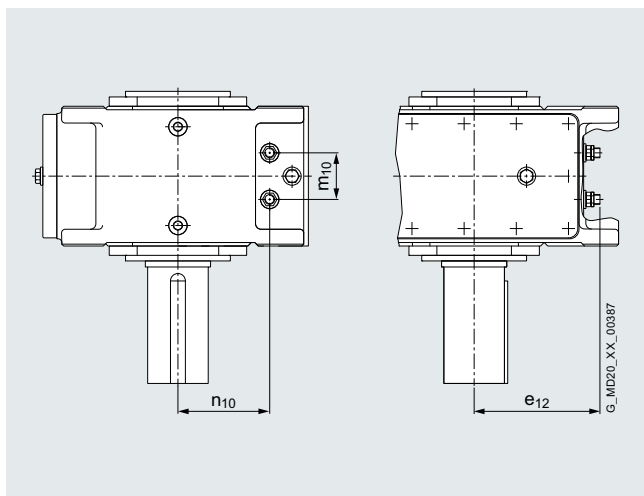
##### Overview (continued)

##### Cooling coil for vertical types

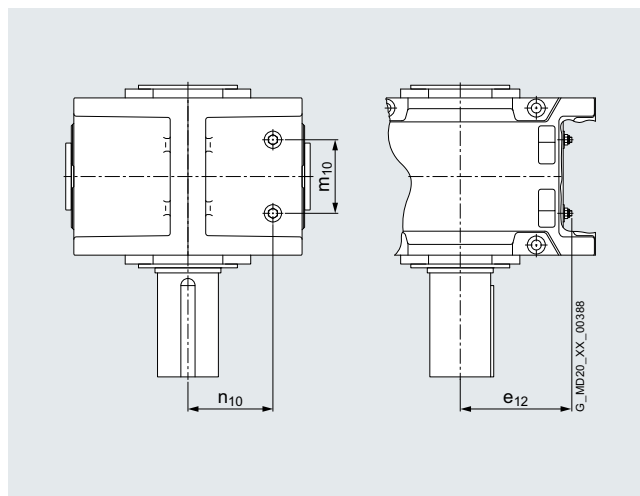
If possible, the cooling coil should be combined with dip lubrication when being installed in a vertically set up gear unit. The following measures should be carried out when using cooling coils in vertically installed gear units in combination with forced lubrication:

- Flow of cool water must be interrupted when gear unit is stopped
- Wet air filter must be used

For constant start and stop operation, cooling coils are only permitted in vertically installed gear units with dip lubrication.



Cooling coil for types H..V, B..V  
up to gear unit size 12



Cooling coil for types H..V, B..V  
from gear unit size 13

## Overview (continued)

## Type H2.V

| Size | m <sub>10</sub> | n <sub>10</sub> | e <sub>12</sub> | l/min <sup>1)</sup> |
|------|-----------------|-----------------|-----------------|---------------------|
| 4    | 34              | 140             | 155             | 4                   |
| 5    | 68              | 166             | 170             | 4                   |
| 6    | 70              | 162             | 215             | 4                   |
| 7    | 100             | 197             | 210             | 4                   |
| 8    | 100             | 197             | 270             | 4                   |
| 9    | 140             | 210             | 245             | 8                   |
| 10   | 100             | 225             | 295             | 8                   |
| 11   | 110             | 285             | 275             | 8                   |
| 12   | 200             | 271             | 360             | 8                   |
| 13   | 252             | 300             | 335             | 8                   |
| 14   | 252             | 300             | 405             | 8                   |
| 15   | 290             | 335             | 395             | 8                   |
| 16   | 290             | 335             | 440             | 8                   |
| 17   | 340             | 380             | 425             | 8                   |
| 18   | 340             | 380             | 485             | 8                   |

from 19 On request

## Type H3.V

| Size | m <sub>10</sub> | n <sub>10</sub> | e <sub>12</sub> | l/min <sup>1)</sup> |
|------|-----------------|-----------------|-----------------|---------------------|
| 5    | 70              | 170             | 175             | 4                   |
| 6    | 70              | 161             | 220             | 4                   |
| 7    | 80              | 197             | 210             | 4                   |
| 8    | 80              | 197             | 270             | 4                   |
| 9    | 150             | 213             | 245             | 4                   |
| 10   | 90              | 225             | 295             | 4                   |
| 11   | 200             | 265             | 275             | 8                   |
| 12   | 200             | 265             | 360             | 8                   |
| 13   | 252             | 300             | 335             | 8                   |
| 14   | 252             | 300             | 405             | 8                   |
| 15   | 290             | 340             | 395             | 8                   |
| 16   | 290             | 340             | 440             | 8                   |
| 17   | 300             | 380             | 425             | 8                   |
| 18   | 300             | 380             | 485             | 8                   |

from 19 On request

## Type B2.V

| Size | m <sub>10</sub> | n <sub>10</sub> | e <sub>12</sub> | l/min <sup>1)</sup> |
|------|-----------------|-----------------|-----------------|---------------------|
| 4    | 74              | 146             | 160             | 4                   |
| 5    | 130             | 168             | 175             | 8                   |
| 6    | 120             | 162             | 220             | 4                   |
| 7    | 140             | 200             | 210             | 8                   |
| 8    | 140             | 200             | 270             | 4                   |
| 9    | 232             | 210             | 245             | 8                   |
| 10   | 150             | 230             | 295             | 8                   |
| 11   | 312             | 265             | 275             | 8                   |
| 12   | 300             | 265             | 360             | 8                   |
| 13   | 324             | 300             | 335             | 8                   |
| 14   | 324             | 300             | 405             | 8                   |
| 15   | 396             | 345             | 390             | 8                   |
| 16   | 396             | 345             | 435             | 8                   |
| 17   | 324             | 395             | 425             | 8                   |
| 18   | 324             | 395             | 485             | 8                   |

## Type B3.V

| Size | m <sub>10</sub> | n <sub>10</sub> | e <sub>12</sub> | l/min <sup>1)</sup> |
|------|-----------------|-----------------|-----------------|---------------------|
| 4    | 34              | 140             | 155             | 4                   |
| 5    | 68              | 166             | 170             | 4                   |
| 6    | 70              | 162             | 215             | 4                   |
| 7    | 100             | 197             | 210             | 4                   |
| 8    | 100             | 197             | 270             | 4                   |
| 9    | 140             | 210             | 245             | 8                   |
| 10   | 100             | 225             | 295             | 8                   |
| 11   | 110             | 285             | 275             | 8                   |
| 12   | 200             | 271             | 360             | 8                   |
| 13   | 252             | 300             | 335             | 8                   |
| 14   | 252             | 300             | 405             | 8                   |
| 15   | 290             | 335             | 395             | 8                   |
| 16   | 290             | 335             | 440             | 8                   |
| 17   | 340             | 380             | 425             | 8                   |
| 18   | 340             | 380             | 485             | 8                   |

from 19 On request

## Ordering information:

|                                                    |                       |
|----------------------------------------------------|-----------------------|
| Article No.:                                       | Order code            |
|                                                    | 2LP302.-.....-Z ■ ■ ■ |
| <b>Cooling coil</b>                                |                       |
| Oil cooling: Cooling coil, catalog version, side 4 | H 6 6                 |

For optimal cooling using cooling water, cooling water flow regulators can be supplied. The valves operate without a supply of auxiliary energy and do not have to be supplied with power.

The volumetric flow is adapted at any time to the current need. The volumetric flow of the cooling water is regulated depending on the sensor temperature.

The cooling water volume regulators are already set to the required setpoint at the factory.

Cooling water connection when using on a standard cooling coil: G<sup>1</sup>/<sub>2</sub>"

Cooling water connection for use on the oil-water cooler in the oil circuit (see page 10/16): G<sup>3</sup>/<sub>4</sub>"

<sup>1)</sup> Required volume of cooling water, maximum cooling water pressure 8 bar.

## Options for operation

### Cooling

#### Additional cooling options

##### Overview

Further cooling options can be implemented – the selection is made via the configurator using the "Other cooling" option, order code **Y37** – the desired cooling option can then be defined in plain text.

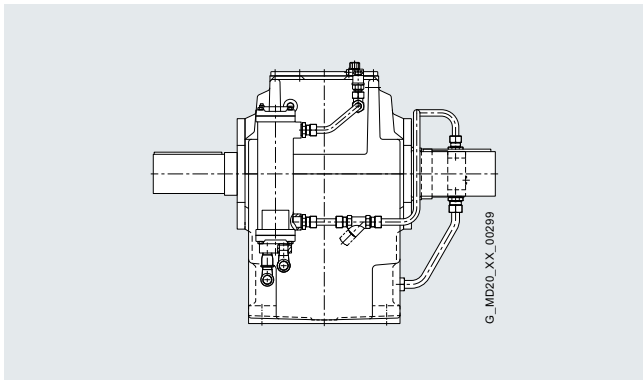
##### **Oil-to-water cooler**

This option allows the precise dimensioning of the cooling, even for dissipating heat quantities that are bigger than can be accomplished using the cooling coil. To this end, the gear unit is equipped with a motor-driven or flange-mounted pump and the oil is directed through the cooler during operation. This option does not require forced lubrication in every case, pure circulation cooling is also possible. To ensure the functionality, a pressure sensor can be installed in the oil line and/or a temperature sensor can be installed in the oil sump. A filter can be installed to improve the oil quality and thus to improve the service life. Refer to the Filter chapter (from page 10/44).

The cooling coil can be designed in the bidding phase by specifying the technical requirements and boundary conditions. The pump assignment and the attaching of the oil-water heat exchanger is standardized.

##### a) Bundled tube heat exchanger

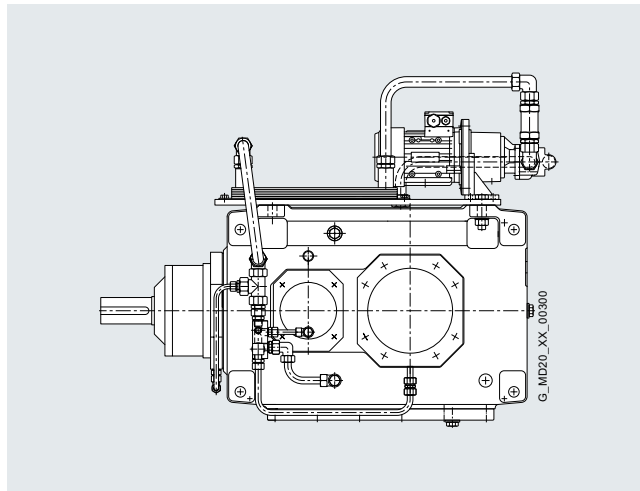
A bundled tube heat exchanger can be used for cooling (suitable for fresh water and sea water).



Example: H1SH09 with flange-mounted pump and oil-water cooler

##### b) Plate heat exchanger

A plate heat exchanger can be used for cooling (not suitable for sea water).



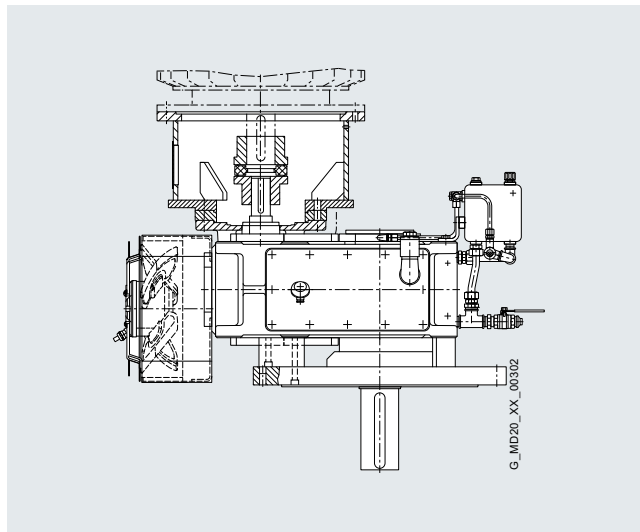
Example: B2SV08 with forced lubrication, motor pump and plate cooler (solution for variable speeds)

##### **Electrically driven fan**

An electrically driven fan can be installed. Cooling can take place with this, regardless of the operating state of the gear unit (e.g. not at low ambient temperatures, when an oil temperature limit is exceeded or in the event of variable speeds). To optimally utilize the advantages of this cooling option, control via temperature monitoring is required. The heat dissipation is at least equal to the standard fan.

The advantage of this cooling variant is that the cooling only takes place when it is really required.

Please contact Flender.

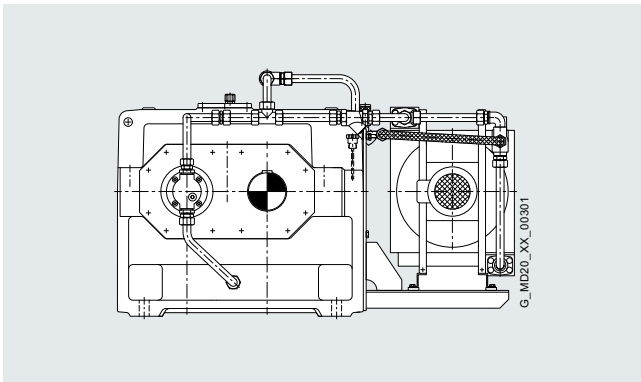


Example: H2SV05 with expansion tank, motor lantern, electrically driven fan, and optional resistance thermometer



**Overview** (continued)**Oil-air cooler / OLCC (oil-air cooler, incl. bypass for cold oil and temperature regulating valve)**

An oil-air cooler can be used for cooling for which no additional cooling medium is needed. To this end, the gear unit is equipped with a motor-driven or flange-mounted pump and the oil is directed through the cooler during operation. This can be installed next to the gear unit or, depending on the job and installation situation, on the sides or top. Environmental conditions that are highly prone to contamination degrade the effectiveness of the cooling system if it is not serviced or cleaned. The pump assignment and the attaching of the maximum possible cooler is standardized.



Example: H1SH07 with oil-air cooler, flange-mounted pump and pressure monitor

**Oil supply system that can be connected to the gear unit**

An oil supply system can be installed for cooling. We offer oil-air cooling systems (OL..) and oil-water cooling systems (OW..). The cooling is laid out in the bidding phase based on the technical boundary conditions. Usually, the suction and pressure lines of the oil supply systems are designed as flexible pipes to compensate vibrations from the main motor, cooler motor and pump motor. On request, the oil supply system/gear unit connection can also be designed with rigid pipes.

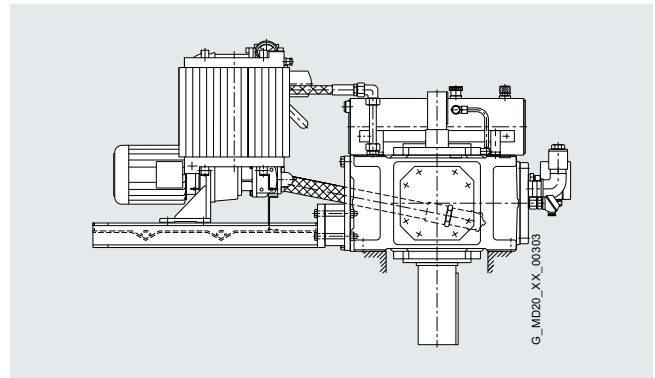
The systems consist of a motor-driven pump, oil heat exchanger, optional oil filter, visual or electronic monitoring devices (e.g. pressure gauges, dial thermometers, pressure monitors, temperature monitors, volumetric flow monitors), 2nd motor pump group, oil tank, cooling water flow regulator, vibration damper, etc.

For applications with maximum plant availability, the minimum options of a double changeover filter, 2nd motor pump and electronic monitoring are recommended.

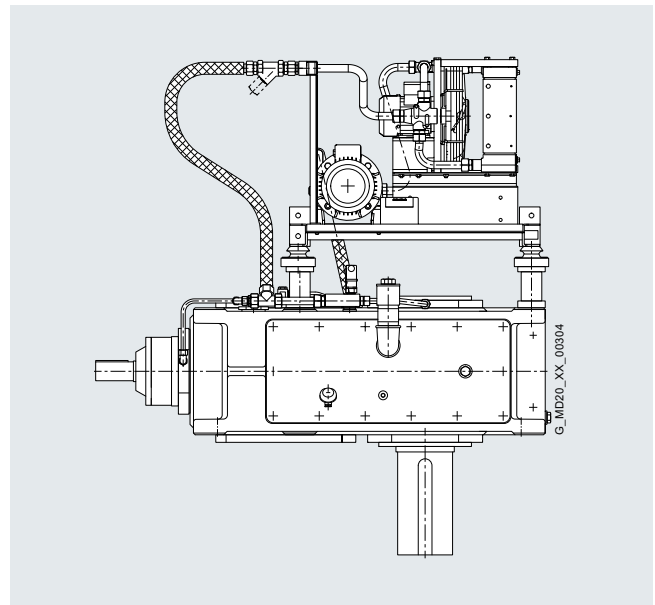
This can be installed next to the gear unit or, depending on the job and installation situation, on the sides or top.

The cooling and lubrication systems can be designed for the required, cooling capacity to be dissipated.

[Please contact Flender.](#)



Example: H2SV05 with OLGE 1, side-mounted



Example: B3SV10 with OLGE 1, top-mounted

## Options for operation

### Cooling

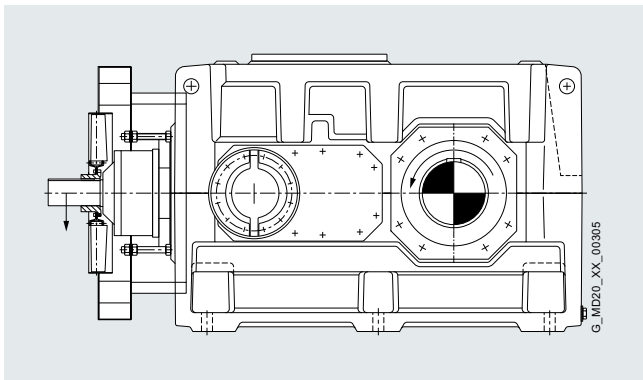
#### Additional cooling options

##### Overview (continued)

##### Fan attachment options (please contact Flender)

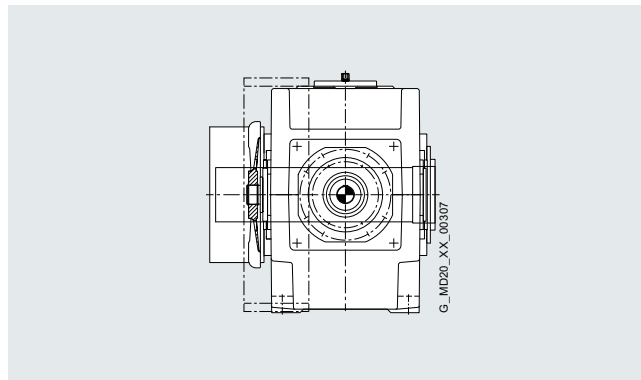
- Axial fan (dependent on direction of rotation, changed fan guard contour), exclusively for bevel helical gear units for increased cooling output compared to the standard radial fan

With bevel helical gear units, it is possible to attach a fan on the extended, first intermediate shaft.

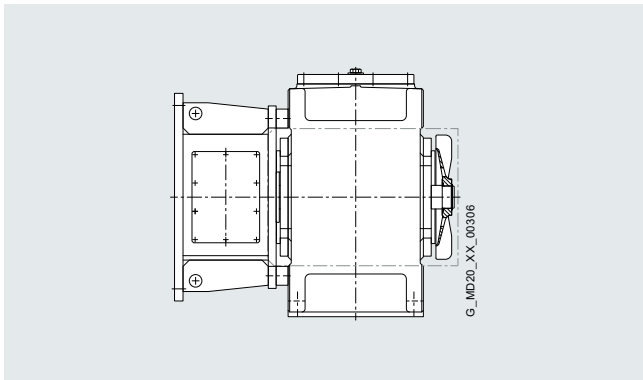


Example: B3SH13 with backstop and axial fan

Alternatively, other attachment options are possible for the standard radial fan:

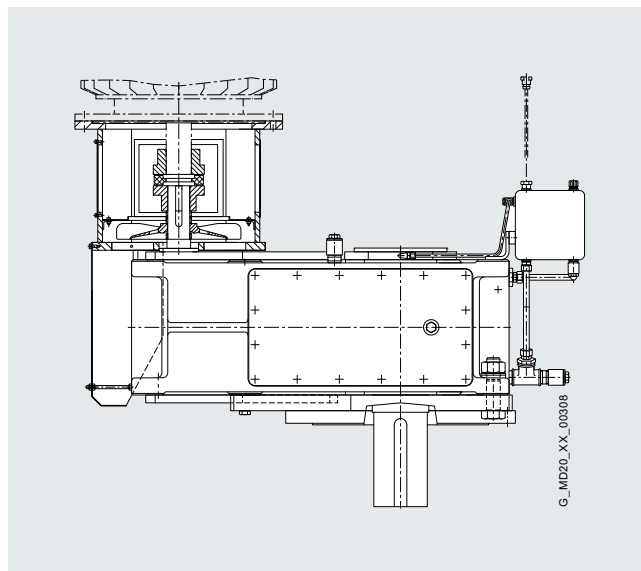


Example: B3DH15 with fan on brought out intermediate shaft



Example: H3SH11 with fan opposite of drive spigots

If it is not possible to attach the fan on the high speed shaft, the fan can also be attached on the opposite side.



Example: H3SV11 – Lantern with integrated fan

It is possible to attach the fan on the high speed shaft in the motor lantern.

The cooling performance may be somewhat less compared to a standard fan.

## Overview

The materials used in a gear unit, comprised of a wide variety of components and lubricants, require defined boundary conditions to ensure proper usage.

Heating elements must be used when the temperature limit for the relevant lubrication variant is undershot.

The selection criteria for oil, lubrication and heating are shown below. Heating for vertical gear units on request. Horizontal mounting position, sizes 3, 5, 7, 9, 11, 13, 14, 15, 16, 17, 18

| Lubrication        | Base oil            | Viscosity ISO-VG at 40 °C in mm <sup>2</sup> /s (cSt) | Oil temperature |        |        |        |        |        |        |        |       |      |      |       |        |   |
|--------------------|---------------------|-------------------------------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|-------|------|------|-------|--------|---|
|                    |                     |                                                       | -45 °C          | -40 °C | -35 °C | -30 °C | -25 °C | -20 °C | -15 °C | -10 °C | -5 °C | 0 °C | 5 °C | 10 °C | >10 °C |   |
| Forced lubrication | Mineral oil         | ISO VG 320                                            | -               | -      | -      | -      | -      | -      | -      | -      | -     | -    | 2    | 2     | 1      | x |
|                    |                     | ISO VG 220                                            | -               | -      | -      | -      | -      | -      | -      | -      | 2     | 2    | 1    | x     | x      |   |
|                    | PAO oil             | ISO VG 320                                            | -               | -      | -      | -      | -      | -      | -      | 2      | 2     | 1    | x    | x     | x      |   |
|                    |                     | ISO VG 220                                            | -               | -      | -      | -      | -      | -      | 2      | 2      | 1     | x    | x    | x     | x      |   |
| Dip lubrication    | Mineral oil         | ISO VG 460                                            | -               | -      | -      | -      | -      | 2      | 2      | 1      | x     | x    | x    | x     | x      |   |
|                    |                     | ISO VG 320                                            | -               | -      | -      | -      | 2      | 2      | 1      | x      | x     | x    | x    | x     | x      |   |
|                    |                     | ISO VG 220                                            | -               | -      | -      | -      | 2      | 2      | 1      | x      | x     | x    | x    | x     | x      |   |
|                    | PAO oil             | ISO VG 460                                            | -               | 2      | 2      | 1      | x      | x      | x      | x      | x     | x    | x    | x     | x      |   |
|                    |                     | ISO VG 320                                            | -               | 2      | 1      | x      | x      | x      | x      | x      | x     | x    | x    | x     | x      |   |
|                    |                     | ISO VG 220                                            | -               | 2      | 1      | x      | x      | x      | x      | x      | x     | x    | x    | x     | x      |   |
|                    | PAO-T <sup>1)</sup> | ISO VG 220                                            | -               | 1      | x      | x      | x      | x      | x      | x      | x     | x    | x    | x     | x      |   |
|                    |                     | ISO VG 150                                            | -               | 1      | x      | x      | x      | x      | x      | x      | x     | x    | x    | x     | x      |   |

Horizontal mounting position, sizes 2, 4, 6, 8, 10, 12

| Lubrication        | Base oil            | Viscosity ISO-VG at 40 °C in mm <sup>2</sup> /s (cSt) | Oil temperature |        |        |        |        |        |        |        |       |      |      |       |        |
|--------------------|---------------------|-------------------------------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|-------|------|------|-------|--------|
|                    |                     |                                                       | -45 °C          | -40 °C | -35 °C | -30 °C | -25 °C | -20 °C | -15 °C | -10 °C | -5 °C | 0 °C | 5 °C | 10 °C | >10 °C |
| Forced lubrication | Mineral oil         | ISO VG 320                                            | -               | -      | -      | -      | -      | -      | -      | -      | -     | -    | 1    | 1     | x      |
|                    |                     | ISO VG 220                                            | -               | -      | -      | -      | -      | -      | -      | -      | 1     | 1    | x    | x     |        |
|                    | PAO oil             | ISO VG 320                                            | -               | -      | -      | -      | -      | -      | -      | -      | 1     | 1    | x    | x     |        |
|                    |                     | ISO VG 220                                            | -               | -      | -      | -      | -      | -      | -      | 1      | 1     | x    | x    | x     |        |
| Dip lubrication    | Mineral oil         | ISO VG 460                                            | -               | -      | -      | -      | -      | 1      | 1      | x      | x     | x    | x    | x     |        |
|                    |                     | ISO VG 320                                            | -               | -      | -      | -      | -      | 1      | 1      | x      | x     | x    | x    | x     |        |
|                    |                     | ISO VG 220                                            | -               | -      | -      | -      | -      | 1      | 1      | x      | x     | x    | x    | x     |        |
|                    | PAO oil             | ISO VG 460                                            | -               | -      | 1      | 1      | x      | x      | x      | x      | x     | x    | x    | x     |        |
|                    |                     | ISO VG 320                                            | -               | 1      | 1      | x      | x      | x      | x      | x      | x     | x    | x    | x     |        |
|                    |                     | ISO VG 220                                            | -               | 1      | 1      | x      | x      | x      | x      | x      | x     | x    | x    | x     |        |
|                    | PAO-T <sup>1)</sup> | ISO VG 220                                            | -               | 1      | x      | x      | x      | x      | x      | x      | x     | x    | x    | x     |        |
|                    |                     | ISO VG 150                                            | -               | 1      | x      | x      | x      | x      | x      | x      | x     | x    | x    | x     |        |

Horizontal mounting position, sizes 19, 20, 21, 22

| Lubrication         | Base oil    | Viscosity ISO-VG at 40 °C in mm <sup>2</sup> /s (cSt) | Oil temperature |        |        |        |        |        |        |        |       |      |      |       |        |
|---------------------|-------------|-------------------------------------------------------|-----------------|--------|--------|--------|--------|--------|--------|--------|-------|------|------|-------|--------|
|                     |             |                                                       | -45 °C          | -40 °C | -35 °C | -30 °C | -25 °C | -20 °C | -15 °C | -10 °C | -5 °C | 0 °C | 5 °C | 10 °C | >10 °C |
| Dip lubrication     | Mineral oil | ISO VG 460                                            | -               | -      | -      | -      | -      | 4      | 4      | 2      | x     | x    | x    | x     | x      |
|                     |             | ISO VG 320                                            | -               | -      | -      | -      | 4      | 4      | 2      | x      | x     | x    | x    | x     |        |
|                     |             | ISO VG 220                                            | -               | -      | -      | -      | 4      | 4      | 2      | x      | x     | x    | x    | x     |        |
|                     | PAO oil     | ISO VG 460                                            | -               | 4      | 4      | 2      | x      | x      | x      | x      | x     | x    | x    | x     |        |
|                     |             | ISO VG 320                                            | -               | 4      | 2      | x      | x      | x      | x      | x      | x     | x    | x    | x     |        |
|                     |             | ISO VG 220                                            | -               | 4      | 2      | x      | x      | x      | x      | x      | x     | x    | x    | x     |        |
| PAO-T <sup>1)</sup> | ISO VG 220  | -                                                     | 2               | x      | x      | x      | x      | x      | x      | x      | x     | x    | x    |       |        |
|                     | ISO VG 150  | -                                                     | 2               | x      | x      | x      | x      | x      | x      | x      | x     | x    | x    |       |        |

x Permitted without additional heating

## Additional heating required

(Before starting up the gear unit, the gear unit must be heated up to starting temperature!)

|   |                                         |
|---|-----------------------------------------|
| 1 | 1 heating element required              |
| 2 | 2 heating elements required             |
| 4 | 4 heating elements required             |
| - | Not permitted, special actions required |

Heating elements are only permitted in combination with oil temperature monitoring. An electrical oil level monitoring system (available on request) is additionally required for heating elements of ATEX design.

Depending on the type and size, up to 4 heating elements can be installed in the gear unit.

| Recommended ISO oil viscosity for | H1     | H2 / H3 | H4     | B2 / B3 | B4     |
|-----------------------------------|--------|---------|--------|---------|--------|
| Dip lubrication                   | VG 320 | VG 460  | VG 320 | VG 460  | VG 320 |
| Forced lubrication                | VG 320 |         |        |         |        |

Labyrinth seals are not permitted to be used with heating elements. For details on the monitoring devices and heating elements, see from page 10/34 "Devices and filters".

<sup>1)</sup> Synthetic oil on a polyalphaolefin basis for temperatures higher than -35 °C. Minimum start temperature (required minimum oil temperature at gear unit start-up).

## Options for operation

### Heating

#### Heating elements

##### Selection and ordering data

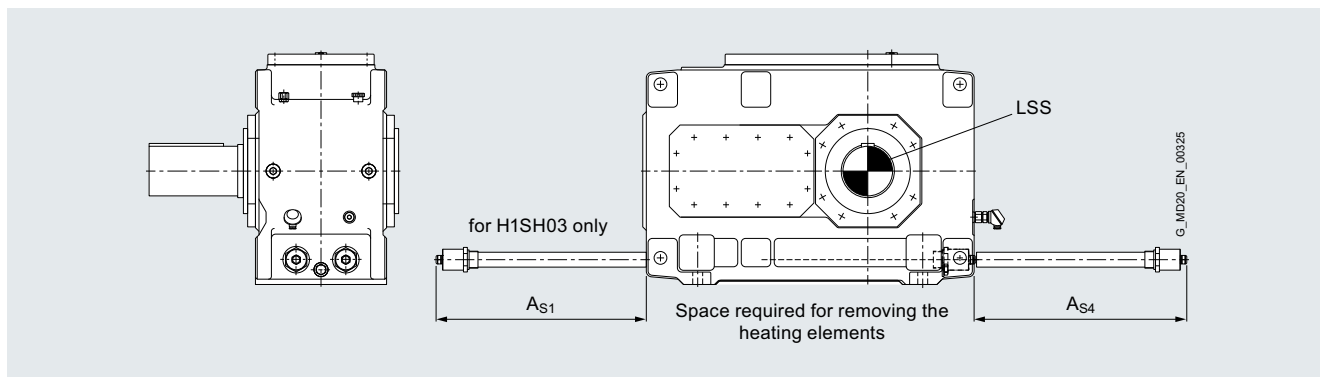
###### Ordering information:

When ordering heating elements and temperature monitoring, **-Z** and the following order codes must be added to the Article No.

| Data position of the Article No.                                                                                     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code |       |
|----------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|------------|-------|
| Article No.:                                                                                                         | 2 | L | P | 3 | 0 | 2 | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z         | ■ ■ ■ |
| <b>Screw-in heating elements (standard version IP65, 230 V, 50 Hz, cable inlet axial)</b>                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            |       |
| One heating element                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            | J 0 0 |
| Two heating elements <sup>1)</sup>                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            | J 0 1 |
| Four heating elements <sup>1)</sup>                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            | J 0 3 |
| <b>Oil temperature monitoring (standard version)</b>                                                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            |       |
| ATH-SW22                                                                                                             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            | H 4 3 |
| <b>Oil temperature recording (standard version; separate evaluation unit required)</b>                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            |       |
| Pt100 resistance thermometer                                                                                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            | H 4 0 |
| Pt100 resistance thermometer with transmitter                                                                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            | H 4 2 |
| <b>Screw-in heating element (ATEX design category 2 + 3) 230 V, 50 Hz, cable inlet acc. to manufacturer's choice</b> |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            |       |
| One heating element                                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            | J 0 5 |
| Two heating elements <sup>1)</sup>                                                                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            | J 0 6 |
| Four heating elements <sup>1)</sup>                                                                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            | J 0 8 |
| <b>Oil temperature recording (ATEX design category 2 + 3; separate evaluation unit required)</b>                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            |       |
| Pt100 resistance thermometer                                                                                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |            | H 4 4 |

<sup>1)</sup> Restrictions might apply depending on the installation space required.  
For availability and dimensions, see configurator.

## Dimensional drawings



## Type H1

| Size | Installed power in W |                    |                    | Installation space in mm |      |
|------|----------------------|--------------------|--------------------|--------------------------|------|
|      | 1 heating element    | 2 heating elements | 4 heating elements | AS1                      | AS4  |
| 03   | 215                  | –                  | –                  | 450 <sup>1)</sup>        | –    |
| 05   | 215                  | 430                | –                  | –                        | 450  |
| 07   | 380                  | 760                | –                  | –                        | 520  |
| 09   | 470                  | 940                | –                  | –                        | 620  |
| 11   | 810                  | 1620               | –                  | –                        | 830  |
| 13   | 1160                 | 2320               | –                  | –                        | 1130 |
| 15   | 1270                 | 2540               | –                  | –                        | 1230 |
| 17   | 1270                 | 2540               | –                  | –                        | 1230 |
| 19   | 1600                 | 3200               | –                  | –                        | 1530 |

## Type H2

| Size | Installed power in W |                    |                    | Installation space in mm |
|------|----------------------|--------------------|--------------------|--------------------------|
|      | 1 heating element    | 2 heating elements | 4 heating elements | AS4                      |
| 04   | 215                  | –                  | –                  | 450                      |
| 05   | 215                  | 430                | –                  | 450                      |
| 06   | 470                  | –                  | –                  | 620                      |
| 07   | 380                  | 760                | –                  | 520                      |
| 08   | 700                  | –                  | –                  | 730                      |
| 09   | 470                  | 940                | –                  | 620                      |
| 10   | 950                  | –                  | –                  | 930                      |
| 11   | 810                  | 1620               | –                  | 830                      |
| 12   | 1160                 | –                  | –                  | 1130                     |
| 13   | 1270                 | 1970               | –                  | 1230                     |
| 14   | 1270                 | 2080               | –                  | 1230                     |
| 15   | 1600                 | 2550               | –                  | 1530                     |
| 16   | 1600                 | 2550               | –                  | 1530                     |
| 17   | 1600                 | 2870               | –                  | 1530                     |
| 18   | 1600                 | 3200               | –                  | 1530                     |
| 19   | –                    | 3200               | 4600               | 1530                     |
| 20   | –                    | 3200               | 5100               | 1530                     |
| 21   | –                    | 2540               | 4628               | 1230                     |
| 22   | –                    | 2540               | 4628               | 1230                     |

## Type H3

| Size | Installed power in W |                    |                    | Installation space in mm |
|------|----------------------|--------------------|--------------------|--------------------------|
|      | 1 heating element    | 2 heating elements | 4 heating elements | AS4                      |
| 05   | 215                  | 430                | –                  | 450                      |
| 06   | 470                  | –                  | –                  | 620                      |
| 07   | 380                  | 760                | –                  | 520                      |
| 08   | 700                  | –                  | –                  | 730                      |
| 09   | 470                  | 940                | –                  | 620                      |
| 10   | 950                  | –                  | –                  | 930                      |
| 11   | 810                  | 1620               | –                  | 830                      |
| 12   | 1160                 | –                  | –                  | 1130                     |
| 13   | 1270                 | 1970               | –                  | 1230                     |
| 14   | 1270                 | 2220               | –                  | 1230                     |
| 15   | 1600                 | 2550               | –                  | 1530                     |
| 16   | 1600                 | 2644               | –                  | 1530                     |
| 17   | 1600                 | 2870               | –                  | 1530                     |
| 18   | 1600                 | 3200               | –                  | 1530                     |
| 19   | –                    | 3200               | 4600               | 1530                     |
| 20   | –                    | 3200               | 5100               | 1530                     |
| 21   | –                    | 2540               | 4860               | 1230                     |
| 22   | –                    | 3200               | 5520               | 1530                     |

## Type H4

| Size | Installed power in W |                    |                    | Installation space in mm |
|------|----------------------|--------------------|--------------------|--------------------------|
|      | 1 heating element    | 2 heating elements | 4 heating elements | AS4                      |
| 07   | 380                  | 760                | –                  | 520                      |
| 08   | 700                  | –                  | –                  | 730                      |
| 09   | 470                  | 940                | –                  | 620                      |
| 10   | 950                  | –                  | –                  | 930                      |
| 11   | 810                  | 1620               | –                  | 830                      |
| 12   | 1160                 | –                  | –                  | 1130                     |
| 13   | 1270                 | 1970               | –                  | 1230                     |
| 14   | 1600                 | 2300               | –                  | 1530                     |
| 15   | 1600                 | 2550               | –                  | 1530                     |
| 16   | 1600                 | 2870               | –                  | 1530                     |
| 17   | 1600                 | 2870               | –                  | 1530                     |
| 18   | 1600                 | 3200               | –                  | 1530                     |
| 19   | –                    | 3200               | 4600               | 1530                     |
| 20   | –                    | 3200               | 5100               | 1530                     |
| 21   | –                    | 2540               | 4860               | 1230                     |
| 22   | –                    | 3200               | 5520               | 1530                     |

LSS: Low speed shaft

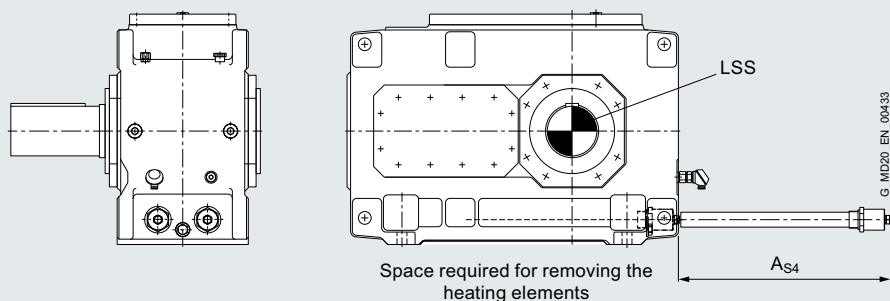
<sup>1)</sup> For type H1, the heating element is installed on housing side 1.

## Options for operation

### Heating

#### Heating elements – Types B2 to B4

#### Dimensional drawings



#### Type B2

| Size | Installed power in W |                    |                    | Installation space in mm<br>$A_{S4}$ |
|------|----------------------|--------------------|--------------------|--------------------------------------|
|      | 1 heating element    | 2 heating elements | 4 heating elements |                                      |
| 04   | 215                  | –                  | –                  | 450                                  |
| 05   | 215                  | 430                | –                  | 450                                  |
| 06   | 470                  | –                  | –                  | 620                                  |
| 07   | 380                  | 760                | –                  | 520                                  |
| 08   | 700                  | –                  | –                  | 730                                  |
| 09   | 470                  | 940                | –                  | 620                                  |
| 10   | 810                  | –                  | –                  | 830                                  |
| 11   | 810                  | 1620               | –                  | 830                                  |
| 12   | 950                  | –                  | –                  | 930                                  |
| 13   | 1160                 | 1860               | –                  | 1130                                 |
| 14   | 1270                 | 2080               | –                  | 1230                                 |
| 15   | 1270                 | 2540               | –                  | 1230                                 |
| 16   | 1270                 | 2540               | –                  | 1230                                 |
| 17   | 1600                 | 2870               | –                  | 1530                                 |
| 18   | 1600                 | 3200               | –                  | 1530                                 |

#### Type B4

| Size | Installed power in W |                    |                    | Installation space in mm<br>$A_{S4}$ |
|------|----------------------|--------------------|--------------------|--------------------------------------|
|      | 1 heating element    | 2 heating elements | 4 heating elements |                                      |
| 05   | 215                  | 430                | –                  | 450                                  |
| 06   | 470                  | –                  | –                  | 620                                  |
| 07   | 380                  | 760                | –                  | 520                                  |
| 08   | 700                  | –                  | –                  | 730                                  |
| 09   | 470                  | 940                | –                  | 620                                  |
| 10   | 950                  | –                  | –                  | 930                                  |
| 11   | 810                  | 1620               | –                  | 830                                  |
| 12   | 1160                 | –                  | –                  | 1130                                 |
| 13   | 1270                 | 1970               | –                  | 1230                                 |
| 14   | 1600                 | 2300               | –                  | 1530                                 |
| 15   | 1600                 | 2550               | –                  | 1530                                 |
| 16   | 1600                 | 2870               | –                  | 1530                                 |
| 17   | 1600                 | 2870               | –                  | 1530                                 |
| 18   | 1600                 | 3200               | –                  | 1530                                 |
| 19   | –                    | 3200               | 4600               | 1530                                 |
| 20   | –                    | 3200               | 5100               | 1530                                 |
| 21   | –                    | 2540               | 4860               | 1230                                 |
| 22   | –                    | 3200               | 5520               | 1530                                 |

#### Type B3

| Size | Installed power in W |                    |                    | Installation space in mm<br>$A_{S4}$ |
|------|----------------------|--------------------|--------------------|--------------------------------------|
|      | 1 heating element    | 2 heating elements | 4 heating elements |                                      |
| 04   | 215                  | –                  | –                  | 450                                  |
| 05   | 215                  | 430                | –                  | 450                                  |
| 06   | 470                  | –                  | –                  | 620                                  |
| 07   | 380                  | 760                | –                  | 520                                  |
| 08   | 700                  | –                  | –                  | 730                                  |
| 09   | 470                  | 940                | –                  | 620                                  |
| 10   | 950                  | –                  | –                  | 930                                  |
| 11   | 810                  | 1620               | –                  | 830                                  |
| 12   | 1160                 | –                  | –                  | 1130                                 |
| 13   | 1270                 | 1970               | –                  | 1230                                 |
| 14   | 1270                 | 2080               | –                  | 1230                                 |
| 15   | 1600                 | 2550               | –                  | 1530                                 |
| 16   | 1600                 | 2550               | –                  | 1530                                 |
| 17   | 1600                 | 2870               | –                  | 1530                                 |
| 18   | 1600                 | 3200               | –                  | 1530                                 |
| 19   | –                    | 3200               | 4600               | 1530                                 |
| 20   | –                    | 3200               | 5100               | 1530                                 |
| 21   | –                    | 2540               | 4628               | 1230                                 |
| 22   | –                    | 2540               | 4628               | 1230                                 |

Overview

Backstop

With single drives which, for example, convey bulk or general cargo "upward", a power failure may cause the conveyed medium to drive the gear unit and motor "in reverse" and the material falls onto the placement point. This can be prevented using a backstop that is integrated in the gear unit.

Attached at a position with the highest possible speed, optimal backstops are assigned to the gear unit types and sizes for Flender FZG gear units.

If several drives are driving a system simultaneously, the same effect can be achieved using torque-limited backstops. The standard backstop is attached in such a way that the direction of rotation that is to be stopped can normally also be changed in the system by our service personnel. For the design with a backstop, it is necessary to specify the direction of rotation of the low speed shaft (LSS). For gear units with low speed shaft (LSS) at both ends, the direction of rotation must be specified for the relevant shaft extension. The direction of rotation is determined by the view of the shaft face of the low speed shaft (LSS).

For specifying the direction of rotation for gear units without a backstop, see page 10/32.

| Design |   | Helical gear unit – type |    |    |    | Bevel helical gear unit – type |    |    |
|--------|---|--------------------------|----|----|----|--------------------------------|----|----|
|        |   | H1                       | H2 | H3 | H4 | B2                             | B3 | B4 |
| A      |   |                          |    |    |    |                                |    |    |
| B      |   |                          |    |    |    |                                |    |    |
| C      | - |                          |    |    |    |                                |    |    |
| D      | - |                          |    |    |    |                                |    |    |

① Backstop Sz. 7–10  
⑥ Backstop Sz. 19–22

② Backstop from Sz. 11  
⑦ Backstop Sz. 5–10

③ Backstop Sz. 4–14  
⑧ Backstop Sz. 11–22

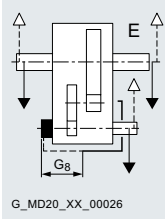
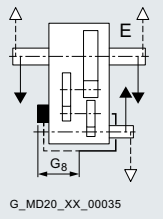
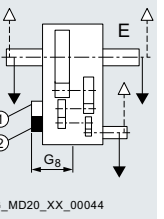
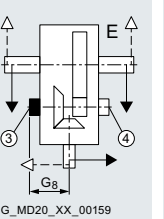
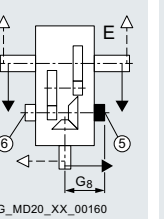
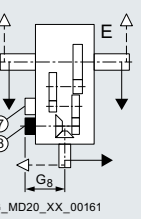
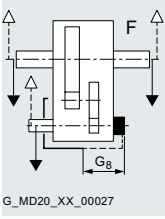
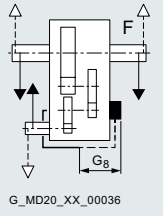
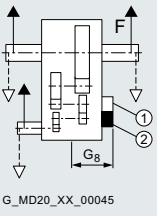
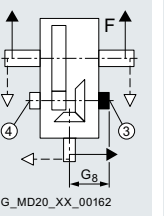
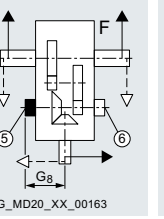
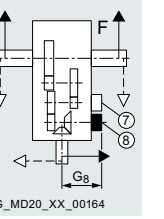
④ Backstop from Sz. 15–18

⑤ Backstop Sz. 4–18

# Options for operation

## Backstop

### Overview (continued)

| Design                   |    |                                                                                                      |                                                                                                      |                                                                                                      |                                                                                                       |                                                                                                        |                                                                                                        |
|--------------------------|----|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Helical gear unit – type |    |                                                                                                      |                                                                                                      | Bevel helical gear unit – type                                                                       |                                                                                                       |                                                                                                        |                                                                                                        |
| H1                       | H2 | H3                                                                                                   | H4                                                                                                   | B2                                                                                                   | B3                                                                                                    | B4                                                                                                     |                                                                                                        |
| E                        | –  | <br>G_MD20_XX_00026 | <br>G_MD20_XX_00035 | <br>G_MD20_XX_00044 | <br>G_MD20_XX_00159 | <br>G_MD20_XX_00160 | <br>G_MD20_XX_00161 |
| F                        | –  | <br>G_MD20_XX_00027 | <br>G_MD20_XX_00036 | <br>G_MD20_XX_00045 | <br>G_MD20_XX_00162 | <br>G_MD20_XX_00163 | <br>G_MD20_XX_00164 |

① Backstop Sz. 7–10  
⑥ Backstop Sz. 19–22

② Backstop from Sz. 11  
⑦ Backstop Sz. 5–10

③ Backstop Sz. 4–14  
⑧ Backstop Sz. 11–22

④ Backstop from Sz. 15–18

⑤ Backstop Sz. 4–18

No backstop can be implemented for versions G, H and I.

### Dimensions

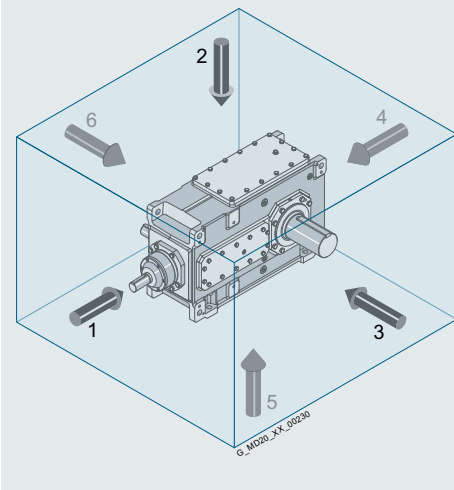
| Gear unit size | Dimensions in mm                   |     |     |                  |     |     |
|----------------|------------------------------------|-----|-----|------------------|-----|-----|
|                | Backstop G8 <sup>1)</sup> for type |     |     |                  |     |     |
|                | H2                                 | H3  | H4  | B2 <sup>2)</sup> | B3  | B4  |
| 4              | 207                                | –   | –   | 284              | 204 | –   |
| 5              | 253                                | 234 | –   | 323              | 223 | 236 |
| 6              | 253                                | 234 | –   | 323              | 223 | 236 |
| 7              | 280                                | 287 | 286 | 375              | 281 | 286 |
| 8              | 280                                | 287 | 286 | 375              | 281 | 286 |
| 9              | 331                                | 317 | 317 | 452              | 317 | 317 |
| 10             | 331                                | 317 | 317 | 452              | 317 | 317 |
| 11             | 392                                | 369 | 333 | 497              | 368 | 333 |
| 12             | 392                                | 369 | 333 | 497              | 368 | 333 |
| 13             | 448                                | 457 | 391 | 559              | 451 | 391 |
| 14             | 448                                | 457 | 391 | 559              | 451 | 391 |
| 15             | 527                                | 522 | 487 | 585              | 497 | 487 |
| 16             | 527                                | 522 | 487 | 585              | 497 | 487 |
| 17             | 576                                | 534 | 487 | 703              | 564 | 487 |
| 18             | 576                                | 534 | 487 | 703              | 564 | 487 |
| 19             | 670                                | 614 | 590 | –                | 621 | 561 |
| 20             | 670                                | 614 | 590 | –                | 621 | 561 |
| 21             | 690                                | 635 | 610 | –                | 640 | 580 |
| 22             | 690                                | 635 | 610 | –                | 640 | 580 |

<sup>1)</sup> Max. dimensions; details acc. to order-related documentation.

<sup>2)</sup> Backstop not possible for  
 B2SH up to size 12, version A, C, E, F  
 B2FH up to size 12, version A, C  
 B2DH up to size 12, version B, D  
 B2SH size 13 and 14, version A, C, E, F  
 B2SH size 15 to 18, version B, D, E, F  
 B2FH size 13 and 14, version A, C  
 B2FH size 15 to 18, version B, D  
 B2DH size 14, version B, D  
 BSDH size 16 and 18, version A, C



**Selection and ordering data**



Irrespective of the mounting position of the gear unit, the face designations "right" and "left" always refer to the horizontal mounting position with the view on side 1.

Side 2 is on top.  
Mounting cover on top (2),  
looking at drive front face (1):  
Side 3 = right  
Side 6 = left

Ordering information:

| Data position of the Article No.                                                            | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
|---------------------------------------------------------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Article No.:                                                                                | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z ■ ■ ■</b> |
| <b>Backstop/direction of rotation</b>                                                       |               |   |   |   |    |    |    |    |    |    |    |                 |
| Mounting of standard backstop, catalog version                                              |               |   |   |   |    |    |    |    |    |    |    | L 0 0           |
| Design with torque limiting                                                                 |               |   |   |   |    |    |    |    |    |    |    | L 1 0           |
| Design with torque limiting, attachment prepared                                            |               |   |   |   |    |    |    |    |    |    |    | L 1 2           |
| Design with torque limiting for ATEX                                                        |               |   |   |   |    |    |    |    |    |    |    | L 1 4           |
| Design with torque limiting for ATEX, attachment prepared                                   |               |   |   |   |    |    |    |    |    |    |    | L 1 6           |
| Direction of rotation, looking at low speed shaft extension (LSS): Clockwise                |               |   |   |   |    |    |    |    |    |    |    | L 9 0           |
| Direction of rotation, looking at low speed shaft extension (LSS): Counter-clockwise        |               |   |   |   |    |    |    |    |    |    |    | L 9 3           |
| Direction of rotation, looking at low speed shaft extension (LSS), shaft journals on side 3 |               |   |   |   |    |    |    |    |    |    |    | L 9 4           |
| Direction of rotation, looking at low speed shaft extension (LSS), shaft journals on side 6 |               |   |   |   |    |    |    |    |    |    |    | L 9 5           |

## Options for operation

Information about oil, information about installation

### Overview

#### Information about oil

Flender FZG gear units are supplied without oil filling as standard.

Ordering information:

The following options can be selected by ordering the gear units with the order code **-Z**:

- Permissible type of oil

| Data position of the Article No.                                                                                                           | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Article No.:                                                                                                                               | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b> ■ ■ ■ |
| <b>Permissible type of oil</b>                                                                                                             |               |   |   |   |    |    |    |    |    |    |    |                 |
| Provided for mineral oil                                                                                                                   |               |   |   |   |    |    |    |    |    |    |    | H 0 0           |
| Provided for synthetic oil on a polyalphaolefin basis (PAO oil)                                                                            |               |   |   |   |    |    |    |    |    |    |    | H 0 2           |
| Provided for synthetic low temperature oil on a polyalphaolefin basis (PAO-T oil)<br>Suitable for ambient temperatures colder than -35 °C. |               |   |   |   |    |    |    |    |    |    |    | H 0 3           |

Different types of oils can be selected in the selection tool.

- Permitted oil viscosities (for recommendations, [see page 10/19](#))

| Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
|----------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Article No.:                     | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b> ■ ■ ■ |
| <b>Oil viscosity</b>             |               |   |   |   |    |    |    |    |    |    |    |                 |
| ISO VG 460 <sup>1)</sup>         |               |   |   |   |    |    |    |    |    |    |    | H 1 0           |
| ISO VG 320                       |               |   |   |   |    |    |    |    |    |    |    | H 1 1           |
| ISO VG 220                       |               |   |   |   |    |    |    |    |    |    |    | H 1 2           |

#### Information about installation

Ordering information:

The following options regarding altitude and installation location are selected using the order code **-Z**:

- Altitude

| Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
|----------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Article No.:                     | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b> ■ ■ ■ |
| <b>Altitude</b>                  |               |   |   |   |    |    |    |    |    |    |    |                 |
| Up to 1000 m                     |               |   |   |   |    |    |    |    |    |    |    | G 3 0           |
| 1001 to 2000 m                   |               |   |   |   |    |    |    |    |    |    |    | G 3 1           |
| 2001 to 3000 m                   |               |   |   |   |    |    |    |    |    |    |    | G 3 2           |
| 3001 to 4000 m                   |               |   |   |   |    |    |    |    |    |    |    | G 3 3           |
| 4001 to 5000 m                   |               |   |   |   |    |    |    |    |    |    |    | G 3 4           |

- Installation location

| Data position of the Article No.     | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
|--------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Article No.:                         | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b> ■ ■ ■ |
| <b>Installation location</b>         |               |   |   |   |    |    |    |    |    |    |    |                 |
| Enclosed room or building with gates |               |   |   |   |    |    |    |    |    |    |    | G 3 5           |
| Building without gates               |               |   |   |   |    |    |    |    |    |    |    | G 3 6           |
| Outdoors                             |               |   |   |   |    |    |    |    |    |    |    | G 3 7           |

<sup>1)</sup> Not available for gear units with forced lubrication and gear units with mounted auxiliary drive.  
Not recommended for vertically installed gear units.

**Overview****Oil level indicator**

Flender FZG gear units are designed with a dip stick for checking the oil level. In addition, an oil level indicator of the type

FSA 127, FSA 176, FSA 254 or an oil level indicator with an integrated FSA-T dial thermometer can be ordered.

| Data position of the Article No.                               | 1 to 6              | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code |
|----------------------------------------------------------------|---------------------|---|---|---|----|----|----|----|----|----|----|------------|
| Article No.:                                                   | 2LP302 . . . . . -Z |   |   |   |    |    |    |    |    |    |    | ■ ■ ■      |
| <b>Oil level indicator</b>                                     |                     |   |   |   |    |    |    |    |    |    |    |            |
| Oil level indicator of type FSA 127                            |                     |   |   |   |    |    |    |    |    |    |    | H 5 2      |
| Oil level indicator FSA 176                                    |                     |   |   |   |    |    |    |    |    |    |    | H 5 3      |
| Oil level indicator FSA 254                                    |                     |   |   |   |    |    |    |    |    |    |    | H 5 4      |
| Oil level indicator with integrated dial thermometer FSA-T 127 |                     |   |   |   |    |    |    |    |    |    |    | H 5 5      |
| Oil level indicator with integrated dial thermometer FSA-T 176 |                     |   |   |   |    |    |    |    |    |    |    | H 5 6      |
| Oil level indicator with integrated dial thermometer FSA-T 254 |                     |   |   |   |    |    |    |    |    |    |    | H 5 7      |

**Housing material**

Cast iron (EN-GJL-200) is the housing material used as standard. Alternatively, a welded housing and a housing made of spheroidal cast iron steel can also be ordered.

| Data position of the Article No.                                  | 1 to 6              | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code |
|-------------------------------------------------------------------|---------------------|---|---|---|----|----|----|----|----|----|----|------------|
| Article No.:                                                      | 2LP302 . . . . . -Z |   |   |   |    |    |    |    |    |    |    | ■ ■ ■      |
| <b>Housing material</b>                                           |                     |   |   |   |    |    |    |    |    |    |    |            |
| Housing made of spheroidal cast iron steel EN-GJS-400-15 (GGG-40) |                     |   |   |   |    |    |    |    |    |    |    | K 2 1      |
| Welded steel                                                      |                     |   |   |   |    |    |    |    |    |    |    | K 2 2      |

**Oil drain valve**

In the basic design, Flender FZG gear units are provided with an oil drain screw with a permanent magnet.

An additional hook-type quick coupling with a hose fitting according to DIN 3489 can further facilitate the oil change.

Oil drain valves, which can be ordered in various designs, facilitate oil changes.

| Data position of the Article No.                                                         | 1 to 6              | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code |
|------------------------------------------------------------------------------------------|---------------------|---|---|---|----|----|----|----|----|----|----|------------|
| Article No.:                                                                             | 2LP302 . . . . . -Z |   |   |   |    |    |    |    |    |    |    | ■ ■ ■      |
| <b>Oil drain</b>                                                                         |                     |   |   |   |    |    |    |    |    |    |    |            |
| Gear unit in mounting position "H": Oil drain valve on gear unit side 4, straight design |                     |   |   |   |    |    |    |    |    |    |    | K 3 0      |
| Gear unit in mounting position "V": Oil drain valve on gear unit side 4, straight design |                     |   |   |   |    |    |    |    |    |    |    | K 3 0      |
| Screw plug with permanent magnet in addition to oil drain valve                          |                     |   |   |   |    |    |    |    |    |    |    | K 3 7      |
| Oil drain valve on gear unit side 4, angled relative to gear unit side 6                 |                     |   |   |   |    |    |    |    |    |    |    | K 3 8      |
| Oil drain valve on gear unit side 4, angled relative to gear unit side 3                 |                     |   |   |   |    |    |    |    |    |    |    | K 3 9      |

**Gear unit ventilation**

Flender FZGs are standard-equipped with an air filter that is suitable for use near splash water and dust accumulations for equalizing the pressure difference between the interior of the

gear unit and the ambient air. Air filters for other kinds of ambient conditions can also be ordered.

| Data position of the Article No.     | 1 to 6              | 7                                                                                                                                                                                                                            | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code |
|--------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|----|----|----|----|----|----|------------|
| Article No.:                         | 2LP302 . . . . . -Z |                                                                                                                                                                                                                              |   |   |    |    |    |    |    |    |    | ■ ■ ■      |
| <b>Gear unit ventilation</b>         | <b>Filter mesh</b>  | <b>Description</b>                                                                                                                                                                                                           |   |   |    |    |    |    |    |    |    |            |
| MANN air filter                      | 40 µm               | <ul style="list-style-type: none"> <li>For gear units with special dust protection requirements</li> <li>With filling sieve, filter mesh oil: 530 µm</li> </ul>                                                              |   |   |    |    |    |    |    |    |    | K 7 1      |
| MANN air filter, encapsulated design | 40 µm               | <ul style="list-style-type: none"> <li>For gear units with special dust protection requirements</li> <li>When risk exists of unit becoming completely covered</li> <li>With filling sieve, filter mesh oil 530 µm</li> </ul> |   |   |    |    |    |    |    |    |    | K 7 2      |
| Wet air filter                       | 3 µm                | <ul style="list-style-type: none"> <li>For gear units that are used intermittently</li> <li>For use in extremely humid environments</li> </ul>                                                                               |   |   |    |    |    |    |    |    |    | K 7 3      |

# Options for operation

## Explosion protection ATEX

### Overview

#### Explosion protection according to directive 2014/34/EU

Flender gear units can be delivered as a modified, certified version upon customer request.

These gear units can be used in hazardous environments.

They then satisfy the requirements of the guideline 2014/34/EU.

| Description of the environment                                                             |                               |                 | Assignment of the device properties |                     |                                      | Flender gear unit Delivery portfolio? |
|--------------------------------------------------------------------------------------------|-------------------------------|-----------------|-------------------------------------|---------------------|--------------------------------------|---------------------------------------|
| Duration of explosion hazard:<br>The quantified specification is only used for orientation | Explosion hazard due to:      |                 | Property                            | Safety requirements | Safe when considering the following: |                                       |
| Continuously frequently, more than 1000 h/year                                             | Gases, mist, vapors<br>Zone 0 | Dust<br>Zone 20 | Category 1                          | Very high           | Seldom occurring faults              | No                                    |
| Occasionally, short-term, between 10 and 1000 h/year                                       | Zone 1                        | Zone 21         | Category 2                          | High                | Typically occurring faults           | Yes                                   |
| Very seldom, short-term, less than 10 h/year                                               | Zone 2                        | Zone 22         | Category 3                          | Normal              | Conditions in normal operation       | Yes                                   |

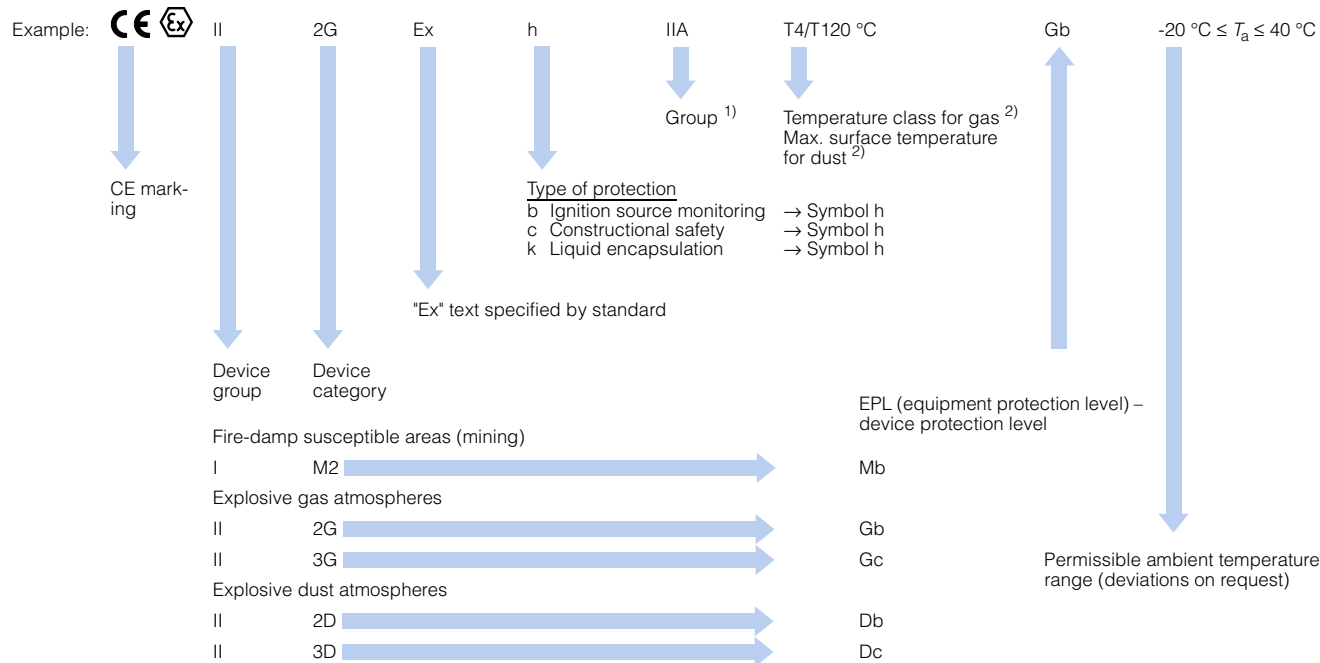
For gear units in ATEX design, the thermal layout of the parameters cited in this catalog may be different.

FZG gear units can be installed in combined zones, e.g. in 22/2. The corresponding selection can be made in the configurator.

Consultation is required here!

**Notice! Flender gear units are not permitted for hybrid mixtures (simultaneous occurrence of explosive gas and dust atmospheres)!**

#### Marking according to EN ISO 80079-36/37



**1) Explanation of groups**

Group I - Fire-damp susceptible areas (mining)  
Mine damp/methane

Group II - Gas group

| Subgroup | Example  |
|----------|----------|
| IIA      | Propane  |
| IIB      | Ethylene |
| IIC      | Hydrogen |

Group III - Dust group

| Subgroup | Definition          |
|----------|---------------------|
| IIIA     | Combustible lint    |
| IIIB     | Non-conductive dust |
| IIIC     | Conductive dust     |

**2) Temperature**

Temperature class for gas

- 450 °C T1 standard
- 300 °C T2 standard
- 200 °C T3 standard
- 135 °C T4 standard
- 100 °C T5 on request
- 085 °C T6 on request

For dust, the maximum surface temperature is specified in °C:

- T120 °C
- T150 °C
- T200 °C

(This concerns the certified maximum value of the surface temperature of the gear unit and of all of the components used in the gear unit BOM (e.g. motor pumps, resistance thermometers, etc.).  
The real maximum surface temperature of the gear unit and gear unit components is often well below the certified maximum value.)



## Options for operation

### Corrosion protection

#### Overview

##### Corrosion protection

To protect the gear unit against corrosion and external influences, Flender gear units with high-value coating systems are offered in various colors.

The corrosion protection system is designed in accordance with the standard ISO 12944-2.

The following is a list of the selection of the coating system based on the corrosivity category for the standard protection lifetime class "medium".

If the required corrosivity category is not known, it is possible to determine the corrosivity category and the recommended coating system in the configurator based on the climatic load (e.g. sea climate, tropics, etc.) and application (e.g. conveyor system, cable railways, wastewater treatment, etc.).

Coating systems for the alternative protection lifetime classes "low" and "high" can also be selected by means of the configurator.

If there are any special requirements for the coating system beyond this, please contact Flender.

##### Description of the corrosivity categories

Based on ISO 12944-2, the atmospheric ambient conditions have been divided into five corrosivity categories. These are described below.

| Corrosivity category                           | Description                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C1</b><br>Normal environmental pollution    | <ul style="list-style-type: none"> <li>Indoor installation</li> <li>Heated buildings with a neutral atmosphere</li> </ul>                                                                                                                                                                                                                                                   |
| <b>C2</b><br>Low environmental pollution       | <ul style="list-style-type: none"> <li>Indoor and outdoor installation</li> <li>Unheated buildings with condensation, production areas with low humidity, e.g. warehouses</li> <li>Atmospheres with little pollution, rural areas</li> </ul>                                                                                                                                |
| <b>C3</b><br>Average environmental pollution   | <ul style="list-style-type: none"> <li>Indoor and outdoor installation</li> <li>Production areas with high levels of humidity and some air pollution</li> <li>Urban and industrial atmospheres with moderate sulfur dioxide loads</li> <li>Coastal areas with low salinity</li> </ul>                                                                                       |
| <b>C4</b><br>High environmental pollution      | <ul style="list-style-type: none"> <li>Indoor and outdoor installation</li> <li>Environments with high humidity and occasionally high levels of atmospheric and chemical pollution</li> <li>Occasional acidic or caustic wet cleaning</li> <li>Industrial areas and coastal areas with moderate salt levels</li> </ul>                                                      |
| <b>C5</b><br>Very high environmental pollution | <ul style="list-style-type: none"> <li>Indoor and outdoor installation</li> <li>Buildings/areas with almost constant condensation and severe pollution</li> <li>Industrial areas with high humidity and aggressive atmosphere</li> <li>Regular acidic or caustic wet cleaning, including cleaning with chemical agents</li> <li>Coastal areas with high salinity</li> </ul> |

##### Selection of the coating system

When selecting the coating system based on the corrosivity category determined or specified by the customer, you must consider whether explosion protection acc. to ATEX 2014/34/EU is required.

If explosion protection according to ATEX 2014/34/EU is required for areas of the explosion subgroup IIC or with minimum ignition energy  $\leq 3$  mJ, then it is essential to select an electrostatically conductive coating (order codes B85, B86, B87) of the relevant corrosion category.

##### Assignment of the coating system to the corrosivity category (protection lifetime class medium)

| Corrosivity category | Standard coating with top coat | Electrostatically conductive coating for explosion protection acc. to ATEX 2014/34/EU with explosion subgroup IIC or minimum ignition energy $\leq 3$ mJ |
|----------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C1 to C3</b>      | Coating system 002 [B41]       | Coating system 012 [B85]                                                                                                                                 |
| <b>C4</b>            | Coating system 004 [B43]       | Coating system 013 [B86]                                                                                                                                 |
| <b>C5</b>            | Coating system 005 [B44]       | Coating system 014 [B87]                                                                                                                                 |

**Overview**Ordering information:

| Data position of the Article No. |                                                                                                                                                                                                             | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Article No.:                     |                                                                                                                                                                                                             | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b> ■ ■ ■ |
| Coating system                   | Description                                                                                                                                                                                                 |               |   |   |   |    |    |    |    |    |    |    |                 |
| 002                              | Standard coating with top coat, medium corrosion resistance                                                                                                                                                 |               |   |   |   |    |    |    |    |    |    |    | <b>B 4 1</b>    |
| 004                              | Standard coating with top coat, high corrosion resistance                                                                                                                                                   |               |   |   |   |    |    |    |    |    |    |    | <b>B 4 3</b>    |
| 005                              | Standard coating with top coat, very high corrosion resistance                                                                                                                                              |               |   |   |   |    |    |    |    |    |    |    | <b>B 4 4</b>    |
| 012                              | Electrostatically conductive coating with top coat, medium corrosion resistance (design with explosion protection acc. to ATEX 2014/34/EU with explosion subgroup IIC or minimum ignition energy ≤ 3 mJ)    |               |   |   |   |    |    |    |    |    |    |    | <b>B 8 5</b>    |
| 013                              | Electrostatically conductive coating with top coat, high corrosion resistance (design with explosion protection acc. to ATEX 2014/34/EU with explosion subgroup IIC or minimum ignition energy ≤ 3 mJ)      |               |   |   |   |    |    |    |    |    |    |    | <b>B 8 6</b>    |
| 014                              | Electrostatically conductive coating with top coat, very high corrosion resistance (design with explosion protection acc. to ATEX 2014/34/EU with explosion subgroup IIC or minimum ignition energy ≤ 3 mJ) |               |   |   |   |    |    |    |    |    |    |    | <b>B 8 7</b>    |
| 003                              | Standard coating <b>without</b> top coat <sup>1)</sup>                                                                                                                                                      |               |   |   |   |    |    |    |    |    |    |    | <b>B 4 2</b>    |

**Color selection**

The top coat of the Flender gear units has the default color RAL 5015 (sky blue). The gear units can also be supplied in other colors upon request.

Cover caps at the gear unit end for covering the shafts and fan covers are normally powder-coated in the yellow warning color RAL 1003 (to warn about rotating parts) and are compatible with all standard coating systems and conductive coatings.

Ordering information:

When ordering gear units in a different color, **-Z** must be added to the Article No.

| Data position of the Article No. |                          | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
|----------------------------------|--------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Article No.:                     |                          | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b> ■ ■ ■ |
| Color selection                  |                          |               |   |   |   |    |    |    |    |    |    |    |                 |
|                                  | RAL 5009 azure blue      |               |   |   |   |    |    |    |    |    |    |    | <b>C 0 1</b>    |
|                                  | RAL 5010 gentian blue    |               |   |   |   |    |    |    |    |    |    |    | <b>C 0 2</b>    |
|                                  | <b>RAL 5015 sky blue</b> |               |   |   |   |    |    |    |    |    |    |    | <b>C 0 0</b>    |
|                                  | RAL 6011 reseda green    |               |   |   |   |    |    |    |    |    |    |    | <b>C 0 6</b>    |
|                                  | RAL 7011 steel gray      |               |   |   |   |    |    |    |    |    |    |    | <b>C 1 3</b>    |
|                                  | RAL 7016 anthracite gray |               |   |   |   |    |    |    |    |    |    |    | <b>C 1 2</b>    |
|                                  | RAL 7030 stone gray      |               |   |   |   |    |    |    |    |    |    |    | <b>C 1 1</b>    |
|                                  | RAL 7031 blue gray       |               |   |   |   |    |    |    |    |    |    |    | <b>C 0 7</b>    |
|                                  | RAL 7035 light gray      |               |   |   |   |    |    |    |    |    |    |    | <b>C 0 8</b>    |
|                                  | RAL 9005 jet black       |               |   |   |   |    |    |    |    |    |    |    | <b>C 1 0</b>    |
|                                  | Unpainted, primed        |               |   |   |   |    |    |    |    |    |    |    | <b>C 1 5</b>    |

Other colors are available on request (see also page 10/32, Further information).

<sup>1)</sup> Not suitable for areas and applications with corrosivity category C5 or explosion protection according to ATEX 2014/34/EU with explosion subgroup IIC or minimum ignition energy ≤ 3 mJ. Without the top coat to be applied by the customer, only corrosivity category C1 is achieved.

## Options for operation

### Test reports, further information

#### Overview

##### Test reports

The declaration of compliance with the order in accordance with EN 10204-2.1 is part of the standard scope of supply.

- Declaration of compliance with the order 2.1  
Certificate in which the manufacturer confirms that the supplied products comply with the requirements of the order without details of test results.

- Test report 2.2  
Certificate in which the manufacturer confirms that the supplied products comply with the requirements of the order complete with the results of non-specific tests.

##### Ordering information:

When ordering with additional test report in accordance with EN 10204-2.2, **-Z** must be added to the Article No.

| Data position of the Article No.              | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
|-----------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Article No.:                                  | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b> ■ ■ ■ |
| <b>Test reports</b>                           |               |   |   |   |    |    |    |    |    |    |    |                 |
| Additionally with test report to EN 10204-2.2 |               |   |   |   |    |    |    |    |    |    |    |                 |
| D 9 7                                         |               |   |   |   |    |    |    |    |    |    |    |                 |

##### Direction of rotation

For gear units without a backstop, the direction of rotation of the low speed shaft (LSS) can be specified using the following order codes. For gear units with double-extended low speed shaft (LSS), the direction of rotation must be specified for the relevant shaft journal. The direction of rotation is determined by the view of the shaft face of the low speed shaft (LSS).

For gear units with direction of rotation identical "at both ends", no order code is required.

For determining the direction of rotation for gear units with a backstop, [see page 10/25](#).

| Data position of the Article No.                                                              | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
|-----------------------------------------------------------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Article No.:                                                                                  | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b> ■ ■ ■ |
| <b>Direction of rotation</b>                                                                  |               |   |   |   |    |    |    |    |    |    |    |                 |
| Low speed shaft (LSS) rotating clockwise                                                      |               |   |   |   |    |    |    |    |    |    |    | L 9 0           |
| Low speed shaft (LSS) rotating counter-clockwise                                              |               |   |   |   |    |    |    |    |    |    |    | L 9 3           |
| Direction of rotation of low speed shaft, looking at right-side spigot (side 3) <sup>1)</sup> |               |   |   |   |    |    |    |    |    |    |    | L 9 4           |
| Direction of rotation of low speed shaft, looking at left-side spigot (side 6) <sup>1)</sup>  |               |   |   |   |    |    |    |    |    |    |    | L 9 5           |

##### Further information

##### Ordering information:

The following further information can be provided in the Article No. using the order code **-Z**.

| Data position of the Article No.                  | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code      |
|---------------------------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|-----------------|
| Article No.:                                      | <b>2LP302</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | <b>-Z</b> ■ ■ ■ |
| <b>Further information</b>                        |               |   |   |   |    |    |    |    |    |    |    |                 |
| Color tone top coat RAL <sup>2)</sup>             |               |   |   |   |    |    |    |    |    |    |    | Y 0 0           |
| Minimum ambient temperature (°C)                  |               |   |   |   |    |    |    |    |    |    |    | Y 0 1           |
| Maximum ambient temperature (°C)                  |               |   |   |   |    |    |    |    |    |    |    | Y 0 2           |
| Input speed $n_1$ Flender gear units (rpm)        |               |   |   |   |    |    |    |    |    |    |    | Y 2 0           |
| Driven machine output $P_2$ (kW) <sup>3)</sup>    |               |   |   |   |    |    |    |    |    |    |    | Y 2 1           |
| Driven machine torque $T_2$ (Nm) <sup>3)</sup>    |               |   |   |   |    |    |    |    |    |    |    | Y 2 2           |
| Input power $P_1$ Flender gear units (kW)         |               |   |   |   |    |    |    |    |    |    |    | Y 2 3           |
| Additional text available for product description |               |   |   |   |    |    |    |    |    |    |    | Y 9 9           |

<sup>1)</sup> This option applies to gear units with low speed shaft (LSS) at both ends.

<sup>2)</sup> Further colors, other than those offered in the catalog.

<sup>3)</sup> Specification of  $P_2$  or  $T_2$



## Overview

The production and assembly of the gear unit and accessories are carried out with the utmost care, taking into account all of the prescribed regulations and personal experience.

Because the Flender gear unit series is a product with a certain percentage of stocked components, a measurement log for the exact installed part is not available in every case.

For reasons of efficiency, manufacturing batches are only randomly measured based on defined test quantities.

Nevertheless, test certificates can be created for Flender gear units on the basis of the certification of the production batch.

| Test certificate | Check according to F 7200 (gearing and shafts before assembly of gear unit) |                                                                                                                                                                        | Issuer   |
|------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 2.1              | P 1.1                                                                       | Certificate of conformity with the order                                                                                                                               | SAP      |
| 2.2              | P 1.2                                                                       | Chemical analysis, mechanical characteristic values of standard components                                                                                             | SAP      |
| 3.1              | P 4.1                                                                       | Chemical analysis (raw material)                                                                                                                                       | Supplier |
|                  | P 4.2                                                                       | Characteristic mechanical values (raw material)                                                                                                                        |          |
|                  | P 4.3                                                                       | Ultrasonic test (UT); (raw material)                                                                                                                                   |          |
|                  | P 4.4                                                                       | Crack detection test (MT)                                                                                                                                              | Factory  |
|                  | P 4.5 <sup>4)</sup>                                                         | Hardness pattern depth                                                                                                                                                 |          |
|                  | P 4.6                                                                       | Tooth flank geometry                                                                                                                                                   |          |
|                  | P 4.7                                                                       | Temper etch detection                                                                                                                                                  |          |
|                  | P 4.16                                                                      | Crack detection test (MT)                                                                                                                                              | Factory  |
|                  | P 4.17 <sup>4)</sup>                                                        | Hardness pattern depth                                                                                                                                                 |          |
|                  | P 4.18                                                                      | Tooth flank geometry                                                                                                                                                   |          |
|                  | P 4.19                                                                      | Temper etch detection                                                                                                                                                  |          |
|                  | P 4.8                                                                       | P 6.8 <sup>5)</sup> Main dimensions                                                                                                                                    | Factory  |
|                  | P 4.9 <sup>1)</sup>                                                         | P 6.9 <sup>5)</sup> Tooth contact pattern (tendency indication)                                                                                                        |          |
|                  | P 4.10                                                                      | P 6.10 <sup>5)</sup> Airborne sound <sup>1)</sup> (1 gear unit per item)                                                                                               | Factory  |
|                  | P 4.11                                                                      | P 6.11 <sup>5)</sup> Structure-borne sound <sup>1)</sup> (1 gear unit per item)                                                                                        | Factory  |
|                  | P 4.12                                                                      | P 6.12 <sup>5)</sup> Temperature trend <sup>1); 3)</sup> (1 gear unit per item)                                                                                        | Factory  |
|                  | P 4.13                                                                      | P 6.13 <sup>5)</sup> End temperature <sup>1); 3)</sup>                                                                                                                 | Factory  |
|                  | P 4.14                                                                      | P 6.14 <sup>5)</sup> Paint thickness (1 gear unit per item)                                                                                                            | Factory  |
|                  | P 4.15                                                                      | P 6.15 <sup>5)</sup> Alignment log for IDS drive unit on swing base/base frame                                                                                         | Factory  |
|                  | Factory confirmation <sup>2)</sup>                                          | Function test run per direction of rotation (without load), check and confirmation of oil tightness, normal heat and noise development, and general visual acceptance) | Factory  |
|                  | Factory confirmation                                                        | Total circumferential backlash for gear unit (on high speed shaft (HSS), low speed shaft (LSS) fixed)                                                                  | Factory  |

### Note:

Request test certificates for housing material from Flender.

<sup>1)</sup> Only practical for test station run "with at least partial load", load test or partial load test separately according to the table below.

<sup>2)</sup> The test range encompasses: Load-free test run depending on type, size and type of lubrication, check for oil tightness, normal heat and noise development, and general visual acceptance, for meaningful measurement results order a load/partial load test run at additional cost.

<sup>3)</sup> Only practical with at least 4 hours of load-free test run (can be ordered separately).

<sup>4)</sup> Only on the basis of the test sample of the furnace batch.

<sup>5)</sup> The P4. tests are created by authorized employees at the factory. The P6. tests can be performed on request in the presence of the customer or by a third party authorized by the customer when the order is placed. Please contact Flender in this regard. The contractually agreed upon test measures remain the deliverables. Please request the load or partial load from Flender prior to placing the order to determine the additional costs.

## Options for operation

Devices and filters

### Pressure measuring instrument

#### Overview

##### Pressure measuring instrument (pressure gauge)

The pressure gauge can be used to carry out a visual inspection of the function of forced lubrication. Any mounting position is possible. No warning or electronic evaluation can take place.

#### Technical specifications

| Pressure measuring instrument   |                                                                   |
|---------------------------------|-------------------------------------------------------------------|
| Display range                   | Dual scale external 0 ... 10 bar black/internal 0 ... 140 psi red |
| Connection                      | bottom                                                            |
| Permissible ambient temperature | -34 °C ... +100 °C                                                |
| Permissible medium temperature  | +100 °C                                                           |
| Degree of protection            | IP65                                                              |



### Pressure monitor

#### Overview

##### Pressure monitor type 0180

The device is used to ensure that the forced lubrication functions. A defined pressure is generated by reducing the wire diameter. In the event of faults (e.g. due to dirty filters), a pressure drop may be detected. At 0.5 bar, the measuring device sends a signal, which can be evaluated at the customer's end. Optionally, in connection with other devices, a pre-warning at 0.8 bar is possible, and a shutdown at 0.3 bar.

No pressure setting is required for commissioning.

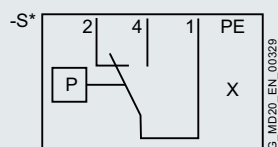


#### Technical specifications

| Pressure monitor                |                                                                      |
|---------------------------------|----------------------------------------------------------------------|
| Permissible ambient temperature | -30 °C ... +100 °C                                                   |
| Degree of protection            | IP65                                                                 |
| Max. switching power            | 4 A/250 V AC/250 VA<br>2 A/24 V DC<br>1 A/50 V DC<br>0.02 A/250 V DC |
| Cable entry                     | PG9                                                                  |

#### Circuit diagrams

##### Electrical connection and cable entry



- S Code for switch
- \* Placeholder for equipment identifier
- X Placeholder for ident number

**Overview****P200 pressure transmitter for gauge pressure**

The pressure transmitter is used for the permanent pressure check. Viscosity or speed-related fluctuations can be determined and warning or shutdown points can be set on the customer's evaluation devices.

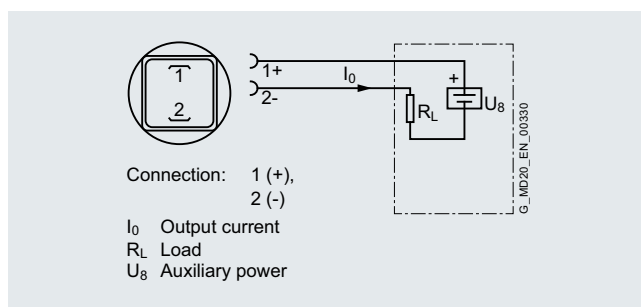
The housing is made of stainless steel.

**Technical specifications****P200 pressure transmitter**

|                           |                                                                                        |
|---------------------------|----------------------------------------------------------------------------------------|
| <b>Measuring range</b>    | 0 – 10 bar,<br>bursting pressure >25 bar                                               |
| <b>Process connection</b> | G $\frac{1}{4}$ " external according to<br>EN 837-1<br>( $\frac{1}{4}$ "-BSP external) |
| <b>Output signal</b>      | 4 ... 20 mA                                                                            |
| <b>Voltage</b>            | 7... 33 V DC                                                                           |

**Circuit diagrams****Electrical connection and cable entry**

Screw connection M16 × 1.5  
Connector acc. to EN 175301-803-A



Connection with current output and connector according to EN 175301

**Dial thermometer****Overview****Dial thermometer**

The dial thermometers are used for visual temperature monitoring.

They are installed in a protective tube so that the dial thermometer can be replaced without oil drainage.

Other versions for vertical installation or a right or left-angled display for horizontal installation are also available.

**Technical specifications****Dial thermometer**

|                                        |                                                                              |
|----------------------------------------|------------------------------------------------------------------------------|
| <b>Display range</b>                   | Dual scale:<br>external -20 ... +120 °C black<br>internal -4 ... +249 °F red |
| <b>Permissible ambient temperature</b> | -40 °C ... +70 °C                                                            |



## Options for operation

### Devices and filters

#### Temperature monitor

##### Overview

##### Temperature monitor ATHs-SW-22

###### Flender standard version

The temperature monitor works according to the principle of liquid expansion. It has two switching points.

The temperature monitor with protective tube must be immersed in the medium along its entire length, because otherwise major switching deviations will occur. The order-specific minimum and maximum temperatures that are to be set are specified in the gear unit documentation.

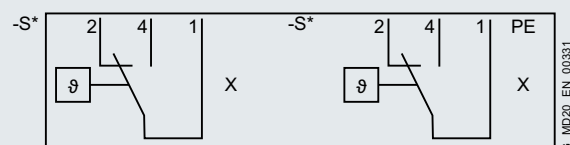


##### Technical specifications

| Temperature monitor             |                                                                                         |
|---------------------------------|-----------------------------------------------------------------------------------------|
| Max. switching power            | 2 A/230 V AC/460 VA p.f. = 0.6<br>10 A/230 V AC/2300 W p.f. = 1<br>0.25 A/230 V DC/58 W |
| Setting range                   | -20° C ... +100 °C,<br>switching differential 3 – 4%                                    |
| Permissible ambient temperature | -50 °C ... +80 °C<br>(on switch head and trunk line<br>in use -40 °C ... +80 °C)        |
| Degree of protection            | IP65                                                                                    |
| Cable entry                     | PG9                                                                                     |

##### Circuit diagrams

###### Electrical connection and cable entry



- S Code for switch
- \* Placeholder for equipment identifier
- X Placeholder for ident number

G\_MD20\_EN\_00331

**Overview****Resistance thermometer**

The measured resistance changes its electrical resistance due to temperature fluctuations.

With the Pt100/RTD the operating temperature can continuously be monitored by means of an evaluation unit of the customer's supply. It is possible to set several switching points on the evaluation unit.

Pt100 resistance thermometer for oil sump

This resistance thermometer is used for measuring the oil temperature in the gear unit housing or oil tank. The Pt100 can be replaced without loss of oil (installation in a Thermowell).



In addition to the oil sump temperature, the bearing temperature can also be monitored. The electronics and connection head are identical to the measuring device shown above.

**Technical specifications**

| Resistance thermometer          |                                                  |
|---------------------------------|--------------------------------------------------|
| Connection head                 | Degree of protection IP65, hinged aluminum cover |
| Cable gland                     | M16 × 1.5                                        |
| Permissible ambient temperature | -40 °C ... 100 °C                                |

## Options for operation

Devices and filters

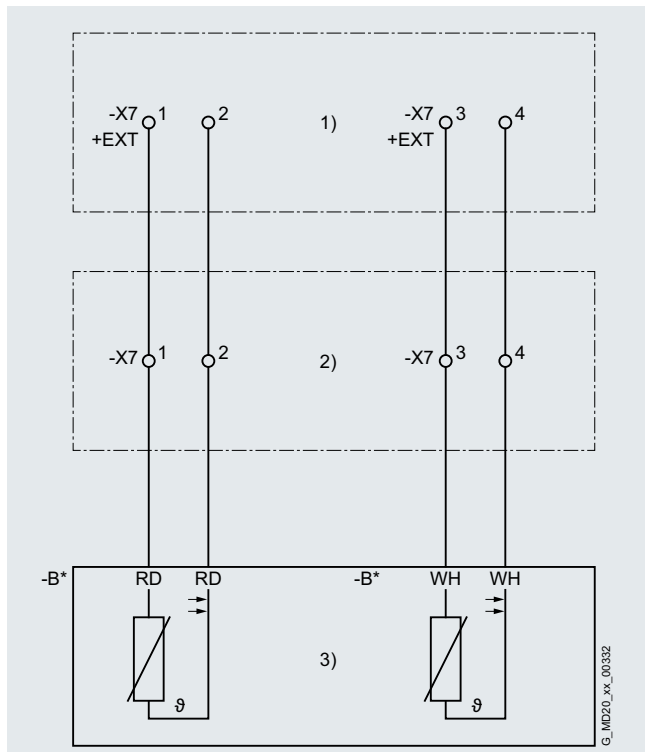
### Resistance thermometer

#### Circuit diagrams

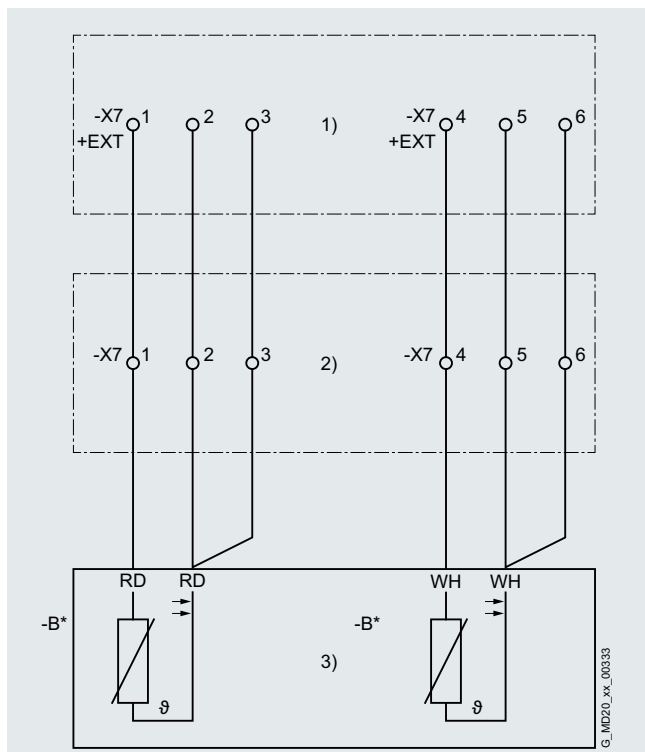
##### Connection

Measurement inaccuracies can be minimized by means of multi-conductor technology.

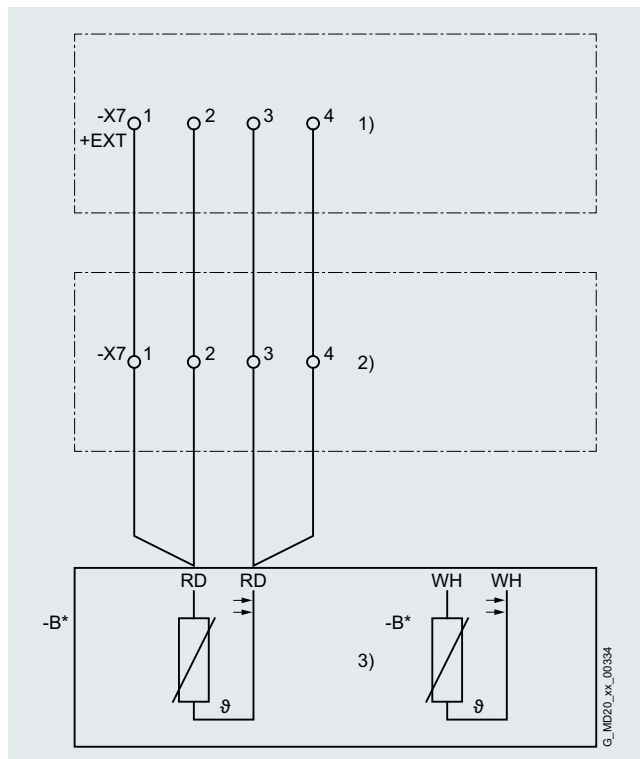
From connection head, a 2, 3 and 4-wire circuit can be implemented (only a single connection is possible here):



2-wire circuit

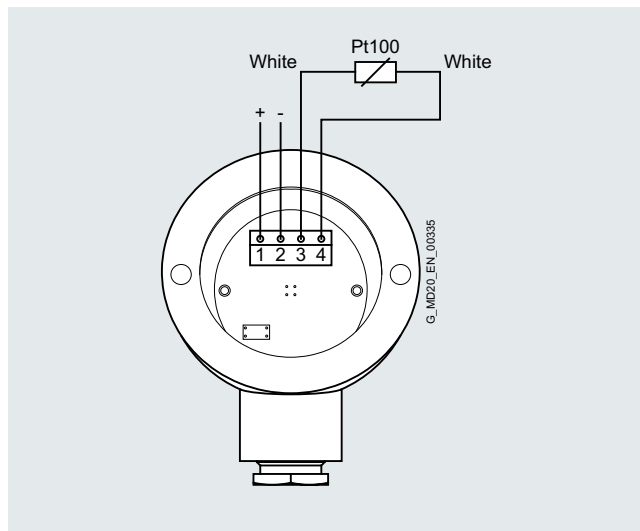


3-wire circuit



4-wire circuit

**Optionally with transmitter** 4 ... 20 mA available (permitted ambient temperature range then -40 °C to +85 °C)



- 1) Evaluation unit of customer's supply
- 2) Terminal box
- 3) Resistance thermometer

## ATEX resistance thermometer Pt100, basic version without type test certificate

## Overview

**ATEX resistance thermometer Pt100, basic version without type test certificate**

This resistance thermometer is installed for measuring bearing and oil temperature in compliance with directive 2014/34/EU (ATEX). The resistance thermometer is used as a simple electrical resource according to EN 60079-11 for use as a category 2 device in potentially explosive gas or dust environments. No EC type test certificate is available for this resistance thermometer.



## Technical specifications

## ATEX resistance thermometers

|                                           |                                                                                                              |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Permitted for hazardous atmosphere</b> | Category 2 (Zones 1 and 21), gas (G), temperature class T4 and dust (D), maximum surface temperature +120 °C |
| <b>Type of protection</b>                 | ia                                                                                                           |
| <b>Connection head</b>                    | Degree of protection IP65, hinged aluminum cover                                                             |
| <b>Cable gland</b>                        | M20 × 1.5                                                                                                    |
| <b>Permissible ambient temperature</b>    | -40 °C ... +100 °C                                                                                           |

## Options for operation

Devices and filters

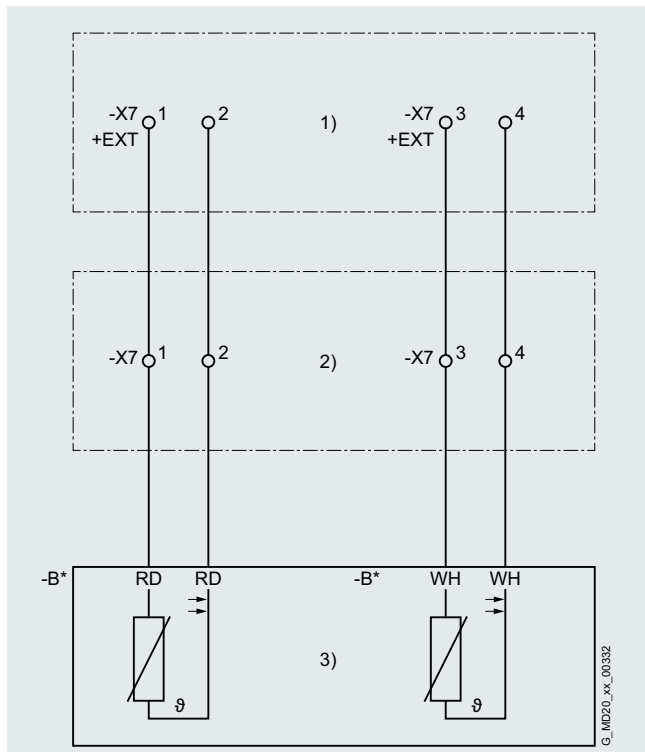
### ATEX resistance thermometer Pt100, basic version without type test certificate

#### Circuit diagrams

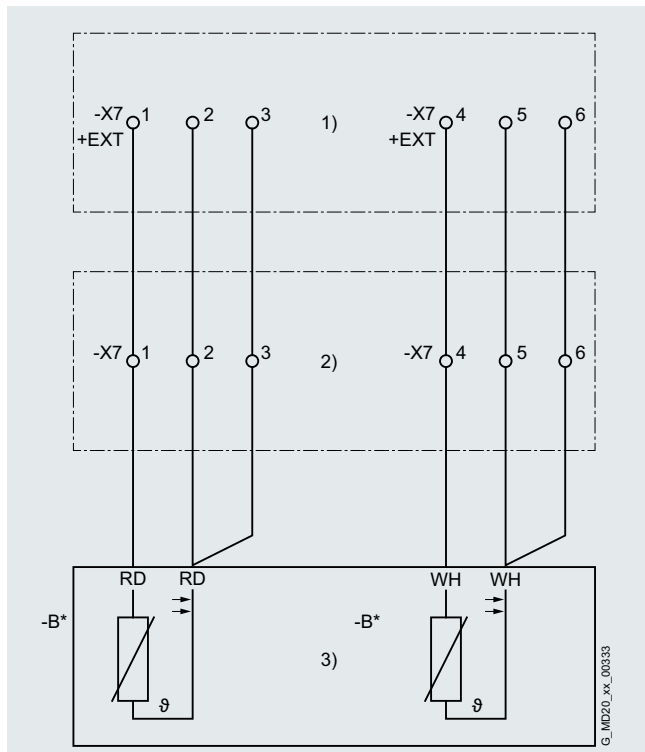
##### Connection

Measurement inaccuracies can be minimized by means of multi-conductor technology.

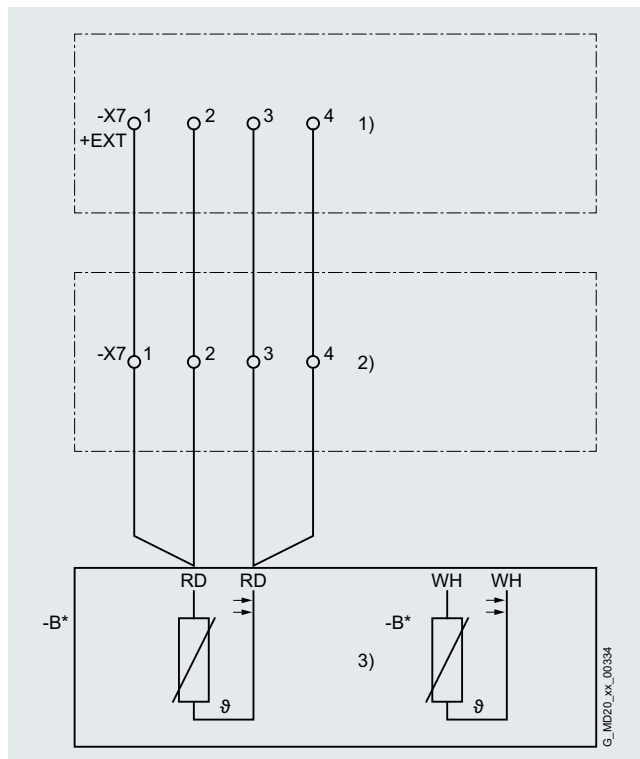
From connection head, a 2, 3 and 4-wire circuit can be implemented (only a single connection is possible here):



2-wire input



3-wire input



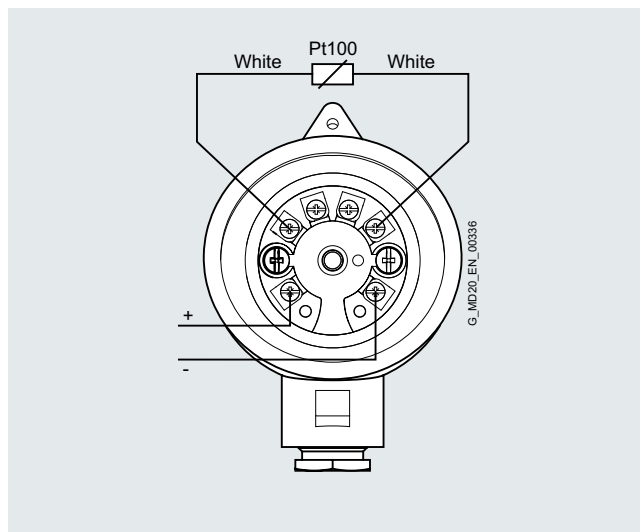
4-wire input

##### Optionally available with the following transmitters

(permitted ambient temperature range then -40 °C to +85 °C)

##### Transmitter type

- SITRANS TH100, 4 ... 20 mA;
- SITRANS TH300, 4 ... 20 mA, HART;
- SITRANS TH400, PROFIBUS PA;
- SITRANS TH400, FOUNDATION Fieldbus



- 1) Evaluation unit of customer's supply
- 2) Terminal box
- 3) Resistance thermometer



## Resistance thermometer Pt100, version with ATEX type test certificate

## Overview

**Resistance thermometer Pt100, version with ATEX type test certificate PTB 09 ATEX 2014X and IECEx – certificate PTB 11.0010X**

This resistance thermometer is used for measuring the oil temperature in the oil sump in a hazardous area. The measuring insert of the Pt100 can be replaced without oil loss. The sensor is designed with a fixed process connection.



## Technical specifications

ATEX marking



**PTB 09 ATEX 2014 X / IECEx PTB 11.0010X**

II 1/2 D Ex ia/ib IIC T200°C Da/Db

II 1/2 G Ex ia/ib IIC T6/T4...T1 Ga/Gb

II 3 G Ex ic IIC T6/T4...T1 Gc

Temperature, electrical data  
see certificate/operating instructions



## Options

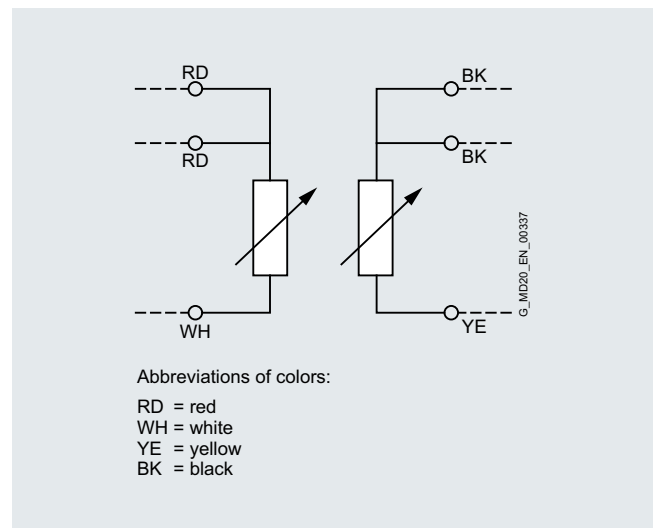
**Some additionally available options for this measuring device are:**

- Other communication protocols: HART, PROFIBUS PA, Foundation Fieldbus
- Other certificates: CSA, EAC, NEPSI
- Other types of protection: Ex n, Ex d (other connection head)
- Further approvals: Marine
- On-site display (different connection head)

## Circuit diagrams

**Connection**

2 × Pt100, tolerance class EN 60715B  
3-wire circuit



Abbreviations of colors: RD = red; WH = white; YE = yellow; BK = black

## Pt100 resistance thermometer

|                                        |                                                                             |
|----------------------------------------|-----------------------------------------------------------------------------|
| <b>Gas (G)</b>                         | Temperature class T4, explosion group IIC                                   |
| <b>Type of protection</b>              | ia                                                                          |
| <b>Connection head</b>                 | BB0, degree of protection IP65, hinged aluminum cover                       |
| <b>Cable gland</b>                     | made of brass M20 x 1.5                                                     |
| <b>Permissible ambient temperature</b> | -40 °C ... +85 °C                                                           |
| <b>Measuring range</b>                 | -50 °C ... +400 °C                                                          |
| <b>Dust (D)</b>                        | Certified for max. permissible surface temperature +200 °C, dust group IIIC |

## Options for operation

### Devices and filters

#### Fill level measurement of liquids with SITRANS LVL100 and LVL200 vibration switches

##### Overview

##### **Fill level measurement of liquids with SITRANS LVL100 and LVL200 vibration switches with failsafe function**

LVL100 and LVL200 are vibration limit level switches for monitoring the oil level when the gear unit is at a standstill.

##### Note:

For error-free recording of the fill level, the gear unit must be at a standstill and sufficient time must be allowed for the oil to return!

##### LVL100 vibration switch

This switching device is available with the following approvals:

- CE, CSA
- IECEX d
- ATEX
- Marine approvals ABS, DNV, LR, RINA, GL, CCS
- FDA, 3A
- Namur

##### LVL200 vibration switch

If it is not certain what type of power supply is available, it is recommended that the LVL200 is used, because it provides both types of connections in one device.



Vibration switches SITRANS LVL100 (left) and LVL200 (right)

##### Technical specifications

| LVL100 vibration switch |                                   |
|-------------------------|-----------------------------------|
| Process temperature     | -40 °C ... +150 °C                |
| Degree of protection    | IP65                              |
| Frequency               | approx. 1100 Hz                   |
| Connection              | Acc. to DIN 43650 incl. connector |

| LVL200 vibration switch |                    |
|-------------------------|--------------------|
| Process temperature     | -50 °C ... +150 °C |
| Housing                 | Aluminum           |
| Degree of protection    | IP66               |
| Cable entry             | M20 × 1.5          |
| Safety category         | SIL2               |
| Frequency               | approx. 1200 Hz    |

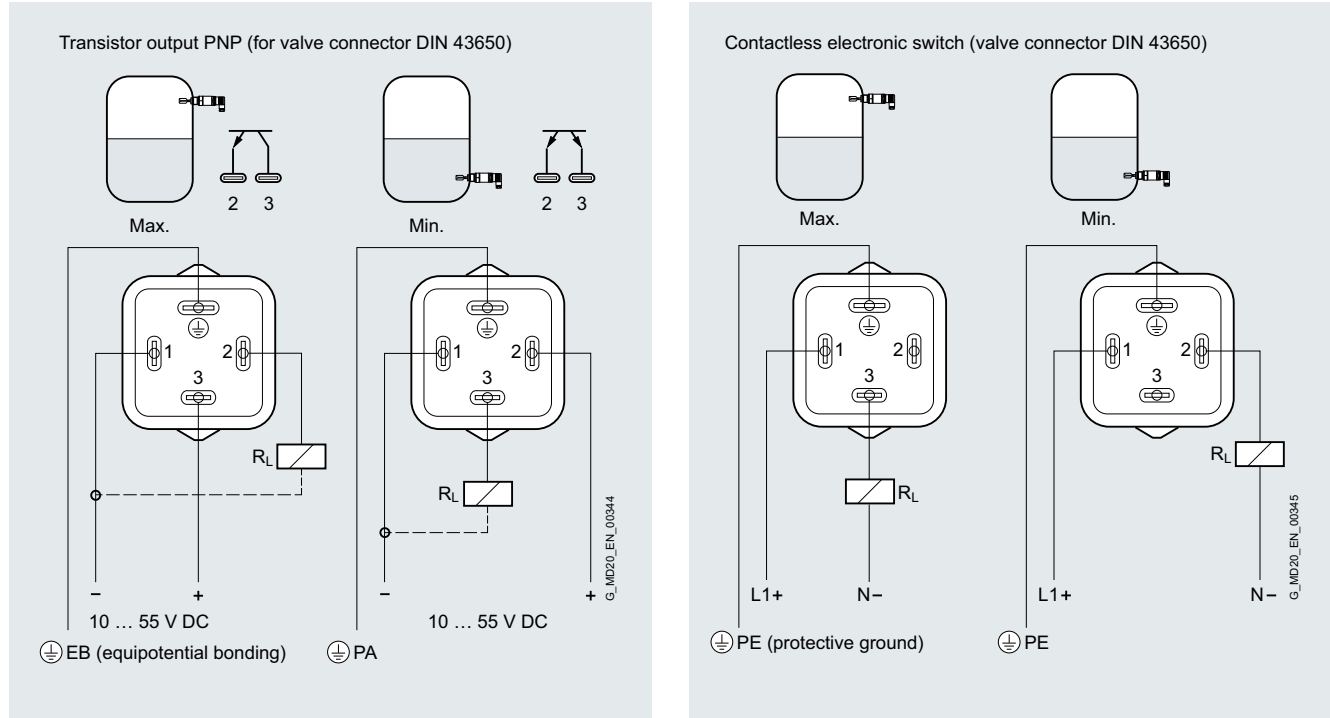
The normal design without a tube extension can be used for horizontal installation in a housing.

For a vertical installation or installation in an oil level pipe, a version with a tube extension is used.

**Circuit diagrams**

**SITRANS LVL100 vibration switch connection**

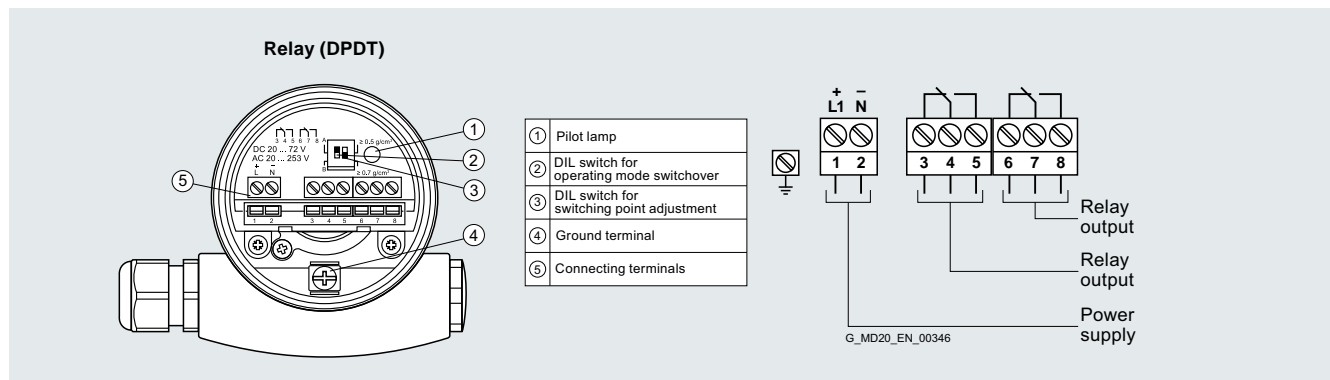
Two standard versions are available:



1) with transistor output PNP, 10 ... 55 V DC

2) for 20 ... 250 V AC/DC

**SITRANS LVL200 vibration switch connection**



Connection:  
Double relay (DPDT)  
20 ... 72 V DC/20 ... 250 V AC (3 A)

## Options for operation

### Devices and filters

#### Volumetric flow measuring device

##### Overview

##### Volumetric flow measuring device

As an alternative to the pressure monitor, a flow monitor can be used to check whether the oil circuit of a forced lubrication is functioning.

It can be used both as a stand-alone device and in combination with a pressure monitor.

The volumetric flow measuring device is designed with an indicator scale and two contacts (change-over contacts).

Optionally, the volumetric flow measuring device is also available without an indicating scale with an analog output signal and with a digital differential pressure transmitter with a digital display and two programmable contacts (normally open or normally closed contacts).

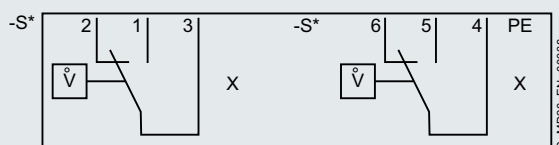


##### Technical specifications

| Volumetric flow measuring device |                                            |
|----------------------------------|--------------------------------------------|
| Permissible ambient temperature  | -20 °C ... +70 °C                          |
| Permissible medium temperature   | -20 °C ... +70 °C                          |
| Max. switching power             | 5 A/250 V AC/500 VA;<br>0.4 A/30 V DC/25 W |
| Degree of protection             | IP65                                       |
| 2 change-over contacts           | can be set separately                      |

##### Circuit diagrams

##### Connection diagram standard version "A"



- S Code for switch
- \* Placeholder for equipment identifier
- X Placeholder for ident number

G\_MD20\_EN\_00338

#### Coarse filter

##### Overview

##### Coarse filter W5911

The coarse filter is installed in the oil circuit downstream of the pump and filters coarse particles of contamination out of the flow of oil. In this way, the oil is kept clean and clogging of the spray nozzles or screens is prevented. The filter sieve of the coarse filter can be cleaned during standstills.



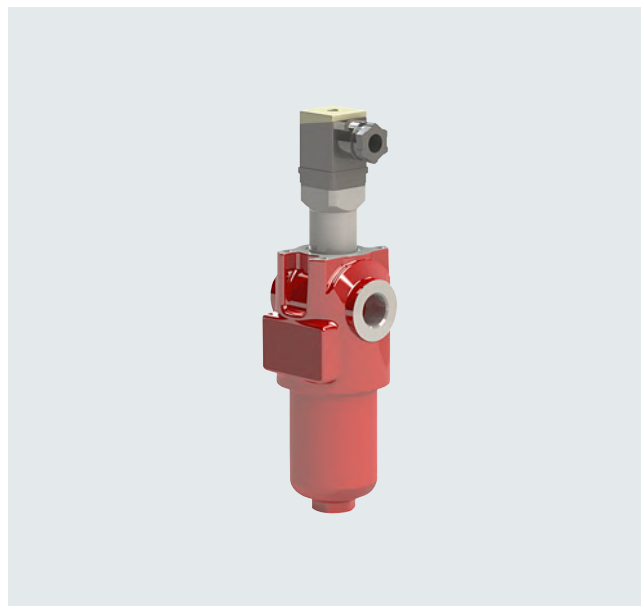
## Overview

**Line filter LF W 60 I C 50 D 1.x /-L24-A2**

Line filters consist of a filter head with a filter bowl screwed into it. The filters are suitable for both directions of flow. The line filters are equipped with an optical and electrical contamination indicator in the filter head.

Creator and copyright holder of the image:

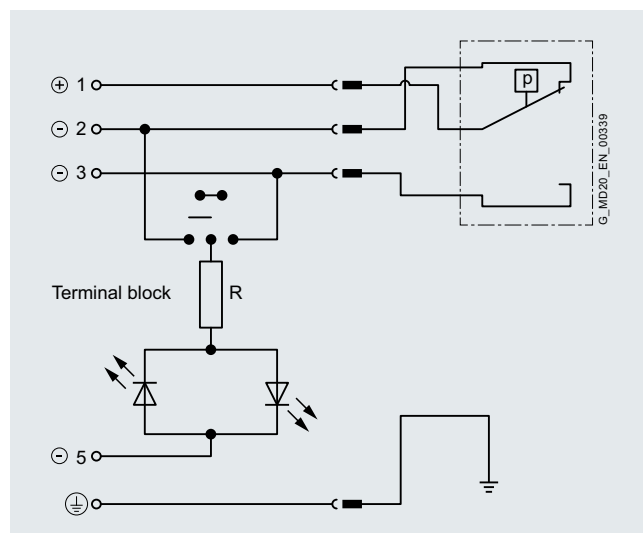
HYDAC Filtrertechnik GmbH  
Industriegebiet  
66280 Sulzbach/Saar



## Technical specifications

| Line filter                                 |                                                                             |
|---------------------------------------------|-----------------------------------------------------------------------------|
| Filter mesh                                 | 50 µm                                                                       |
| Lamp                                        | 24 V                                                                        |
| Contamination indicator                     | Response pressure 2 bar                                                     |
| Type of indicator                           | Optical indicator and electric switch                                       |
| Weight                                      | 0.150 kg                                                                    |
| Response pressure or indication range       | 2 bar -10%<br>5 bar -10%<br>8 bar ±10%                                      |
| Permitted positive operating pressure       | 210 bar                                                                     |
| Permitted temperature range                 | -30 °C ... +100 °C                                                          |
| Connection thread                           | G 1/2 "                                                                     |
| Max. tightening torque                      | 33 Nm                                                                       |
| Switching type                              | NC contacts or NO contacts,<br>switching contacts<br>(change-over contacts) |
| Max. switching voltage                      | 24 V, 48 V, 115 V, 230 V<br>depending on use of lamps                       |
| Electronic connection                       | M20 plug-in connection<br>cable socket acc. to<br>EN 175301-803             |
| Max. switching capacity with ohmic load     | 60 W DC<br>100 VA AC                                                        |
| Switching capacity <sup>1)</sup>            | Ohmic 3 A at 24 V DC<br>Ohmic 0.03 ... 5 A<br>at max. 230 V AC              |
| Degree of protection according to DIN 40050 | IP65 (only with attached and<br>correctly wired cable socket)               |
| Ordering example                            | VM 5 D.0/-L24                                                               |

## Circuit diagrams



<sup>1)</sup> Required amperage > 20 mA

## Options for operation

### Devices and filters

#### Double changeover filter

##### Overview

##### **Double changeover filter**

The double changeover filters are equipped with a filter sieve with a filter mesh of 60 µm. They are provided with a contamination indicator, which visually indicates the degree of contamination. In addition, a signal can be activated via an electrical contact, if the contamination exceeds the permitted degree.

The double changeover filters are designed for continuous filtration. They are suited for manually switching to the second filter chamber during operation, thus ensuring 100% availability of the system.



a) Boxer design for oil quantities up to 70 l/min  
b) Double changeover filter for larger quantities of oil

##### Technical specifications

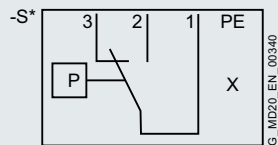
###### Double changeover filter

###### *Electrical limit data (max. contact load)*

|                      |                           |
|----------------------|---------------------------|
| Operational voltage  | ≤ 250 V DC and ≤ 250 V AC |
| Switching current    | ≤ 1 A                     |
| Switching capacity   | ≤ 30 W or ≤ 60 VA         |
| Degree of protection | IP65                      |

##### Circuit diagrams

###### Circuit diagram for electrically connecting the contamination indicator



- S Code for switch
- \* Placeholder for equipment identifier
- X Placeholder for ident number

## Overview

Production plants must run more and more reliably with minimum downtime.

Objectives:

- Improved productivity and availability of the plant
- Detection, diagnostics and localization of faults
- Optimization of the maintenance activities and their scheduling
- Purchasing of replacement parts based on need

Result:

- Repairs that can be planned and optimal stocking of replacement parts
- Reduced maintenance costs thanks to early detection of wear-related faults
- Prevention of collateral damage
- The maintenance is efficiently supported



Acceleration sensor

| Gear unit type/Mounting position                                                   | Size range | Malfunction message, machine protection/monitoring                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                    |            | Basic                                                                                                                                                                                                                                                                                                                                          | Advanced                                                                                                                                                                                                                                              | Professional                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H1_H                                                                               | 3 ... 19   | <ul style="list-style-type: none"> <li>• Pt100 in oil sump</li> <li>• 1 vibration transmitter</li> <li>• Wiring in the terminal box, 2 devices</li> </ul>                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• Pt100 in oil sump</li> <li>• 1 vibration transmitter</li> <li>• 2 x Pt100 at the low speed shaft and at the high speed shaft <sup>1)</sup></li> <li>• Wiring in the terminal box, 5 ... 6 devices</li> </ul> | <ul style="list-style-type: none"> <li>• Pt100 in oil sump</li> <li>• 3 vibration transmitters</li> <li>• 2 x Pt100 at each shaft <sup>1)</sup></li> <li>• Wiring of all devices in the terminal box (8 ... 14)</li> </ul> | <ul style="list-style-type: none"> <li>• Acquiring and recording measured values via existing system controller (PLC)</li> <li>• Shutdown of the machine in the event of impermissible operating conditions</li> <li>• Detection of faults only in late stage</li> <li>• Condition-based maintenance not possible</li> </ul>                                                                                                                                                            |
| H2_H                                                                               | 4 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H3_H                                                                               | 5 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H4_H                                                                               | 7 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B2_H                                                                               | 4 ... 18   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B3_H                                                                               | 4 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B4_H                                                                               | 5 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Malfunction message, machine protection/monitoring Smart Sensor DX500</b>       |            |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H1_H                                                                               | 3 ... 18   | <ul style="list-style-type: none"> <li>• Online condition monitoring sensor for early detection of errors, recommended up to size 18</li> </ul>                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H2_H                                                                               | 4 ... 18   | <ul style="list-style-type: none"> <li>• Attached to gear unit, including 5 m of cable for the power supply and 10 m for the Ethernet connection</li> </ul>                                                                                                                                                                                    |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H3_H                                                                               | 5 ... 18   | <ul style="list-style-type: none"> <li>• Fixed measuring point and "RED" warning signal when maximum vibration values specified for a specific drive are exceeded.</li> </ul>                                                                                                                                                                  |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H4_H                                                                               | 7 ... 18   | <b>Function</b>                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B2_H                                                                               | 4 ... 18   | <ul style="list-style-type: none"> <li>• Early detection of damage</li> </ul>                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B3_H                                                                               | 4 ... 18   | <ul style="list-style-type: none"> <li>• Measures vibration, analyzes measured data online on the gear unit.</li> </ul>                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B4_H                                                                               | 5 ... 18   | <ul style="list-style-type: none"> <li>• Automatic alarm when gear unit-specific limits are exceeded</li> <li>• Integrated analysis function: Sensor works autonomously</li> <li>• Easy, independent monitoring and diagnostic solution, primarily for gear units in the low to medium torque range in many industrial applications</li> </ul> |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Early detection of damage: Mobile measurement Condition monitoring – mobile</b> |            |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H1_H                                                                               | 3 ... 19   | <ul style="list-style-type: none"> <li>• Optical marking of measuring points</li> <li>• Gear unit kinematics (frequency)</li> </ul>                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>• Acceleration sensors on the bearings</li> <li>• Wiring in switch box</li> <li>• Gear unit kinematics (frequency)</li> </ul>                                                                                  | <b>Function</b>                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>• Preparation of the gear unit for recording and evaluating sensor data via a mobile condition monitoring measuring device (measuring device not included in scope of supply)</li> <li>• Regular, manually initiated measurements, performed by customer's maintenance personnel or service employees</li> </ul>                                                                                                                                 |
| H2_H                                                                               | 4 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H3_H                                                                               | 5 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H4_H                                                                               | 7 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B2_H                                                                               | 4 ... 18   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B3_H                                                                               | 4 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B4_H                                                                               | 5 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Early detection of damage: Online system Condition monitoring – Online</b>      |            |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H1_H                                                                               | 3 ... 19   | <ul style="list-style-type: none"> <li>• Acceleration sensors on the bearings</li> <li>• Wiring in terminal box</li> <li>• Gear unit kinematics (frequency)</li> </ul>                                                                                                                                                                         | <ul style="list-style-type: none"> <li>• Acceleration sensors on the bearings</li> <li>• Speed sensor <sup>2)</sup></li> <li>• Wiring in terminal box</li> <li>• Gear unit kinematics (frequency)</li> </ul>                                          | <b>Function</b>                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>• Preparation of the gear unit for recording and evaluating via a permanently installed measuring system with remote access (not included in scope of supply)</li> <li>• Continuous, automatic recording, evaluation and monitoring of measured data</li> <li>• For alerting via the system: Diagnostics by qualified personnel</li> <li>• Remote access via secure Internet connection, monitoring by service provider, e.g. Flender</li> </ul> |
| H2_H                                                                               | 4 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H3_H                                                                               | 5 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| H4_H                                                                               | 7 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B2_H                                                                               | 4 ... 18   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B3_H                                                                               | 4 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B4_H                                                                               | 5 ... 28   |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

<sup>1)</sup> For bevel helical gear units (B..) only 1x Pt100 on the high speed shaft (HSS).

<sup>2)</sup> Supplied loose; the attachment of an encoder to the coupling is possible via a second setscrew thread (must be ordered when ordering the coupling!) and the sensor.

## Options for operation

Devices and filters

### Condition monitoring and machine protection

#### Overview (continued)

#### **Sensor packages for gear unit monitoring and machine protection**

##### Measuring nipples for shock pulse measurement

These measuring nipples are special screws, which are mounted in a threaded hole with conical centering on the housing. A sensor can be placed on the measuring nipple to measure gear unit vibrations and to use this to assess the condition of the gear unit.

With the head shape, a reproducible positioning of the sensor is achieved for recurring measurements and the comparability of measurements is improved.



SPM nipple

### Heating

#### Overview

##### **Heating**

When the minimum oil temperature is undershot, the gear unit oil must be heated up. The ambient temperature is not relevant for this.

To reach the necessary oil temperatures, the gear unit must be heated at the customer's end using a suitable means. The following options are available to do this:

- Heating plates that are secured under the gear unit
- Use of heating covers
- Heat radiators to heat up the gear unit, especially add-on assemblies and pipes, from the outside
- Steam and hot water pipes with a constantly circulating heating medium that run alongside the gear unit
- Heating elements

Heating elements can be selected and ordered for this function for Flender FZG gear units as standard. Depending on the type, size and requirement, up to 4 heating elements can be installed in the gear unit.

The heating elements are switched (on/off) either via thermostats or temperature monitors ATH or Pt100 with control unit. The heating system must be shut down when the oil temperature reaches 20 °C.

The heating element can be replaced without any oil loss. It is necessary to observe the dismantling space for this ([see from page 10/21](#)).

In a standard scenario, the heating elements are installed on the face-end output in the housing (side 4):

##### Notes:

- Undershooting of the limit temperatures of the gear unit oil can often be prevented even without heating systems by running the gear unit load-free.
- For severely fluctuating ambient temperatures that make additional cooling necessary, a mechanical fan (mounted on the gear unit shaft) should be avoided. Electrically driven fans are especially well-suited for this scenario.



Cartridge type heating element with replaceable heating insert

#### Technical specifications

##### **Standard heating element**

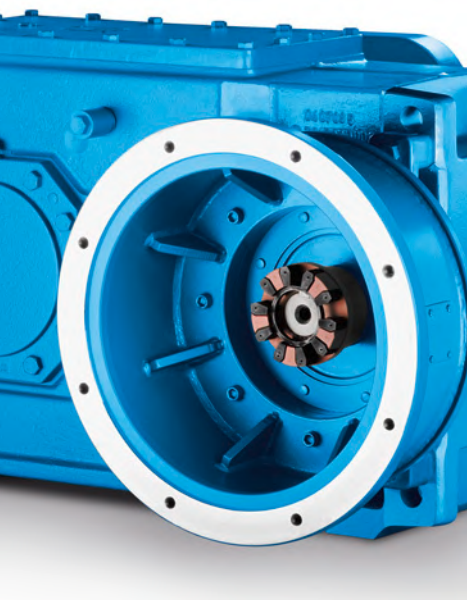
##### Heating

##### *Replaceable ceramic heating insert*

|                         |                       |
|-------------------------|-----------------------|
| Degree of protection    | IP65                  |
| Voltage                 | 230 V                 |
| Specific heating output | 0.7 W/cm <sup>2</sup> |



## Options for installation and add-on parts



|              |                                                                        |
|--------------|------------------------------------------------------------------------|
| <b>11/2</b>  | <b>Motor bell housing for IEC standard motor (EN 50347)</b>            |
| 11/2         | Motor frame sizes that can be mounted                                  |
| 11/3         | Fitting dimensions for IEC standard motors                             |
| <b>11/4</b>  | <b>Motor bell housing for IEC standard motor with N-BIPEX coupling</b> |
|              | <u>Helical gear units</u>                                              |
| 11/4         | Type H2, gear unit sizes 4 to 12                                       |
| 11/6         | Type H3, gear unit sizes 5 to 18                                       |
| 11/10        | Type H4, gear unit sizes 7 to 18                                       |
|              | <u>Bevel helical gear units</u>                                        |
| 11/12        | Type B2, gear unit sizes 4 to 12                                       |
| 11/14        | Type B3, gear unit sizes 4 to 18                                       |
| 11/16        | Type B4, gear unit sizes 5 to 18                                       |
| <b>11/18</b> | <b>Motor bell housing for IEC standard motor with N-EUPEX coupling</b> |
|              | <u>Helical gear units</u>                                              |
| 11/18        | Type H2, gear unit sizes 4 to 14                                       |
| 11/20        | Type H3, gear unit sizes 5 to 18                                       |
| 11/24        | Type H4, gear unit sizes 7 to 18                                       |
|              | <u>Bevel helical gear units</u>                                        |
| 11/26        | Type B2, gear unit sizes 4 to 12                                       |
| 11/28        | Type B3, gear unit sizes 4 to 18                                       |
| 11/30        | Type B4, gear unit sizes 5 to 18                                       |
| <b>11/32</b> | <b>Vibration-damping torque reaction arm for gear unit housing</b>     |
| 11/32        | Types H2, H3, H4, B2, B3, B4                                           |
| <b>11/34</b> | <b>Gear unit swing base for bevel helical gear unit</b>                |
|              | <u>Types B3 and B4</u>                                                 |
| 11/36        | Article No. overview                                                   |
| 11/38        | Torque reaction arm                                                    |
| 11/39        | Motor support                                                          |
| 11/40        | Transport, ATEX                                                        |
| 11/41        | Additional options and notes                                           |
| <b>11/42</b> | <b>Mounting flange - long spacer</b>                                   |
| <b>11/44</b> | <b>Mounting flange - short spacer</b>                                  |
| <b>11/46</b> | <b>Piggy back</b>                                                      |

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor (EN 50347)

#### Motor frame sizes that can be mounted

##### Overview

Motor bell housings allow a flange motor to be attached to the gear unit by means of a coupling without a much setup effort.

Overview of the respective largest attachable motor sizes:

| Gear unit size                      | Type of gear unit |      |       |            |      |      |
|-------------------------------------|-------------------|------|-------|------------|------|------|
|                                     | H2                | H3   | H4    | B2         | B3   | B4   |
| <b>Horizontal mounting position</b> |                   |      |       |            |      |      |
| <b>4</b>                            | 200               | –    | –     | 200        | 200  | –    |
| <b>5/6</b>                          | 225               | 225  | –     | 225        | 225  | 160  |
| <b>7/8</b>                          | 280               | 280  | 180   | 280        | 280  | 200  |
| <b>9/10</b>                         | 280               | 280  | 225   | 280        | 280  | 225  |
| <b>11/12</b>                        | 315M              | 315M | 250   | 315M       | 315M | 280  |
| <b>13/14</b>                        | On request        | 355  | 315M  | 355        | 355  | 315M |
| <b>15/16</b>                        |                   | 355  | 315   | On request | 355  | 355M |
| <b>17/18</b>                        |                   | 355  | 355 M |            | 355  | 355  |
| <b>Vertical mounting position</b>   |                   |      |       |            |      |      |
| <b>4</b>                            | 225               | –    | –     | 200        | 200  | –    |
| <b>5/6</b>                          | 250               | 250  | –     | 225        | 225  | 160  |
| <b>7/8</b>                          | 315M              | 315M | 180   | 280        | 280  | 200  |
| <b>9/10</b>                         | 315M              | 315M | 225   | 280        | 280  | 225  |
| <b>11/12</b>                        | 315M              | 315M | 250   | 315M       | 315M | 280  |
| <b>13/14</b>                        | 355               | 355  | 315M  | 355        | 355  | 315M |
| <b>15/16</b>                        | On request        | 355  | 315   | On request | 355  | 355M |
| <b>17/18</b>                        |                   | 355  | 355 M |            | 355  | 355  |

##### Basis

- Recommended factor for driven machine for the gear unit
- Continuous duty
- 50 Hz, 4-pole motor; motor utilization 100%
- No downrating of the motor, e.g. due to high ambient temperatures

##### Note

Flender gear units with motor bell housings are the standard for use with flexible couplings from Flender.

The coupling types N-EUPEX B and N-BIPEX are used.

The combinations listed in the tables are the existing solutions with an especially short delivery time.

The gear unit with motor bell housing is suitable both for installing on the gear unit feet and as a shaft-mounted gear unit for connecting with a torque reaction arm.

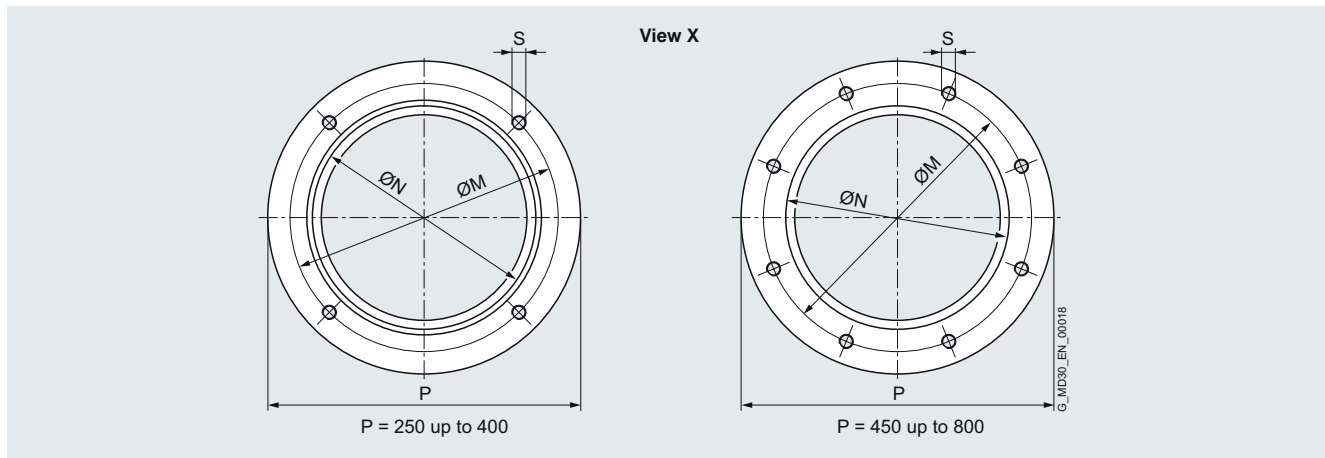
Other sizes or assignments are possible. Please contact Flender.

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor (EN 50347)

#### Fitting dimensions for IEC standard motors

#### Dimensional drawings



#### Flange dimensions

For three-phase motors with squirrel-cage rotor according to EN 50347

|                              |    | Motor frame sizes |      |              |              |              |      |              |      |              |              |                    |     |
|------------------------------|----|-------------------|------|--------------|--------------|--------------|------|--------------|------|--------------|--------------|--------------------|-----|
|                              |    | 100L              | 112M | 132S<br>132M | 160M<br>160L | 180M<br>180L | 200L | 225S<br>225M | 250M | 280S<br>280M | 315S<br>315M | 315L <sup>1)</sup> |     |
| Max. power $P_N$<br>at 50 Hz | kW | 3                 | 4    | 7.5          | 15           | 22           | 30   | 45           | 55   | 90           | 132          | 200                | 315 |
| ØP                           | mm | 250               | 250  | 300          | 350          | 350          | 400  | 450          | 550  | 550          | 660          | 660                | 800 |
| ØN (H7)                      | mm | 180               | 180  | 230          | 250          | 250          | 300  | 350          | 450  | 450          | 550          | 550                | 680 |
| ØM                           | mm | 215               | 215  | 265          | 300          | 300          | 350  | 400          | 500  | 500          | 600          | 600                | 740 |
| S                            |    | 4 x M12           |      |              | 4 x M16      |              |      | 8 x M16      |      |              | 8 x M20      |                    |     |

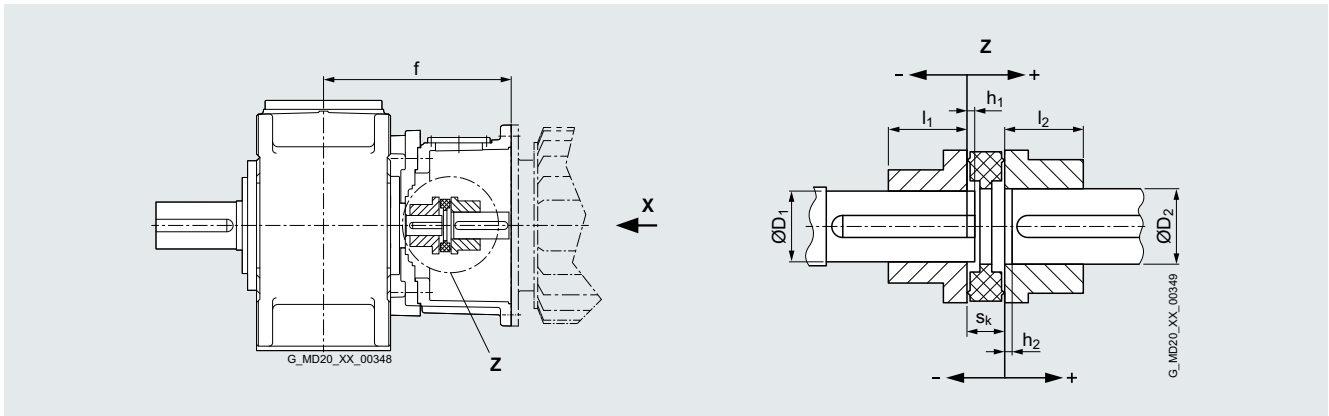
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-BIPEX coupling

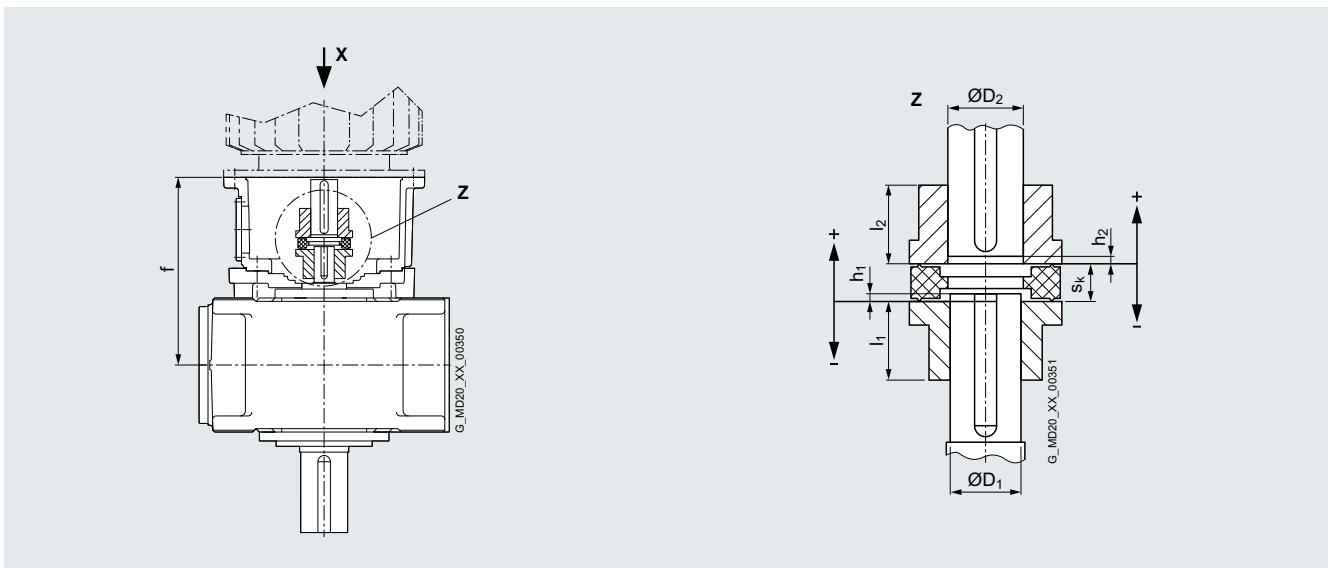
Helical gear unit, type H2, gear unit sizes 4 to 12

### Design

#### Horizontal mounting position



#### Vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure.  
For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), see page 11/3.
- Helical gear unit in design C, D, G, H, I on request only.
- Not in connection with Taconite E or labyrinth seal at the drive shaft.

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-BIPEX coupling

#### Helical gear unit, type H2, gear unit sizes 4 to 12

#### Design (continued)

| Size         | Dimensions in mm        |                                                                              |                  |       |       |       |       |       |       |     |               |                                                                                |                  |       |       |       |       |       |       |       |
|--------------|-------------------------|------------------------------------------------------------------------------|------------------|-------|-------|-------|-------|-------|-------|-----|---------------|--------------------------------------------------------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|
|              | IEC motor <sup>1)</sup> | Ratios $i_N$<br>6 - 11 (sizes 4, 5, 7, 9, 11)<br>8 - 14 (sizes 6, 8, 10, 12) |                  |       |       |       |       |       |       |     |               | Ratios $i_N$<br>12 - 22 (sizes 4, 5, 7, 9, 11)<br>16 - 28 (sizes 6, 8, 10, 12) |                  |       |       |       |       |       |       |       |
|              |                         | N-BIPEX<br>BWN                                                               | $s_k$            | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$ |               | N-BIPEX<br>BWN                                                                 | $s_k$            | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$   |
| <b>4</b>     | 160 <sup>4)</sup>       | -                                                                            | -                | -     | -     | -     | -     | -     | -     | -   | <sup>8)</sup> | 38                                                                             | 24               | 45    | 32    | 45    | 42    | 14    | 0     | 370   |
|              | 180 <sup>4)</sup>       | -                                                                            | -                | -     | -     | -     | -     | -     | -     | -   | <sup>8)</sup> | 38                                                                             | 24               | 45    | 32    | 45    | 42    | 14    | 0     | 370   |
|              | 200 <sup>4)</sup>       | -                                                                            | -                | -     | -     | -     | -     | -     | -     | -   | <sup>8)</sup> | 42                                                                             | 26               | 50    | 32    | 50    | 55    | 10    | 0     | 376   |
|              | 225 <sup>4)</sup>       | <sup>3) 8)</sup>                                                             | 48               | 28    | 56    | 45    | 56    | 60    | 21    | 0   | 417           | <sup>3) 8)</sup>                                                               | 48               | 28    | 56    | 32    | 56    | 60    | 1     | 0     |
| <b>5/6</b>   | 200                     | -                                                                            | -                | -     | -     | -     | -     | -     | -     | -   | <sup>8)</sup> | 42                                                                             | 26               | 50    | 38    | 50    | 55    | 9     | 0     | 402   |
|              | 225 <sup>5)</sup>       | -                                                                            | -                | -     | -     | -     | -     | -     | -     | -   |               | 48                                                                             | 28               | 56    | 38    | 56    | 60    | 0     | 0     | 443   |
|              | 250 <sup>4)</sup>       | <sup>3) 8)</sup>                                                             | 55               | 30    | 65    | 50    | 65    | 65    | 20.5  | 0   | 444.5         | <sup>3)</sup>                                                                  | 55               | 30    | 65    | 38    | 65    | 65    | 0.5   | 0     |
| <b>7/8</b>   | 225                     | -                                                                            | -                | -     | -     | -     | -     | -     | -     | -   | <sup>8)</sup> | 48                                                                             | 28               | 56    | 50    | 56    | 60    | 14.5  | 0     | 473.5 |
|              | 250 <sup>6)</sup>       | -                                                                            | -                | -     | -     | -     | -     | -     | -     | -   | <sup>8)</sup> | 55                                                                             | 30               | 65    | 50    | 65    | 65    | 15    | 0     | 475   |
|              | 280 <sup>6)</sup>       | -                                                                            | -                | -     | -     | -     | -     | -     | -     | -   |               | 55 <sup>9)</sup>                                                               | 30               | 65    | 50    | 65    | 75    | -2    | 2     | 494   |
|              | 315 <sup>2) 4)</sup>    | <sup>3) 8)</sup>                                                             | 65 <sup>9)</sup> | 35    | 75    | 60    | 75    | 85    | 19    | 0   | 531           | <sup>3)</sup>                                                                  | 65 <sup>9)</sup> | 35    | 75    | 50    | 75    | 80    | -3    | 3     |
| <b>9/10</b>  | 280                     | -                                                                            | -                | -     | -     | -     | -     | -     | -     | -   | <sup>8)</sup> | 55 <sup>9)</sup>                                                               | 30               | 65    | 60    | 65    | 75    | 20    | 0     | 530   |
|              | 315 <sup>2) 7)</sup>    | <sup>3) 8)</sup>                                                             | 65 <sup>9)</sup> | 35    | 75    | 75    | 75    | 80    | 19    | 0   | 566           | <sup>3) 8)</sup>                                                               | 65 <sup>9)</sup> | 35    | 75    | 60    | 75    | 80    | 19    | 0     |
| <b>11/12</b> | 315 <sup>2)</sup>       | -                                                                            | -                | -     | -     | -     | -     | -     | -     | -   | <sup>8)</sup> | 65 <sup>9)</sup>                                                               | 35               | 75    | 70    | 75    | 80    | 14    | 0     | 606   |

1) Other gear unit and motor sizes on request.

2) Only frame sizes 315 S and 315 M.

3) Only for vertical gear units.

4) For type H2D. Version A + B, mounting not possible.

5) For type H2D. Size 5, version A + B mounting not possible.

6) For type H2D. Size 7, version A + B mounting not possible.

7) For type H2D. Size 9, version A + B mounting not possible.

8) Parallel key shortened on gear unit side.

9) Cam ring 95 ShoreA.

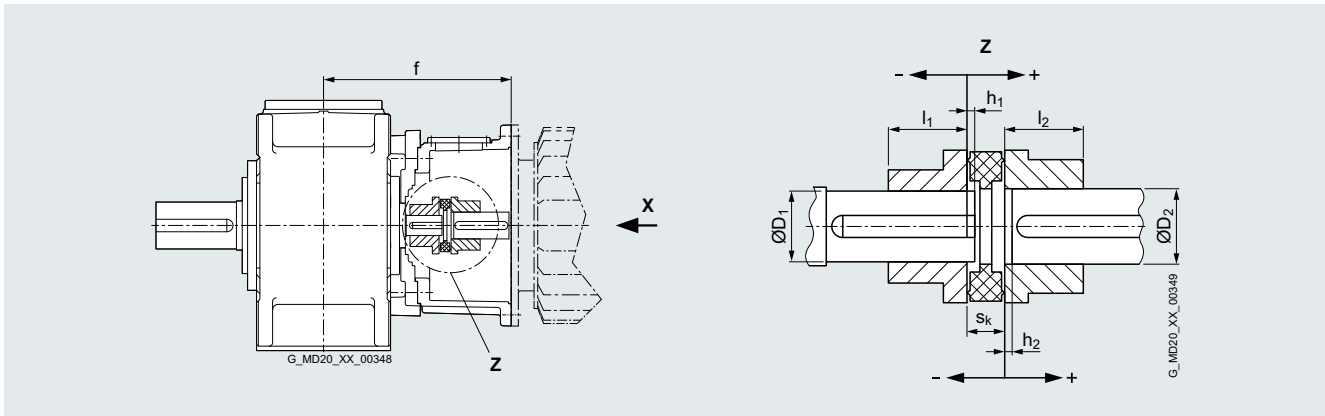
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-BIPEX coupling

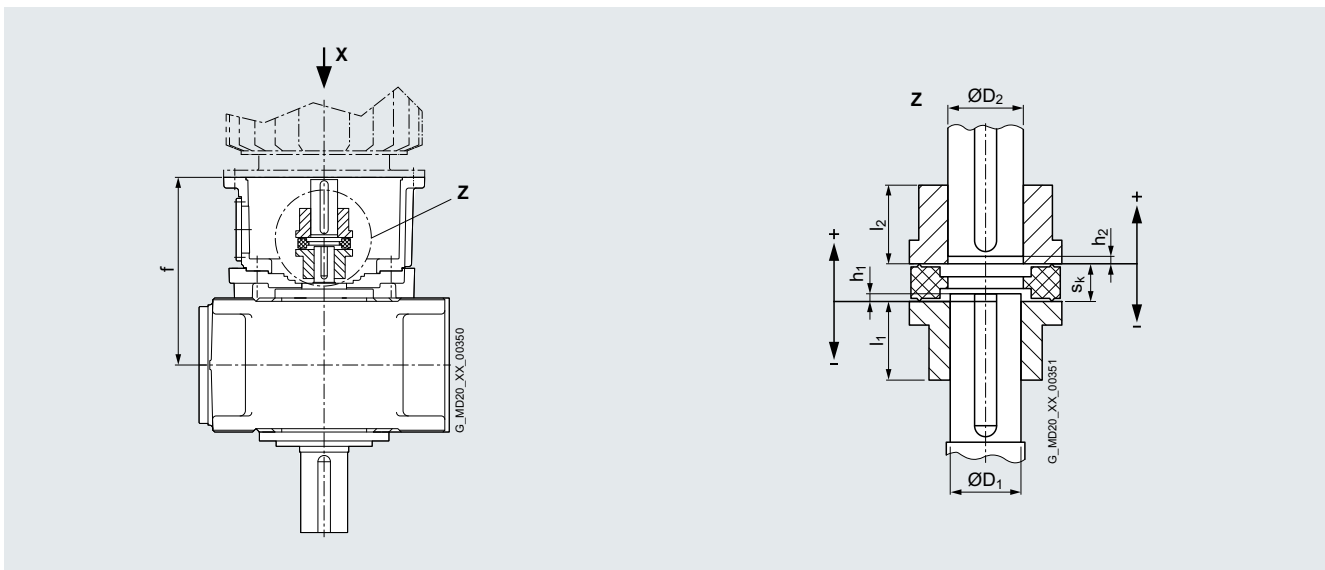
Helical gear unit, type H3, gear unit sizes 5 to 18

### Design

#### Horizontal mounting position



#### Vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure. For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), see [page 11/3](#).
- Helical gear unit in design G, H, I on request only.
- Not in connection with Taconite E or labyrinth seal at the drive shaft.

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-BIPEX coupling

#### Helical gear unit, type H3, gear unit sizes 5 to 18

#### Design (continued)

| Size                    | Dimensions in mm           |                                |       |       |       |       |       |       |     |       |                                |              |       |       |       |       |       |       |       |
|-------------------------|----------------------------|--------------------------------|-------|-------|-------|-------|-------|-------|-----|-------|--------------------------------|--------------|-------|-------|-------|-------|-------|-------|-------|
|                         | Ratios $i_N$               |                                |       |       |       |       |       |       |     |       |                                | Ratios $i_N$ |       |       |       |       |       |       |       |
| IEC motor <sup>1)</sup> | N-BIPEX BWN                | $s_k$                          | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$ |       | N-BIPEX BWN                    | $s_k$        | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$   |
| <b>5/6</b>              | 132                        | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -                              | -            | -     | -     | -     | -     | -     | -     | -     |
|                         | 160                        | 38                             | 24    | 45    | 40    | 45    | 42    | 0     | 0   | 364   | <sup>6)</sup> 38               | 24           | 45    | 30    | 45    | 42    | 5     | -1    | 338   |
|                         | 180                        | 38                             | 24    | 45    | 40    | 45    | 48    | 0     | 0   | 364   | <sup>6)</sup> 38               | 24           | 45    | 30    | 45    | 48    | 5     | -1    | 338   |
|                         | 200                        | <sup>6)</sup> 42               | 26    | 50    | 40    | 50    | 55    | 16    | 0   | 350   |                                | 24           | 50    | 30    | 50    | 55    | -3    | 3     | 350   |
|                         | 225                        | <sup>6)</sup> 48               | 28    | 56    | 40    | 56    | 60    | 7     | 0   | 391   | -                              | -            | -     | -     | -     | -     | -     | -     | -     |
|                         | 250                        | <sup>3) 4) 6)</sup> 55         | 30    | 61    | 40    | 65    | 65    | 9     | 0   | 391   | -                              | -            | -     | -     | -     | -     | -     | -     | -     |
| <b>7/8</b>              | 160                        | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -                              | -            | -     | -     | -     | -     | -     | -     | -     |
|                         | 180                        | -                              | -     | -     | -     | -     | -     | -     | -   | -     | <sup>6)</sup> 38               | 24           | 45    | 35    | 45    | 48    | 12    | 0     | 367   |
|                         | 200                        | 42                             | 26    | 50    | 45    | 50    | 55    | -2    | 2   | 405   | <sup>6)</sup> 42               | 26           | 50    | 35    | 50    | 55    | 2     | 0     | 379   |
|                         | 225                        | <sup>6)</sup> 48               | 28    | 56    | 45    | 56    | 60    | 13    | 0   | 420   | 48                             | 28           | 56    | 35    | 56    | 60    | -7    | 0     | 420   |
|                         | 250                        | <sup>6)</sup> 55               | 30    | 65    | 45    | 65    | 65    | 15    | 0   | 420   | 55                             | 30           | 65    | 35    | 65    | 65    | -5    | 0     | 420   |
|                         | 280                        | 55 <sup>7)</sup>               | 30    | 65    | 45    | 65    | 75    | -5.5  | 0   | 440.5 | -                              | -            | -     | -     | -     | -     | -     | -     | -     |
|                         | 315 <sup>2)</sup>          | 4) 65 <sup>7)</sup>            | 35    | 75    | 45    | 75    | 80    | -7.5  | 0   | 477.5 | -                              | -            | -     | -     | -     | -     | -     | -     | -     |
| <b>9/10</b>             | 180                        | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -                              | -            | -     | -     | -     | -     | -     | -     | -     |
|                         | 200                        | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -                              | -            | -     | -     | -     | -     | -     | -     | -     |
|                         | 225                        | <sup>6)</sup> 48               | 28    | 56    | 60    | 56    | 60    | 3.5   | 0   | 519.5 | <sup>6)</sup> 48               | 28           | 56    | 45    | 56    | 60    | 13.5  | 0     | 484.5 |
|                         | 250                        | <sup>6)</sup> 55               | 30    | 65    | 60    | 65    | 65    | 5.5   | 0   | 519.5 | <sup>6)</sup> 55               | 30           | 65    | 45    | 65    | 65    | 15.5  | 0     | 484.5 |
|                         | 280                        | <sup>6)</sup> 55 <sup>7)</sup> | 30    | 65    | 60    | 65    | 75    | 20    | 0   | 505   | 55 <sup>7)</sup>               | 30           | 65    | 45    | 65    | 75    | -2.5  | 2.5   | 505   |
|                         | 315 <sup>2)</sup>          | 4) 65 <sup>7)</sup>            | 35    | 75    | 60    | 75    | 80    | 15    | 0   | 545   | 4) 65 <sup>7)</sup>            | 35           | 75    | 45    | 75    | 80    | -3.5  | 3.5   | 542   |
| <b>11/12</b>            | 225                        | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -                              | -            | -     | -     | -     | -     | -     | -     | -     |
|                         | 250                        | -                              | -     | -     | -     | -     | -     | -     | -   | -     | <sup>6)</sup> 55               | 30           | 65    | 50    | 65    | 65    | 15.5  | 0     | 489.5 |
|                         | 280                        | <sup>6)</sup> 55 <sup>7)</sup> | 30    | 65    | 70    | 65    | 75    | 5     | 0   | 540   | 55 <sup>7)</sup>               | 30           | 65    | 50    | 65    | 75    | -2.5  | 2.5   | 510   |
|                         | 315 <sup>2)</sup>          | <sup>6)</sup> 65 <sup>7)</sup> | 35    | 75    | 70    | 75    | 80    | 3     | 0   | 577   | 65 <sup>7)</sup>               | 35           | 75    | 50    | 75    | 80    | -3.5  | 3.5   | 547   |
| <b>13/14</b>            | 250                        | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -                              | -            | -     | -     | -     | -     | -     | -     | -     |
|                         | 280                        | -                              | -     | -     | -     | -     | -     | -     | -   | -     | <sup>6)</sup> 55 <sup>7)</sup> | 30           | 65    | 60    | 65    | 75    | 16    | 0     | 599   |
|                         | 315 <sup>2)</sup>          | <sup>6)</sup> 75               | 40    | 85    | 85    | 85    | 80    | 14    | 0   | 666   | <sup>6)</sup> 65 <sup>7)</sup> | 35           | 75    | 60    | 75    | 80    | 14    | 0     | 636   |
|                         | 315 (200 kW) <sup>5)</sup> | <sup>6)</sup> 75 <sup>7)</sup> | 40    | 85    | 85    | 85    | 80    | 14    | 0   | 666   | <sup>6)</sup> 75 <sup>7)</sup> | 40           | 85    | 60    | 85    | 80    | 14    | 0     | 636   |
|                         | 315 (250 kW) <sup>5)</sup> | <sup>6)</sup> 75 <sup>7)</sup> | 40    | 85    | 85    | 85    | 80    | 14    | 0   | 666   | <sup>6)</sup> 75 <sup>7)</sup> | 40           | 85    | 60    | 85    | 80    | 14    | 0     | 636   |
|                         | 315 (315 kW) <sup>5)</sup> | <sup>6)</sup> 75 <sup>8)</sup> | 40    | 85    | 85    | 85    | 80    | 14    | 0   | 666   | <sup>6)</sup> 75 <sup>8)</sup> | 40           | 85    | 60    | 85    | 80    | 14    | 0     | 636   |
|                         | 355 (355 kW) <sup>5)</sup> | <sup>6)</sup> 75 <sup>8)</sup> | 40    | 85    | 85    | 85    | 90    | 12    | 0   | 668   | 75 <sup>8)</sup>               | 40           | 85    | 60    | 85    | 90    | -6.5  | 6.5   | 668   |
|                         | 355 (400 kW) <sup>5)</sup> | <sup>6)</sup> 90 <sup>7)</sup> | 45    | 100   | 85    | 100   | 90    | 17    | 0   | 668   | -                              | -            | -     | -     | -     | -     | -     | -     | -     |

<sup>1)</sup> Other motor sizes on request.

<sup>2)</sup> Only frame sizes 315 S and 315 M.

<sup>3)</sup> Length  $l_1$  of the coupling hub shortened for placement on the gear unit shaft.

<sup>4)</sup> Only for vertical gear units.

<sup>5)</sup> Non-standard motor (sizes not included in EN 50347).

<sup>6)</sup> Parallel key shortened on gear unit side.

<sup>7)</sup> Cam ring 95 ShoreA.

<sup>8)</sup> Cam ring 64 ShoreD.

## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-BIPEX coupling

### Helical gear unit, type H3, gear unit sizes 5 to 18

#### Design (continued)

| Size                                     | Dimensions in mm                                                                                                                                             |       |       |       |       |       |       |       |     |                                |                                                                                                                                                          |       |       |       |       |       |       |     |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-----|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-----|
|                                          | Ratios $i_N$<br>25 - 45 (sizes 5, 7, 9, 11)<br>31.5 - 56 (sizes 6, 8, 10, 12)<br>22.4 - 45 (sizes 13, 15, 17)<br>28 - 56 (size 14)<br>25 - 50 (sizes 16, 18) |       |       |       |       |       |       |       |     |                                | Ratios $i_H$<br>50 - 63 (sizes 5, 7, 9, 11)<br>63 - 80 (sizes 6, 8, 10, 12)<br>50 - 63 (sizes 13, 15, 17)<br>63 - 80 (size 14)<br>56 - 71 (sizes 16, 18) |       |       |       |       |       |       |     |
| IEC motor <sup>1)</sup>                  | N-BIPEX BWN                                                                                                                                                  | $s_k$ | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$ | N-BIPEX BWN                    | $s_k$                                                                                                                                                    | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$ |
| <b>15/16</b> 280                         | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     | -   | -                              | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -   |
| 315 <sup>2)</sup>                        | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     | -   | <sup>4)</sup> 65 <sup>5)</sup> | 35                                                                                                                                                       | 75    | 75    | 75    | 80    | 11    | 0     | 684 |
| 315 (200 kW) <sup>3)</sup>               | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     | -   | <sup>4)</sup> 75 <sup>5)</sup> | 40                                                                                                                                                       | 85    | 75    | 85    | 80    | 16    | 0     | 684 |
| 315 (250 kW) <sup>3)</sup>               | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     | -   | <sup>4)</sup> 75 <sup>5)</sup> | 40                                                                                                                                                       | 85    | 75    | 85    | 80    | 16    | 0     | 684 |
| 315 (315 kW) <sup>3)</sup> <sup>4)</sup> | 90                                                                                                                                                           | 45    | 100   | 100   | 100   | 80    | 1     | 0     | 764 | <sup>4)</sup> 75 <sup>6)</sup> | 40                                                                                                                                                       | 85    | 75    | 85    | 80    | 16    | 0     | 684 |
| 355 (355 kW) <sup>3)</sup>               | 90                                                                                                                                                           | 45    | 100   | 100   | 100   | 90    | -1.5  | 1.5   | 768 | 75 <sup>6)</sup>               | 40                                                                                                                                                       | 85    | 75    | 85    | 90    | -8    | 8     | 716 |
| 355 (400 kW) <sup>3)</sup>               | 90 <sup>5)</sup>                                                                                                                                             | 45    | 100   | 100   | 100   | 90    | -1.5  | 1.5   | 768 | 75 <sup>6)</sup>               | 40                                                                                                                                                       | 85    | 75    | 85    | 90    | -8    | 8     | 716 |
| <b>17/18</b> 315 <sup>2)</sup>           | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     | -   | -                              | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -   |
| 315 (200 kW) <sup>3)</sup>               | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     | -   | -                              | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -   |
| 315 (250 kW) <sup>3)</sup>               | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     | -   | -                              | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -   |
| 315 (315 kW) <sup>3)</sup>               | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     | -   | <sup>4)</sup> 75 <sup>6)</sup> | 40                                                                                                                                                       | 85    | 75    | 85    | 80    | 16    | 0     | 714 |
| 355 (355 kW) <sup>3)</sup>               | 90                                                                                                                                                           | 45    | 100   | 100   | 100   | 90    | -1.5  | 1.5   | 798 | 75 <sup>6)</sup>               | 40                                                                                                                                                       | 85    | 75    | 85    | 90    | -8    | 8     | 746 |
| 355 (400 kW) <sup>3)</sup>               | 90 <sup>5)</sup>                                                                                                                                             | 45    | 100   | 100   | 100   | 90    | -1.5  | 1.5   | 798 | 75 <sup>6)</sup>               | 40                                                                                                                                                       | 85    | 75    | 85    | 90    | -8    | 8     | 746 |

1) Other motor sizes on request.

2) Only frame sizes 315 S and 315 M.

3) Non-standard motor (sizes not included in EN 50347).

4) Parallel key shortened on gear unit side.

5) Cam ring 95 ShoreA.

6) Cam ring 64 ShoreD.



## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-BIPEX coupling

#### Helical gear unit, type H3, gear unit sizes 5 to 18

#### Design (continued)

| Size                       | Dimensions in mm           |                   |                  |                  |                |                |                |                |                |                |       |
|----------------------------|----------------------------|-------------------|------------------|------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|
|                            | IEC motor <sup>1)</sup>    |                   | N-BIPEX BWN      | s <sub>k</sub>   | l <sub>1</sub> | D <sub>1</sub> | l <sub>2</sub> | D <sub>2</sub> | h <sub>1</sub> | h <sub>2</sub> | f     |
| <b>5/6</b>                 | 132                        |                   | 28               | 20               | 35             | 24             | 35             | 38             | -1             | 1              | 302   |
|                            | 160                        |                   | 38               | 24               | 45             | 24             | 45             | 42             | -2             | 2              | 338   |
|                            | 180                        |                   | 38               | 24               | 45             | 24             | 45             | 48             | -2             | 2              | 338   |
|                            | 200                        |                   | –                | –                | –              | –              | –              | –              | –              | –              | –     |
|                            | 225                        |                   | –                | –                | –              | –              | –              | –              | –              | –              | –     |
|                            | 250                        |                   | –                | –                | –              | –              | –              | –              | –              | –              | –     |
| <b>7/8</b>                 | 160                        | <sup>4)</sup>     | 38               | 24               | 45             | 28             | 45             | 42             | 2              | 0              | 367   |
|                            | 180                        | <sup>4)</sup>     | 38               | 24               | 45             | 28             | 45             | 48             | 2              | 0              | 367   |
|                            | 200                        |                   | 42               | 26               | 50             | 28             | 50             | 55             | -6             | 2              | 379   |
|                            | 225                        |                   | 48               | 28               | 56             | 28             | 56             | 60             | -17            | 0              | 420   |
|                            | 250                        |                   | –                | –                | –              | –              | –              | –              | –              | –              | –     |
|                            | 280                        |                   | –                | –                | –              | –              | –              | –              | –              | –              | –     |
|                            | 315 <sup>2)</sup>          |                   | –                | –                | –              | –              | –              | –              | –              | –              | –     |
| <b>9/10</b>                | 180                        | <sup>4)</sup>     | 38               | 24               | 45             | 32             | 45             | 48             | 12.5           | 0              | 431.5 |
|                            | 200                        | <sup>4)</sup>     | 42               | 26               | 50             | 32             | 50             | 55             | 2.5            | 0              | 443.5 |
|                            | 225                        |                   | 48               | 28               | 56             | 32             | 56             | 60             | -3.5           | 3              | 484.5 |
|                            | 250                        |                   | 55               | 30               | 65             | 32             | 65             | 65             | -2.5           | 2              | 484.5 |
|                            | 280                        |                   | –                | –                | –              | –              | –              | –              | –              | –              | –     |
|                            | 315 <sup>2)</sup>          |                   | –                | –                | –              | –              | –              | –              | –              | –              | –     |
| <b>11/12</b>               | 225                        | <sup>4)</sup>     | 48               | 28               | 56             | 42             | 56             | 60             | 3.5            | 0              | 489.5 |
|                            | 250                        | <sup>4)</sup>     | 55               | 30               | 65             | 42             | 65             | 65             | 5.5            | 0              | 489.5 |
|                            | 280                        |                   | 55 <sup>5)</sup> | 30               | 65             | 42             | 65             | 75             | -7.5           | 7.5            | 510   |
|                            | 315 <sup>2)</sup>          |                   | 65 <sup>5)</sup> | 35               | 75             | 42             | 75             | 80             | -8.5           | 8.5            | 547   |
| <b>13/14</b>               | 250                        | <sup>4)</sup>     | 55               | 30               | 65             | 50             | 65             | 65             | 11.5           | 0              | 578.5 |
|                            | 280                        |                   | 55 <sup>5)</sup> | 30               | 65             | 50             | 65             | 75             | -4.5           | 4.5            | 599   |
|                            | 315 <sup>2)</sup>          |                   | 65 <sup>5)</sup> | 35               | 75             | 50             | 75             | 80             | -5.5           | 5.5            | 636   |
|                            | 315 (200 kW) <sup>3)</sup> |                   | 75 <sup>5)</sup> | 40               | 85             | 50             | 85             | 80             | -3             | 3              | 636   |
|                            | 315 (250 kW) <sup>3)</sup> |                   | 75 <sup>5)</sup> | 40               | 85             | 50             | 85             | 80             | -3             | 3              | 636   |
|                            | 315 (315 kW) <sup>3)</sup> |                   | 75 <sup>6)</sup> | 40               | 85             | 50             | 85             | 80             | -3             | 3              | 636   |
|                            | 355 (355 kW) <sup>3)</sup> |                   | –                | –                | –              | –              | –              | –              | –              | –              | –     |
|                            | 355 (400 kW) <sup>3)</sup> |                   | –                | –                | –              | –              | –              | –              | –              | –              | –     |
| <b>15/16</b>               | 280                        | <sup>4)</sup>     | 55 <sup>5)</sup> | 30               | 65             | 60             | 65             | 75             | 13             | 0              | 647   |
|                            | 315 <sup>2)</sup>          | <sup>4)</sup>     | 65 <sup>5)</sup> | 35               | 75             | 60             | 75             | 80             | 11             | 0              | 684   |
|                            | 315 (200 kW) <sup>3)</sup> | <sup>4)</sup>     | 75 <sup>5)</sup> | 40               | 85             | 60             | 85             | 80             | 16             | 0              | 684   |
|                            | 315 (250 kW) <sup>3)</sup> | <sup>4)</sup>     | 75 <sup>5)</sup> | 40               | 85             | 60             | 85             | 80             | 16             | 0              | 684   |
|                            | 315 (315 kW) <sup>3)</sup> | <sup>4)</sup>     | 75 <sup>6)</sup> | 40               | 85             | 60             | 85             | 80             | 16             | 0              | 684   |
|                            | 355 (355 kW) <sup>3)</sup> |                   | 75 <sup>6)</sup> | 40               | 85             | 60             | 85             | 90             | -8             | 8              | 716   |
|                            | 355 (400 kW) <sup>3)</sup> |                   | 75 <sup>6)</sup> | 40               | 85             | 60             | 85             | 90             | -8             | 8              | 716   |
|                            | <b>17/18</b>               | 315 <sup>2)</sup> | <sup>4)</sup>    | 65 <sup>5)</sup> | 35             | 75             | 60             | 75             | 80             | 11             | 0     |
| 315 (200 kW) <sup>3)</sup> |                            | <sup>4)</sup>     | 75 <sup>5)</sup> | 40               | 85             | 60             | 85             | 80             | 16             | 0              | 714   |
| 315 (250 kW) <sup>3)</sup> |                            | <sup>4)</sup>     | 75 <sup>5)</sup> | 40               | 85             | 60             | 85             | 80             | 16             | 0              | 714   |
| 315 (315 kW) <sup>3)</sup> |                            | <sup>4)</sup>     | 75 <sup>6)</sup> | 40               | 85             | 60             | 85             | 80             | 16             | 0              | 714   |
| 355 (355 kW) <sup>3)</sup> |                            |                   | 75 <sup>6)</sup> | 40               | 85             | 60             | 85             | 90             | -8             | 8              | 746   |
| 355 (400 kW) <sup>3)</sup> |                            |                   | 75 <sup>6)</sup> | 40               | 85             | 60             | 85             | 90             | -8             | 8              | 746   |

1) Other motor sizes on request.

2) Only frame sizes 315 S and 315 M.

3) Non-standard motor (sizes not included in EN 50347).

4) Parallel key shortened on gear unit side.

5) Cam ring 95 ShoreA.

6) Cam ring 64 ShoreD.

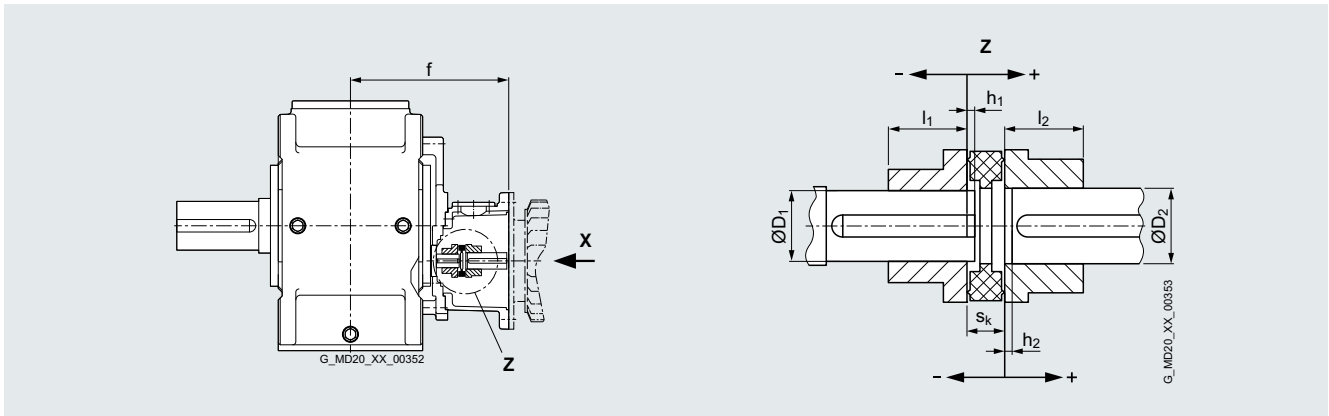
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-BIPEX coupling

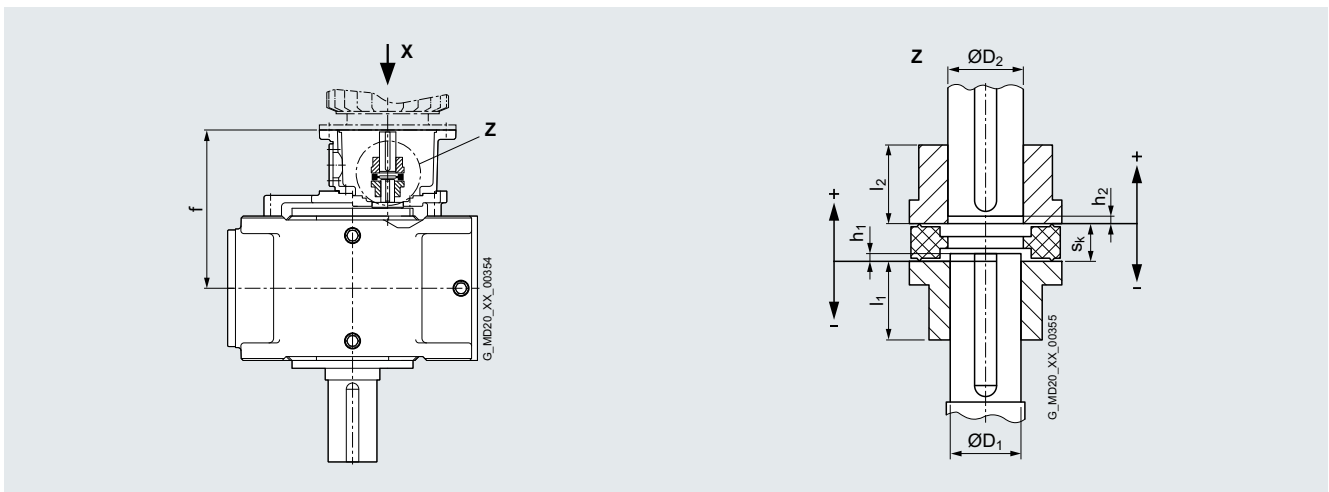
Helical gear unit, type H4, gear unit sizes 7 to 18

### Design

#### Horizontal mounting position



#### Vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure. For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), [see page 11/3](#).
- Helical gear unit in design G, H, I on request only.
- Not in connection with Taconite E or labyrinth seal at the drive shaft.

**Options for installation and add-on parts**  
**Motor bell housing for IEC standard motor with N-BIPEX coupling**

**Helical gear unit, type H4, gear unit sizes 7 to 18**

**Design (continued)**

| Size         | Dimensions in mm           |                                |                |                |                |                |                |                |                |       |                                |    |    |    |    |    |      |      |       |
|--------------|----------------------------|--------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|--------------------------------|----|----|----|----|----|------|------|-------|
|              | IEC motor <sup>1)</sup>    | N-BIPEX BWN                    | s <sub>k</sub> | l <sub>1</sub> | D <sub>1</sub> | l <sub>2</sub> | D <sub>2</sub> | h <sub>1</sub> | h <sub>2</sub> | f     | Ratios $i_N$                   |    |    |    |    |    |      |      |       |
|              |                            |                                |                |                |                |                |                |                |                |       | Ratios $i_N$                   |    |    |    |    |    |      |      |       |
|              |                            |                                |                |                |                |                |                |                |                |       | 200 - 355 (sizes 7, 9, 11)     |    |    |    |    |    |      |      |       |
|              |                            |                                |                |                |                |                |                |                |                |       | 250 - 450 (sizes 8, 10, 12)    |    |    |    |    |    |      |      |       |
|              |                            |                                |                |                |                |                |                |                |                |       | 100 - 180 (sizes 13, 15, 17)   |    |    |    |    |    |      |      |       |
|              |                            |                                |                |                |                |                |                |                |                |       | 125 - 224 (size 14)            |    |    |    |    |    |      |      |       |
|              |                            |                                |                |                |                |                |                |                |                |       | 224 - 400 (sizes 16, 18)       |    |    |    |    |    |      |      |       |
| <b>7/8</b>   | 100                        | —                              | —              | —              | —              | —              | —              | —              | —              | —     | <sup>4)</sup> 24               | 18 | 30 | 24 | 30 | 28 | 10   | -2   | 296   |
|              | 112                        | —                              | —              | —              | —              | —              | —              | —              | —              | —     | <sup>4)</sup> 24               | 18 | 30 | 24 | 30 | 28 | 10   | -2   | 296   |
|              | 132                        | <sup>4)</sup> 28               | 20             | 35             | 30             | 35             | 38             | 1.5            | 0              | 328.5 | 28                             | 20 | 35 | 24 | 35 | 38 | -4.5 | 4    | 328.5 |
|              | 160                        | 38                             | 24             | 45             | 30             | 45             | 42             | -0.5           | 0              | 364.5 | 38                             | 24 | 45 | 24 | 45 | 42 | -5   | 5.5  | 364.5 |
|              | 180                        | 38                             | 24             | 45             | 30             | 45             | 48             | -0.5           | 0              | 364.5 | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
| <b>9/10</b>  | 132                        | —                              | —              | —              | —              | —              | —              | —              | —              | —     | 28                             | 20 | 35 | 28 | 35 | 38 | -2.5 | 2    | 369.5 |
|              | 160                        | <sup>4)</sup> 38               | 24             | 45             | 35             | 45             | 42             | 3.5            | 0              | 405.5 | 38                             | 24 | 45 | 28 | 45 | 42 | -3.5 | 3    | 405.5 |
|              | 180                        | <sup>4)</sup> 38               | 24             | 45             | 35             | 45             | 48             | 3.5            | 0              | 405.5 | 38                             | 24 | 45 | 28 | 45 | 48 | -3.5 | 3    | 405.5 |
|              | 200                        | 42                             | 26             | 50             | 35             | 50             | 55             | -3.5           | 3              | 417.5 | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
|              | 225                        | 48                             | 28             | 56             | 35             | 56             | 60             | -8             | 7.5            | 458.5 | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
| <b>11/12</b> | 160                        | —                              | —              | —              | —              | —              | —              | —              | —              | —     | <sup>4)</sup> 38               | 24 | 45 | 32 | 45 | 42 | 16.5 | 0    | 447.5 |
|              | 180                        | <sup>4)</sup> 38               | 24             | 45             | 45             | 45             | 48             | 10.5           | 0              | 473.5 | <sup>4)</sup> 38               | 24 | 45 | 32 | 45 | 48 | 16.5 | 0    | 447.5 |
|              | 200                        | <sup>4)</sup> 42               | 26             | 50             | 45             | 50             | 55             | 0.5            | 0              | 485.5 | <sup>4)</sup> 42               | 26 | 50 | 32 | 50 | 55 | 6.5  | 0    | 459.5 |
|              | 225                        | <sup>4)</sup> 48               | 28             | 56             | 45             | 56             | 60             | 17.5           | 0              | 500.5 | 48                             | 28 | 56 | 32 | 56 | 60 | -1.5 | 1    | 500.5 |
|              | 250                        | <sup>4)</sup> 55               | 30             | 65             | 45             | 65             | 65             | 16.5           | 0              | 500.5 | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
| <b>13/14</b> | 160                        | —                              | —              | —              | —              | —              | —              | —              | —              | —     | <sup>4)</sup> 38               | 24 | 45 | 38 | 45 | 42 | 1.5  | 0    | 517.5 |
|              | 180                        | —                              | —              | —              | —              | —              | —              | —              | —              | —     | <sup>4)</sup> 38               | 24 | 45 | 38 | 45 | 48 | 1.5  | 0    | 517.5 |
|              | 200                        | <sup>4)</sup> 42               | 26             | 50             | 50             | 50             | 55             | 11.5           | 0              | 529.5 | <sup>4)</sup> 42               | 26 | 50 | 38 | 50 | 55 | 17.5 | 0    | 503.5 |
|              | 225                        | 48                             | 28             | 56             | 50             | 56             | 60             | -3.5           | 3              | 579.5 | <sup>4)</sup> 48               | 28 | 56 | 38 | 56 | 60 | 8.5  | 0    | 544.5 |
|              | 250                        | 55                             | 30             | 65             | 50             | 65             | 65             | -2.5           | 2              | 579.5 | <sup>4)</sup> 55               | 30 | 65 | 38 | 65 | 65 | 10.5 | 0    | 544.5 |
|              | 280                        | <sup>4)</sup> 55 <sup>5)</sup> | 30             | 65             | 50             | 65             | 75             | 15             | 0              | 565   | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
|              | 315 <sup>2)</sup>          | <sup>4)</sup> 65 <sup>5)</sup> | 35             | 75             | 50             | 75             | 80             | 8              | 0              | 602   | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
| <b>15/16</b> | 200                        | —                              | —              | —              | —              | —              | —              | —              | —              | —     | 42                             | 26 | 50 | 50 | 50 | 55 | -4   | -3.5 | 598.5 |
|              | 225                        | 48                             | 28             | 56             | 60             | 56             | 60             | -0.5           | 0              | 648.5 | <sup>4)</sup> 48               | 28 | 56 | 50 | 56 | 60 | 9.5  | 0    | 613.5 |
|              | 250                        | <sup>4)</sup> 55               | 30             | 65             | 60             | 65             | 65             | 1.5            | 0              | 648.5 | <sup>4)</sup> 55               | 30 | 65 | 50 | 65 | 65 | 11.5 | 0    | 613.5 |
|              | 280                        | <sup>4)</sup> 55 <sup>5)</sup> | 30             | 65             | 60             | 65             | 75             | 16             | 0              | 634   | <sup>5)</sup> 55 <sup>5)</sup> | 30 | 65 | 50 | 65 | 75 | -9   | 9    | 634   |
|              | 315 <sup>2)</sup>          | <sup>4)</sup> 65 <sup>5)</sup> | 35             | 75             | 60             | 75             | 80             | 14             | 0              | 671   | <sup>5)</sup> 65 <sup>5)</sup> | 35 | 75 | 50 | 75 | 80 | -5.5 | 5.5  | 671   |
|              | 315 (200 kW) <sup>3)</sup> | <sup>4)</sup> 75 <sup>5)</sup> | 40             | 85             | 60             | 85             | 80             | 19             | 0              | 671   | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
|              | 315 (250 kW) <sup>3)</sup> | <sup>4)</sup> 75 <sup>5)</sup> | 40             | 85             | 60             | 85             | 80             | 19             | 0              | 671   | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
|              | 315 (315 kW) <sup>3)</sup> | <sup>4)</sup> 75 <sup>6)</sup> | 40             | 85             | 60             | 85             | 80             | 19             | 0              | 671   | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
| <b>17/18</b> | 225                        | —                              | —              | —              | —              | —              | —              | —              | —              | —     | <sup>4)</sup> 48               | 28 | 56 | 50 | 56 | 60 | 4.5  | 0    | 623.5 |
|              | 250                        | —                              | —              | —              | —              | —              | —              | —              | —              | —     | <sup>4)</sup> 55               | 30 | 65 | 50 | 65 | 65 | 6.5  | 0    | 623.5 |
|              | 280                        | <sup>4)</sup> 55 <sup>5)</sup> | 30             | 65             | 60             | 65             | 75             | 11             | 0              | 644   | <sup>5)</sup> 55 <sup>5)</sup> | 30 | 65 | 50 | 65 | 75 | -7   | 7    | 644   |
|              | 315 <sup>2)</sup>          | <sup>4)</sup> 65 <sup>5)</sup> | 35             | 75             | 60             | 75             | 80             | 9              | 0              | 681   | <sup>5)</sup> 65 <sup>5)</sup> | 35 | 75 | 50 | 75 | 80 | -8   | 8    | 681   |
|              | 315 (200 kW) <sup>3)</sup> | <sup>4)</sup> 75 <sup>5)</sup> | 40             | 85             | 60             | 85             | 80             | 14             | 0              | 681   | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
|              | 315 (250 kW) <sup>3)</sup> | <sup>4)</sup> 75 <sup>5)</sup> | 40             | 85             | 60             | 85             | 80             | 14             | 0              | 681   | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
|              | 315 (315 kW) <sup>3)</sup> | <sup>4)</sup> 75 <sup>6)</sup> | 40             | 85             | 60             | 85             | 80             | 14             | 0              | 681   | —                              | —  | —  | —  | —  | —  | —    | —    | —     |
|              | 355 (355 kW) <sup>3)</sup> | <sup>4)</sup> 75 <sup>6)</sup> | 40             | 85             | 60             | 85             | 90             | -9             | 9              | 713   | —                              | —  | —  | —  | —  | —  | —    | —    | —     |

1) Other motor sizes on request.

2) Only frame sizes 315 S and 315 M.

3) Non-standard motor (sizes not included in EN 50347).

4) Parallel key shortened on gear unit side.

5) Cam ring 95 ShoreA.

6) Cam ring 64 ShoreD.

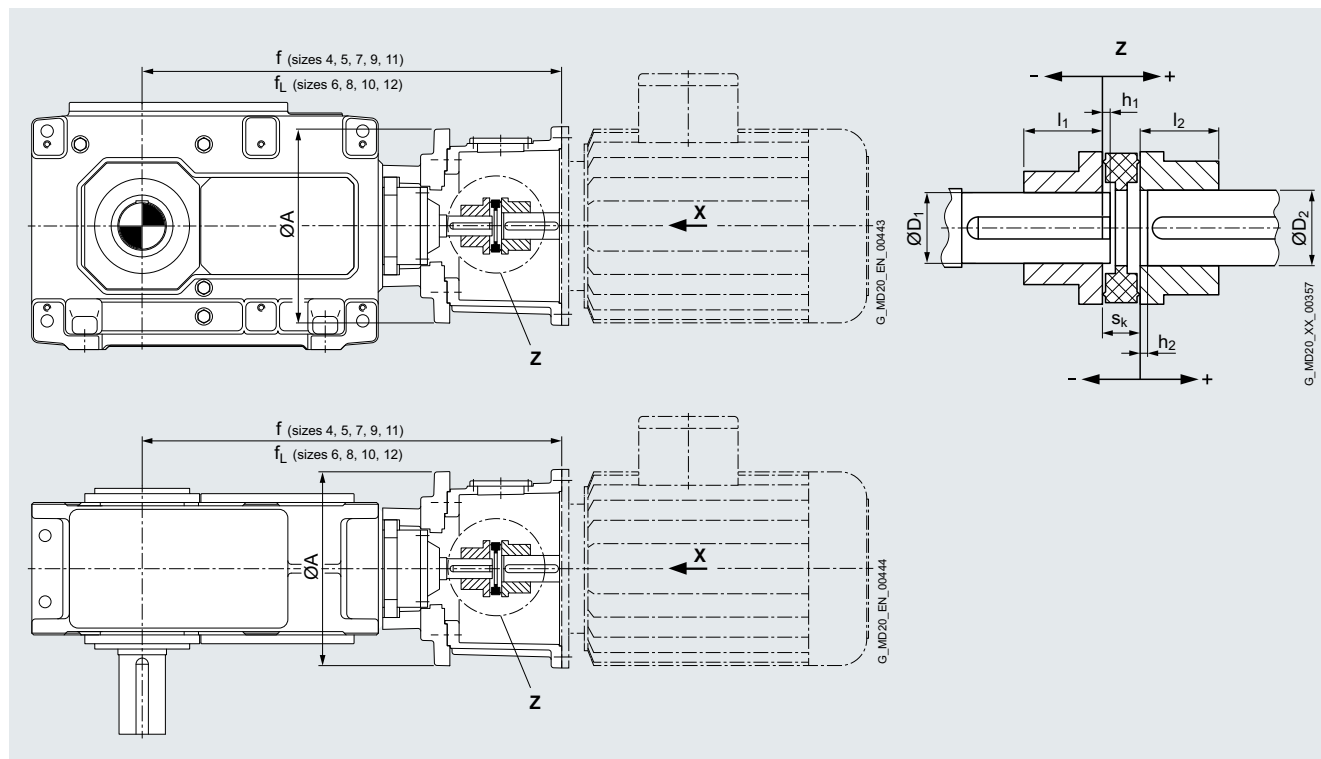
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-BIPEX coupling

Bevel helical gear unit, type B2, gear unit sizes 4 to 12

### Design

#### Horizontal and vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure. For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), see page 11/3.
- Not in connection with Taconite E or labyrinth seal at the drive shaft.

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-BIPEX coupling

#### Bevel helical gear unit, type B2, gear unit sizes 4 to 12

#### Design (continued)

| Size                    | Dimensions in mm                                                                 |                                |       |       |       |       |       |       |     |       |     |                                |                  |                                                                                    |       |       |       |       |       |       |       |     |
|-------------------------|----------------------------------------------------------------------------------|--------------------------------|-------|-------|-------|-------|-------|-------|-----|-------|-----|--------------------------------|------------------|------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-----|
|                         | Ratios $i_N$<br>5 - 11.2 (sizes 4, 5, 7, 9, 11)<br>6.3 - 14 (sizes 6, 8, 10, 12) |                                |       |       |       |       |       |       |     |       |     |                                |                  | Ratios $i_N$<br>12.5 - 18 (sizes 4, 5, 7, 9, 11)<br>16 - 22.4 (sizes 6, 8, 10, 12) |       |       |       |       |       |       |       |     |
| IEC motor <sup>1)</sup> | N-BIPEX BWN                                                                      | $s_k$                          | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$ | $f_L$ | $A$ | N-BIPEX BWN                    | $s_k$            | $l_1$                                                                              | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$   | $f_L$ | $A$ |
| <b>4</b>                | 180                                                                              | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -   | 38                             | 24               | 45                                                                                 | 35    | 45    | 48    | 0.5   | 0     | 678.5 | -     | 350 |
|                         | 200                                                                              | <sup>3)</sup> 42               | 26    | 50    | 45    | 50    | 55    | 16.5  | 0   | 684.5 | -   | 350                            | 42               | 26                                                                                 | 50    | 35    | 50    | 55    | -2    | 1.5   | 684.5 | -   |
| <b>5/6</b>              | 200                                                                              | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -   | <sup>3)</sup> 42               | 26               | 50                                                                                 | 40    | 50    | 55    | 7.5   | 0     | 763.5 | 798.5 | 350 |
|                         | 225                                                                              | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -   | 48                             | 28               | 56                                                                                 | 40    | 56    | 60    | -1.5  | 0     | 804.5 | 839.5 | 350 |
| <b>7/8</b>              | 250                                                                              | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -   | <sup>3)</sup> 55               | 30               | 65                                                                                 | 50    | 65    | 65    | 5     | 0     | 915   | 960   | 440 |
|                         | 280                                                                              | <sup>3)</sup> 55 <sup>4)</sup> | 30    | 65    | 70    | 65    | 75    | 11    | 0   | 934   | 979 | 440                            | 55 <sup>4)</sup> | 30                                                                                 | 65    | 50    | 65    | 75    | -7    | 7     | 934   | 979 |
| <b>9/10</b>             | 280                                                                              | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -   | 55 <sup>4)</sup>               | 30               | 65                                                                                 | 60    | 65    | 75    | -4.5  | 4.5   | 1074  | 1124  | 445 |
| <b>11/12</b>            | 315 <sup>2)</sup>                                                                | -                              | -     | -     | -     | -     | -     | -     | -   | -     | -   | <sup>3)</sup> 65 <sup>4)</sup> | 35               | 75                                                                                 | 70    | 75    | 80    | 14    | 0     | 1256  | 1326  | 520 |

<sup>1)</sup> Other gear unit and motor sizes on request.

<sup>2)</sup> Only frame sizes 315 S and 315 M.

<sup>3)</sup> Parallel key shortened on gear unit side.

<sup>4)</sup> Cam ring 95 ShoreA.

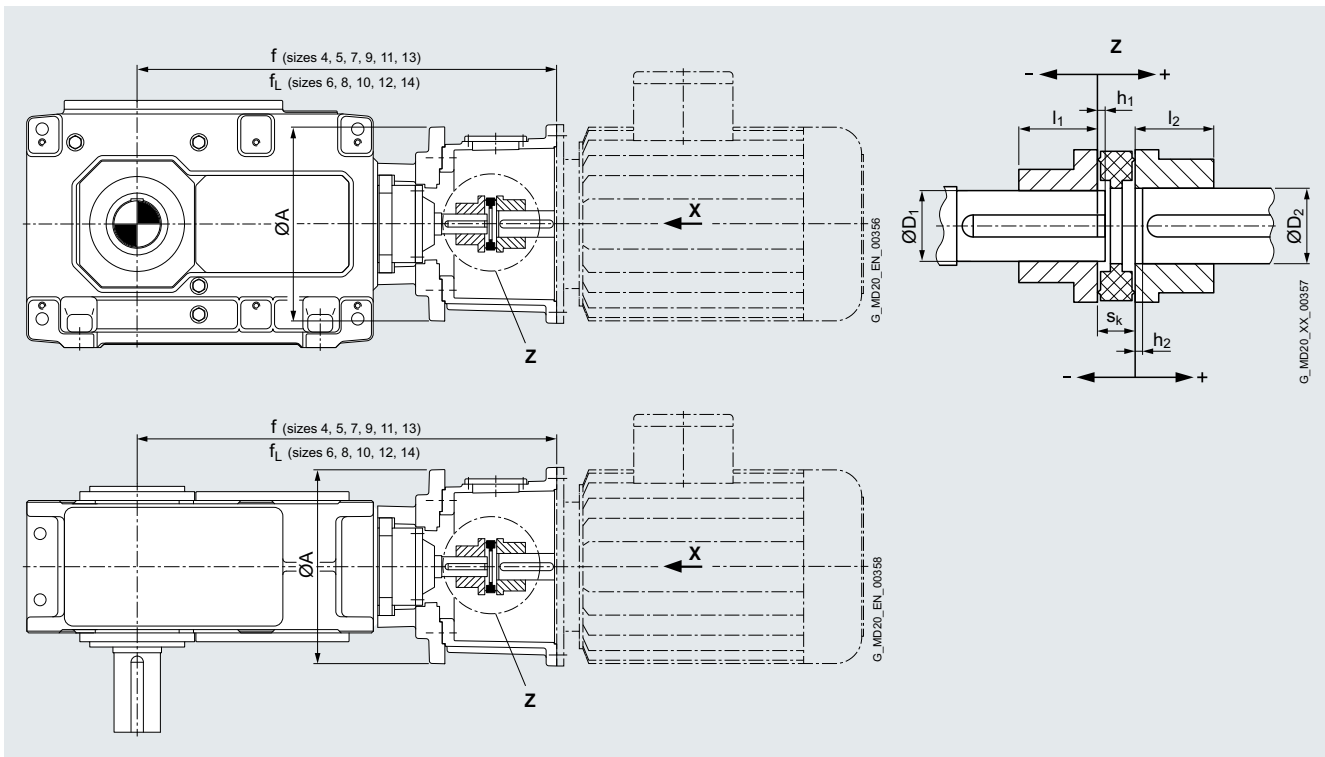
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-BIPEX coupling

Bevel helical gear unit, type B3, gear unit sizes 4 to 18

### Design

#### Horizontal and vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure. For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), [see page 11/3](#).
- Not in connection with Taconite E or labyrinth seal at the drive shaft.

# Options for installation and add-on parts

## Motor bell housing for IEC standard motor with N-BIPEX coupling

### Bevel helical gear unit, type B3, gear unit sizes 4 to 18

#### Design (continued)

| Size                    | Dimensions in mm           |                  |                  |       |       |       |       |       |     |       |        |              |                  |                  |                  |       |       |       |       |      |        |        |        |       |     |
|-------------------------|----------------------------|------------------|------------------|-------|-------|-------|-------|-------|-----|-------|--------|--------------|------------------|------------------|------------------|-------|-------|-------|-------|------|--------|--------|--------|-------|-----|
|                         | Ratios $i_N$               |                  |                  |       |       |       |       |       |     |       |        | Ratios $i_N$ |                  |                  |                  |       |       |       |       |      |        |        |        |       |     |
| IEC motor <sup>1)</sup> | N-BIPEX BWN                | $s_k$            | $l_1$            | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$ | $f_L$ | A      | Ratios $i_N$ |                  |                  |                  |       |       |       |       |      |        |        |        |       |     |
|                         |                            |                  |                  |       |       |       |       |       |     |       |        | N-BIPEX BWN  | $s_k$            | $l_1$            | $D_1$            | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$  | $f_L$  | A      |        |       |     |
| 4                       | 132                        | -                | -                | -     | -     | -     | -     | -     | -   | -     | -      | 4)           | 28               | 20               | 35               | 25    | 35    | 38    | 13.5  | 0    | 646.5  | -      | 250    |       |     |
|                         | 160                        | 38               | 24               | 45    | 30    | 45    | 42    | -4.5  | 0   | 708.5 | -      | 250          | 4)               | 38               | 24               | 45    | 25    | 45    | 42    | 11.5 | 0      | 682.5  | -      | 250   |     |
|                         | 180                        | 38               | 24               | 45    | 30    | 45    | 48    | -4.5  | 0   | 708.5 | -      | 250          | 4)               | 38               | 24               | 45    | 25    | 45    | 48    | 11.5 | 0      | 682.5  | -      | 250   |     |
|                         | 200                        | 4)               | 42               | 26    | 50    | 30    | 50    | 55    | 12  | 0     | 694.5  | -            | 250              | -                | -                | -     | -     | -     | -     | -    | -      | -      | -      | -     | -   |
| 5/6                     | 160                        | 4)               | 38               | 24    | 45    | 35    | 45    | 42    | 18  | 0     | 771.5  | 806.5        | 350              | 4)               | 38               | 24    | 45    | 28    | 45    | 42   | -2.5   | 0      | 771.5  | 806.5 | 350 |
|                         | 180                        | 4)               | 38               | 24    | 45    | 35    | 45    | 48    | 18  | 0     | 771.5  | 806.5        | 350              | 4)               | 38               | 24    | 45    | 28    | 45    | 48   | -2.5   | 0      | 771.5  | 806.5 | 350 |
|                         | 200                        | 4)               | 42               | 26    | 50    | 35    | 50    | 55    | 7.5 | 0     | 783.5  | 818.5        | 350              | 4)               | 42               | 26    | 50    | 28    | 50    | 55   | -13    | 0      | 783.5  | 818.5 | 350 |
|                         | 225                        | 48               | 28               | 56    | 35    | 56    | 60    | -1.5  | 0   | 824.5 | 859.5  | 350          | -                | -                | -                | -     | -     | -     | -     | -    | -      | -      | -      | -     | -   |
| 7/8                     | 160                        | -                | -                | -     | -     | -     | -     | -     | -   | -     | -      | -            | 38               | 24               | 45               | 35    | 45    | 42    | 0.5   | 0    | 903.5  | 948.5  | 440    |       |     |
|                         | 180                        | -                | -                | -     | -     | -     | -     | -     | -   | -     | -      | -            | 38               | 24               | 45               | 35    | 45    | 48    | 0.5   | 0    | 903.5  | 948.5  | 440    |       |     |
|                         | 200                        | 4)               | 42               | 26    | 50    | 45    | 50    | 55    | 17  | 0     | 909.5  | 954.5        | 440              | 42               | 26               | 50    | 35    | 50    | 55    | -3.5 | 0      | 909.5  | 954.5  | 440   |     |
|                         | 225                        | 4)               | 48               | 28    | 56    | 45    | 56    | 60    | 7.5 | 0     | 950.5  | 995.5        | 440              | 4)               | 48               | 28    | 56    | 35    | 56    | 60   | 2.5    | 0      | 935.5  | 980.5 | 440 |
|                         | 250                        | 4)               | 55               | 30    | 65    | 45    | 65    | 65    | 8   | 0     | 952    | 997          | 440              | 4)               | 55               | 30    | 65    | 35    | 65    | 65   | 5      | 0      | 935.5  | 980.5 | 440 |
|                         | 280                        | 55 <sup>5)</sup> | 30               | 65    | 45    | 65    | 75    | -6    | 5   | 971   | 1016   | 440          | -                | -                | -                | -     | -     | -     | -     | -    | -      | -      | -      | -     | -   |
| 9/10                    | 200                        | -                | -                | -     | -     | -     | -     | -     | -   | -     | -      | -            | 4)               | 42               | 26               | 50    | 40    | 50    | 55    | 1.5  | 0      | 1034.5 | 1084.5 | 440   |     |
|                         | 225                        | 4)               | 48               | 28    | 56    | 55    | 56    | 60    | 1.5 | 0     | 1075.5 | 1125.5       | 440              | 48               | 28               | 56    | 40    | 56    | 60    | -7.5 | 0      | 1075.5 | 1125.5 | 440   |     |
|                         | 250                        | 4)               | 55               | 30    | 65    | 55    | 65    | 65    | 3   | 0     | 1077   | 1127         | 440              | 55               | 30               | 65    | 40    | 65    | 65    | -7   | 0      | 1077   | 1127   | 440   |     |
|                         | 280                        | 55 <sup>5)</sup> | 30               | 65    | 55    | 65    | 75    | -8    | 8   | 1096  | 1146   | 440          | 55 <sup>5)</sup> | 30               | 65               | 40    | 65    | 75    | -6    | 0    | 1076   | 1126   | 440    |       |     |
| 11/12                   | 225                        | -                | -                | -     | -     | -     | -     | -     | -   | -     | -      | -            | 48               | 28               | 56               | 50    | 56    | 60    | -5.5  | 0    | 1243.5 | 1313.5 | 440    |       |     |
|                         | 250                        | 4)               | 55               | 30    | 65    | 70    | 65    | 65    | 5   | 0     | 1260   | 1330         | 440              | 55               | 30               | 65    | 50    | 65    | 65    | -3.5 | 0      | 1243.5 | 1313.5 | 440   |     |
|                         | 280                        | 55 <sup>5)</sup> | 30               | 65    | 70    | 65    | 75    | -7    | 7   | 1279  | 1349   | 440          | 4)               | 55 <sup>5)</sup> | 30               | 65    | 50    | 65    | 75    | 11   | 0      | 1229   | 1299   | 440   |     |
|                         | 315 <sup>2)</sup>          | 65 <sup>5)</sup> | 35               | 75    | 70    | 75    | 80    | -8    | 8   | 1316  | 1386   | 440          | 4)               | 65 <sup>5)</sup> | 35               | 75    | 50    | 75    | 80    | 0    | 9      | 1266   | 1336   | 440   |     |
| 13/14                   | 280                        | -                | -                | -     | -     | -     | -     | -     | -   | -     | -      | -            | 4)               | 55 <sup>5)</sup> | 30               | 65    | 60    | 65    | 75    | 11   | 0      | 1424   | 1494   | 650   |     |
|                         | 315 <sup>2)</sup>          | 65 <sup>5)</sup> | 35               | 75    | 80    | 75    | 80    | 14    | 0   | 1481  | 1551   | 445          | 4)               | 65 <sup>5)</sup> | 35               | 75    | 60    | 80    | 80    | 9    | 0      | 1461   | 1531   | 650   |     |
|                         | 315 (200 kW) <sup>3)</sup> | 4)               | 75 <sup>5)</sup> | 40    | 85    | 80    | 85    | 80    | 14  | 0     | 1481   | 1551         | 445              | 4)               | 75 <sup>5)</sup> | 40    | 85    | 60    | 90    | 80   | 9      | 0      | 1461   | 1531  | 650 |
|                         | 315 (250 kW) <sup>3)</sup> | 4)               | 75 <sup>5)</sup> | 40    | 85    | 80    | 85    | 80    | 14  | 0     | 1481   | 1551         | 445              | 4)               | 75 <sup>5)</sup> | 40    | 85    | 60    | 90    | 80   | 9      | 0      | 1461   | 1531  | 650 |
|                         | 315 (315 kW) <sup>3)</sup> | 4)               | 75 <sup>6)</sup> | 40    | 85    | 80    | 85    | 80    | 14  | 0     | 1481   | 1551         | 445              | 4)               | 75 <sup>6)</sup> | 40    | 85    | 60    | 100   | 80   | 9      | 0      | 1461   | 1531  | 650 |
|                         | 355 (355 kW) <sup>3)</sup> | On request       |                  |       |       |       |       |       |     |       |        |              | On request       |                  |                  |       |       |       |       |      |        |        |        |       |     |
|                         | 355 (400 kW) <sup>3)</sup> | On request       |                  |       |       |       |       |       |     |       |        |              | On request       |                  |                  |       |       |       |       |      |        |        |        |       |     |
| 15/16                   | 315 <sup>2)</sup>          | -                | -                | -     | -     | -     | -     | -     | -   | -     | -      | -            | 4)               | 65 <sup>5)</sup> | 35               | 75    | 70    | 75    | 80    | 12   | 0      | 1700   | 1746   | 650   |     |
|                         | 315 (200 kW) <sup>3)</sup> | -                | -                | -     | -     | -     | -     | -     | -   | -     | -      | -            | 4)               | 75 <sup>5)</sup> | 40               | 85    | 70    | 85    | 80    | 17   | 0      | 1700   | 1746   | 650   |     |
|                         | 315 (250 kW) <sup>3)</sup> | -                | -                | -     | -     | -     | -     | -     | -   | -     | -      | -            | 4)               | 75 <sup>5)</sup> | 40               | 85    | 70    | 85    | 80    | 17   | 0      | 1700   | 1746   | 650   |     |
|                         | 315 (315 kW) <sup>3)</sup> | 75 <sup>6)</sup> | 40               | 85    | 90    | 85    | 80    | -8    | 0   | 1750  | 1796   | 650          | 4)               | 75 <sup>6)</sup> | 40               | 85    | 70    | 85    | 80    | 17   | 0      | 1700   | 1746   | 650   |     |
|                         | 355 (355 kW) <sup>3)</sup> | On request       |                  |       |       |       |       |       |     |       |        |              | On request       |                  |                  |       |       |       |       |      |        |        |        |       |     |
|                         | 355 (400 kW) <sup>3)</sup> | On request       |                  |       |       |       |       |       |     |       |        |              | On request       |                  |                  |       |       |       |       |      |        |        |        |       |     |
| 17/18                   | 315 (200 kW) <sup>3)</sup> | On request       |                  |       |       |       |       |       |     |       |        |              | On request       |                  |                  |       |       |       |       |      |        |        |        |       |     |
|                         | 315 (250 kW) <sup>3)</sup> | On request       |                  |       |       |       |       |       |     |       |        |              | On request       |                  |                  |       |       |       |       |      |        |        |        |       |     |
|                         | 315 (315 kW) <sup>3)</sup> | On request       |                  |       |       |       |       |       |     |       |        |              | On request       |                  |                  |       |       |       |       |      |        |        |        |       |     |
|                         | 355 (355 kW) <sup>3)</sup> | On request       |                  |       |       |       |       |       |     |       |        |              | On request       |                  |                  |       |       |       |       |      |        |        |        |       |     |
|                         | 355 (400 kW) <sup>3)</sup> | On request       |                  |       |       |       |       |       |     |       |        |              | On request       |                  |                  |       |       |       |       |      |        |        |        |       |     |

1) Other motor sizes on request.

2) Only frame sizes 315 S and 315 M.

3) Non-standard motor (sizes not included in EN 50347).

4) Parallel key shortened on gear unit side.

5) Cam ring 95 ShoreA.

6) Cam ring 64 ShoreD.

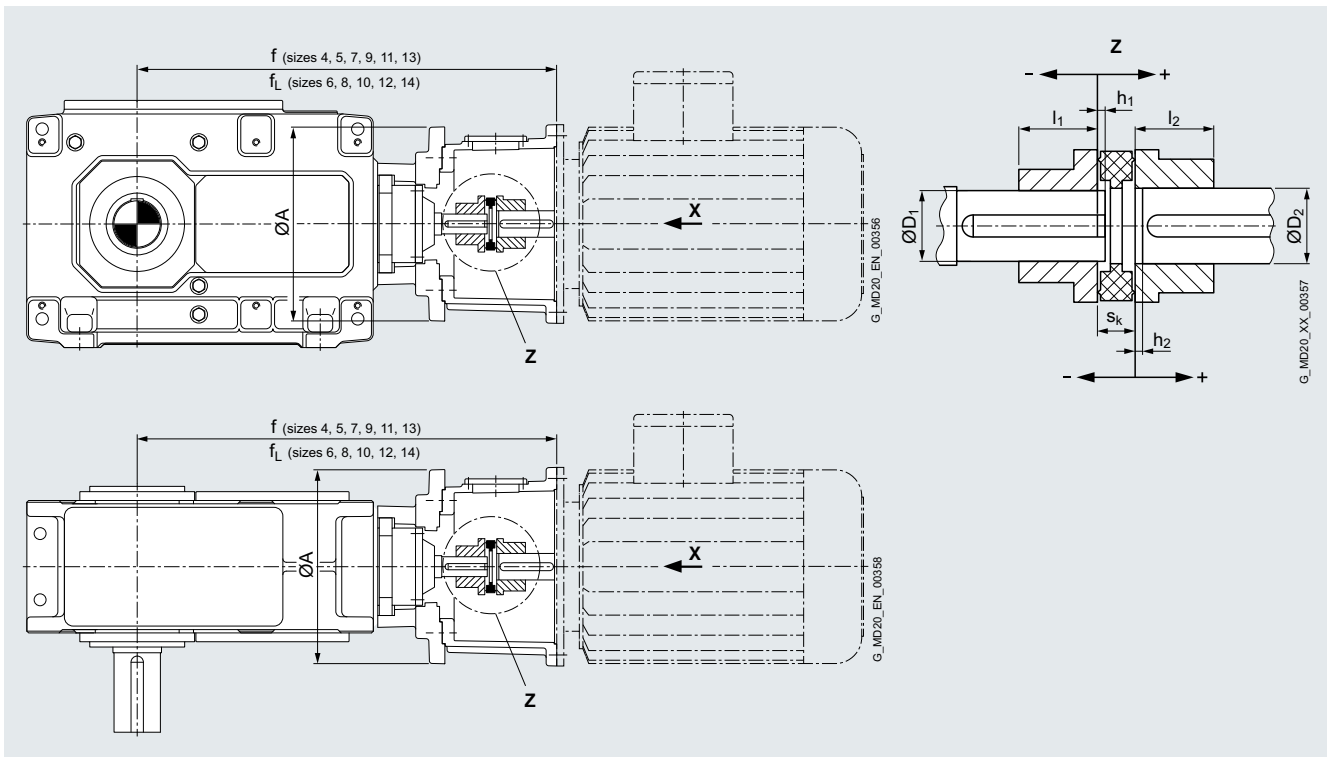
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-BIPEX coupling

Bevel helical gear unit, type B4, gear unit sizes 5 to 18

### Design

#### Horizontal and vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure. For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), [see page 11/3](#).
- Not in connection with Taconite E or labyrinth seal at the drive shaft.



### Options for installation and add-on parts Motor bell housing for IEC standard motor with N-BIPEX coupling

#### Bevel helical gear unit, type B4, gear unit sizes 5 to 18

#### Design (continued)

| Size         | Dimensions in mm                                                                                                                                                |                                |       |       |       |       |       |       |       |        |        |                                                                                                                                                                    |                                |       |       |       |       |       |       |        |        |        |     |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------|-------|-------|-------|-------|-------|--------|--------|--------|-----|
|              | Ratios $i_N$<br>80 - 180 (sizes 5, 7, 9, 11)<br>100 - 224 (sizes 6, 8, 10, 12)<br>80 - 180 (sizes 13, 15, 17)<br>100 - 224 (size 14)<br>90 - 200 (sizes 16, 18) |                                |       |       |       |       |       |       |       |        |        | Ratios $i_N$<br>200 - 315 (sizes 5, 7, 9, 11)<br>250 - 400 (sizes 6, 8, 10, 12)<br>200 - 315 (sizes 13, 15, 17)<br>250 - 400 (size 14)<br>224 - 355 (sizes 16, 18) |                                |       |       |       |       |       |       |        |        |        |     |
|              | IEC motor <sup>1)</sup>                                                                                                                                         | N-BIPEX BWN                    | $s_k$ | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$    | $f_L$  | A                                                                                                                                                                  | N-BIPEX BWN                    | $s_k$ | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$  | $f$    | $f_L$  | A   |
| <b>5/6</b>   | 100                                                                                                                                                             | —                              | —     | —     | —     | —     | —     | —     | —     | —      | —      | <sup>4)</sup> 24                                                                                                                                                   | 18                             | 25    | 20    | 25    | 28    | 8     | 0     | 735    | 770    | 250    |     |
|              | 112                                                                                                                                                             | 24                             | 18    | 25    | 28    | 25    | 28    | -1    | 1     | 750    | 785    | 250                                                                                                                                                                | <sup>4)</sup> 24               | 18    | 25    | 20    | 25    | 28    | 8     | 0      | 735    | 770    | 250 |
|              | 132                                                                                                                                                             | <sup>4)</sup> 28               | 20    | 35    | 28    | 35    | 38    | 2.5   | 0     | 767.5  | 802.5  | 250                                                                                                                                                                | <sup>4)</sup> 28               | 20    | 35    | 20    | 35    | 38    | 2.5   | 0      | 767.5  | 802.5  | 250 |
|              | 160                                                                                                                                                             | <sup>4)</sup> 38               | 24    | 45    | 28    | 45    | 42    | 1.5   | 0     | 802.5  | 837.5  | 250                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
| <b>7/8</b>   | 112                                                                                                                                                             | —                              | —     | —     | —     | —     | —     | —     | —     | —      | —      | <sup>4)</sup> 24                                                                                                                                                   | 18                             | 25    | 25    | 25    | 28    | 8     | 0     | 855    | 900    | 250    |     |
|              | 132                                                                                                                                                             | <sup>4)</sup> 28               | 20    | 35    | 30    | 35    | 38    | 7.5   | 0     | 887.5  | 932.5  | 250                                                                                                                                                                | <sup>4)</sup> 28               | 20    | 35    | 25    | 35    | 38    | 13    | 0      | 872.5  | 917.5  | 250 |
|              | 160                                                                                                                                                             | 38                             | 24    | 45    | 30    | 45    | 42    | -2.5  | 2     | 933.5  | 978.5  | 250                                                                                                                                                                | <sup>4)</sup> 38               | 24    | 45    | 25    | 45    | 42    | 12    | 0      | 907.5  | 952.5  | 250 |
|              | 180                                                                                                                                                             | 38                             | 24    | 45    | 30    | 45    | 48    | -4.5  | 2.5   | 933.5  | 978.5  | 250                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
|              | 200                                                                                                                                                             | <sup>4)</sup> 42               | 26    | 50    | 30    | 50    | 55    | 11.5  | 0     | 919.5  | 964.5  | 250                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
| <b>9/10</b>  | 132                                                                                                                                                             | —                              | —     | —     | —     | —     | —     | —     | —     | —      | —      | <sup>4)</sup> 28                                                                                                                                                   | 20                             | 35    | 28    | 35    | 38    | 1.5   | 0     | 1001.5 | 1051.5 | 350    |     |
|              | 160                                                                                                                                                             | <sup>4)</sup> 38               | 24    | 45    | 35    | 45    | 42    | 17.5  | 0     | 1036.5 | 1086.5 | 350                                                                                                                                                                | 38                             | 24    | 45    | 28    | 45    | 42    | -1.5  | 1      | 1036.5 | 1086.5 | 350 |
|              | 180                                                                                                                                                             | <sup>4)</sup> 38               | 24    | 45    | 35    | 45    | 48    | 17.5  | 0     | 1036.5 | 1086.5 | 350                                                                                                                                                                | 38                             | 24    | 45    | 28    | 45    | 48    | -1.5  | 1      | 1036.5 | 1086.5 | 350 |
|              | 200                                                                                                                                                             | <sup>4)</sup> 42               | 26    | 50    | 35    | 50    | 55    | 7.5   | 0     | 1048.5 | 1098.5 | 350                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
|              | 225                                                                                                                                                             | 48                             | 28    | 56    | 35    | 56    | 60    | -1    | 0.5   | 1089.5 | 1139.5 | 350                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
| <b>11/12</b> | 160                                                                                                                                                             | —                              | —     | —     | —     | —     | —     | —     | —     | —      | —      | <sup>4)</sup> 38                                                                                                                                                   | 24                             | 45    | 35    | 45    | 42    | 0.5   | 0     | 1223.5 | 1293.5 | 440    |     |
|              | 180                                                                                                                                                             | 38                             | 24    | 45    | 45    | 45    | 48    | -3    | 2.5   | 1249.5 | 1319.5 | 440                                                                                                                                                                | 38                             | 24    | 45    | 35    | 45    | 48    | 0.5   | 0      | 1223.5 | 1293.5 | 440 |
|              | 200                                                                                                                                                             | <sup>4)</sup> 42               | 26    | 50    | 45    | 50    | 55    | 16.5  | 0     | 1229.5 | 1299.5 | 440                                                                                                                                                                | 42                             | 26    | 50    | 35    | 50    | 55    | -2    | -1.5   | 1229.5 | 1299.5 | 440 |
|              | 225                                                                                                                                                             | <sup>4)</sup> 48               | 28    | 56    | 45    | 56    | 60    | 7.5   | 0     | 1270.5 | 1340.5 | 440                                                                                                                                                                | 48                             | 28    | 56    | 35    | 56    | 60    | -6.5  | 6      | 1270.5 | 1340.5 | 440 |
|              | 250                                                                                                                                                             | <sup>4)</sup> 55               | 30    | 65    | 45    | 65    | 65    | 8     | 0     | 1272   | 1342   | 440                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
|              | 280                                                                                                                                                             | <sup>5)</sup> 55               | 30    | 65    | 45    | 65    | 75    | -5.5  | -5.5  | 1291   | 1361   | 440                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
| <b>13/14</b> | 180                                                                                                                                                             | —                              | —     | —     | —     | —     | —     | —     | —     | —      | —      | <sup>4)</sup> 38                                                                                                                                                   | 24                             | 45    | 40    | 45    | 48    | 5.5   | 0     | 1398.5 | 1468.5 | 440    |     |
|              | 200                                                                                                                                                             | <sup>4)</sup> 42               | 26    | 50    | 55    | 50    | 55    | 11.5  | 0     | 1404.5 | 1474.5 | 440                                                                                                                                                                | <sup>4)</sup> 42               | 26    | 50    | 40    | 50    | 55    | 1.5   | 0      | 1404.5 | 1474.5 | 440 |
|              | 225                                                                                                                                                             | <sup>4)</sup> 48               | 28    | 56    | 55    | 56    | 60    | 2.5   | 0     | 1445.5 | 1515.5 | 440                                                                                                                                                                | 48                             | 28    | 56    | 40    | 56    | 60    | -4    | 3.5    | 1445.5 | 1515.5 | 440 |
|              | 250                                                                                                                                                             | <sup>4)</sup> 55               | 30    | 65    | 55    | 65    | 65    | 3     | 0     | 1447   | 1517   | 440                                                                                                                                                                | 55                             | 30    | 65    | 40    | 65    | 65    | -3.5  | 3.5    | 1447   | 1517   | 440 |
|              | 280                                                                                                                                                             | <sup>4)</sup> 55 <sup>5)</sup> | 30    | 65    | 55    | 65    | 75    | 4     | 0     | 1446   | 1516   | 440                                                                                                                                                                | <sup>5)</sup> 55               | 30    | 65    | 40    | 65    | 75    | -3    | 3      | 1446   | 1516   | 440 |
|              | 315 <sup>2)</sup>                                                                                                                                               | <sup>4)</sup> 65 <sup>5)</sup> | 35    | 75    | 55    | 75    | 80    | 2     | 0     | 1483   | 1553   | 440                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
|              | 315 (200 kW) <sup>3)</sup>                                                                                                                                      | <sup>4)</sup> 75 <sup>5)</sup> | 40    | 85    | 55    | 85    | 80    | 2     | 0     | 1483   | 1553   | 440                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
|              | 315 (250 kW) <sup>3)</sup>                                                                                                                                      | <sup>4)</sup> 75 <sup>5)</sup> | 40    | 85    | 55    | 85    | 80    | 2     | 0     | 1483   | 1553   | 440                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
| <b>15/16</b> | 200                                                                                                                                                             | —                              | —     | —     | —     | —     | —     | —     | —     | —      | —      | <sup>4)</sup> 42                                                                                                                                                   | 26                             | 50    | 50    | 50    | 55    | -6    | 5.5   | 1659.5 | 1705.5 | 440    |     |
|              | 225                                                                                                                                                             | <sup>4)</sup> 55               | 30    | 65    | 70    | 65    | 60    | 6.5   | 0     | 1700.5 | 1746.5 | 440                                                                                                                                                                | 48                             | 28    | 56    | 50    | 56    | 60    | -3    | 2.5    | 1685.5 | 1731.5 | 440 |
|              | 250                                                                                                                                                             | <sup>4)</sup> 55               | 30    | 65    | 70    | 65    | 65    | 5     | 0     | 1702   | 1748   | 440                                                                                                                                                                | 55                             | 30    | 65    | 50    | 65    | 65    | -2    | 1.5    | 1685.5 | 1731.5 | 440 |
|              | 280                                                                                                                                                             | <sup>5)</sup> 55               | 30    | 65    | 70    | 65    | 75    | -7    | 7     | 1721   | 1767   | 440                                                                                                                                                                | <sup>4)</sup> 55 <sup>5)</sup> | 30    | 65    | 50    | 65    | 75    | 11    | 0      | 1671   | 1717   | 440 |
|              | 315 <sup>2)</sup>                                                                                                                                               | <sup>4)</sup> 65 <sup>5)</sup> | 35    | 75    | 70    | 75    | 80    | 4     | 0     | 1738   | 1784   | 440                                                                                                                                                                | <sup>4)</sup> 65 <sup>5)</sup> | 35    | 75    | 50    | 75    | 80    | 9     | 0      | 1708   | 1754   | 440 |
|              | 315 (200 kW) <sup>3)</sup>                                                                                                                                      | <sup>4)</sup> 75 <sup>5)</sup> | 40    | 85    | 70    | 85    | 80    | 9     | 0     | 1738   | 1784   | 440                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
|              | 315 (250 kW) <sup>3)</sup>                                                                                                                                      | <sup>4)</sup> 75 <sup>5)</sup> | 40    | 85    | 70    | 85    | 80    | 9     | 0     | 1738   | 1784   | 440                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
|              | 315 (315 kW) <sup>3)</sup>                                                                                                                                      | <sup>4)</sup> 75 <sup>6)</sup> | 40    | 85    | 70    | 85    | 80    | 9     | 0     | 1738   | 1784   | 440                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
|              | 355 (355 kW) <sup>3)</sup>                                                                                                                                      | <sup>4)</sup> On request       | —     | —     | —     | —     | —     | —     | —     | —      | —      | —                                                                                                                                                                  | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
| <b>17/18</b> | 225                                                                                                                                                             | —                              | —     | —     | —     | —     | —     | —     | —     | —      | —      | 48                                                                                                                                                                 | 28                             | 56    | 50    | 56    | 60    | -3    | 2.5   | 1733.5 | 1793.5 | 440    |     |
|              | 250                                                                                                                                                             | —                              | —     | —     | —     | —     | —     | —     | —     | —      | —      | 55                                                                                                                                                                 | 30                             | 65    | 50    | 65    | 65    | -2    | 1.5   | 1733.5 | 1793.5 | 440    |     |
|              | 280                                                                                                                                                             | <sup>5)</sup> 55               | 30    | 65    | 70    | 65    | 75    | -7    | 7     | 1769   | 1829   | 440                                                                                                                                                                | <sup>4)</sup> 55 <sup>5)</sup> | 30    | 65    | 50    | 65    | 75    | 12    | 0      | 1718.5 | 1778.5 | 440 |
|              | 315 <sup>2)</sup>                                                                                                                                               | <sup>4)</sup> 65 <sup>5)</sup> | 35    | 75    | 70    | 75    | 80    | 14    | 0     | 1776   | 1836   | 440                                                                                                                                                                | <sup>4)</sup> 65 <sup>5)</sup> | 35    | 75    | 50    | 75    | 80    | 9     | 0      | 1756   | 1816   | 440 |
|              | 315 (200 kW) <sup>3)</sup>                                                                                                                                      | <sup>4)</sup> 75 <sup>5)</sup> | 40    | 85    | 70    | 85    | 80    | 19    | 0     | 1776   | 1836   | 440                                                                                                                                                                | <sup>4)</sup> 75 <sup>5)</sup> | 40    | 85    | 70    | 85    | 80    | 14    | 0      | 1756   | 1816   | 440 |
|              | 315 (250 kW) <sup>3)</sup>                                                                                                                                      | <sup>4)</sup> 75 <sup>5)</sup> | 40    | 85    | 70    | 85    | 80    | 19    | 0     | 1776   | 1836   | 440                                                                                                                                                                | <sup>4)</sup> 75 <sup>5)</sup> | 40    | 85    | 70    | 85    | 80    | 14    | 0      | 1756   | 1816   | 440 |
|              | 315 (315 kW) <sup>3)</sup>                                                                                                                                      | <sup>4)</sup> 75 <sup>6)</sup> | 40    | 85    | 70    | 85    | 80    | 19    | 0     | 1776   | 1836   | 440                                                                                                                                                                | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
|              | 355 (355 kW) <sup>3)</sup>                                                                                                                                      | On request                     | —     | —     | —     | —     | —     | —     | —     | —      | —      | —                                                                                                                                                                  | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |
|              | 355 (400 kW) <sup>3)</sup>                                                                                                                                      | On request                     | —     | —     | —     | —     | —     | —     | —     | —      | —      | —                                                                                                                                                                  | —                              | —     | —     | —     | —     | —     | —     | —      | —      | —      | —   |

1) Other motor sizes on request.

2) Only frame sizes 315 S and 315 M.

3) Non-standard motor (sizes not included in EN 50347).

4) Parallel key shortened on gear unit side.

5) Cam ring 95 ShoreA.

6) Cam ring 64 ShoreD.

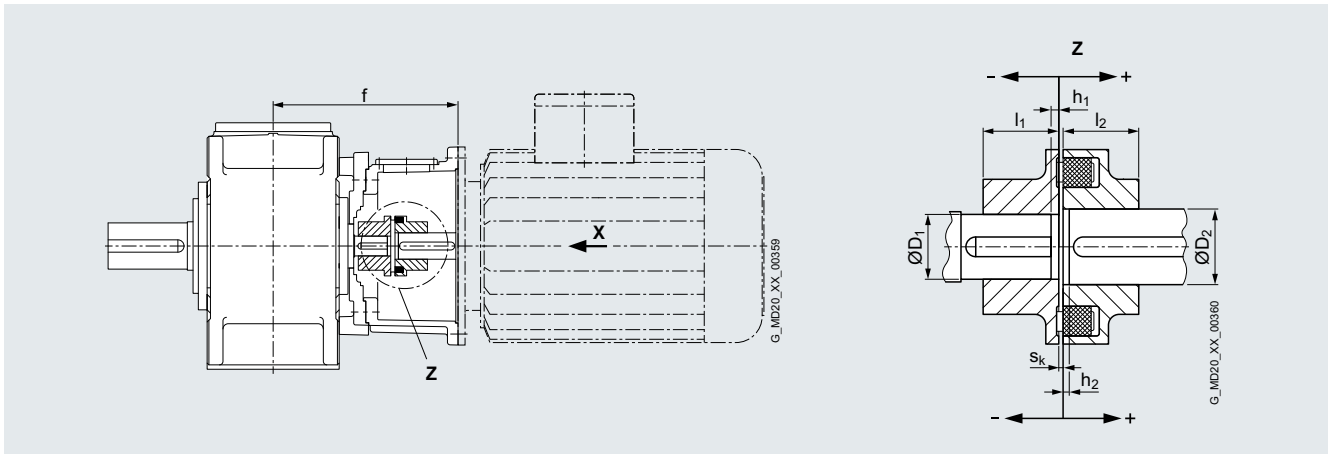
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-EUPEX coupling

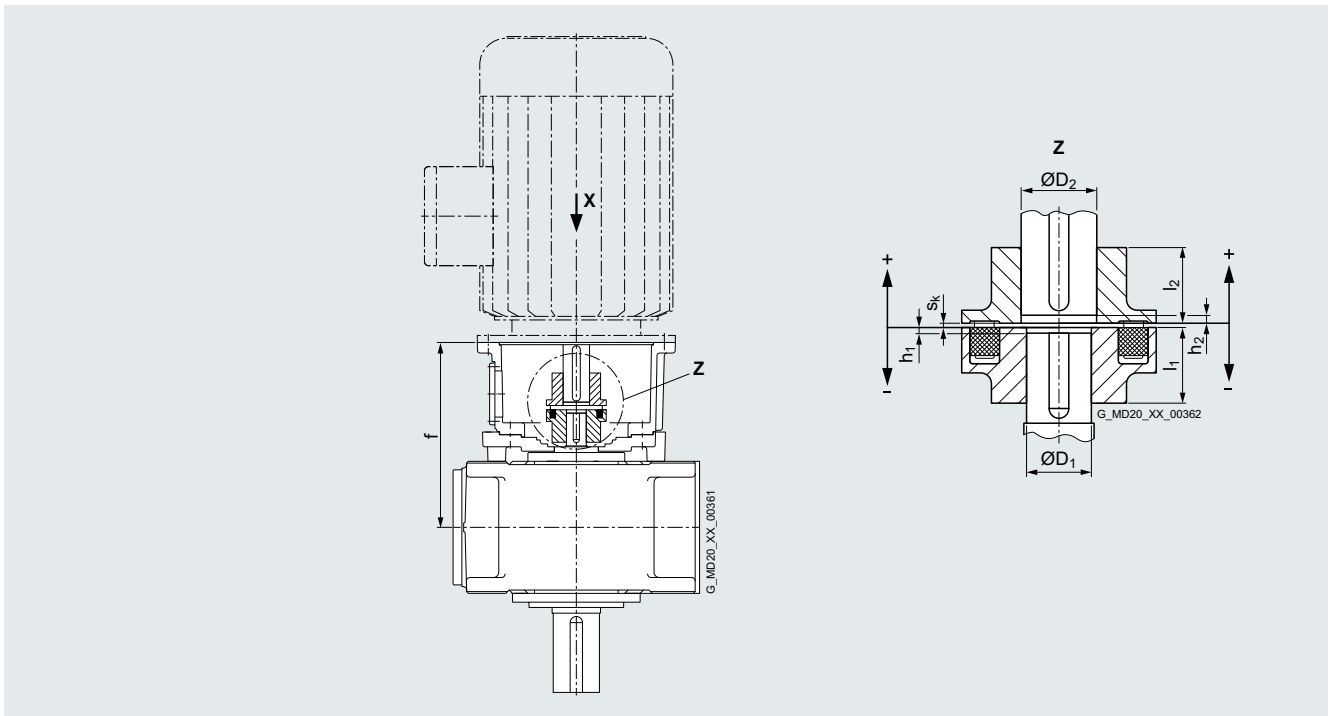
Helical gear unit, type H2, gear unit sizes 4 to 14

### Design

#### Horizontal mounting position



#### Vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure.  
For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), [see page 11/3](#).
- Helical gear unit in design C, D, G, H, I on request only.
- Not in connection with Taconite E or labyrinth seal at the drive shaft.

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-EUPEX coupling

#### Helical gear unit, type H2, gear unit sizes 4 to 14

#### Design (continued)

| Size                    | Dimensions in mm                                                             |                    |       |       |       |       |       |       |      |         |                                                                                |       |       |       |       |       |       |       |     |
|-------------------------|------------------------------------------------------------------------------|--------------------|-------|-------|-------|-------|-------|-------|------|---------|--------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-----|
|                         | Ratios $i_N$<br>6 - 11 (sizes 4, 5, 7, 9, 11)<br>8 - 14 (sizes 6, 8, 10, 12) |                    |       |       |       |       |       |       |      |         | Ratios $i_N$<br>12 - 22 (sizes 4, 5, 7, 9, 11)<br>16 - 28 (sizes 6, 8, 10, 12) |       |       |       |       |       |       |       |     |
| IEC motor <sup>1)</sup> | N-EUPEX                                                                      | $s_k$              | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$  | N-EUPEX | $s_k$                                                                          | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$   |     |
| <b>4</b>                | 160 <sup>4)</sup>                                                            | –                  | –     | –     | –     | –     | –     | –     | –    | B125    | 3                                                                              | 50    | 32    | 50    | 42    | 0     | 7     | 370   |     |
|                         | 180 <sup>4)</sup>                                                            | –                  | –     | –     | –     | –     | –     | –     | –    | B140    | 3                                                                              | 55    | 32    | 55    | 48    | 0     | 7     | 370   |     |
|                         | 200 <sup>4)</sup>                                                            | –                  | –     | –     | –     | –     | –     | –     | –    | B160    | 4                                                                              | 60    | 32    | 60    | 55    | 0     | 12    | 376   |     |
|                         | 225 <sup>4)</sup>                                                            | <sup>3)</sup> B180 | 4     | 70    | 45    | 70    | 60    | 0     | 3    | 417     | <sup>3)</sup> B180                                                             | 4     | 70    | 32    | 70    | 60    | 0     | 8     | 402 |
| <b>5/6</b>              | 200                                                                          | –                  | –     | –     | –     | –     | –     | –     | –    | B160    | 4                                                                              | 60    | 38    | 60    | 55    | 0     | 13    | 402   |     |
|                         | 225 <sup>5)</sup>                                                            | –                  | –     | –     | –     | –     | –     | –     | –    | –       | –                                                                              | –     | –     | –     | –     | –     | –     | –     |     |
|                         | 250 <sup>4)</sup>                                                            | <sup>3)</sup> B180 | 4     | 70    | 50    | 70    | 65    | 0     | 5.5  | 444.5   | <sup>3)</sup> B180                                                             | 4     | 70    | 38    | 70    | 65    | 0     | 9     | 428 |
| <b>7/8</b>              | 225                                                                          | –                  | –     | –     | –     | –     | –     | –     | –    | B180    | 4                                                                              | 70    | 50    | 70    | 60    | 0     | 9.5   | 473.5 |     |
|                         | 250 <sup>6)</sup>                                                            | –                  | –     | –     | –     | –     | –     | –     | –    | B180    | 4                                                                              | 70    | 50    | 70    | 65    | 0     | 11    | 475   |     |
|                         | 280 <sup>6)</sup>                                                            | –                  | –     | –     | –     | –     | –     | –     | –    | B200    | 4                                                                              | 80    | 50    | 80    | 75    | 0     | 10    | 474   |     |
|                         | 315 <sup>2) 4)</sup>                                                         | <sup>3)</sup> B225 | 4     | 90    | 60    | 90    | 80    | 0     | 12   | 531     | <sup>3)</sup> B250                                                             | 5.5   | 100   | 50    | 100   | 80    | 0     | 15.5  | 511 |
| <b>9/10</b>             | 280                                                                          | –                  | –     | –     | –     | –     | –     | –     | –    | B200    | 4                                                                              | 80    | 60    | 80    | 75    | 0     | 5     | 530   |     |
|                         | 315 <sup>2) 7)</sup>                                                         | <sup>3)</sup> B225 | 4     | 90    | 75    | 90    | 80    | -3    | 9    | 566     | <sup>3)</sup> B225                                                             | 4     | 90    | 60    | 90    | 80    | 0     | 12    | 566 |
| <b>11/12</b>            | 315 <sup>2)</sup>                                                            | –                  | –     | –     | –     | –     | –     | –     | –    | B225    | 4                                                                              | 90    | 70    | 90    | 80    | 0     | 17    | 606   |     |
| Size                    | Ratios $i_N$<br>12 - 20 (size 13)<br>16 - 25 (size 14)                       |                    |       |       |       |       |       |       |      |         |                                                                                |       |       |       |       |       |       |       |     |
| IEC motor <sup>1)</sup> | N-EUPEX                                                                      | $s_k$              | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$  |         |                                                                                |       |       |       |       |       |       |       |     |
| <b>13/14</b>            | 355 (355 kW) <sup>8)</sup>                                                   | <sup>3)</sup> B280 | 5.5   | 110   | 85    | 110   | 90    | -1    | 16.5 | 693     |                                                                                |       |       |       |       |       |       |       |     |
|                         | 355 (400 kW) <sup>8)</sup>                                                   | <sup>3)</sup> B280 | 5.5   | 110   | 85    | 110   | 90    | -1    | 16.5 | 693     |                                                                                |       |       |       |       |       |       |       |     |

<sup>1)</sup> Other motor sizes on request.

<sup>2)</sup> Only frame sizes 315 S and 315 M.

<sup>3)</sup> Only for vertical gear units.

<sup>4)</sup> For type H2D. Version A + B, mounting not possible.

<sup>5)</sup> For type H2D. Size 5, version A + B mounting not possible.

<sup>6)</sup> For type H2D. Size 7, version A + B mounting not possible.

<sup>7)</sup> For type H2D. Size 9, version A + B mounting not possible.

<sup>8)</sup> Non-standard motor (sizes not included in EN 50347).

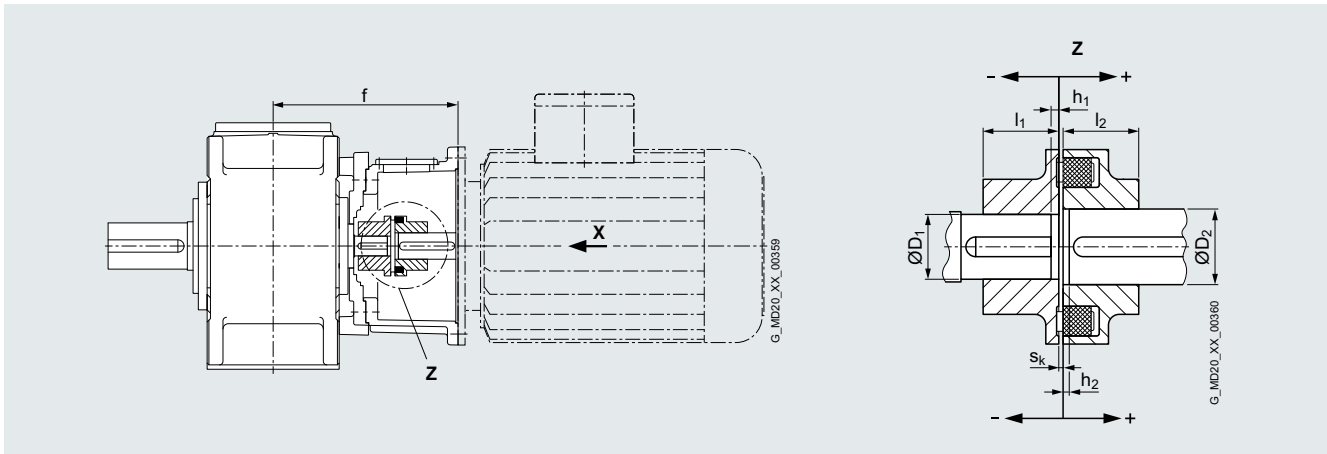
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-EUPEX coupling

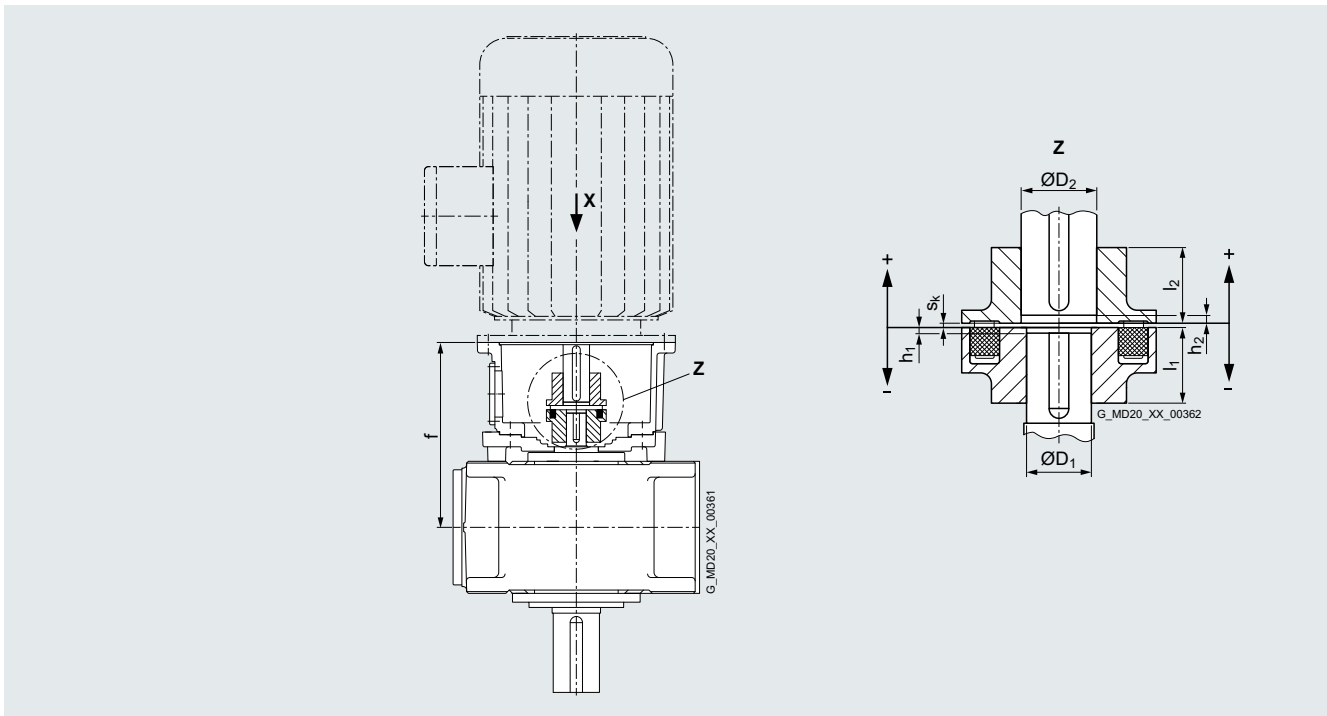
Helical gear unit, type H3, gear unit sizes 5 to 18

### Design

#### Horizontal mounting position



#### Vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure. For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), [see page 11/3](#).
- Helical gear unit in design G, H, I on request only.
- Not in connection with Taconite E or labyrinth seal at the drive shaft.

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-EUPEX coupling

#### Helical gear unit, type H3, gear unit sizes 5 to 18

#### Design (continued)

| Size                    | Dimensions in mm                                                                                                                                             |                    |       |       |       |       |       |       |      |         |                                                                                                                                                          |       |       |       |       |       |       |      |     |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|-------|-------|-------|-------|-------|------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|------|-----|
|                         | Ratios $i_N$<br>25 - 45 (sizes 5, 7, 9, 11)<br>31.5 - 56 (sizes 6, 8, 10, 12)<br>22.4 - 45 (sizes 13, 15, 17)<br>28 - 56 (size 14)<br>25 - 50 (sizes 16, 18) |                    |       |       |       |       |       |       |      |         | Ratios $i_N$<br>50 - 63 (sizes 5, 7, 9, 11)<br>63 - 80 (sizes 6, 8, 10, 12)<br>50 - 63 (sizes 13, 15, 17)<br>63 - 80 (size 14)<br>56 - 71 (sizes 16, 18) |       |       |       |       |       |       |      |     |
| IEC motor <sup>1)</sup> | N-EUPEX                                                                                                                                                      | $s_k$              | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | f    | N-EUPEX | $s_k$                                                                                                                                                    | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | f    |     |
| <b>5/6</b>              | 132                                                                                                                                                          | -                  | -     | -     | -     | -     | -     | -     | -    | -       | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    | -   |
|                         | 160                                                                                                                                                          | B125               | 3     | 50    | 40    | 50    | 42    | -12   | 9    | 364     | B125                                                                                                                                                     | 3     | 50    | 30    | 50    | 42    | -7    | 8    | 338 |
|                         | 180                                                                                                                                                          | B140               | 3     | 55    | 40    | 55    | 48    | -6.5  | 14.5 | 364     | B140                                                                                                                                                     | 3     | 55    | 30    | 55    | 48    | -5    | 10   | 338 |
|                         | 200                                                                                                                                                          | B160               | 4     | 60    | 40    | 60    | 55    | 0     | 6    | 350     | B160                                                                                                                                                     | 4     | 60    | 30    | 60    | 55    | -17   | 9    | 350 |
|                         | 225                                                                                                                                                          | B180               | 4     | 70    | 40    | 70    | 60    | -10   | 7    | 391     | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    | -   |
|                         | 250                                                                                                                                                          | <sup>3)</sup> B180 | 4     | 70    | 40    | 70    | 65    | -11.5 | 5    | 391     | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    | -   |
| <b>7/8</b>              | 160                                                                                                                                                          | -                  | -     | -     | -     | -     | -     | -     | -    | -       | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    | -   |
|                         | 180                                                                                                                                                          | -                  | -     | -     | -     | -     | -     | -     | -    | B140    | 3                                                                                                                                                        | 55    | 35    | 55    | 48    | 0     | 9     | 367  |     |
|                         | 200                                                                                                                                                          | B160               | 4     | 60    | 45    | 60    | 55    | 0     | 0    | 379     | B160                                                                                                                                                     | 4     | 60    | 35    | 60    | 55    | -9    | 12   | 379 |
|                         | 225                                                                                                                                                          | B180               | 4     | 70    | 45    | 70    | 60    | 0     | 11   | 420     | B180                                                                                                                                                     | 4     | 70    | 35    | 70    | 60    | -18   | 12.5 | 420 |
|                         | 250                                                                                                                                                          | B180               | 4     | 70    | 45    | 70    | 65    | 0     | 11   | 420     | B180                                                                                                                                                     | 4     | 70    | 35    | 70    | 65    | -15   | 16   | 420 |
|                         | 280                                                                                                                                                          | B200               | 4     | 80    | 45    | 80    | 75    | -14.5 | 17   | 441     | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    |     |
| <b>9/10</b>             | 180                                                                                                                                                          | -                  | -     | -     | -     | -     | -     | -     | -    | -       | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    | -   |
|                         | 200                                                                                                                                                          | -                  | -     | -     | -     | -     | -     | -     | -    | -       | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    | -   |
|                         | 225                                                                                                                                                          | B180               | 4     | 70    | 60    | 70    | 60    | -13.5 | 7    | 520     | B180                                                                                                                                                     | 4     | 70    | 45    | 70    | 60    | 0     | 10.5 | 485 |
|                         | 250                                                                                                                                                          | B180               | 4     | 70    | 60    | 70    | 65    | 11.5  | 9    | 520     | B180                                                                                                                                                     | 4     | 70    | 45    | 70    | 65    | 0     | 10.5 | 485 |
|                         | 280                                                                                                                                                          | B200               | 4     | 80    | 60    | 80    | 75    | 0     | 6    | 505     | B200                                                                                                                                                     | 4     | 80    | 45    | 80    | 75    | -5    | 26   | 505 |
|                         | 315 <sup>2)</sup>                                                                                                                                            | <sup>3)</sup> B225 | 4     | 90    | 60    | 90    | 80    | 0     | 13   | 542     | <sup>3)</sup> B225                                                                                                                                       | 4     | 90    | 45    | 90    | 80    | -12   | 26   | 542 |
| <b>11/12</b>            | 225                                                                                                                                                          | -                  | -     | -     | -     | -     | -     | -     | -    | -       | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    | -   |
|                         | 250                                                                                                                                                          | -                  | -     | -     | -     | -     | -     | -     | -    | B180    | 4                                                                                                                                                        | 70    | 65    | 70    | 65    | 0     | 10.5  | 490  |     |
|                         | 280                                                                                                                                                          | B200               | 4     | 80    | 70    | 80    | 75    | -12   | 9    | 540     | B200                                                                                                                                                     | 4     | 80    | 75    | 80    | 75    | -14   | 17   | 510 |
|                         | 315 <sup>2)</sup>                                                                                                                                            | B225               | 4     | 90    | 70    | 90    | 80    | 0     | -2   | 547     | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    |     |
| <b>13/14</b>            | 250                                                                                                                                                          | -                  | -     | -     | -     | -     | -     | -     | -    | -       | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    | -   |
|                         | 280                                                                                                                                                          | -                  | -     | -     | -     | -     | -     | -     | -    | B200    | 4                                                                                                                                                        | 80    | 60    | 80    | 75    | 0     | 10    | 599  |     |
|                         | 315 <sup>2)</sup>                                                                                                                                            | B225               | 4     | 90    | 85    | 90    | 80    | -18   | 4    | 666     | B225                                                                                                                                                     | 4     | 90    | 60    | 90    | 80    | 0     | 17   | 636 |
|                         | 315 (200 kW) <sup>4)</sup>                                                                                                                                   | B225               | 4     | 90    | 85    | 90    | 80    | -18   | 4    | 666     | B225                                                                                                                                                     | 4     | 90    | 60    | 90    | 80    | 0     | 17   | 636 |
|                         | 315 (250 kW) <sup>4)</sup>                                                                                                                                   | B225               | 4     | 90    | 85    | 90    | 80    | -18   | 4    | 666     | B225                                                                                                                                                     | 4     | 90    | 60    | 90    | 80    | 0     | 17   | 636 |
|                         | 315 (315 kW) <sup>4)</sup>                                                                                                                                   | B225               | 4     | 90    | 85    | 90    | 80    | -18   | 4    | 666     | B250                                                                                                                                                     | 4     | 100   | 60    | 100   | 80    | 0     | 17   | 636 |
|                         | 355 (355 kW) <sup>4)</sup>                                                                                                                                   | B280               | 5.5   | 110   | 85    | 110   | 90    | 2.5   | 0    | 643     | B280                                                                                                                                                     | 5.5   | 110   | 60    | 110   | 90    | 0     | 22.5 | 643 |
|                         | 355 (400 kW) <sup>4)</sup>                                                                                                                                   | B280               | 5.5   | 110   | 85    | 110   | 90    | 2.5   | 0    | 643     | -                                                                                                                                                        | -     | -     | -     | -     | -     | -     | -    |     |

<sup>1)</sup> Other motor sizes on request.

<sup>2)</sup> Only frame sizes 315 S and 315 M.

<sup>3)</sup> Only for vertical gear units.

<sup>4)</sup> Non-standard motor (sizes not included in EN 50347).

## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-EUPEX coupling

### Helical gear unit, type H3, gear unit sizes 5 to 18

#### Design (continued)

| Size                           | Dimensions in mm |       |       |       |       |       |       |       |     |         |              |       |       |       |       |       |       |     |
|--------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|-----|---------|--------------|-------|-------|-------|-------|-------|-------|-----|
|                                | Ratios $i_N$     |       |       |       |       |       |       |       |     |         | Ratios $i_N$ |       |       |       |       |       |       |     |
| IEC motor <sup>1)</sup>        | N-EUPEX          | $s_k$ | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$ | N-EUPEX | $s_k$        | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$ |
| <b>15/16</b> 280               | –                | –     | –     | –     | –     | –     | –     | –     | –   | –       | –            | –     | –     | –     | –     | –     | –     | –   |
| 315 <sup>2)</sup>              | –                | –     | –     | –     | –     | –     | –     | –     | –   | B225    | 4            | 90    | 75    | 90    | 80    | -8    | 12    | 684 |
| 315 (200 kW) <sup>3)</sup>     | –                | –     | –     | –     | –     | –     | –     | –     | –   | B225    | 4            | 90    | 75    | 90    | 80    | -8    | 12    | 684 |
| 315 (250 kW) <sup>3)</sup>     | –                | –     | –     | –     | –     | –     | –     | –     | –   | B225    | 4            | 90    | 75    | 90    | 80    | -8    | 12    | 684 |
| 315 (315 kW) <sup>3)</sup>     | B250             | 4     | 100   | 100   | 100   | 80    | -8.5  | 0     | 764 | B225    | 4            | 90    | 75    | 90    | 80    | -8    | 12    | 684 |
| 355 (355 kW) <sup>3)</sup>     | B280             | 5.5   | 110   | 100   | 110   | 90    | -17.5 | 0     | 743 | B280    | 5.5          | 110   | 75    | 110   | 90    | 0     | 25.5  | 691 |
| 355 (400 kW) <sup>3)</sup>     | B280             | 5.5   | 110   | 100   | 110   | 90    | -17.5 | 0     | 743 | B280    | 5.5          | 110   | 75    | 110   | 90    | 0     | 25.5  | 691 |
| <b>17/18</b> 315 <sup>2)</sup> | –                | –     | –     | –     | –     | –     | –     | –     | –   | –       | –            | –     | –     | –     | –     | –     | –     | –   |
| 315 (200 kW) <sup>3)</sup>     | –                | –     | –     | –     | –     | –     | –     | –     | –   | –       | –            | –     | –     | –     | –     | –     | –     | –   |
| 315 (250 kW) <sup>3)</sup>     | –                | –     | –     | –     | –     | –     | –     | –     | –   | –       | –            | –     | –     | –     | –     | –     | –     | –   |
| 315 (315 kW) <sup>3)</sup>     | –                | –     | –     | –     | –     | –     | –     | –     | –   | B225    | 4            | 90    | 75    | 90    | 80    | -6.5  | 13.5  | 714 |
| 355 (355 kW) <sup>3)</sup>     | B280             | 5.5   | 110   | 100   | 110   | 90    | -17.5 | 0     | 773 | B280    | 5.5          | 110   | 75    | 110   | 90    | 0     | 25.5  | 721 |
| 355 (400 kW) <sup>3)</sup>     | B280             | 5.5   | 110   | 100   | 110   | 90    | -17.5 | 0     | 773 | B280    | 5.5          | 110   | 75    | 110   | 90    | 0     | 25.5  | 721 |

<sup>1)</sup> Other motor sizes on request.

<sup>2)</sup> Only frame sizes 315 S and 315 M.

<sup>3)</sup> Non-standard motor (sizes not included in EN 50347).

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-EUPEX coupling

#### Helical gear unit, type H3, gear unit sizes 5 to 18

#### Design (continued)

| Size                       | Dimensions in mm           |                   |                |                |                |                |                |                |                |       |
|----------------------------|----------------------------|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|
|                            | IEC motor <sup>1)</sup>    | N-EUPEX           | s <sub>k</sub> | l <sub>1</sub> | D <sub>1</sub> | l <sub>2</sub> | D <sub>2</sub> | h <sub>1</sub> | h <sub>2</sub> | f     |
| <b>5/6</b>                 | 132                        | B95               | 3              | 35             | 24             | 35             | 38             | -7             | 12             | 302   |
|                            | 160                        | B125              | 3              | 50             | 24             | 50             | 42             | -17            | 8              | 338   |
|                            | 180                        | B140              | 3              | 55             | 24             | 55             | 48             | -15            | 10             | 338   |
|                            | 200                        | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
|                            | 225                        | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
|                            | 250                        | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
|                            | <b>7/8</b>                 | 160               | B125           | 3              | 50             | 28             | 50             | 42             | -7             | 12    |
| 180                        |                            | B140              | 3              | 55             | 28             | 55             | 48             | -10            | 9              | 367   |
| 200                        |                            | B160              | 4              | 60             | 28             | 60             | 55             | -17            | 13             | 379   |
| 225                        |                            | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
| 250                        |                            | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
| 280                        |                            | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
| <b>9/10</b>                | 180                        | B140              | 3              | 55             | 32             | 55             | 48             | 0              | 8.5            | 431.5 |
|                            | 200                        | B160              | 4              | 60             | 32             | 60             | 55             | 0              | 19.5           | 443.5 |
|                            | 225                        | B180              | 4              | 70             | 32             | 70             | 60             | -9             | 21.5           | 484.5 |
|                            | 250                        | B180              | 4              | 70             | 32             | 70             | 65             | -5.5           | 25             | 484.5 |
|                            | 280                        | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
|                            | 315 <sup>2)</sup>          | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
| <b>11/12</b>               | 225                        | B180              | 4              | 70             | 42             | 70             | 60             | -9.5           | 11             | 489.5 |
|                            | 250                        | B180              | 4              | 70             | 42             | 70             | 65             | -9.5           | 11             | 489.5 |
|                            | 280                        | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
|                            | 315 <sup>2)</sup>          | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
| <b>13/14</b>               | 250                        | B180              | 4              | 70             | 50             | 70             | 65             | -5             | 9.5            | 578.5 |
|                            | 280                        | B200              | 4              | 80             | 50             | 80             | 75             | -5             | 30             | 599   |
|                            | 315 <sup>2)</sup>          | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
|                            | 315 (200 kW) <sup>3)</sup> | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
|                            | 315 (250 kW) <sup>3)</sup> | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
|                            | 315 (315 kW) <sup>3)</sup> | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
|                            | 355 (355 kW) <sup>3)</sup> | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
|                            | 355 (400 kW) <sup>3)</sup> | –                 | –              | –              | –              | –              | –              | –              | –              | –     |
| <b>15/16</b>               | 280                        | B200              | 4              | 80             | 60             | 80             | 75             | 0              | 13             | 647   |
|                            | 315 <sup>2)</sup>          | B225              | 4              | 90             | 60             | 90             | 80             | 0              | 20             | 684   |
|                            | 315 (200 kW) <sup>3)</sup> | B225              | 4              | 90             | 60             | 90             | 80             | 0              | 20             | 684   |
|                            | 315 (250 kW) <sup>3)</sup> | B225              | 4              | 90             | 60             | 90             | 80             | 0              | 20             | 684   |
|                            | 315 (315 kW) <sup>3)</sup> | B250              | 4              | 100            | 60             | 100            | 80             | 0              | 20             | 684   |
|                            | 355 (355 kW) <sup>3)</sup> | B280              | 5.5            | 110            | 60             | 110            | 90             | 0              | 25.5           | 691   |
|                            | 355 (400 kW) <sup>3)</sup> | B280              | 5.5            | 110            | 60             | 110            | 90             | 0              | 25.5           | 691   |
|                            | <b>17/18</b>               | 315 <sup>2)</sup> | B225           | 4              | 90             | 60             | 90             | 80             | 0              | 20    |
| 315 (200 kW) <sup>3)</sup> |                            | B225              | 4              | 90             | 60             | 90             | 80             | 0              | 20             | 714   |
| 315 (250 kW) <sup>3)</sup> |                            | B225              | 4              | 90             | 60             | 90             | 80             | 0              | 20             | 714   |
| 315 (315 kW) <sup>3)</sup> |                            | B250              | 4              | 100            | 60             | 100            | 80             | 0              | 20             | 714   |
| 355 (355 kW) <sup>3)</sup> |                            | B280              | 5.5            | 110            | 60             | 110            | 90             | 0              | 25.5           | 721   |
| 355 (400 kW) <sup>3)</sup> |                            | B280              | 5.5            | 110            | 60             | 110            | 90             | 0              | 25.5           | 721   |

<sup>1)</sup> Other motor sizes on request.

<sup>2)</sup> Only frame sizes 315 S and 315 M.

<sup>3)</sup> Non-standard motor (sizes not included in EN 50347).

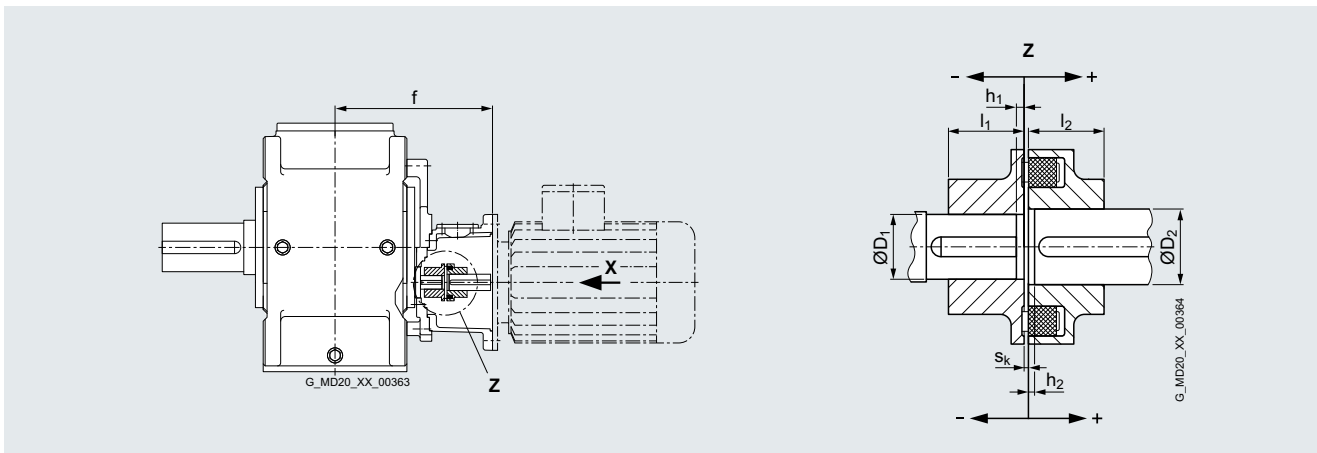
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-EUPEX coupling

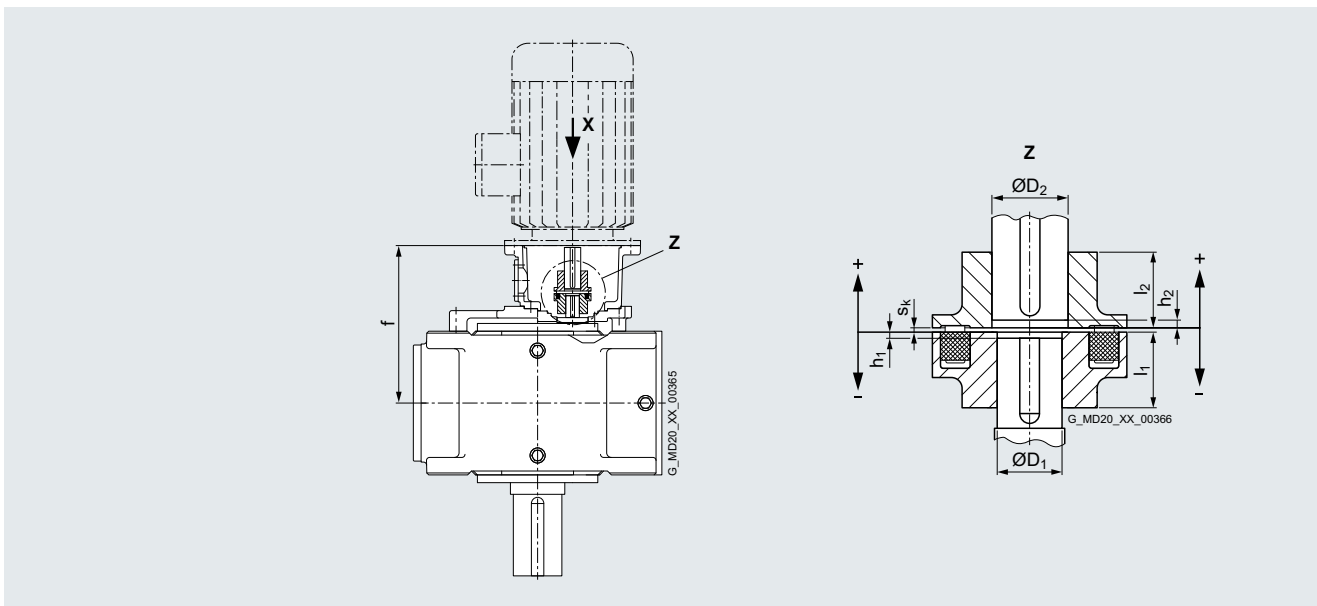
Helical gear unit, type H4, gear unit sizes 7 to 18

### Design

#### Horizontal mounting position



#### Vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure.  
For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), see [page 11/3](#).
- Helical gear unit in design G, H, I on request only.
- Not in connection with Taconite E or labyrinth seal at the drive shaft.



## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-EUPEX coupling

#### Helical gear unit, type H4, gear unit sizes 7 to 18

#### Design (continued)

| Size         | Dimensions in mm           |                                                                                                                                                              |       |       |       |       |       |       |      |         |                                                                                                                                                              |       |       |       |       |       |       |       |       |
|--------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
|              | IEC motor <sup>1)</sup>    | Ratios $i_N$<br>100 - 180 (sizes 7, 9, 11)<br>125 - 224 (sizes 8, 10, 12)<br>100 - 180 (sizes 13, 15, 17)<br>125 - 224 (size 14)<br>112 - 200 (sizes 16, 18) |       |       |       |       |       |       |      |         | Ratios $i_N$<br>200 - 355 (sizes 7, 9, 11)<br>250 - 450 (sizes 8, 10, 12)<br>200 - 355 (sizes 13, 15, 17)<br>250 - 450 (size 14)<br>224 - 400 (sizes 16, 18) |       |       |       |       |       |       |       |       |
|              | N-EUPEX                    | $s_k$                                                                                                                                                        | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$  | N-EUPEX | $s_k$                                                                                                                                                        | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$   |       |
| <b>7/8</b>   | 100                        | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | B80     | 3                                                                                                                                                            | 30    | 24    | 30    | 28    | -7    | 6     | 296   |       |
|              | 112                        | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | B80     | 3                                                                                                                                                            | 30    | 24    | 30    | 28    | -7    | 6     | 296   |       |
|              | 132                        | B95                                                                                                                                                          | 3     | 35    | 30    | 35    | 38    | -7    | 8    | 328.5   | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
|              | 160                        | B125                                                                                                                                                         | 3     | 50    | 30    | 50    | 42    | -6.5  | 15   | 364.5   | B125                                                                                                                                                         | 3     | 50    | 24    | 50    | 42    | -17   | 15    | 364.5 |
|              | 180                        | B140                                                                                                                                                         | 3     | 55    | 30    | 55    | 48    | -17   | 4.5  | 364.5   | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
| <b>9/10</b>  | 132                        | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | B95     | 3                                                                                                                                                            | 35    | 28    | 35    | 38    | -10   | 11.5  | 369.5 |       |
|              | 160                        | B125                                                                                                                                                         | 3     | 50    | 35    | 50    | 42    | -6.5  | 11   | 405.5   | B125                                                                                                                                                         | 3     | 50    | 28    | 50    | 42    | -13   | 14.5  | 405.5 |
|              | 180                        | B140                                                                                                                                                         | 3     | 55    | 35    | 55    | 48    | -10   | 7.5  | 405.5   | B140                                                                                                                                                         | 3     | 55    | 28    | 55    | 48    | -20   | 7.5   | 405.5 |
|              | 200                        | B160                                                                                                                                                         | 4     | 60    | 35    | 60    | 55    | -10   | 14.5 | 417.5   | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
|              | 225                        | B180                                                                                                                                                         | 4     | 70    | 35    | 70    | 60    | -18.5 | 21   | 458.5   | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
| <b>11/12</b> | 160                        | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | B125    | 3                                                                                                                                                            | 50    | 32    | 50    | 42    | 0     | 4.5   | 447.5 |       |
|              | 180                        | B140                                                                                                                                                         | 3     | 55    | 45    | 55    | 48    | -7    | 3.5  | 437.5   | B140                                                                                                                                                         | 3     | 55    | 32    | 55    | 48    | 0     | 4.5   | 447.5 |
|              | 200                        | B160                                                                                                                                                         | 4     | 60    | 45    | 60    | 55    | -6.5  | 15   | 485.5   | B160                                                                                                                                                         | 4     | 60    | 32    | 60    | 55    | 0     | 15.5  | 459.5 |
|              | 225                        | B180                                                                                                                                                         | 4     | 70    | 45    | 70    | 60    | 0     | 6.5  | 500.5   | B180                                                                                                                                                         | 4     | 70    | 32    | 70    | 60    | -3    | 23.5  | 500.5 |
|              | 250                        | B180                                                                                                                                                         | 4     | 70    | 45    | 70    | 65    | 0     | 6.5  | 500.5   | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
| <b>13/14</b> | 160                        | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | B125    | 3                                                                                                                                                            | 50    | 38    | 50    | 42    | -9    | 10.5  | 517.5 |       |
|              | 180                        | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | B140    | 3                                                                                                                                                            | 55    | 38    | 55    | 48    | -3.5  | 16    | 517.5 |       |
|              | 200                        | B160                                                                                                                                                         | 4     | 60    | 50    | 60    | 55    | -2    | 8.5  | 529.5   | B160                                                                                                                                                         | 4     | 60    | 38    | 60    | 55    | 0     | 4.5   | 503.5 |
|              | 225                        | B180                                                                                                                                                         | 4     | 70    | 50    | 70    | 60    | -9.5  | 21   | 579.5   | B180                                                                                                                                                         | 4     | 70    | 38    | 70    | 60    | -4    | 11.5  | 544.5 |
|              | 250                        | B180                                                                                                                                                         | 4     | 70    | 50    | 70    | 65    | -7.5  | 23   | 579.5   | B180                                                                                                                                                         | 4     | 70    | 38    | 70    | 65    | -4    | 11.5  | 544.5 |
|              | 280                        | B200                                                                                                                                                         | 4     | 80    | 50    | 80    | 75    | 0     | 16   | 565     | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
|              | 315 <sup>2)</sup>          | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | -       | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
| <b>15/16</b> | 200                        | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | B160    | 4                                                                                                                                                            | 60    | 50    | 60    | 55    | 0     | 3.5   | 572.5 |       |
|              | 225                        | B180                                                                                                                                                         | 4     | 70    | 60    | 70    | 60    | -15.5 | 9    | 648.5   | B180                                                                                                                                                         | 4     | 70    | 50    | 70    | 60    | 0     | 14.5  | 613.5 |
|              | 250                        | B180                                                                                                                                                         | 4     | 70    | 60    | 70    | 65    | -13.5 | 11   | 648.5   | B180                                                                                                                                                         | 4     | 70    | 50    | 70    | 65    | 0     | 14.5  | 613.5 |
|              | 280                        | B200                                                                                                                                                         | 4     | 80    | 60    | 80    | 75    | 0     | 10   | 634     | B200                                                                                                                                                         | 4     | 80    | 50    | 80    | 75    | -3    | 32    | 634   |
|              | 315 <sup>2)</sup>          | B225                                                                                                                                                         | 4     | 90    | 60    | 90    | 80    | 0     | 17   | 671     | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
|              | 315 (200 kW) <sup>3)</sup> | B225                                                                                                                                                         | 4     | 90    | 60    | 90    | 80    | 0     | 17   | 671     | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
|              | 315 (250 kW) <sup>3)</sup> | B225                                                                                                                                                         | 4     | 90    | 60    | 90    | 80    | 0     | 17   | 671     | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
|              | 315 (315 kW) <sup>3)</sup> | B225                                                                                                                                                         | 4     | 90    | 60    | 90    | 80    | 0     | 17   | 671     | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
| <b>17/18</b> | 225                        | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | B180    | 4                                                                                                                                                            | 70    | 50    | 70    | 60    | -3    | 16.5  | 623.5 |       |
|              | 250                        | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | B180    | 4                                                                                                                                                            | 70    | 50    | 70    | 65    | -4    | 15.5  | 623.5 |       |
|              | 280                        | B200                                                                                                                                                         | 4     | 80    | 60    | 80    | 75    | -5    | 10   | 644     | B200                                                                                                                                                         | 4     | 80    | 50    | 80    | 75    | -6    | 34    | 644   |
|              | 315 <sup>2)</sup>          | B225                                                                                                                                                         | 4     | 90    | 60    | 90    | 80    | 0     | 22   | 681     | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
|              | 315 (200 kW) <sup>3)</sup> | B225                                                                                                                                                         | 4     | 90    | 60    | 90    | 80    | 0     | 22   | 681     | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
|              | 315 (250 kW) <sup>3)</sup> | B225                                                                                                                                                         | 4     | 90    | 60    | 90    | 80    | 0     | 22   | 681     | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
|              | 315 (315 kW) <sup>3)</sup> | B225                                                                                                                                                         | 4     | 90    | 60    | 90    | 80    | 0     | 22   | 681     | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |
|              | 355 (355 kW) <sup>3)</sup> | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -    | -       | -                                                                                                                                                            | -     | -     | -     | -     | -     | -     | -     |       |

<sup>1)</sup> Other motor sizes on request.

<sup>2)</sup> Only frame sizes 315 S and 315 M.

<sup>3)</sup> Non-standard motor (sizes not included in EN 50347).

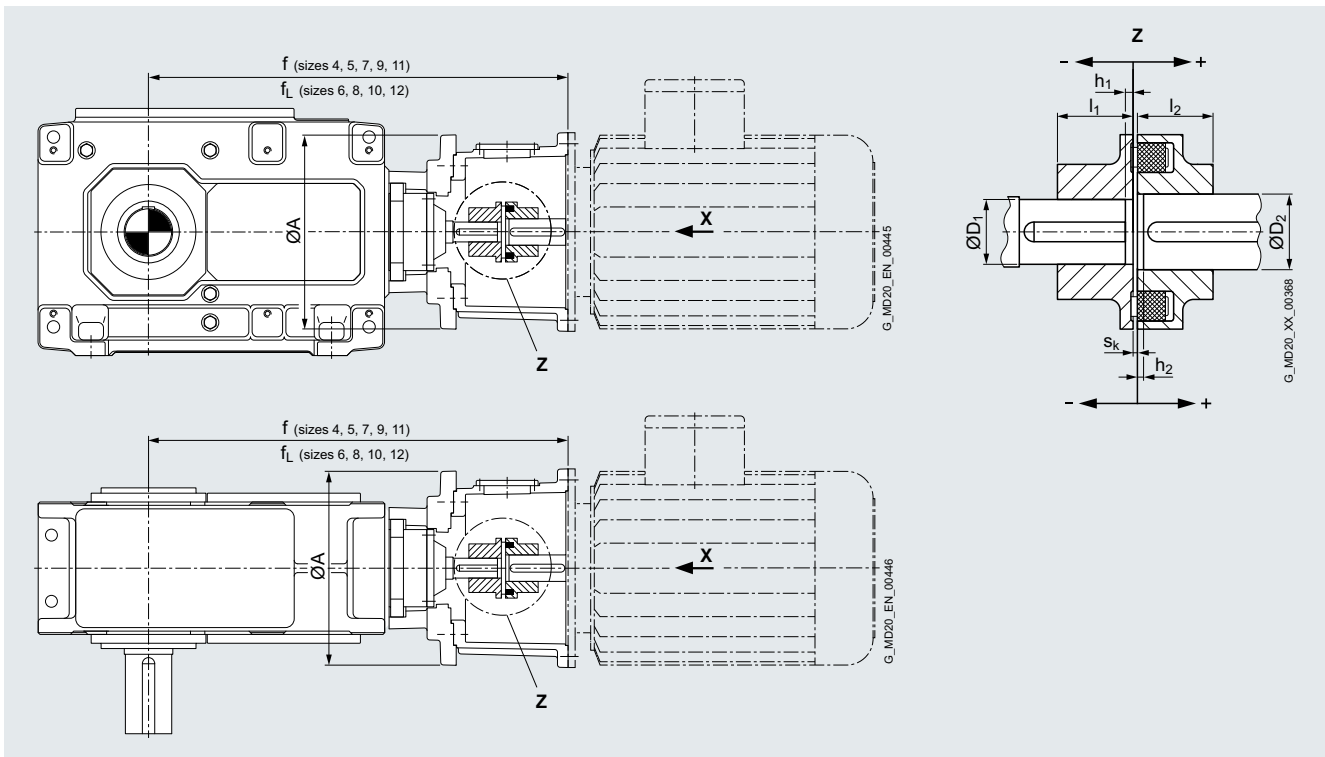
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-EUPEX coupling

Bevel helical gear unit, type B2, gear unit sizes 4 to 12

### Design

#### Horizontal and vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure. For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), [see page 11/3](#).
- Not in connection with Taconite E or labyrinth seal at the drive shaft.

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-EUPEX coupling

#### Bevel helical gear unit, type B2, gear unit sizes 4 to 12

#### Design (continued)

| Size         | Dimensions in mm        |         |       |       |       |       |       |       |       |       |       |     |
|--------------|-------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|
|              | IEC motor <sup>1)</sup> | N-EUPEX | $s_k$ | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$   | $f_L$ | $A$ |
| <b>4</b>     | 180                     | –       | –     | –     | –     | –     | –     | –     | –     | –     | –     | –   |
|              | 200                     | B160    | 4     | 60    | 45    | 60    | 55    | 0     | 5.5   | 684.5 | –     | 400 |
| <b>5/6</b>   | 200                     | –       | –     | –     | –     | –     | –     | –     | –     | –     | –     | –   |
|              | 225                     | –       | –     | –     | –     | –     | –     | –     | –     | –     | –     | –   |
| <b>7/8</b>   | 250                     | –       | –     | –     | –     | –     | –     | –     | –     | –     | –     | –   |
|              | 280                     | B200    | 4     | 80    | 70    | 80    | 75    | -9    | 6     | 934   | 979   | 550 |
| <b>9/10</b>  | 280                     | –       | –     | –     | –     | –     | –     | –     | –     | –     | –     | –   |
| <b>11/12</b> | 315 <sup>2)</sup>       | –       | –     | –     | –     | –     | –     | –     | –     | –     | –     | –   |

<sup>1)</sup> Other gear unit and motor sizes on request.

<sup>2)</sup> Only frame sizes 315 S and 315 M.

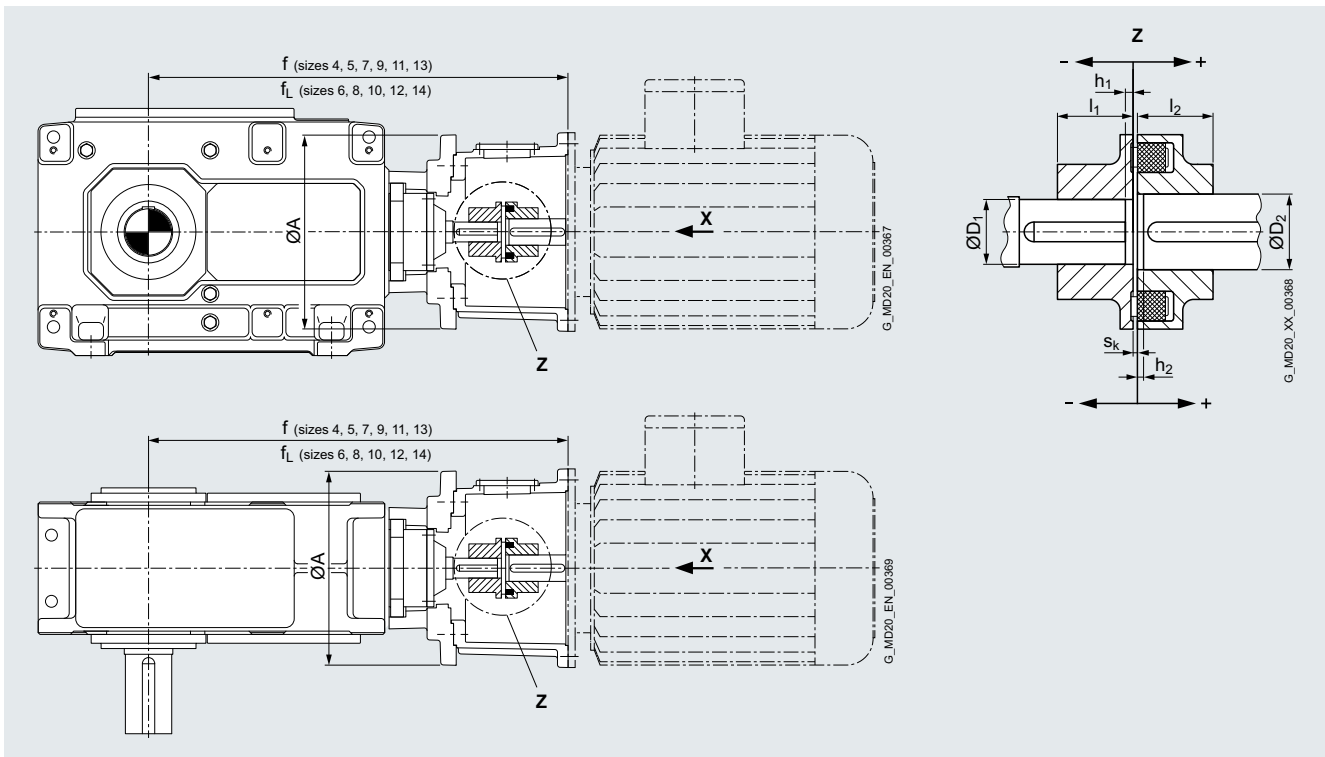
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-EUPEX coupling

Bevel helical gear unit, type B3, gear unit sizes 4 to 18

### Design

#### Horizontal and vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure. For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), [see page 11/3](#).
- Not in connection with Taconite E or labyrinth seal at the drive shaft.

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-EUPEX coupling

#### Bevel helical gear unit, type B3, gear unit sizes 4 to 18

#### Design (continued)

| Size                    | Dimensions in mm                                                                                                                                                   |            |       |       |       |       |       |       |      |        |        |         |                                                                                                                                                                |       |       |       |       |       |       |        |        |        |     |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|-------|-------|-------|-------|-------|------|--------|--------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|--------|--------|--------|-----|
|                         | Ratios $i_N$<br>12.5 - 45 (sizes 3, 4, 5, 7, 9, 11)<br>16 - 56 (sizes 6, 8, 10, 12)<br>12.5 - 45 (sizes 13, 15, 17)<br>16 - 56 (size 14)<br>14 - 50 (sizes 16, 18) |            |       |       |       |       |       |       |      |        |        |         | Ratios $i_N$<br>50 - 71 (sizes 3, 4, 5, 7, 9, 11)<br>63 - 90 (sizes 6, 8, 10, 12)<br>50 - 71 (sizes 13, 15, 17)<br>63 - 90 (size 14)<br>56 - 80 (sizes 16, 18) |       |       |       |       |       |       |        |        |        |     |
| IEC motor <sup>1)</sup> | N-EUPEX X                                                                                                                                                          | $s_k$      | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$  | $f_L$  | A      | N-EUPEX | $s_k$                                                                                                                                                          | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$    | $f_L$  | A      |     |
| <b>4</b>                | 132                                                                                                                                                                | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B95     | 3                                                                                                                                                              | 35    | 25    | 35    | 38    | 0     | 4.5   | 646.5  | -      | 250    |     |
|                         | 160                                                                                                                                                                | B125       | 3     | 50    | 30    | 50    | 42    | 0     | -0.5 | 682.5  | -      | 250     | B125                                                                                                                                                           | 3     | 50    | 25    | 50    | 42    | 0     | 9.5    | 682.5  | -      | 250 |
|                         | 180                                                                                                                                                                | B140       | 3     | 55    | 30    | 55    | 48    | 0     | -0.5 | 682.5  | -      | 250     | B140                                                                                                                                                           | 3     | 55    | 25    | 55    | 48    | 0     | 9.5    | 682.5  | -      | 250 |
|                         | 200                                                                                                                                                                | B160       | 4     | 60    | 30    | 60    | 55    | 0     | 11   | 694.5  | -      | 250     | -                                                                                                                                                              | -     | -     | -     | -     | -     | -     | -      | -      | -      | -   |
| <b>5/6</b>              | 160                                                                                                                                                                | B125       | 3     | 50    | 35    | 50    | 42    | 0     | 3.5  | 771.5  | 806.5  | 340     | B125                                                                                                                                                           | 3     | 50    | 28    | 50    | 42    | -7    | 17     | 771.5  | 806.5  | 340 |
|                         | 180                                                                                                                                                                | B140       | 3     | 55    | 35    | 55    | 48    | 0     | 3.5  | 771.5  | 806.5  | 340     | B140                                                                                                                                                           | 3     | 55    | 28    | 55    | 48    | -2    | 22     | 771.5  | 806.5  | 340 |
|                         | 200                                                                                                                                                                | B160       | 4     | 60    | 35    | 60    | 55    | 0     | 15   | 783.5  | 818.5  | 340     | B160                                                                                                                                                           | 4     | 60    | 28    | 60    | 55    | -8    | 27     | 783.5  | 818.5  | 340 |
|                         | 225                                                                                                                                                                | B180       | 4     | 70    | 35    | 70    | 60    | -8    | 18   | 824.5  | 859.5  | 340     | -                                                                                                                                                              | -     | -     | -     | -     | -     | -     | -      | -      | -      | -   |
| <b>7/8</b>              | 160                                                                                                                                                                | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B125    | 3                                                                                                                                                              | 50    | 35    | 50    | 42    | -8    | 13    | 903.5  | 948.5  | 440    |     |
|                         | 180                                                                                                                                                                | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B140    | 3                                                                                                                                                              | 55    | 35    | 55    | 48    | -3    | 18    | 903.5  | 948.5  | 440    |     |
|                         | 200                                                                                                                                                                | B160       | 4     | 60    | 45    | 60    | 55    | 0     | 5.5  | 909.5  | 954.5  | 440     | B160                                                                                                                                                           | 4     | 60    | 35    | 60    | 55    | 0     | 1.5    | 885.5  | 930.5  | 440 |
|                         | 225                                                                                                                                                                | B180       | 4     | 70    | 45    | 70    | 60    | 0     | 1.5  | 935.5  | 980.5  | 440     | B180                                                                                                                                                           | 4     | 70    | 35    | 70    | 60    | 0     | 22     | 935.5  | 980.5  | 440 |
|                         | 250                                                                                                                                                                | B180       | 4     | 70    | 45    | 70    | 65    | 0     | 1.5  | 935.5  | 980.5  | 440     | B180                                                                                                                                                           | 4     | 70    | 35    | 70    | 65    | 0     | 22     | 935.5  | 980.5  | 440 |
|                         | 280                                                                                                                                                                | B200       | 4     | 80    | 45    | 80    | 75    | 0     | 17   | 950.5  | 945.5  | 440     | -                                                                                                                                                              | -     | -     | -     | -     | -     | -     | -      | -      | -      | -   |
| <b>9/10</b>             | 200                                                                                                                                                                | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B160    | 4                                                                                                                                                              | 60    | 40    | 60    | 55    | 0     | 21    | 1034.5 | 1084.5 | 440    |     |
|                         | 225                                                                                                                                                                | B180       | 4     | 70    | 55    | 70    | 60    | -2    | 5    | 1060.5 | 1110.5 | 440     | B180                                                                                                                                                           | 4     | 70    | 40    | 70    | 60    | 0     | 17     | 1060.5 | 1110.5 | 440 |
|                         | 250                                                                                                                                                                | B180       | 4     | 70    | 55    | 70    | 65    | 0     | 6.5  | 1060.5 | 1110.5 | 440     | B180                                                                                                                                                           | 4     | 70    | 40    | 70    | 65    | 0     | 17     | 1060.5 | 1110.5 | 440 |
|                         | 280                                                                                                                                                                | B200       | 4     | 80    | 55    | 80    | 75    | 0     | 22   | 1046   | 1096.5 | 440     | B200                                                                                                                                                           | 4     | 80    | 40    | 80    | 75    | 0     | 2      | 1046   | 1096   | 440 |
| <b>11/12</b>            | 225                                                                                                                                                                | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B180    | 4                                                                                                                                                              | 70    | 50    | 70    | 60    | -9    | 21    | 1243.5 | 1313.5 | 440    |     |
|                         | 250                                                                                                                                                                | B180       | 4     | 70    | 70    | 70    | 65    | -5    | 0    | 1243.5 | 1313.5 | 440     | B180                                                                                                                                                           | 4     | 70    | 50    | 70    | 65    | -9    | 21     | 1243.5 | 1313.5 | 440 |
|                         | 280                                                                                                                                                                | B200       | 4     | 80    | 70    | 80    | 75    | -12   | 8    | 1258.5 | 1328.5 | 440     | B200                                                                                                                                                           | 4     | 80    | 50    | 80    | 75    | 0     | 15     | 1229   | 1299   | 440 |
|                         | 315 <sup>2)</sup>                                                                                                                                                  | B225       | 4     | 90    | 70    | 90    | 80    | -10   | 17   | 1296   | 1366   | 440     | B225                                                                                                                                                           | 4     | 90    | 50    | 90    | 80    | 0     | 22     | 1266   | 1336   | 440 |
| <b>13/14</b>            | 280                                                                                                                                                                | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B200    | 4                                                                                                                                                              | 80    | 60    | 80    | 75    | 0     | 15    | 1424   | 1494   | 445    |     |
|                         | 315 <sup>2)</sup>                                                                                                                                                  | B225       | 4     | 90    | 80    | 90    | 80    | -9    | 8    | 1481   | 1551   | 445     | B225                                                                                                                                                           | 4     | 90    | 60    | 90    | 80    | 0     | 22     | 1461   | 1531   | 445 |
|                         | 315 (200 kW) <sup>3)</sup>                                                                                                                                         | B225       | 4     | 90    | 80    | 90    | 80    | -9    | 8    | 1481   | 1551   | 445     | B225                                                                                                                                                           | 4     | 90    | 60    | 90    | 80    | 0     | 22     | 1461   | 1531   | 445 |
|                         | 315 (250 kW) <sup>3)</sup>                                                                                                                                         | B225       | 4     | 90    | 80    | 90    | 80    | -9    | 8    | 1481   | 1551   | 445     | B225                                                                                                                                                           | 4     | 90    | 60    | 90    | 80    | 0     | 22     | 1461   | 1531   | 445 |
|                         | 315 (315 kW) <sup>3)</sup>                                                                                                                                         | B225       | 4     | 90    | 80    | 90    | 80    | -9    | 8    | 1481   | 1551   | 445     | B225                                                                                                                                                           | 4     | 90    | 60    | 90    | 80    | 0     | 22     | 1461   | 1531   | 445 |
|                         | 355 (355 kW) <sup>3)</sup>                                                                                                                                         | On request |       |       |       |       |       |       |      |        |        |         | On request                                                                                                                                                     |       |       |       |       |       |       |        |        |        |     |
|                         | 355 (400 kW) <sup>3)</sup>                                                                                                                                         | On request |       |       |       |       |       |       |      |        |        |         | On request                                                                                                                                                     |       |       |       |       |       |       |        |        |        |     |
| <b>15/16</b>            | 315 <sup>2)</sup>                                                                                                                                                  | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B225    | 4                                                                                                                                                              | 90    | 70    | 90    | 80    | -3    | 14    | 1698   | 1744   | 520    |     |
|                         | 315 (200 kW) <sup>3)</sup>                                                                                                                                         | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B225    | 4                                                                                                                                                              | 90    | 70    | 90    | 80    | -3    | 14    | 1698   | 1744   | 520    |     |
|                         | 315 (250 kW) <sup>3)</sup>                                                                                                                                         | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B225    | 4                                                                                                                                                              | 90    | 70    | 90    | 80    | -3    | 14    | 1698   | 1744   | 520    |     |
|                         | 315 (315 kW) <sup>3)</sup>                                                                                                                                         | B250       | 5     | 100   | 90    | 100   | 80    | -21   | 0    | 1728   | 1774   | 520     | B250                                                                                                                                                           | 4     | 100   | 70    | 100   | 80    | -3    | 14     | 1698   | 1744   | 520 |
|                         | 355 (355 kW) <sup>3)</sup>                                                                                                                                         | On request |       |       |       |       |       |       |      |        |        |         | On request                                                                                                                                                     |       |       |       |       |       |       |        |        |        |     |
|                         | 355 (400 kW) <sup>3)</sup>                                                                                                                                         | On request |       |       |       |       |       |       |      |        |        |         | On request                                                                                                                                                     |       |       |       |       |       |       |        |        |        |     |
|                         | 355 (400 kW) <sup>3)</sup>                                                                                                                                         | On request |       |       |       |       |       |       |      |        |        |         | On request                                                                                                                                                     |       |       |       |       |       |       |        |        |        |     |
| <b>17/18</b>            | 315 (200 kW) <sup>2)</sup>                                                                                                                                         | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B225    | 4                                                                                                                                                              | 90    | 80    | 90    | 80    | -10   | 1     | 1945   | 2000.5 | 645    |     |
|                         | 315 (250 kW) <sup>3)</sup>                                                                                                                                         | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B225    | 4                                                                                                                                                              | 90    | 80    | 90    | 80    | -10   | 1     | 1945   | 2000.5 | 645    |     |
|                         | 315 (315 kW) <sup>3)</sup>                                                                                                                                         | -          | -     | -     | -     | -     | -     | -     | -    | -      | -      | B250    | 4                                                                                                                                                              | 100   | 80    | 100   | 80    | -10   | 1     | 1945   | 2000.5 | 645    |     |
|                         | 355 (355 kW) <sup>3)</sup>                                                                                                                                         | On request |       |       |       |       |       |       |      |        |        |         | On request                                                                                                                                                     |       |       |       |       |       |       |        |        |        |     |
|                         | 355 (400 kW) <sup>3)</sup>                                                                                                                                         | On request |       |       |       |       |       |       |      |        |        |         | On request                                                                                                                                                     |       |       |       |       |       |       |        |        |        |     |
|                         | 355 (400 kW) <sup>3)</sup>                                                                                                                                         | On request |       |       |       |       |       |       |      |        |        |         | On request                                                                                                                                                     |       |       |       |       |       |       |        |        |        |     |

<sup>1)</sup> Other motor sizes on request.

<sup>2)</sup> Only frame sizes 315 S and 315 M.

<sup>3)</sup> Non-standard motor (sizes not included in EN 50347).

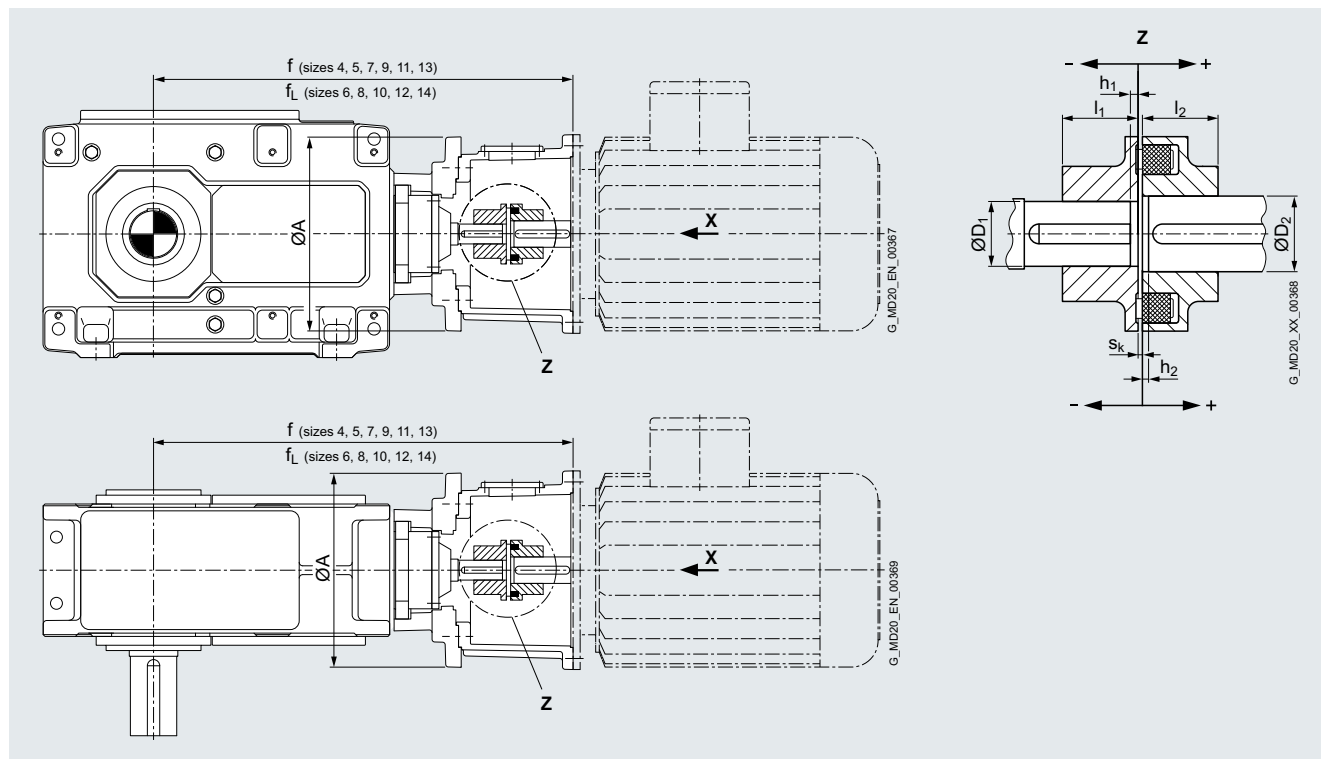
## Options for installation and add-on parts

Motor bell housing for IEC standard motor with N-EUPEX coupling

Bevel helical gear unit, type B4, gear unit sizes 5 to 18

### Design

#### Horizontal and vertical mounting position



- For applications with special design requirements (high switching frequency, alternating direction of load; e.g. hoisting gears, traveling gears, etc.), a coupling design is to be checked in accordance with the respective valid coupling brochure. For deviating couplings, please consult Flender.
- For mounting dimensions for IEC motors EN 50347 (View X), [see page 11/3](#).
- Not in connection with Taconite E or labyrinth seal at the drive shaft.

## Options for installation and add-on parts

### Motor bell housing for IEC standard motor with N-EUPEX coupling

#### Bevel helical gear unit, type B4, gear unit sizes 5 to 18

#### Design (continued)

| Size                       | Dimensions in mm                                                                                                                                                |       |       |       |       |       |       |       |      |        |        |                                                                                                                                                                    |       |       |       |       |       |       |       |        |        |        |     |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|------|--------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|-----|
|                            | Ratios $i_N$<br>80 - 180 (sizes 5, 7, 9, 11)<br>100 - 224 (sizes 6, 8, 10, 12)<br>80 - 180 (sizes 13, 15, 17)<br>100 - 224 (size 14)<br>90 - 200 (sizes 16, 18) |       |       |       |       |       |       |       |      |        |        | Ratios $i_N$<br>200 - 315 (sizes 5, 7, 9, 11)<br>250 - 400 (sizes 6, 8, 10, 12)<br>200 - 315 (sizes 13, 15, 17)<br>250 - 400 (size 14)<br>224 - 355 (sizes 16, 18) |       |       |       |       |       |       |       |        |        |        |     |
| IEC motor <sup>1)</sup>    | N-EUPEX                                                                                                                                                         | $s_k$ | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$  | $f_L$  | A      | N-EUPEX                                                                                                                                                            | $s_k$ | $l_1$ | $D_1$ | $l_2$ | $D_2$ | $h_1$ | $h_2$ | $f$    | $f_L$  | A      |     |
| <b>5/6</b>                 | 100                                                                                                                                                             | -     | -     | -     | -     | -     | -     | -     | -    | -      | -      | B80                                                                                                                                                                | 3     | 30    | 20    | 30    | 28    | 0     | 6     | 734    | 769    | 245    |     |
|                            | 112                                                                                                                                                             | B80   | 3     | 30    | 28    | 30    | 28    | 0     | 1    | 734    | 769    | 245                                                                                                                                                                | B80   | 3     | 30    | 20    | 30    | 28    | 0     | 6      | 734    | 769    | 245 |
|                            | 132                                                                                                                                                             | B95   | 3     | 35    | 28    | 35    | 38    | -5.5  | 8    | 766.5  | 801.5  | 245                                                                                                                                                                | B95   | 3     | 35    | 20    | 35    | 38    | -6    | 12.5   | 766.5  | 801.5  | 245 |
|                            | 160                                                                                                                                                             | B125  | 3     | 50    | 28    | 50    | 42    | -4.5  | 15   | 802.5  | 837.5  | 245                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      | -   |
| <b>7/8</b>                 | 112                                                                                                                                                             | -     | -     | -     | -     | -     | -     | -     | -    | -      | -      | B80                                                                                                                                                                | 3     | 30    | 25    | 30    | 28    | -3.5  | 2.5   | 854    | 899    | 250    |     |
|                            | 132                                                                                                                                                             | B95   | 3     | 35    | 30    | 35    | 38    | -3    | 5.5  | 886.5  | 931.5  | 250                                                                                                                                                                | B95   | 3     | 35    | 25    | 35    | 38    | 0     | 3.5    | 871.5  | 916.5  | 250 |
|                            | 160                                                                                                                                                             | B125  | 3     | 50    | 30    | 50    | 42    | 0     | -0.5 | 907.5  | 952.5  | 250                                                                                                                                                                | B125  | 3     | 50    | 25    | 50    | 42    | 0     | 9.5    | 907.5  | 952.5  | 250 |
|                            | 180                                                                                                                                                             | B140  | 3     | 55    | 30    | 55    | 48    | 0     | -0.5 | 907.5  | 952.5  | 250                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      | -   |
|                            | 200                                                                                                                                                             | B160  | 4     | 60    | 30    | 60    | 55    | 0     | 10.5 | 919.5  | 964.5  | 250                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      | -   |
| <b>9/10</b>                | 132                                                                                                                                                             | -     | -     | -     | -     | -     | -     | -     | -    | -      | -      | B95                                                                                                                                                                | 3     | 35    | 28    | 35    | 38    | -7.5  | 10    | 1000.5 | 1050.5 | 340    |     |
|                            | 160                                                                                                                                                             | B125  | 3     | 50    | 35    | 50    | 42    | 0     | 3.5  | 1036.5 | 1086.5 | 340                                                                                                                                                                | B125  | 3     | 50    | 28    | 50    | 42    | -7    | 16.5   | 1036.5 | 1086.5 | 340 |
|                            | 180                                                                                                                                                             | B140  | 3     | 55    | 35    | 55    | 48    | 0     | 3.5  | 1036.5 | 1086.5 | 340                                                                                                                                                                | B140  | 3     | 55    | 28    | 55    | 48    | -2    | 21.5   | 1036.5 | 1086.5 | 340 |
|                            | 200                                                                                                                                                             | B160  | 4     | 60    | 35    | 60    | 55    | 0     | 14.5 | 1048.5 | 1098.5 | 340                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
|                            | 225                                                                                                                                                             | B180  | 4     | 70    | 35    | 70    | 60    | 0     | 25.5 | 1089.5 | 1139.5 | 340                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
| <b>11/12</b>               | 160                                                                                                                                                             | -     | -     | -     | -     | -     | -     | -     | -    | -      | -      | B125                                                                                                                                                               | 3     | 50    | 35    | 50    | 42    | -8    | 12.5  | 1223.5 | 1293.5 | 440    |     |
|                            | 180                                                                                                                                                             | B140  | 3     | 55    | 45    | 55    | 48    | -0.5  | 0    | 1223.5 | 1293.5 | 440                                                                                                                                                                | B140  | 3     | 55    | 35    | 55    | 48    | -3    | 17.5   | 1223.5 | 1293.5 | 440 |
|                            | 200                                                                                                                                                             | B180  | 4     | 70    | 45    | 70    | 55    | 0     | 5.5  | 1229.5 | 1299.5 | 440                                                                                                                                                                | B180  | 4     | 70    | 35    | 70    | 55    | 0     | 1.5    | 1205.5 | 1275.5 | 440 |
|                            | 225                                                                                                                                                             | B180  | 4     | 70    | 45    | 70    | 60    | 0     | 1.5  | 1255.5 | 1325.5 | 440                                                                                                                                                                | B180  | 4     | 70    | 35    | 70    | 60    | 0     | 21.5   | 1255.5 | 1325.5 | 440 |
|                            | 250                                                                                                                                                             | B180  | 4     | 70    | 45    | 70    | 65    | 0     | 1.5  | 1255   | 1325   | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
|                            | 280                                                                                                                                                             | B200  | 4     | 80    | 45    | 80    | 75    | 0     | 17   | 1270.5 | 1340.5 | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
| <b>13/14</b>               | 180                                                                                                                                                             | -     | -     | -     | -     | -     | -     | -     | -    | -      | -      | B140                                                                                                                                                               | 3     | 55    | 40    | 55    | 48    | -3    | 12.5  | 1398.5 | 1468.5 | 440    |     |
|                            | 200                                                                                                                                                             | B160  | 4     | 60    | 55    | 60    | 55    | -7.5  | 3    | 1404.5 | 1474.5 | 440                                                                                                                                                                | B160  | 4     | 60    | 40    | 60    | 55    | 0     | 20.5   | 1404.5 | 1474.5 | 440 |
|                            | 225                                                                                                                                                             | B180  | 4     | 70    | 55    | 70    | 60    | -1.5  | 5    | 1430.5 | 1500.5 | 440                                                                                                                                                                | B180  | 4     | 70    | 40    | 70    | 60    | 0     | 16.5   | 1430.5 | 1500.5 | 440 |
|                            | 250                                                                                                                                                             | B180  | 4     | 70    | 55    | 70    | 65    | 0     | 6.5  | 1430   | 1500   | 440                                                                                                                                                                | B180  | 4     | 70    | 40    | 70    | 65    | 0     | 16.5   | 1430   | 1500   | 440 |
|                            | 280                                                                                                                                                             | B200  | 4     | 80    | 55    | 80    | 75    | 0     | 22   | 1446   | 1516   | 440                                                                                                                                                                | B225  | 4     | 90    | 40    | 90    | 75    | -7    | 25     | 1446   | 1516   | 440 |
|                            | 315 <sup>2)</sup>                                                                                                                                               | B225  | 4     | 90    | 55    | 90    | 80    | -5    | 24   | 1483   | 1553   | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
|                            | 315 (200 kW) <sup>3)</sup>                                                                                                                                      | B225  | 4     | 90    | 55    | 90    | 80    | -5    | 24   | 1483   | 1553   | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
|                            | 315 (250 kW) <sup>3)</sup>                                                                                                                                      | B225  | 4     | 90    | 55    | 90    | 80    | -5    | 24   | 1483   | 1553   | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
| <b>15/16</b>               | 200                                                                                                                                                             | -     | -     | -     | -     | -     | -     | -     | -    | -      | -      | B160                                                                                                                                                               | 4     | 60    | 50    | 60    | 55    | -1    | 8.5   | 1635.5 | 1681.5 | 440    |     |
|                            | 225                                                                                                                                                             | B200  | 4     | 80    | 70    | 80    | 60    | -4.5  | 0    | 1685.5 | 1731.5 | 440                                                                                                                                                                | B180  | 4     | 70    | 50    | 70    | 60    | -9    | 20.5   | 1685.5 | 1731.5 | 440 |
|                            | 250                                                                                                                                                             | B200  | 4     | 80    | 70    | 80    | 65    | -4.5  | 0    | 1685.5 | 1731.5 | 440                                                                                                                                                                | B180  | 4     | 70    | 50    | 70    | 65    | -7    | 22.5   | 1685.5 | 1731.5 | 440 |
|                            | 280                                                                                                                                                             | B200  | 4     | 80    | 70    | 80    | 75    | -11.5 | 8.5  | 1701   | 1747   | 440                                                                                                                                                                | B200  | 4     | 80    | 50    | 80    | 75    | 0     | 15     | 1671   | 1717   | 440 |
|                            | 315 <sup>2)</sup>                                                                                                                                               | B225  | 4     | 90    | 70    | 90    | 80    | -10   | 17   | 1738   | 1784   | 440                                                                                                                                                                | B225  | 4     | 90    | 50    | 90    | 80    | 0     | 22     | 1708   | 1754   | 440 |
|                            | 315 (200 kW) <sup>3)</sup>                                                                                                                                      | B225  | 4     | 90    | 70    | 90    | 80    | -10   | 17   | 1738   | 1784   | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
|                            | 315 (250 kW) <sup>3)</sup>                                                                                                                                      | B225  | 4     | 90    | 70    | 90    | 80    | -10   | 17   | 1738   | 1784   | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
|                            | 315 (315 kW) <sup>3)</sup>                                                                                                                                      | B225  | 4     | 90    | 70    | 90    | 80    | -10   | 17   | 1738   | 1784   | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
|                            | 355 (355 kW) <sup>3)</sup>                                                                                                                                      | B250  | 5     | 100   | 70    | 100   | 90    | 0     | 28   | 1533   | 1603   | 645                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      |        |     |
|                            | <b>17/18</b>                                                                                                                                                    | 225   | -     | -     | -     | -     | -     | -     | -    | -      | -      | -                                                                                                                                                                  | B180  | 4     | 70    | 50    | 70    | 60    | -9    | 20.5   | 1733.5 | 1793.5 | 440 |
| 250                        |                                                                                                                                                                 | -     | -     | -     | -     | -     | -     | -     | -    | -      | -      | B180                                                                                                                                                               | 4     | 70    | 50    | 70    | 65    | -7    | 22.5  | 1733.5 | 1793.5 | 440    |     |
| 280                        |                                                                                                                                                                 | B200  | 4     | 80    | 70    | 80    | 75    | -11.5 | 8.5  | 1749   | 1809   | 440                                                                                                                                                                | B200  | 4     | 80    | 50    | 80    | 75    | 0     | 15     | 1719   | 1779   | 440 |
| 315 <sup>2)</sup>          |                                                                                                                                                                 | B225  | 4     | 90    | 70    | 90    | 80    | -9.5  | 17.5 | 1786   | 1846   | 440                                                                                                                                                                | B225  | 4     | 90    | 50    | 90    | 80    | 0     | 22     | 1756   | 1816   | 440 |
| 315 (200 kW) <sup>3)</sup> |                                                                                                                                                                 | B225  | 4     | 90    | 70    | 90    | 80    | -9.5  | 17.5 | 1786   | 1846   | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
| 315 (250 kW) <sup>3)</sup> |                                                                                                                                                                 | B225  | 4     | 90    | 70    | 90    | 80    | -9.5  | 17.5 | 1786   | 1846   | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
| 315 (315 kW) <sup>3)</sup> |                                                                                                                                                                 | B225  | 4     | 90    | 70    | 90    | 80    | -9.5  | 17.5 | 1786   | 1846   | 440                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
| 355 (355 kW) <sup>3)</sup> |                                                                                                                                                                 | B250  | 5     | 100   | 70    | 100   | 90    | -8    | 20   | 1788   | 1848   | 645                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |
| 355 (400 kW) <sup>3)</sup> |                                                                                                                                                                 | B280  | 5     | 110   | 70    | 110   | 90    | -8    | 20   | 1788   | 1848   | 645                                                                                                                                                                | -     | -     | -     | -     | -     | -     | -     | -      | -      | -      |     |

<sup>1)</sup> Other motor sizes on request.

<sup>2)</sup> Only frame sizes 315 S and 315 M.

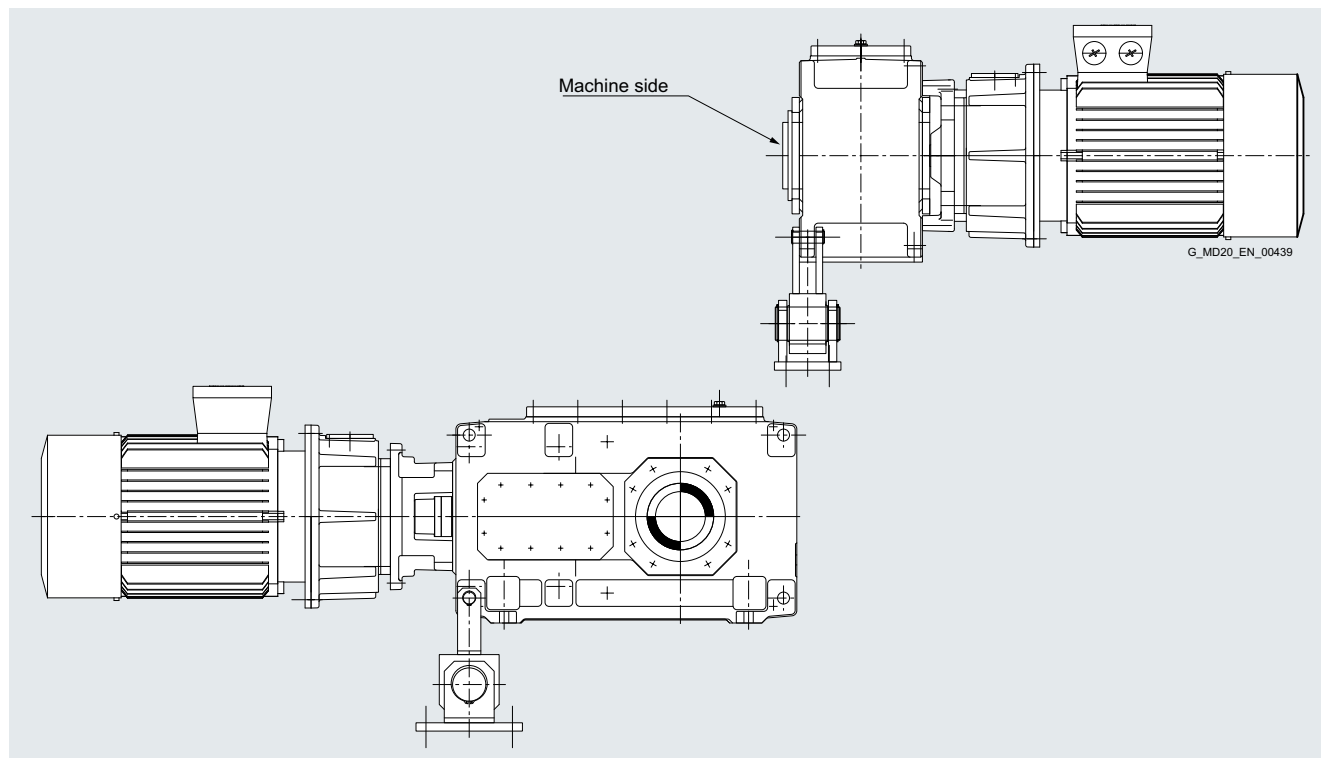
<sup>3)</sup> Non-standard motor (sizes not included in EN 50347).

## Options for installation and add-on parts

### Vibration-damping torque reaction arm for gear unit housing

Types H2, H3, H4, B2, B3, B4

#### Overview



The maximum transmissible torque is limited by the torque reaction arm.

The following applies:  $T_{\max} = f_{\text{DMST}} \times T_{2\text{rated}}$

Peak torque factor  $f_{\text{DMST}}$  for torque reaction arm <sup>1)</sup>

| Gear unit size | Type       |     |     |     |     |     |  |
|----------------|------------|-----|-----|-----|-----|-----|--|
|                | H2         | H3  | H4  | B2  | B3  | B4  |  |
| 4              | 1.3        | –   | –   | 1.2 | 1.2 | –   |  |
| 5              | 1.9        | 2.0 | –   | 1.2 | 1.6 | 2.0 |  |
| 6              | 1.6        | 1.7 | –   | 1.2 | 1.4 | 1.7 |  |
| 7              | 2.0        | 2.0 | 2.0 | 1.3 | 1.8 | 2.0 |  |
| 8              | 1.7        | 2.0 | 2.0 | 1.2 | 1.6 | 2.0 |  |
| 9              | 1.5        | 1.6 | 1.7 | 1.2 | 1.2 | 1.7 |  |
| 10             | 1.3        | 1.4 | 1.4 | 1.2 | 1.2 | 1.4 |  |
| 11             | 2.0        | 2.0 | 2.0 | 1.9 | 2.0 | 1.2 |  |
| 12             | 2.0        | 2.0 | 2.0 | 1.8 | 2.0 | 1.2 |  |
| 13             | –          | 2.0 | 2.0 | 1.4 | 1.8 | 2.0 |  |
| 14             | –          | 1.9 | 2.0 | 1.3 | 1.7 | 2.0 |  |
| 15             | –          | 1.5 | 1.7 | –   | 1.4 | 1.6 |  |
| 16             | –          | 1.4 | 1.5 | –   | 1.3 | 1.5 |  |
| 17             | –          | 1.2 | 1.3 | –   | 1.2 | 1.3 |  |
| 18             | –          | 1.2 | 1.2 | –   | 1.2 | 1.2 |  |
| 19 – 22        | On request |     |     |     |     |     |  |

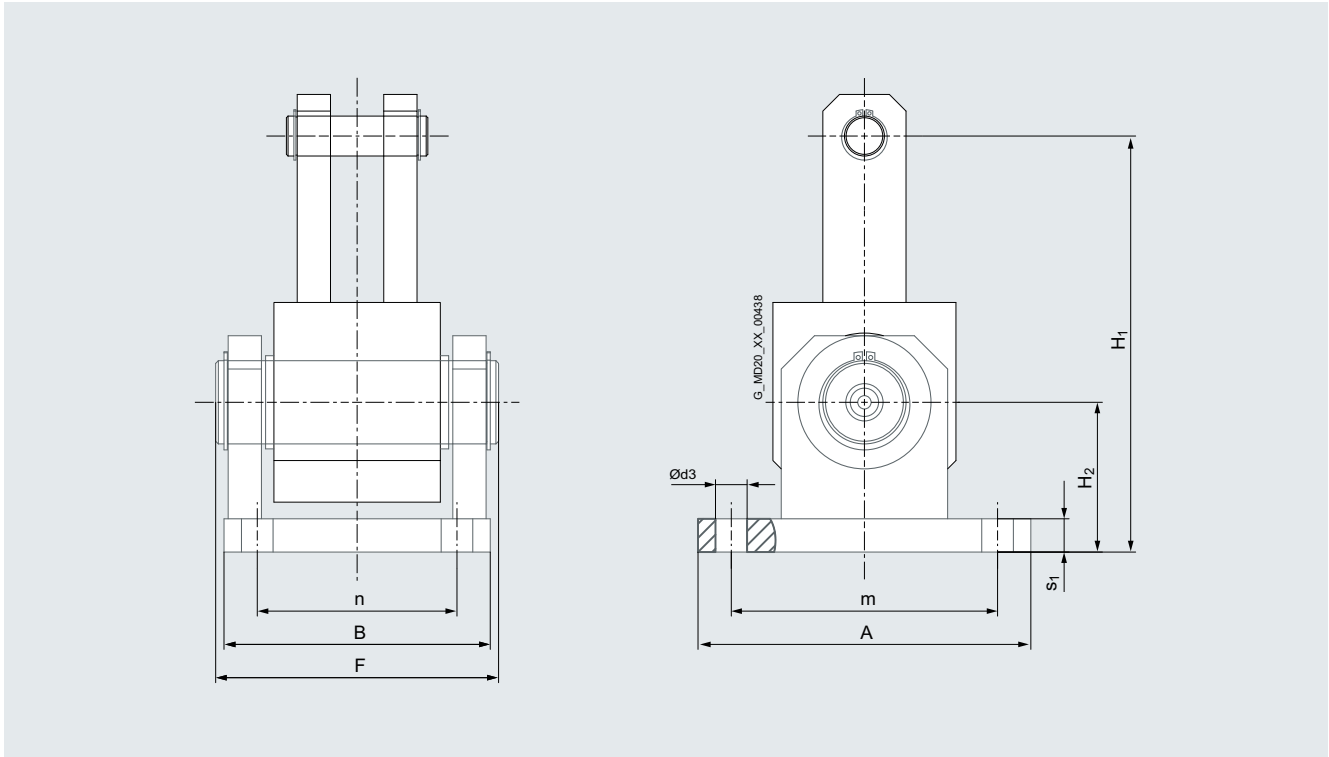
<sup>1)</sup> The specified table values are minimum values. If necessary, higher peak torques can be permitted if the direction of rotation and motor type are specified. Consultation is required.



## Options for installation and add-on parts

### Vibration-damping torque reaction arm for gear unit housing

Types H2, H3, H4, B2, B3, B4

**Overview** (continued)

| Gear unit size | Dimensions in mm |     |                 |     |                |                |     |     |                |     | Metalastik socket | Weight kg |
|----------------|------------------|-----|-----------------|-----|----------------|----------------|-----|-----|----------------|-----|-------------------|-----------|
|                | A                | B   | Ød <sub>3</sub> | F   | H <sub>1</sub> | H <sub>2</sub> | m   | n   | s <sub>1</sub> |     |                   |           |
| <b>4</b>       | 160              | 110 | 19              | 116 | 200            | 65             | 120 | 70  | 15             | 79  | 6.8               |           |
| <b>5 + 6</b>   | 200              | 160 | 19              | 170 | 250            | 90             | 160 | 120 | 20             | 95  | 16                |           |
| <b>7 + 8</b>   | 320              | 200 | 19              | 195 | 400            | 140            | 260 | 130 | 25             | 772 | 37                |           |
| <b>9 + 10</b>  | 320              | 200 | 19              | 195 | 400            | 140            | 260 | 130 | 25             | 772 | 42                |           |
| <b>11 + 12</b> | 400              | 300 | 24              | 320 | 500            | 175            | 320 | 240 | 30             | 805 | 155               |           |
| <b>13 + 14</b> | 400              | 300 | 24              | 320 | 500            | 175            | 320 | 240 | 30             | 805 | 159               |           |
| <b>15 + 16</b> | 400              | 300 | 24              | 320 | 500            | 175            | 320 | 240 | 30             | 805 | 163               |           |
| <b>17 + 18</b> | 400              | 300 | 24              | 320 | 500            | 175            | 320 | 240 | 30             | 805 | 167               |           |
| <b>19 – 22</b> | On request       |     |                 |     |                |                |     |     |                |     |                   |           |

Torque reaction arm on the driven machine side (helical gear unit version C, D, G, H, I only on request).

For gear units without motor bell housings, couplings that do not transmit any lateral forces must be used.

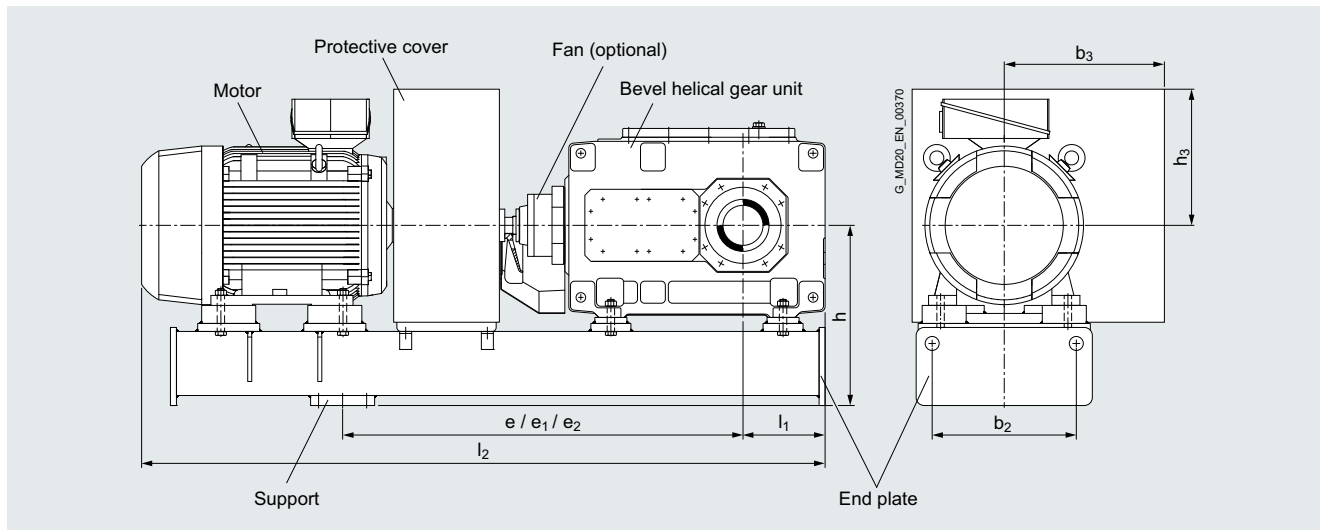
Torque reaction arm in combination with fan only on request.

## Options for installation and add-on parts

### Gear unit swing base for bevel helical gear unit

#### Types B3 and B4

#### Overview



The gear unit swing base is a special beam construction that is perfectly laid out for accommodating the individual components of a drive assembly. The drive assembly can be mounted as a unit in the customer's work machine. The individual components are aligned to one another during the installation.

The drive assembly mainly consists of a bevel helical gear unit and a motor.

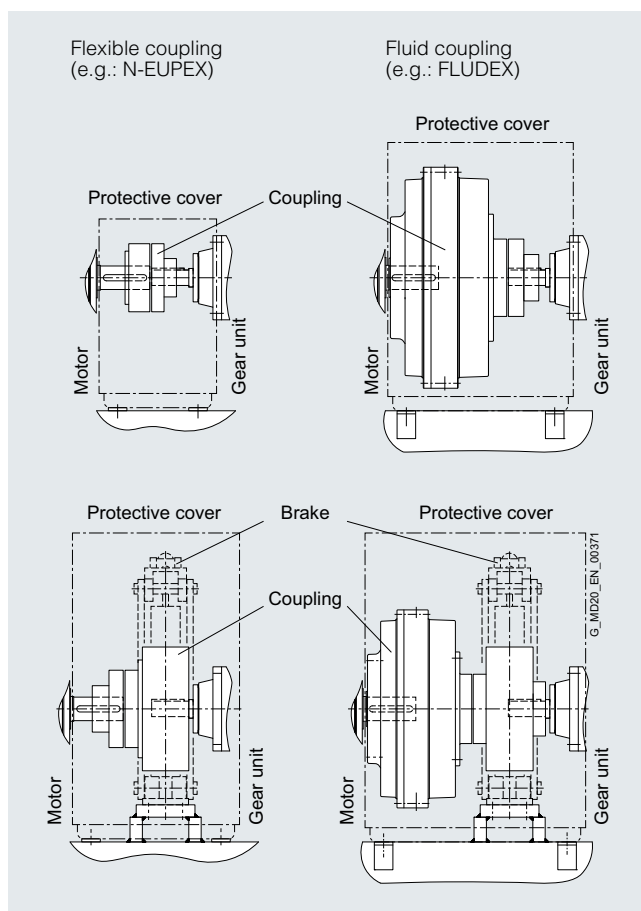
The gear units encompass the types B3 and B4 in sizes 4 to 18. Types B2 and T3 and sizes 19 to 28 are also available on request. You can find details about the gear unit in Chapter 6.

Flexible couplings (e.g. N-EUPEX) and fluid couplings (e.g. FLUDEX) are available for connecting the main components. Depending on the requirement, drive-side brakes of various manufacturers and types can be provided.

The coupling and brake are protected against accidental contact by a protective cover. In connection with a fluid coupling, the protective cover must be equipped with a monitoring system (see notes).

Gear units with gear unit swing bases are provided as a shaft-mounted gear unit for connecting to a torque reaction arm. The gear unit swing base is available with or without a vibration-damping support (see torque reaction arm).

A drive assembly can also be implemented as a foundation installation. The beam construction needed for this is the base frame. This is not shown in this catalog, but is available upon request.



## Options for installation and add-on parts

### Gear unit swing base for bevel helical gear unit

Types B3 and B4

**Overview** (continued)**Connection dimensions**

| Gear unit sizes | Dimensions in mm  |                |                |      |                |                |                   |                |                |      |                |                |
|-----------------|-------------------|----------------|----------------|------|----------------|----------------|-------------------|----------------|----------------|------|----------------|----------------|
|                 | Gear unit type B3 |                |                |      |                |                | Gear unit type B4 |                |                |      |                |                |
|                 | e                 | e <sub>1</sub> | e <sub>2</sub> | h    | h <sub>1</sub> | h <sub>2</sub> | e                 | e <sub>1</sub> | e <sub>2</sub> | h    | h <sub>1</sub> | h <sub>2</sub> |
| 4               | 850               | 850            | 1250           | 380  | 430            | 610            | –                 | –              | –              | –    | –              | –              |
| 5               | 1000              | 1050           | 1300           | 450  | 515            | 715            | 1000              | 950            | 1250           | 450  | 515            | 715            |
| 6               | 1050              | 1100           | 1350           | 450  | 515            | 715            | 1050              | 1000           | 1300           | 450  | 515            | 715            |
| 7               | 1150              | 1250           | 1450           | 540  | 630            | 880            | 1150              | 1050           | 1350           | 540  | 630            | 880            |
| 8               | 1200              | 1300           | 1500           | 540  | 630            | 880            | 1200              | 1100           | 1400           | 540  | 630            | 880            |
| 9               | 1350              | 1450           | 1650           | 630  | 720            | 970            | 1350              | 1250           | 1500           | 630  | 720            | 970            |
| 10              | 1400              | 1500           | 1700           | 630  | 720            | 970            | 1400              | 1300           | 1550           | 630  | 720            | 970            |
| 11              | 1550              | 1650           | 1900           | 740  | 880            | 1280           | 1550              | 1450           | 1650           | 740  | 880            | 1280           |
| 12              | 1600              | 1700           | 1950           | 740  | 880            | 1280           | 1600              | 1500           | 1700           | 740  | 880            | 1280           |
| 13              | 1750              | 1900           | 2150           | 850  | 990            | 1390           | 1750              | 1700           | 1900           | 850  | 990            | 1390           |
| 14              | 1750              | 1900           | 2150           | 850  | 990            | 1390           | 1750              | 1700           | 1900           | 850  | 990            | 1390           |
| 15              | 2000              | 2200           | 2450           | 975  | 1150           | 1650           | 2000              | 2000           | 2200           | 975  | 1150           | 1650           |
| 16              | 2000              | 2200           | 2450           | 975  | 1150           | 1650           | 2000              | 2000           | 2200           | 975  | 1150           | 1650           |
| 17              | 2200              | 2500           | 2750           | 1025 | 1200           | 1700           | 2200              | 2200           | 2400           | 1025 | 1200           | 1700           |
| 18              | 2200              | 2500           | 2750           | 1025 | 1200           | 1700           | 2200              | 2200           | 2400           | 1025 | 1200           | 1700           |

h<sub>1</sub> and h<sub>2</sub>, see graphic page 11/38.

| Gear unit sizes | Dimensions in mm                                |     |     |     |     |     |     |     |     |     |      |      |      |    | Type |
|-----------------|-------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|----|------|
|                 | Dimension b <sub>2</sub> for motor axis heights |     |     |     |     |     |     |     |     |     |      |      |      |    |      |
|                 | 100                                             | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 | 355  | 400  | 450  |    |      |
| 4               | 240                                             | 240 | 340 | 340 | 420 | 420 | 600 | 600 | 600 | –   | –    | –    | –    | B3 |      |
| 5/6             | 290                                             | 290 | 290 | 420 | 420 | 420 | 600 | 600 | 600 | 700 | –    | –    | –    |    |      |
| 7/8             | 340                                             | 340 | 340 | 340 | 420 | 420 | 600 | 600 | 600 | 700 | –    | –    | –    |    |      |
| 9/10            | 420                                             | 420 | 420 | 420 | 420 | 420 | 600 | 600 | 600 | 800 | 800  | –    | –    |    |      |
| 11/12           | 490                                             | 490 | 490 | 490 | 490 | 490 | 490 | 700 | 700 | 700 | 1000 | 1000 | 1000 |    |      |
| 13/14           | 600                                             | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 700 | 1000 | 1000 | 1000 |    |      |
| 15/16           | 700                                             | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 1000 | 1000 | 1000 |    |      |
| 17/18           | 800                                             | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800  | 1000 | 1000 |    |      |
| 5/6             | 290                                             | 290 | 290 | 420 | 420 | 420 | –   | –   | –   | –   | –    | –    | –    | B4 |      |
| 7/8             | 340                                             | 340 | 340 | 340 | 420 | 420 | 600 | 600 | –   | –   | –    | –    | –    |    |      |
| 9/10            | 420                                             | 420 | 420 | 420 | 420 | 420 | 600 | 600 | 600 | –   | –    | –    | –    |    |      |
| 11/12           | 490                                             | 490 | 490 | 490 | 490 | 490 | 490 | 700 | 700 | 700 | –    | –    | –    |    |      |
| 13/14           | 600                                             | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 700 | –    | –    | –    |    |      |
| 15/16           | 700                                             | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 1000 | 1000 | –    |    |      |
| 17/18           | 800                                             | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800  | 1000 | –    |    |      |

h, h<sub>1</sub>, h<sub>2</sub> If motor axis height ≤ Gear unit axis height  
e Elastic (flexible) coupling  
e<sub>1</sub> FLUDEX coupling without antechamber, with or without drum brake (f<sub>A</sub> = 2)  
e<sub>2</sub> FLUDEX coupling with antechamber, with or without drum brake (f<sub>A</sub> = 1.5)  
l<sub>1</sub>, l<sub>2</sub>, b<sub>3</sub>, h<sub>3</sub> Dimensions determined by installed components, motor, coupling, brakes, etc.  
(to be found in dimension drawing or bid drawing)

The specifications e, e<sub>1</sub> and e<sub>2</sub> can be adapted to customer specifications, changes to several dimensions are possible during this.

## Options for installation and add-on parts

Gear unit swing base for bevel helical gear unit

### Article No. overview

#### Selection and ordering data

The following ordering information refers to the gear unit swing base with separate Article No. and order position.

| The Article No. is supplemented with order codes (Y..) assigned by the configurator. | Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |   |
|--------------------------------------------------------------------------------------|----------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|---|
|                                                                                      | Article No.                      | <b>2DA061</b> | ■ | - | . | ■  | ■  | ■  | .  | -  | .  | .  | 0 |
| <b>Gear unit type and fan</b>                                                        |                                  |               |   |   |   |    |    |    |    |    |    |    |   |
| B3/T3 without fan                                                                    |                                  |               | 1 |   |   |    |    |    |    |    |    |    |   |
| B4 without fan                                                                       |                                  |               | 2 |   |   |    |    |    |    |    |    |    |   |
| B3_E without fan                                                                     |                                  |               | 3 |   |   |    |    |    |    |    |    |    |   |
| B3/T3 with fan                                                                       |                                  |               | 5 |   |   |    |    |    |    |    |    |    |   |
| B3_E with fan                                                                        |                                  |               | 6 |   |   |    |    |    |    |    |    |    |   |
| <b>Gear unit sizes</b>                                                               |                                  |               |   |   |   |    |    |    |    |    |    |    |   |
| 4                                                                                    |                                  |               |   |   |   | D  |    |    |    |    |    |    |   |
| 5                                                                                    |                                  |               |   |   |   | E  |    |    |    |    |    |    |   |
| 6                                                                                    |                                  |               |   |   |   | F  |    |    |    |    |    |    |   |
| 7                                                                                    |                                  |               |   |   |   | G  |    |    |    |    |    |    |   |
| 8                                                                                    |                                  |               |   |   |   | H  |    |    |    |    |    |    |   |
| 9                                                                                    |                                  |               |   |   |   | J  |    |    |    |    |    |    |   |
| 10                                                                                   |                                  |               |   |   |   | K  |    |    |    |    |    |    |   |
| 11                                                                                   |                                  |               |   |   |   | L  |    |    |    |    |    |    |   |
| 12                                                                                   |                                  |               |   |   |   | M  |    |    |    |    |    |    |   |
| 13                                                                                   |                                  |               |   |   |   | N  |    |    |    |    |    |    |   |
| 14                                                                                   |                                  |               |   |   |   | P  |    |    |    |    |    |    |   |
| 15                                                                                   |                                  |               |   |   |   | Q  |    |    |    |    |    |    |   |
| 16                                                                                   |                                  |               |   |   |   | R  |    |    |    |    |    |    |   |
| 17                                                                                   |                                  |               |   |   |   | S  |    |    |    |    |    |    |   |
| 18                                                                                   |                                  |               |   |   |   | T  |    |    |    |    |    |    |   |
| <b>Motor frame sizes (specifications required for motor)</b>                         |                                  |               |   |   |   |    |    |    |    |    |    |    |   |
| IEC motor 56 M                                                                       |                                  |               |   |   |   |    |    | A  | 0  |    |    |    |   |
| IEC motor 63 M                                                                       |                                  |               |   |   |   |    |    | B  | 0  |    |    |    |   |
| IEC motor 71 M                                                                       |                                  |               |   |   |   |    |    | C  | 0  |    |    |    |   |
| IEC motor 80 M                                                                       |                                  |               |   |   |   |    |    | D  | 0  |    |    |    |   |
| IEC motor 100 S                                                                      |                                  |               |   |   |   |    |    | E  | 0  |    |    |    |   |
| IEC motor 100 L                                                                      |                                  |               |   |   |   |    |    | F  | 0  |    |    |    |   |
| IEC motor 112 S                                                                      |                                  |               |   |   |   |    |    | G  | 0  |    |    |    |   |
| IEC motor 112 M                                                                      |                                  |               |   |   |   |    |    | H  | 0  |    |    |    |   |
| IEC motor 112 L                                                                      |                                  |               |   |   |   |    |    | J  | 0  |    |    |    |   |
| IEC motor 132 S                                                                      |                                  |               |   |   |   |    |    | K  | 0  |    |    |    |   |
| IEC motor 132 M                                                                      |                                  |               |   |   |   |    |    | L  | 0  |    |    |    |   |
| IEC motor 132 L                                                                      |                                  |               |   |   |   |    |    | M  | 0  |    |    |    |   |
| IEC motor 160 S                                                                      |                                  |               |   |   |   |    |    | N  | 0  |    |    |    |   |
| IEC motor 160 M                                                                      |                                  |               |   |   |   |    |    | P  | 0  |    |    |    |   |
| IEC motor 160 L                                                                      |                                  |               |   |   |   |    |    | Q  | 0  |    |    |    |   |
| IEC motor 180 S                                                                      |                                  |               |   |   |   |    |    | R  | 0  |    |    |    |   |
| IEC motor 180 M                                                                      |                                  |               |   |   |   |    |    | S  | 0  |    |    |    |   |
| IEC motor 180 L                                                                      |                                  |               |   |   |   |    |    | T  | 0  |    |    |    |   |
| IEC motor 200 S                                                                      |                                  |               |   |   |   |    |    | U  | 0  |    |    |    |   |
| IEC motor 200 M                                                                      |                                  |               |   |   |   |    |    | V  | 0  |    |    |    |   |
| IEC motor 200 L                                                                      |                                  |               |   |   |   |    |    | W  | 0  |    |    |    |   |
| IEC motor 225S                                                                       |                                  |               |   |   |   |    |    | A  | 1  |    |    |    |   |
| IEC motor 225M                                                                       |                                  |               |   |   |   |    |    | B  | 1  |    |    |    |   |
| IEC motor 225L                                                                       |                                  |               |   |   |   |    |    | C  | 1  |    |    |    |   |
| IEC motor 250S                                                                       |                                  |               |   |   |   |    |    | D  | 1  |    |    |    |   |
| IEC motor 250M                                                                       |                                  |               |   |   |   |    |    | E  | 1  |    |    |    |   |
| IEC motor 250L                                                                       |                                  |               |   |   |   |    |    | F  | 1  |    |    |    |   |
| IEC motor 280S                                                                       |                                  |               |   |   |   |    |    | G  | 1  |    |    |    |   |
| IEC motor 280M                                                                       |                                  |               |   |   |   |    |    | H  | 1  |    |    |    |   |
| IEC motor 280L                                                                       |                                  |               |   |   |   |    |    | J  | 1  |    |    |    |   |
| IEC motor 315S                                                                       |                                  |               |   |   |   |    |    | K  | 1  |    |    |    |   |
| IEC motor 315M                                                                       |                                  |               |   |   |   |    |    | L  | 1  |    |    |    |   |
| Non-standard motor 315L (based on EN 50347)                                          |                                  |               |   |   |   |    |    | M  | 1  |    |    |    |   |
| Non-standard motor 355S (based on EN 50347)                                          |                                  |               |   |   |   |    |    | N  | 1  |    |    |    |   |
| Non-standard motor 355M (based on EN 50347)                                          |                                  |               |   |   |   |    |    | P  | 1  |    |    |    |   |
| Non-standard motor 355L (based on EN 50347)                                          |                                  |               |   |   |   |    |    | Q  | 1  |    |    |    |   |
| Non-standard motor 400S (based on EN 50347)                                          |                                  |               |   |   |   |    |    | R  | 1  |    |    |    |   |
| Non-standard motor 400M (based on EN 50347)                                          |                                  |               |   |   |   |    |    | S  | 1  |    |    |    |   |
| Non-standard motor 400L (based on EN 50347)                                          |                                  |               |   |   |   |    |    | T  | 1  |    |    |    |   |

## Options for installation and add-on parts

### Gear unit swing base for bevel helical gear unit

#### Article No. overview

#### Selection and ordering data (continued)

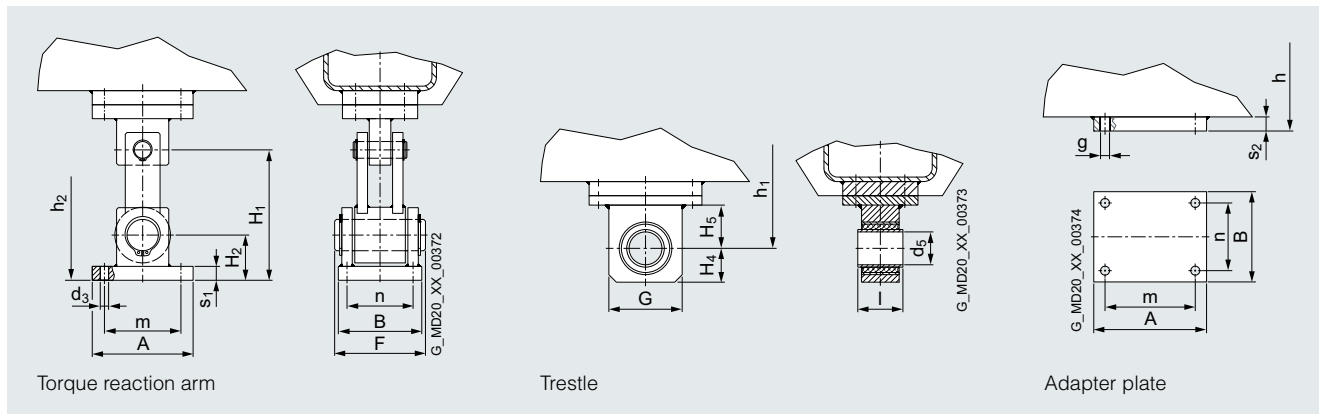
| The Article No. is supplemented with order codes (Y..) assigned by the configurator. | Data position of the Article No. | 1 to 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |   |   |
|--------------------------------------------------------------------------------------|----------------------------------|--------|---|---|---|----|----|----|----|----|----|----|---|---|
| Article No.                                                                          |                                  | 2DA061 | . | - | . | .  | ■  | ■  | ■  | -  | ■  | ■  | . | 0 |
| <b>Motor frame sizes (specifications required for motor)</b>                         |                                  |        |   |   |   |    |    |    |    |    |    |    |   |   |
| Special motor 56                                                                     |                                  |        |   |   |   | A  | 4  |    |    |    |    |    |   |   |
| Special motor 63                                                                     |                                  |        |   |   |   | B  | 4  |    |    |    |    |    |   |   |
| Special motor 71                                                                     |                                  |        |   |   |   | C  | 4  |    |    |    |    |    |   |   |
| Special motor 80                                                                     |                                  |        |   |   |   | D  | 4  |    |    |    |    |    |   |   |
| Special motor 100                                                                    |                                  |        |   |   |   | E  | 4  |    |    |    |    |    |   |   |
| Special motor 112                                                                    |                                  |        |   |   |   | F  | 4  |    |    |    |    |    |   |   |
| Special motor 132                                                                    |                                  |        |   |   |   | G  | 4  |    |    |    |    |    |   |   |
| Special motor 160                                                                    |                                  |        |   |   |   | H  | 4  |    |    |    |    |    |   |   |
| Special motor 180                                                                    |                                  |        |   |   |   | J  | 4  |    |    |    |    |    |   |   |
| Special motor 200                                                                    |                                  |        |   |   |   | K  | 4  |    |    |    |    |    |   |   |
| Special motor 225                                                                    |                                  |        |   |   |   | L  | 4  |    |    |    |    |    |   |   |
| Special motor 250                                                                    |                                  |        |   |   |   | M  | 4  |    |    |    |    |    |   |   |
| Special motor 280                                                                    |                                  |        |   |   |   | N  | 4  |    |    |    |    |    |   |   |
| Special motor 315                                                                    |                                  |        |   |   |   | P  | 4  |    |    |    |    |    |   |   |
| Special motor 355                                                                    |                                  |        |   |   |   | Q  | 4  |    |    |    |    |    |   |   |
| Special motor 400                                                                    |                                  |        |   |   |   | R  | 4  |    |    |    |    |    |   |   |
| Special motor 450                                                                    |                                  |        |   |   |   | S  | 4  |    |    |    |    |    |   |   |
| <b>Cover support high speed shaft (HSS)</b>                                          |                                  |        |   |   |   |    |    |    |    |    |    |    |   |   |
| Without cover support                                                                |                                  |        |   |   |   |    |    |    |    |    |    | 0  |   |   |
| Cover support for flexible coupling (specifications for coupling needed)             |                                  |        |   |   |   |    |    |    |    |    |    | 1  |   |   |
| Cover support for fluid coupling (specifications for coupling needed)                |                                  |        |   |   |   |    |    |    |    |    |    | 2  |   |   |
| <b>Brake size</b>                                                                    |                                  |        |   |   |   |    |    |    |    |    |    |    |   |   |
| Without brake                                                                        |                                  |        |   |   |   |    |    |    |    |    |    | 0  |   |   |
| 200                                                                                  |                                  |        |   |   |   |    |    |    |    |    |    | 1  |   |   |
| 250                                                                                  |                                  |        |   |   |   |    |    |    |    |    |    | 2  |   |   |
| 315                                                                                  |                                  |        |   |   |   |    |    |    |    |    |    | 3  |   |   |
| 400                                                                                  |                                  |        |   |   |   |    |    |    |    |    |    | 4  |   |   |
| 500                                                                                  |                                  |        |   |   |   |    |    |    |    |    |    | 5  |   |   |
| 630                                                                                  |                                  |        |   |   |   |    |    |    |    |    |    | 6  |   |   |
| 710                                                                                  |                                  |        |   |   |   |    |    |    |    |    |    | 7  |   |   |
| <b>Brake type (further brake types on request)</b>                                   |                                  |        |   |   |   |    |    |    |    |    |    |    |   |   |
| Without brake                                                                        |                                  |        |   |   |   |    |    |    |    |    |    | A  |   |   |
| Siegerland TE                                                                        |                                  |        |   |   |   |    |    |    |    |    |    | B  |   |   |
| Siegerland SBH                                                                       |                                  |        |   |   |   |    |    |    |    |    |    | C  |   |   |

## Options for installation and add-on parts

### Gear unit swing base for bevel helical gear unit

#### Torque reaction arm

#### Overview



| Assignment to gear unit size <sup>1)</sup> |                    | Dimensions in mm |     |     |                |     |     |                |                |     |     |                |                |                |                |                |     |
|--------------------------------------------|--------------------|------------------|-----|-----|----------------|-----|-----|----------------|----------------|-----|-----|----------------|----------------|----------------|----------------|----------------|-----|
| Standard support                           | Reinforced support | m                | n   | g   | d <sub>3</sub> | A   | B   | s <sub>2</sub> | d <sub>5</sub> | l   | G   | H <sub>4</sub> | H <sub>5</sub> | s <sub>1</sub> | H <sub>1</sub> | H <sub>2</sub> | F   |
| 4                                          | –                  | 95               | 65  | M12 | 15             | 120 | 90  | 25             | 25             | 56  | 60  | 30             | 38             | 12             | 180            | 50             | 96  |
| 5 – 6                                      | 4                  | 120              | 70  | M16 | 19             | 160 | 110 | 25             | 32             | 72  | 75  | 40             | 50             | 15             | 200            | 65             | 116 |
| 7 – 10                                     | 5 – 6              | 160              | 120 | M16 | 19             | 200 | 160 | 25             | 50             | 110 | 110 | 55             | 70             | 20             | 250            | 90             | 170 |
| 11 – 14                                    | 7 – 10             | 260              | 130 | M16 | 19             | 320 | 200 | 25             | 100            | 120 | 180 | 90             | 115            | 25             | 400            | 140            | 195 |
| 15 – 18                                    | 11 – 14            | 320              | 240 | M20 | 24             | 400 | 300 | 30             | 124            | 230 | 240 | 110            | 145            | 30             | 500            | 175            | 320 |
| –                                          | 15 – 18            | 320              | 240 | M20 | 24             | 400 | 300 | 30             | 124            | 230 | 240 | 110            | 145            | 30             | 500            | 175            | 320 |

h<sub>1</sub> and h<sub>2</sub>, see table page 11/35.

A drive assembly with a gear unit swing base has two connection interfaces. One interface is the low speed shaft (LSS). The second interface is the torque reaction arm. This is available in various designs and versions.

The torque reaction arm is vibration-damping and is provided for foundation mounting. The trestle is vibration-damping and

prepared for accommodating a customer-side foundation connection.

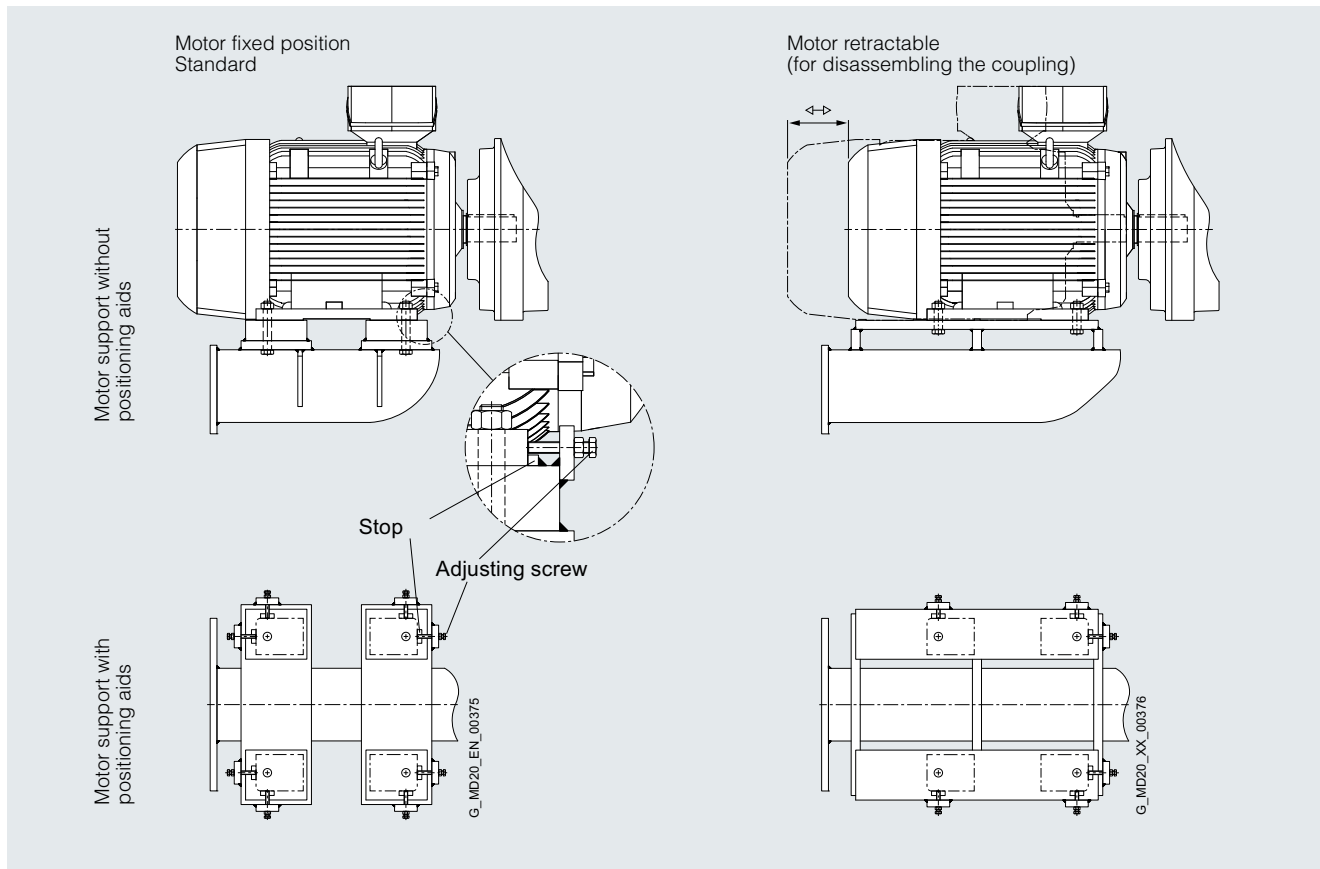
Furthermore, it is possible to prepare the gear unit swing base for a torque reaction arm. In this case, the gear unit swing base is equipped with an adapter plate.

|                                           | Data position of the Article No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|-------------------------------------------|----------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|---------------------|
| Article No.                               |                                  | 2 | D | A | 0 | 6 | 1 | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■            |
| <b>Torque reaction arm</b>                |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     |
| Torque reaction arm (standard)            |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | K 0 3               |
| Torque reaction arm (reinforced)          |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | K 0 4               |
| Torque reaction arm (front side of motor) |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | K 0 5               |
| Trestle (standard)                        |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | K 0 6               |
| Trestle (reinforced)                      |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | K 0 7               |
| Trestle (front side of motor)             |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | K 0 8               |
| Adapter plate (standard)                  |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | K 0 9               |
| Adapter plate (reinforced)                |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | K 1 0               |
| Adapter plate (front side of motor)       |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    | K 1 1               |

<sup>1)</sup> The user cannot select the reaction arm variant (standard or reinforced), as this is defined depending on the layout of the drive train.

**Overview**

**Positioning of motors on gear unit swing base**



To facilitate assembly, the support surfaces of the motor feet on the swing base can be provided with various help options.

Adjusting screws are provided for aligning the motor. They can be used to align the motor on the swing base to the gear unit drive shaft. The adjusting screws are available in several variants and combinations.

Side-mounted adjusting screws can be provided for the gear unit.

Stops can be attached after the motor is aligned. This makes it possible to re-position the motor exactly in the same position after disassembly. The stops can be implemented in several variants and combinations.

The standard swing base version is designed for a fixed position of the motor. Upon request, the gear unit swing base can be implemented for axial offsetting of the motor, e.g. for coupling disassembly. Adjusting screws or alignment blocks are not possible on the fan side of the motor.

Note:

To ensure that an N-EUPEX coupling version A in combination with a fan-cooled gear unit can be disassembled even without the "motor retractable" swing base option, you must ensure that coupling part 2/3 is positioned on the motor shaft.

|                                        | Data position of the Article No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |       |
|----------------------------------------|----------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|---------------------|-------|
| Article No.                            | <b>2DA061</b>                    | . | . | . | . | . | . | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z                  | ■ ■ ■ |
| <b>Component positioning</b>           |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     |       |
| Adjusting screws the motor output side |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     | G 8 0 |
| Adjusting screws on side of motor      |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     | G 8 1 |
| Adjusting screws on motor fan side     |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     | G 8 2 |
| Stops on motor output side             |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     | G 8 3 |
| Stops on side of motor                 |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     | G 8 4 |
| Stops on motor fan side                |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     | G 8 5 |
| Adjusting screws on side of gear unit  |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     | G 8 6 |
| <b>Motor option</b>                    |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     |       |
| Motor retractable                      |                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |                     | N 0 0 |

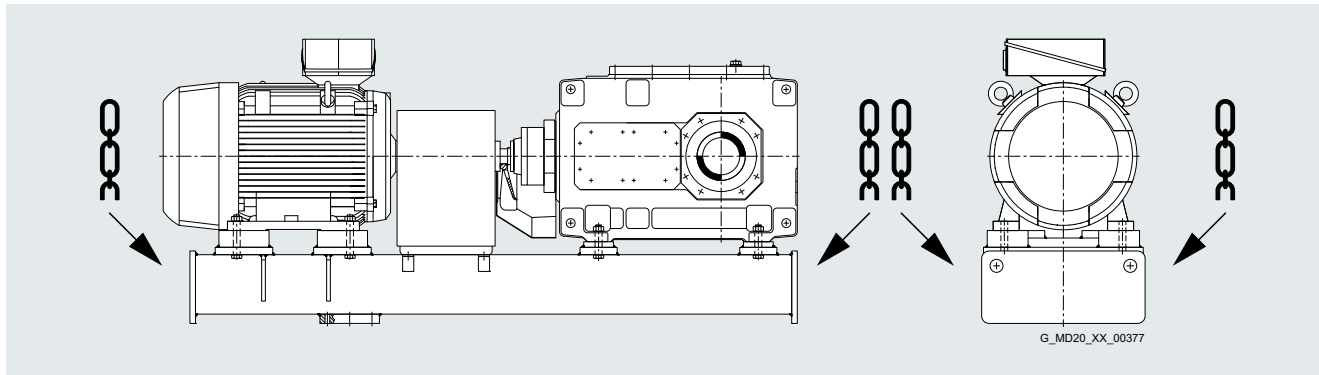


## Options for installation and add-on parts

### Gear unit swing base for bevel helical gear unit

#### Transport, ATEX

#### Overview



**Note:**

The drive unit must be transported and handled with suitable equipment only. Additional specifications and information can be found in the supplied documentation.

The end plates on the swing base are designed to be rectangular (standard). Upon request, both end plates can be trapezoidal or "trapezoidal on the motor side and square on the gear unit side" or "rectangular on the motor side and square on the gear unit side".

|                                                                   | Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|-------------------------------------------------------------------|----------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|---------------------|
| Article No.                                                       |                                  | <b>2DA061</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■            |
| <b>End plate shape</b>                                            |                                  |               |   |   |   |    |    |    |    |    |    |    |                     |
| End plates on both sides trapezoidal                              |                                  |               |   |   |   |    |    |    |    |    |    |    | K 4 0               |
| End plates on both sides rectangular                              |                                  |               |   |   |   |    |    |    |    |    |    |    | K 4 1               |
| End plates trapezoidal on motor side and square on gear unit side |                                  |               |   |   |   |    |    |    |    |    |    |    | K 4 2               |
| End plates rectangular on motor side and square on gear unit side |                                  |               |   |   |   |    |    |    |    |    |    |    | K 4 3               |

For practical transport, a holder can be attached for air filters, screw plugs or replacement fusible lock screws in various

designs and located in different positions can be attached to the gear unit swing base.

|                                                                                                             | Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|-------------------------------------------------------------------------------------------------------------|----------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|---------------------|
| Article No.                                                                                                 |                                  | <b>2DA061</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■            |
| <b>Screw plug holder</b>                                                                                    |                                  |               |   |   |   |    |    |    |    |    |    |    |                     |
| Transport air filter for gear unit on front of gear unit low speed shaft (LSS)                              |                                  |               |   |   |   |    |    |    |    |    |    |    | L 0 0               |
| Transport air filter for gear unit and auxiliary drive on front of gear unit low speed shaft (LSS)          |                                  |               |   |   |   |    |    |    |    |    |    |    | L 0 1               |
| 2 units of replacement fusible lock screws for fluid couplings on front of gear unit high speed shaft (HSS) |                                  |               |   |   |   |    |    |    |    |    |    |    | L 0 2               |
| 3 units of replacement fusible lock screws for fluid couplings on front of gear unit high speed shaft (HSS) |                                  |               |   |   |   |    |    |    |    |    |    |    | L 0 3               |

For usage locations with special requirements for transporting drives (e.g. underground), the gear unit swing base can be equipped with special transport aids such as receptacles for

forklift tines or skids. These options will be carried out upon request.

|                            | Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|----------------------------|----------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|---------------------|
| Article No.                |                                  | <b>2DA061</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■            |
| <b>Transport aids</b>      |                                  |               |   |   |   |    |    |    |    |    |    |    |                     |
| Forklift holder            |                                  |               |   |   |   |    |    |    |    |    |    |    | M 5 0               |
| Skids                      |                                  |               |   |   |   |    |    |    |    |    |    |    | M 5 1               |
| <b>ATEX requirements</b>   |                                  |               |   |   |   |    |    |    |    |    |    |    |                     |
| Swing bases in ATEX design |                                  |               |   |   |   |    |    |    |    |    |    |    | X 0 0               |



## Options for installation and add-on parts

### Gear unit swing base for bevel helical gear unit

#### Additional options and notes

#### Overview

To protect the drive train from excess heat due to the sun's rays, a sun roof can be attached for many designs. In the event of an

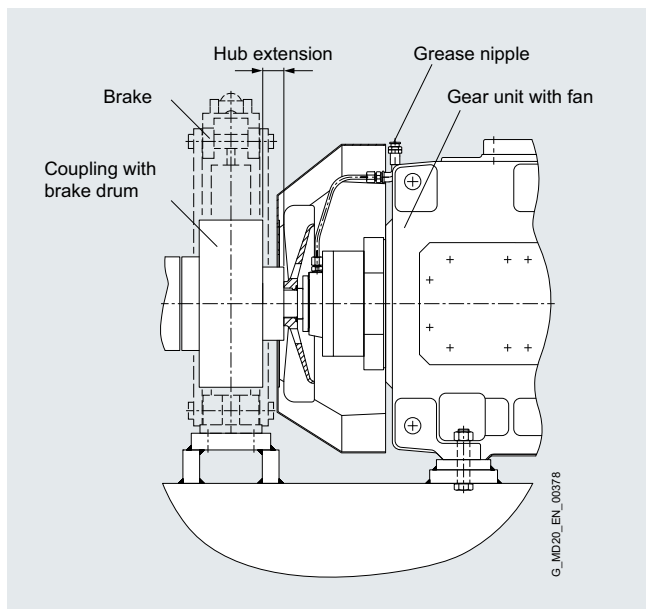
order, the definition of the dimensions and arrangement must be closely coordinated with Flender.

|                                  | Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|----------------------------------|----------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|---------------------|
|                                  | Article No.                      | <b>2DA061</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■            |
| <b>Sun roof</b>                  |                                  |               |   |   |   |    |    |    |    |    |    |    |                     |
| Sun roof over entire drive train |                                  |               |   |   |   |    |    |    |    |    |    |    | L 5 0               |
| Sun roof over gear unit          |                                  |               |   |   |   |    |    |    |    |    |    |    | L 5 1               |
| Sun roof over motor              |                                  |               |   |   |   |    |    |    |    |    |    |    | L 5 2               |

A protective cover can be attached to prevent unintentional contact with the rotating low speed shaft, including a possible coupling.

|                                                                                             | Data position of the Article No. | 1 to 6        | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | "-Z" and order code |
|---------------------------------------------------------------------------------------------|----------------------------------|---------------|---|---|---|----|----|----|----|----|----|----|---------------------|
|                                                                                             | Article No.                      | <b>2DA061</b> | . | . | . | .  | .  | .  | .  | .  | .  | .  | -Z ■ ■ ■            |
| <b>Protective cover slow speed shaft (LSS)</b>                                              |                                  |               |   |   |   |    |    |    |    |    |    |    |                     |
| Holder for cover of low speed shaft (LSS) on side 3 (looking toward high speed shaft (HSS)) |                                  |               |   |   |   |    |    |    |    |    |    |    | M 0 0               |
| Holder for cover of low speed shaft (LSS) on side 6 (looking toward high speed shaft (HSS)) |                                  |               |   |   |   |    |    |    |    |    |    |    | M 0 1               |
| Holder for cover of low speed shaft (LSS) both sides                                        |                                  |               |   |   |   |    |    |    |    |    |    |    | M 0 2               |

If the drive unit is to be used in an environment that requires an ATEX design, the corresponding option must be selected.



For the combination of gear unit with fan cooling and drum brakes, the coupling must always be implemented with extended hubs (see figure).

The position of the grease nipple for the Taconite type seal on the drive shaft is always above the housing on the front panel, regardless of the cooling option.



In the event of an accident, there is a risk of hot oil escaping when fluid couplings are used. In the worst case scenario, this can lead to irreversible personal injury. To reduce the risk to a minimum, each FLUDEX coupling must be designed with an EOC system. The information, version and ordering data can be found in the coupling catalog.

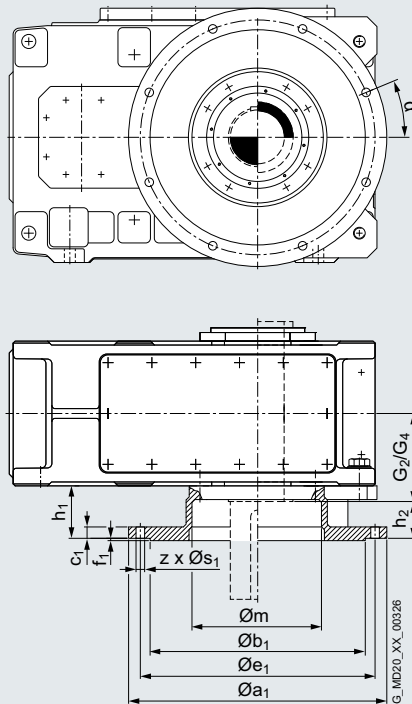
## Options for installation and add-on parts

Mounting flange - long spacer, mounting flange - short spacer

### Mounting flange - long spacer

#### Overview

#### Mounting flange - long spacer for sizes 4 to 12



Mounting flange - long spacer, sizes 4 to 12

#### Notes:

Possible versions, [see Table 3](#).

Combinations with backstop or pump on request.

Combinations with motor bell housings or fans for H gear units of version C and D on request.

Table 1

| Torque factor $f$                   |      |     |     |     |     |     |     |     |     |     |
|-------------------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>H2.., H3.., H4.., B3.., B4..</b> |      |     |     |     |     |     |     |     |     |     |
| Factor                              | Size | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  |
| $f$                                 |      | 1.1 | 1.2 | 1.6 | 1.2 | 1.4 | 1.3 | 1.5 | 1.3 | 1.4 |
| <b>B2..</b>                         |      |     |     |     |     |     |     |     |     |     |
| Factor                              | Size | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  |
| $f$                                 |      | 1.0 | 1.0 | 1.3 | 1.0 | 1.2 | 1.1 | 1.3 | 1.1 | 1.2 |

## Options for installation and add-on parts

### Mounting flange - long spacer, mounting flange - short spacer

#### Mounting flange - long spacer

#### Overview (continued)

##### Mounting flange - long spacer for sizes 4 to 12 (continued)

Table 2

| Size <sup>1)</sup> | Dimensions in mm |                   |                |                |                |                |                |                  |                    | Additional weight<br>kg | H2S., H2D., H2H.,<br>H3S., H3D., H3H.,<br>H4S., H4D., H4H.,<br>B3S., B3D., B3H.,<br>B4S., B4D., B4H. | B2S., B2H.,<br>B2D. |
|--------------------|------------------|-------------------|----------------|----------------|----------------|----------------|----------------|------------------|--------------------|-------------------------|------------------------------------------------------------------------------------------------------|---------------------|
|                    | a <sub>1</sub>   | b <sub>1</sub> f7 | c <sub>1</sub> | e <sub>1</sub> | f <sub>1</sub> | h <sub>1</sub> | h <sub>2</sub> | m <sub>max</sub> | Z × s <sub>1</sub> |                         |                                                                                                      |                     |
| 4                  | 450              | 350               | 24.5           | 400            | 5              | 82.5           | 50             | 205              | 8 × 17.5           | 40                      | 140                                                                                                  | 170                 |
| 5                  | 550              | 450               | 25             | 500            | 5              | 90             | 52.5           | 245              | 8 × 17.5           | 60                      | 165                                                                                                  | 200                 |
| 6                  | 550              | 450               | 25             | 500            | 5              | 90             | 52.5           | 245              | 8 × 17.5           | 65                      | 165                                                                                                  | 200                 |
| 7                  | 660              | 550               | 25             | 600            | 5              | 135            | 90             | 290              | 8 × 22             | 90                      | 195                                                                                                  | 235                 |
| 8                  | 660              | 550               | 30             | 600            | 5              | 135            | 90             | 315              | 8 × 22             | 100                     | 195                                                                                                  | 235                 |
| 9                  | 660              | 550               | 29             | 600            | 6              | 134            | 84             | 325              | 12 × 22            | 110                     | 235                                                                                                  | 270                 |
| 10                 | 660              | 550               | 34             | 600            | 6              | 134            | 84             | 355              | 12 × 26            | 120                     | 235                                                                                                  | 270                 |
| 11                 | 800              | 680               | 44             | 740            | 6              | 184            | 129            | 420              | 12 × 26            | 210                     | 270                                                                                                  | 320                 |
| 12                 | 800              | 680               | 44             | 740            | 6              | 184            | 129            | 435              | 12 × 26            | 220                     | 270                                                                                                  | 320                 |

Table 3

| Possible types, sizes, versions |               |       |                              |                              |
|---------------------------------|---------------|-------|------------------------------|------------------------------|
| Size                            | H2.H          | H2.V  | H3.H, H4.H, B2.H, B3.H, B4.H | H3.V, H4.V, B2.V, B3.V, B4.V |
| 4                               | A + B         | B     | A + B + C + D                | B + C                        |
| 5                               | A + B         | B     | A + B + C + D                | B + C                        |
| 6                               | A + B         | B     | A + B + C + D                | B + C                        |
| 7                               | A + B         | B     | A + B + C + D                | B + C                        |
| 8                               | A + B         | B     | A + B + C + D                | B + C                        |
| 9                               | A + B         | B     | A + B + C + D                | B + C                        |
| 10                              | A + B + C + D | B + C | A + B + C + D                | B + C                        |
| 11                              | A + B         | B     | A + B + C + D                | B + C                        |
| 12                              | A + B + C + D | B + C | A + B + C + D                | B + C                        |

#### Mounting flange - long spacer

|                               |                                                                                                                                       |   |   |   |    |    |    |    |    |    |    |            |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|----|----|----|----|----|----|------------|
| Position of the Article No.   | 1 to 6                                                                                                                                | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code |
| Article No.:                  | 2LP302 . . . . . -Z                                                                                                                   |   |   |   |    |    |    |    |    |    |    |            |
| <b>Housing support</b>        | <div style="display: flex; justify-content: space-between; align-items: center;"> <span style="font-size: 1.2em;">K 0 2</span> </div> |   |   |   |    |    |    |    |    |    |    |            |
| Mounting flange - long spacer |                                                                                                                                       |   |   |   |    |    |    |    |    |    |    |            |

<sup>1)</sup>  $T_{2max} \leq T_{2N}/f$

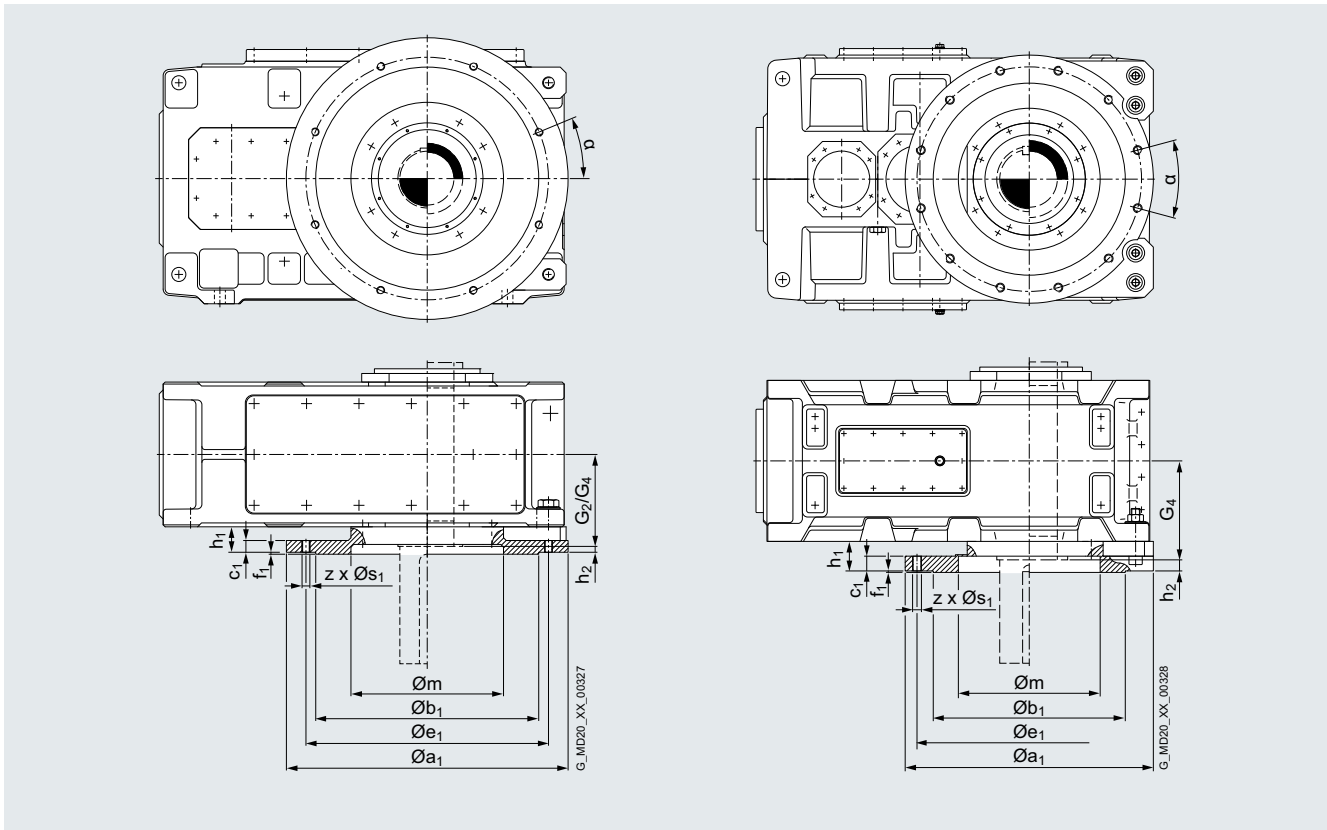
## Options for installation and add-on parts

Mounting flange - long spacer, mounting flange - short spacer

### Mounting flange - short spacer

Overview (continued)

#### Mounting flange - short spacer for sizes 4 to 16



Mounting flange - short spacer, sizes 4 to 12 on left, sizes 13 to 16 on right

#### Notes:

Beyond size 13, only housings without feet are used, i.e. in mounting position M.

Possible versions, see Table 3.

Combinations with backstop or pump on request.

Combinations with motor bell housings or fans for H gear units of version C and D on request.

Table 1

| Torque factor $f$        |      |     |     |     |     |     |     |     |     |     |     |     |     |     |
|--------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| H2., H3., H4., B3., B4.. |      |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Factor                   | Size | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  |
| $f$                      |      | 1.1 | 1.2 | 1.5 | 1.2 | 1.4 | 1.3 | 1.5 | 1.3 | 1.4 | 1.4 | 1.1 | 1.4 | 1.2 |
| B2..                     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Factor                   | Size | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  |
| $f$                      |      | 1.0 | 1.0 | 1.2 | 1.0 | 1.2 | 1.1 | 1.3 | 1.1 | 1.2 | 1.2 | 1.0 | 1.2 | 1.0 |

## Options for installation and add-on parts

### Mounting flange - long spacer, mounting flange - short spacer

#### Mounting flange - short spacer

#### Overview (continued)

#### Mounting flange - short spacer for sizes 4 to 16 (continued)

Table 2

| Type             | Size <sup>1)</sup> | Dimensions in mm |                   |                |                |                |                |                |                  |                    | Additional weight<br>kg | H2S., H2D., H2H.,<br>H3S., H3D., H3H.,<br>H4S., H4D., H4H.,<br>B3S., B3D., B3H.,<br>B4S., B4D., B4H. | B2S., B2H.,<br>B2D. |
|------------------|--------------------|------------------|-------------------|----------------|----------------|----------------|----------------|----------------|------------------|--------------------|-------------------------|------------------------------------------------------------------------------------------------------|---------------------|
|                  |                    | a <sub>1</sub>   | b <sub>1</sub> f7 | c <sub>1</sub> | e <sub>1</sub> | f <sub>1</sub> | h <sub>1</sub> | h <sub>2</sub> | m <sub>max</sub> | Z × s <sub>1</sub> |                         |                                                                                                      |                     |
| ..S., ..D., ..H. | 4                  | 445              | 340               | 25             | 400            | 5              | 55             | 22.5           | 205              | 8 × M 16           | 35                      | 140                                                                                                  | 170                 |
| ..S., ..D., ..H. | 5                  | 565              | 430               | 25             | 515            | 5              | 60             | 22.5           | 245              | 8 × M 16           | 55                      | 165                                                                                                  | 200                 |
| ..S., ..D., ..H. | 6                  | 565              | 430               | 25             | 515            | 5              | 60             | 22.5           | 245              | 8 × M 16           | 55                      | 165                                                                                                  | 200                 |
| ..S., ..D., ..H. | 7                  | 670              | 530               | 25             | 620            | 5              | 60             | 15             | 295              | 8 × M 20           | 80                      | 195                                                                                                  | 235                 |
| ..S., ..D., ..H. | 8                  | 670              | 530               | 40             | 620            | 5              | 80             | 35             | 300              | 8 × M 20           | 110                     | 195                                                                                                  | 235                 |
| ..S., ..D., ..H. | 9                  | 670              | 530               | 35             | 620            | 5              | 80             | 30             | 320              | 12 × M 20          | 105                     | 235                                                                                                  | 270                 |
| ..S., ..D., ..H. | 10                 | 730              | 560               | 35             | 680            | 5              | 80             | 30             | 355              | 12 × M 24          | 125                     | 235                                                                                                  | 270                 |
| ..S., ..D., ..H. | 11                 | 730              | 560               | 40             | 680            | 5              | 90             | 35             | 400              | 12 × M 24          | 145                     | 270                                                                                                  | 320                 |
| ..S., ..D., ..H. | 12                 | 730              | 560               | 40             | 680            | 5              | 90             | 35             | 420              | 12 × M 24          | 155                     | 270                                                                                                  | 320                 |
| ..S.             | 13                 | 840              | 650               | 50             | 760            | 5              | 100            | 37.5           | 450              | 12 × M 30          | 245                     | 335                                                                                                  | 390                 |
| ..D., ..H.       | 13                 | 840              | 650               | 50             | 760            | 5              | 100            | 37.5           | 450              | 12 × M 30          | 240                     | 335                                                                                                  | –                   |
| ..S.             | 14                 | 840              | 650               | 50             | 760            | 5              | 100            | 37.5           | 480              | 12 × M 30          | 255                     | 335                                                                                                  | 390                 |
| ..D., ..H.       | 14                 | 840              | 650               | 50             | 760            | 5              | 100            | 37.5           | 480              | 12 × M 30          | 245                     | 335                                                                                                  | 390                 |
| ..S.             | 15                 | 960              | 750               | 50             | 880            | 5              | 100            | 30             | 530              | 16 × M 30          | 315                     | 380                                                                                                  | 460                 |
| ..D., ..H.       | 15                 | 960              | 750               | 50             | 880            | 5              | 100            | 30             | 530              | 16 × M 30          | 305                     | 380                                                                                                  | –                   |
| ..S.             | 16                 | 960              | 750               | 50             | 880            | 5              | 100            | 30             | 540              | 16 × M 30          | 320                     | 380                                                                                                  | 460                 |
| ..D., ..H.       | 16                 | 960              | 750               | 50             | 880            | 5              | 100            | 30             | 540              | 16 × M 30          | 315                     | 380                                                                                                  | 450                 |

Table 3

| Possible types, sizes, versions |                  |       |                                                                                                         |                                 |
|---------------------------------|------------------|-------|---------------------------------------------------------------------------------------------------------|---------------------------------|
| Size                            | H2SH, H2HH, H2DH | H2.V  | H3SH, H4SH,<br>B2SH, B3SH, B4SH,<br>H3HH, H4HH,<br>B2HH, B3HH, B4HH,<br>H3DH, H4DH,<br>B2DH, B3DH, B4DH | H3.V, H4.V,<br>B2.V, B3.V, B4.V |
| 4                               | A + B            | B     | A + B + C + D                                                                                           | B + C                           |
| 5                               | A + B            | B     | A + B + C + D                                                                                           | B + C                           |
| 6                               | A + B            | B     | A + B + C + D                                                                                           | B + C                           |
| 7                               | A + B            | B     | A + B + C + D                                                                                           | B + C                           |
| 8                               | A + B            | B     | A + B + C + D                                                                                           | B + C                           |
| 9                               | A + B            | B     | A + B + C + D                                                                                           | B + C                           |
| 10                              | A + B + C + D    | B + C | A + B + C + D                                                                                           | B + C                           |
| 11                              | A + B            | B     | A + B + C + D                                                                                           | B + C                           |
| 12                              | A + B + C + D    | B + C | A + B + C + D                                                                                           | B + C                           |
| 13                              | A + B            | B     | A + B + C + D                                                                                           | B + C                           |
| 14                              | A + B + C + D    | B + C | A + B + C + D                                                                                           | B + C                           |
| 15 <sup>2)</sup>                | A + B + C + D    | B + C | A + B + C + D                                                                                           | B + C                           |
| 16 <sup>2)</sup>                | A + B + C + D    | B + C | A + B + C + D                                                                                           | B + C                           |

#### Mounting flange - short spacer

|                                |                                                                                                                                                                                                                                                 |   |   |   |    |    |    |    |    |    |    |            |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|----|----|----|----|----|----|------------|
| Position of the Article No.    | 1 to 6                                                                                                                                                                                                                                          | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order code |
| Article No.:                   | 2LP302 . . . . . -Z                                                                                                                                                                                                                             |   |   |   |    |    |    |    |    |    |    |            |
| <b>Housing support</b>         | <div style="float: right; text-align: right;"> <span style="border: 1px solid black; padding: 2px;">K</span> <span style="border: 1px solid black; padding: 2px;">0</span> <span style="border: 1px solid black; padding: 2px;">1</span> </div> |   |   |   |    |    |    |    |    |    |    |            |
| Mounting flange - short spacer |                                                                                                                                                                                                                                                 |   |   |   |    |    |    |    |    |    |    |            |

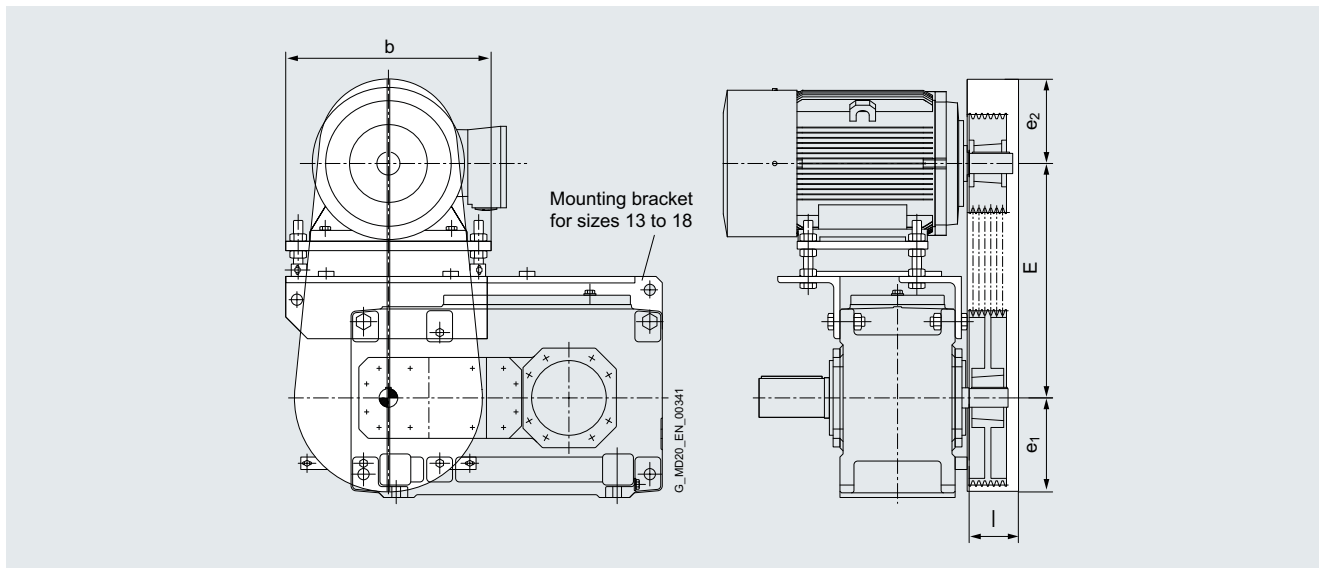
<sup>1)</sup>  $T_{2max} \leq T_{2N}/f$

<sup>2)</sup> Type B2.. Size 15 + 16 not possible in version A or C!

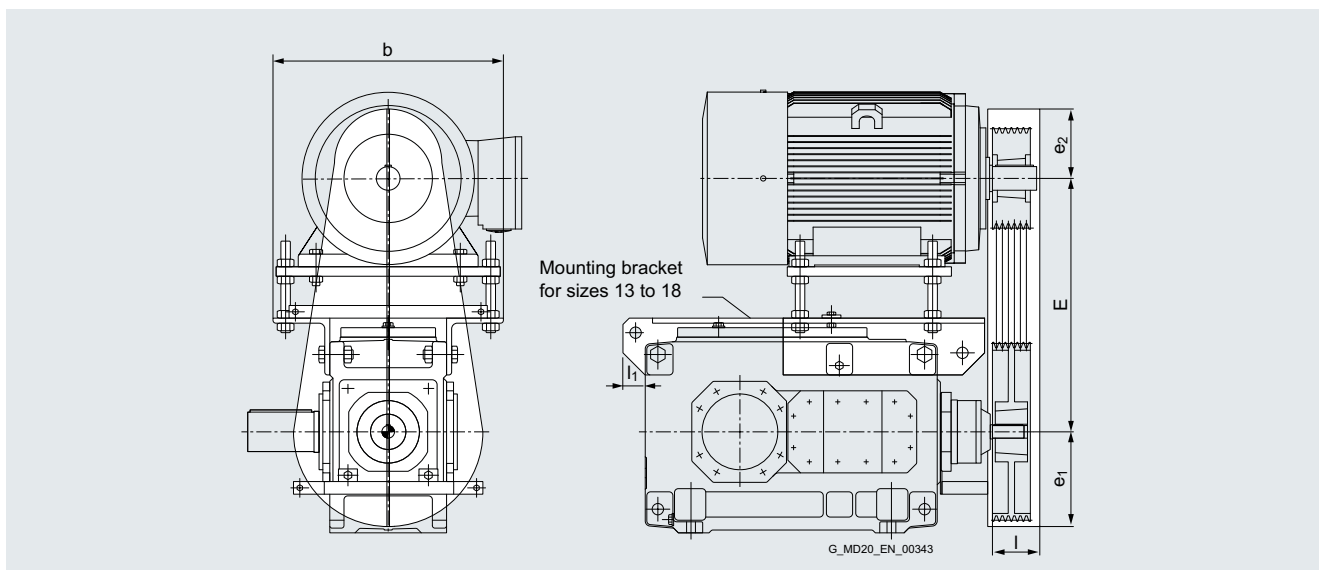
# Options for installation and add-on parts

## Piggy back

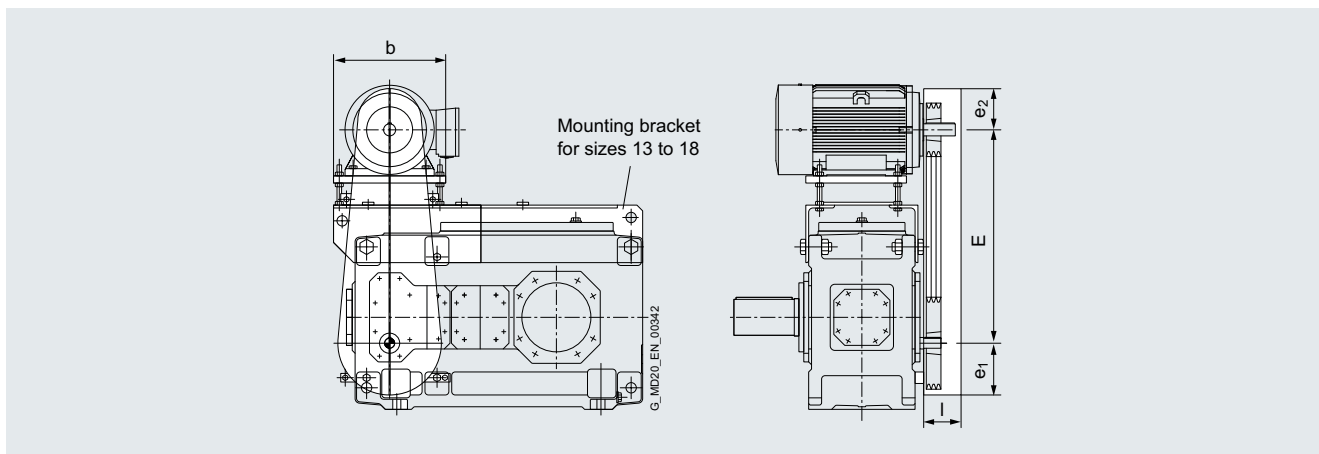
### Overview



Piggy back for helical gear unit, horizontal installation, type H3



Piggy back for bevel helical gear unit, horizontal installation, types B3 and B4



Piggy back for helical gear unit, horizontal installation, type H4

**Overview** (continued)

If motors cannot be positioned in front of the gear unit due to space concerns, it is possible to mount the motors piggy back.

Piggy back versions for gear units are listed here as examples, other sizes on request.

In addition, other speeds can be driven on the low speed shaft by changing the pulley drive and the drive is protected during high dynamic peak loads from the application.

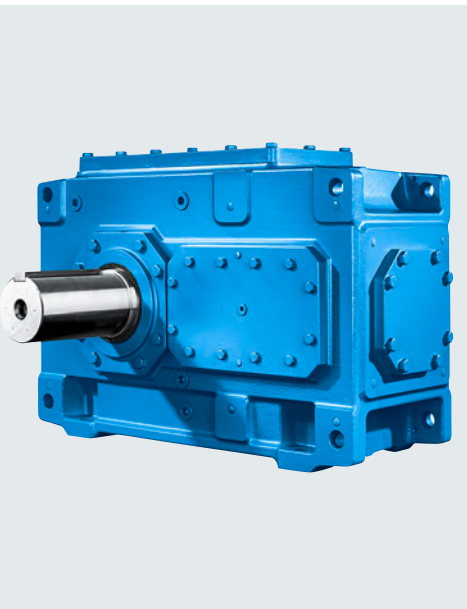
| Type Size        | IEC motor | $i$<br>gear units | $i$<br>belt drive         | $i_{total}$  | Belt pulley motor shaft | Belt number | Dimensions in mm |     |       |       |     |
|------------------|-----------|-------------------|---------------------------|--------------|-------------------------|-------------|------------------|-----|-------|-------|-----|
|                  |           |                   |                           |              |                         |             | b                | E   | $e_1$ | $e_2$ | l   |
| <b>H3.H</b><br>5 | 132 S     | 71 – 90           | 1.25<br>1.4<br>1.6<br>1.8 | 89 – 162     | SPZ 140                 | 2           | 390              | 493 | 180   | 177   | 120 |
|                  | 132 M     | 50 – 90           |                           | 63 – 162     | SPZ 140                 | 3           | 390              | 493 | 180   | 177   | 120 |
|                  | 160 M     | 35.5 - 71         |                           | 44 – 128     | SPZ 180                 | 3           | 390              | 530 | 180   | 140   | 120 |
|                  | 160 L     | 25 – 50           |                           | 31 – 90      | SPA 180                 | 3           | 390              | 530 | 180   | 140   | 120 |
| <b>H4.H</b><br>9 | 112 M     | 315<br>355        | 1.25<br>1.4<br>1.6<br>1.8 | 394 – 639    | SPZ 112                 | 2           | 390              | 672 | 125   | 108   | 70  |
|                  | 132 S     | 224 – 355         |                           | 280 – 639    | SPZ 140                 | 2           | 390              | 701 | 180   | 154   | 120 |
|                  | 132 M     | 160 – 315         |                           | 200 – 567    | SPZ 140                 | 3           | 390              | 701 | 180   | 154   | 120 |
|                  | 160 M     | 112 - 224         |                           | 140 – 403    | SPZ 180                 | 3           | 390              | 742 | 180   | 143   | 120 |
|                  | 160 L     | 100 – 160         |                           | 125 – 288    | SPA 180                 | 3           | 390              | 742 | 180   | 143   | 120 |
| <b>B3.H</b><br>4 | 112 M     | 56 – 71           | 1.25<br>1.4<br>1.6<br>1.8 | 70 – 127.8   | SPZ 112                 | 2           | 375              | 421 | 120   | 104   | 85  |
|                  | 132 S     | 45 – 71           |                           | 56.3 - 127.8 | SPZ 140                 | 2           | 455              | 434 | 180   | 182   | 120 |
|                  | 132 M     | 31.5 - 45         |                           | 39.4 – 81    | SPZ 140                 | 3           | 455              | 434 | 180   | 182   | 120 |
|                  | 160 M     | 20 – 45           |                           | 25 – 81      | SPZ 180                 | 3           | 455              | 476 | 180   | 140   | 120 |
|                  | 160 L     | 31.5<br>35.5      |                           | 39.4 – 63.9  | SPA 180                 | 3           | 455              | 476 | 180   | 140   | 120 |
| <b>B4.H</b><br>9 | 132 S     | 224 – 315         | 1.25<br>1.4<br>1.6<br>1.8 | 280 – 567    | SPZ 140                 | 2           | 550              | 572 | 180   | 178   | 120 |
|                  | 132 M     | 160 – 315         |                           | 200 – 567    | SPZ 140                 | 3           | 550              | 572 | 180   | 178   | 120 |
|                  | 160 M     | 112 - 224         |                           | 140 – 403    | SPZ 180                 | 3           | 550              | 615 | 180   | 135   | 120 |
|                  | 160 L     | 80 – 160          |                           | 100 – 288    | SPA 180                 | 3           | 550              | 615 | 180   | 135   | 120 |
|                  | 180 M     | 80 – 140          |                           | 100 – 252    | SPA 250                 | 3           | 550              | 626 | 250   | 184   | 120 |
|                  | 180 L     | 80 – 112          |                           | 100 – 202    | SPA 250                 | 3           | 550              | 626 | 250   | 184   | 120 |

## Options for installation and add-on parts

### Notes



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**General delivery conditions**

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#### Overview

For general terms and conditions of Flender GmbH, see:

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