

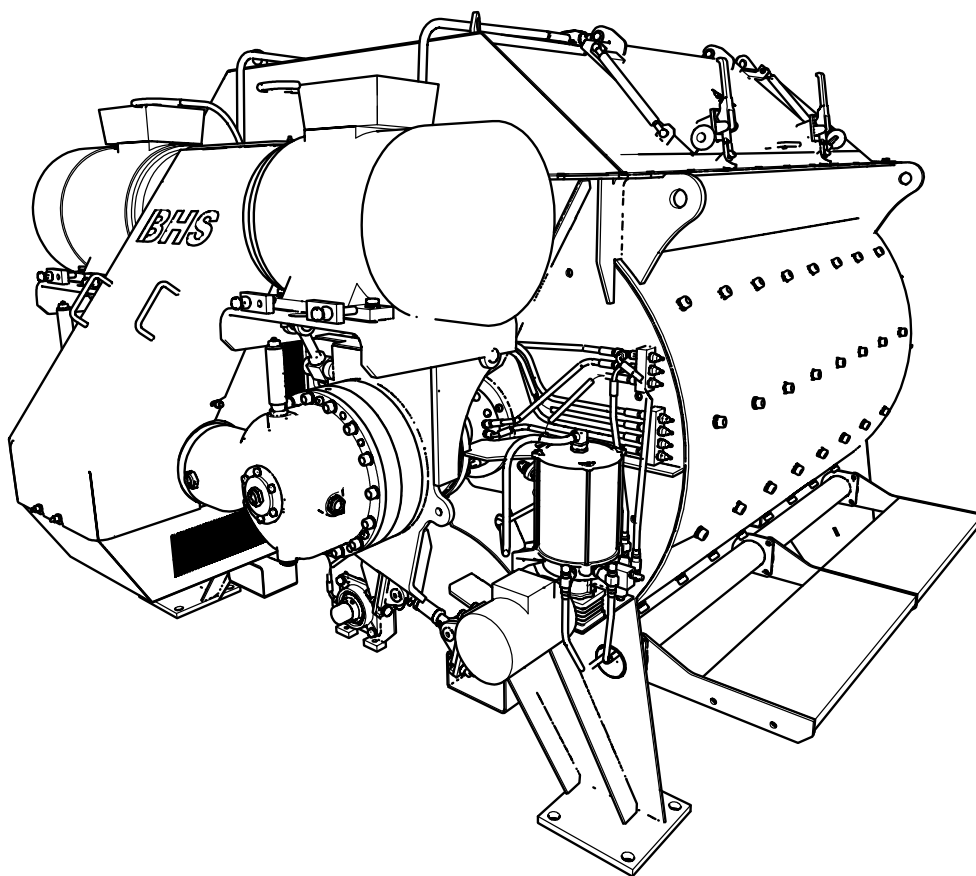
Operating manual

en-uk

BHS
SONTHOFEN

Twin-shaft batch mixer

OX 2.00 - 37kw B-34660-103-50-01





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Twin-shaft Batch Mixer

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2 About these operating instructions

These operating instructions describe the following machine:

Machine designation	Project/ Serial number	Type	Year built
Twin-shaft batch mixer	B-34660-103-50-01	OX 2.00	2022

2.1 Overview

Take note of the following when reading these operating instructions

- ▶ Read the instructions before operating and carrying out any work on the machine.
You must have understood the contents of these operating instructions.
- ▶ It forms part of the machine and must be kept in its vicinity in an accessible manner. Ensure that these instructions are maintained in a legible condition and keep them near the machine.
- ▶ When resold, these instructions must be passed on to the new owner.
- ▶ In case of loss, please request a copy from BHS-Sonthofen GmbH; we will be happy to make you an offer.

2.1.1 Target group of these operating instructions

The machine has been designed with safety precautions to prevent injuries and damage, but these can still occur if the machine is not used properly.

These operating instructions will help you to operate this machine safely, correctly and effectively. It addresses both the operator of this machine and the user.

2.1.2 Definition of operator and user

Definition operator:

- ▶ A company or firm/enterprise that has authority over and responsibility for the machine.

Definition user:

- ▶ A trained person who, with the consent of the operator, works on, cleans or maintains the machine.

2.2 Copyright

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These operating instructions were created by BHS-Sonthofen GmbH. No part of these operating instructions may be reproduced, transmitted, transcribed, stored in a retrieval system or translated into any language or computer language in any form without prior written permission.

Any violations will result in an obligation to pay damages. All rights reserved in case of patent and utility model registration.

2.3 Disclaimer

BHS-Sonthofen GmbH reserves the right to make changes to these operating instructions and the product described therein without prior notice.

Even though the operating instructions have been prepared with great care, they may still contain errors or deviations.

Necessary corrections will be included in the subsequent edition.

2.4 Trade names / trademarks

All hardware and software names used are trade names and/or trademarks of the respective manufacturers.

3 Safety

3.1 Use of the machine

3.1.1 General information

The intended use results from the designated use as described in the working documents and the technical specification as well as the performance limits stated therein.

Only the specified original spare and wear parts from BHS-Sonthofen GmbH ensure optimum operation of the machine. These parts must be used to maintain the warranty.

3.1.2 Intended use

The twin-shaft batch mixer may only be used for commercial purposes. It is intended for the production of concrete mixes and mineral mixtures in fixed mixing ratios according to technical specifications.

These mixtures must not be explosive, toxic or hazardous to health.

The following points must be observed to ensure proper operation:

- ▶ Only trained and authorised persons may work on the machine.
- ▶ The machine may only be operated when a trough cover has been installed.
- ▶ The machine may only be operated with safety devices installed.
- ▶ Electrical safety devices must be correctly integrated into the system control and their function checked.
- ▶ National and legal regulations and rules for the prevention of accidents must be observed.
- ▶ The operating instructions of the operator.
- ▶ Observance of the technical documentation, in particular, the operating instructions and compliance with inspection and maintenance procedures.

3.1.3 Improper use

Any use that is not included in the 'Intended use' section is considered improper use. Exceptions require the written permission of BHS-Sonthofen GmbH.

Improper use also includes:

- ▶ Customer modifications without prior written approval by BHS-Sonthofen GmbH.
- ▶ The use of unapproved mixing material.
- ▶ Operation by unauthorised persons.
- ▶ Operation in disregard of safety regulations.

- ▶ Operation with deactivated, modified or defective safety devices.
- ▶ Overfilling of the mixer.
- ▶ Loading and emptying ratios that are outside the specified limits.

BHS-Sonthofen GmbH is not liable for damages resulting from this.

3.1.4 Misuse and misapplication

Misuse and misapplication includes, for example:

- ▶ Failure to observe the instructions relevant to use and safety.
- ▶ Manipulation, changes to the machine and bypassing protective and safety devices.
- ▶ Use of inadmissible tools and aids.
- ▶ Use of prohibited substances and auxiliary materials.
- ▶ Operation by untrained personnel.

3.1.5 Operating environment and space requirements

The space requirements for the installation and operating site of the machine are defined in the corresponding order-related regulations and documents and are agreed with the customer.

This accounts for:

- ▶ Clearances for movement and adequate lighting required for operation, repair, maintenance, servicing and cleaning.
- ▶ National regulations and laws.

3.1.6 Time limits

The machine may only be operated within the time limits defined in the order-related regulations and documents, including:

- ▶ Operating duration
- ▶ Maintenance intervals
- ▶ Cleaning guidelines
- ▶ Servicing guidelines

3.1.7 Replacement and wear parts

Observe the specified intervals for the replacement of spare and wear parts to keep the machine in a safe and efficient condition.

Only the specified original spare and wear parts from BHS-Sonthofen GmbH ensure optimum operation of the machine. These parts must be used to maintain the warranty.

Also refer to section: "[Maintenance and repairs](#)"

3.2 Notes for the operator

The machine may only be used in the commercial sector. The operator is subject to the applicable industrial safety regulations.

In addition to the safety and warning instructions in this operating manual, the safety, accident prevention and environmental protection regulations applicable to the machine's area of application must be observed.

In particular, the following must be observed:

- ▶ The machine may only be operated in perfect, fully functional condition with the trough cover having been installed.
- ▶ Electrical safety devices must be correctly integrated into the system control and their function checked.
- ▶ Safety devices must be checked regularly for their functionality and must not be overridden under any circumstances.
- ▶ The complete instructions must be available to operating staff in legible condition at the operating site of the machine.
- ▶ Regular instruction of personnel regarding all applicable aspects relating to occupational safety.
- ▶ All safety and warning signs attached to the machine must not be removed and must remain legible.
- ▶ When handling loads, the limits for manual lifting and carrying must be observed.
- ▶ The operator must provide the necessary personal protective equipment (PPE) to the relevant personnel.
- ▶ The machine control and its documentation is not included in the scope of delivery of BHS-Sonthofen GmbH.

3.3 Personnel requirements

3.3.1 Classification of personnel

Classification	Pursuant to DIN 31000; VDE 1000
Layperson	A layperson is someone who "... is not qualified as a professional or a person who has been instructed."
Instructed person	An instructed person is someone who "... has been informed and, if necessary, trained about the tasks assigned to them and the possible dangers of improper behaviour; they have also been instructed about the necessary protective equipment and protective measures." Regarding these instructions, there must be documented evidence of instruction/training.
Specialist, qualified personnel	A specialist (skilled personnel) is defined as staff who "... on the basis of their specialist training, knowledge and experience as well as knowledge of the relevant regulations are able to assess the work assigned to them and recognise possible dangers."

3.3.2 Personnel requirements

The machine may only be operated by persons who are 14 years or older. The applicable national occupational safety regulations must be observed.

Mechanical work Mechanical work on the machine may only be carried out by a trained and instructed specialist. This specialist must have the following qualifications:

- Completed training in a mechanical field (e.g., mechanic, machine fitter or mechatronic technician).






Electrical work Electrical work on the machine may only be carried out by a trained and instructed electrician. This qualified electrician must have the following qualifications:

- Completed training in an electrotechnical field (e.g., electrician, electronics engineer or mechatronics engineer).

3.4 Explanation of the warning notices

Safety instructions and warning notices serve your safety by pointing your attention to imminently and/or potentially dangerous situations. Observe the applicable warnings before performing each work step.







The safety notices in these operating instructions are as follows:

⚠ DANGER	
	Indicates an imminently hazardous situation that will result in death or serious injury.
⚠ WARNING	
	Indicates a potentially hazardous situation that could result in serious injury or death.
⚠ CAUTION	
	Indicates a potentially dangerous situation which could result in minor or moderate injury.
ATTENTION	
	Indicates a situation that could result in property damage.
NOTE	
	Useful information that facilitates the handling and efficient operation of the machine.





3.5 Explanation of the icons

Warning icons and icons referring to mandatory actions may be found in these operating instructions or at the machine. Typical icons are explained below.

3.5.1 Warning icons

Warning icons	Explanation
	General hazard sign.
	Risk of electric shock from exposed live parts or from live components.
	Risk of crushing from falling, tilting or moving parts.
	Risk of limbs being crushed by moving parts.
	Hot surfaces, danger of burns or scalding.
	Risk of being drawn in by counter-rotating shafts.
	Hazard due to automatic start-up.

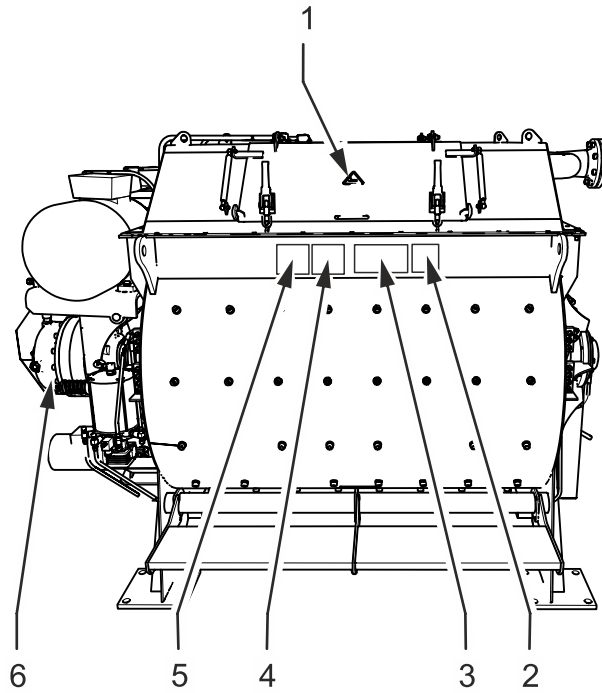
3.5.2 Mandatory action icons

Mandatory action icons	Explanation
	<p>General mandatory action sign.</p>
	<p>Read the operating instructions.</p>
	<p>Use hearing protection.</p>
	<p>Use safety shoes.</p>
	<p>Wear protective gloves.</p>
	<p>Wear head protection (e.g., safety helmet).</p>

3.6 Signs on the machine

All signs attached to the machine are firmly attached to the surface.

Make sure that all signs are legible and complete. Signs on the machine must not be removed.



Item No.	Designation	Illustration
1.	Risk of crushing warning sign.	

Item No.	Designation	Illustration
2.	Sound power level sign.	
3.	Twin-shaft batch mixer type plate.	
4.	'Installation and maintenance work' warning sign.	

Item No.	Designation	Illustration
5.	'Cleaning the mixer during long breaks in operation' warning sign.	
6.	Hot surface warning sign.	

3.7 General safety instructions and warning notices

⚠ DANGER	
	<p>Risk of electric shock from exposed live parts. Death or serious injury.</p> <p>Never switch on the machine if you see damaged or exposed live parts.</p> <p>Never touch electrical components and contacts when the unit is switched on.</p>

⚠ DANGER	
	<p>Risk of injury due to unintentional start-up. Crushing or shearing injuries to limbs.</p> <p>Switch off the machine and secure it against unintentional start-up.</p> <p>A sign must be attached at the switch-on point indicating that work is being carried out on the machine.</p>

⚠ WARNING



Risk of crushing by moving parts of the machine.

Crushing or shearing injuries to hands or limbs.

Never reach into moving components. Secure heavy components against falling or tilting.

Work relating to transport, installation, storage, initial start-up, servicing, maintenance, decommissioning, dismantling and disposal may only be carried out by authorised specialist personnel.

⚠ WARNING



Risk of crushing by moving, tilting and falling loads.

Crushing and shearing injuries to body and limbs.

Only use suitable, technically impeccable and tested lifting equipment that offers sufficient lifting capacity. Keep the hazard zone clear.

⚠ WARNING



Risk of burns from hot media.

Burns of body parts and limbs.

Safety goggles and protective gloves must be worn when working in the vicinity of hot media. Let the components cool down sufficiently before commencing work.

⚠ WARNING



Risk of burns from hot surfaces

Burns of body parts and limbs.

Protective gloves and protective clothing must be worn when working in the vicinity of hot surfaces. Let the components cool down sufficiently before commencing work.

3.8 Personal protective equipment

The following personal protective equipment is mandatory when performing work on the machine:

- ▶ Protective gloves
- ▶ Safety shoes
- ▶ Hearing protection
- ▶ Safety glasses
- ▶ Safety helmet

4 Transport, installation and storage

4.1 Transport

⚠ WARNING



Risk of crushing by moving, tilting and falling loads.

Crushing and shearing injuries to body and limbs.

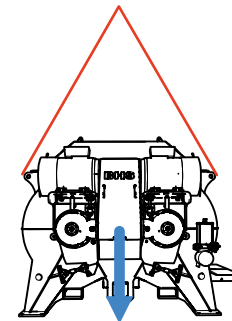
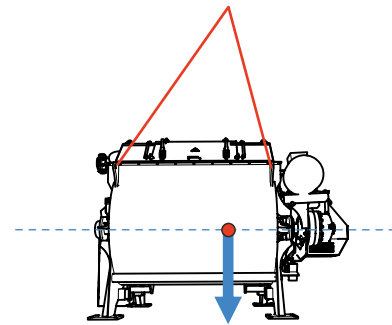
Only use suitable, technically impeccable and tested lifting equipment that offers sufficient lifting capacity. Keep the hazard zone clear.

Observe the following when transporting the machine:

1. Transport may only be carried out by appropriately trained personnel.
2. Prior to transport, all power supplies must be disconnected from the machine and moving components must be secured.
3. Ensure that the sling ropes attached to the Twin-shaft batch mixer do not fall below the angle of 45° to the horizontal (to the lifting load) without a mixer trough cover and 60° with a mixer trough cover. We recommend using a load beam.
4. Make sure that all four lifting points are lifted evenly at the same time to avoid twisting.

Observe the following when transporting the machine:

5. Only lift the machine at the specified lifting and lashing points. Pay attention to the centre of gravity and secure the machine against tipping if necessary.



6. Make sure that no connection cables are damaged during transport.

4.1.1 Overview of lifting points

ATTENTION

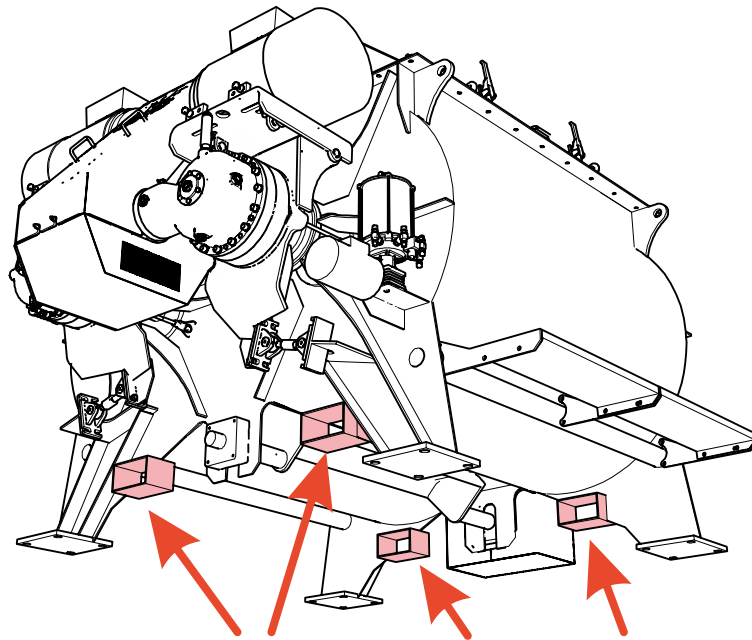


Ensure even lifting

The machine must be lifted by all four lifting points simultaneously. Make sure that the slings attached to the machine do not fall below the angle of 45° to the horizontal (to the lifting load) if there is no mixer trough cover and 60° if there is a mixer trough cover.

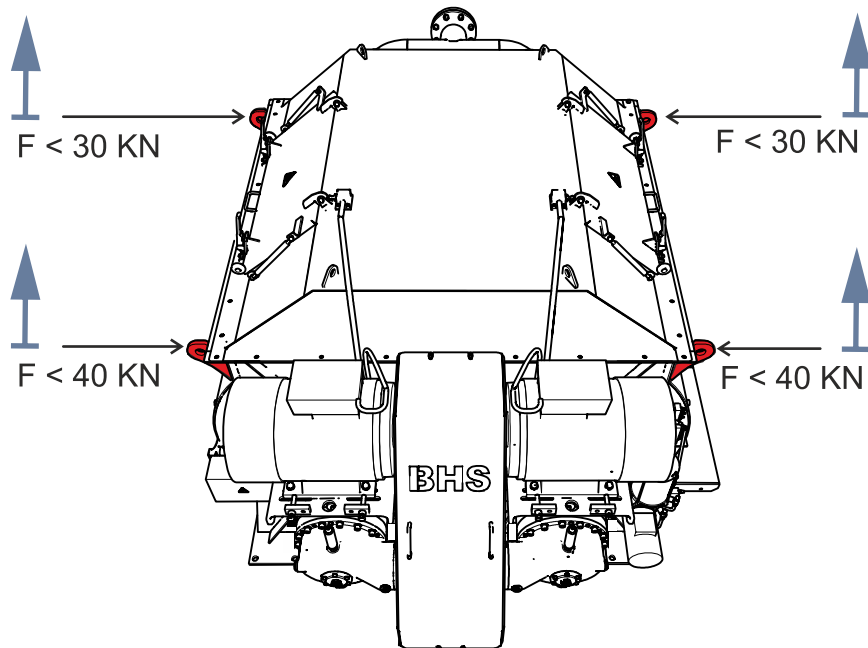
Forklift lifting points, supports

4x supports for lifting the machine with a forklift

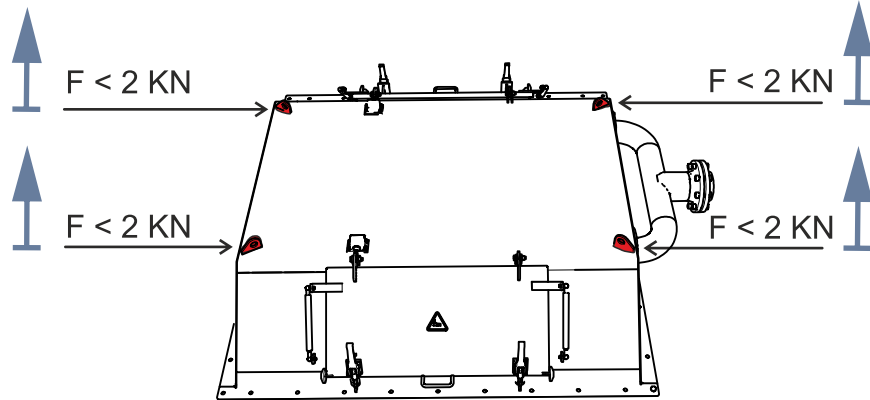


Machine lifting points

4x lifting rings for lifting the machine



Trough cover lifting points 4x lifting rings for lifting the trough cover



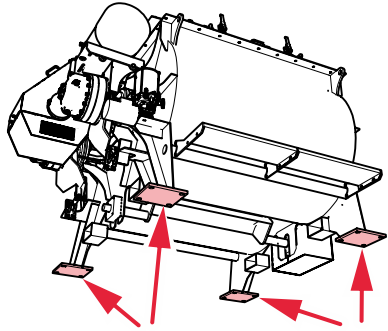
4.2 Installation

4.2.1 Installation of the mixer in the system

- Preparatory work**
- ▶ Check whether the machine is in an undamaged condition following transport.
 - ▶ Check the condition of the installation site (see "[Installation drawing](#)").
 - ▶ Check the support surfaces on the mixer platform; they must be exactly the same level, even and horizontal ($< 1 \text{ mm/m}$).
 - ▶ Compensate for differences in height between the support surfaces using appropriate steel sheets.
 - ▶ Clean the support surfaces.

Installation

Installation		
1.	Lift the machine onto the mixer platform.	See " Transport "
2.	Check that the mixing trough is level ($< 1 \text{ mm/m}$).	If necessary, compensate for height differences under the base surfaces using steel sheets.
3.	Check the mixer mechanism for freedom of movement.	Turn the mixer mechanism by hand; if there is tension, compensate for height differences under the base surfaces of the mixing trough using steel sheets if necessary.

Installation	
<p>4. Fasten the mixer base surfaces (arrows) to the mixer platform with galvanised screws (M24 quality 8.8, 742 Nm). "Tightening torques"</p>	
<p>5. Check that the mixing trough is level (< 1 mm/m) and that the mixer mechanism can rotate freely.</p>	<p>Turn the mixer mechanism by hand; if there is tension, compensate for height differences under the base surfaces of the mixing trough using steel sheets if necessary.</p>
<p>6. Remove the transport lock on the discharge gate.</p>	<p>See "Securing the discharge gate"</p>

Electrical connection

The electrical system must be installed by a qualified electrician. ["Personnel requirements"](#)

Connection details, see ["Electrical diagrams"](#)

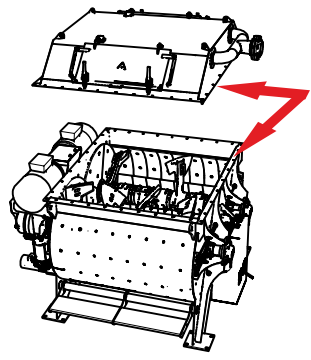
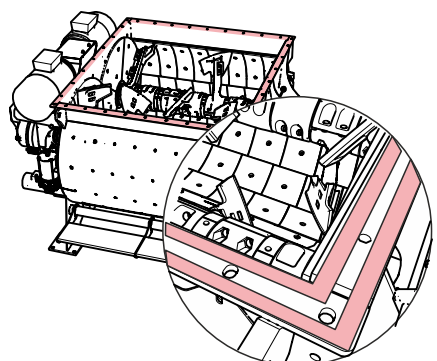
Connection for material infeeds

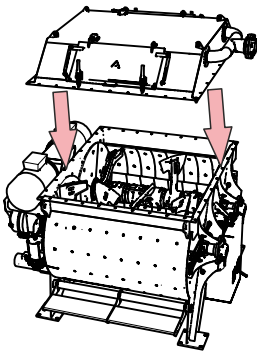
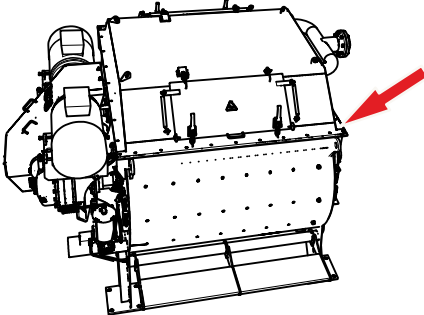
The machine connections may only be installed by qualified personnel of BHS-Sonthofen GmbH or specialist companies commissioned by it.

For tightening torques, see ["Tightening torques"](#)

4.2.2 Installation of the trough cover on the mixer

Installation

Installation	
<p>1. Clean the support surfaces on the trough cover and on the mixer.</p>	
<p>2. Glue the sealing tape (article no. 910296800) onto the support surface of the mixer, in two rows, inside and outside the screw connections.</p>	

Installation	
<p>3. Place the trough cover on the mixer.</p>	
<p>4. Screw the trough cover tightly to the mixer (M12 quality 8.8, 87 Nm). "Tightening torques"</p>	

Electrical connection

The installation of the electrical equipment, the integration into the safety circuit and the system control must be carried out by a qualified electrician. ["Personnel requirements"](#)

Connection details, see ["Electrical diagrams"](#)

Connection for material infeeds

The machine connections may only be installed by qualified personnel of BHS-Sonthofen GmbH or specialist companies commissioned by it.

For tightening torques, see ["Tightening torques"](#)

4.3 Storage

ATTENTION	
	<p>Damage arising from improper storage If the machine is stored inadequately, damage may occur.</p>

Observe the following during storage:

- ▶ The machine should be stored in temperature-controlled warehouses or buildings.
- ▶ Store the machine on a level and stable surface.

- ▶ Store the machine in a dry and dust-free place and provide chemical air dehumidifiers for individual parts.
- ▶ Cover the machine with a weatherproof tarpaulin to protect it from the elements while allowing rain and condensation water to drain away.
- ▶ The lower and upper limit values specified for the ambient conditions should not be exceeded or undershot.
- ▶ The surfaces of the machine must be treated with a corrosion protection agent.
- ▶ All openings, especially at the terminal cabinets, must be closed to prevent the penetration of moisture.
- ▶ Rubber and plastic parts must be protected from direct sunlight.

ATTENTION



Damage to rubber and plastic parts from lubricants and oils

Rubberised components and plastic surfaces can be damaged by lubricants and oils.

Keep rubberised components and plastic surfaces free of general lubricants and oils. Treat rubberised components and plastic surfaces only with special lubricants and special oils.

- ▶ Fill the gearboxes completely with oil. Information on the oil can be found in the maintenance section or in the technical specifications.

ATTENTION



Reduce the oil level before restarting

An incorrect oil level can damage the gearbox and the seals.

Before commissioning, restore the correct oil level and check the oil.

- ▶ Rotatable components must be turned 2–3 revolutions every three months.
- ▶ Spray all pin connections, joints, pedestal bearings and bare turned parts with preservative oil. This preservation procedure must be repeated every 9 to 12 months.

5 Technical specifications

5.1 Environmental conditions

Environmental conditions	
Operating temperature	-10°C to +45°C
Permissible humidity	< 95%

5.2 Electrical specifications

Electrical specifications		
Voltage	U	380 V AC Δ
Power	P	2 x 37 kW
Frequency	f	50 Hz
Rated current	I _n	2 x 71 A
Control voltage	U	24 V DC

5.3 Pneumatics

Pneumatics	
Inlet pressure	8 bar
Operating pressure	8 bar
Nominal consumption	107.2 litres of normal air

5.4 Weight and dimensions

Weight and dimensions		
Total weight	kg	5760
Length	mm	3060
Width	mm	2315
Height	mm	2061

5.5 Operating resources

Operating resources	Quantity	Quality
Gearbox	2 x 8 l	see section " Lubricants "
▶ Initial filling		Shell Omala S4 WE
Central lubrication (optional)	10 l	see section " Lubricants "
▶ Initial filling		Bechem High-Lub L2

5.6 Noise emission


Noise emission	
Emission value	
Workplace-related emission value	< 110dBA

5.7 V-belt

V-belt	
Number of V-belts per side	4
Ø Motor V-belt pulley	236 mm
Ø Gearbox V-belt pulley	500 mm
Centre distance	655 mm
Preload force per V-belt	682 N

6 Initial commissioning

6.1 Before commissioning

⚠ DANGER	
	<p>Risk of injury due to unintentional start-up. Crushing or shearing injuries to limbs.</p> <p>Switch off the machine and secure it against unintentional start-up.</p> <p>A sign must be attached at the switch-on point indicating that work is being carried out on the machine.</p>

Before the initial commissioning, the following points must be checked:

- ▶ The machine is aligned horizontally. If necessary, tolerances in the steel construction are to be compensated by spacer plates.
- ▶ No foreign bodies or material in the Twin-shaft batch mixer.
- ▶ V-belt tension. (See section: "[Tab. 7: Check V-belt](#)")
- ▶ The direction of rotation of the two mixers – these must work towards the opposite side of the drive, and between the mixers upwards.
- ▶ Mixer blades for collision (turn mixer mechanism by hand).
- ▶ Gap distance between the mixer blades and the tub tiles. (See section: "[Wear parts](#)")
- ▶ Cables and screw connections for tightness.
- ▶ Safety devices on of the trough cover for function.

6.2 Preparation for initial commissioning

For optimal operation, the wear lining of the machine must be coated in before commissioning for the first time, only this can guarantee the optimal fit.

After empty and unloaded operation for 30 minutes, during which you also checked the function of the discharge gate, slurry the mixer as follows:

- ▶ Fill the machine with a 75% capacity, liquid concrete consistency, grain size 4–8 mm.
- ▶ Operate the machine with this load for one hour.
- ▶ Give the machine a general cleaning.
- ▶ Let the concrete slurry dry between the mixing trough and the tub tiles overnight.

6.3 Initial commissioning

After preparation, proceed Twin-shaft batch mixer as follows with the operation:

First week of operation	50% fill capacity per batch
Second week of operation	75% fill capacity per batch
From third week of operation	100% fill capacity per batch

NOTE




Pay attention to the correct setting of the material loading!

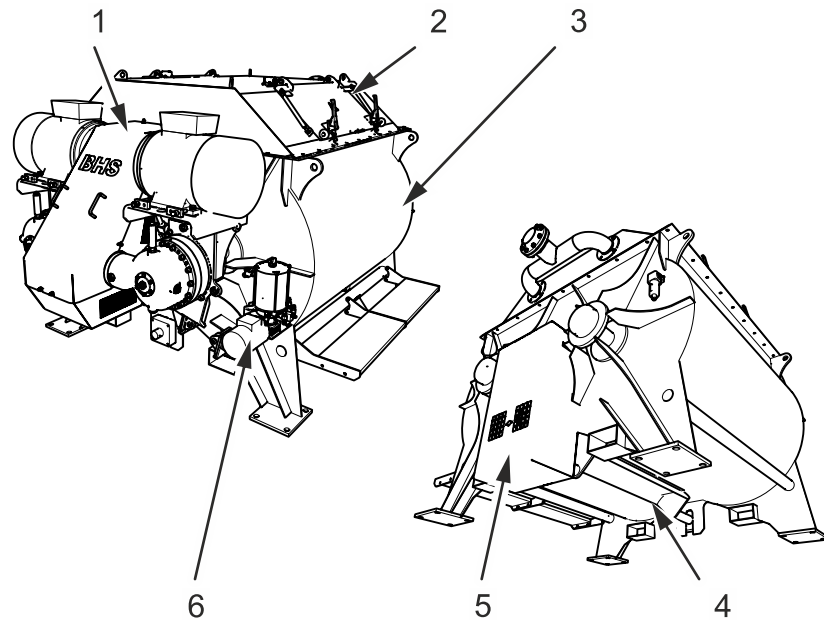
7 Design and purpose

7.1 Design

The Twin-shaft batch mixer essentially consists of the following:

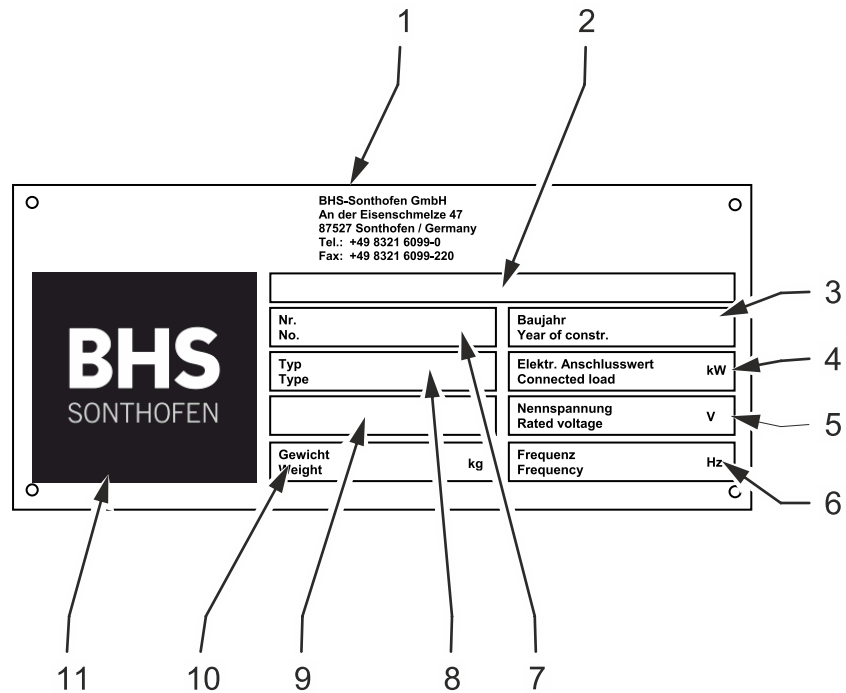
NOTE	
	Other components can be added to the mixer as needed in a modular manner.

Twin-shaft batch mixer



Machine zones	
1.	Mixer drive
2.	Mixing trough cover
3.	Mixing trough
4.	Discharge gate
5.	Discharge gate actuation
6.	Central lubrication pump

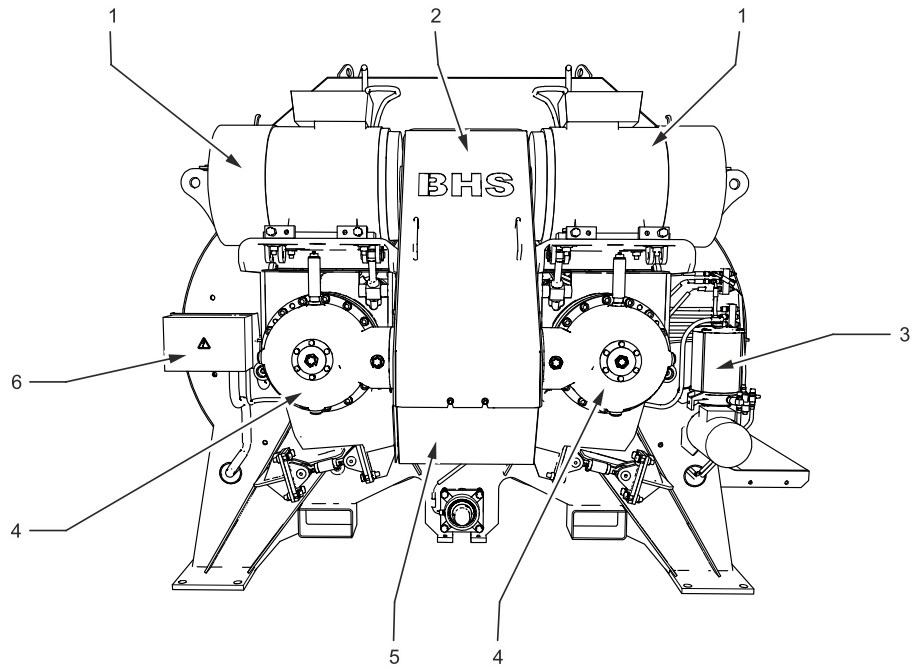
7.1.1 Type plate



Type plate	
1.	Manufacturer address
2.	Type designation
3.	Year built
4.	Electrical connection value
5.	Rated voltage
6.	Frequency
7.	Project/Serial number
8.	Type
9.	-
10.	Weight
11.	Manufacturer logo

Design and purpose

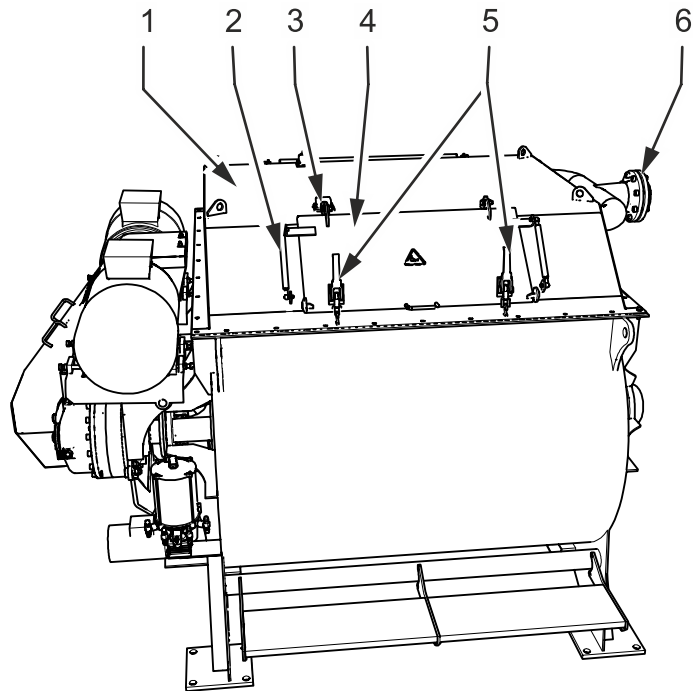
Mixer drive



Mixer drive	
1.	Drive motor
2.	V-belt protective cover
3.	Grease lubrication pump
4.	Gearbox
5.	Cover for synchronous coupling
6.	Terminal box

Design and purpose

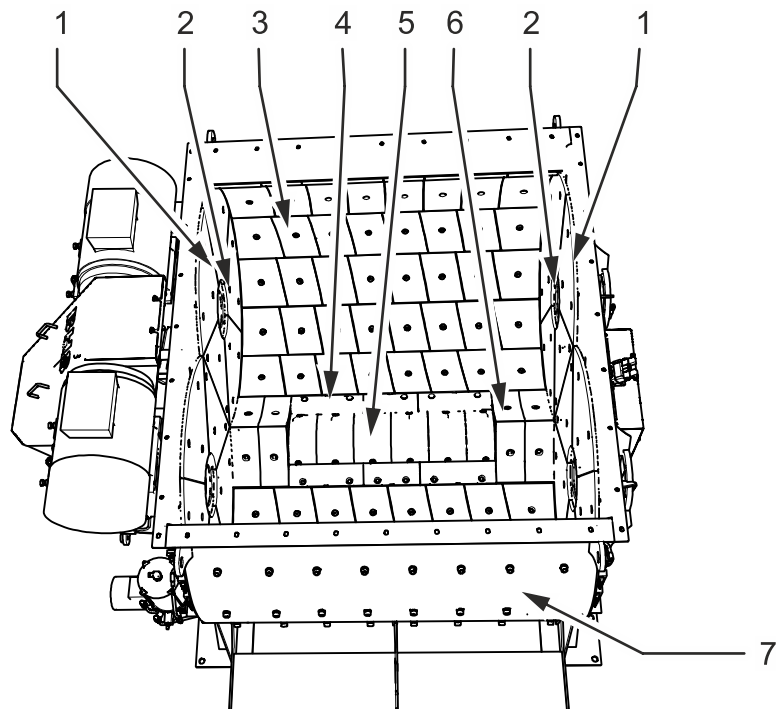
Mixing trough cover



Mixing trough cover	
1.	Mixing trough cover
2.	Gas pressure spring, maintenance cover
3.	Roller end switch
4.	Maintenance cover
5.	Manual maintenance cover lock
6.	Fluid inlet

Design and purpose

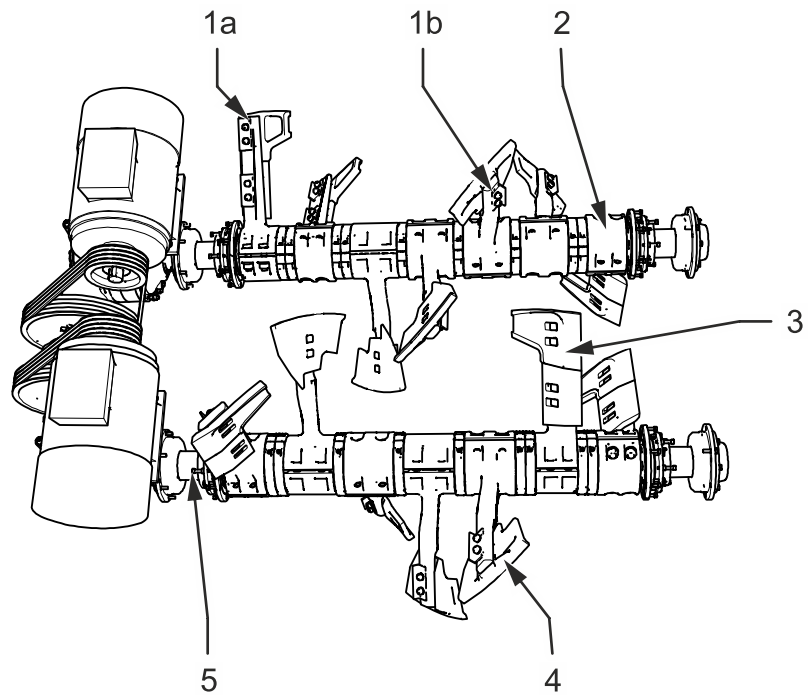
Mixing trough



Mixing trough	
1.	End-wall tiles/end-wall plates
2.	Dust cover/anti-wear ring (mixer shaft seal)
3.	Tub tiles/tub plates
4.	Gate rail
5.	Roller protection
6.	Gate cover
7.	Mixing trough

Design and purpose

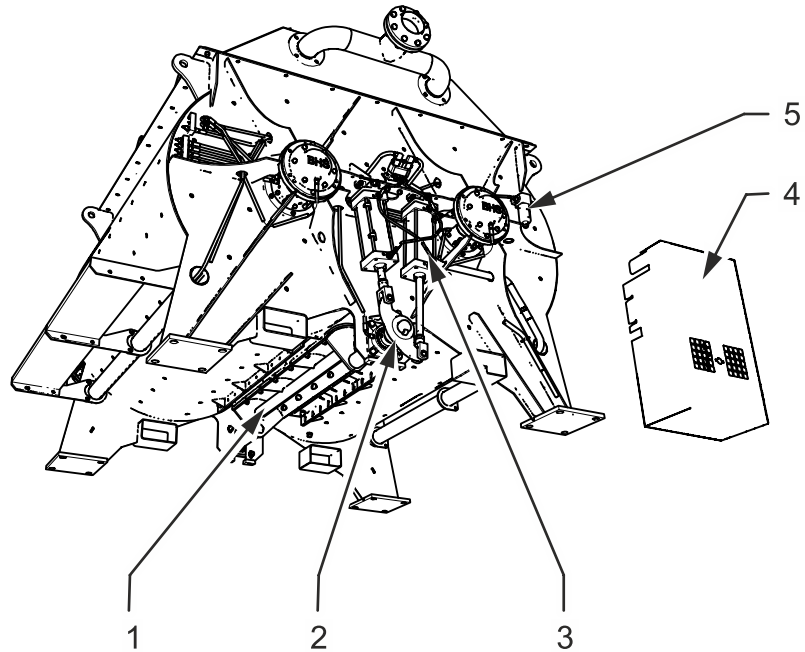
Mixer mechanism



Mixer mechanism	
1.	Mixer arm (1a side arm, 1b centre arm)
2.	Counterpart
3.	Side blades/side plates
4.	Centre blade
5.	Mixer shaft

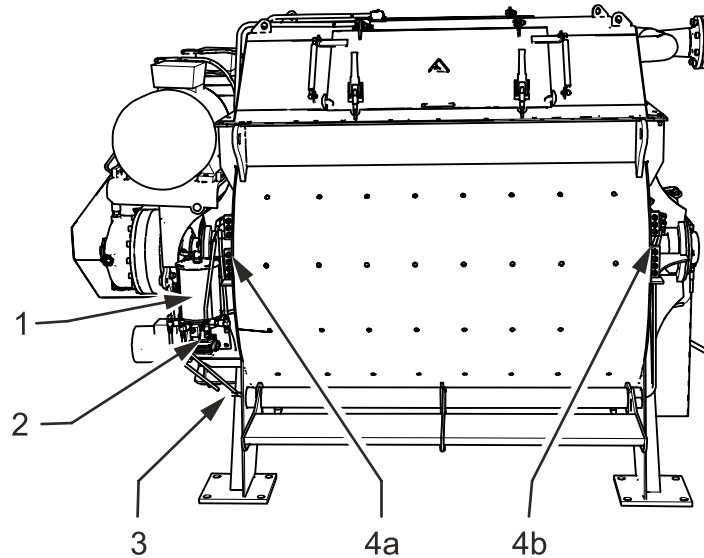
Design and purpose

Discharge gate,
discharge gate
pneumatics




Discharge gate, discharge gate hydraulics	
1.	Gate roller
2.	Discharge gate lever
3.	Pneumatic cylinder
4.	Protective cover of discharge gate actuation
5.	Automatic pneumatic filter

Central lubrication



Central lubrication	
1.	Storage tank
2.	Lubrication pump
3.	Lubrication lines
4.	Centrally combined lubrication points ((4a) drive side (4b) opposite side of the drive) for manual lubrication

7.2 Safety devices on the machine

⚠ WARNING	
	<p>Danger from missing or defective safety devices Risk of injury due to open hazard areas</p> <p>Safety devices must not be overridden, dismantled or manipulated.</p> <p>The machine must not be operated with defective or missing safety devices.</p>

There are mechanical (fixed and movable safety devices) and electronic safety devices on the machine.

These protect against hazardous areas (e.g. moving machine parts, hot surfaces, live components, etc.).

All safety devices must be checked before each start of operation and when changing shifts.

If there are any damage or malfunctions, the machine must not be operated or must be taken out of service immediately.

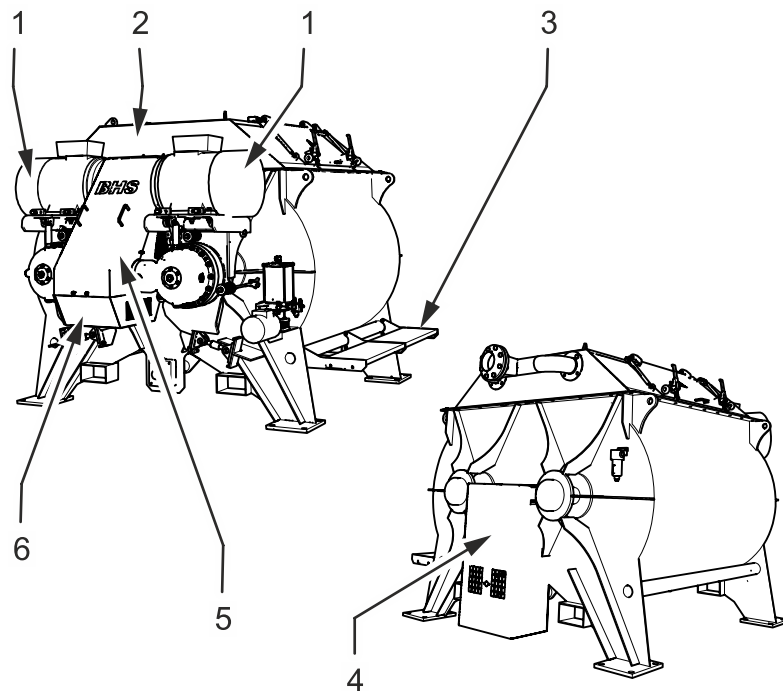
7.2.1 Emergency stop

The operating instructions contain information on how to remedy a fault after an emergency stop has been triggered.

The emergency stop is not included in the scope of delivery of BHS-Sonthofen GmbH.

7.2.2 Fixed safety devices on the machine

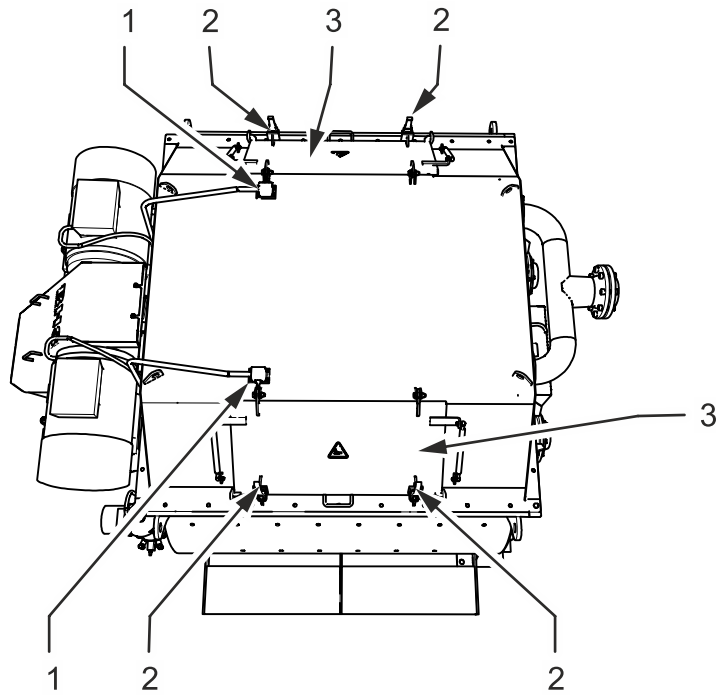
Fixed safety devices



Component designation	
1.	Fan cover, drive motor
2.	Trough cover
3.	Work platform
4.	Protective cover, discharge gate actuation
5.	Protective cover, V-belt top
6.	Protective cover, V-belt bottom

7.2.3 Movable safety devices on the machine

Movable safety devices



Component designation	
1.	Electronic/mechanical safety, maintenance cover
2.	Eccentric lock, manual maintenance cover lock
3.	Maintenance cover

7.3 Purpose

The function of the machine consists in the automatic, batchwise production of concrete mixes and mineral mixtures in fixed mixing ratios.

Configuration of inlet position and loading procedure

The position and direction of the binders (c) and aggregate inlets (a) are crucial for short mixing times and a good mixing effect.

It also prevents caking on the mixer mechanism.

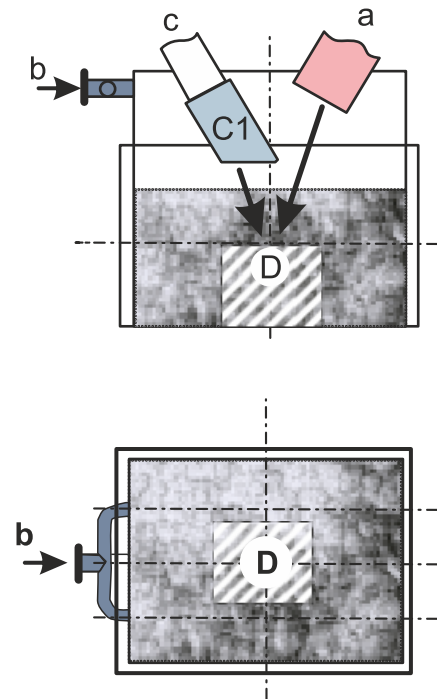
The recommended arrangement of feeding devices provides for the addition of binders (c) and aggregates (a) within the theoretical target area (D) This extends across the middle third of the mixer in a longitudinal direction and is centrally located between the mixing shafts. The area extends up vertically to the level of the mixing shafts.

The binder inlet must be made using a rubber hose (C1) attached to the inlet pipe for binders (c). This must be aligned parallel to the mixing shaft so that it is gently tapped by one of the mixing blades each time they rotate (self-cleaning). This acts to reduce the risk of caking.

It is loaded with water by means of the:

- U-shaped pipeline, with holes or rows of nozzles.
- Baffle plate.

Liquid additives can be added to the water.



Configuration of inlet position and loading procedure

Alternative arrangements are the responsibility of the customer or must be agreed with BHS-Sonthofen.

The mixer must be loaded with aggregates (a), water (b) and binders (c) in a particular, timed sequence.

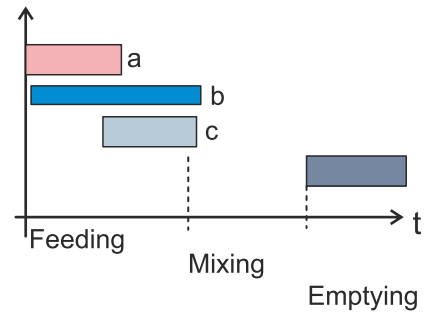
The twin-shaft batch mixer does not require any dry mixing time.

The water is usually called up at the same time as the aggregates or 1–2 seconds later.

Water should stop being added at the same or after the binder is added.

It is important that the aggregates run ahead of the binder (c).

When the binder is called up, 80–90 per cent of the aggregates should already be in the mixing trough




8 Operation and troubleshooting

8.1 Operation


8.1.1 Operator stations at the machine


There is no operator station in normal operation at the machine.

8.1.2 Establishing operational readiness

ATTENTION	
	<p>Damage from starting operation at low temperature Immediate operation under load at low temperatures below 0°C can damage the machine.</p> <p>Check that the mixing trough is free from icing and freezing and run the machine for 30 minutes at low temperatures in the idle mode before starting production.</p>

8.2 Troubleshooting

⚠ DANGER	
	<p>Risk of injury due to unintentional start-up. Crushing or shearing injuries to limbs.</p> <p>Switch off the machine and secure it against unintentional start-up.</p> <p>A sign must be attached at the switch-on point indicating that work is being carried out on the machine.</p>

⚠ WARNING	
	<p>Personnel requirements for troubleshooting Personal injury and damage to property possible in case of insufficiently qualified personnel.</p> <p>The situation leading to the malfunction may only be remedied by trained personnel.</p>

- ▶ Mechanical work for troubleshooting must be carried out when the machine is at a standstill.
- ▶ Sudden pressure drops in the hydraulics or other faults can cause unexpected movements of machine parts. Secure the moving machine parts before troubleshooting.

Troubleshooting

Fault	Possible cause	Action to take
Motor running noises	Contamination	Check for contamination and clean
	Fan blades are touching the fan hood	Replace bent fan blade/fan hood
	Faulty bearing	Replace bearing
The machine does not start when empty	Mechanical blocking	Remove blocking
	Motors are working against one another	Correctly adjust the direction of motor rotation
Unusual noises or vibrations on the gearbox	Low oil level	Top up oil and check gearbox for leaks
	Mechanical damage	Consult with Service personnel
The mixer drive runs unevenly	Cement/concrete layer on the synchronous coupling or on the V-belt pulleys	Remove the cement/concrete layer from the affected component
	Torque support, drive motor, knocked out	Replace torque support
Increased operating temperature of the gearbox	Impaired cooling due to contamination	Cleaning the housing surfaces
	Heat build-up in of the system	Ensure adequate ventilation
	Low oil level	Check the oil level at room temperature and top up if necessary, change the oil if necessary
	Oil is old or dirty	Change the oil
Discharge gate closes suddenly	Cushioning incorrectly set on the cylinder (too low)	Correct the attenuation
Discharge gate jams when closing	Seal gap too large, mixing material is jammed	Correct the gate rails
	Cushioning incorrectly set on the cylinder (too high)	Correct the attenuation

Fault	Possible cause	Action to take
Intermediate positions for discharge gates are overrun	Limit switch on cylinder defective	Replace the limit switch on the cylinder
The machine stops	V-belt tension too low	Adjust the V-belt tension
	Electrical failure	Check fuses and operating voltage
	Double loading	Empty the mixing trough
Caking on mixer shafts, mixer mechanism	Incorrect loading of mixing material	Correct the loading sequence.
	Incorrect cement in-feed	
	Cement inlet pipe without rubber hose	Replace the hose
Loud mixing noise	Gap between the mixer blade and the tub tiles too large	Correct the gap
Excessive wear on the mixer mechanism	Gap between the mixer blades and the tub tiles too large	Correct the gap.
Mixing material escaping from the mixer shaft seal	Defective axial face seal	Replace axial face seal

9 Maintenance and repairs

⚠ DANGER



Risk of injury due to unintentional start-up when working at the mixing trough

Crushing or shearing injuries to trunk and limbs.

Work on and in the mixing trough must be carried out when the machine is at a standstill.

Mixer shafts must also be secured against unintentional movements by means of wedges.

A sign must be attached at the switch-on point indicating that work is being carried out on the machine.

⚠ WARNING



Danger of shearing or crushing due to unsecured discharge gate

Manual operation of the discharge gate can cause serious injuries.

Secure the area of the discharge gate. No personnel may be in the mixing trough and there must be a sufficient safety distance from the discharge gate.

⚠ WARNING



Risk of injury due to misuse

Severe personal injury and damage to property possible in case of insufficiently qualified personnel.

The installation, operation, maintenance and servicing personnel must have the appropriate qualifications for this work on the machine.

ATTENTION



Damage arising from incorrectly set components

Incorrect setting of the components on the machine can lead to property damage, faulty products or delays in the production process.

The settings may only be carried out by a specialist.

The repair work that may not be described in these operating instructions may only be carried out by qualified personnel of BHS-Sonthofen GmbH.

9.1 Preventive inspections

To prevent damage and longer downtimes, the condition of the machine and in particular the wear parts must be checked regularly every 50 hours. In particular the following points:


- ▶ General condition of the machine.
- ▶ Condition/degree of wear of mixer blades, mixer arms, tub tiles and end-wall tiles.
- ▶ Gap between mixer blades and tub tiles and between discharge gate and gate rail.
- ▶ Check V-belt and synchronous coupling.

9.2 Adjustment of loading of mixing material

When adjusting the settings for loading, the following parameters must be observed in the control:

- ▶ Composition of the mixing material.
- ▶ Consistency of the mixing material.
- ▶ Use of additives.
- ▶ Use of special additives (e.g. steel fibres).

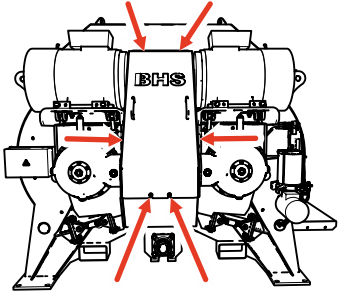
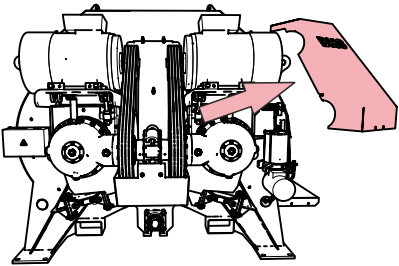
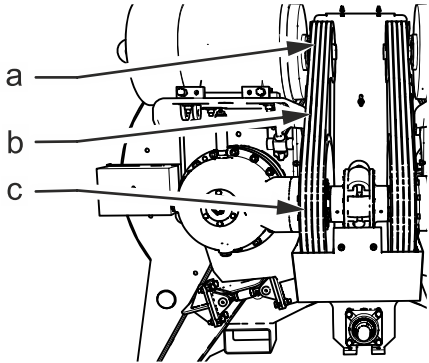
9.3 V-belt

⚠ WARNING	
	<p>Risk of injury due to automatic start Crushing or shearing injuries to limbs due to automatic or unintended start.</p> <p>Work must be carried out when the machine is at a standstill.</p> <p>The machine must be secured against unintentional switch-on and restart.</p>

Preparatory work:

- ▶ Switch off the machine.
- ▶ A sign must be attached at the switch-on point indicating that work is being carried out on the machine.
- ▶ Secure the machine against accidental start-up.
- ▶ Secure mixer shafts against unintentional movements (for example, by means of wedges between the mixer blades and the trough wall).

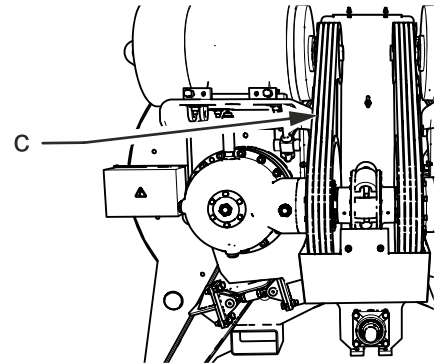
9.3.1 Check V-belt

Check V-belt	
<p>Remove the V-belt protective cover</p> <ol style="list-style-type: none"> 1. Loosen the 6 retaining nuts (arrows) on the V-belt protective cover. 2. Lift off the V-belt protective cover and place it on a suitable, clean surface. 	 
<p>Visual inspection of V-belts and pulleys</p> <ol style="list-style-type: none"> 1. Check the belt pulleys (a, c) for dirt and defects. 2. Check the V-belts (b) for damage. 	

Check V-belt

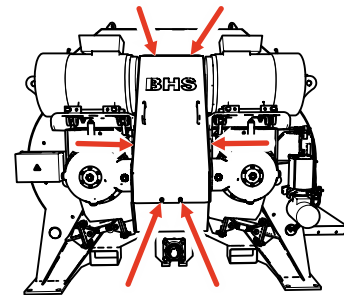
Check V-belt tension

1. Measure the V-belt tension in the middle between the two V-belt pulleys (c) using a suitable measuring device. The setpoint can be found in the technical specifications.
2. Compare the values of the individual belts on each drive side. If there is a large deviation, it can be assumed that the individual V-belts are defective and the V-belt set must be replaced.



Attach the protective cover

1. Place the V-belt protective cover on top.
2. Tighten the 6 retaining nuts (arrows) of the V-belt protective cover.

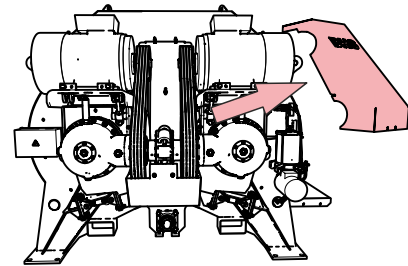
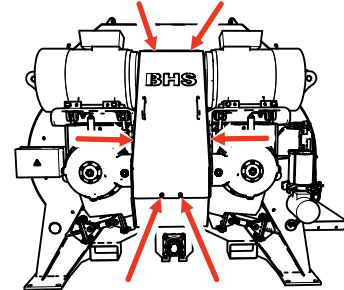


9.3.2 Adjusting the V-belt tension

Adjusting the V-belt tension

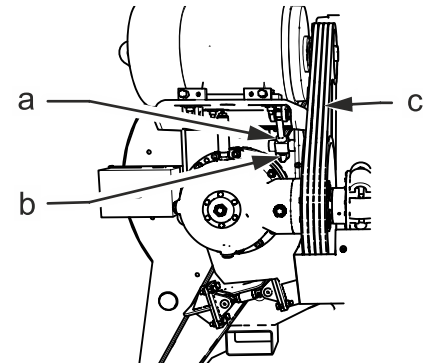
Remove the V-belt protective cover

1. Loosen the 6 retaining nuts (arrows) on the V-belt protective cover.
2. Lift off the V-belt protective cover and place it on a suitable, clean surface.



Adjust the belt tension

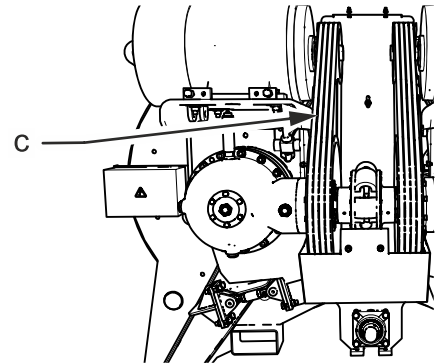
1. Loosen the lock nut (b)
2. Set the belt tension by loosening (belt slackened) or tightening (belt tension is increased) the adjusting nut (a).
3. Secure the setting by tightening the lock nut (b)



Adjusting the V-belt tension

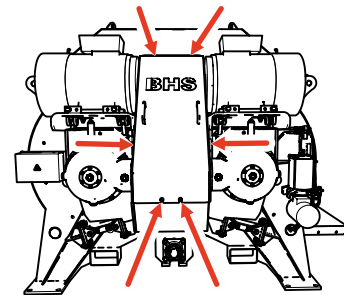
Check V-belt tension

1. Measure the V-belt tension in the middle between the two V-belt pulleys (c) using a suitable measuring device. The setpoint can be found in the technical specifications.
2. Compare the values of each on each drive side. In the event of a major deviation, it can be assumed that individual V-belts are defective, and the V-belt set must be replaced.

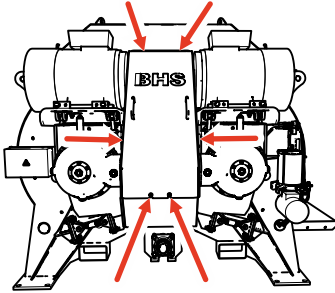
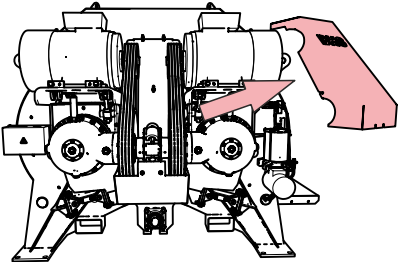
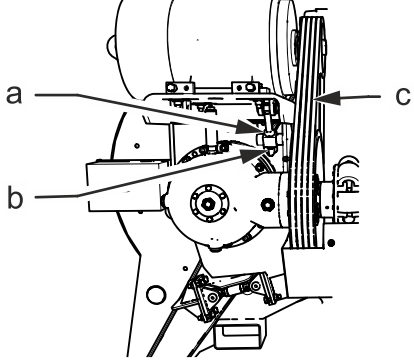


Attach the V-belt protective cover

1. Place the V-belt protective cover on top.
2. Tighten the 6 retaining nuts (arrows) of the V-belt protective cover.

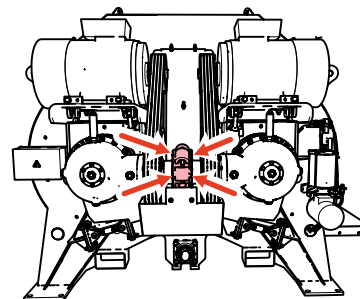


9.3.3 Changing the V-belt

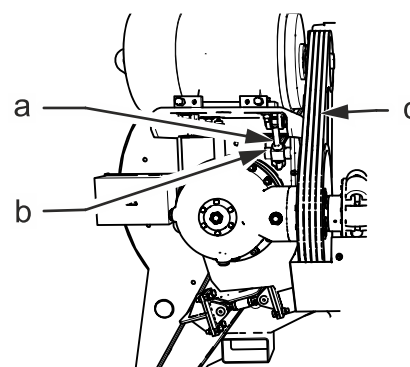
Changing the V-belt, removing the protective cover	
<p>1. Loosen the 6 retaining nuts (arrows) on the V-belt protective cover.</p>	
<p>2. Lift off the V-belt protective cover (A) and place it on a suitable, clean surface.</p>	
Changing the V-belt	
<p>1. Loosen the lock nut (b) Loosen the adjusting nut (a) until the V-belts (c) are slack enough to remove them.</p>	

Changing the V-belt

2. Loosen the screws of the rubber parts of the synchronous coupling.
Remove the rubber parts and secure the coupling hubs against twisting.
Remove the V-belts.
Put on the new V-belts.
Install the rubber parts.
["Tightening torques"](#)



Tension the V-belts (c) by tightening the adjusting nut (a). Check the V-belt tension in the middle between the two V-belt pulleys (c) using a suitable measuring device. The setpoint can be found in the technical specifications. Secure the setting by tightening the lock nut (b)

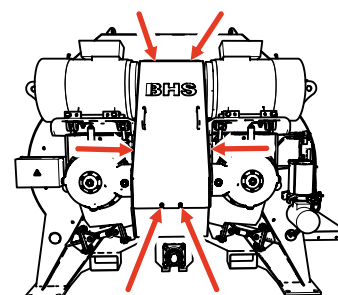


Check the setting of the synchronous coupling ["Checking and adjusting the synchronous coupling"](#)

Changing the V-belt, attaching the protective cover

Attach the protective cover

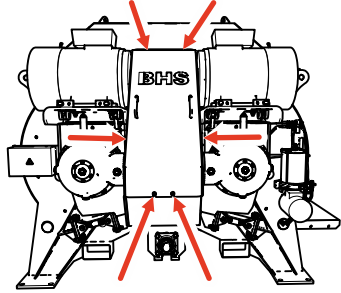
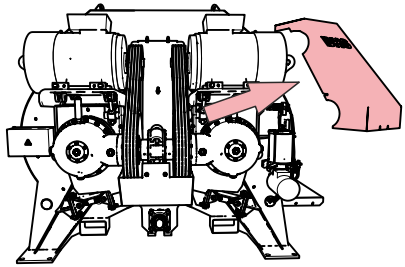
1. Place the V-belt protective cover on top.
2. Tighten the 6 retaining nuts (arrows) of the V-belt protective cover.



9.4 Checking and adjusting the synchronous coupling

- Preparatory work**
- ▶ Switch off the machine.
 - ▶ Secure the machine against accidental start-up.

Checking and adjusting the synchronous coupling

Installation	
<p>1. Loosen the 6 screws (arrows) on the protective cover.</p>	
<p>2. Lift off the protective cover.</p>	

Installation	
<p>3. Check the following:</p> <ul style="list-style-type: none"> ▶ The rubber parts for damage and wear. ▶ Distance (A) must be the same as distance (B), 75 ± 2 mm or 116 ± 3 mm depending on the design. ▶ The difference between distance (A) and distance (B) must not exceed 1.5 mm. ▶ The gearbox axes must be precisely aligned (C) (maximum tolerance ± 0.6 mm). ▶ Turn the mixer shafts by 90° and check the setting. ▶ Repeat the process until you have rotated the mixer shafts by 360°. 	
<p>4. Setting the synchronous coupling:</p> <ul style="list-style-type: none"> ▶ Loosen the counter-nuts on the turnbuckles of the torque supports (arrows) ▶ Set the position of the gearboxes in relation to one another by turning the turnbuckles on the torque supports (arrows). ▶ Secure the turnbuckles of the torque supports by tightening the counter-nuts. 	
<p>5. Install the protective cover of the synchronous coupling and tighten the 6 screws (arrows).</p>	

9.5 Discharge gate

9.5.1 Securing the discharge gate

Secure the discharge gate before the following work:

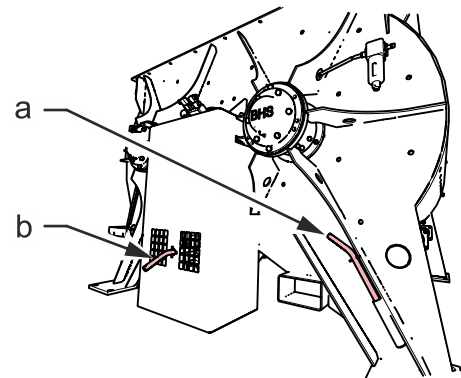
- ▶ All work in the mixing trough.
- ▶ When working in the swivel range of the discharge gate.
- ▶ When working on the discharge hopper and on the following units.
- ▶ Work on the discharge gate actuation.

Securing the discharge gate

1. Switch off the machine.

2. Remove the safety bolt from the bracket (position a).

3. Insert the safety bolt into the opening for the discharge gate lock (position b). When inserting the safety bolt, turn it by 90° in order to secure it with the locking pins in the cover.



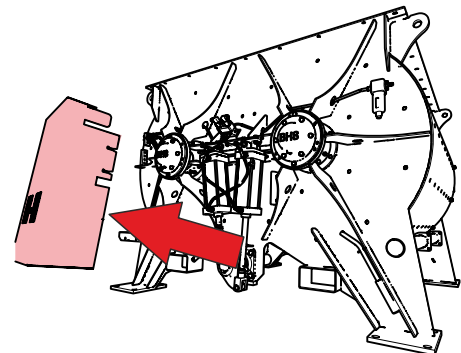
9.5.2 Replacing the pneumatic cylinder

Discharge gate, replacing the pneumatic cylinder

1. Switch off the machine and secure it against start-up.

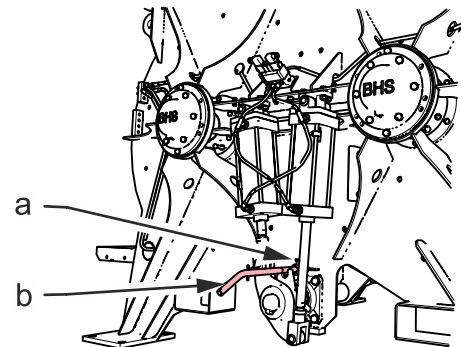
2. Make sure that the pneumatic system is depressurised.

3. Remove the protective cover from the discharge gate pneumatics.

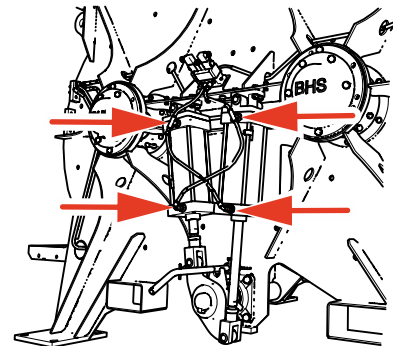


Discharge gate, replacing the pneumatic cylinder

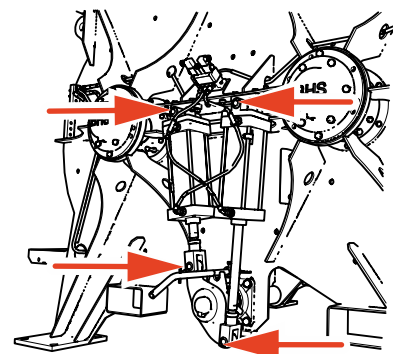
4. Secure the discharge gate with the safety bolt (b) and fix it with the safety screw (a).



5. Loosen the pneumatic connections on the cylinders.



6. Remove the bolts of the pneumatic cylinders and take them out.



7. Make sure that the length of the new pneumatic cylinders is set correctly.

8. The new cylinders are installed in the reverse order.

9. Install the protective cover.

9.6 Wear parts

⚠ DANGER



Risk of injury due to unintentional start-up when working at the mixing trough

Crushing or shearing injuries to trunk and limbs.

Work on and in the mixing trough must be carried out when the machine is at a standstill.

Mixer shafts must also be secured against unintentional movements by means of wedges.

A sign must be attached at the switch-on point indicating that work is being carried out on the machine.

ATTENTION



Damage arising from material caking

Mixing material and dirt residues can cause damage.

Remove all mixing material and dirt residues in the work area, level out any unevenness on the support surfaces.

NOTE

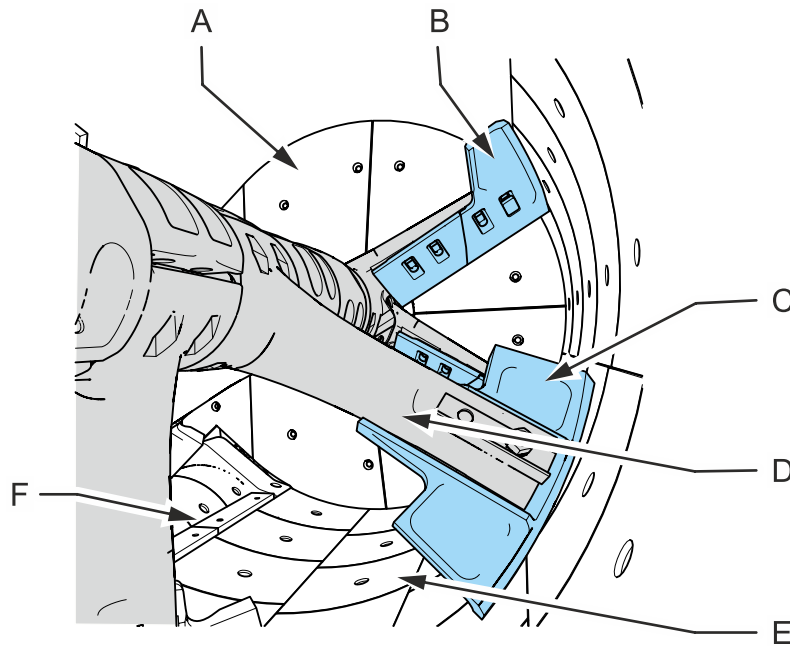


The machine must be cleaned before starting maintenance, inspection and servicing work. See section: Cleaning

All wear parts in the mixing trough must be checked on a monthly basis.

Wear parts may only be worn to such an extent that the base units of the mixing trough and discharge gate are not damaged.

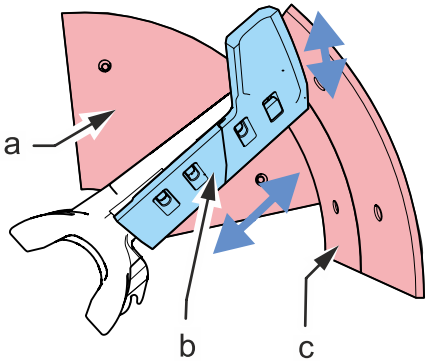
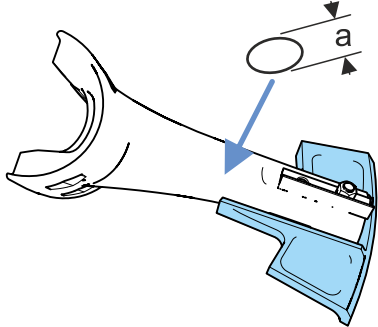
The service lives of the wear parts may – depending on different parameters, such as the loading situation, the type and properties of the aggregates, consistency of the mixing material and above all the narrowest possible gap setting between the mixing tools and the wear lining – vary drastically.



Wear parts	
A	End-wall tiles
B	Side blades/side plates
C	Centre blade
D	Mixer arm
E	Tub tiles
F	Discharge gate rail

9.6.1 Wear limits

Wear limits
<p>1. Gaps between mixer blades and tub tiles.</p> <p>The gap at the narrowest point of the respective blade should be 1–2 mm. It must be readjusted at the latest when the distance between the blades and the tub protection in the lower mixing trough area is 10 mm .</p> <p>If the gap can no longer be adjusted, the wear parts must be replaced.</p> <p>The smaller the gap, the lower the wear. The larger the gap, the greater the wear!</p>

Wear limits	
<p>2. End-wall tiles (a): The end-wall tiles (a) must be replaced at the latest when the minimum thickness is less than 6 mm .</p>	
<p>3. Side blades and side plates (b): The mixer blades (b) must be replaced at the latest when they can no longer be readjusted.</p>	
<p>4. Tub tiles (c): The tub tiles (c) must be replaced at the latest when holes in the tile (wear indicator) appear in alignment with the screw connection.</p>	
<p>5. Mixer arms: The mixer arms must be replaced at the latest when the material thickness (a) at the weakest point of the mixer arm is less than 40 mm .</p>	

9.6.2 Replacing end-wall and tub tiles

Replacing end-wall and tub tiles
<ol style="list-style-type: none"> 1. Secure the discharge gate. See section: "Securing the discharge gate" 2. Loosen the screw connections of the end-wall and tub tiles. 3. Remove the end-wall and tub tiles. 4. Clean the mixing trough. 5. Insert the new end-wall and tub tiles and screw them tight. For tightening torques, see table: "Tightening torques" 6. Turn the mixer mechanism by hand. Check the mixer mechanism for freedom of movement, noting the gaps between the mixer blades and tub tiles. 7. Grout the wear lining. See section: "Preparation for initial commissioning"

9.6.3 Setting and replacing the mixer blade

Setting and replacing the mixer blade	
Secure the discharge gate. See section: " Securing the discharge gate "	
<p>1. Check the gap between the tub tiles (c) and the mixer blade (b). The gap at the narrowest point should be 1–2 mm in the lower trough area up to a maximum of 10 mm.</p> <p>The mixer blades made of special cast iron can be adjusted in the radial direction, the side blades and plates also in the axial direction.</p> <p>If the gap can no longer be adjusted, the wear parts must be replaced.</p>	
<p>2. Loosen the screws of the mixer blade (b).</p>	
<p>3. Clean the support and the oblong hole surfaces, if necessary replace screws, nuts and mixer blade.</p>	
<p>4. Adjust the mixer blade to the correct gap size (a).</p>	
<p>5. Tighten the screws of the mixer blade (b).</p>	
<p>6. Turn the mixer mechanism by hand. Check the mixer mechanism for freedom of movement and correct gaps.</p>	

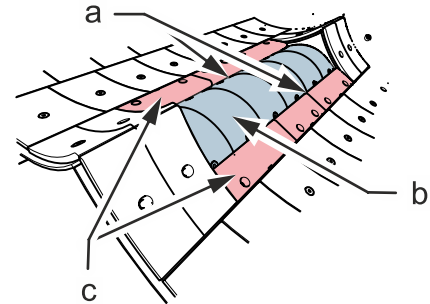
9.6.4 Checking and adjusting the discharge gate gap

Checking the gate rail gap

Checking the gate rail gap

1. Secure the discharge gate. See section: "[Securing the discharge gate](#)"

2. Check the gap (a) between the discharge gate (b) and the gate rails (c). The gap should be 1–2 mm.

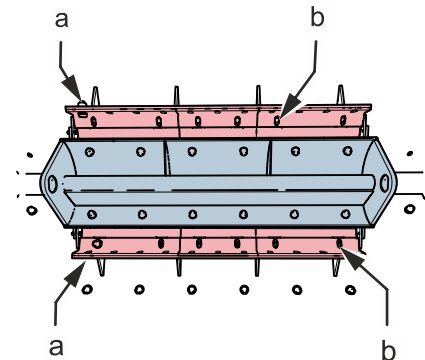


Adjusting the gate rail gap

Adjusting the gate rail gap

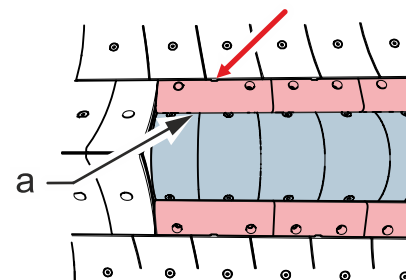
1. Secure the discharge gate. See section: "[Securing the discharge gate](#)"

2. Loosen the fastening screws (a) and (b) of the gate rails on the underside of the machine.



3. Clean the support surfaces and oblong holes.

4. Move the discharge gate rails until the gap (a) is set correctly (1–2 mm). A lever tool can be attached to the recess (arrow) for support.



Adjusting the gate rail gap

- | | |
|--|--|
| 5. Check the free movement of the discharge gate. | |
| 6. Tighten the fastening screws of the discharge gate rails. | |

Checking and adjusting the gap, discharge gate, sealing strip

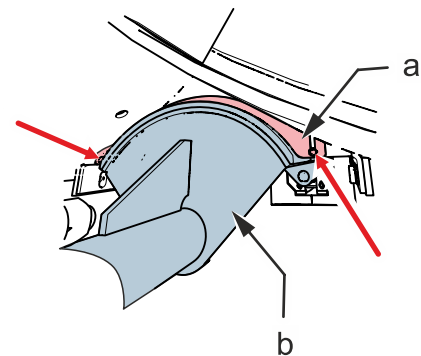
Checking and adjusting the gap, discharge gate, sealing strip

1. Secure the discharge gate. See section: "[Securing the discharge gate](#)"

2. Check the gap between the sealing strip (a) and the discharge gate (b). The gap should be 1–2 mm.


3. Adjustment of the gap

- ▶ Loosen the fastening screws (arrows) of the gate rails.
- ▶ Move the sealing strips until the gap is set correctly (1–2 mm).
- ▶ Check the free movement of the discharge gate.
- ▶ Tighten the fastening screws (arrows) of the sealing strips.



10 Servicing

10.1 Preparing for maintenance work


NOTE	
	Irregular or inadequate machine maintenance can lead to damage. Carry out maintenance work regularly and as prescribed.

Please take note the following before starting maintenance work:

- ▶ Maintenance personnel must be appropriately qualified for this work and must have been trained or instructed and informed about all dangers, risks and the mode of operation of the machine.
- ▶ Ensure that the shut-off devices operate properly before starting maintenance work.
- ▶ Whenever possible, switch off the machine before performing maintenance or repair work. Secure the machine against accidental or unauthorised start-up.
- ▶ If you carry out maintenance work that requires the machine to be switched on, secure the machine against unintentional operation.
- ▶ Sudden pressure drops or other faults can cause unexpected movements of machine parts.
- ▶ Do not climb on the machine during maintenance work. Instead, use suitable climbing aids and secure them against tipping or falling over.
- ▶ Only the specified original spare and wear parts from BHS-Sonthofen GmbH ensure optimum operation of the machine. These parts must be used to maintain the warranty.
- ▶ Lubricants must be stored in closed containers at room temperature, and they need to be kept safe from dust and moisture to prevent contamination.
- ▶ Before carrying out maintenance, inspection or servicing work in the mixing trough, the machine must have been cleaned as prescribed.

10.2 Maintenance and lubrication plan

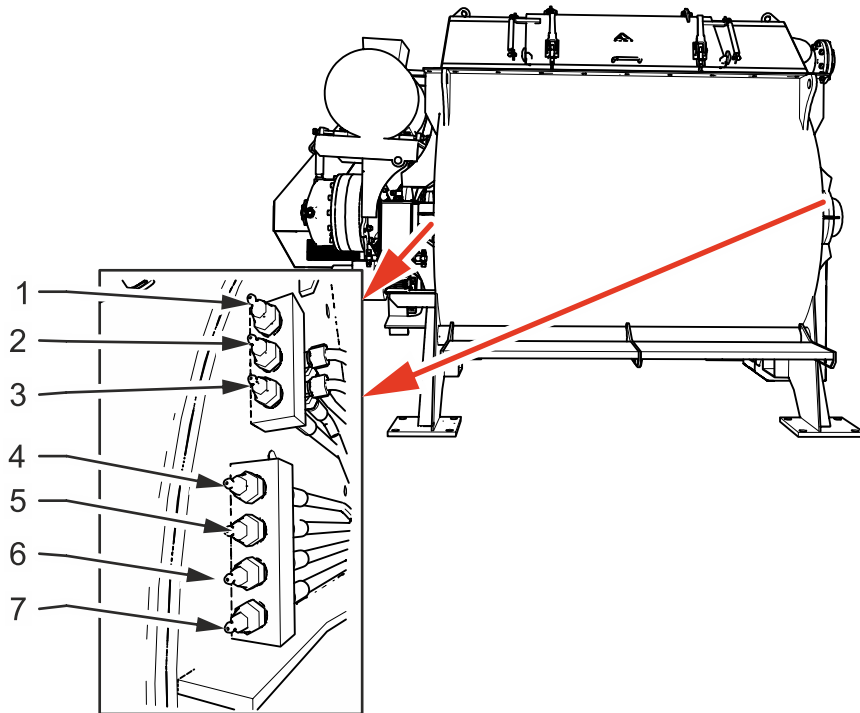
Maintenance plan

NOTE	
	The machine must be cleaned before starting maintenance, inspection and servicing work. See section: Cleaning

Work	Cycle
Central lubrication Check function and fill level	8 hours
Discharge gate Check function and condition	40 hours

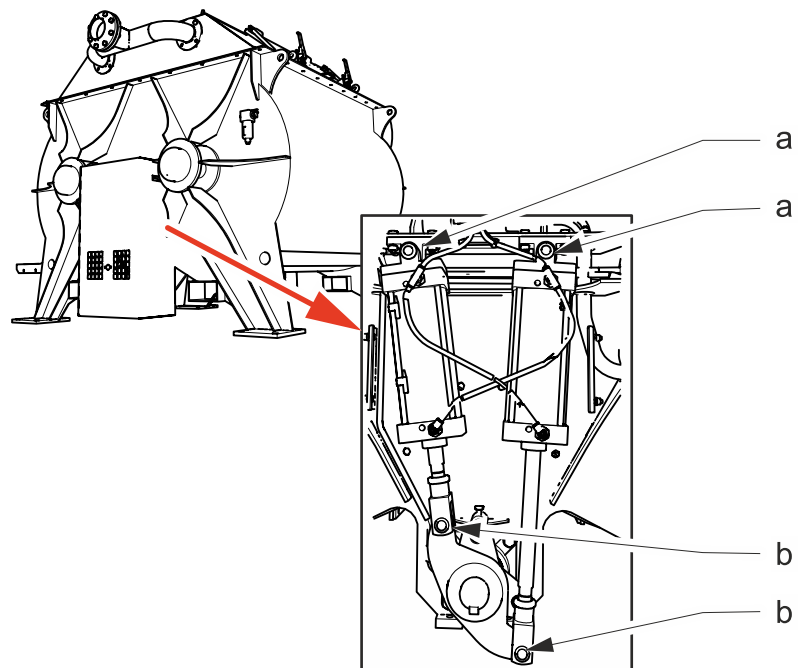
Work	Cycle
Check safety devices	300 hours
Check lines for leaks and damage	300 hours
Check the V-belt tension	300 hours With new V-belts daily until no more elongation can be observed.
Discharge gate actuation Check condition	300 hours
Synchronous coupling Check function and condition	300 hours
Mixer mechanism Check condition	300 hours
Check gearbox oil temperature and check for leaks	300 hours
Gearbox oil change	First oil change: 1,000 hours 6,000 hours
Discharge gate actuation Check pneumatics for tightness and condition	Annually 1,500 hours

Lubrication plan,
central lubrica-
tion points



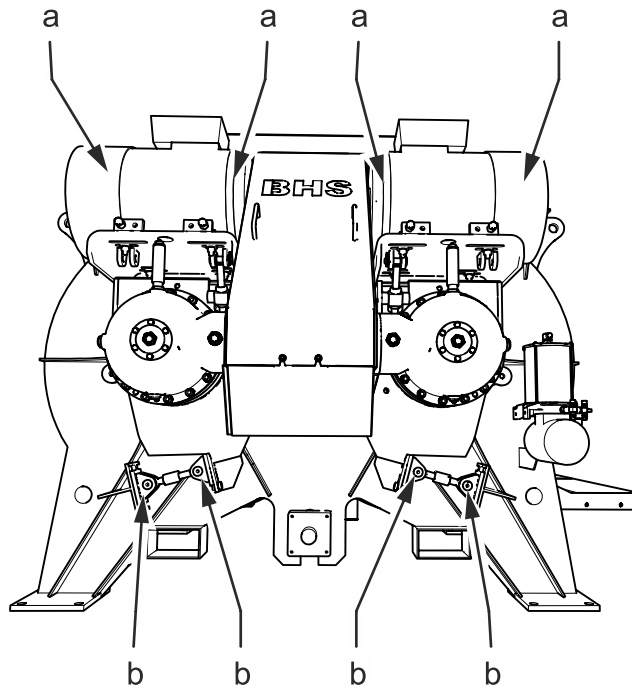
	Mark	Lubrication points	Cycle
1. / 2.	Red	Lubricate the inner sealing chambers of the mixer shaft seal (until clean grease emerges) by triggering the central lubrication on the control unit or manually relubricating.	Relubrication after 8 hours
3. / 4.	Yellow	Lubricate the outer sealing chambers of the mixer shaft seal (until clean grease emerges) by triggering the central lubrication on the control unit or manually relubricating.	5 grams every 40 hours
5. / 6. / 7.	Blue	Bearings, mixer shafts Pedestal bearing, discharge gate	5 grams every 300 hours

Lubrication plan,
drive opposite
side



	Lubrication points	Cycle
a / b	Swivel heads/bolts	1 gram every 300 hours

Lubrication plan,
drive side



	Lubrication points	Cycle
a	Motor bearings (with motor running), see "Three-phase motor"	20 grams every 8,000 hours
b	Swivel heads/bolts	1 gram every 300 hours

10.3 Gearbox

This section describes the following work on the gearbox:

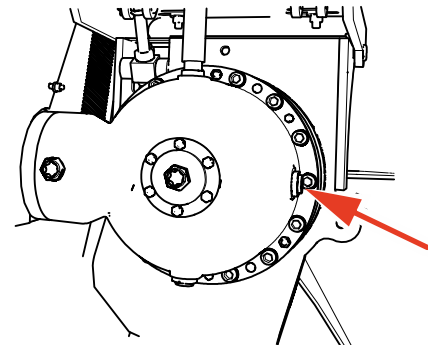
- ▶ Checking oil level and oil condition.
- ▶ Oil change at gearbox.

⚠ WARNING	
	<p>Risk of burns from hot oil Burns of body parts and limbs.</p> <p>Safety goggles and protective gloves must be worn when working at the hydraulic unit and gearbox. Let the components cool down sufficiently before commencing work.</p>

Checking oil level

Checking oil level

1. Wait until the gearbox has cooled down and come to a standstill.
2. Check the oil level on the sight glass (arrow). The correct oil level is given when the gearbox oil is up to the middle of the sight glass (arrow).
3. In the event of deviations, the oil level must be corrected.



Oil change

The oil must be changed shortly after the shutdown while still warm (housing surface lukewarm), otherwise complete draining is not guaranteed due to the poor fluidity of the oil.

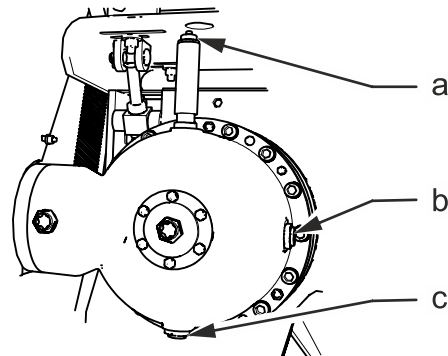
NOTE



Use only the approved oils.
See section: Oils/lubricants.

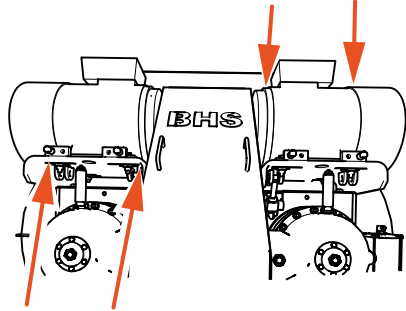
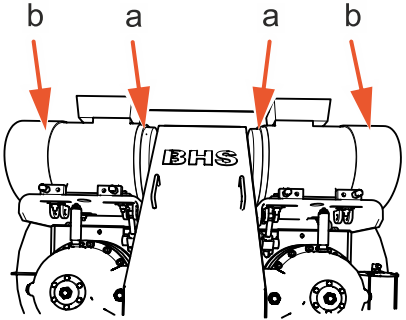
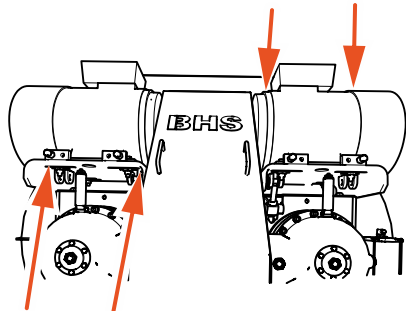
Oil change

1. Place a suitable container under the oil drain (c).
 2. Loosen the oil filler screw (a) and unscrew it.
 3. Unscrew the oil drain screw (c).
 4. Drain the oil completely.
 5. Close the oil drain with the screw plug and sealing ring. (Make sure the tightening torque is according to ["Approved oils"](#))
 6. Fill with new oil (see section ["Approved oils"](#)) through the oil filler opening to the required level.
 7. Check the oil level (see Checking the oil level)
- ✓ Oil that has run past must be bound with suitable means and, like the used oil, disposed of in accordance with national regulations. See section: ["Disposal"](#)




10.4 Three-phase motor

Lubrication of the three phase motor

Lubrication of the motor	
<p>1. Loosen the plugs of the lubricant outlets</p>	
<p>2. Lubricate the motor bearings on the drive side (a) with 20 grams every 8,000 hours, the motor bearings on the fan side (b) with 20 grams every 8,000 hours.</p>	
<p>3. After two (2) hours of operation following lubrication, close the plugs of the lubricant outlets to ensure that all excess lubricant is expelled from the bearings.</p>	

11 Cleaning

11.1 Preparing for cleaning work

ATTENTION	
	<p>Damage arising from improper cleaning Irregular or inadequate cleaning of the machine can lead to damage and malfunctions.</p> <p>Carry out the cleaning work regularly and as prescribed to avoid damage or malfunctions.</p>

Please take note of the following before performing cleaning work:

- ▶ The machine must be empty.
- ▶ Coarse soiling and material residues have been removed.
- ▶ Cleaning mode has been activated in the control unit.

11.2 Cleaning work

Pre-cleaning

Proceed as follows for pre-cleaning:

1. Empty the mixing trough.
2. Remove coarse soiling.
3. Remove residues of mixing material from the mixing trough.

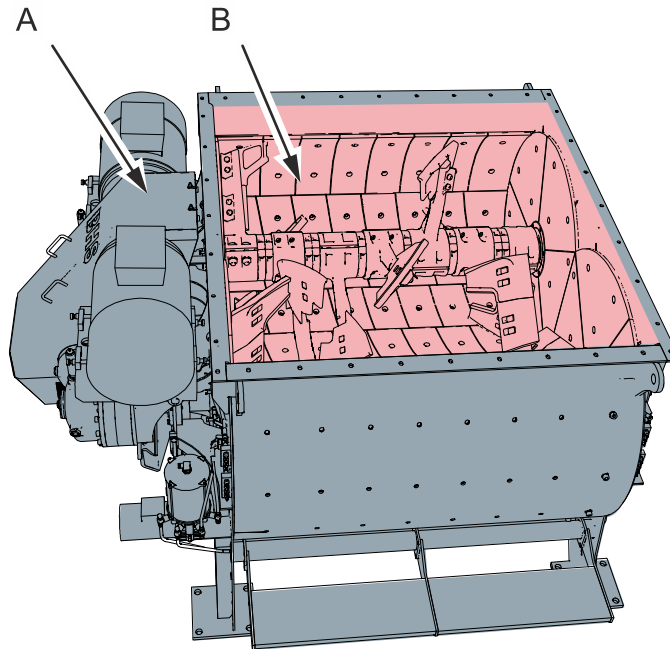
Cleaning

Cleaning


Give the machine with splash water. High-pressure cleaning is possible inside the trough.

Open and close the discharge gate several times during cleaning.



Cleaning areas



Cleaning areas	
A	Cleaning with splash water
B	High-pressure cleaning

ATTENTION	
	<p>Grease rinsed out Corrosion, damage to seals and bearings.</p> <p>To prevent corrosion and damage to seals and bearings, a lubrication cycle must take place after each cleaning until fresh grease emerges from the shaft seals.</p>

11.3 Disposal of cleaning agents

 WARNING	
	<p>Damage to the environment due to leaking media Damage to persons and the environment</p> <p>Dispose in an appropriate manner.</p> <ul style="list-style-type: none">▶ Always observe the local regulations for waste disposal.▶ Commission an authorised disposal company with the professional disposal of your waste.▶ Ask BHS-Sonthofen GmbH for assistance.

Cleaning agent residues, soaked cloths or lubricants must be disposed of in an environmentally friendly manner in accordance with the manufacturer's instructions. Observe the local regulations as well as the rules and laws applicable at the time of disposal. See section: "[Disposal](#)"

12 Decommissioning/Dismantling

⚠ WARNING

**Risk of crushing by moving, tilting and falling loads.**

Crushing and shearing injuries to body and limbs.

Only use suitable, technically impeccable and tested lifting equipment that offers sufficient lifting capacity. Keep the hazard zone clear.

⚠ WARNING

**Risk of injury due to residual pressure in the pneumatic or hydraulic system**

After pressing the emergency stop button, residual pressure may be present in the pneumatic or hydraulic system, which might set machine parts in motion. This can result in limbs and body parts being crushed.


Depressurise the corresponding components.

Assign only qualified personnel to carry out such work or commission BHS-Sonthofen GmbH with supporting you or performing dismantling and disposal tasks.

Disconnect the power, pneumatic and hydraulic supply and make sure that all machine feeders are out of operation.

Remove consumables, cleaning agents and residues from the machine and dispose of them.

13 Disposal

⚠ WARNING	
	<p>Damage to the environment due to leaking media Damage to persons and the environment</p> <p>Dispose in an appropriate manner.</p> <ul style="list-style-type: none">▶ Always observe the local regulations for waste disposal.▶ Commission an authorised disposal company with the professional disposal of your waste.▶ Ask BHS-Sonthofen GmbH for assistance.

During disposal, observe the local regulations as well as the applicable rules and laws. Ensure to take special care when disposing of environmentally hazardous substances.

BHS-Sonthofen GmbH can advise you on the disposal of the machine.

Please note that the machine must be separated into the following basic substances when it is disposed of:

- ▶ Metallic materials (aluminium, steel)
- ▶ Other metallic materials (copper).
- ▶ Plastics.
- ▶ Liquids and lubricants (oils, lubricating greases).
- ▶ Dispose of cleaning agent residues, soaked rags and lubricants.

14 Tightening torques

14.1 Table of tightening torques

Observe the following tightening torques when working on the machine:

Thread size	Tightening torque (Nm)
M4	3.1 / 4.5 / 5.25
M5	6.1 / 9 / 10.4
M6	11 / 15 / 18
M8	25 / 37 / 43
M10	51 / 75 / 87
M12	87 / 128 / 150
M16	214 / 314 / 365
M20	431 / 615 / 710
M24	742 / 1057 / 1220
M30	1489 / 2121 / 2450
M36	2594 / 3695 / 4280

(Metric pursuant to DIN 13, strength classes: 8.8 / 10.9 / 12.9)

Cover screw	Tightening torque (Nm)
M10 x 1.0	10
M12 x 1.5	20
M14 x 1.5	30
M16 x 1.5	34
M18 x 1.5	42
M20 x 1.5	50
M22 x 1.5	60
M26 x 1.5	70
M27 x 2.0	85

Tightening torques

Cover screw	Tightening torque (Nm)
M33 x 2.0	130
M48 x 1.5	150
M60 x 2.0	170

(Metric pursuant to DIN 13)

Cover screw	Tightening torque (Nm)
G 1/8 A	10
G 1/4 A	26
G 3/8 A	34
G 1/2 A	60
G 3/4 A	85
G 1 A	130
G 1½ A	150
G 2 A	170

(Pipe thread pursuant to DIN ISO 228)

Taper socket type	Tightening torque (Nm)
2012 / 2017	31
2517 / 2525	48
3020 / 3030	90
3525 / 3535	113
4040	170
4545	192
5050	271

(Pursuant to DIN 6885)

15 Lubricants

15.1 Overview

This section describes the approved oils and lubricants that must be used when performing oil changes and lubrication work.

15.2 Approved oils

Gearbox Use the following VG 220 oils:

Manufacturer	Oil grade
SINOPEC	L - CKD 220
Shell	Omala S4 WE 220
Mobil	Mobilgear SHC XMP 150-220
Castrol	Alphasyn EP 150-220
BP	Eversyn EXP 150-220

15.3 Authorised lubricants

General lubrication work Only use class II lithium saponified greases.

Manufacturer	On surfaces < 60°C	On surfaces > 60°C
Bechem	High-Lub L2	
ARAL	Aralub HL 2	Aralub HTR 2
Shell	Alvania RL 2	
BP	Energrease LS 2	Energrease HTG
Mobil	Mobiluy EP 2	
Castrol	Olit 2 EP	Optitemp HT 2
Elkalub	GLS 135 / N2	GLS 962 / N2

Lubricants

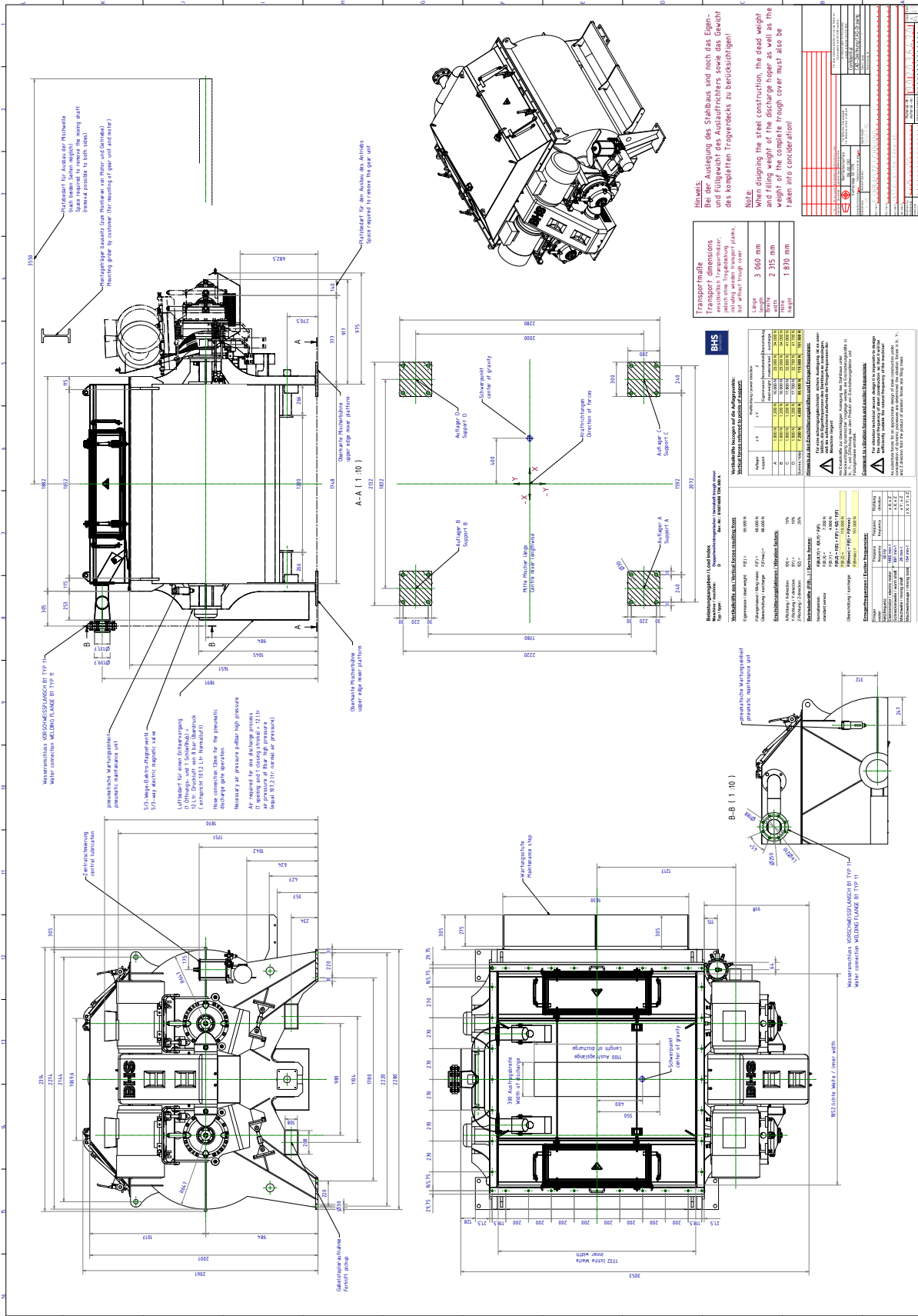
**Bearings, three-
phase motors**

Manufacturer	Grease class / Type
Shell	Alvania R 3
Mobil	Unirex N3

Joints

Manufacturer	Grease class / Type
Dow Corning	Molykote Polygliss N
Elkalub	GLL 10 / N2

16 Installation drawing



17 Electrical diagrams

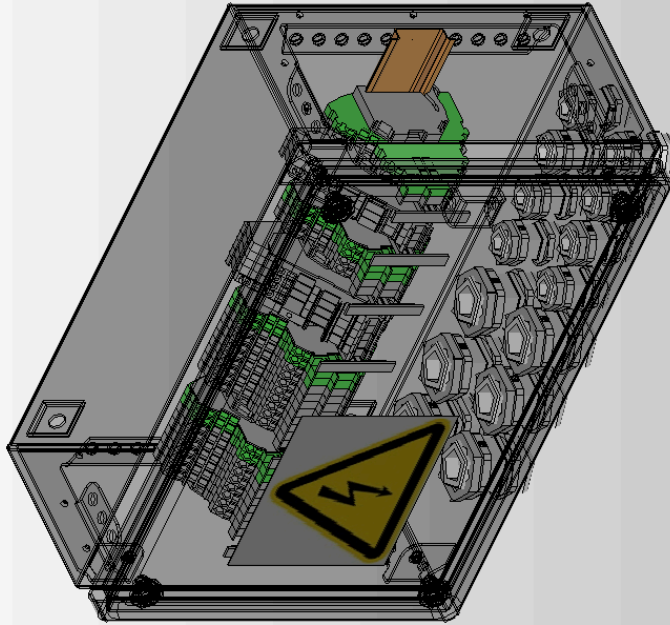
Table of contents

Column X: an automatically generated site was manually reworked

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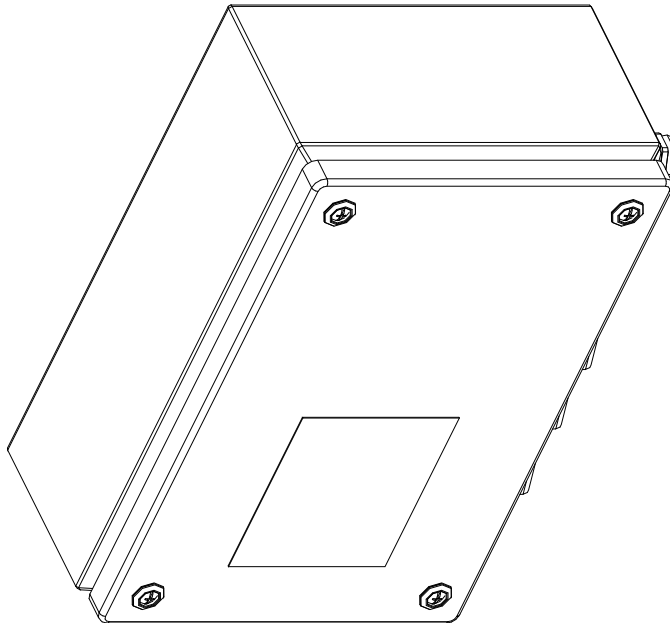
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&A=EB1+Dok/2	Table of contents : &A=EB1+Dok/1 - &R=EB1+MA/2		20.07.2020	Sazzad Kabir	
&M=EB1+SZ/1	ISO view		20.07.2020	Sazzad Kabir	
&M=EB1+SZ/3	SZ drilling schematic from the front		20.07.2020	Sazzad Kabir	
&M=EB1+SZ/4	SZ drilling schematic from below		20.07.2020	Sazzad Kabir	
&M=EB1+SZ/5	construction		20.07.2020	Sazzad Kabir	
&S=EB1+SZ/1	explanation		20.07.2020	Sazzad Kabir	
&S=EB1+SZ/2	Locking unit		20.07.2020	Sazzad Kabir	
&S=EB1+SZ/3	Coded limit switch for cover		20.07.2020	Sazzad Kabir	
&S=EB1+SZ/4	Discharge gate sensors		20.07.2020	Sazzad Kabir	
&S=EB1+SZ/5	motor temperature		20.07.2020	Sazzad Kabir	
&S=EB1+SZ/7	Valve for discharge gate actuation		20.07.2020	Sazzad Kabir	
&S=EB1+SZ/8	Grease lubrication pump level sensor		20.07.2020	Sazzad Kabir	
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S2 Klemmenkasten
1:2

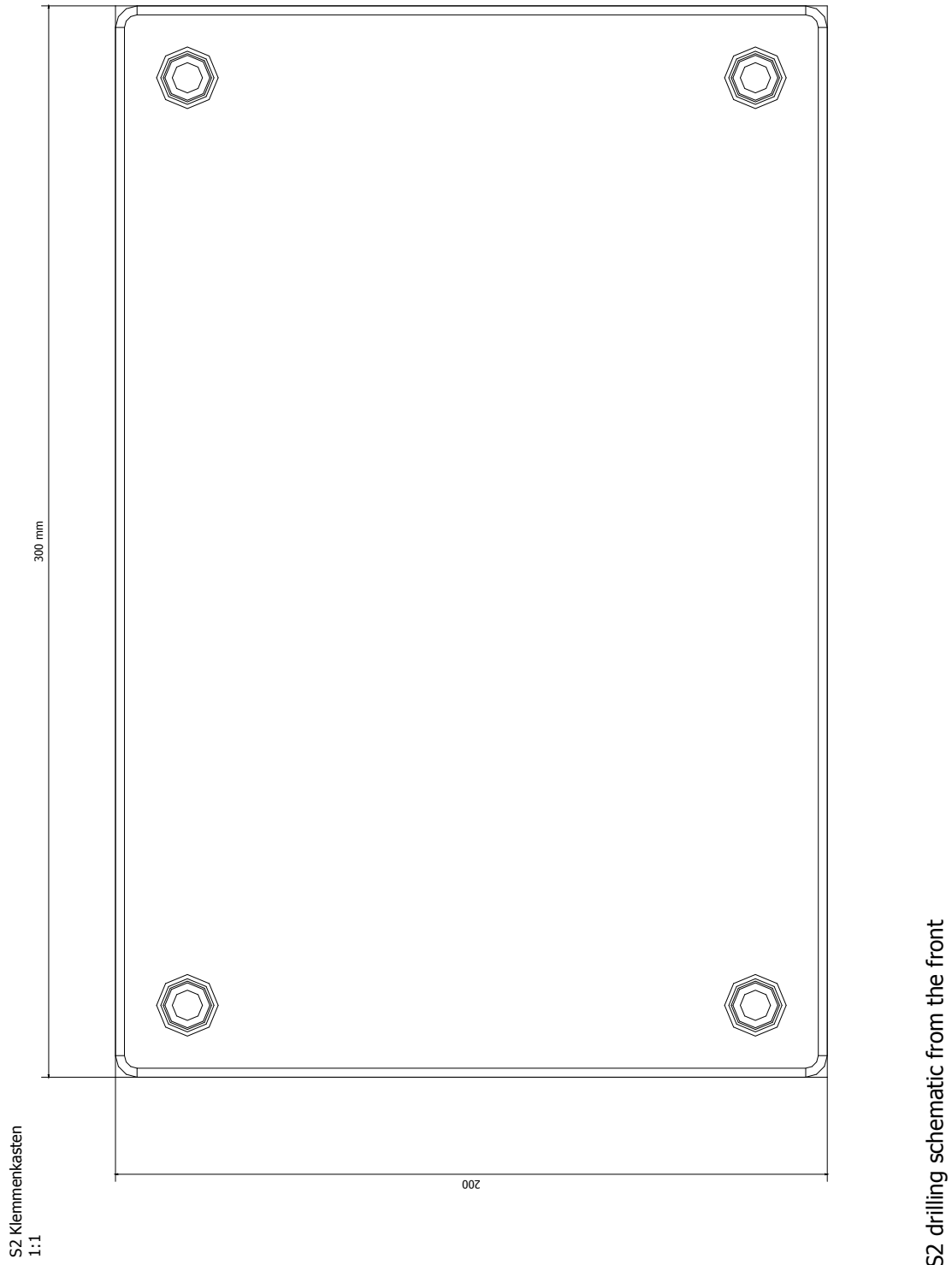


ISO view

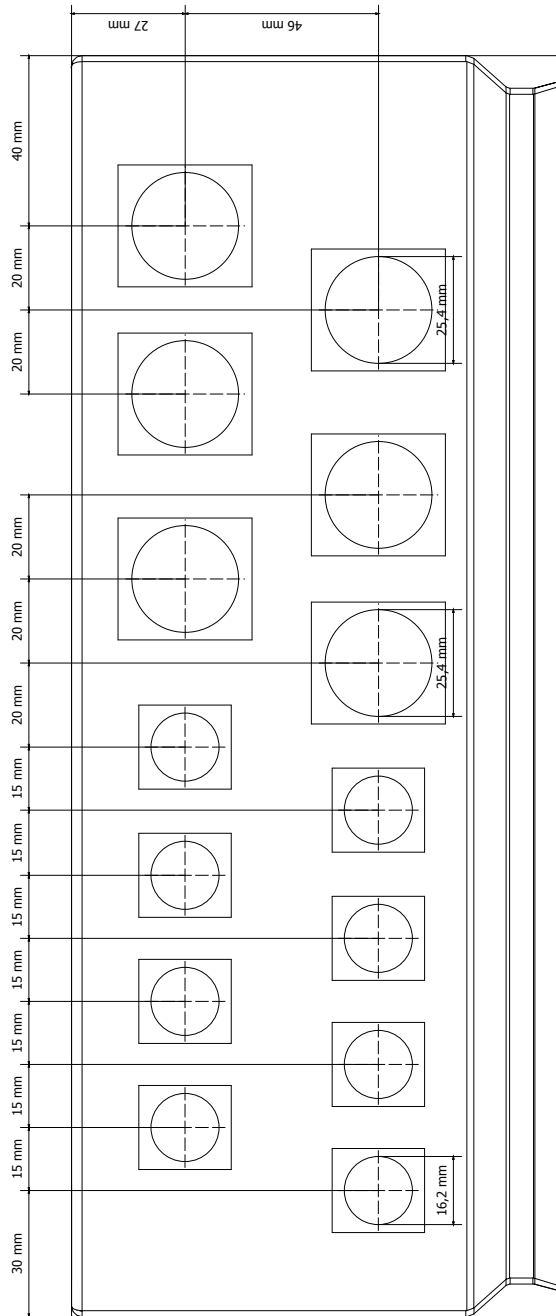
S2 Klemmenkasten
1:2



ISO view



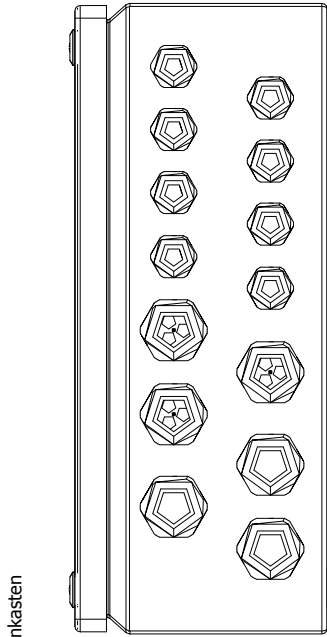
Electrical diagrams



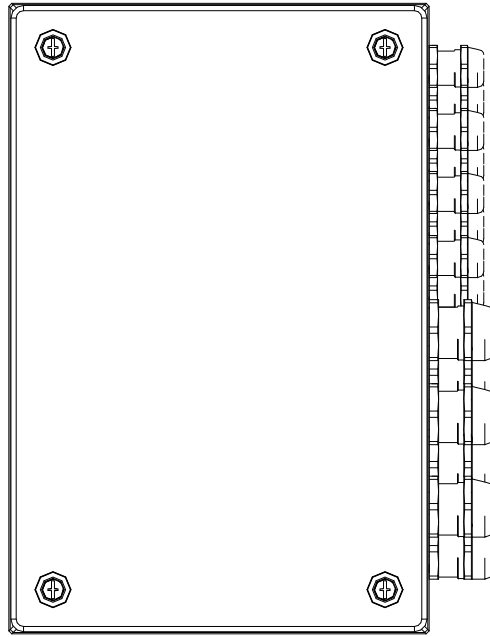
S2 Klemmenkasten
1:1

S2 drilling schematic from below

Electrical diagrams



S2 Klemmenkasten
1:2



construction
S2 Klemmenkasten
1:2

construction

(BHS) 411.007

Item	DT	BHS Nr.	Type number
1	1UC1	920001221	KL150510
9	1UA1	511004000	TS 35...7,5
149	1UR25	920008775	SKINTOP MS-M 25 x 1,5
150	1UR25	920008775	SKINTOP MS-M 25 x 1,5
151	1UR25	920008775	SKINTOP MS-M 25 x 1,5
155	1UR16	920008773	SKINTOP MS-M 16 x 1,5
156	1UR16	920008773	SKINTOP MS-M 16 x 1,5
157	1UR16	920008773	SKINTOP MS-M 16 x 1,5
160	1UR16	920008773	SKINTOP MS-M 16 x 1,5
161	1UR16	920008773	SKINTOP MS-M 16 x 1,5
162	1UR16	920008773	SKINTOP MS-M 16 x 1,5
163	1UR25	920008775	SKINTOP MS-M 25 x 1,5
164	1UR25	920008775	SKINTOP MS-M 25 x 1,5
166	1UR25	920008775	SKINTOP MS-M 25 x 1,5
167	1UR25	920001180	SKINTOP DEX-M
168	1UR25	920001180	SKINTOP DEX-M
170	1UR25	920001180	SKINTOP DEX-M
248	1UR16	920008773	SKINTOP MS-M 16 x 1,5
249	1UR16	920008773	SKINTOP MS-M 16 x 1,5
294	1UC1		
295	1UC1		
296	1UC1		
297	1UC1		
298	1UC1		
299	1UC1		
300	1UC1		
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305	2XG1	920008794	2002-2231
306	2XG1	920008794	2002-2231
307	2XG1	920008794	2002-2231
308	2XG1	920008794	2002-2231
309	2XG1	920008795	2002-2237
310	2XG1	920008795	2002-2237
311	2XG1	920008797	2002-2291
312	2XG1	920008782	249-116
313	2XG1	920009181	249-120
314	3XG1	920008782	249-116
315	3XG1	920008794	2002-2231
316	3XG1	920008794	2002-2231
317	3XG1	920008794	2002-2231
318	3XG1	920008794	2002-2231
319	3XG1	920008794	2002-2231
320	3XG1	920008794	2002-2231
321	3XG1	920008794	2002-2231
322	3XG1	920008794	2002-2231
323	3XG1	920008795	2002-2237
324	3XG1	920008795	2002-2237
325	2XG1	920008797	2002-2291
326	3XG1	920008782	249-116
327	3XG1	920009181	249-120
328	4XG3	920008782	249-116
329	4XG3	920011756	280-577
330	4XG3	920011755	280-570
331	4XG3	920011755	280-570
332	4XG3	920011755	280-570
333	4XG3	920011755	280-570

Item	DT	BHS Nr.	Type number
334	4XG3	920008786	280-519
335	4XG3	920008782	249-116
336	4XG3	920009181	249-120
337	5XG1	920008782	249-116
338	5XG1	920008794	2002-2231
339	5XG1	920008794	2002-2231
340	5XG1	920008795	2002-2237
341	5XG1	920008795	2002-2237
342	5XG1	920008797	2002-2291
343	5XG1	920008782	249-116
344	5XG1	920009181	249-120
345	7XG1	920008782	249-116
346	7XG1	920008782	280-578
347	7XG1	920013710	380-572
348	7XG1	920013710	380-572
349	7XG1	920008789	280-530
350	7XG1	920008782	249-116
351	7XG1	920009181	249-120
352	8XG1	920008782	249-116
353	8XG1	920008794	2002-2231
354	8XG1	920008795	2002-2237
355	8XG1	920008782	249-116
356	8XG1	920009181	249-120

wiring details:

conductor coloring:	
phase:	
L1	BK
L2	BK
L3	BK
N	BU
PE	GNYE

control circuit 24V DC	
L+	BU
0V (M)	BU/WH
safety circuit	
channel 1/2	GY

analog signals	
0-10V, 0-20mA	VT
Other	WH

external voltage	
230 V	OG

Voltage bevor Main switch	
phase L1,L2,L3	OG
N	BU

minimum cross section standard H05V-K / H07V-K	
power circuit	min. 1,5mm ²
control circuit 230V	min. 1,5mm ²
control circuit 24V	min. 1mm ²

Short-circuit proof NSGAföU	
power circuit	min. 2,5mm ²

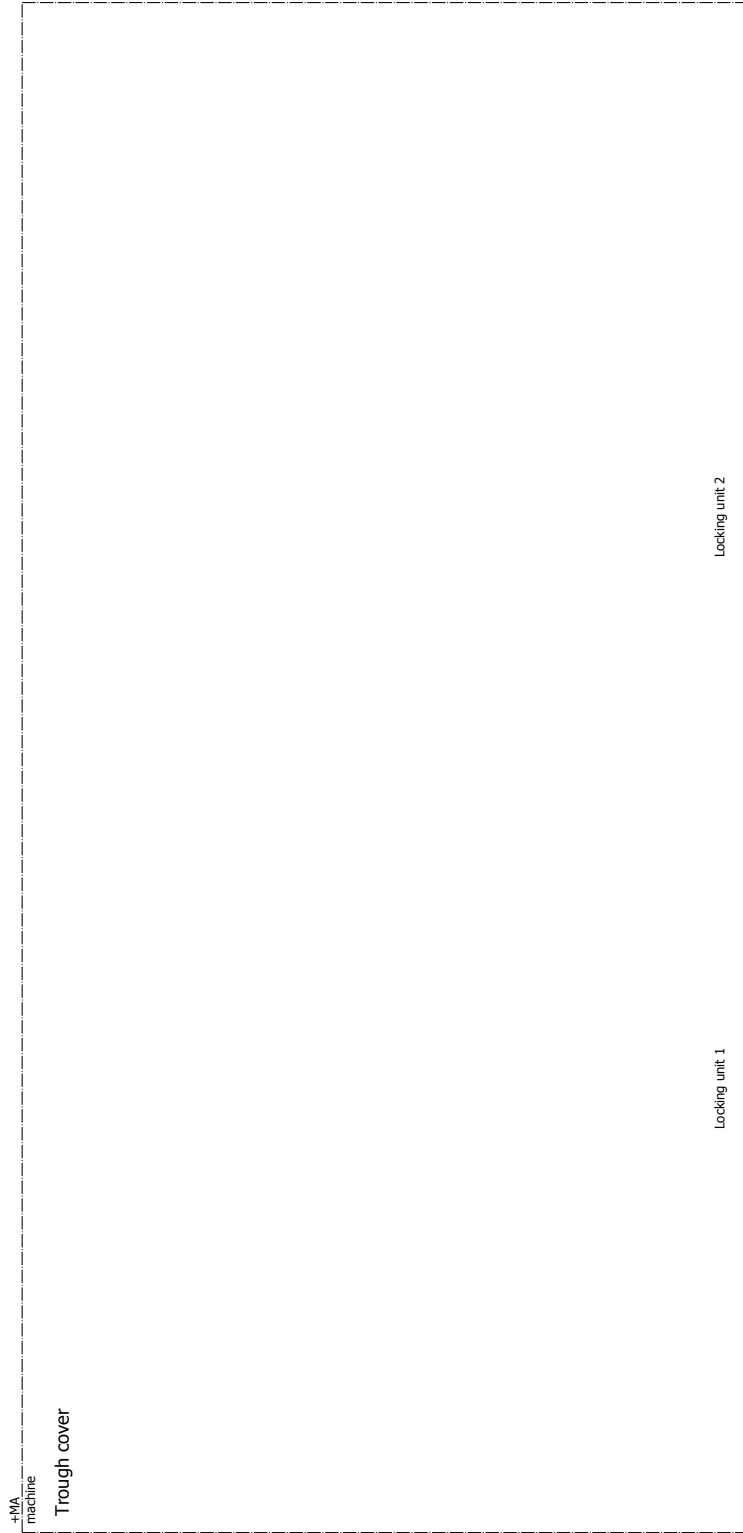
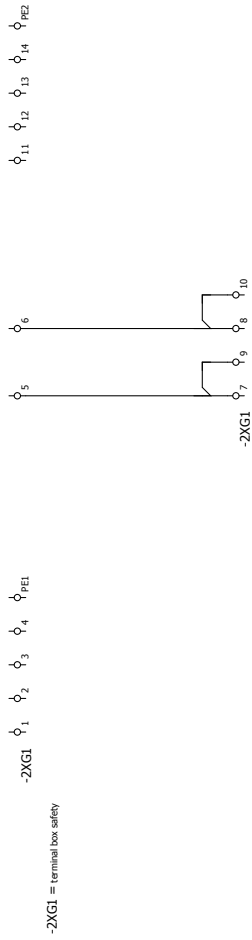
transducer circuit	
X/5A and X/1A	min. 2,5mm ²

KB = terminal bridge

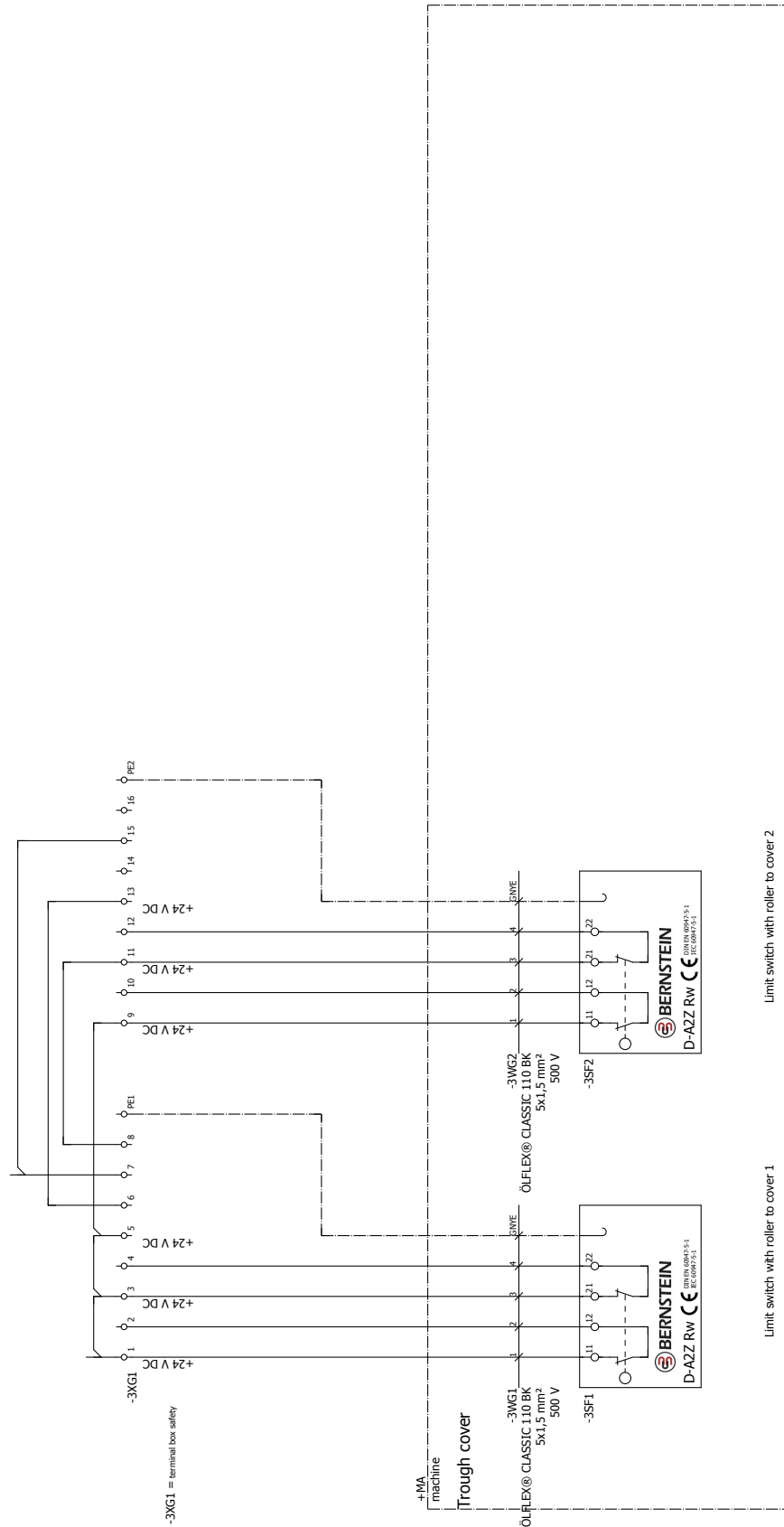
for every manifold are Inspection records with value indication after DIN EN 60439-1 or. DIN EN 60204 Closed create and to the manifold the System control to be attached.

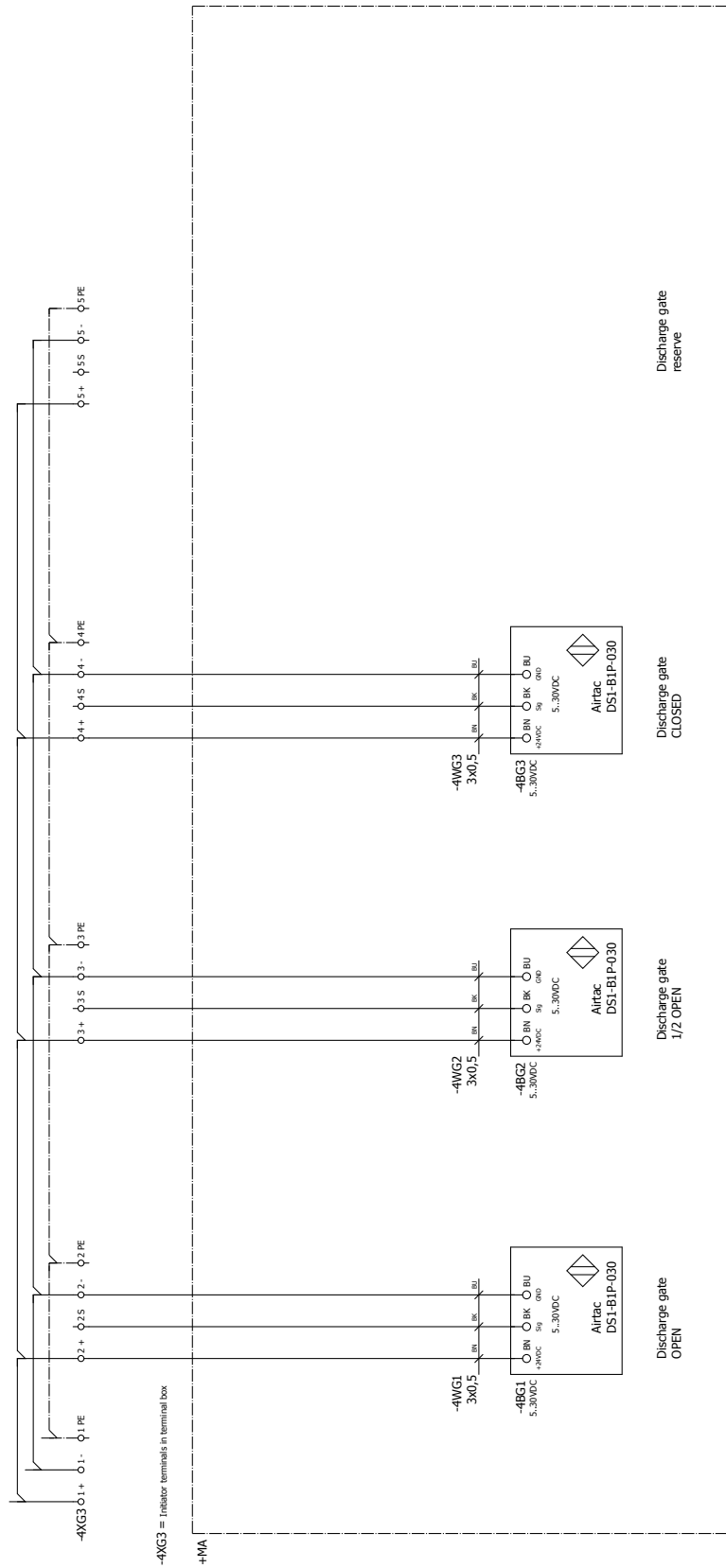
definition conductor colour	
code	Color
BK	Black
BN	Brown
RD	Red
OG	Orange
YE	Yellow
GN	Green
BU	Blue
VT	Violet
GY	Gray
WH	White
PK	Pink
GD	Gold
TQ	Turquoise
SR	Silver
GNYE	Green/Yellow
SH	Shield

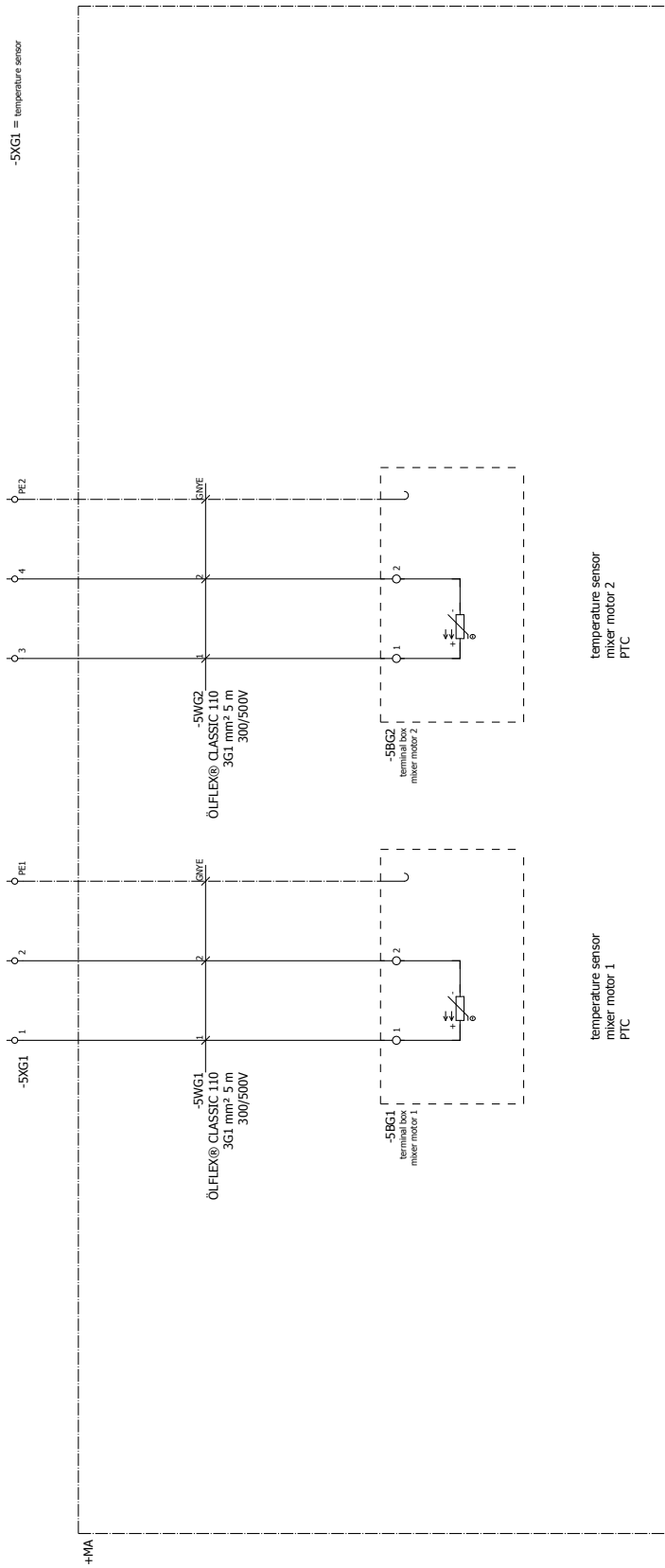
Electrical diagrams



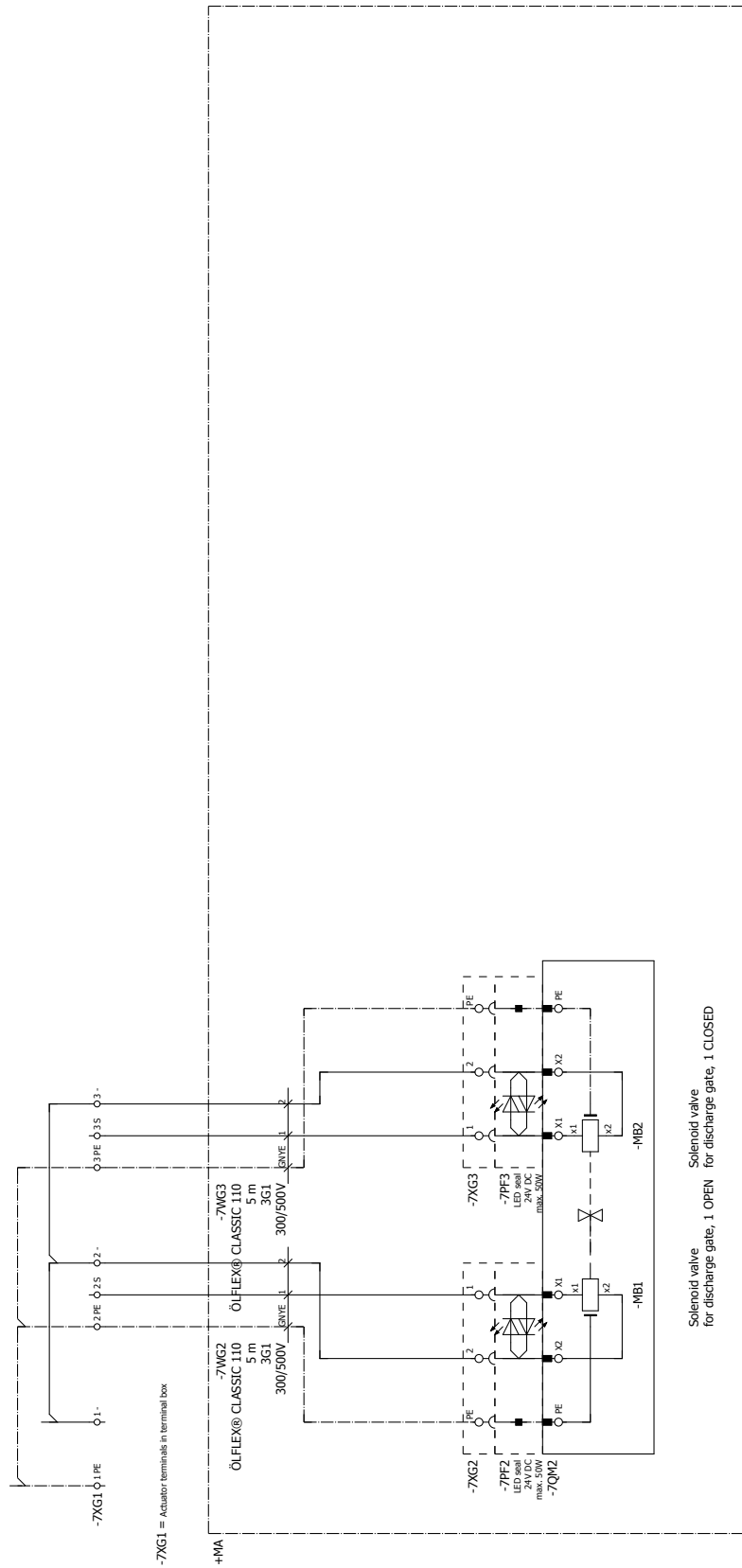
Electrical diagrams



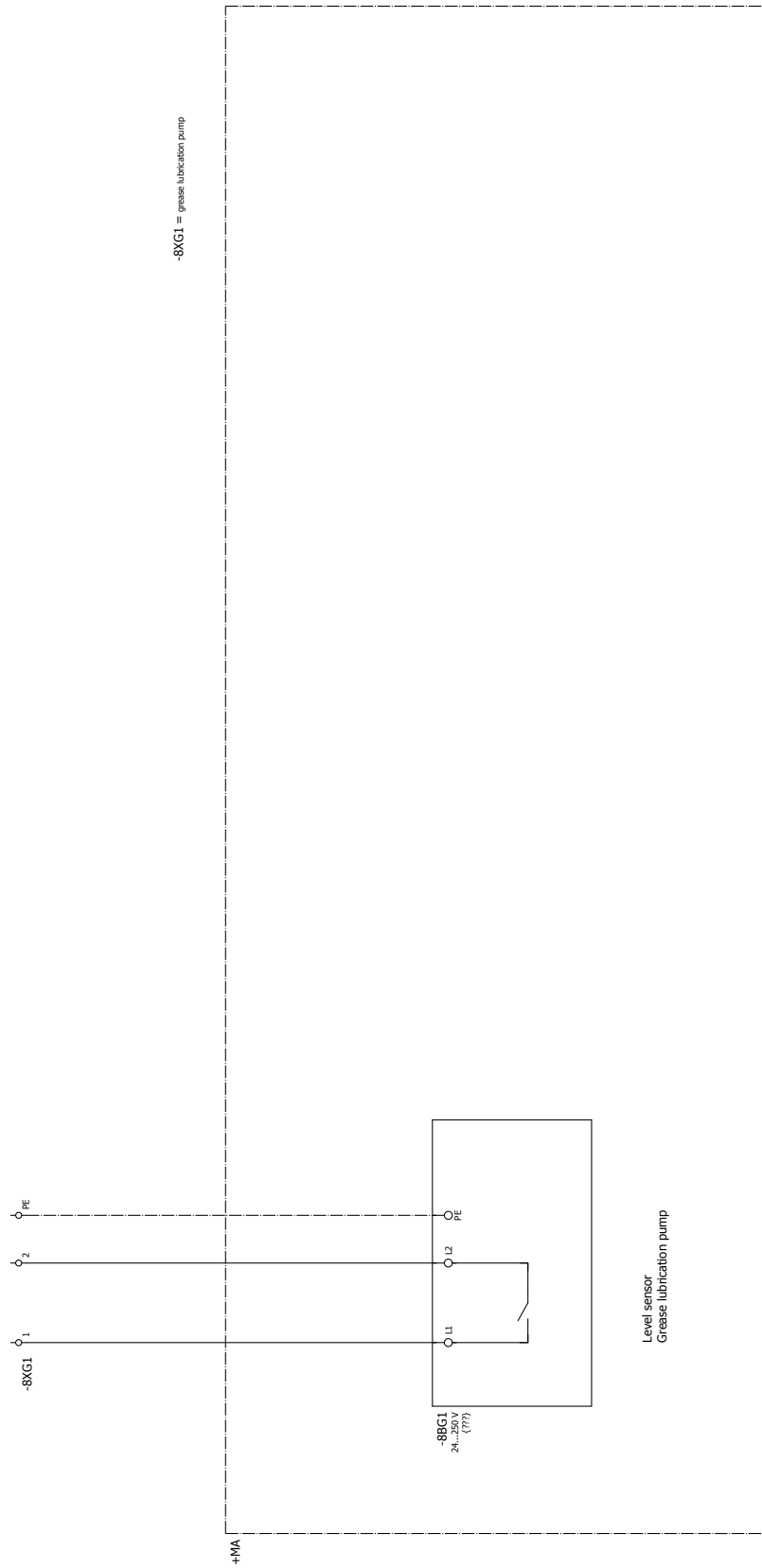




Electrical diagrams



Electrical diagrams



Electrical diagrams

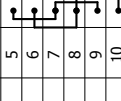
Parts list

[BHS_F01_001]

Device tag	Quantity	Description	Type number	Manufacturer	Manufacturer	Part number
-1UA1	1	Mounting rail EN 60713Z (13x7,5)	TS 35-7,5			BHS
-1UB16	8	Cable gland SKINTOP MS-M 16 x L5 / d 4,5; 10mm nickelized	SKINTOP MS-M 16 x L5	LAPP		53104000
-1UR16	8	Cable gland counter nut SKINDUCHT SM-PE-M 16 x L1,5 nickelized	SKINDUCHT SM-PE-M 16 x L1,5	LAPP		920068773
-1UR25	6	Cable gland SKINTOP MS-M 25 x L5 / d 5; 17mm nickelized	SKINTOP MS-M 25 x L5	LAPP		920068759
-1UR25	3	Multiple sealing inserts, SKINTOP DIX-M M25 2x7mm	SKINTOP DIX-M	LAPP		920068775
-1UR25	1	Cable gland counter nut SKINDUCHT SM-PE-M 25 x L1,5 nickelized	SKINDUCHT SM-PE-M 25 x L1,5	LAPP		920010190
-1UC1	1	KL 1 terminal box, WIDP: 300x300x120 mm, Sheet steel, without mounting plate	KL 1.03510	Rittal		920006801
-1UC1	1	Lightning bolt warning sign sticker	Aufleber Warnschild Blitz			920001221
-2XG1	2	screwless end clamp TS 35	249-116	Wago		920006792
-2XG1	1	Adjustable-sigplate 10mm	249-120	Wago		920006981
-2XG1	2	Jumper triple for terminal 2mm ²	2004-402	Wago		920010193
-2XG1	7	2.5mm ² grey 2-wire 2-levelled spring terminal	2002-2321	Wago		920068794
-2XG1	2	2.5mm ² grey 2-wire 2-levelled spring terminal	2002-2327	Wago		920068795
-3XG1	1	END AND INTERMEDIATE PLATE	2002-2291	Wago		920068797
-3XG1	2	screwless end clamp TS 35	249-116	Wago		920006782
-3XG1	1	Adjustable-sigplate 10mm	249-120	Wago		920006981
-3XG1	3	Jumper triple for terminal 4mm ²	2004-403	Wago		920006858
-3XG1	8	2.5mm ² grey 2-wire 2-levelled spring terminal	2002-2321	Wago		920006794
-3XG1	2	2.5mm ² grey 2-wire 2-levelled spring terminal	2002-2327	Wago		920006795
-3XG1	1	END AND INTERMEDIATE PLATE	2002-2291	Wago		920006981
-4XG1	1	Adjustable-sigplate 10mm	249-120	Wago		920006981
-4XG1	2	screwless end clamp TS 35	249-116	Wago		920006782
-4XG1	1	2.5mm ² grey 2-wire 2-levelled spring terminal with PE	280-577	Wago		920011736
-4XG1	4	inhibitor clamp 2,5MM ² with PE	280-570	Wago		920006783
-4XG1	8	ADJACENT JUMPER	280-402	Wago		920006786
-4XG1	1	End-plate for inhibitor-terminal	280-319	Wago		920006981
-5XG1	1	Adjustable-sigplate 10mm	249-116	Wago		920006782
-5XG1	2	screwless end clamp TS 35	249-120	Wago		920006981
-5XG1	2	2.5mm ² grey 2-wire 2-levelled spring terminal	2002-2321	Wago		920068794
-5XG1	2	2.5mm ² grey 2-wire 2-levelled spring terminal	2002-2327	Wago		920068795
-5XG1	1	END AND INTERMEDIATE PLATE	2002-2291	Wago		920068797
-7XG1	1	Adjustable-sigplate 10mm	249-120	Wago		920009981
-7XG1	2	screwless end clamp TS 35	249-116	Wago		920006782
-7XG1	1	2.5mm ² actuator supply terminal with PE connection on the control cabinet	280-578	Wago		920006787
-7XG1	2	2.5mm ² actuator terminal without suppression diode	280-572	Wago		920013710
-7XG1	2	ADJACENT JUMPER	280-402	Wago		920006783
-7XG1	1	End-plate for actuator-terminal	280-320	Wago		920006789
-8XG1	1	Adjustable-sigplate 10mm	249-120	Wago		920006789
-8XG1	2	screwless end clamp TS 35	249-116	Wago		920006782
-8XG1	1	2.5mm ² grey 2-wire 2-levelled spring terminal	2002-2321	Wago		920006794
-8XG1	1	2.5mm ² grey 2-wire 2-levelled spring terminal	2002-2327	Wago		920006795

F13_001

Terminal diagram

Function text	Cable name		Strip =EB1+S2-2XG1 terminal box safety						Page / column
	Cable type	Terminal	Target designation	Connection point	Jumper	Target designation	Connection point		
			Target designation	Connection point	Jumper	Target designation	Connection point		
Locking unit 1		1					8.572.2		
"		2					8.572.3		
"		3					8.572.3		
"		4					8.572.3		
"		5					8.572.4		
"		6						8.572.5	
"		7					8.572.4		
"		8					8.572.5		
"		9					8.572.4		
"		10					8.572.5		
Locking unit 2		11					8.572.6		
"		12					8.572.6		
"		13					8.572.6		
"		14					8.572.6		
Locking unit 1		PE1					8.572.3		
Locking unit 2		PE2					8.572.6		

F13_001

Terminal diagram

Function text	Cable name		Cable type		Terminal	Jumper	Target designation	Connection point	Target designation	Connection point	Cable name	Cable type	Page / column
	+MA-3WG1	+MA-3WG2	ÖLFLEX® CLASSIC 110 BK	ÖLFLEX® CLASSIC 110 BK									
+24 V DC			1		1							8.57.1	
			2		2								8.57.1
+24 V DC			3		3								8.57.1
			4		4								8.57.1
+24 V DC					5							8.57.2	
Limit switch with roller to cover 1					6							8.57.2	
=					7							8.57.2	
+24 V DC			1		8							8.57.2	
Limit switch with roller to cover 1			2		9							8.57.3	
+24 V DC					10							8.57.3	
Limit switch with roller to cover 1			3		11							8.57.4	
+24 V DC					12							8.57.4	
Limit switch with roller to cover 2					13							8.57.4	
=					14							8.57.4	
					15							8.57.4	
Limit switch with roller to cover 1					16							8.57.4	
					PE1							8.57.2	
Limit switch with roller to cover 2					PE2							8.57.4	

Electrical diagrams

FI3_001

Terminal diagram

Function text	Cable name		Target designation	Connection point	Terminal	Jumper	Target designation	Connection point	Cable type	Cable name	Page / column		
	+MA-4WG1	+MA-4WG2										+MA-4WG3	Cable type
Discharge gate OPEN	BN			BN	1						8.5/4.0		
	BK			BK	2							8.5/4.0	
	BU			BU	2								8.5/4.1
Discharge gate 1/2 OPEN	BN			BN	3							8.5/4.1	
	BK			BK	3							8.5/4.2	
	BU			BU	3								8.5/4.3
Discharge gate CLOSED	BN			BN	4							8.5/4.4	
	BK			BK	4							8.5/4.5	
	BU			BU	4								8.5/4.5
Discharge gate reserve					5							8.5/4.7	
					5								8.5/4.7
							5						8.5/4.7

FI3_001

Terminal diagram

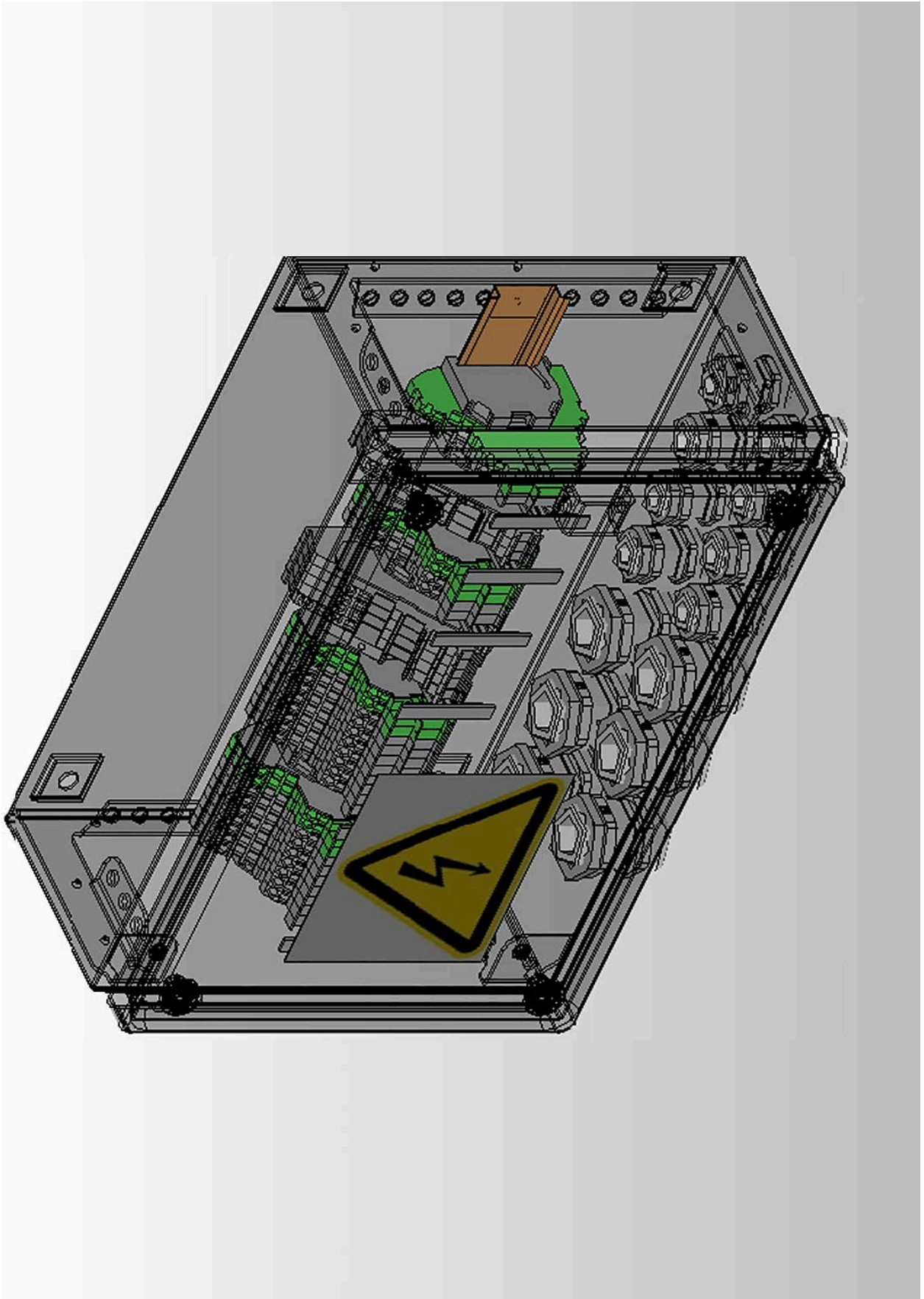
Function text	Cable name		Cable type			Cable name		Cable type		Page / column
	Target designation	Connection point	Terminal	Jumper	Target designation	Connection point	Terminal	Jumper		
temperature sensor mixer motor 1 PTC	+MA-5BG1	1	1						8/5/3	
	+MA-5BG1	2	2							8/5/4
temperature sensor mixer motor 2 PTC	+MA-5BG2	1	3						8/5/5	
	+MA-5BG2	2	4							8/5/6
temperature sensor mixer motor 1 PTC	+MA-5BG1	PE	PE1						8/5/4	
	+MA-5BG2	PE	PE2							8/5/6
temperature sensor mixer motor 2 PTC										

Electrical diagrams

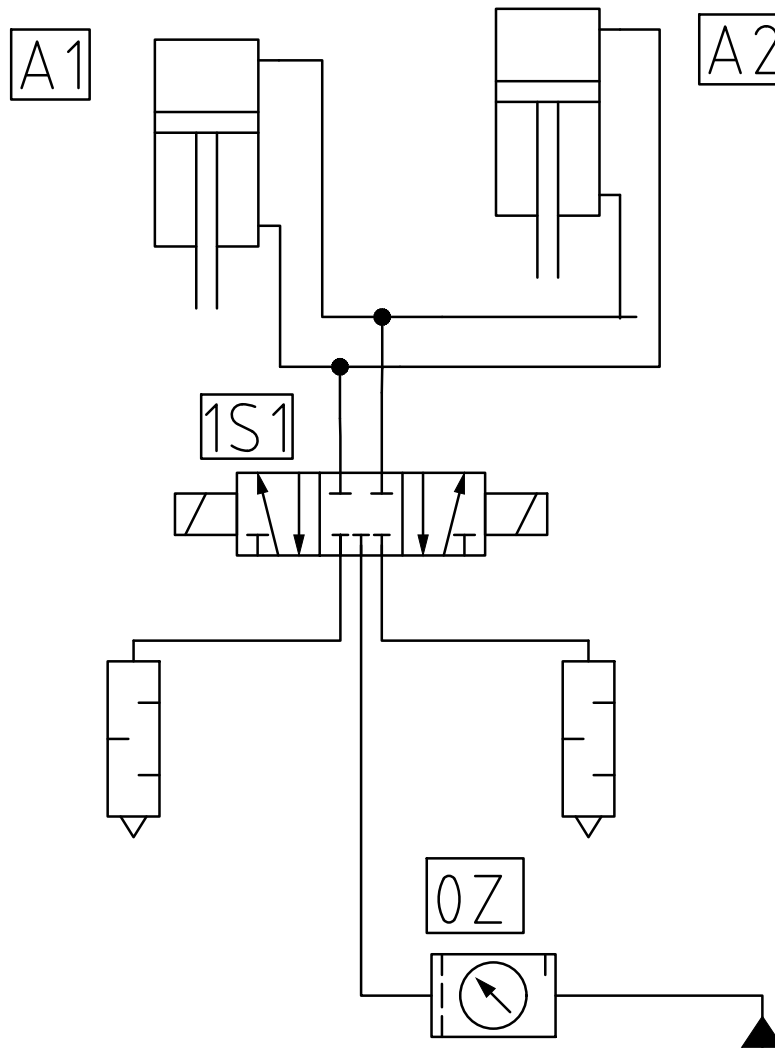
F13_001

Terminal diagram

Function text		Cable name			Cable type			Strip			Page / column
		Terminal	Connection point	Target designation	Jumper	Target designation	Connection point	Cable name	Cable type		
											8.57.0
											8.57.1
	Schedule valve for discharge plate, 1 OPEN		PE/PE		1						8.57.1
"	"		PE-1		2						8.57.2
	Schedule valve for discharge plate, 1 CLOSED		PE-2		3						8.57.2
"	"		PE-1		3						8.57.2
"	"		PE-2		3						8.57.3



18 Pneumatics plans



Spare Parts List

en-uk



OX 2.00 - 37kw B-34660-103-50-01

Condition for continuous function and readiness for use of the machine/plant is that the most important spare and wearing parts are kept on stock.

Our guarantee covers only original spare parts, which have been supplied by us.

With your spare parts order please indicate the following:

		see:
Werk no.		spare parts list, nameplate, client's documentation cover sheet
Year of construction		nameplate, client's documentation cover sheet

No. of spare parts (f. e. 9X XXXXX)	item	part no.	required quantity	denomination

By ordering hoses, seals and similar materials please specify the required length. Deviations from the above indication make the treatment of your order difficult and can lead to wrong deliveries.

Dept.:

After Sales Service



BHS-Sonthofen GmbH

Postfach 1164
An der Eisenschmelze 47
87527 Sonthofen

Tel.:

Mixing, Crushing and Recycling Division

Tel.: +49 8321 6099 - 149

Filtration Division

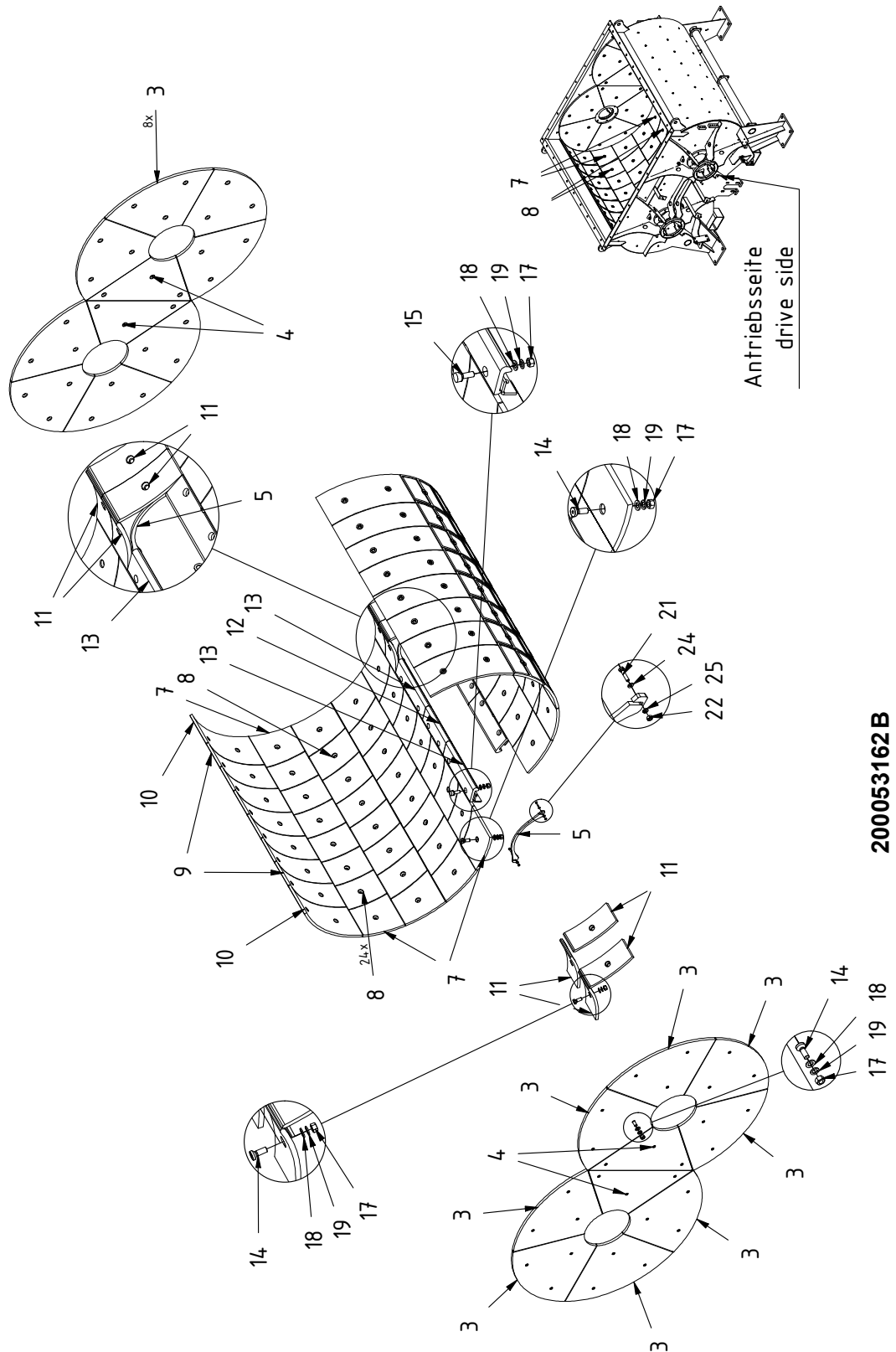
Tel. : +49 8321 6099 - 340

Fax.: +49 8321 6099 - 220

Email: service@bhs-sonthofen.de

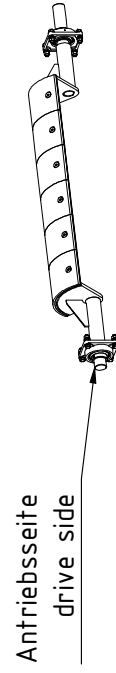
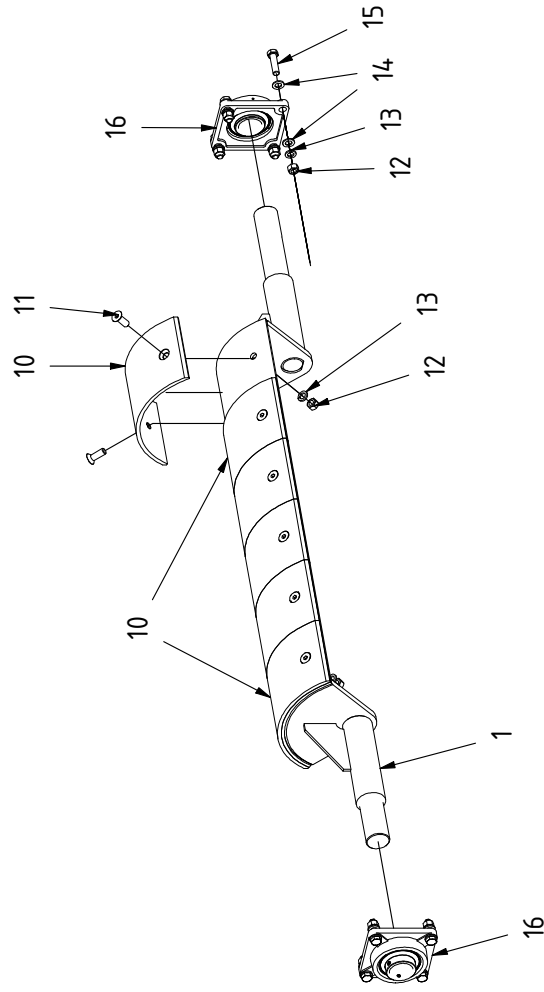
Kopfmaterial 902036621
 Beschreibung ERSATZTEILLISTE

Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0020	200053162		TROGVERSCHLEISSTEILE TROUGH WEARING PARTS	1.000	ST
0030	200053369		ENTLEERSCHIEBER KPL DISCHARGE ROTARY GATE KPL	1.000	ST
0031	200053620		ENTLEERSCHIEBERBETAETIG. PNEU. AGS DISCHARGE DOOR OPERATION PNEU. NDS	1.000	ST
0034	200017379		HEBELANBAU PNEUMATIK LEVEREXTENSION	1.000	ST
0037	200053714		AUSRUESTUNG ENTLEERSCHIEBERBET. PNEU. EQUIPMENT DISCHARGE DOOR PNEU.	1.000	ST
0039	200053894		WARTUNGSEINHEIT MAINTENANCE UNIT	1.000	ST
0050	200053169		MISCHWELLE M.LAGERUNG MIXING SHAFT WITH BEARING	1.000	ST
0051	200053163		MISCHWERK MIXING TOOLS	1.000	ST
0060	200053864		SCHMIERLEITUNG AS LUBRICATION PIPE AS	1.000	ST
0061	200053865		SCHMIERLEITUNG AGS LUBRICATION PIPE AGS	1.000	ST
0063	200053166		ZENTRALSCHMIERUNG CENTRAL LUBRICATION	1.000	ST
0070	200053161		ANTRIEB O.TURBO 2X37KW DRIVE WITHOUT TURBO	1.000	ST
0072	200053164		AUSRUESTUNG ANTRIEB EQUIPMENT DRIVE	1.000	ST
0104	200053668		TROGABDECKUNG KPL TROUGH COVER COMPLETE	1.000	ST



Kopfmaterial 200053162
Beschreibung TROGVERSCHLEISSTEILE

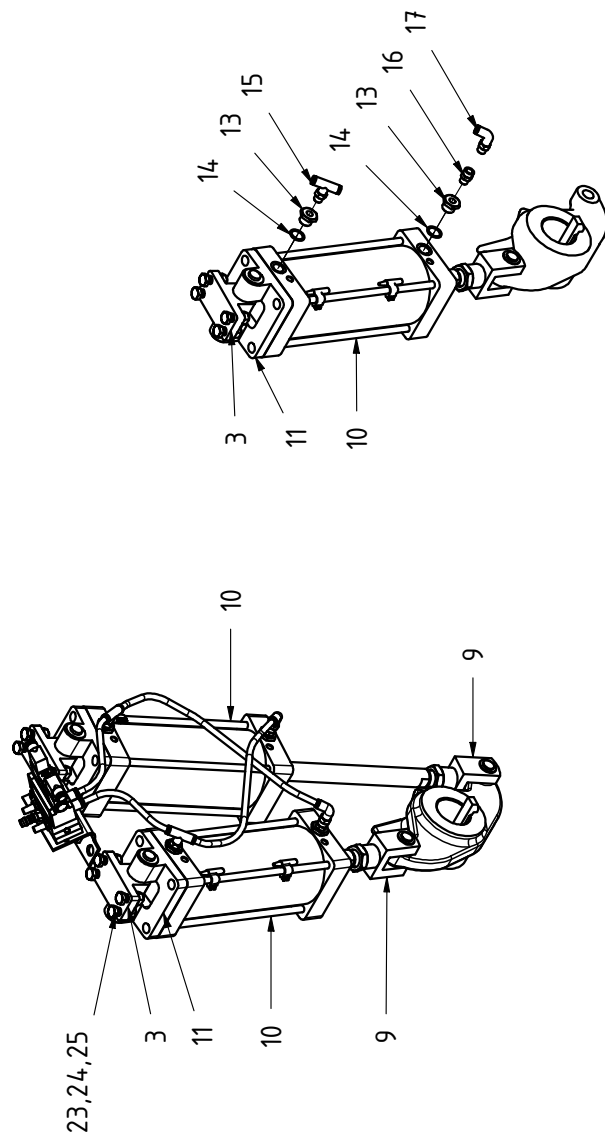
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0003	200054174		STIRNWANDBLECH SEGMENT FRONT WALL STEEL LINER	16.000	ST
0004	200054172		STIRNWANDBLECH MITTELST FRONT WALL STEEL LINER CENTRE	4.000	ST
0005	200053477		DICHTSTREIFEN SEALING STRAP	2.000	ST
0007	200053197		WANNENKACHEL AUSSEN TROUGH TILE EXTERNAL	16.000	ST
0008	200053201		WANNENKACHEL INNEN TROUGH TILE INTERNAL	48.000	ST
0009	200053703		WANNENBLECH OBEN KPL TROUGH SHEET UPPER PART CPL	12.000	ST
0010	200053702		WANNENBLECH OBEN KPL TROUGH SHEET UPPER PART CPL	4.000	ST
0011	200053209		SCHIEBERABDECKUNG DISCHARGE DOOR COVER	8.000	ST
0012	200053208		SCHIEBERLEISTE KURZ DISCHARGE DOOR LEDGE SHORT	2.000	ST
0013	200053205		SCHIEBERLEISTE DISCHARGE DOOR LEDGE	4.000	ST
0014	100240700		SENKSCHRAUBE COUNTERSUNK SCREW	156.000	ST
0015	101148800		SENKSCHRAUBE COUNTERSUNK SCREW	12.000	ST
0017	503041600		6KT-MUTTER HEXAGON NUT	190.000	ST
0018	503351600		SCHEIBE DISK	220.000	ST
0019	200045342		SENKSCHRAUBE COUNTERSUNK SCREW	8.000	ST
0021	500175200		6KT-SCHRAUBE HEXAGON BOLT	4.000	ST
0022	503000600		6KT-MUTTER HEXAGON NUT	4.000	ST
0024	503350600		SCHEIBE DISK	4.000	ST
0025	503347800		SICHERUNGSSCHEIBE NORDLOCK LOCK WASHER	4.000	ST



200053369 B

Kopfmaterial 200053369
Beschreibung ENTLEERSCHIEBER KPL

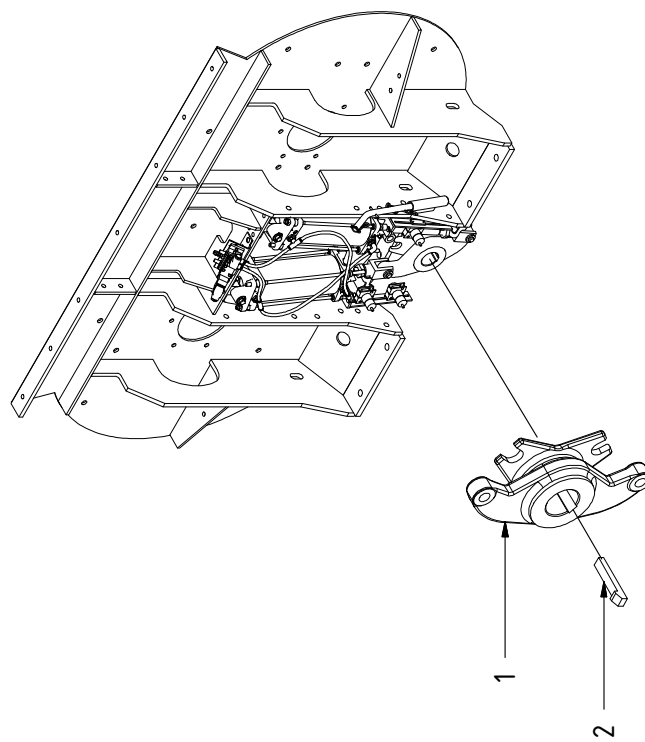
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0001	200053165		ENTLEERSCHIEBER SCHWEISSBAUGRUPPE DISCHARGE ROTARY GATE WELDING ASSEMBLY	1.000	ST
0010	200053372		WALZENSCHUTZ BLECH ROLLER PROTECTION SHEET	6.000	ST
0011	500856900		SENKSCHRAUBE M.INNEN-6KT HEX. SOCK. COUNTERS. HEAD	12.000	ST
0012	503001600		6KT-MUTTER HEXAGON NUT	20.000	ST
0013	503361600		FEDERRING SPRING RING	24.000	ST
0014	503351600		SCHEIBE DISK	16.000	ST
0015	500029100		6KT-SCHRAUBE HEXAGON BOLT	8.000	ST
0016	920015113		FLANSLAGER 4 LOCH FLANGE BEARING	2.000	ST



200053620 B

Kopfmaterial 200053620
Beschreibung ENTLEERSCHIEBERBETAETIG.

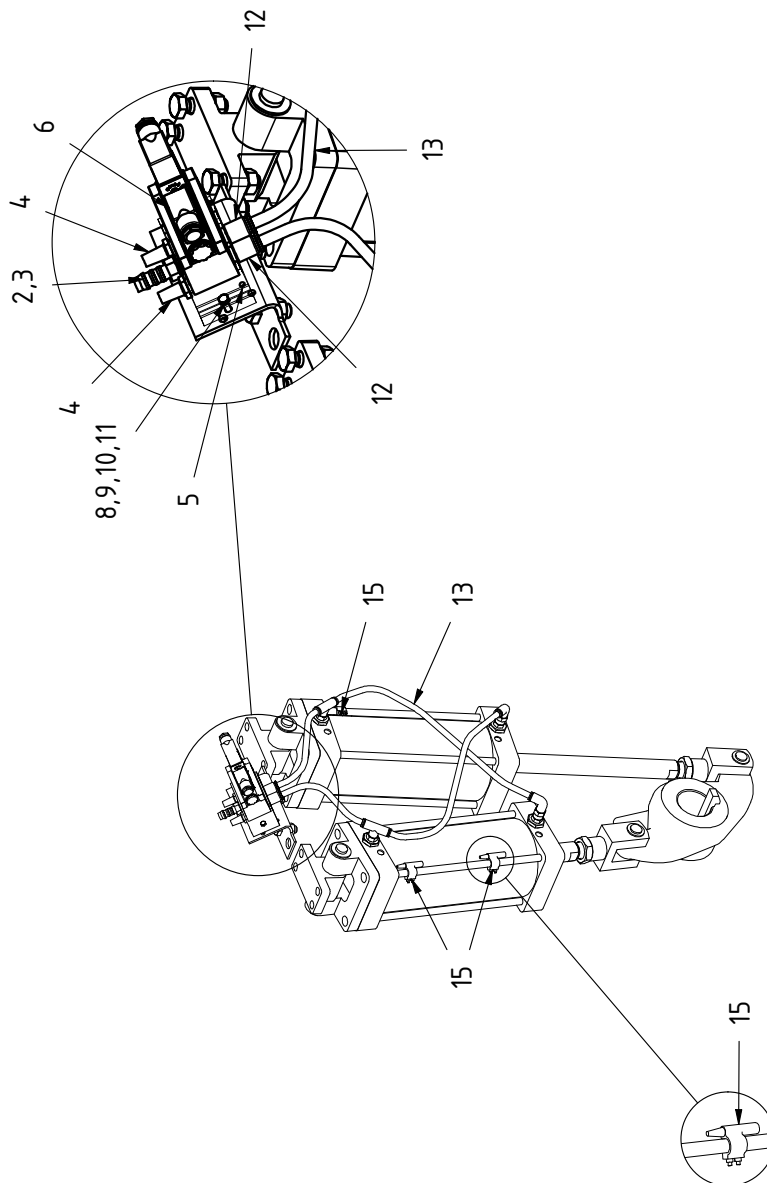
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0003	504312701		GEGENLAGER O.BOLZEN COUNTERBEARING WITHOUT BOLT	2.000	ST
0009	504311801		GABELGELENK FORK JOINT	2.000	ST
0010	504310201		PNEUMATIKZYLINDER PNEUMATIC CYLINDER	2.000	ST
0011	504313801		AUFHAENGEBEFESTIGUNG M. BOLZE SUSPENSION FIXTURE W. BOLT	2.000	ST
0013	504321200		REDUZIERVERSCHRAUBUNG REDUCING SCREW FITTING	4.000	ST
0014	503502200		DICHTRING sealing ring	4.000	ST
0015	504326100		VERSCHRAUBUNG >STECK< SCREW FITTING	2.000	ST
0016	504320600		REDUZIERVERSCHRAUBUNG REDUCING SCREW FITTING	4.000	ST
0017	504326600		VERSCHRAUBUNG >STECK< SCREW FITTING	2.000	ST
0023	500133500		6KT-SCHRAUBE HEXAGON BOLT M12X 40	8.000	ST
0024	503041200		6KT-MUTTER HEXAGON NUT	10.000	ST
0025	503361200		FEDERRING SPRING RING	10.000	ST



200017379A

Kopfmaterial 200017379
Beschreibung HEBELANBAU PNEUMATIK

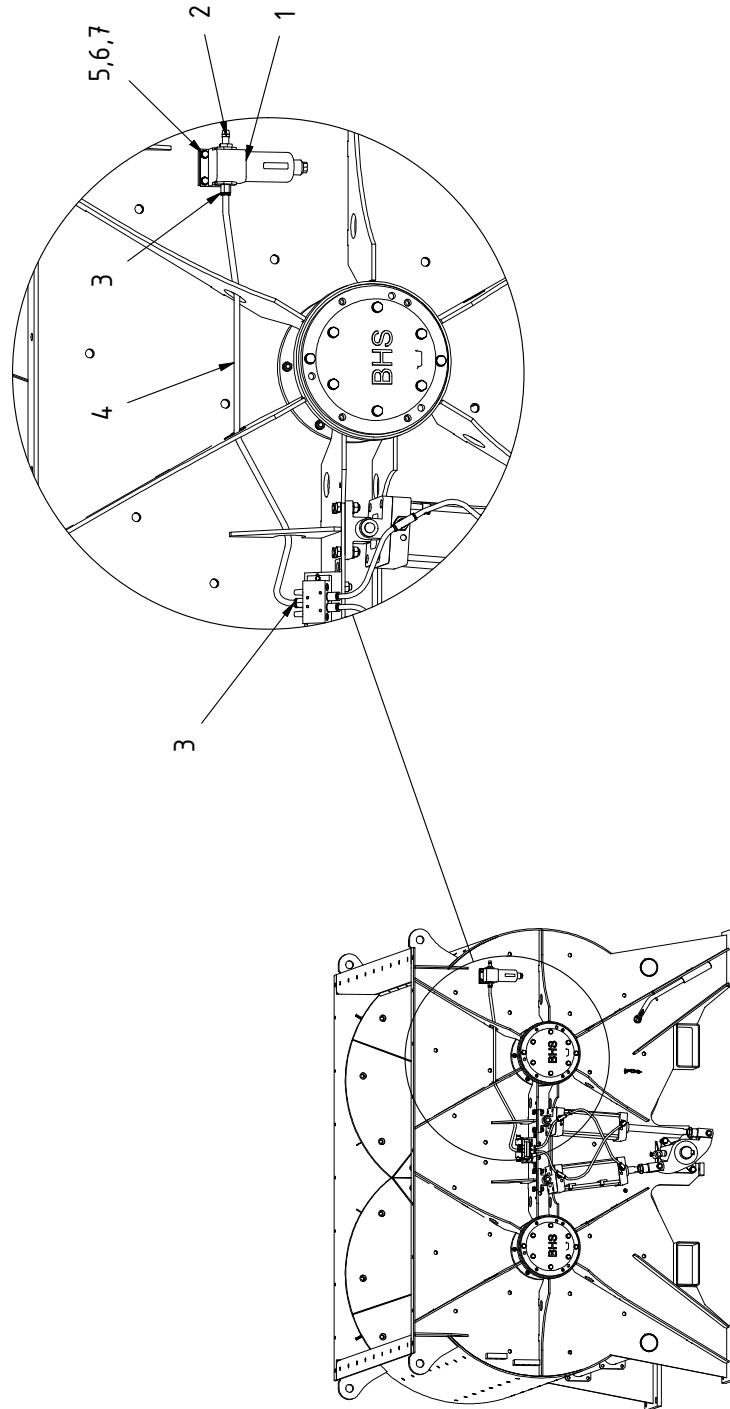
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0001	100372500		HEBEL LEVER	1.000	ST
0002	506114900		NASENKEIL GIB KEY	1.000	ST



200053714 B

Kopfmaterial 200053714
 Beschreibung AUSRUESTUNG

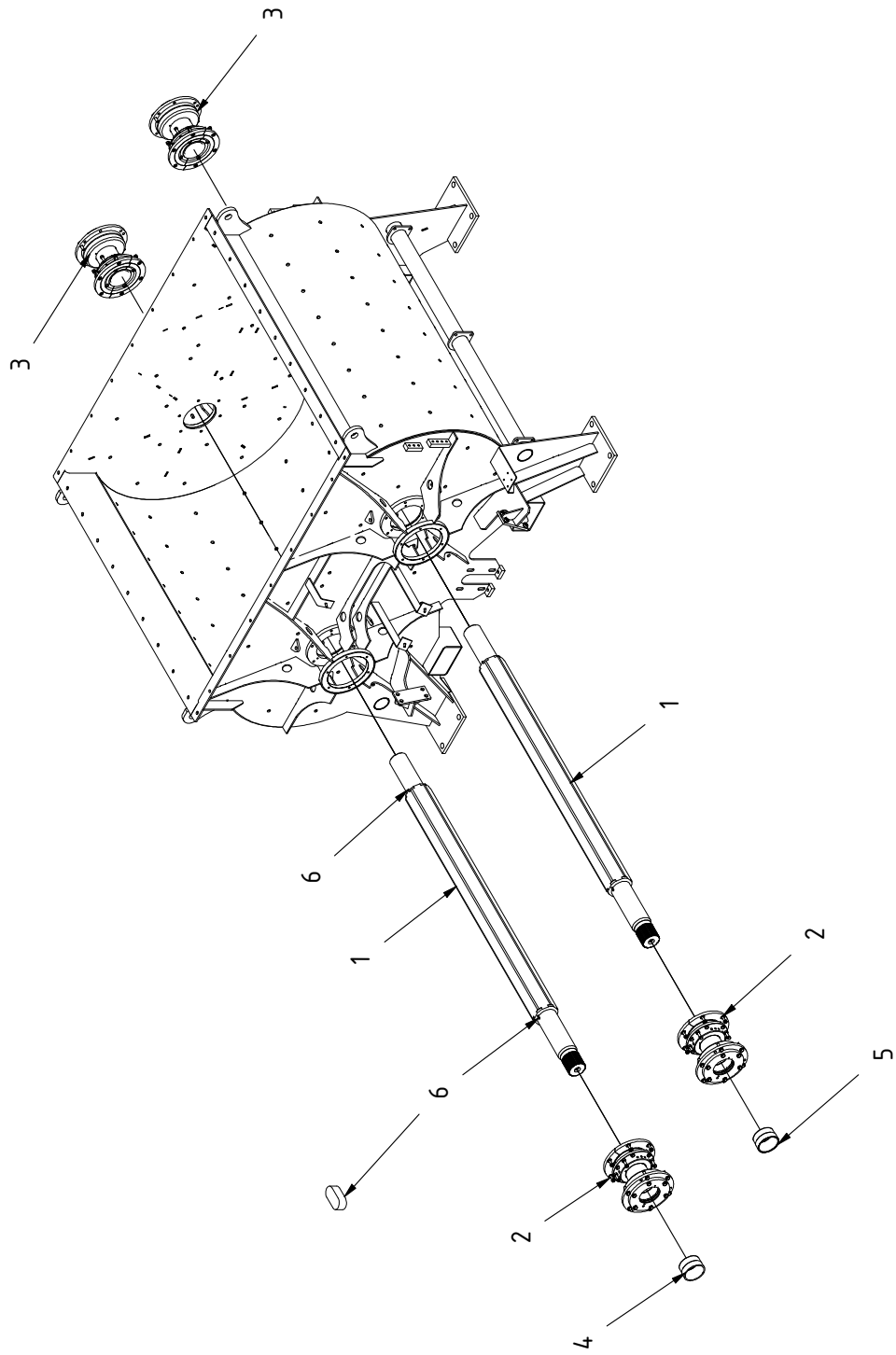
Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0002	100411100		SCHLAUCHTUELLE HOSE NOZZLE	1.000	ST
0003	503501500		DICHTRING SEALING RING	1.000	ST
0004	504315600		GERAEUSCHDAEMPFER SILENCER	2.000	ST
0005	504315001		GRUNDPLATTE BASE PLATE	1.000	ST
0006	504315010		MAGNETVENTIL 5/3 WEG ISO1 SOLENOID VALVE 5/3 WAY ISO1	1.000	ST
0008	500173100		6KT-SCHRAUBE HEXAGON BOLT	2.000	ST
0009	503000500		6KT-MUTTER HEXAGON NUT	2.000	ST
0010	503335500		SCHNORR-SICHERUNG TOOTH LOCK WASHER	2.000	ST
0011	503422500		SCHEIBE DISK	2.000	ST
0012	504325300		VERSCHRAUBUNG >STECK< SCREW FITTING	2.000	ST
0013	541501400		SCHLAUCH 10/6.5 (AD/ID) HOSE	1.000	M
0015	920013308		NAEHERUNGSSCHALTER IND. F. ZYLINDER 125 PROXIMITY SWITCH IND. F. CYLINDER 125	3.000	ST



200053894 B

Kopfmaterial 200053894
 Beschreibung WARTUNGSEINHEIT

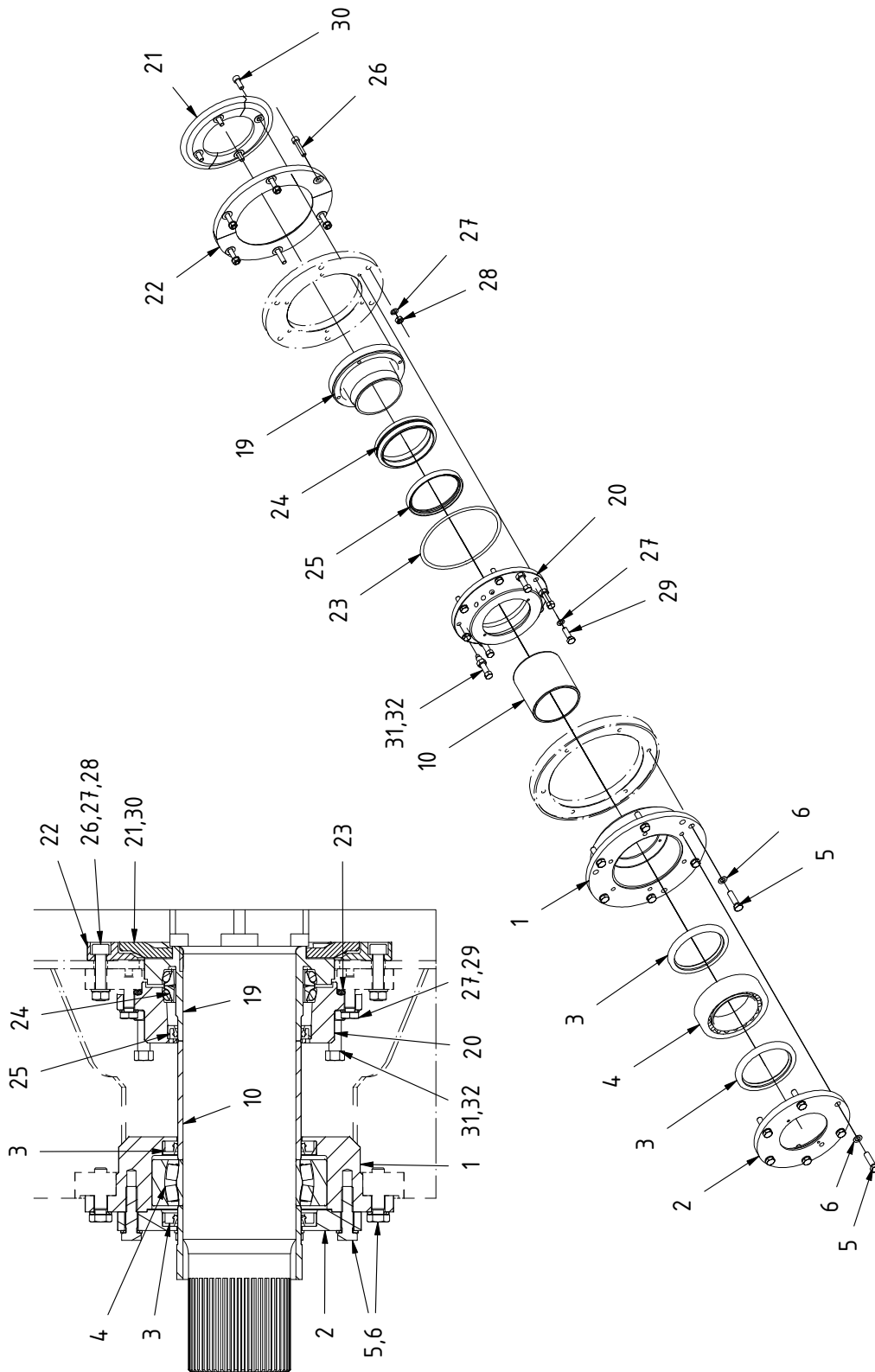
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0001	920008714		FILTER GF400-15 FILTER	1.000	ST
0002	504350400		SCHLAUCHTUELLE HOSE NOZZLE	1.000	ST
0003	504325101		VERSCHRAUBUNG >STECK< SCREW FITTING	2.000	ST
0004	541501500		SCHLAUCH 12/8,0 (AD/ID) HOSE 12/8,0 (AD/ID)	1.000	M
0005	500107300		6KT-SCHRAUBE hexagon bolt	2.000	ST
0006	503360800		FEDERRING SPRING RING	2.000	ST
0007	503350800		SCHEIBE DISK	2.000	ST



200053169 A

Kopfmaterial 200053169
Beschreibung MISCHWELLE M.LAGERUNG

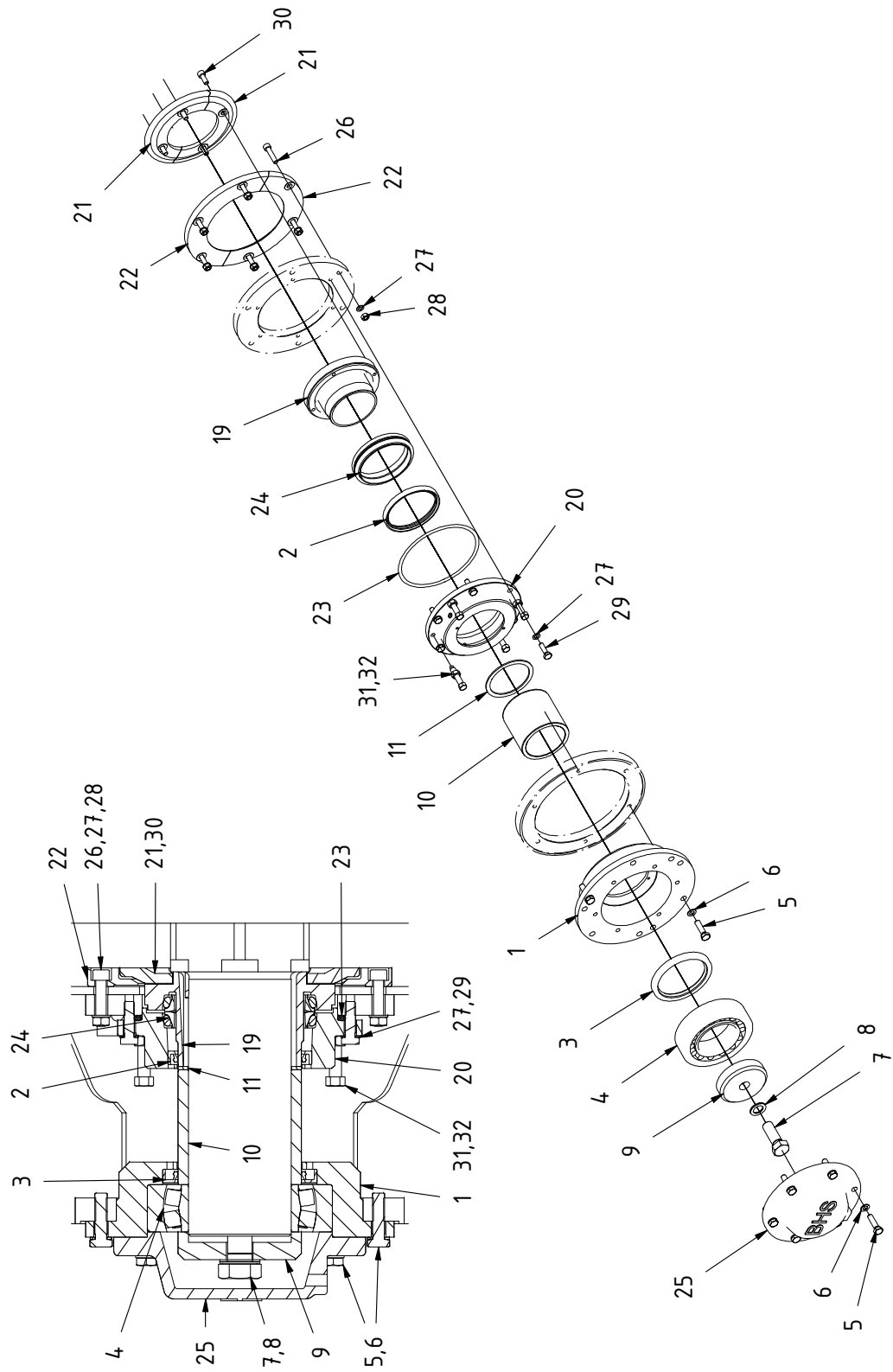
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0001	200053387		MISCHWELLE MIXING SHAFT	2.000	ST
0002	200053423		LAGERUNG BEARING	2.000	ST
0003	200053422		LAGERUNG BEARING	2.000	ST
0004	200053866		DISTANZBUCHSE DISTANCE SLEEVE	1.000	ST
0005	200053867		DISTANZBUCHSE DISTANCE SLEEVE	1.000	ST
0006	506104500		KEIL WEDGE	4.000	ST



200053423 A

Kopfmaterial 200053423
 Beschreibung LAGERUNG

Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0001	100358700		LAGERKOERPER bearing box	1.000	ST
0002	100016100		LAGERDECKEL BEARING COVER	1.000	ST
0003	507078100		WELLENDICHTRING SHAFT SEALING RING	2.000	ST
0004	910249200		PENDELROLLENLAGER SELF-ALIGNING ROLLER BRG.	1.000	ST
0005	500133500		6KT-SCHRAUBE HEXAGON BOLT	12.000	ST
0006	503361200		FEDERRING SPRING RING	12.000	ST
0010	100358500		DISTANZBUCHSE DISTANCE SLEEVE	1.000	ST
0019	100358800		WELLENBUCHSE SHAFT BUSH	1.000	ST
0020	101115100		AUFNAHMERING RETAINING RING	1.000	ST
0021	100262200		STAUBDECKEL DUST COVER	2.000	ST
0022	100262100		SCHLEISSRING WEARING RING	2.000	ST
0023	101050900		DICHTUNGSRING SEALING RING	1.000	ST
0024	504301000		GLEITRINGDICHTUNG AXIAL FACE SEAL	1.000	ST
0025	910682400		WELLENDICHTRING TRC001200 SHAFT SEALING RING	1.000	ST
0026	500506100		ZYLINDERSCHRAUBE CYLINDER HEAD SCREW	6.000	ST
0027	503361000		FEDERRING SPRING RING	12.000	ST
0028	503041000		6KT-MUTTER HEXAGON NUT	6.000	ST
0029	500130600		6KT-SCHRAUBE HEXAGON BOLT	6.000	ST
0030	500505700		ZYLINDERSCHRAUBE CYLINDER HEAD SCREW	4.000	ST
0031	500223000		6KT-SCHRAUBE MIT ZAPFEN HEX.BOLT FULL DOG POINT	4.000	ST
0032	503041200		6KT-MUTTER HEXAGON NUT	4.000	ST



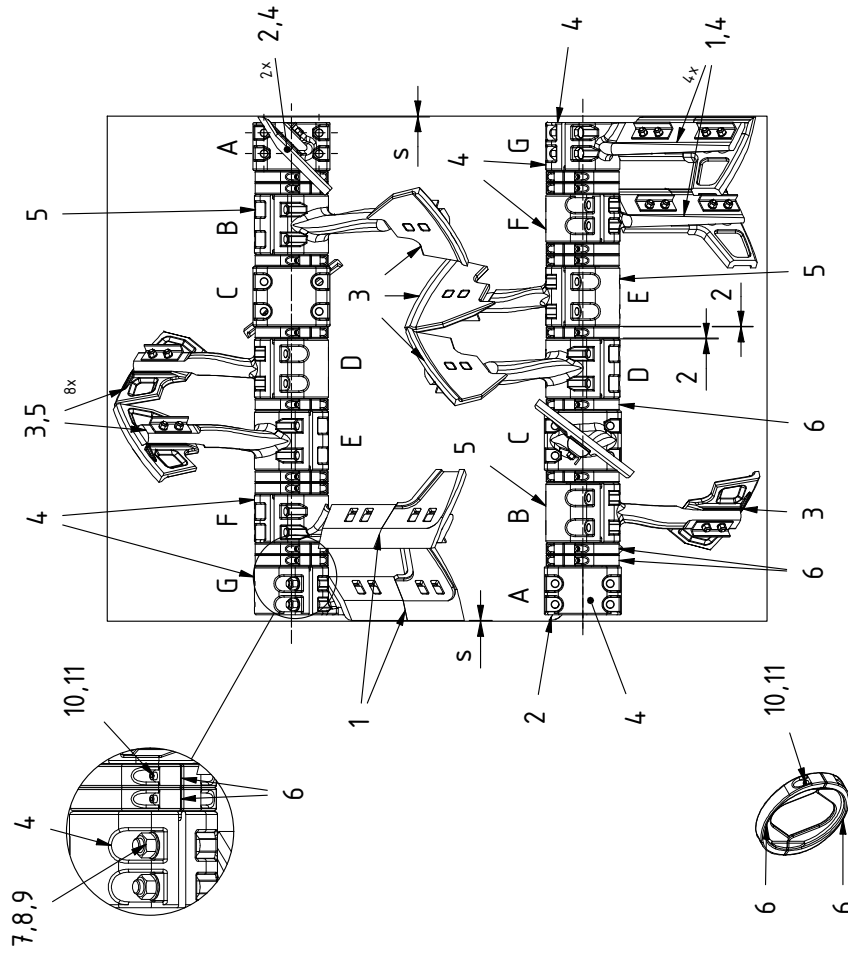
200053422 A

Kopfmaterial 200053422
 Beschreibung LAGERUNG

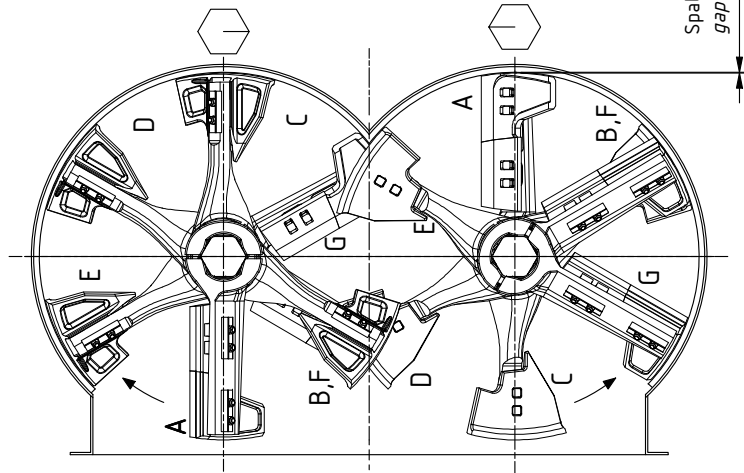
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0001	100016500		LAGERKOERPER bearing box	1.000	ST
0002	910682400		WELLENDICHTRING TRC001200 SHAFT SEALING RING	1.000	ST
0003	507078100		WELLENDICHTRING SHAFT SEALING RING	1.000	ST
0004	506771400		PENDELROLLENLAGER SELF-ALIGNING ROLLER BRG.	1.000	ST
0005	500133500		6KT-SCHRAUBE HEXAGON BOLT	12.000	ST
0006	503361200		FEDERRING SPRING RING	12.000	ST
0007	500142700		6KT-SCHRAUBE HEXAGON BOLT	1.000	ST
0008	503346400		SICHERUNGSSCHEIBE NORDLOCK LOCK WASHER	1.000	ST
0009	100016700		SCHLUSSSCHEIBE END DISK	1.000	ST
0010	101132300		DISTANZBUCHSE DISTANCE SLEEVE	1.000	ST
0011	504305700		LAMINUM-PASSRING LAMINUM ADJUSTING RING	1.000	ST
0019	100016300		WELLENBUCHSE SHAFT BUSH	1.000	ST
0020	101115100		AUFNAHMERING RETAINING RING	1.000	ST
0021	100262200		STAUBDECKEL DUST COVER	2.000	ST
0022	100262100		SCHLEISSRING WEARING RING	2.000	ST
0023	101050900		DICHTUNGSRING SEALING RING	1.000	ST
0024	504301000		GLEITRINGDICHTUNG AXIAL FACE SEAL	1.000	ST
0025	100016800		LAGERDECKEL AUSSEN BEARING COVER	1.000	ST
0026	500506100		ZYLINDERSCHRAUBE CYLINDER HEAD SCREW	6.000	ST
0027	503361000		FEDERRING SPRING RING	12.000	ST
0028	503041000		6KT-MUTTER HEXAGON NUT	6.000	ST

Kopfmaterial 200053422
Beschreibung LAGERUNG

Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0029	500130600		6KT-SCHRAUBE HEXAGON BOLT	6.000	ST
0030	500505700		ZYLINDERSCHRAUBE CYLINDER HEAD SCREW	4.000	ST
0031	500223000		6KT-SCHRAUBE MIT ZAPFEN HEX.BOLT FULL DOG POINT	4.000	ST
0032	503041200		6KT-MUTTER HEXAGON NUT	4.000	ST



Markierungen auf der antriebsseitigen Mischwellen-Stirnseite zur Einstellung des Mischwerks (Kerbe zeigt zur Mitte)
 Marks on drive end mixing shaft face to adjust the mixing tools (notch points to the centre)

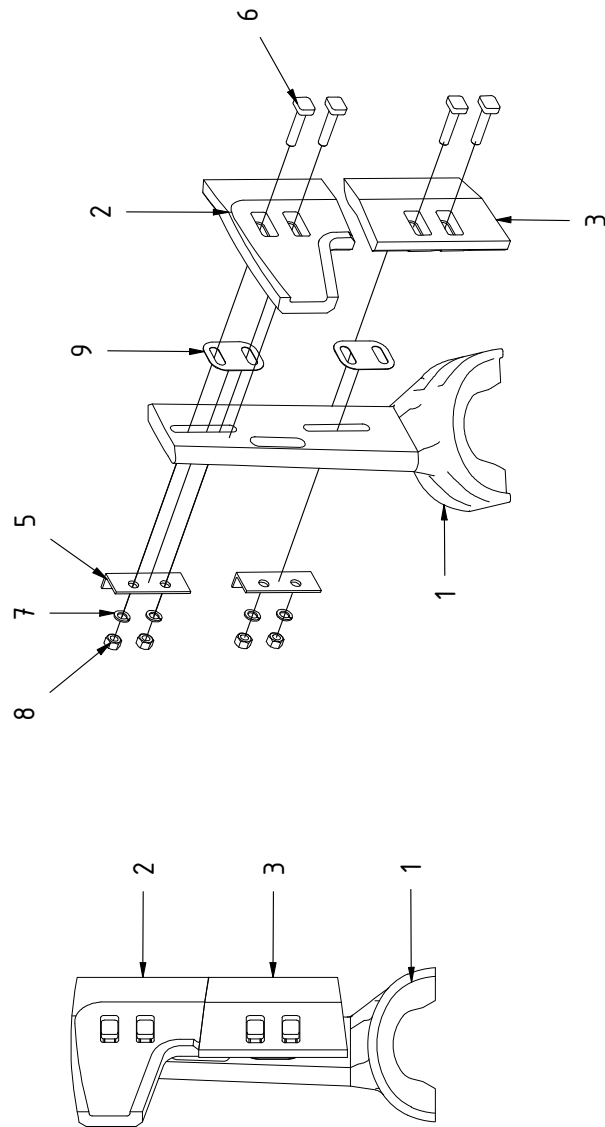


Maß s = min 1 mm an der engsten Stelle
 dimensions s = min 1 mm at narrowest point

200053163A

Kopfmaterial 200053163
Beschreibung MISCHWERK

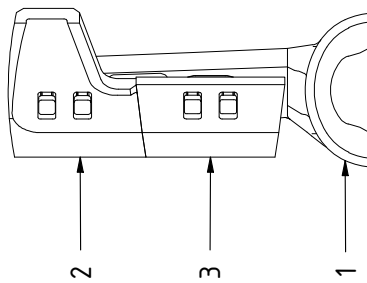
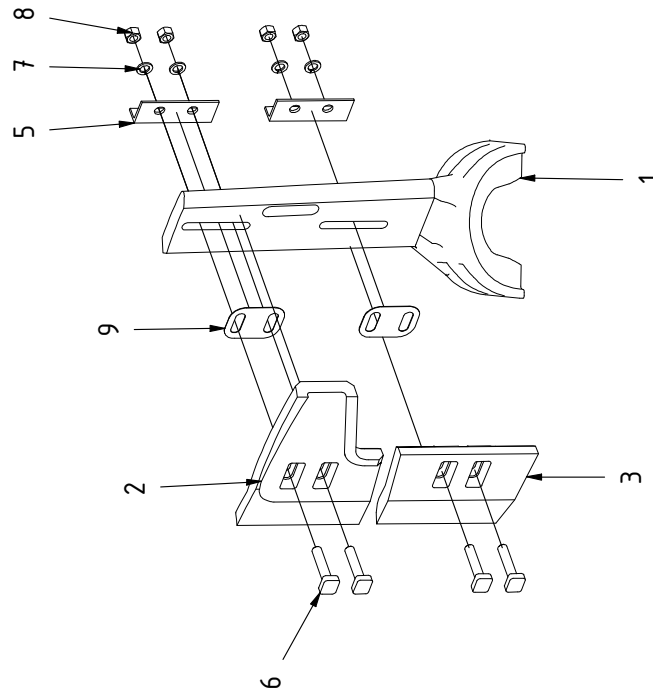
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0001	200053246		SEITENARM LINKS KPL LATERAL ARM LEFT CPL	4.000	ST
0002	200053247		SEITENARM RECHTS KPL LATERAL ARM RIGHT CPL	2.000	ST
0003	200053248		MITTELARM KPL CENTRAL ARM CPL	8.000	ST
0004	200053249		GEGENSTUECK FUER SEITENARM COUNTERPART FOR LATERAL ARM	6.000	ST
0005	200053250		GEGENSTUECK FUER MITTELARM COUNTERPART FOR MIDDLE ARM	8.000	ST
0006	200053212		FUELLSTUECK 38MM FILLING-UP PIECE 38MM	36.000	ST
0007	500034400		6KT-SCHRAUBE HEXAGON BOLT	56.000	ST
0008	503042400		6KT-MUTTER HEXAGON NUT	56.000	ST
0009	503435700		KUGELSCHEIBE SPHERICAL DISK	56.000	ST
0010	500504500		ZYLINDERSCHRAUBE CYLINDER HEAD SCREW	36.000	ST
0011	503040800		6KT-MUTTER HEXAGON NUT	36.000	ST



200053246 A

Kopfmaterial 200053246
Beschreibung SEITENARM LINKS KPL

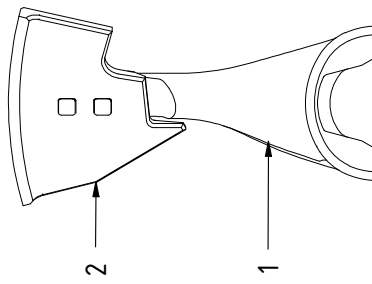
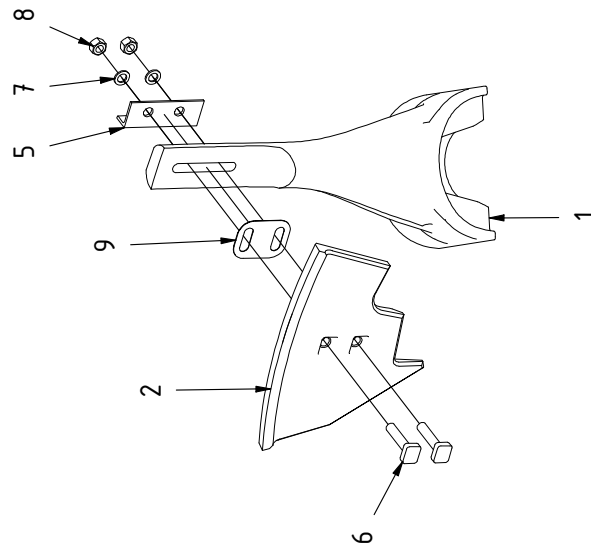
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0001	200053217		SEITENARM LINKS LATERAL ARM	1.000	ST
0002	200053253		SEITENPLATTE LATERAL PLATE	1.000	ST
0003	200053251		SEITENSCHAUFEL LINKS LATERAL BLADE	1.000	ST
0005	100179000		VERSCHLEISSCHUTZ WEAR PROTECTION	2.000	ST
0006	200005682		MISCHSCHAUFELSCHRAUBE MIXING BLADE SCREW	4.000	ST
0007	503361600		FEDERRING SPRING RING	4.000	ST
0008	503041600		6KT-MUTTER HEXAGON NUT	4.000	ST
0009	200053301		AUFLAGEBLECH F. MISCHARM ARM SUPPORTING PLATE F. MIXER ARM	2.000	ST



200053247 A

Kopfmaterial 200053247
Beschreibung SEITENARM RECHTS KPL

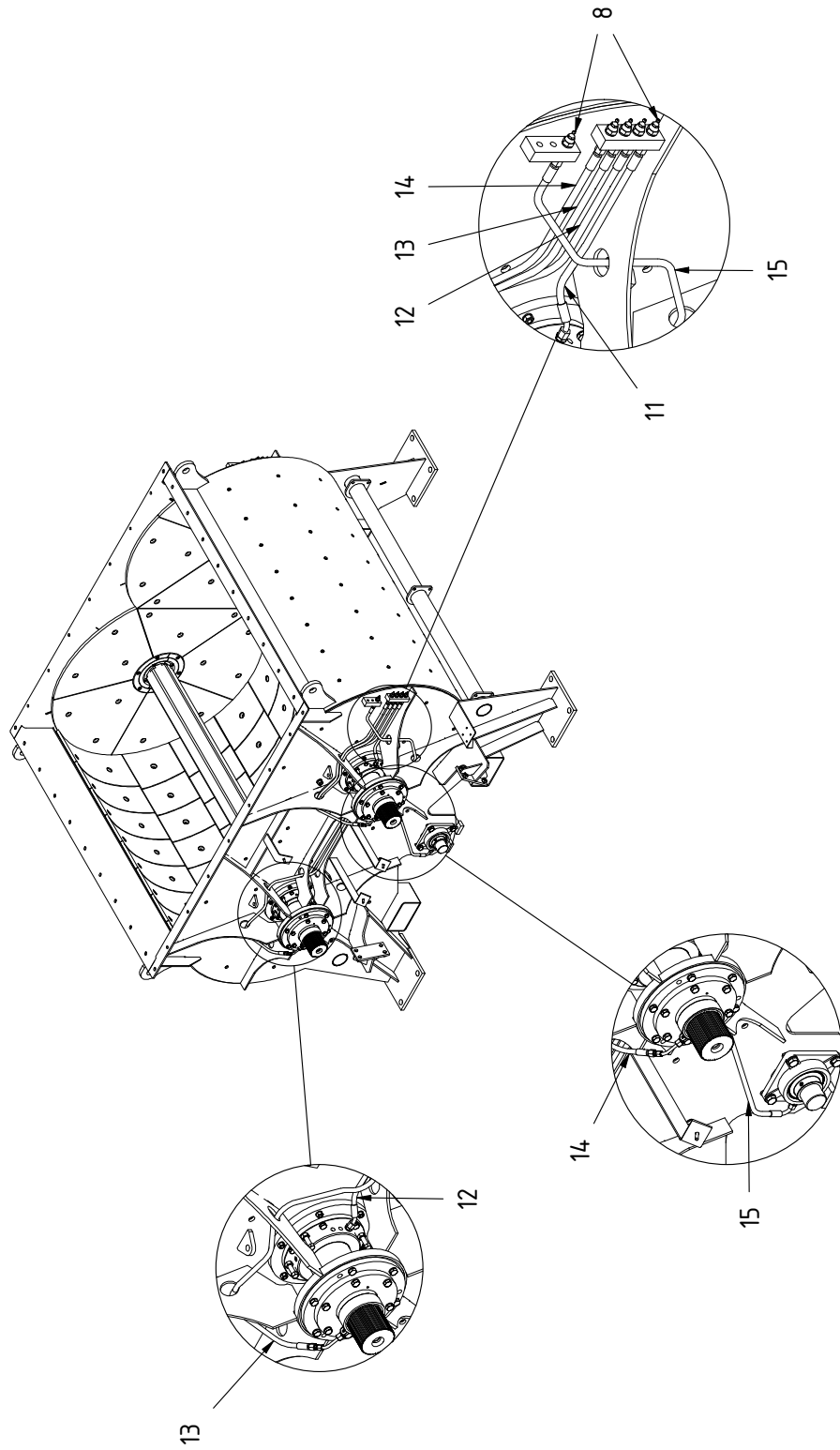
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0001	200053218		SEITENARM RECHTS LATERAL ARM	1.000	ST
0002	200053252		SEITENPLATTE LATERAL PLATE	1.000	ST
0003	200053251		SEITENSCHAUFEL RECHTS LATERAL BLADE	1.000	ST
0005	200005747		VERSCHLEISSCHUTZ WEAR PROTECTION	2.000	ST
0006	200005682		MISCHSCHAUFELSCHRAUBE MIXING BLADE SCREW	4.000	ST
0007	503361600		FEDERRING SPRING RING	4.000	ST
0008	503041600		6KT-MUTTER HEXAGON NUT	4.000	ST
0009	200053301		AUFLAGEBLECH F. MISCHARM ARM SUPPORTING PLATE F. MIXER ARM	2.000	ST



200053248 A

Kopfmaterial 200053248
Beschreibung MITTELARM KPL

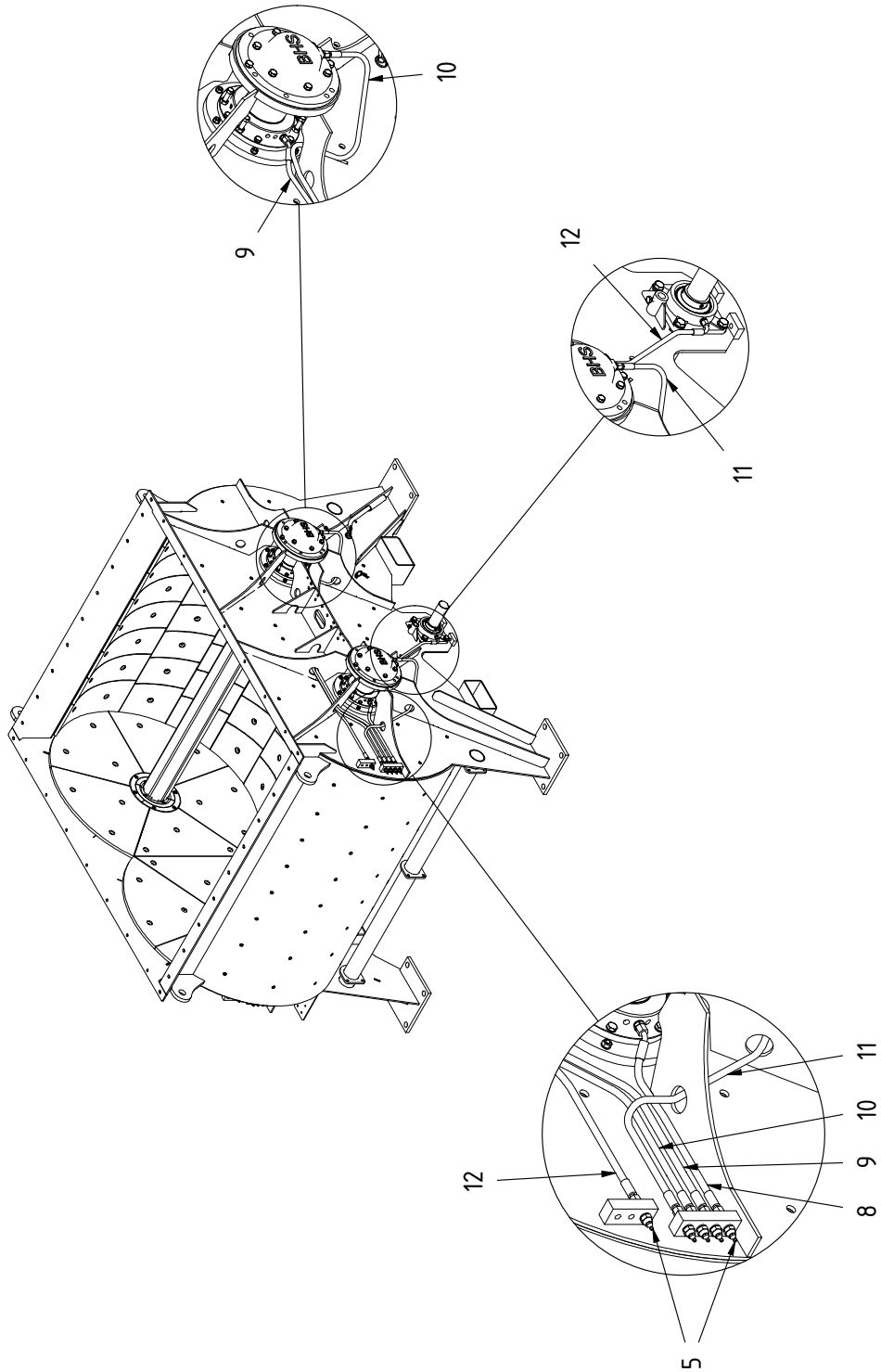
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0001	200053236		MITTELARM CENTRAL ARM	1.000	ST
0002	200053211		MITTELSCHAUFEL CENTRAL BLADE	1.000	ST
0005	200005747		VERSCHLEISSCHUTZ WEAR PROTECTION	1.000	ST
0006	200005682		MISCHSCHAUFELSCHRAUBE MIXING BLADE SCREW	2.000	ST
0007	503361600		FEDERRING SPRING RING	2.000	ST
0008	503041600		6KT-MUTTER HEXAGON NUT	2.000	ST
0009	200053301		AUFLAGEBLECH F. MISCHARM ARM SUPPORTING PLATE F. MIXER ARM	1.000	ST



200053864 A

Kopfmaterial 200053864
 Beschreibung SCHMIERLEITUNG AS

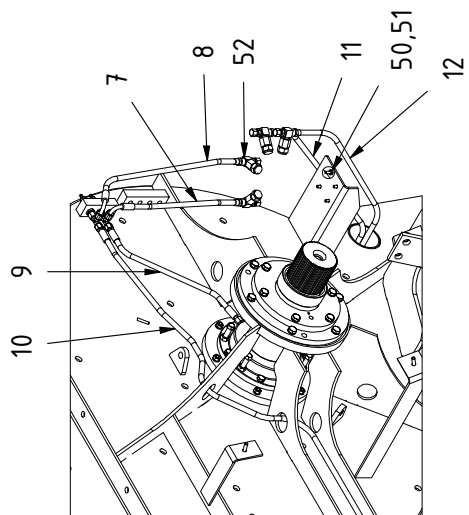
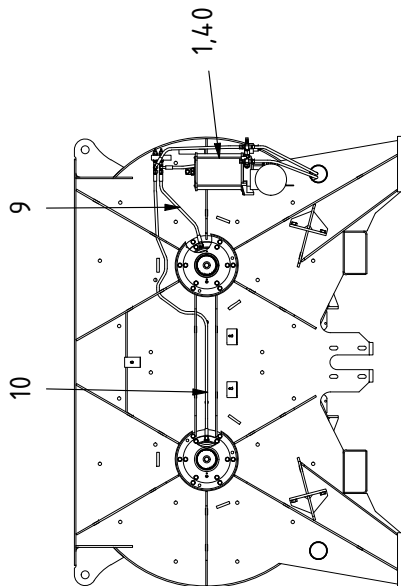
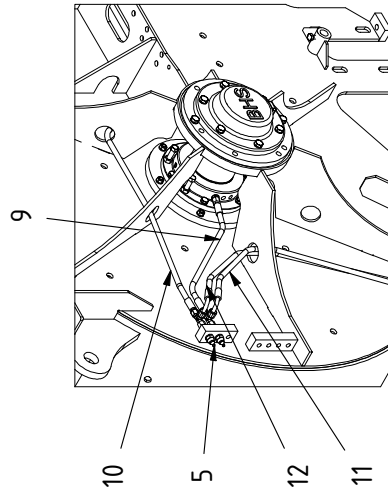
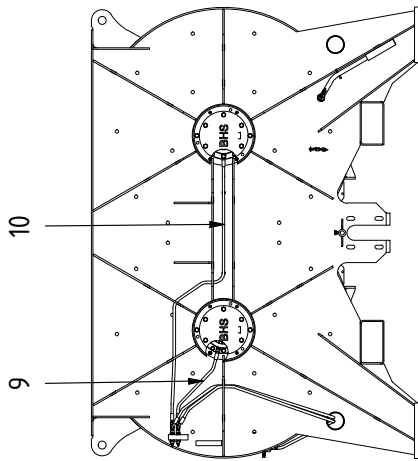
Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0008	910795000		KEGELSCHMIERNIPPEL CONICAL LUBR. HEAD	5.000	ST
0011	920003382		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST
0012	920002880		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST
0013	920011565		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST
0014	910781300		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE 6	1.000	ST
0015	920002703		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST



200053865 A

Kopfmaterial 200053865
 Beschreibung SCHMIERLEITUNG AGS

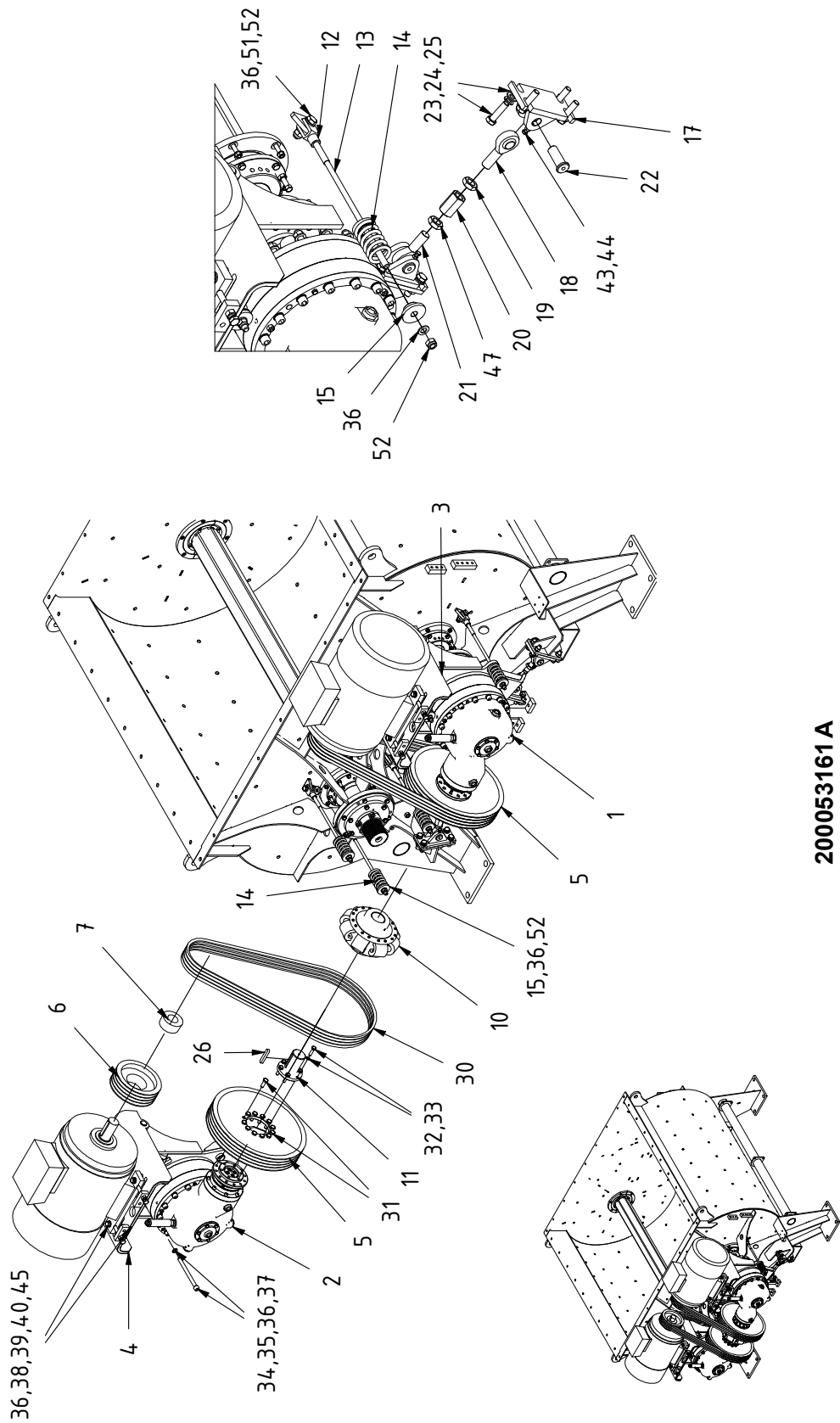
Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0005	910795000		KEGELSCHMIERNIPPEL CONICAL LUBR. HEAD	5.000	ST
0008	920003382		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST
0009	920002880		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST
0010	920012541		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST
0011	920005195		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST
0012	920002703		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST



200053166 A

Kopfmaterial 200053166
 Beschreibung ZENTRALSCHMIERUNG

Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0001	920015104		FETTSCHEIERPUMPE GREASE PUMP	1.000	ST
0005	910795000		KEGELSCHMIERNIPPEL CONICAL LUBR. HEAD	4.000	ST
0007	920003320		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST
0008	920005718		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	1.000	ST
0009	910677000		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	2.000	ST
0010	910692200		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE	2.000	ST
0011	920006893		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE 6	1.000	ST
0012	920005584		SCHLAUCHLEITUNG 1SN-DN 6 HOSE PIPE 6	1.000	ST
0040	509531000		WAEI.ZLAGERFETT K2K ANTIFRICT. BEARING GREASE	4.000	KG
0050	500104900		6KT-SCHRAUBE hexagon bolt	4.000	ST
0051	503350600		SCHEIBE DISK	4.000	ST
0052	920010182		PUMPENELEMENT PUMP ELEMENT	4.000	ST



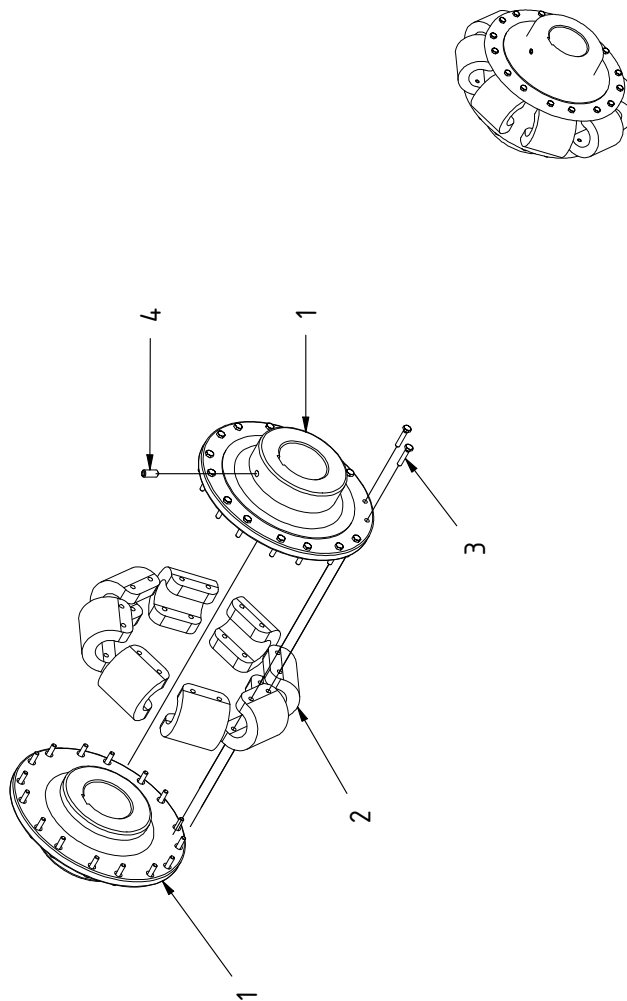
200053161 A

Kopfmaterial 200053161
Beschreibung ANTRIEB O.TURBO 2X37KW

Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0001	920014980		PLANETENGETRIEBE RECHTS EPICYCLIC GEAR RIGHT	1.000	ST
0002	920015102		PLANETENGETRIEBE LINKS EPICYCLIC GEAR LEFT	1.000	ST
0003	200053829		DREHMOMENTSTUETZE RE KPL TORQUE SUPPORT RIGHT COMP	1.000	ST
0004	200053828		DREHMOMENTSTUETZE LI KPL TORQUE SUPPORT LEFT COMPL	1.000	ST
0005	200055572		KEILRIEMENSCHLEIBE MIT BOHRUNG D130 V-BELT PULLEY WITH HOLE D130	2.000	ST
0006	910506700		KEILRIEMENSCHLEIBE TL V-BELT PULLEY TL SPB 236X4	2.000	ST
0007	505791100		SPANNBUCHSE TAPER-LOCK SPRING COLLET	2.000	ST
0010	200053467		KUPPLUNG MCF COUPLING	1.000	ST
0011	200053502		KUPPLUNGSWELLE COUPLING SHAFT	2.000	ST
0012	920015124		GABELKOPF DIN 71752 FORK HEAD DIN 71752	6.000	ST
0013	531406600		GEWINDEBOLZEN M16 threaded bolt	6.000	M
0014	920015118		DRUCKFEDER DIN 2098 PRESSURE SPRING	6.000	ST
0015	200053857		SCHLUSSSCHEIBE END DISK	6.000	ST
0017	100615000		ABSTUETZBOCK BEARING BLOCK	4.000	ST
0018	910210900		GELENKKOPF ASKUBAL JOINT HEAD	2.000	ST
0019	910210700		6KT-MUTTER FLACH HEXAGON NUT	2.000	ST
0020	100360300		SPANNSCHLOSS TURNBUCKLE	2.000	ST
0021	910211000		GELENKKOPF ASKUBAL JOINT HEAD	2.000	ST
0022	100616000		BOLZEN BOLT	4.000	ST
0023	500029100		6KT-SCHRAUBE HEXAGON BOLT	16.000	ST
0024	503361600		FEDERRING SPRING RING	16.000	ST

Kopfmaterial 200053161
 Beschreibung ANTRIEB O.TURBO 2X37KW

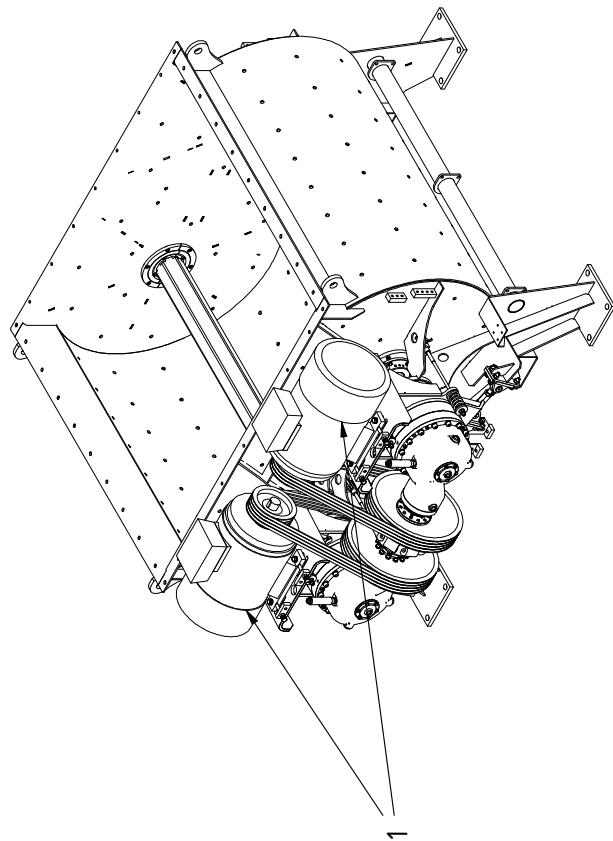
Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0025	503351600		SCHEIBE DISK	16.000	ST
0026	506014200		PASSFEDER feather key	2.000	ST
0030	505733900		KEILRIEMEN V-belt	8.000	ST
0031	920015126		6KT-SCHRAUBE M14 HEXAGON BOLT	24.000	ST
0032	500133600		6KT-SCHRAUBE HEXAGON BOLT	12.000	ST
0033	503321200		FEDERRING SPRING RING	12.000	ST
0034	920015125		ZYLINDERSCHRAUBE CYLINDER HEAD SCREW	26.000	ST
0035	503041600		6KT-MUTTER HEXAGON NUT	34.000	ST
0036	503351600		SCHEIBE DISK	52.000	ST
0037	503348100		SICHERUNGSSCHEIBE NORDLOCK LOCK WASHER	26.000	ST
0038	500029500		6KT-SCHRAUBE HEXAGON BOLT	8.000	ST
0039	503441800		SCHEIBE DISK	8.000	ST
0040	503041600		6KT-MUTTER HEXAGON NUT	8.000	ST
0043	500177600		6KT-SCHRAUBE HEXAGON BOLT	4.000	ST
0044	503040800		6KT-MUTTER HEXAGON NUT	4.000	ST
0045	503361600		FEDERRING SPRING RING	8.000	ST
0047	910210800		6KT-MUTTER FLACH HEXAGON NUT	2.000	ST
0049	503422800		SCHEIBE disk	3.000	ST
0050	503040800		6KT-MUTTER HEXAGON NUT	3.000	ST
0051	500029100		6KT-SCHRAUBE HEXAGON BOLT	6.000	ST
0052	503101600		6KT-SCHRAUBE HEXAGON BOLT	12.000	ST



200053467 A

Kopfmaterial 200053467
Beschreibung KUPPLUNG MCF

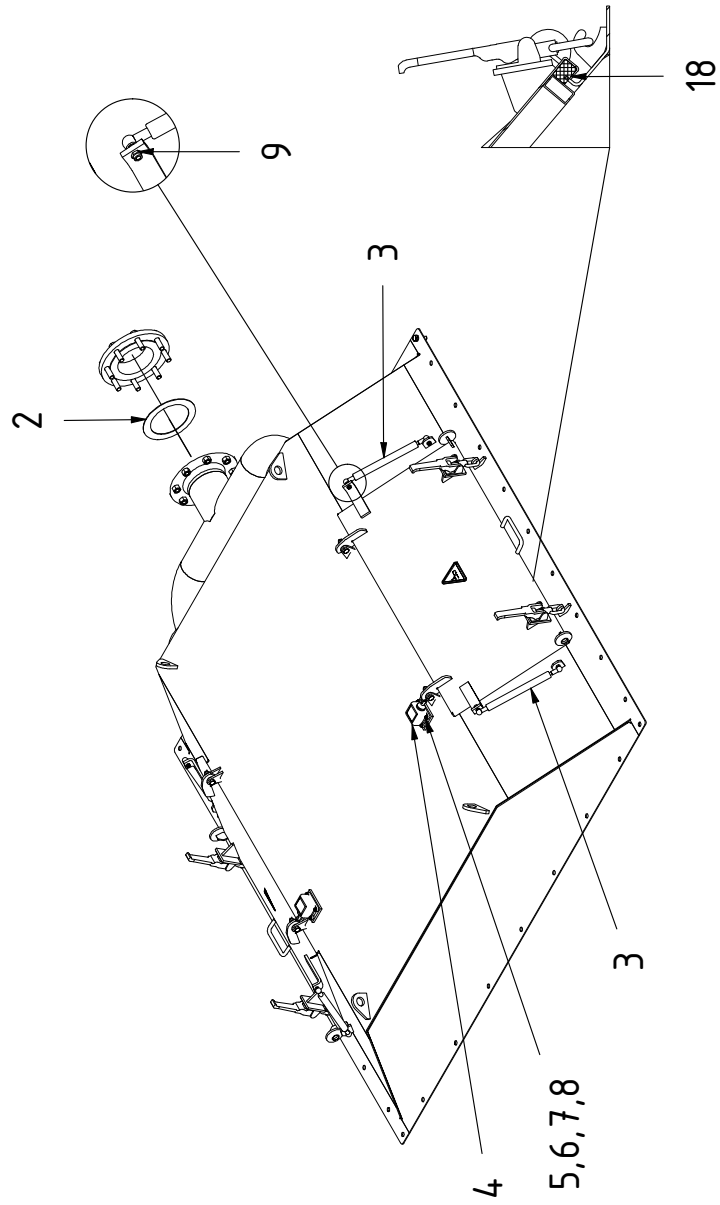
Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0001	200053470		KUPPLUNGSNABE COUPLING HUB	2.000	ST
0002	920012293		KREUZSTOLLEN RUBBER ELEMENT	8.000	ST
0003	500175300		6KT-SCHRAUBE hexagon bolt	32.000	ST
0004	501645900		GEWINDESTIFT THREADED PIN	2.000	ST



200053164 A

Kopfmaterial 200053164
Beschreibung AUSRUESTUNG ANTRIEB

Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0001	920014985		DREHSTROMMOTOR 37 KW (S3) THREE-PHASE MOTOR 37 KW (S3)	2.000	ST



200053668 A

Kopfmaterial 200053668
 Beschreibung TROGABDECKUNG KPL

Pos. Mark	Artikelnummer Item Code	Klassifikation Classification	Beschreibung Description	Menge Quantity	ME QU
0002	508103100		FLACHDICHTUNG flat seal	1.000	ST
0003	920009540		GASFEDER PNEUMATIC SPRING	4.000	ST
0004	910002300		ENDSCHALTER M.ROLLE LIMIT SWITCH	2.000	ST
0005	560000411		KABELVERSCHRAUBUNG cable water-proof connection	2.000	ST
0006	503350500		SCHEIBE DISK	8.000	ST
0007	503361200		FEDERRING SPRING RING	36.000	ST
0008	500733200		ZYLINDERSCHRAUBE CHEESE HEAD SCREW	8.000	ST
0009	503100800		6KT-MUTTER M.KLEMMTEIL HEXAGON NUT W. CLAMP PART	8.000	ST
0018	540015600		FLACH 30X20 (MOOSGUMMI) FLAT	2.000	M