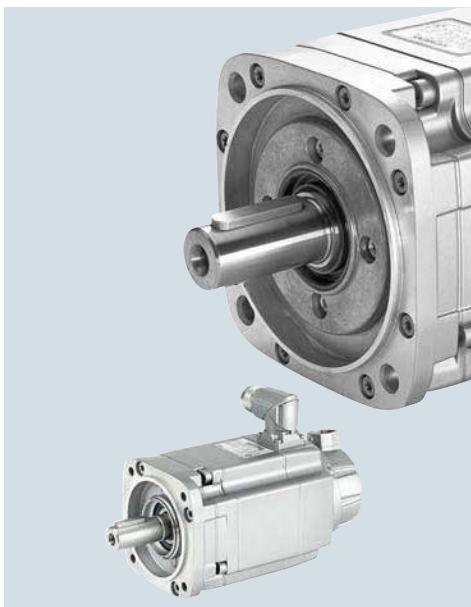



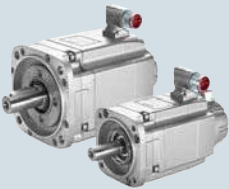
SIMOTICS servomotors



| | |
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| Chap. 13 | Drive Technology Configurator Product selection tool www.siemens.com/dt-configurator |
| Chap. 13 | SIZER for Siemens Drives Engineering tool www.siemens.com/sizer |
| Chap. 13 | CAD CREATOR Dimensional drawing and 2D/3D CAD generator www.siemens.com/cadcreator |

SIMOTICS servomotors

Overview

| Motor type | Features | Degree of protection | Type of cooling |
|--|---|--|--|
| SIMOTICS S servomotors – permanent-magnet | | | |
|  <p>SIMOTICS S-1FT7 Compact</p> | Compact Very high power density | IP64 ¹⁾ (optional IP65, IP67) | Natural cooling Forced ventilation Water cooling |
| | High Dynamic Very low rotor moment of inertia | IP64 (optional IP65, IP67) | Forced ventilation Water cooling |
|  <p>SIMOTICS S-1FK7 Compact</p> <hr/> <p>Compact for Power Modules 230 V 1 AC</p> <hr/> <p>SIMOTICS S-1FK7 High Dynamic</p> <hr/> <p>High Dynamic for Power Modules 230 V 1 AC</p> <hr/> <p>SIMOTICS S-1FK7 High Inertia</p> | Compact High power density | IP64 (optional IP65) | Natural cooling |
| | High Dynamic Very low rotor moment of inertia | IP64 (optional IP65) | Natural cooling |
| | High Inertia High or variable load moment of inertia | IP64 (optional IP65) | Natural cooling |

SIMOTICS S servomotors

The potential applications for SIMOTICS S-1FT7/S-1FK7 motors are extremely diverse.

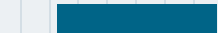





On machine tools, they are designated and used as feed motors.

On production machines, e.g., printing, packaging and textile machines, they are designated as synchronous servomotors.

Core types can be supplied for certain motor types. These core types can be express delivered as replacement motors in the event of plant outages and offer the advantage of a quicker spare parts supply. For this reason, core types should be used for configuration wherever possible.

The selection and ordering data for the SINAMICS S120 Motor Modules are based on the booksize format by way of example. Other formats are also possible. The SIZER for Siemens Drives engineering tool is available for detailed configuration

¹⁾ Core type: IP65.

| Shaft height | Rated power P_{rated} for duty type S1 kW (hp) | | | | | | Rated torque M_{rated} | Selection and ordering data |
|--|--|---|---|--------------------|-----|------|---|--------------------------------|
| | 0.01 | 0.1 | 1 | 10 | 100 | 1000 | | |
| SH 36/SH 48/SH 63/ SH 80/SH 100/SH 132 | | |  | | | | 1.4 ... 108 Nm (12.4 ... 956 lb _f -in) | 8/16 |
| SH 80/SH 100 | | | 0.88 (1.18) | 17 (22.8) | | | 21 ... 73 Nm (186 ... 646 lb _f -in) | |
| SH 63/SH 80/SH 100 | | |  | | | | 9.2 ... 125 Nm (81.4 ... 1106 lb _f -in) | |
| SH 63/SH 80 | | |  | | | | 11 ... 33 Nm (97.4 ... 292 lb _f -in) | 8/30 |
| SH 63/SH 80 | | | 3.1 (4.16) | 34.2 (45.9) | | | 16.5 ... 51 Nm (146 ... 451 lb _f -in) | |
| SH 20/SH 28/SH 36/ SH 48/SH 63/SH 80/ SH 100 | |  | | | | | 0.08 ... 37 Nm (0.71 ... 327 lb _f -in) | 8/36 |
| SH 20/SH 28/SH 36/ SH 48 | | 0.05 (0.07) | 0.8 (1.07) | 8.2 (11.0) | | | 0.08 ... 2.6 Nm (0.71 ... 23 lb _f -in) | |
| SH 36/SH 48/SH 63/ SH 80 | | |  | | | | 0.9 ... 18 Nm (8.0 ... 159 lb _f -in) | 8/42 |
| SH 36/SH 48 | | | 0.6 (0.80) | 3.8 (5.10) | | | 1.2 ... 3 Nm (10.6 ... 26.6 lb _f -in) | |
| SH 48/SH 63/SH 80/ SH 100 | | |  | | | | 1.5 ... 37 Nm (13.3 ... 327 lb _f -in) | 8/44 |
| | | | 0.4 (0.54) | 0.9 (1.21) | | | | |

SIMOTICS servomotors

Technical definitions for AC motors

Overview

Regulations, standards, and specifications

The motors comply with the appropriate standards and regulations, see table below.

As a result of the fact that in many countries the national regulations have been harmonized with the international IEC 60034-1 recommendation, there are no longer any differences with respect to coolant temperatures, temperature classes, and temperature rise limits

| | |
|---|----------------------------------|
| General specifications for rotating electrical machines | IEC 60034-1 |
| Terminal designations and direction of rotation for electrical machines | IEC 60034-8 |
| Types of construction of rotating electrical machines | IEC 60034-7 |
| Cooling methods of rotating electrical machines | IEC 60034-6 |
| Degrees of protection of rotating electrical machines | IEC 60034-5 |
| Vibration severity of rotating electrical machines | IEC 60034-14 |
| Noise limit values for rotating electrical machines | IEC 60034-9 |
| Cylindrical shaft extensions for electric machines | DIN 748 Part 3/ DIN IEC 60072 |

The motors listed below are UL-approved by Underwriters Laboratories Inc. and also comply with Canadian cUR standards: SIMOTICS S-1FK7/S-1FT7/SIMOTICS T-1FW3/S-1FW6/SIMOTICS M-1PH8 (without brake)/SIMOTICS L-1FN3.

Degrees of protection for AC motors

A suitable degree of protection must be selected depending on the operating and environmental conditions to protect the machine against:

- Ingress of water, dust, and solid foreign objects,
- Contact with rotating parts inside a motor, and
- Contact with live parts.

Degrees of protection of electric motors are specified by a code. This comprises 2 letters, 2 digits and, if required, an additional letter.

IP (International Protection)

Code letter designating the degree of protection against contact and the ingress of solid foreign objects and water

0 to 6

1st digit designating the degree of touch protection and protection against ingress of solid foreign objects

0 to 8

2nd digit designating the degree of protection against ingress of water (no oil protection)

W, S and M

Additional code letters for special degrees of protection

Most motors are supplied with the following degrees of protection:

| Motor | Degree of protection | 1st digit: Touch protection | Protection against foreign objects | 2nd digit: Protection against water |
|-------------------|---------------------------|--|--|--|
| Internally cooled | IP23 | Protection against finger contact | Protection against medium-sized, solid foreign objects above 12 mm Ø | Protection against spray water up to 60° from the vertical |
| Surface-cooled | IP54 | Complete protection against accidental contact | Protection against damaging dust deposits | Splash water from any direction |
| | IP55 | | | Jet water from any direction |
| | IP64 | Complete protection against accidental contact | Protection against ingress of dust | Splash water from any direction |
| | IP65 ¹⁾ | | | Jet water from any direction |
| | IP67 ¹⁾ | | | Motor under specified pressure and time conditions under water |

Recommended degrees of protection for AC motors

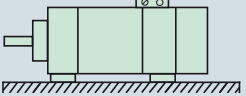
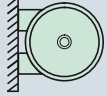
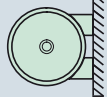
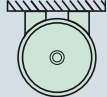
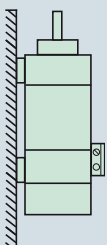
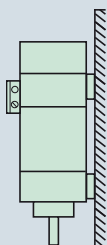
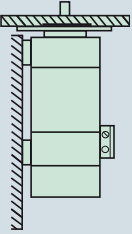
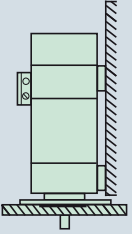
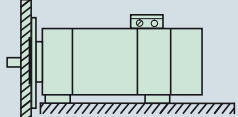
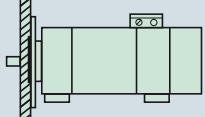
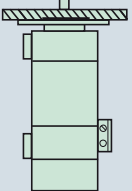
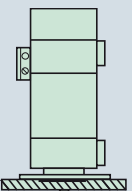
When cooling lubricants are used, protection against water alone is inadequate. The IP rating should only be considered as a guideline in this case. The motors may have to be protected by suitable covers. Attention must be paid to providing suitable sealing of the motor shaft for the selected degree of protection for the motor (for 1FT7: degree of protection IP67).

The table can serve as a decision aid for selecting the proper degree of protection for motors. With mounting position IM V3/IM V19/IM V6/IM V35 with shaft extension facing upwards, a permanent covering of liquid on the flange must be avoided. With a mounting position with the shaft extension facing upwards, liquid remaining on the motor flange can be avoided by selecting a 1FT7 motor with degree of protection IP67 and a recessed flange.

| | Liquids | General workshop environment | Water; general cooling lubricant (95% water, 5% oil) |
|--|---------|------------------------------|--|
| Effect | | | |
| Dry | | IP64 | – |
| Liquid-enriched environment | | – | IP64 |
| Mist | | – | IP65 |
| Spray | | – | IP65 |
| Jet | | – | IP67 |
| Splash/brief immersion/constant inundation | | – | IP67 |

¹⁾ DIN VDE 0530 Part 5 or EN 60034 Part 5 specifies that there are only 5 degrees of protection for the first digit code and 8 degrees of protection for the second digit code in relation to rotating electrical machinery. However, IP6 is included in DIN 40050, which generally applies to electrical equipment.

Overview (continued)

| Types of construction/mounting positions | Types of construction/mounting positions |
|---|---|
| <p>IM B3</p>  | <p>IM B6</p>  |
| <p>IM B7</p>  | <p>IM B8</p>  |
| <p>IM V6</p>  | <p>IM V5</p>  |
| <p>IM V35¹⁾</p>  | <p>IM V15¹⁾</p>  |
| <p>IM B35¹⁾</p>  | <p>IM B5, IM B 14</p>  |
| <p>IM V3, IM V19</p>  | <p>IM V1, IM V18</p>  |

¹⁾ Fixing on the flange and feet is necessary.

SIMOTICS servomotors

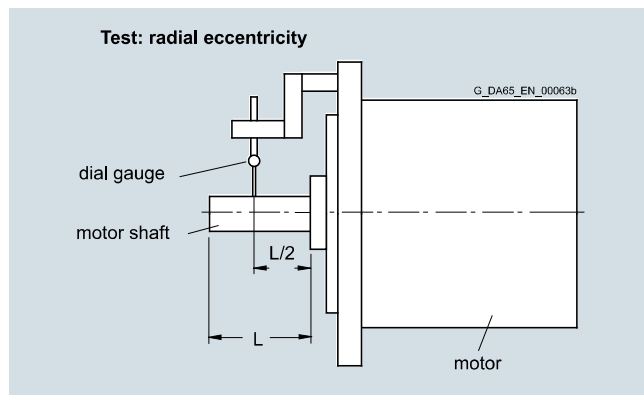
Technical definitions for AC motors

Overview (continued)

Radial eccentricity tolerance of shaft in relation to housing axis

referred to cylindrical shaft extensions

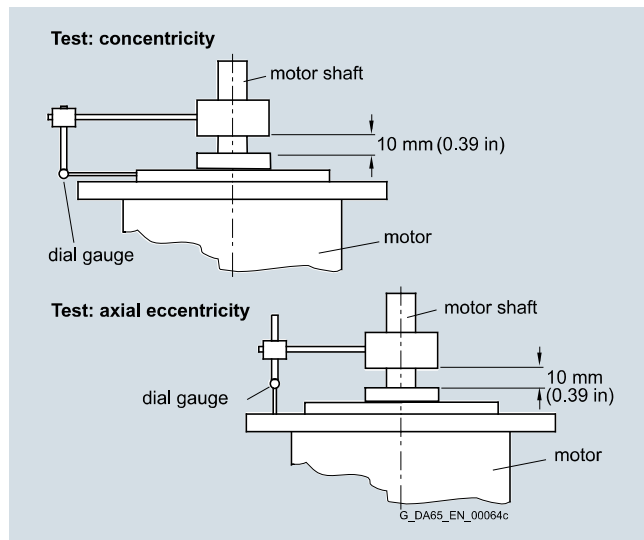
| Shaft height SH | Tolerance N mm (in) | Tolerance R mm (in) | Tolerance SPECIAL mm (in) |
|--------------------|---------------------------|---------------------------|---------------------------------|
| 28/36 | 0.035 (0.00138) | 0.018 (0.00071) | – |
| 48/63 | 0.04 (0.00157) | 0.021 (0.00083) | – |
| 80/100/132 | 0.05 (0.00197) | 0.025 (0.00098) | 0.01 (0.00039) |
| 160/180/225 | 0.06 (0.00236) | 0.03 (0.00118) | 0.01/–/– (0.00039)/–/– |
| 280 | 0.07 (0.00276) | 0.035 (0.00138) | – |
| 355 | 0.08 (0.00315) | 0.04 (0.00157) | – |



Concentricity and axial eccentricity tolerance of the flange surface relative to the shaft axis

(referred to the centering diameter of the mounting flange)

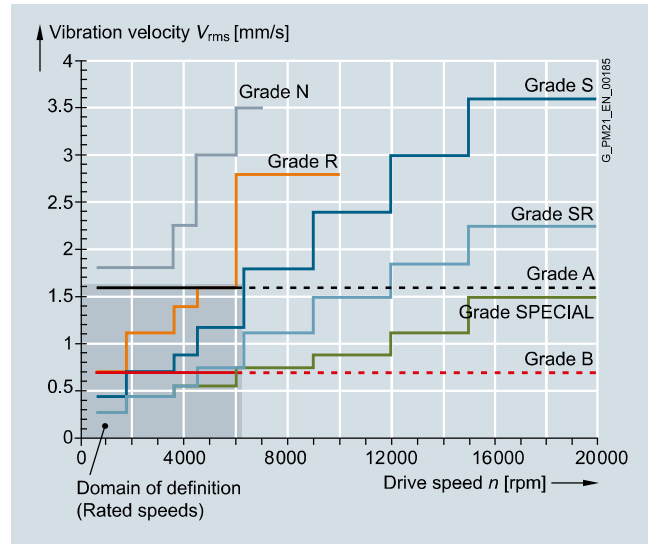
| Shaft height SH | Tolerance N mm (in) | Tolerance R mm (in) | Tolerance SPECIAL mm (in) |
|--------------------|---------------------------|---------------------------|------------------------------------|
| 28/36/48 | 0.08 (0.00315) | 0.04 (0.00157) | – |
| 63/80/100 | 0.1 (0.00394) | 0.05 (0.00197) | –/0.03/0.04 –/(0.00118/0.00157) |
| 132/160/180/225 | 0.125 (0.00492) | 0.063 (0.00248) | 0.04/0.04/– (0.00157/0.00157)/– |
| 280/355 | 0.16 (0.00630) | 0.08 (0.00315) | – |



Vibration severity and vibration severity grade A in accordance with IEC 60034-14

The vibration severity is the RMS value of the vibration velocity (frequency range from 10 to 1000 Hz). The vibration severity is measured using electrical measuring instruments in compliance with DIN 45666.

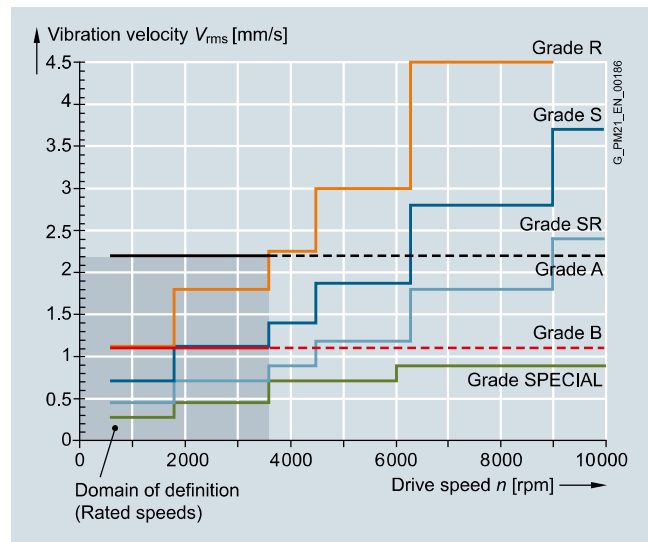
The values indicated refer only to the motor. These values can increase as a result of the overall system vibrational behavior due to installation.



Vibration severity limit values for shaft heights 20 to 132

The speeds of 1800 rpm and 3600 rpm and the associated limit values are defined in accordance with IEC 60034-14. The speeds of 4500 rpm and 6000 rpm and the specified values are defined by the motor manufacturer.

The motors maintain vibration severity grade A up to rated speed.



Vibration severity limit values for shaft heights 160 to 280

Overview (continued)

Balancing according to DIN ISO 8821

In addition to the balance quality of the motor, the vibration quality of motors with mounted belt pulleys and coupling is essentially determined by the balance quality of the mounted component.

If the motor and mounted component are separately balanced before they are assembled, then the process used to balance the belt pulley or coupling must be adapted to the motor balancing type. The following different balancing methods are used on motors of types SIMOTICS M-1PH8:

- Half-key balancing
- Full-key balancing
- Plain shaft extension

The letter H (half key) or F (full key) is printed on the shaft extension face to identify a half-key balanced or a full-key balanced SIMOTICS M-1PH8 motor.

SIMOTICS S-1FT7/S-1FK7 motors with feather key are always half-key balanced.

In general, motors with a plain shaft are recommended for systems with the most stringent vibrational quality requirements. For full-key balanced motors, we recommend belt pulleys with two opposite keyways, but only one feather key in the shaft extension.

Vibration stress, imitted vibration values

The following maximum permissible vibration stress limits at full reliability performance apply only to SIMOTICS S-1FT7/1FK7 permanent-magnet servomotors.

Vibration stress according to DIN ISO 10816:

| Vibration frequency | Vibration values for 1FT7/1FK7 (naturally cooled and water-cooled) | |
|---------------------|--|---|
| 10 ... 2000 Hz | Vibration velocity V_{rms} | ≤ 4.5 mm/s (0.18 in/s) |
| | Vibration acceleration a axial | ≤ 25 m/s ² (82.0 ft/s ²) |
| | Vibration acceleration a radial | ≤ 50 m/s ² (164.0 ft/s ²) |

For motors with forced ventilation, the limit values for axial and radial acceleration are limited to 10 m/s² (32.8 ft/s²)

For all main motors of type SIMOTICS M-1PH8, the following limits are valid for (imitted) vibration values introduced into the motor from outside:

| Vibration frequency | Vibration values for 1PH808/1PH810/1PH813/1PH816 | |
|---------------------|--|--|
| < 6.3 Hz | Vibration displacement s | ≤ 0.16 mm (0.006 in) |
| 6.3 ... 250 Hz | Vibration velocity V_{rms} | ≤ 4.5 mm/s (0.18 in/s) |
| > 250 Hz | Vibration acceleration a | ≤ 10 m/s ² (32.8 ft/s ²) |

| Vibration frequency | Vibration values for 1PH818/1PH822/1PH828 | |
|---------------------|---|--|
| < 6.3 Hz | Vibration displacement s | ≤ 0.26 mm (0.010 in) |
| 6.3 ... 63 Hz | Vibration velocity V_{rms} | ≤ 7.1 mm/s (0.28 in/s) |
| > 63 Hz | Vibration acceleration a | ≤ 4.0 m/s ² (13.12 ft/s ²) |

For all torque motors of type SIMOTICS T-1FW3, the following limits are valid for (imitted) vibration values introduced into the motor from outside:

| Vibration frequency | Vibration values for 1FW3 | |
|---------------------|------------------------------|--|
| < 6.3 Hz | Vibration displacement s | ≤ 0.26 mm (0.010 in) |
| 6.3 ... 63 Hz | Vibration velocity V_{rms} | ≤ 7.1 mm/s (0.28 in/s) |
| > 63 Hz | Vibration acceleration a | ≤ 4.0 m/s ² (13.12 ft/s ²) |

Coolant temperature (ambient temperature) and installation altitude for motors with natural cooling and forced ventilation

Operation (unrestricted): -15 °C to +40 °C (+5 to 104 °F)

The rated power (rated torque) is applicable to continuous duty (S1) in accordance with EN 60034-1 at rated frequency, a coolant temperature of 40 °C (104 °F) and an installation altitude of up to 1000 m (3281 ft) above sea level.

Apart from the SIMOTICS M-1PH8 motors, all motors are designed for temperature class 155 (F) and utilized in accordance with temperature class 155 (F). The SIMOTICS M-1PH8 motors are designed for temperature class 180 (H). For all other conditions, the factors given in the table below must be applied to determine the permissible output (torque).

The coolant temperature and installation altitude are rounded to 5 °C (41 °F) and 500 m (1640 ft) respectively.

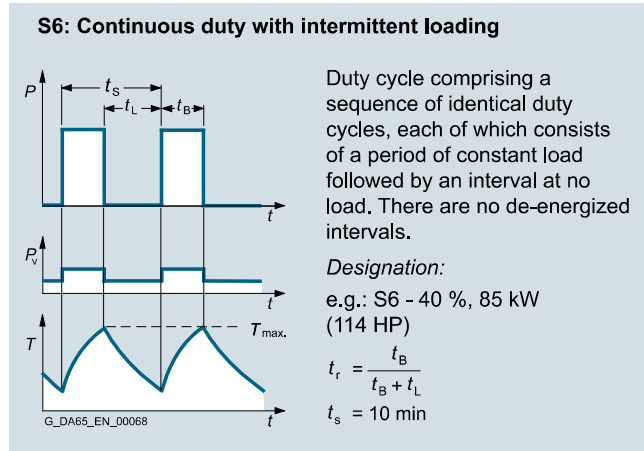
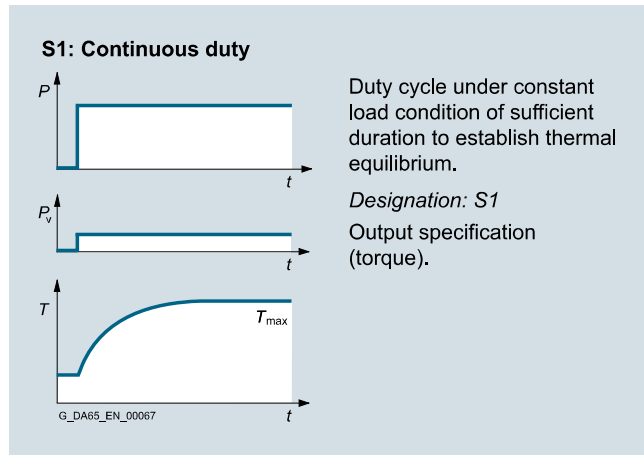
| Installation altitude above sea level m (ft) | Coolant temperature (ambient temperature) | | | |
|---|---|---------------------------------|-------------------|-------------------|
| | < 30 °C (86 °F) | 30 ... 40 °C (86 ... 104 °F) | 45 °C (113 °F) | 50 °C (122 °F) |
| 1000 (3281) | 1.07 | 1.00 | 0.96 | 0.92 |
| 1500 (4922) | 1.04 | 0.97 | 0.93 | 0.89 |
| 2000 (6562) | 1.00 | 0.94 | 0.90 | 0.86 |
| 2500 (8203) | 0.96 | 0.90 | 0.86 | 0.83 |
| 3000 (9843) | 0.92 | 0.86 | 0.82 | 0.79 |
| 3500 (11484) | 0.88 | 0.82 | 0.79 | 0.75 |
| 4000 (13124) | 0.82 | 0.77 | 0.74 | 0.71 |

SIMOTICS servomotors

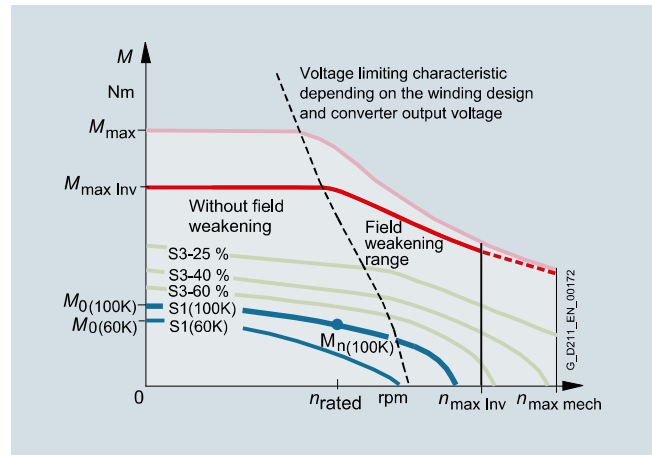
Technical definitions for AC motors

Overview (continued)

Duty types S1 and S6 in accordance with EN 60034-1



Characteristic curves



Torque characteristic of a synchronous motor operating on a converter with field weakening (example)

| | |
|----------------|---|
| n_{rated} | Rated speed |
| $n_{max Inv}$ | Maximum permissible electric speed limit |
| $n_{max mech}$ | Maximum permissible mechanical speed limit |
| M_0 | Static torque |
| M_{rated} | Rated torque at rated speed |
| $M_{max Inv}$ | Achievable maximum torque with recommended motor module |
| M_{max} | Maximum permissible torque |

8

Rated torque

The torque supplied on the shaft is indicated in Nm (lb_f-ft) in the selection and ordering data.

$$M_{rated} = 9.55 \times P_{rated} \times \frac{1000}{n_{rated}}$$

P_{rated} Rated power in kW

n_{rated} Rated speed in rpm

M_{rated} Rated torque in Nm

$$M_{rated} = P_{rated} \times \frac{5250}{n_{rated}}$$

P_{rated} Rated power in hp

n_{rated} Rated speed in rpm

M_{rated} Rated torque in lb_f-ft

DURIGNIT IR 2000 insulation

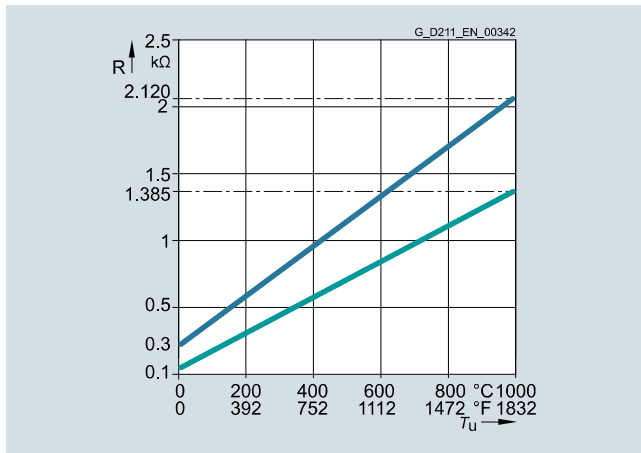
The DURIGNIT IR 2000 insulation system consists of high-quality enamel wires and insulating sheeting in conjunction with solvent-free resin impregnation.

The insulating material system ensures that these motors will have a high mechanical and electrical stability, high service value, and a long service life.

The insulation system protects the winding to a large degree against aggressive gases, vapors, dust, oil, and increased air humidity. It can withstand the usual vibration stressing.

Overview (continued)

Motor protection



PT1000 temperature sensor characteristic does not focus on temperature range of importance (i.e. 0 to 300 degrees C)

The motor temperature for converter-fed motor operation is measured using the Pt1000 temperature sensor (see characteristic) and the KTY84-130 in isolated cases.

This temperature sensor is a semi-conductor that changes its resistance depending on temperature in accordance with a defined curve.

Siemens converters calculate the motor temperature from the resistance of the temperature sensor.

Their parameters can be set for specific alarm and shutdown temperatures.

The temperature sensor is embedded in the winding overhang of the motor in the same way as a PTC thermistor.

Motors without an integrated DRIVE-CLiQ are now fitted with the new Pt1000 temperature sensor. Exception 1FW6: The conversion will not take place until mid-2017.

Motors with an integrated DRIVE-CLiQ interface (1FT7/1FK7/1PH8/1FW3) will generally be converted to Pt1000 from the start of 2017.

Both sensors are evaluated in the SINAMICS S120 drive system as a standard function.

If the motors are operated on converters that do not feature a temperature sensor evaluation function, the temperature can be evaluated with the external 3RS1040 temperature monitoring relay.

For further information, please refer to Catalog IC 10 or visit the Siemens Industry Mall.

www.siemens.com/industrymall

Paint finish

SIMOTICS S-1FT7/S-1FK7 motors (up to SH 100) without a paint finish have an impregnated resin coating. Motors with primer have corrosion protection.

All motors can be painted over with commercially available paints. Up to 2 additional paint coats are permissible.

| Version | Suitability of paint finish for climate group in accordance with IEC 60721, Part 2 – 1 |
|----------------------|---|
| Paint finish | Moderate (expanded) for indoor and outdoor installation with roof protection Briefly up to 150 °C (302 °F) Continuously up to 120 °C (248 °F) |
| Special paint finish | Worldwide (expanded) for outdoor installation Briefly up to 150 °C (302 °F) Continuously up to 120 °C (248 °F) Also For corrosive atmospheres up to 1% acid and alkali concentration or permanent dampness in sheltered rooms |

SIMOTICS servomotors

Technical definitions for AC motors

Overview (continued)

Built-in encoder systems without DRIVE-CLiQ interface

For motors without an integrated DRIVE-CLiQ interface, the analog encoder signal in the drive system is converted into a digital signal. For these motors as well as external encoders, the encoder signals must be connected to SINAMICS S120 via Sensor Modules.

Built-in encoder systems with DRIVE-CLiQ interface

For motors with an integrated DRIVE-CLiQ interface, the analog encoder signal is internally converted to a digital signal. No further conversion of the encoder signal in the drive system is required. The motor-internal encoders are the same encoders that are used for motors without a DRIVE-CLiQ interface. Motors with a DRIVE-CLiQ interface simplify commissioning and diagnostics, for example, as the encoder system is identified automatically.

The different encoder types, incremental, absolute, or resolver, are all connected with one type of MOTION-CONNECT DRIVE-CLiQ cable.

Short designations for the encoder systems

The first letters of the short designation define the encoder type. This is followed by the resolution in signals per revolution if S/R is specified (for encoders without DRIVE-CLiQ interface) or in bits if DQ or DQI is specified (for encoders with DRIVE-CLiQ interface).

| Type | Resolution/interface | |
|-----------------------------|----------------------|---|
| AM AS IC IN HTL | xxxxSR | Encoder <u>without</u> DRIVE-CLiQ interface Resolution = xxxx signals per revolution |
| AM AS IC IN R | xxDQ or xxDQI | Encoder <u>with</u> DRIVE-CLiQ interface Resolution = xx bits (2^{xx}) |
| AM | | Multi-turn absolute encoder |
| AS | | Single-turn absolute encoder |
| IC | | Incremental encoder sin/cos with commutation position C and D tracks |
| IN | | Incremental encoder sin/cos without commutation position |
| HTL | | Incremental encoder with HTL signal |
| R | | Resolver |

Overview of motor encoder systems

| Encoder <u>without</u> DRIVE-CLiQ interface | | | | | Encoder <u>with</u> DRIVE-CLiQ interface | | | | | Absolute position within one revolution (single-turn) | Absolute position over 4096 revolutions (multi-turn) | For use in safety applications ¹⁾ |
|---|---|------|------|------|--|---|------|------|------|---|--|--|
| Encoder | Identification letter in the motor article number | | | | Encoder | Identification letter in the motor article number | | | | | | |
| | 1FT7 | 1FK7 | 1FW3 | 1PH8 | | 1FT7 | 1FK7 | 1FW3 | 1PH8 | | | |
| – | – | – | – | – | AM24DQI | C/L | C | C | – | Yes | Yes | Yes |
| – | – | – | – | – | AM20DQI | – | R | – | – | Yes | Yes | Yes |
| – | – | – | – | – | AS24DQI | B/K | B | B | – | Yes | No | Yes |
| – | – | – | – | – | AS20DQI | – | Q | – | – | Yes | No | Yes |
| AM2048S/R | M | E | E | E | AM22DQ | F | F | F | F | Yes | Yes | Yes |
| AM512S/R | – | H | – | – | AM20DQ | – | L | – | – | Yes | Yes | Yes |
| AM32S/R | – | G | – | – | AM16DQ | – | K | – | – | Yes | Yes | No |
| AM16S/R | – | J | – | – | AM15DQ | – | V | – | – | Yes | Yes | No |
| AS2048S/R | – | – | – | – | AS22DQ | – | – | – | – | Yes | No | No |
| IC2048S/R | N | A | A | M | IC22DQ | D | D | D | D | No | No | Yes |
| IN2048S/R | – | – | – | – | IN22DQ | – | – | – | – | No | No | Yes |
| HTL1024S/R | – | – | – | H | – | – | – | – | – | No | No | No |
| HTL2048S/R | – | – | – | J | – | – | – | – | – | No | No | No |
| Resolver p=1 | – | T | – | – | R14DQ | – | P | – | – | Yes | No | No |
| Resolver p=3 | – | S | S | – | R15DQ | – | U | U | – | No | No | No |
| Resolver p=4 | – | S | S | – | R15DQ | – | U | U | – | No | No | No |

Not every encoder is available for every motor shaft height.

– Not possible

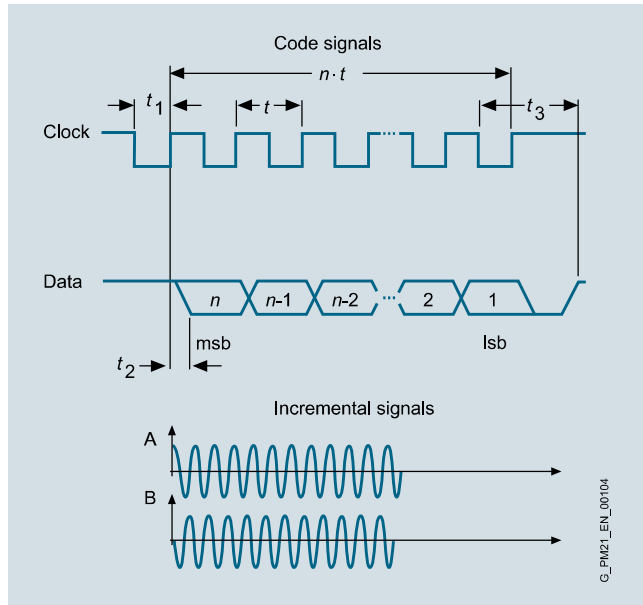
¹⁾ Not for SIMOTICS T-1FW3.

Overview (continued)

Multi-turn absolute encoder

This encoder outputs an absolute angular position between 0° and 360° in the specified resolution. An internal measuring gearbox enables it to differentiate 4096 revolutions.

So with a ball screw, for example, the absolute position of the slide can be determined over a long distance.



Multi-turn absolute encoder

Single-turn absolute encoder

This encoder outputs an absolute angular position between 0° and 360° in the specified resolution. In contrast to the multi-turn absolute encoder, it has no measuring gearbox and can therefore only supply the position value within one revolution. It does not have a traversing range.

Absolute encoders without DRIVE-CLiQ interface

| | |
|-------------------|---|
| AM2048S/R encoder | Absolute encoder 2048 S/R, 4096 revolutions, multi-turn, with EnDat interface |
| AM512S/R encoder | Absolute encoder 512 S/R, 4096 revolutions, multi-turn, with EnDat interface |
| AM32S/R encoder | Absolute encoder 32 S/R, 4096 revolutions, multi-turn, with EnDat interface |
| AM16S/R encoder | Absolute encoder 16 S/R, 4096 revolutions, multi-turn, with EnDat interface |
| AS2048S/R encoder | Absolute encoder 2048 S/R, single-turn |

Absolute encoders with DRIVE-CLiQ interface

| | |
|-------------------------------|---|
| AM24DQI encoder | Absolute encoder, 24 bit (resolution 16777216, internal encoder 2048 S/R) + 12 bit multi-turn (traversing range 4096 revolutions) |
| AM20DQI encoder | Absolute encoder, 20 bit (resolution 1048576, internal 512 S/R) + 12 bit multi-turn (traversing range 4096 revolutions) |
| AM22DQ encoder | Absolute encoder, 22 bit (resolution 4194304, internal encoder 2048 S/R) + 12 bit multi-turn (traversing range 4096 revolutions) |
| AM20DQ encoder | Absolute encoder, 20 bit (resolution 1048576, internal 512 S/R) + 12 bit multi-turn (traversing range 4096 revolutions) |
| AM16DQ encoder | Absolute encoder, 16 bit (resolution 65536, internal 32 S/R) + 12 bit multi-turn (traversing range 4096 revolutions) |
| AM15DQ encoder | Absolute encoder, 15 bit (resolution 32768, internal 16 S/R) + 12 bit multi-turn (traversing range 4096 revolutions) |
| AS24DQI encoder ¹⁾ | Absolute encoder, single-turn, 24 bit (resolution 16777216) |
| AS20DQI encoder ¹⁾ | Absolute encoder, single-turn, 20 bit (resolution 1048576) |

Technical specifications

Absolute encoders without DRIVE-CLiQ interface

| | |
|---|------------------|
| Supply voltage | 5 V |
| Absolute position interface via EnDat 2.1 | |
| • Traversing range (multi-turn) ²⁾ | 4096 revolutions |
| Incremental signals (sinusoidal 1 V _{pp}) | |
| • Signals per revolution | 2048/512/32/16 |

Absolute encoders with DRIVE-CLiQ interface

| | |
|---|--|
| Supply voltage | 24 V |
| Absolute position via DRIVE-CLiQ | |
| • Resolution within one revolution | $2^{24}/2^{22}/2^{20}/2^{16}/2^{15}$ bit |
| • Traversing range (multi-turn) ²⁾ | 4096 revolutions |

¹⁾ Not for absolute encoder, single-turn AS

²⁾ The single-turn absolute encoder is used for the previous incremental encoders.

SIMOTICS servomotors

Technical definitions for AC motors

Overview (continued)

Incremental encoder

This encoder senses relative movements and does not supply absolute position information. In combination with evaluation logic, a zero point can be determined using the integrated reference mark, which can be used to calculate the absolute position.

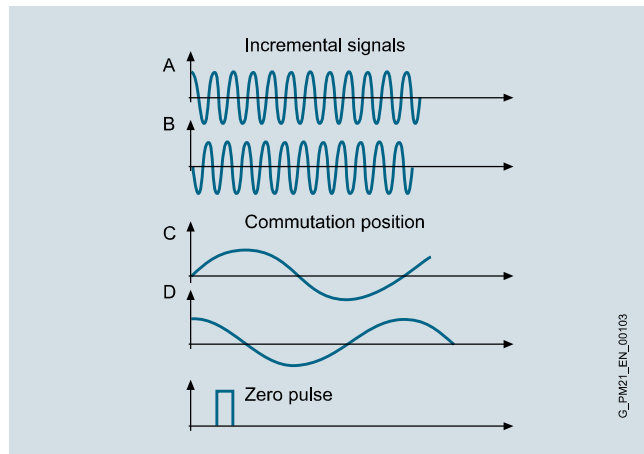
Incremental encoder IC/IN (sin/cos)

The encoder outputs sine and cosine signals. These can be interpolated using evaluation logic (usually 2048 points) and the direction of rotation can be determined.

In the version with DRIVE-CLiQ interface, this evaluation logic is already integrated in the encoder.

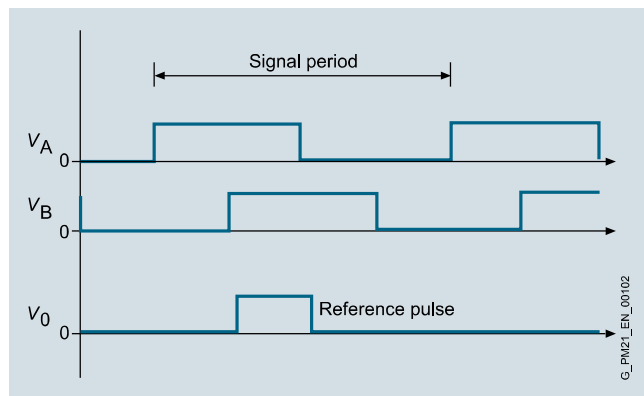
Commutation position

The position of the rotor is required for commutation of a synchronous motor. Encoders with commutation position (also termed C and D tracks) detect the angular position of the rotor.



Incremental encoder IC/IN (sin/cos), commutation position only for IC

Incremental encoder HTL



Incremental encoder HTL

Incremental encoders without DRIVE-CLiQ interface

| | |
|--------------------|---|
| Encoder IC2048S/R | Incremental encoder sin/cos 1 V _{pp} 2048 S/R with C and D tracks |
| Encoder IN2048S/R | Incremental encoder sin/cos 1 V _{pp} 2048 S/R without C and D tracks |
| Encoder HTL2048S/R | Incremental encoder HTL 2048 S/R |
| Encoder HTL1024S/R | Incremental encoder HTL 1024 S/R |

Incremental encoders with DRIVE-CLiQ interface¹⁾

| | |
|----------------|--|
| IC22DQ encoder | Incremental encoder 22-bit (resolution 4194304, internal 2048 S/R) + commutation position 11 bit |
| IN22DQ encoder | Incremental encoder 22-bit (resolution 4194304, internal 2048 S/R) without commutation position |

Technical specifications

Incremental encoder IC/IN (sin/cos) without DRIVE-CLiQ interface

| | |
|--------------------------------------|-----------|
| Supply voltage | 5 V |
| Incremental signals per revolution | |
| • Resolution (sin/cos) | 2048 |
| • Commutation position (only for IC) | 1 sin/cos |
| • Reference signal | 1 |

Incremental encoder IC/IN (sin/cos) with DRIVE-CLiQ interface

| | |
|--|---------------------|
| Supply voltage | 24 V |
| Incremental signals per revolution | |
| • Resolution | 2 ²² bit |
| • Commutation position in bits (only for IC) | 11 |
| • Reference signal | 1 |

Incremental encoder HTL without DRIVE-CLiQ interface

| | |
|------------------------------------|-------------|
| Supply voltage | 10 ... 30 V |
| Incremental signals per revolution | |
| • Resolution (HTL) | 2048/1024 |
| • Reference signal | 1 |

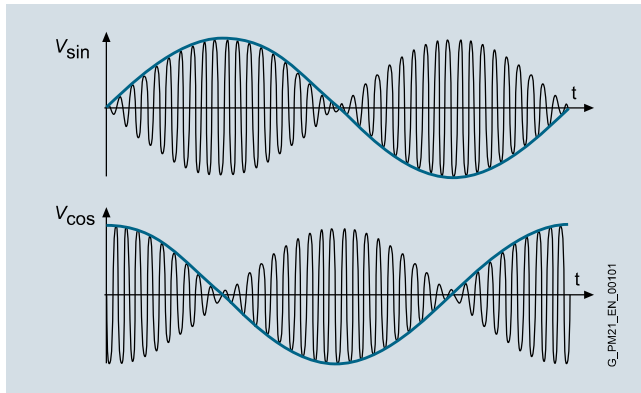
¹⁾ Instead of the IC22DQ incremental encoder, the AS24DQ1 single-turn absolute encoder is used for SIMOTICS S-1FK7/1FT7.

Overview (continued)

Resolver

The number of sine and cosine periods per revolution corresponds to the number of pole pairs of the resolver. In the case of a 2-pole resolver, the evaluation electronics may output an additional zero pulse per encoder revolution. This zero pulse ensures a unique assignment of the position information in relation to an encoder revolution. A 2-pole resolver can therefore be used as a single-turn encoder.

2-pole resolvers can be used for motors with any number of poles. With multi-pole resolvers, the pole pair numbers of the motor and the resolver are always identical, so that the resolution is correspondingly higher than with 2-pole resolvers.



Resolvers without DRIVE-CLiQ interface ¹⁾

| | |
|----------------|-----------------|
| Resolver p = 1 | 2-pole resolver |
| Resolver p = 3 | 6-pole resolver |
| Resolver p = 4 | 8-pole resolver |

Resolvers with DRIVE-CLiQ interface

| | |
|-------|--|
| R15DQ | 15-bit resolver (resolution 32768, internal multi-pole) |
| R14DQ | 14-bit resolver (resolution 16384, internal 2-pole) |

Technical specifications

Resolvers without DRIVE-CLiQ interface

| | |
|-------------------------|--|
| Excitation voltage, rms | 2 ... 8 V |
| Excitation frequency | 5 ... 10 kHz |
| Output signals | $U_{\text{sine track}} = r \times U_{\text{excitation}} \times \sin \alpha$ $U_{\text{cosine track}} = r \times U_{\text{excitation}} \times \cos \alpha$ $\alpha = \arctan (U_{\text{sine track}} / U_{\text{cosine track}})$ |
| Transmission ratio | $r = 0.5 \pm 5\%$ |

Resolvers with DRIVE-CLiQ interface

| | |
|----------------|---------------------|
| Supply voltage | 24 V |
| • Resolution | $2^{15}/2^{14}$ bit |

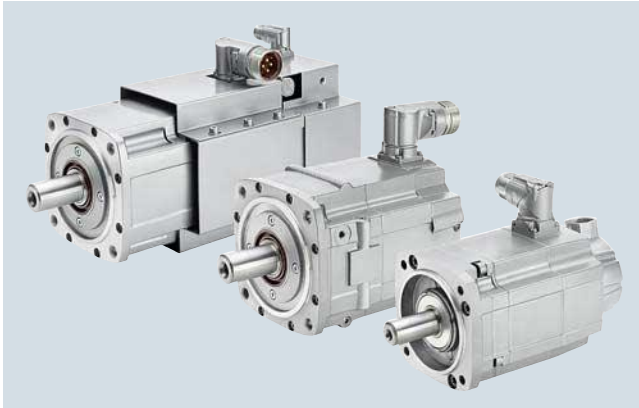
¹⁾ Output signals:
 2-pole resolver: 1 sin/cos signal per revolution
 6-pole resolver: 3 sin/cos signals per revolution
 8-pole resolver: 4 sin/cos signals per revolution

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7

Overview



SIMOTICS S-1FT7 motors, forced ventilation, water cooling, and natural cooling

The SIMOTICS S-1FT7 servomotors are permanent-magnet synchronous motors with very compact dimensions and an attractive design.

The S-1FT7 motors fulfill the highest standards in terms of dynamic performance, speed setting range, shaft and flange accuracy. They are equipped with state-of-the-art encoder technology and optimized for operation on our fully digital drive and control systems.

Natural cooling, forced ventilation, or water cooling are available as cooling methods. With the natural cooling method, heat is dissipated through the surface of the motor. With the forced ventilation method, heat is forced out by means of built-on fans. The water cooling method achieves maximum cooling, thereby ensuring that the motor can be operated at maximum output.

Benefits

- Excellent dynamic performance in a wide speed range thanks to high overload capability $\sim 4 \times M_0$ with natural cooling
- Wide speed setting range
- Outstanding resistance to vibratory and shock loads thanks to vibration-isolated encoder mounting
- High degree of protection – allows operation even under demanding ambient conditions
- Quick and easy mounting due to cross-profile (up to SH 100) and rotatable connectors with quick-release locks
- Zero-backlash holding brake
- Extremely high efficiency

SIMOTICS S-1FT7 Compact motors

S-1FT7 Compact motors have a low torque ripple so that they are ideal for use in machine tool applications that require extremely high surface quality and optimum machining results. Thanks to their compact dimensions, they can be installed in confined spaces.

SIMOTICS S-1FT7 High Dynamic motors

S-1FT7 High Dynamic motors have very low rotor moments of inertia to achieve extremely good dynamic performance and very short cycle times. The motors are available with forced ventilation or water cooling and have high continuous output ratings as a result.

Application

- High-performance machine tools
- Machines with stringent requirements in terms of dynamic performance and precision, e.g.:
 - Packaging machines
 - Foil extractor machines
 - Printing machines
 - Handling equipment

More information

Some SIMOTICS S-1FT7 Compact motors are available as core types. These core types can be express delivered as replacement motors in the event of plant outages and offer the advantage of a quicker spare parts supply. For this reason, core types should be used for configuration wherever possible.

The selection and ordering data for the SINAMICS S120 Motor Modules are based on the booksize format by way of example. Other formats are also possible. The SIZER for Siemens Drives engineering tool is available for detailed configuration.

Technical specifications

| SIMOTICS S-1FT7 Compact/S-1FT7 High Dynamic | |
|---|--|
| Motor type | Permanent-magnet synchronous motor |
| Magnet material | Rare-earth magnetic material |
| Cooling | Natural cooling, forced ventilation, water cooling |
| Temperature monitoring | Temperature sensor in stator winding |
| Stator winding insulation in accordance with EN 60034-1 (IEC 60034-1) | Temperature class 155 (F) for a winding temperature rise of $\Delta T = 100$ K at an ambient temperature of 40 °C (104 °F). For water cooling, max. inlet temperature 30 °C (86 °F). Avoid condensation. |
| Type of construction in accordance with EN 60034-7 (IEC 60034-7) | IM B5 (IM V1, IM V3) with recessed flange (more compact) or with a flange compatible with 1FT6/1FK7 |
| Degree of protection in accordance with EN 60034-5 (IEC 60034-5) | IP64/IP65/IP67 |
| Shaft extension at DE in accordance with DIN 748-3 (IEC 60072-1) | Plain shaft/feather key and keyway (half-key balancing) |
| Shaft and flange accuracy in accordance with DIN 42955 (IEC 60072-1) ¹⁾ | Tolerance N/tolerance R |
| Vibration severity in accordance with EN 60034-14 (IEC 60034-14) | Grade A is maintained up to rated speed/Grade R |
| Sound pressure level LpA (1 m) in accordance with EN ISO 1680, max. | |
| Tolerance +3 dB Natural/water cooling | |
| • 1FT703 | 60 dB |
| • 1FT704 ... 1FT706 | 65 dB |
| • 1FT708 ... 1FT713 | 70 dB |
| Forced ventilation | |
| • 1FT708 ... 1FT710 | 73 dB |
| Connection | Connectors for signals and power rotatable |
| Paint finish | Pearl dark gray RAL 9023 |
| 2nd rating plate | Enclosed separately |
| Holding brake | Without/with |
| Certificate of suitability | cURus |

Built-in encoder systems without DRIVE-CLiQ interface

| Incremental encoder | |
|---------------------|--|
| Encoder IC2048S/R | Incremental encoder sin/cos 1 V _{pp} 2048 S/R with C and D tracks |
| Absolute encoder | |
| Encoder AM2048S/R | Absolute encoder 2048 S/R, 4096 revolutions, multi-turn |

Built-in encoder systems with DRIVE-CLiQ interface

| Single-turn absolute encoder ²⁾ | |
|--|--|
| Encoder AS24DQI | Absolute encoder, single-turn, 24 bit |
| Multi-turn absolute encoder | |
| Encoder AM24DQI | Absolute encoder, 24 bit + 12-bit multi-turn |

S/R = signals/revolution

- 1) Shaft extension run-out, concentricity of centering ring and shaft, and perpendicularity of flange to shaft.
- 2) The single-turn absolute encoder is used for the previous incremental encoders.
- 3) Additional plain text required.

Options

| Order code | Description |
|----------------|---|
| J.. | Mounting of SP+ planetary gearbox (see SIMOTICS S geared motors) |
| K20 | Reinforced bearing with transverse forces as specified in the latest configuration manual (S-1FT7 Compact only, in conjunction with flange compatible with S-1FT6/S-1FT7) |
| L03 | Version for increased vibration stress (information about validity and specification can be found in the latest configuration manual) |
| N05 | Alternative shaft geometry |
| N16 | Version for increased chemical resistance |
| N40 | Stainless-steel shaft and coating for increased chemical resistance (information about validity and specification can be found in the latest configuration manual) |
| Q12 | Sealing air connection (Only in conjunction with degree of protection IP67. Not in combination with terminal box) |
| Y84 | Customer specifications on rating plate (max. 30 characters) ³⁾ |
| | Paint finish |
| K23 | Special paint finish for "Worldwide" climate group: Primer and paint finish: Anthracite RAL 7016 |
| K23+X.. | Special paint finish for "Worldwide" climate group: Primer and other paint finish can be selected from X01 to X09 |
| K24 | Primed (unpainted) |
| X01 | Paint finish: Jet black, matt RAL 9005 |
| X02 | Paint finish: Cream white RAL 9001 |
| X03 | Paint finish: Reseda green RAL 6011 |
| X04 | Paint finish: Pebble gray RAL 7032 |
| X05 | Paint finish: Sky blue RAL 5015 |
| X06 | Paint finish: Light ivory RAL 1015 |
| X08 | Paint finish: White aluminum |
| X09 | Paint finish: Anthracite RAL 7016 |

-Z must be added to the Article No. to order a motor with options.

N05

Alternative shaft geometry

The following versions are delivered with a smaller shaft extension:

- 1FT7034-5A.71-.... /1FT7042-5A.71-....
- 1FT7062-5A.71-.... /1FT7064-5A.71-....
- 1FT7082-5A.71-.... /1FT7084-5A.71-.... /1FT7086-5A.71-....
- 1FT7102-5A.71-.... /1FT7105-5A.71-.... /1FT7108-5A.71-....

Shaft dimensions (diameter × length) according to shaft height (SH):

- SH 36: 11 × 23 mm (0.43 × 0.91 in)
- SH 48: 14 × 30 mm (0.55 × 1.18 in)
- SH 63: 19 × 40 mm (0.75 × 1.57 in)
- SH 80: 24 × 50 mm (0.94 × 1.97 in)
- SH 100: 32 × 58 mm (1.26 × 2.28 in)

N16

Version for increased chemical resistance

Please refer to the latest configuration manual for further information.

Option N16 is available for the following naturally cooled SIMOTICS S-1FT7 Compact motors (only up to SH 100):

- 1FT7...-5A...-1B.. AS24DQI encoder
- 1FT7...-5A...-1C.. AM24DQI encoder
- 1FT7...-5A...-1M.. AM2048S/R encoder

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact > Core type – Natural cooling

Selection and ordering data

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FT7 Compact synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|---|--------------|---------------------------------|---------------------------|---------------------------------|---------------------------------|---|-------------------|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | Core type | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | Article No. | | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) |
| SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Natural cooling | | | | | | | | | |
| 2000 | 100 | 5.03 (6.75) | 30 (22.1) | 24 (17.7) | 10 | 1FT7102-1AC7-1 | 5 | 91.4 (80.90) | 26.1 (57.5) |
| | | 7.96 (10.7) | 50 (36.9) | 38 (28.0) | 15 | 1FT7105-1AC7-1 | 5 | 178 (157.55) | 44.2 (97.4) |
| 3000 | 48 | 1.35 (1.81) | 5 (3.69) | 4.3 (3.17) | 2.6 | 1FT7044-1AF7-1 | 3 | 5.43 (4.81) | 7.2 (15.9) |
| | | 1.7 (2.28) | 6 (4.43) | 5.4 (3.98) | 3.9 | 1FT7062-1AF7-1 | 5 | 7.36 (6.51) | 7.1 (15.7) |
| | 63 | 2.39 (3.21) | 9 (6.64) | 7.6 (5.61) | 5.2 | 1FT7064-1AF7-1 | 5 | 11.9 (10.53) | 9.7 (21.4) |
| | | 3.24 (4.34) | 13 (9.59) | 10.3 (7.60) | 6.6 | 1FT7082-1AF7-1 | 5 | 26.5 (23.46) | 14 (30.9) |
| 80 | 4.56 (6.12) | 20 (14.8) | 14.5 (10.7) | 8.5 | 1FT7084-1AF7-1 | 5 | 45.1 (39.92) | 20.8 (45.9) | |
| | 5.65 (7.58) | 28 (20.7) | 18 (13.3) | 11 | 1FT7086-1AF7-1 | 5 | 63.6 (56.29) | 27.5 (60.6) | |
| | 4500 | 4.82 (6.46) ¹⁾ | 20 (14.8) | 11.5 (8.48) ¹⁾ | 10.1 ¹⁾ | 1FT7084-1AH7-1 | 5 | 45.1 (39.92) | 20.8 (45.9) |
| 4.71 (6.32) | | 28 (20.7) | 10 (7.38) | 10 | 1FT7086-1AH7-1 | 5 | 63.6 (56.29) | 27.5 (60.6) | |
| 6000 | 36 | 0.88 (1.18) | 2 (1.48) | 1.4 (1.03) | 2.1 | 1FT7034-1AK7-1 | 3 | 0.85 (0.75) | 3.8 (8.38) |
| | | 2.13 (2.86) ²⁾ | 6 (4.43) | 3.7 (2.73) ²⁾ | 5.9 ²⁾ | 1FT7062-1AK7-1 | 5 | 7.36 (6.51) | 7.1 (15.7) |
| | 63 | 2.59 (3.47) ³⁾ | 9 (6.64) | 5.5 (4.06) ³⁾ | 6.1 ³⁾ | 1FT7064-1AK7-1 | 5 | 11.9 (10.53) | 9.7 (21.4) |

With DRIVE-CLiQ interface:

Flange: Classic (compatible with 1FT6/1FK7)
Recessed (more compact)

Encoder: AS24DQI encoder RJ45 signal connection
M17 signal connection
AM24DQI encoder RJ45 signal connection
M17 signal connection

1
0
B
K
C
L
4
5
N
M
G
H
1

Without DRIVE-CLiQ interface:

Flange: Classic (compatible with 1FT6/1FK7)
Recessed (more compact)

Encoder: IC2048S/R encoder M23 signal connection
AM2048S/R encoder M23 signal connection

Shaft extension:

Plain shaft
Plain shaft

Shaft and flange accuracy:

Tolerance N
Tolerance N

Holding brake:

Without
With

Vibration severity:

Grade A

Degree of protection:

IP65

8

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact > Core type – Natural cooling

| Motor type (repeated) | Efficiency 4) | Stall current | Calculated power P_{calc} ⁸⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|------------------|---|---|--|---|--|--|-------------------------|
| | | | | Rated output current ⁵⁾ | Booksize format Internal air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ⁶⁾ | Pre-assembled cable |
| | | | | | | | | |
| % | A | I_0 at M_0 $\Delta T = 100$ K | P_{calc} at M_0 $\Delta T = 100$ K | A | | | | |
| 1FT7102-1AC7... | 93 | 12.5 | 6.28 (8.42) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 1.5 | 6FX002-5N26-.... |
| 1FT7105-1AC7... | 93 | 18 | 10.47 (14.0) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 2.5 | 6FX002-5N36-.... |
| 1FT7044-1AF7... | 92 | 2.8 | 1.57 (2.11) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7062-1AF7... | 91 | 3.9 | 1.88 (2.52) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7064-1AF7... | 93 | 5.7 | 2.83 (3.80) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7082-1AF7... | 93 | 7.6 | 4.08 (5.47) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7084-1AF7... | 93 | 11 | 6.28 (8.42) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7086-1AF7... | 93 | 15.5 | 8.8 (11.8) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 2.5 | 6FX002-5N36-.... |
| 1FT7084-1AH7... | 93 | 15.6 | 9.42 (12.6) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 2.5 | 6FX002-5N36-.... |
| 1FT7086-1AH7... | 91 | 22.4 | 13.19 (17.7) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX002-5N46-.... |
| 1FT7034-1AK7... | 90 | 2.7 | 1.26 (1.69) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7062-1AK7... | 90 | 8.4 | 3.77 (5.06) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7064-1AK7... | 91 | 9 | 5.65 (7.58) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |

Motor Module:
Single Motor Module **1**
Double Motor Module **2**

Version status

Power cable:
MOTION-CONNECT 800PLUS **8**
MOTION-CONNECT 500 **5**

Without brake cores
With brake cores⁷⁾ **C**
D

Length code

....
For information on the cables, refer to
MOTION-CONNECT connection systems

8

1) These values refer to $n = 4000$ rpm.

2) These values refer to $n = 5500$ rpm.

3) These values refer to $n = 4500$ rpm.

4) Optimum efficiency in continuous duty.

5) With default setting of the pulse frequency.

6) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

7) Cable cross-section for brake connection 2 × 1.5 mm².

8) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb\cdot ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Natural cooling**Selection and ordering data**

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FT7 Compact synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) | |
|---|--------------|---------------------------------|---------------------------|---------------------------------|---------------------------------|--|------------------------------|---|------------------------|-------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | | p | J | m | |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | | Article No. | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) | |
| SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Natural cooling | | | | | | | | | | |
| 1500 | 100 | 4.08 (5.47) | 30 (22.1) | 26 (19.2) | 8 | 1FT7102-5AB7 ■-1 ■■■■ | 5 | 91.4 (80.90) | 26.1 (57.6) | |
| | | 6.6 (8.85) | 50 (36.9) | 42 (31.0) | 13 | 1FT7105-5AB7 ■-1 ■■■■ | 5 | 178 (158) | 44.2 (97.5) | |
| | | 9.58 (12.8) | 70 (51.6) | 61 (45.0) | 16 | 1FT7108-5AB7 ■-1 ■■■■ | 5 | 248 (220) | 59 (130) | |
| | 132 | 10.52 (14.1) | 90 (66.4) | 67 (49.4) | 17.4 | 1FT7132-5AB7 ■-1 ■■■■ | 4 | 459 (406) | 76 (168) | |
| | | 12.88 (17.3) | 118 (87.0) | 82 (60.5) | 22.0 | 1FT7134-5AB7 ■-1 ■■■■ | 4 | 604 (535) | 92 (203) | |
| | | 14.45 (19.4) | 140 (103) | 92 (67.9) | 25.0 | 1FT7136-5AB7 ■-1 ■■■■ | 4 | 748 (662) | 108 (238) | |
| | | 16.96 (22.7) | 170 (125) | 108 (79.7) | 28.5 | 1FT7138-5AB7 ■-1 ■■■■ | 4 | 896 (793) | 124 (273) | |
| | 2000 | 80 | 2.39 (3.21) | 13 (9.59) | 11.4 (8.41) | 4.9 | 1FT7082-5AC7 ■-1 ■■■■ | 5 | 26.5 (23.5) | 14 (30.9) |
| | | | 3.54 (4.75) | 20 (14.8) | 16.9 (12.5) | 8.4 | 1FT7084-5AC7 ■-1 ■■■■ | 5 | 45.1 (39.9) | 20.8 (45.9) |
| 4.71 (6.32) | | | 28 (20.7) | 22.5 (16.6) | 9.2 | 1FT7086-5AC7 ■-1 ■■■■ | 5 | 63.6 (56.3) | 27.5 (60.6) | |
| 100 | | 5.03 (6.75) | 30 (22.1) | 24 (17.7) | 10 | 1FT7102-5AC7 ■-1 ■■■■ | 5 | 91.4 (80.9) | 26.1 (57.6) | |
| | | 7.96 (10.7) | 50 (36.9) | 38 (28.0) | 15 | 1FT7105-5AC7 ■-1 ■■■■ | 5 | 178 (158) | 44.2 (97.5) | |
| | | 10.5 (14.1) | 70 (51.6) | 50 (36.9) | 18 | 1FT7108-5AC7 ■-1 ■■■■ | 5 | 248 (220) | 59 (130) | |
| 132 | | 11.52 (15.4) | 90 (66.4) | 55 (40.6) | 18.7 | 1FT7132-5AC7 ■-1 ■■■■ | 4 | 459 (406) | 76 (168) | |
| | | 13.82 (18.5) ⁵⁾ | 118 (87.0) | 66 (48.7) ⁵⁾ | 21 ⁵⁾ | 1FT7134-5AC7 ■-1 ■■■■ | 4 | 604 (535) | 92 (203) | |
| | | 14.87 (19.9) ⁵⁾ | 140 (103) | 71 (52.4) ⁵⁾ | 23.0 ⁵⁾ | 1FT7136-5AC7 ■-1 ■■■■ | 4 | 748 (662) | 109 (240) | |

With DRIVE-CLiQ interface:

| | | | |
|----------|---------------------------------------|------------------------|---|
| Flange: | Classic (compatible with 1FT6/1FK7) | 1 | |
| | Recessed (more compact) ⁷⁾ | 0 | |
| Encoder: | AS24DQI encoder | RJ45 signal connection | B |
| | | M17 signal connection | K |
| | AM24DQI encoder | RJ45 signal connection | C |
| | | M17 signal connection | L |

Without DRIVE-CLiQ interface:

| | | | |
|----------|---------------------------------------|-----------------------|---|
| Flange: | Classic (compatible with 1FT6/1FK7) | 4 | |
| | Recessed (more compact) ⁷⁾ | 5 | |
| Encoder: | IC2048S/R encoder | M23 signal connection | N |
| | AM2048S/R encoder | M23 signal connection | M |

| | | | |
|------------------------------------|--------------------------------|---------------------|---|
| Connector outlet direction: | Connector sizes 1 and 1.5 | Rotatable connector | 1 |
| | Connector size 3 ¹⁾ | Transverse right | 1 |
| | | Transverse left | 2 |
| | | Axial NDE | 3 |
| Axial DE | 4 | | |

| | | |
|--|---------------------------|---|
| Terminal box/cable entry: ¹⁾ | Top/transverse from right | 5 |
| | Top/transverse from left | 6 |
| | Top/axial from NDE | 7 |
| | Top/axial from DE | 8 |

| | | | | | | |
|-------------------------|------------------------|----------------------------|-------------|----------------|---------|---|
| Shaft extension: | Feather key and keyway | Shaft and flange accuracy: | Tolerance N | Holding brake: | Without | A |
| | | | Tolerance N | | With | B |
| | Feather key and keyway | Tolerance R | Without | D | | |
| | | Tolerance R | With | E | | |
| | Plain shaft | Tolerance N | Without | G | | |
| | | Tolerance N | With | H | | |
| | Plain shaft | Tolerance R | Without | K | | |
| | | Tolerance R | With | L | | |

| | | | | |
|----------------------------|------------------------------|---------|------|---|
| Vibration severity: | Degree of protection: | Grade A | IP64 | 0 |
| | | Grade A | IP65 | 1 |
| | | Grade A | IP67 | 2 |
| | | Grade R | IP64 | 3 |
| | | Grade R | IP65 | 4 |
| Grade R | IP67 | 5 | | |

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Natural cooling

| Motor type (repeated) | Efficiency 2) | Stall current | Calculated power P_{calc} ⁸⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|---|--|---|--|--|--|--|------------------------|
| | | | | Rated output current ³⁾ | Booksized format Internal air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ⁴⁾ | Pre-assembled cable |
| | | | | | | | | |
| η | I_0 at M_0 $\Delta T = 100$ K | P_{calc} at M_0 $\Delta T = 100$ K | | | | | | |
| % | A | kW (hp) | A | | | | | |
| 1FT7102-5AB7... | 93 | 9 | 4.71 (6.32) | 9 | 6SL3120-1TE21-0AD. | 1.5 | 4 × 1.5 | 6FX002-5N26-.... |
| 1FT7105-5AB7... | 93 | 15 | 7.85 (10.5) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 1.5 | 6FX002-5N26-.... |
| 1FT7108-5AB7... | 93 | 18 | 10.99 (14.7) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 2.5 | 6FX002-5N36-.... |
| 1FT7132-5AB7... | 94 | 22.5 | 14.14 (19.0) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX002-5N46-.... |
| 1FT7134-5AB7... | 95 | 30.0 | 18.53 (24.8) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 6 | 6FX002-5N54-.... |
| 1FT7136-5AB7... | 94 | 36.0 | 21.99 (29.5) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 6 | 6FX002-5N54-.... |
| 1FT7138-5AB7... | 94 | 43.0 | 26.7 (35.8) | 45 | 6SL3120-1TE24-5AA. | 3 | 4 × 10 | 6FX002-5N14-.... |
| 1FT7082-5AC7... | 93 | 5 | 2.72 (3.65) | 5 | 6SL3120-1TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7084-5AC7... | 93 | 9 | 4.19 (5.62) | 9 | 6SL3120-1TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7086-5AC7... | 93 | 10.6 | 5.86 (7.86) | 18 | 6SL3120-1TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7102-5AC7... | 93 | 12.5 | 6.28 (8.42) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 1.5 | 6FX002-5N26-.... |
| 1FT7105-5AC7... | 93 | 18 | 10.47 (14.0) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 2.5 | 6FX002-5N36-.... |
| 1FT7108-5AC7... | 93 | 25 | 14.66 (19.7) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX002-5N46-.... |
| 1FT7132-5AC7... | 94 | 29.5 | 18.85 (25.3) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 6 | 6FX002-5N56-.... |
| 1FT7134-5AC7... | 95 | 36.0 | 24.71 (33.1) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 6 | 6FX002-5N54-.... |
| 1FT7136-5AC7... | 94 | 43.0 | 29.32 (39.3) | 45 | 6SL3120-1TE24-5AA. | 3 | 4 × 10 | 6FX002-5N14-.... |

Motor Module:
Single Motor Module **1**
Double Motor Module **2**

Version status

Power cable:
MOTION-CONNECT 800PLUS **8**
MOTION-CONNECT 500 **5**

Without brake cores
With brake cores⁶⁾ **C**
D

Length code **....**

For information on the cables, refer to
MOTION-CONNECT connection systems

8

1) Connector size 3 not rotatable. An alternative terminal box can be selected with connector size 3 only.

2) Optimum efficiency in continuous duty.

3) With default setting of the pulse frequency.

4) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

5) Rated data are applicable with a DC link voltage of 600 to 720 V DC.

6) Cable cross-section for brake connection 2 × 1.5 mm².

7) Only up to SH 100.

8) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb\cdot ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Natural cooling

Selection and ordering data

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FT7 Compact synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|---|--------------|---------------------------------|---------------------------|---------------------------------|---------------------------------|--|---|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | Article No. | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) | |
| SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Natural cooling | | | | | | | | | |
| 3000 | 48 | 0.85 (1.14) | 3 (2.21) | 2.7 (1.99) | 2.1 | 1FT7042-5AF7-1 ■■■■ | 3 | 2.81 (2.49) | 4.6 (10.1) |
| | | 1.35 (1.81) | 5 (3.69) | 4.3 (3.17) | 2.6 | 1FT7044-5AF7-1 ■■■■ | 3 | 5.43 (4.81) | 7.2 (15.9) |
| | | 1.76 (2.36) | 7 (5.16) | 5.6 (4.13) | 3.5 | 1FT7046-5AF7-1 ■■■■ | 3 | 7.52 (6.66) | 9.3 (20.5) |
| 63 | 63 | 1.7 (2.28) | 6 (4.43) | 5.4 (3.98) | 3.9 | 1FT7062-5AF7-1 ■■■■ | 5 | 7.36 (6.51) | 7.1 (15.7) |
| | | 2.39 (3.21) | 9 (6.64) | 7.6 (5.61) | 5.2 | 1FT7064-5AF7-1 ■■■■ | 5 | 11.9 (10.5) | 9.7 (21.4) |
| | | 2.92 (3.92) | 12 (8.85) | 9.3 (6.86) | 7.2 | 1FT7066-5AF7-1 ■■■■ | 5 | 16.4 (14.5) | 12.3 (27.1) |
| | | 3.42 (4.59) | 15 (11.1) | 10.9 (8.04) | 6.7 | 1FT7068-5AF7-1 ■■■■ | 5 | 23.2 (20.5) | 16.3 (35.9) |
| 80 | 80 | 3.24 (4.34) | 13 (9.59) | 10.3 (7.60) | 6.6 | 1FT7082-5AF7-1 ■■■■ | 5 | 26.5 (23.5) | 14 (30.9) |
| | | 4.55 (6.10) | 20 (14.8) | 14.5 (10.7) | 8.5 | 1FT7084-5AF7-1 ■■■■ | 5 | 45.1 (39.9) | 20.8 (45.9) |
| | | 5.65 (7.58) | 28 (20.7) | 18 (13.3) | 11 | 1FT7086-5AF7-1 ■■■■ | 5 | 63.6 (56.3) | 27.5 (60.6) |
| 100 | 100 | 6.28 (8.42) | 30 (22.1) | 20 (14.8) | 12 | 1FT7102-5AF7-1 ■■■■ | 5 | 91.4 (80.9) | 26.1 (57.6) |
| | | 8.8 (11.8) | 50 (36.9) | 28 (20.7) | 15 | 1FT7105-5AF7-1 ■■■■ | 5 | 178 (158) | 44.2 (97.5) |
| | | 6.28 (8.42) | 70 (51.6) | 20 (14.8) | 12 | 1FT7108-5AF7-1 ■■■■ | 5 | 248 (220) | 59 (130) |
| 132 | 132 | 8.48 (11.4) | 90 (66.4) | 27 (19.9) | 14 | 1FT7132-5AF7-1 ■■■■ | 4 | 459 (406) | 77 (170) |

With DRIVE-CLiQ interface:

Flange: Classic (compatible with 1FT6/1FK7)
Recessed (more compact)⁶⁾

Encoder: AS24DQI encoder RJ45 signal connection
M17 signal connection
AM24DQI encoder RJ45 signal connection
M17 signal connection

Without DRIVE-CLiQ interface:

Flange: Classic (compatible with 1FT6/1FK7)
Recessed (more compact)⁶⁾

Encoder: IC2048S/R encoder M23 signal connection
AM2048S/R encoder M23 signal connection

Connector outlet direction:

Connector sizes 1 and 1.5 Rotatable connector
Connector size 3¹⁾ Transverse right
Transverse left
Axial NDE
Axial DE

Terminal box/ cable entry:¹⁾

Top/transverse from right
Top/transverse from left
Top/axial from NDE
Top/axial from DE

Shaft extension:

Feather key and keyway
Feather key and keyway
Feather key and keyway
Feather key and keyway
Plain shaft
Plain shaft
Plain shaft
Plain shaft

Shaft and flange accuracy:

Tolerance N
Tolerance N
Tolerance R
Tolerance R
Tolerance N
Tolerance N
Tolerance R
Tolerance R

Holding brake:

Without
With
Without
With
Without
With
Without
With

Vibration severity:

Grade A
Grade A
Grade A
Grade R
Grade R
Grade R

Degree of protection:

IP64
IP65
IP67
IP64
IP65
IP67

1
0
B
K
C
L
4
5
N
M
1
1
2
3
4
5
6
7
8
A
B
D
E
G
H
K
L
0
1
2
3
4
5

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Natural cooling

| Motor type (repeated) | Efficiency 2) | Stall current | Calculated power P_{calc} ⁷⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|---|--|---|--|---|--|--|------------------------|
| | | | | Rated output current ³⁾ | Booksize format Internal air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ⁴⁾ | Pre-assembled cable |
| | | | | | | | | |
| η | I_0 at M_0 $\Delta T = 100$ K | P_{calc} at M_0 $\Delta T = 100$ K | A | | | | | |
| % | A | kW (hp) | | | | | | |
| 1FT7042-5AF7... | 92 | 2.1 | 0.94 (1.26) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7044-5AF7... | 92 | 2.8 | 1.57 (2.11) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7046-5AF7... | 92 | 4 | 2.2 (2.95) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7062-5AF7... | 91 | 3.9 | 1.88 (2.52) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7064-5AF7... | 93 | 5.7 | 2.83 (3.80) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7066-5AF7... | 92 | 8.4 | 3.77 (5.06) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7068-5AF7... | 92 | 8.3 | 4.71 (6.32) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7082-5AF7... | 93 | 7.6 | 4.08 (5.47) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7084-5AF7... | 93 | 11 | 6.28 (8.42) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... |
| 1FT7086-5AF7... | 93 | 15.5 | 8.8 (11.8) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 2.5 | 6FX002-5N36-.... |
| 1FT7102-5AF7... | 93 | 18 | 9.42 (12.6) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 2.5 | 6FX002-5N36-.... |
| 1FT7105-5AF7... | 94 | 26 | 15.71 (21.1) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX002-5N46-.... |
| 1FT7108-5AF7... | 93 | 36 | 21.99 (29.5) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 6 | 6FX002-5N54-.... |
| 1FT7132-5AF7... | 94 | 43.5 | 28.27 (37.9) | 45 | 6SL3120-1TE24-5AA. | 3 | 4 × 10 | 6FX002-5S14-.... |

| | | |
|--------------------------------|---|------|
| Motor Module: | | |
| Single Motor Module | 1 | |
| Double Motor Module | 2 | |
| Version status | | |
| Power cable: | | |
| MOTION-CONNECT 800PLUS | 8 | |
| MOTION-CONNECT 500 | 5 | |
| Without brake cores | | C |
| With brake cores ⁵⁾ | | D |
| Length code | | |

For information on the cables, refer to MOTION-CONNECT connection systems

1) Connector size 3 not rotatable. An alternative terminal box can be selected with connector size 3 only.

2) Optimum efficiency in continuous duty.

3) With default setting of the pulse frequency.

4) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

5) Cable cross-section for brake connection 2 × 1.5 mm².

6) Only up to SH 100.

7) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Natural cooling**Selection and ordering data**

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FT7 Compact synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|---|--------------|---------------------------------|---------------------------|---------------------------------|---------------------------------|---|-------------------|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | Article No. | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | | | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) |
| SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Natural cooling | | | | | | | | | |
| 4500 | 48 | 1.32 (1.77) ¹⁾ | 7 (5.16) | 3.6 (2.66) ¹⁾ | 4.7 ¹⁾ | 1FT7046-5AH7-1 ■■■■ | 3 | 7.52 (6.66) | 9.3 (20.5) |
| | 63 | 2.55 (3.42) ²⁾ | 12 (8.85) | 6.1 (4.50) ²⁾ | 7.5 ²⁾ | 1FT7066-5AH7-1 ■■■■ | 5 | 16.4 (14.5) | 12.3 (27.1) |
| | 80 | 3.77 (5.06) | 13 (9.59) | 8 (5.90) | 7.8 | 1FT7082-5AH7-1 ■■■■ | 5 | 26.5 (23.5) | 14 (30.9) |
| | | 4.82 (6.46) ²⁾ | 20 (14.8) | 11.5 (8.48) ²⁾ | 10.1 ²⁾ | 1FT7084-5AH7-1 ■■■■ | 5 | 45.1 (39.9) | 20.8 (45.9) |
| | 4.71 (6.32) | 28 (20.7) | 10 (7.38) | 10 | 1FT7086-5AH7-1 ■■■■ | 5 | 63.6 (56.3) | 27.5 (60.6) | |
| 6000 | 36 | 0.88 (1.18) | 2 (1.48) | 1.4 (1.03) | 2.1 | 1FT7034-5AK7-1 ■■■■ | 3 | 0.85 (0.75) | 3.8 (8.38) |
| | | 1.07 (1.43) | 3 (2.21) | 1.7 (1.25) | 2.4 | 1FT7036-5AK7-1 ■■■■ | 3 | 1.33 (1.18) | 5.0 (11.0) |
| | 48 | 1.26 (1.69) | 3 (2.21) | 2 (1.48) | 3 | 1FT7042-5AK7-1 ■■■■ | 3 | 2.81 (2.49) | 4.6 (10.1) |
| | | 1.41 (1.89) ³⁾ | 5 (3.69) | 3 (2.21) ³⁾ | 3.6 ³⁾ | 1FT7044-5AK7-1 ■■■■ | 3 | 5.43 (4.81) | 7.2 (15.9) |
| | 63 | 2.13 (2.86) ⁴⁾ | 6 (4.43) | 3.7 (2.73) ⁴⁾ | 5.9 ⁴⁾ | 1FT7062-5AK7-1 ■■■■ | 5 | 7.36 (6.51) | 7.1 (15.7) |
| | | 2.59 (3.47) ³⁾ | 9 (6.64) | 5.5 (4.06) ³⁾ | 6.1 ³⁾ | 1FT7064-5AK7-1 ■■■■ | 5 | 11.9 (10.5) | 9.7 (21.4) |

With DRIVE-CLiQ interface:

| | | | | | |
|----------|-------------------------------------|------------------------|--|--|--|
| Flange: | Classic (compatible with 1FT6/1FK7) | 1 | | | |
| | Recessed (more compact) | 0 | | | |
| Encoder: | AS24DQI encoder | RJ45 signal connection | | | |
| | | M17 signal connection | | | |
| | AM24DQI encoder | RJ45 signal connection | | | |
| | | M17 signal connection | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Without DRIVE-CLiQ interface:

| | | | | | |
|----------|-------------------------------------|-----------------------|--|--|--|
| Flange: | Classic (compatible with 1FT6/1FK7) | 4 | | | |
| | Recessed (more compact) | 5 | | | |
| Encoder: | IC2048S/R encoder | M23 signal connection | | | |
| | | M23 signal connection | | | |
| | | | | | |
| | | | | | |

Shaft extension:

Feather key and keyway
 Feather key and keyway
 Feather key and keyway
 Feather key and keyway
 Plain shaft
 Plain shaft
 Plain shaft
 Plain shaft

Shaft and flange accuracy:

Tolerance N
 Tolerance N
 Tolerance R
 Tolerance R
 Tolerance N
 Tolerance N
 Tolerance R
 Tolerance R

Holding brake:

Without
 With
 Without
 With
 Without
 With
 Without
 With

A
 B
 D
 E
 G
 H
 K
 L

Vibration severity:

Grade A
 Grade A
 Grade A
 Grade R
 Grade R
 Grade R

Degree of protection:

IP64
 IP65
 IP67
 IP64
 IP65
 IP67

0
 1
 2
 3
 4
 5

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Natural cooling

| Motor type (repeated) | Efficiency 5) | Stall current | Calculated power P_{calc} ⁹⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | | |
|--------------------------|------------------|------------------|---|--|--|--|--|------------------------|-------------|
| | | | | Rated output current ⁶⁾ | Booksized format Internal air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ⁷⁾ | Pre-assembled cable | Article No. |
| | | | | | | | | | |
| 1FT7046-5AH7... | 90 | 8.1 | 3.3 (4.43) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... | |
| 1FT7066-5AH7... | 90 | 13.6 | 5.65 (7.58) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... | |
| 1FT7082-5AH7... | 93 | 12.3 | 6.13 (8.22) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... | |
| 1FT7084-5AH7... | 93 | 15.6 | 9.42 (12.6) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 2.5 | 6FX002-5N36-.... | |
| 1FT7086-5AH7... | 91 | 22.4 | 13.19 (17.7) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX002-5N46-.... | |
| 1FT7034-5AK7... | 90 | 2.7 | 1.26 (1.69) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... | |
| 1FT7036-5AK7... | 90 | 4.0 | 1.88 (2.52) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... | |
| 1FT7042-5AK7... | 91 | 3.9 | 1.88 (2.52) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... | |
| 1FT7044-5AK7... | 91 | 5.7 | 3.14 (4.21) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... | |
| 1FT7062-5AK7... | 90 | 8.4 | 3.77 (5.06) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... | |
| 1FT7064-5AK7... | 91 | 9 | 5.65 (7.58) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-.... | |

Motor Module:
Single Motor Module 1
Double Motor Module 2

Version status

Power cable:
MOTION-CONNECT 800PLUS 8
MOTION-CONNECT 500 5

Without brake cores
With brake cores^{7) 8)} C
D

Length code

.....
For information on the cables, refer to
MOTION-CONNECT connection systems

1) These values refer to $n = 3500$ rpm.

2) These values refer to $n = 4000$ rpm.

3) These values refer to $n = 4500$ rpm.

4) These values refer to $n = 5500$ rpm.

5) Optimum efficiency in continuous duty.

6) With default setting of the pulse frequency.

7) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

8) Cable cross-section for brake connection 2 × 1.5 mm².

9) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Forced ventilation**Selection and ordering data**

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FT7 Compact synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|--|--------------|---------------------------------|---------------------------|---------------------------------|---------------------------------|---|-------------------|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | Article No. | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | | | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) |
| SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Forced ventilation | | | | | | | | | |
| 2000 | 80 | 5.0 (6.71) | 27 (19.9) | 24 (17.7) | 13.5 | 1FT7084-5SC7 ■-1 ■ ■ ■ ■ | 5 | 45 (39.8) | 25 (55.1) |
| | | 6.7 (8.98) | 36 (26.6) | 32 (23.6) | 17 | 1FT7086-5SC7 ■-1 ■ ■ ■ ■ | 5 | 64 (56.7) | 36 (79.4) |
| | 100 | 11.7 (15.7) | 65 (47.9) | 56 (41.3) | 29 | 1FT7105-5SC7 ■-1 ■ ■ ■ ■ | 5 | 178 (158) | 50 (110) |
| | | 15.3 (20.5) | 91 (67.1) | 73 (53.8) | 33 | 1FT7108-5SC7 ■-1 ■ ■ ■ ■ | 5 | 248 (220) | 64 (141) |
| 3000 | 80 | 7.2 (9.66) | 27 (19.9) | 23 (17.0) | 18.5 | 1FT7084-5SF7 ■-1 ■ ■ ■ ■ | 5 | 45 (39.8) | 25 (55.1) |
| | | 9.1 (12.2) | 36 (26.6) | 29 (21.4) | 24 | 1FT7086-5SF7 ■-1 ■ ■ ■ ■ | 5 | 64 (56.7) | 36 (79.4) |
| | 100 | 15.1 (20.2) | 65 (47.9) | 48 (35.4) | 35 | 1FT7105-5SF7 ■-1 ■ ■ ■ ■ | 5 | 178 (158) | 50 (110) |
| | | 18.8 (25.2) | 91 (67.1) | 60 (44.3) | 38 | 1FT7108-5SF7 ■-1 ■ ■ ■ ■ | 5 | 248 (220) | 64 (141) |
| 4500 | 80 | 9.9 (13.3) | 27 (19.9) | 21 (15.5) | 24.5 | 1FT7084-5SH7 ■-1 ■ ■ ■ ■ | 5 | 45 (39.8) | 25 (55.1) |
| | | 11.8 (15.8) | 36 (26.6) | 25 (18.4) | 25 | 1FT7086-5SH7 ■-1 ■ ■ ■ ■ | 5 | 64 (56.7) | 36 (79.4) |

With DRIVE-CLiQ interface:

| | | | |
|----------|-------------------------------------|------------------------|---|
| Flange: | Classic (compatible with 1FT6/1FK7) | 1 | |
| | Recessed (more compact) | 0 | |
| Encoder: | AS24DQI encoder | RJ45 signal connection | B |
| | AM24DQI encoder | RJ45 signal connection | C |

Without DRIVE-CLiQ interface:

| | | | |
|----------|-------------------------------------|-----------------------|---|
| Flange: | Classic (compatible with 1FT6/1FK7) | 4 | |
| | Recessed (more compact) | 5 | |
| Encoder: | IC2048S/R encoder | M23 signal connection | N |
| | AM2048S/R encoder | M23 signal connection | M |

Connector outlet direction:

| | | |
|--------------------------------|---------------------|---|
| Connector sizes 1 and 1.5 | Rotatable connector | 1 |
| Connector size 3 ¹⁾ | Transverse right | 1 |
| | Transverse left | 2 |
| | Axial NDE | 3 |
| | Axial DE | 4 |

**Terminal box/
cable entry:**¹⁾

| | |
|---------------------------|---|
| Top/transverse from right | 5 |
| Top/transverse from left | 6 |
| Top/axial from NDE | 7 |
| Top/axial from DE | 8 |

Shaft extension:

| | |
|-------------|--|
| Feather key | |
| Feather key | |
| Feather key | |
| Feather key | |
| Plain shaft | |
| Plain shaft | |
| Plain shaft | |
| Plain shaft | |

Shaft and flange accuracy:

| | |
|-------------|--|
| Tolerance N | |
| Tolerance N | |
| Tolerance R | |
| Tolerance R | |
| Tolerance N | |
| Tolerance N | |
| Tolerance R | |
| Tolerance R | |

Holding brake:

| | |
|---------|---|
| Without | A |
| With | B |
| Without | D |
| With | E |
| Without | G |
| With | H |
| Without | K |
| With | L |

Vibration severity:

| | |
|---------|--|
| Grade A | |
| Grade A | |
| Grade R | |
| Grade R | |

Degree of protection:²⁾

| | |
|------|---|
| IP64 | 0 |
| IP65 | 1 |
| IP64 | 3 |
| IP65 | 4 |

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Forced ventilation

| Motor type (repeated) | Efficiency ³⁾ | Stall current | Calculated power P_{calc} ⁷⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | | |
|--------------------------|---|--|---|--|--|--|--|--------------------------|-------------|
| | | | | Rated output current ⁴⁾ | Booksized format Internal air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ⁵⁾ | Pre-assembled cable | Article No. |
| | | | | | | | | | |
| η | I_0 at M_0 $\Delta T = 100$ K | P_{calc} at M_0 $\Delta T = 100$ K | A | | | | | | |
| 1FT7084-5SC7... | 93 | 15 | 5.7 (7.64) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 1.5 | 6FX0002-5N26-.... | |
| 1FT7086-5SC7... | 93 | 19.5 | 7.5 (10.1) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 2.5 | 6FX0002-5N36-.... | |
| 1FT7105-5SC7... | 93 | 31 | 13.6 (18.2) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 6 | 6FX0002-5N54-.... | |
| 1FT7108-5SC7... | 93 | 39 | 19.1 (25.6) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 10 | 6FX0002-5N64-.... | |
| 1FT7084-5SF7... | 94 | 21 | 8.5 (11.4) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 2.5 | 6FX0002-5N36-.... | |
| 1FT7086-5SF7... | 93 | 29 | 11.3 (15.2) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 6 | 6FX0002-5N56-.... | |
| 1FT7105-5SF7... | 94 | 45 | 20.4 (27.4) | 45 | 6SL3120-1TE24-5AA. | 3 | 4 × 10 | 6FX0002-5N54-.... | |
| 1FT7108-5SF7... | 94 | 57 | 28.6 (38.4) | 60 | 6SL3120-1TE26-0AA. | 3 | 4 × 16 | 6FX0002-5N52-.... | |
| 1FT7084-5SH7... | 94 | 30.5 | 12.7 (17.0) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 6 | 6FX0002-5N56-.... | |
| 1FT7086-5SH7... | 93 | 34 | 17.0 (22.8) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 6 | 6FX0002-5N54-.... | |

Motor Module:
Single Motor Module **1**
Double Motor Module **2**

Version status

Power cable:
MOTION-CONNECT 800PLUS **8**
MOTION-CONNECT 500 **5**

Without brake cores
With brake cores⁶⁾ **C**
D

Length code

....

For information on the cables, refer to
MOTION-CONNECT connection systems

8

1) Connector size 3 not rotatable. An alternative terminal box can be selected with connector size 3 only.

2) The degree of protection refers to the motor. The built-in fan meets the requirements of degree of protection IP54.

3) Optimum efficiency in continuous duty.

4) With default setting of the pulse frequency.

5) The current carrying capacity of the power cable complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

6) Cable cross-section for brake connection 2 × 1.5 mm².

7) $P_{calc} [kW] = \frac{M_0 [Nm] \times \eta_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times \eta_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Water cooling**Selection and ordering data**

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FT7 Compact synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|---|--------------|-------------------------------------|---------------------------|---------------------------------|---------------------------------|---|-------------------|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | Article No. | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | | | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) |
| SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Water cooling | | | | | | | | | |
| 1500 | 100 | 7.9 (10.6) | 50 (36.9) | 50 (36.9) | 20.3 | 1FT7102-5WB7-1 ■ ■ ■ ■ | 5 | 98.9 (87.5) | 36.6 (80.7) |
| | | 14.1 (18.9) | 90 (66.4) | 90 (66.4) | 29.5 | 1FT7105-5WB7-1 ■ ■ ■ ■ | 5 | 191 (169) | 54.8 (121) |
| | | 19.6 (26.3) | 125 (92.2) | 125 (92.2) | 40.3 | 1FT7108-5WB7-1 ■ ■ ■ ■ | 5 | 265 (235) | 68.6 (151) |
| 2000 | 80 | 4.4 (5.90) | 21 (15.5) | 21 (15.5) | 11 | 1FT7082-5WC7-1 ■ ■ ■ ■ | 5 | 28.9 (25.6) | 20.7 (45.6) |
| | | 7.33 (9.83) | 35 (25.8) | 35 (25.8) | 17 | 1FT7084-5WC7-1 ■ ■ ■ ■ | 5 | 48.3 (42.6) | 27.5 (60.6) |
| | | 10.5 (14.1) | 50 (36.9) | 50 (36.9) | 24 | 1FT7086-5WC7-1 ■ ■ ■ ■ | 5 | 67.8 (60.0) | 34.1 (75.2) |
| | 100 | 10.4 (13.9) | 50 (36.9) | 49.5 (36.5) | 29.3 | 1FT7102-5WC7-1 ■ ■ ■ ■ | 5 | 98.9 (87.5) | 36.6 (80.7) |
| | | 18.8 (25.2) | 90 (66.4) | 90 (66.4) | 40.8 | 1FT7105-5WC7-1 ■ ■ ■ ■ | 5 | 191 (169) | 54.8 (121) |
| | | 26.2 (35.1) | 125 (92.2) | 125 (92.2) | 47.5 | 1FT7108-5WC7-1 ■ ■ ■ ■ | 5 | 265 (235) | 69.6 (153) |
| With DRIVE-CLiQ interface: | | | | | | | | | |
| Flange: | | Classic (compatible with 1FT6/1FK7) | | | | 1 | | | |
| | | Recessed (more compact) | | | | 0 | | | |
| Encoder: | | AS24DQI encoder | | RJ45 signal connection | | B | | | |
| | | | | M17 signal connection | | | | | |
| | | AM24DQI encoder | | RJ45 signal connection | | C | | | |
| | | | | M17 signal connection | | L | | | |
| Without DRIVE-CLiQ interface: | | | | | | | | | |
| Flange: | | Classic (compatible with 1FT6/1FK7) | | | | 4 | | | |
| | | Recessed (more compact) | | | | 5 | | | |
| Encoder: | | IC2048S/R encoder | | M23 signal connection | | N | | | |
| | | AM2048S/R encoder | | M23 signal connection | | | | | |
| | | | | | | M | | | |
| Connector outlet direction: | | | | | | | | | |
| Connector sizes 1 and 1.5 | | Rotatable connector | | | | 1 | | | |
| Connector size 3 ¹⁾ | | Transverse right | | | | 1 | | | |
| | | Transverse left | | | | 2 | | | |
| | | Axial NDE | | | | 3 | | | |
| | | Axial DE | | | | 4 | | | |
| Terminal box/cable entry: ¹⁾ | | | | | | | | | |
| Top/transverse from right | | | | | | 5 | | | |
| Top/transverse from left | | | | | | 6 | | | |
| Top/axial from NDE | | | | | | 7 | | | |
| Top/axial from DE | | | | | | 8 | | | |
| Shaft extension: | | | | | | | | | |
| Feather key and keyway | | Shaft and flange accuracy: | | Holding brake: | | A | | | |
| Feather key and keyway | | Tolerance N | | Without | | | | | |
| | | Tolerance N | | With | | B | | | |
| Feather key and keyway | | Tolerance R | | Without | | D | | | |
| Feather key and keyway | | Tolerance R | | With | | E | | | |
| Plain shaft | | Tolerance N | | Without | | G | | | |
| Plain shaft | | Tolerance N | | With | | H | | | |
| Plain shaft | | Tolerance R | | Without | | K | | | |
| Plain shaft | | Tolerance R | | With | | L | | | |
| Vibration severity: | | | | | | | | | |
| Grade A | | Degree of protection: | | | | 0 | | | |
| Grade A | | IP64 | | | | | | | |
| Grade A | | IP65 | | | | | | | |
| Grade R | | IP64 | | | | 3 | | | |
| Grade R | | IP65 | | | | 4 | | | |
| Grade R | | IP67 | | | | 5 | | | |

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Water cooling

| Motor type (repeated) | Efficiency ²⁾ | Stall current | Calculated power P_{calc} ⁶⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | | |
|--------------------------|---|--|---|--|--|--|--|------------------------|-------------|
| | | | | Rated output current ³⁾ | Booksized format Internal air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ⁴⁾ | Pre-assembled cable | Article No. |
| | | | | | | | | | |
| η | I_0 at M_0 $\Delta T = 100$ K | P_{calc} at M_0 $\Delta T = 100$ K | A | Article No. | Size | mm ² | Article No. | | |
| 1FT7102-5WB7... | 93 | 17.8 | 7.9 (10.6) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 2.5 | 6FX0002-5N36-.... | |
| 1FT7105-5WB7... | 94 | 28 | 14.1 (18.9) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX0002-5N46-.... | |
| 1FT7108-5WB7... | 94 | 39 | 19.6 (26.3) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 10 | 6FX0002-5N64-.... | |
| 1FT7082-5WC7... | 93 | 10.7 | 4.4 (5.90) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 1.5 | 6FX0002-5N26-.... | |
| 1FT7084-5WC7... | 94 | 16.5 | 7.3 (9.79) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 2.5 | 6FX0002-5N36-.... | |
| 1FT7086-5WC7... | 94 | 23 | 10.5 (14.1) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX0002-5N46-.... | |
| 1FT7102-5WC7... | 94 | 25.5 | 10.5 (14.1) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX0002-5N46-.... | |
| 1FT7105-5WC7... | 94 | 39 | 18.8 (25.2) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 10 | 6FX0002-5N64-.... | |
| 1FT7108-5WC7... | 95 | 45.3 | 26.2 (35.1) | 45 | 6SL3120-1TE24-5AA. | 3 | 4 × 10 | 6FX0002-5S14-.... | |

| | | | |
|--------------------------------|---|---|------|
| Motor Module: | | | |
| Single Motor Module | 1 | | |
| Double Motor Module | 2 | | |
| Version status | | | |
| Power cable: | | | |
| MOTION-CONNECT 800PLUS | 8 | | |
| MOTION-CONNECT 500 | 5 | | |
| Without brake cores | | C | |
| With brake cores ⁵⁾ | | D | |
| Length code | | | |

For information on the cables, refer to MOTION-CONNECT connection systems

¹⁾ Connector size 3 not rotatable. An alternative terminal box can be selected with connector size 3 only.

²⁾ Optimum efficiency in continuous duty.

³⁾ With default setting of the pulse frequency.

⁴⁾ The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

⁵⁾ Cable cross-section for brake connection 2 × 1.5 mm².

⁶⁾ $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Water cooling

Selection and ordering data

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FT7 Compact synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) | |
|---|--------------|---------------------------------|---------------------------|---------------------------------|---------------------------------|---|-------------------------------|---|------------------------|-------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | Article No. | p | J | m | |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | | | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) | |
| SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Water cooling | | | | | | | | | | |
| 3000 | 63 | 3.1 (4.16) | 10 (7.38) | 10 (7.38) | 7.8 | 1FT7062-5WF7-1 ■ ■ ■ ■ | 5 | 8.1 (7.17) | 11 (24.3) | |
| | | 5 (6.71) | 16 (11.8) | 16 (11.8) | 12.5 | 1FT7064-5WF7-1 ■ ■ ■ ■ | 5 | 12.9 (11.4) | 13.7 (30.2) | |
| | | 6.2 (8.31) | 20 (14.8) | 19.6 (14.5) | 14.4 | 1FT7066-5WF7-1 ■ ■ ■ ■ | 5 | 17.7 (15.7) | 16.3 (35.9) | |
| | | 9.3 (12.5) | 30 (22.1) | 29.5 (21.8) | 19.6 | 1FT7068-5WF7-1 ■ ■ ■ ■ | 5 | 24.8 (22.0) | 20.1 (44.3) | |
| | 80 | 6.4 (8.58) | 21 (15.5) | 20.5 (15.1) | 16 | 1FT7082-5WF7-1 ■ ■ ■ ■ | 5 | 28.9 (25.6) | 20.7 (45.6) | |
| | | 11 (14.8) | 35 (25.8) | 35 (25.8) | 24.2 | 1FT7084-5WF7-1 ■ ■ ■ ■ | 5 | 48.3 (42.8) | 27.5 (60.6) | |
| | | 15.4 (20.7) | 50 (36.9) | 49 (36.1) | 36 | 1FT7086-5WF7-1 ■ ■ ■ ■ | 5 | 67.8 (60.0) | 34.1 (75.2) | |
| | 100 | 14.3 (19.2) | 50 (36.9) | 45.5 (33.6) | 38.8 | 1FT7102-5WF7-1 ■ ■ ■ ■ | 5 | 98.9 (87.5) | 36.6 (80.7) | |
| | | 24.8 (33.3) | 90 (66.4) | 79 (58.3) | 49.5 | 1FT7105-5WF7-1 ■ ■ ■ ■ | 5 | 164 (145) | 55.9 (123) | |
| | | 34.2 (45.9) | 125 (92.2) | 109 (80.4) | 60 | 1FT7108-5WF7-1 ■ ■ ■ ■ | 5 | 265 (235) | 69.6 (153) | |
| | 4500 | 63 | 9.1 (12.2) | 20 (14.8) | 19.4 (14.3) | 20.8 | 1FT7066-5WH7-1 ■ ■ ■ ■ | 5 | 17.7 (15.7) | 16.3 (35.9) |
| | | | 8.95 (12.0) | 21 (15.5) | 19 (14.0) | 23.9 | 1FT7082-5WH7-1 ■ ■ ■ ■ | 5 | 28.9 (25.6) | 20.7 (45.6) |
| 80 | | 15.08 (20.2) | 35 (25.8) | 32 (23.6) | 34.5 | 1FT7084-5WH7-1 ■ ■ ■ ■ | 5 | 48.3 (42.8) | 27.5 (60.6) | |
| | | 20.3 (27.2) | 50 (36.9) | 43 (31.7) | 38 | 1FT7086-5WH7-1 ■ ■ ■ ■ | 5 | 67.8 (60.0) | 34.1 (75.2) | |
| 6000 | 63 | 5.8 (7.78) | 10 (7.38) | 9.2 (6.79) | 12.7 | 1FT7062-5WK7-1 ■ ■ ■ ■ | 5 | 8.1 (7.17) | 11 (24.3) | |
| | | 8.9 (11.9) | 16 (11.8) | 14.2 (10.5) | 20 | 1FT7064-5WK7-1 ■ ■ ■ ■ | 5 | 12.9 (11.4) | 13.7 (30.2) | |

| | | | | |
|--|--|--|-----------------------|--|
| With DRIVE-CLiQ interface: | | | 1 0 | B K C L |
| Flange: | Classic (compatible with 1FT6/1FK7) Recessed (more compact) | | | |
| Encoder: | AS24DQI encoder | RJ45 signal connection M17 signal connection | 4 5 | N M |
| | AM24DQI encoder | RJ45 signal connection M17 signal connection | | |
| Without DRIVE-CLiQ interface: | | | 1 1 2 3 4 | |
| Flange: | Classic (compatible with 1FT6/1FK7) Recessed (more compact) | | | |
| Encoder: | IC2048S/R encoder | M23 signal connection | 5 6 7 8 | |
| | AM2048S/R encoder | M23 signal connection | | |
| Connector outlet direction: | | | 1 1 2 3 4 | |
| Connector sizes 1 and 1.5 | | Rotatable connector | | |
| Connector size 3 ¹⁾ | | Transverse right Transverse left Axial NDE Axial DE | | |
| | | | | |
| Terminal box/cable entry: ¹⁾ | | | 5 6 7 8 | |
| Top/transverse from right | | | | |
| Top/transverse from left | | | | |
| Top/axial from NDE Top/axial from DE | | | | |
| Shaft extension: | | Shaft and flange accuracy: | Holding brake: | |
| Feather key and keyway | | Tolerance N | Without | |
| Feather key and keyway | | Tolerance N | With | |
| Feather key and keyway | | Tolerance R | Without | |
| Feather key and keyway | | Tolerance R | With | |
| Plain shaft | | Tolerance N | Without | |
| Plain shaft | | Tolerance N | With | |
| Plain shaft | | Tolerance R | Without | |
| Plain shaft | | Tolerance R | With | |
| Vibration severity: | | Degree of protection: | | A B D E G H K L 0 1 2 3 4 5 |
| Grade A | | IP64 | | |
| Grade A | | IP65 | | |
| Grade A | | IP67 | | |
| Grade R | | IP64 | | |
| Grade R | | IP65 | | |
| Grade R | | IP67 | | |

For footnotes, see next page.

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 Compact – Water cooling

| Motor type (repeated) | Efficiency 2) | Stall current | Calculated power P_{calc} ⁷⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|---|--|---|--|--|--|--|------------------------|
| | | | | Rated output current ³⁾ | Booksized format Internal air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ⁴⁾ | Pre-assembled cable |
| | | | | | | | | |
| η | I_0 at M_0 $\Delta T = 100$ K | P_{calc} at M_0 $\Delta T = 100$ K | A | | | | | |
| % | A | kW (hp) | | | | | | |
| 1FT7062-5WF7... | 91 | 7.4 | 3.1 (4.16) | 9 | 6SL3120-1TE21-0AD. | 1 | 4 × 1.5 | 6FX0002-5N06-.... |
| 1FT7064-5WF7... | 91 | 11.9 | 5.0 (6.71) | 18 | 6SL3120-1TE21-8AD. | 1 | 4 × 1.5 | 6FX0002-5N06-.... |
| 1FT7066-5WF7... | 91 | 14 | 6.3 (8.45) | 18 | 6SL3120-1TE21-8AD. | 1 | 4 × 1.5 | 6FX0002-5N06-.... |
| 1FT7068-5WF7... | 93 | 19 | 9.4 (12.6) | 18 ⁵⁾ | 6SL3120-1TE21-8AD. | 1 | 4 × 2.5 | 6FX0002-5N16-.... |
| 1FT7082-5WF7... | 94 | 16 | 6.6 (8.85) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 2.5 | 6FX0002-5N36-.... |
| 1FT7084-5WF7... | 94 | 23 | 11.0 (14.8) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX0002-5N46-.... |
| 1FT7086-5WF7... | 94 | 34 | 15.7 (21.1) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 6 | 6FX0002-5N54-.... |
| 1FT7102-5WF7... | 95 | 40 | 15.7 (21.1) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 10 | 6FX0002-5N64-.... |
| 1FT7105-5WF7... | 94 | 53.2 | 28.3 (38.0) | 60 | 6SL3120-1TE26-0AA. | 3 | 4 × 16 | 6FX0002-5S23-.... |
| 1FT7108-5WF7... | 95 | 65 | 39.3 (52.7) | 85 | 6SL3120-1TE28-5AA. | 3 | 4 × 16 | 6FX0002-5G23-.... |
| 1FT7066-5WH7... | 91 | 19.7 | 9.4 (12.6) | 30 | 6SL3120-1TE23-0AD. | 1 | 4 × 2.5 | 6FX0002-5N16-.... |
| 1FT7082-5WH7... | 94 | 24 | 9.9 (13.3) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX0002-5N46-.... |
| 1FT7084-5WH7... | 94 | 34.3 | 16.5 (22.1) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 6 | 6FX0002-5N54-.... |
| 1FT7086-5WH7... | 94 | 40.5 | 23.6 (31.6) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 10 | 6FX0002-5N64-.... |
| 1FT7062-5WK7... | 92 | 12.5 | 6.3 (8.45) | 18 | 6SL3120-1TE21-8AD. | 1 | 4 × 1.5 | 6FX0002-5N06-.... |
| 1FT7064-5WK7... | 92 | 20.2 | 10.1 (13.5) | 30 | 6SL3120-1TE23-0AD. | 1 | 4 × 2.5 | 6FX0002-5N16-.... |

| | | | | | |
|--------------------------------|---|--|--|---|------|
| Motor Module: | | | | | |
| Single Motor Module | 1 | | | | |
| Double Motor Module | 2 | | | | |
| Version status | | | | | |
| Power cable: | | | | | |
| MOTION-CONNECT 800PLUS | 8 | | | | |
| MOTION-CONNECT 500 | 5 | | | | |
| Without brake cores | | | | C | |
| With brake cores ⁶⁾ | | | | D | |
| Length code | | | | | |

For information on the cables, refer to
MOTION-CONNECT connection systems

1) Connector size 3 is not rotatable. An alternative terminal box can be selected with connector size 3 only.

2) Optimum efficiency in continuous duty.

3) With default setting of the pulse frequency.

4) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

5) With the specified Motor Module, the motor cannot be fully utilized at M_0 with a winding temperature rise of $\Delta T = 100$ K.

If a Motor Module with a higher rating is used, you must check whether the specified power cable can be connected to the larger Motor Module.

6) Cable cross-section for brake connection 2×1.5 mm².

7) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 High Dynamic – Forced ventilation/Water cooling

Selection and ordering data

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FT7 High Dynamic synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|---|--------------|---------------------------------------|---------------------------------|---------------------------------------|---------------------------------------|---|-------------------|--|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | | p | J | m |
| rpm | | kW (hp) | Nm (lb _r -ft) | Nm (lb _r -ft) | A | | Article No. | 10^{-4} kgm ² (10^{-3} lb _r -in-s ²) | kg (lb) |
| SIMOTICS S-1FT7 High Dynamic for DC link voltage 510 ... 720 V DC – Forced ventilation | | | | | | | | | |
| 3000 | 63 | 3.8 (5.10) | 14 (10.3) | 12 (8.85) | 10.5 | 1FT7065-7S F 7 -1 ■ ■ ■ ■ | 5 | 6.4 (5.66) | 19 (41.9) |
| | | 4.4 (5.90) | 17 (12.5) | 14 (10.3) | 13 | 1FT7067-7S F 7 -1 ■ ■ ■ ■ | 5 | 8.3 (7.35) | 23 (50.7) |
| | 80 | 7.2 (9.66) | 34 (25.1) | 23 (17.0) | 20 | 1FT7085-7S F 7 -1 ■ ■ ■ ■ | 5 | 20.7 (18.3) | 34 (75.0) |
| | | 10.4 (13.9) | 48 (35.4) | 33 (24.3) | 29 | 1FT7087-7S F 7 -1 ■ ■ ■ ■ | 5 | 27.4 (24.3) | 42 (92.6) |
| 4500 | 63 | 5.2 (6.97) | 14 (10.3) | 11 (8.11) | 13.5 | 1FT7065-7SH 7 -1 ■ ■ ■ ■ | 5 | 6.4 (5.66) | 19 (41.9) |
| | | 6.1 (8.18) | 17 (12.5) | 13 (9.59) | 15 | 1FT7067-7SH 7 -1 ■ ■ ■ ■ | 5 | 8.3 (7.35) | 23 (50.7) |
| | 80 | 8.2 (11.0) | 34 (25.1) | 17.5 (12.9) | 22.5 | 1FT7085-7SH 7 -1 ■ ■ ■ ■ | 5 | 20.7 (18.3) | 34 (75.0) |
| | | 10.8 (14.5) | 48 (35.4) | 23 (17.0) | 24 | 1FT7087-7SH 7 -1 ■ ■ ■ ■ | 5 | 27.4 (24.3) | 43 (94.8) |
| SIMOTICS S-1FT7 High Dynamic for DC link voltage 510 ... 720 V DC – Water cooling | | | | | | | | | |
| 3000 | 63 | 5.7 (7.64) | 19 (14.0) | 18 (13.3) | 15 | 1FT7065-7WF 7 -1 ■ ■ ■ ■ | 5 | 6.4 (5.66) | 16 (35.3) |
| | | 7.4 (9.92) | 25 (18.4) | 23.5 (17.3) | 21 | 1FT7067-7WF 7 -1 ■ ■ ■ ■ | 5 | 8.3 (7.35) | 22 (48.5) |
| | 80 | 11.9 (16.0) | 43 (31.7) | 38 (28.0) | 32 | 1FT7085-7WF 7 -1 ■ ■ ■ ■ | 5 | 20.7 (18.3) | 32 (70.6) |
| | | 16.0 (21.5) | 61 (45.0) | 51 (37.6) | 43 | 1FT7087-7WF 7 -1 ■ ■ ■ ■ | 5 | 27.4 (24.3) | 41 (90.4) |
| 4500 | 63 | 7.8 (10.5) | 19 (14.0) | 16.5 (12.2) | 20 | 1FT7065-7WH 7 -1 ■ ■ ■ ■ | 5 | 6.4 (5.66) | 16 (35.3) |
| | | 10.4 (14.0) | 25 (18.4) | 22 (16.2) | 25 | 1FT7067-7WH 7 -1 ■ ■ ■ ■ | 5 | 8.3 (7.35) | 22 (48.5) |
| | 80 | 15.6 (20.9) | 43 (31.7) | 33 (24.3) | 48 | 1FT7085-7WH 7 -1 ■ ■ ■ ■ | 5 | 20.7 (18.3) | 32 (70.6) |
| | | 21.7 (29.1) | 61 (45.0) | 46 (33.9) | 53 | 1FT7087-7WH 7 -1 ■ ■ ■ ■ | 5 | 27.4 (24.3) | 41 (90.4) |

With DRIVE-CLiQ interface:

| | | |
|----------|---|--------|
| Flange: | Classic (compatible with 1FT6/1FK7) Recessed (more compact) | 1 0 |
| Encoder: | AS24DQI encoder | B K |
| | RJ45 signal connection M17 signal connection (Only for water cooling) | |
| | AM24DQI encoder | C L |
| | RJ45 signal connection M17 signal connection (Only for water cooling) | |

Without DRIVE-CLiQ interface:

| | | |
|----------|--|-----------------------|
| Flange: | Classic (compatible with 1FT6/1FK7) Recessed (more compact) | 4 5 |
| Encoder: | IC2048S/R encoder | N M |
| | M23 signal connection | |
| | AM2048S/R encoder | M23 signal connection |

Connector outlet direction:

| | | |
|--------------------------------|---------------------|---|
| Connector sizes 1 and 1.5 | Rotatable connector | 1 |
| Connector size 3 ¹⁾ | Transverse right | 1 |
| | Transverse left | 2 |
| | Axial NDE | 3 |
| | Axial DE | 4 |

Terminal box/ cable entry:¹⁾

| | |
|---------------------------|---|
| Top/transverse from right | 5 |
| Top/transverse from left | 6 |
| Top/axial from NDE | 7 |
| Top/axial from DE | 8 |

Shaft extension:

| | |
|------------------------|--------|
| Feather key and keyway | A B |
| Feather key and keyway | |
| Feather key and keyway | D E |
| Feather key and keyway | |
| Plain shaft | G H |
| Plain shaft | |
| Plain shaft | K L |
| Plain shaft | |

Shaft and flange accuracy:

| | |
|-------------|--------|
| Tolerance N | A B |
| Tolerance N | |
| Tolerance R | D E |
| Tolerance R | |
| Tolerance N | G H |
| Tolerance N | |
| Tolerance R | K L |
| Tolerance R | |

Holding brake:

| | |
|---------|--------|
| Without | A B |
| With | |
| Without | D E |
| With | |
| Without | G H |
| With | |
| Without | K L |
| With | |

Vibration severity:

| | |
|---------|-------------|
| Grade A | 0 1 2 |
| Grade A | |
| Grade A | |
| Grade R | 3 4 5 |
| Grade R | |
| Grade R | |

Degree of protection:

| | |
|-------------------------------|-------------|
| IP64 | 0 1 2 |
| IP65 | |
| IP67 (only for water cooling) | |
| IP64 | 3 4 5 |
| IP65 | |
| IP67 (only for water cooling) | |

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FT7 High Dynamic – Forced ventilation/Water cooling

| Motor type (repeated) | Efficiency 2) | Stall current | Calculated power P_{calc} ⁶⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|------------------|---|---|--|--|--|--|------------------------|
| | | | | Rated output current ³⁾ | Booksized format Internal air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ⁴⁾ | Pre-assembled cable |
| | η | I_0 at M_0 $\Delta T = 100$ K | P_{calc} at M_0 $\Delta T = 100$ K | I_{rated} | Article No. | Size | mm ² | Article No. |
| | % | A | kW (hp) | A | | | | |
| 1FT7065-7SF7... | 92 | 12 | 4.4 (5.90) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 1.5 | 6FX0002-5N26-.... |
| 1FT7067-7SF7... | 94 | 15 | 5.3 (7.11) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 1.5 | 6FX0002-5N26-.... |
| 1FT7085-7SF7... | 92 | 28 | 10.7 (14.3) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX0002-5N46-.... |
| 1FT7087-7SF7... | 93 | 40 | 15.1 (20.3) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 10 | 6FX0002-5N64-.... |
| 1FT7065-7SH7... | 92 | 16 | 6.6 (8.85) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 2.5 | 6FX0002-5N36-.... |
| 1FT7067-7SH7... | 94 | 19 | 8.0 (10.7) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 2.5 | 6FX0002-5N36-.... |
| 1FT7085-7SH7... | 92 | 40 | 16.0 (21.5) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 10 | 6FX0002-5N64-.... |
| 1FT7087-7SH7... | 93 | 45 | 22.6 (30.3) | 45 | 6SL3120-1TE24-5AA. | 3 | 4 × 10 | 6FX0002-5S14-.... |
| 1FT7065-7WF7... | 92 | 16 | 6.0 (8.05) | 18 | 6SL3120-1TE21-8AD. | 1.5 | 4 × 2.5 | 6FX0002-5N36-.... |
| 1FT7067-7WF7... | 94 | 22 | 7.9 (10.6) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX0002-5N46-.... |
| 1FT7085-7WF7... | 93 | 36 | 13.5 (18.1) | 45 | 6SL3120-1TE24-5AA. | 1.5 | 4 × 6 | 6FX0002-5N54-.... |
| 1FT7087-7WF7... | 94 | 51 | 19.2 (25.8) | 60 | 6SL3120-1TE26-0AA. | 3 | 4 × 16 | 6FX0002-5S23-.... |
| 1FT7065-7WH7... | 92 | 22 | 9.0 (12.1) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX0002-5N46-.... |
| 1FT7067-7WH7... | 94 | 28 | 11.8 (15.8) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX0002-5N46-.... |
| 1FT7085-7WH7... | 94 | 58 | 20.3 (27.2) | 60 | 6SL3120-1TE26-0AA. | 3 | 4 × 16 | 6FX0002-5S23-.... |
| 1FT7087-7WH7... | 94 | 67 | 28.7 (38.5) | 85 | 6SL3120-1TE28-5AA. | 3 | 4 × 25 | 6FX0002-5DG33-.... |

| | | | |
|-----------------------|---|--|--|
| Motor Module: | | | |
| Single Motor Module | 1 | | |
| Double Motor Module | 2 | | |
| Version status | | | |

| | | | |
|--------------------------------|---|---|------|
| Power cable: | | | |
| MOTION-CONNECT 800PLUS | 8 | | |
| MOTION-CONNECT 500 | 5 | | |
| Without brake cores | | C | |
| With brake cores ⁵⁾ | | D | |
| Length code | | | |

For information on the cables, refer to MOTION-CONNECT connection systems

1) Connector size 3 is not rotatable. An alternative terminal box can be selected with connector size 3 only.

2) Optimum efficiency in continuous duty.

3) With default setting of the pulse frequency.

4) The current carrying capacity of the power cable complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

5) Cable cross-section for brake connection 2 × 1.5 mm².

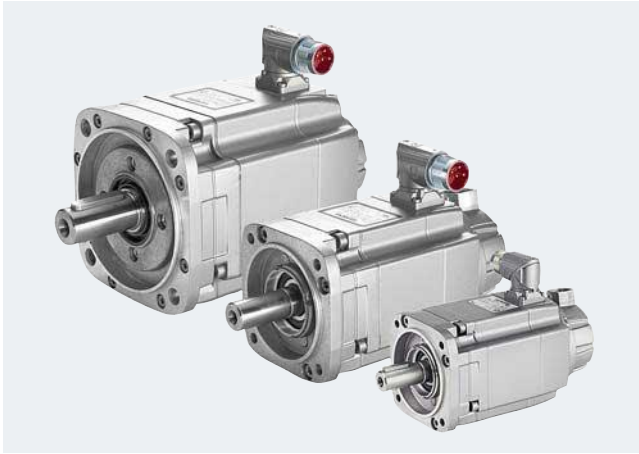
6) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7

Overview



SIMOTICS S-1FK7 motors

SIMOTICS S-1FK7 motors are compact permanent-magnet synchronous motors. The available options, gearboxes and encoders, together with the expanded product range, mean that the SIMOTICS S-1FK7 motors can be perfectly adapted to any application. They therefore also satisfy the permanently increasing demands of state-of-the-art machine generations.

S-1FK7 motors can be combined with the SINAMICS S120 drive system to create a powerful system with high functionality. The integrated encoder systems for speed and position control can be selected depending on the application.

The motors are designed for operation without external cooling and the heat is dissipated through the motor surface. The S-1FK7 motors have a high overload capability.

Benefits

SIMOTICS S-1FK7 Compact motors:

- Space-saving installation due to extremely high power density
- For universal applications
- Wide range of motors

SIMOTICS S-1FK7 High Dynamic motors:

- Extremely high dynamic response thanks to the very low rotor moment of inertia

SIMOTICS S-1FK7 High Inertia motors:

- Robust closed-loop control properties for high or variable load moment of inertia
- Minimal optimization and commissioning overhead for the compensation of disturbances

Application

- Machine tools
- Robots and handling systems
- Wood, glass, ceramic, and stone working
- Packaging, plastic, and textile machines
- Printing machines
- Auxiliary axes

Technical specifications

| SIMOTICS S-1FK7 Compact/High Dynamic/High Inertia | |
|---|---|
| Motor type | Permanent-magnet synchronous motor |
| Magnet material | Rare-earth magnetic material |
| Cooling | Natural cooling |
| Temperature monitoring | Temperature sensor in stator winding |
| Stator winding insulation in accordance with EN 60034-1 (IEC 60034-1) | Temperature class 155 (F) for a winding temperature rise of $\Delta T = 100$ K at an ambient temperature of 40 °C (104 °F). |
| Type of construction in accordance with EN 60034-7 (IEC 60034-7) | IM B5 (IM V1, IM V3) |
| Degree of protection in accordance with EN 60034-5 (IEC 60034-5) ¹⁾ | IP64 (optional IP65) |
| Shaft extension at DE in accordance with DIN 748-3 (IEC 60072-1) | Plain shaft, optional shaft with feather key (half-key balancing) |
| Shaft and flange accuracy in accordance with DIN 42955 (IEC 60072-1) ²⁾ | Tolerance N |
| Vibration severity in accordance with EN 60034-14 (IEC 60034-14) | Grade A is maintained up to rated speed |
| Sound pressure level L_{pA} (1 m) in accordance with EN ISO 1680, max. Tolerance +3 dB | |
| • 1FK701 ... 1FK704 | 55 dB |
| • 1FK706 | 65 dB |
| • 1FK708/1FK710 | 70 dB |
| Connection | Connectors for signals and power |
| Paint finish ³⁾ | Anthracite (RAL 7016) |
| 2nd rating plate | Enclosed separately |
| Holding brake | Optional integrated holding brake (free of backlash, 24 V DC) |
| Certificate of suitability | cURus |

Built-in encoder systems without DRIVE-CLiQ interface

| Incremental encoder | |
|---------------------|---|
| Encoder IC2048S/R | Incremental encoder sin/cos 1 V_{pp} 2048 S/R with C and D tracks |
| Absolute encoder | |
| Encoder AM2048S/R | Absolute encoder 2048 S/R, 4096 revolutions, multi-turn |
| Encoder AM512S/R | Absolute encoder 512 S/R, 4096 revolutions, multi-turn |
| Encoder AM16S/R | Absolute encoder 16 S/R, 4096 revolutions, multi-turn |
| Resolver | |
| Resolver Multi-pole | Multi-pole resolver (number of pole pairs corresponds to number of pole pairs of the motor) |
| Resolver 2-pole | 2-pole resolver |

Built-in encoder systems with DRIVE-CLiQ interface

| Single-turn incremental encoder/absolute encoder ⁴⁾ | |
|--|---|
| Encoder IC22DQ | Incremental encoder 22-bit + commutation position 11 bit |
| Encoder AS24DQI | Absolute encoder, single-turn, 24 bit |
| Encoder AS20DQI | Absolute encoder, single-turn, 20 bit |
| Multi-turn absolute encoders | |
| Encoder AM24DQI | Absolute encoder, 24 bit + 12 bit, multi-turn (traversing range 4096 revolutions) |
| Encoder AM20DQI/AM20DQ | Absolute encoder, 20 bit + 12 bit, multi-turn (traversing range 4096 revolutions) |
| Encoder AM15DQ | Absolute encoder, 15 bit + 12 bit, multi-turn (traversing range 4096 revolutions) |
| Resolver | |
| Resolver R15DQ | 15-bit resolver (internal multi-pole) |
| Resolver R14DQ | 14-bit resolver (internal 2-pole) |

S/R = signals/revolution

¹⁾ 1FK701 can be supplied only with IP54 degree of protection.

²⁾ Shaft extension run-out, concentricity of centering ring and shaft, and perpendicularity of flange to shaft.

³⁾ 1FK702 without a paint finish as standard.

⁴⁾ The single-turn absolute encoder is used for the previous incremental encoders.

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7

Options

| Order code | Description |
|------------|--|
| J.. | Mounting of SP+ planetary gearbox (see SIMOTICS S geared motors) |
| M03 | Version for potentially explosive atmospheres Zone 2 in accordance with EN 50021/IEC 60079-15 |
| M39 | Version for potentially explosive atmospheres Zone 22 in accordance with EN 50281/IEC 61241-1 |
| N05 | Alternative shaft geometry |
| N16 | Version for increased chemical resistance |
| N24 | Reinforced brake ¹⁾ |
| Q31 | Metal rating plate instead of adhesive label |
| V.. | Mounting of planetary gearbox LP+ (see SIMOTICS S geared motors) |
| | Paint finish |
| K23 | Special paint finish for "Worldwide" climate group: Primer and paint finish: Anthracite RAL 7016 ¹⁾ |
| K23+X.. | Special paint finish for "Worldwide" climate group: Primer and other paint finish can be selected from X01 to X27 |
| K24 | Primer (without paint finish) ²⁾ |
| X01 | Paint finish: Jet black, matt RAL 9005 ³⁾ |
| X02 | Paint finish: Cream white RAL 9001 ³⁾ |
| X03 | Paint finish: Reseda green RAL 6011 ³⁾ |
| X04 | Paint finish: Pebble grey RAL 7032 ³⁾ |
| X05 | Paint finish: Sky blue RAL 5015 ³⁾ |
| X06 | Paint finish: Pale ivory RAL 1015 ³⁾ |
| X08 | Paint finish: Suitable for food grade applications White aluminum RAL 9006 ³⁾ |
| X27 | Paint finish: Dark pearl grey RAL 9023 ³⁾ |

-Z must be added to the Article No. to order a motor with options.

N24

Reinforced brake

When option "Reinforced brake" is selected for S-1FK7 motors, they are fitted with a holding brake that is stronger than the standard brake (cf. built-in holding brakes).

The option "Reinforced brake" is available for the following S-1FK7 motors:

- 1FK703.-2....-.... ;
- 1FK704.-2....-.... ; 1FK704.-3....-.... ;
- 1FK706.-2....-.... ; 1FK706.-3....-.... ;
- 1FK708.-2....-.... ; 1FK708.-3....-.... ; 1FK7086-4....-.... ;
- 1FK7101-2....-.... ; 1FK7101-3....-.... ;
- 1FK7103-2....-.... ; 1FK7103-3....-.... ;
- 1FK7105-2....-.... ; 1FK7105-3....-.... ;

Note:

Check whether the mechanical components of the customer's machine are capable of withstanding increased forces and torques in the event of an Emergency Off scenario before using motors with a reinforced brake.

M03

Version for potentially explosive atmospheres Zone 2 in accordance with IEC 60079-15

Combustible or potentially explosive gases or vapors occur only rarely or briefly in Zone 2 areas. This type of protection is designated as EEx nA II (non sparking).

The special conditions for operating S-1FK7 motors in Zone 2 areas, in particular the reduction in permissible operating speeds, are described in detail in Annex 610.40089.01 to the EC Declaration of Conformity 664.20038.02.

M39

Version for potentially explosive atmospheres Zone 22 in accordance with IEC 61241-1

Combustible or potentially explosive dust (non-conductive dust) occurs only rarely or briefly in Zone 22 areas. This type of protection is designated as Ex 3D T 160 °C (320 °F).

The special conditions for operating S-1FK7 motors in Zone 22 areas are described in detail in Annex 610.40090.01 to the EC Declaration of Conformity 664.20039.02.

Note regarding M03 and M39 options:

It is not always permissible to combine the option for potentially explosive atmospheres with other motor options. Please refer to the configuration manual for further information.

A version with a DRIVE-CLiQ interface on the motor is only possible for DQI encoders with RJ45 connector. DQ encoders with SMI cannot be combined with option M03 or M39.

¹⁾ For the option "Reinforced brake", a brake-version 1FK7 motor must be ordered with B or H in the 15th data position.

²⁾ For the primer, the 1FK702 motors must be ordered with 0 or 2 in the 16th data position.

³⁾ For the paint finish, the 1FK702 motors must be ordered with 3 or 5 on the 16th data position.

Options (continued)

N05

Alternative shaft geometry

S-1FK7 motors are delivered with a shaft extension that has an alternative shaft geometry (smaller dimensions).

- 1FK703: 11 × 23 mm (0.43 × 0.91 in)
- 1FK704: 14 × 30 mm (0.55 × 1.18 in)
- 1FK706: 19 × 40 mm (0.75 × 1.57 in)
- 1FK708: 24 × 50 mm (0.94 × 1.97 in)
- 1FK710: 32 × 58 mm (1.26 × 2.28 in)

Note:

The S-1FK7 motors with the option N05 are always shaft-compatible and flange-compatible with the corresponding S-1FT5 motors.

Exception: S-1FK706 motors are only shaft-compatible with S-1FT506... motors.

N16

Version for increased chemical resistance

Plants and systems in the foodstuff industry or machine tools are typical applications for these types of versions.

The PS Premium paint system of these motors is resistant to a broad range of commonly used cleaning agents and disinfectants.

Additional properties of motors equipped with option N16:

- 4-coat paint system
- Nickel-plated connector

Note:

The PS Premium paint system has been tested with a broad spectrum of industrial cleaning products with pH values ranging from 1.5 to 13. Resistance to the acidic and alkaline cleaning products used, as well as disinfectants, was verified by a material resistance test performed by ECOLAB Deutschland GmbH.

Option N16 is available for S-1FK703 to S-1FK710 motors with the following encoders:

- AM20DQI (1FK7...-.....-R..)
 - Absolute encoder, 20 bit + 12 bit
 - Multi-turn with DRIVE-CLiQ interface
- AM24DQI (1FK7...-.....-C..)
 - Absolute encoder, 24 bit + 12 bit
 - Multi-turn with DRIVE-CLiQ interface
- AS24DQI (1FK7...-.....-B..)
 - Absolute encoder, single-turn, 24 bit
 - With DRIVE-CLiQ interface
- AM2048S/R (1FK7...-.....-E..)
 - Absolute encoder 2048 S/R,
 - 4096 revolutions, multi-turn, with EnDat interface
- Multi-pole resolver (1FK7...-.....-S..)
- Two-pole resolver (1FK7...-.....-T..)

Motors with DRIVE-CLiQ interface differ from the standard motor version in the following respects:

- The motor is 5 mm longer and has the same overall length as a motor without DRIVE-CLiQ interface
- The connector is implemented as a rotatable angle plug
- The height of the interfering contour relative to the motor center is 82 mm (3.23 in)
- A non-standard signal cable is required (see MOTION-CONNECT connection systems > Connection overview for SIMOTICS S-1FT7/S-1FK7 motors with RJ45 connection or with option N16 installed on SINAMICS S120)

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 Compact – Natural cooling

Selection and ordering data

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FK7 Compact synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|---|--------------|--|--|--|--|--|-------------------|---|--|
| n_{rated} | SH | P_{rated} at $\Delta T=100\text{ K}$ | M_0 at $\Delta T=100\text{ K}$ | M_{rated} at $\Delta T=100\text{ K}$ | I_{rated} at $\Delta T=100\text{ K}$ | Article No. | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | | | 10^{-4} kgm^2 ($10^{-3}\text{ lb}_f\text{-in-s}^2$) | kg (lb) |
| SIMOTICS S-1FK7 Compact for DC link voltage 510 ... 720 V DC – Natural cooling | | | | | | | | | |
| 2000 | 48 | 0.6 (0.80) | 3.0 (2.21) | 2.8 (2.07) | 1.55 | 1FK7042-2AC7-1 ■ ■ ■ ■ | 4 | 2.9 (2.57) | 4.6 (10.1) |
| | 63 | 1.1 (1.48) 1.5 (2.01) 1.9 (2.55) | 6.0 (4.43) 8.5 (6.27) 11.0 (8.11) | 5.3 (3.91) 7.0 (5.16) 8.9 (6.56) | 2.95 2.65 4.4 | 1FK7060-2AC7-1 ■ ■ ■ ■ 1FK7062-2AC7-1 ■ ■ ■ ■ 1FK7063-2AC7-1 ■ ■ ■ ■ | 4 4 4 | 7.7 (6.82) 11.2 (9.91) 14.7 (13.0) | 7.1 (15.7) 9.1 (20.1) 11.1 (24.5) |
| | 80 | 2.1 (2.82) 2.6 (3.49) 3.1 (4.16) | 12.0 (8.85) 16.0 (11.8) 20.0 (14.8) | 10.0 (7.38) 12.5 (9.22) 15.0 (11.1) | 4.4 6.3 6.7 | 1FK7081-2AC7-1 ■ ■ ■ ■ 1FK7083-2AC7-1 ■ ■ ■ ■ 1FK7084-2AC7-1 ■ ■ ■ ■ | 4 4 4 | 20 (17.7) 26 (23.0) 32.5 (28.8) | 12.9 (28.4) 15.6 (34.4) 18.3 (40.3) |
| | 100 | 3 (4.02) 4.3 (5.77) 5.2 (6.97) 7.7 (10.3) | 18.0 (13.3) 27.0 (19.9) 36.0 (26.6) 48.0 (35.4) | 14.5 (10.7) 20.5 (15.1) 25.0 (18.4) 37.0 (27.3) | 7.1 9.7 11.0 16.0 | 1FK7100-2AC7-1 ■ ■ ■ ■ 1FK7101-2AC7-1 ■ ■ ■ ■ 1FK7103-2AC7-1 ■ ■ ■ ■ 1FK7105-2AC7-1 ■ ■ ■ ■ | 4 4 4 4 | 54 (47.8) 79 (69.9) 104 (92.1) 154 (136) | 17.6 (38.8) 23.0 (50.7) 28.5 (62.8) 39.0 (86.0) |
| 3000 | 48 | 0.8 (1.07) | 3.0 (2.21) | 2.6 (1.92) | 2.0 | 1FK7042-2AF7-1 ■ ■ ■ ■ | 4 | 2.9 (2.57) | 4.6 (10.1) |
| | 63 | 1.5 (2.01) 1.9 (2.55) 2.3 (3.08) | 6.0 (4.43) 8.5 (6.27) 11.0 (8.11) | 4.7 (3.47) 6.0 (4.43) 7.3 (5.38) | 3.7 4.0 5.6 | 1FK7060-2AF7-1 ■ ■ ■ ■ 1FK7062-2AF7-1 ■ ■ ■ ■ 1FK7063-2AF7-1 ■ ■ ■ ■ | 4 4 4 | 7.7 (6.82) 11.2 (9.91) 14.7 (13.0) | 7.1 (15.7) 9.1 (20.1) 11.1 (24.5) |
| | 80 | 2.1 (2.82) 2.7 (3.62) 3.3 (4.43) 3.1 (4.16) | 8.0 (5.90) 12.0 (8.85) 16.0 (11.8) 20.0 (14.8) | 6.8 (5.02) 8.7 (6.42) 10.5 (7.74) 10.0 (7.38) | 4.4 6.8 7.2 6.5 | 1FK7080-2AF7-1 ■ ■ ■ ■ 1FK7081-2AF7-1 ■ ■ ■ ■ 1FK7083-2AF7-1 ■ ■ ■ ■ 1FK7084-2AF7-1 ■ ■ ■ ■ | 4 4 4 4 | 14.2 (12.6) 20 (17.7) 26 (23.0) 32.5 (28.8) | 10.3 (22.7) 12.9 (28.4) 15.6 (34.4) 18.3 (40.3) |
| | 100 | 3.8 (5.10) 4.9 (6.57) 4.4 (5.90) 8.2 (11.0) | 18.0 (13.3) 27.0 (19.9) 36.0 (26.6) 48.0 (35.4) | 12.0 (8.85) 15.5 (11.4) 14.0 (10.3) 26.0 (19.2) | 8.0 11.6 11.5 18.0 | 1FK7100-2AF7-1 ■ ■ ■ ■ 1FK7101-2AF7-1 ■ ■ ■ ■ 1FK7103-2AF7-1 ■ ■ ■ ■ 1FK7105-2AF7-1 ■ ■ ■ ■ | 4 4 4 4 | 54 (47.8) 79 (69.9) 104 (92.1) 154 (136) | 17.6 (38.8) 23.0 (50.7) 28.5 (62.8) 39.0 (86.0) |

| | | | | | | |
|---|-------------------------|----------------------------|----------------|-------------|------------------|---------|
| Encoder systems for motors without DRIVE-CLiQ interface: | IC2048S/R encoder | 4 | A | | | |
| | AM2048S/R encoder | 4 | E | | | |
| | Multi-pole resolver | 4 | S | | | |
| | 2-pole resolver | 4 | T | | | |
| Encoder systems for motors with DRIVE-CLiQ interface: | AS24DQI encoder | 1 | B | | | |
| | AM24DQI encoder | 1 | C | | | |
| | AS20DQI encoder | 1 | Q | | | |
| | AM20DQI encoder | 1 | R | | | |
| | R15DQ resolver | 1 | U | | | |
| | R14DQ resolver | 1 | P | | | |
| Shaft extension: | Feather key | Shaft and flange accuracy: | Holding brake: | Without | A B G H | |
| | Feather key | | | Tolerance N | | With |
| | Plain shaft | | | Tolerance N | | Without |
| | Plain shaft | | | Tolerance N | | With |
| Degree of protection: | IP64 | | | | 0 | |
| | IP65 | | | | 1 | |
| | IP65 and DE flange IP67 | | | | 2 | |

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 Compact – Natural cooling

| Motor type (repeated) | Efficiency η % | Stall current I_0 at M_0 $\Delta T=100$ K A | Calculated power P_{calc} at M_0 $\Delta T=100$ K kW (hp) | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|---------------------------|--|--|---|--|---|---|---|
| | | | | Rated output current ²⁾ A | Booksize format Internal air cooling For other components, see SINAMICS S120 drive system Article No. | Power connector Size | Cable cross- section ³⁾ mm ² | Pre-assembled cable Article No. |
| | | | | | | | | |
| 1FK7042-2AC71-... | 88 | 1.6 | 0.6 (0.80) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7060-2AC71-... | 90 | 3.15 | 1.3 (1.74) | 3 ⁴⁾ | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7062-2AC71-... | 90 | 3.0 | 1.8 (2.41) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7063-2AC71-... | 91 | 5.3 | 2.3 (3.08) | 5 ⁴⁾ | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7081-2AC71-... | 93 | 5.0 | 2.5 (3.35) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7083-2AC71-... | 93 | 7.5 | 3.4 (4.56) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7084-2AC71-... | 93 | 8.5 | 4.2 (5.63) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7100-2AC71-... | 92 | 8.4 | 3.8 (5.10) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7101-2AC71-... | 93 | 12.3 | 5.7 (7.64) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 1.5 | 6FX002-5N26-... |
| 1FK7103-2AC71-... | 93 | 14.4 | 7.5 (10.1) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 1.5 | 6FX002-5N26-... |
| 1FK7105-2AC71-... | 93 | 20.0 | 10.1 (13.5) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 2.5 | 6FX002-5N36-... |
| 1FK7042-2AF71-... | 89 | 2.2 | 0.9 (1.21) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7060-2AF71-... | 90 | 4.45 | 1.9 (2.55) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7062-2AF71-... | 91 | 5.3 | 2.7 (3.62) | 5 ⁴⁾ | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7063-2AF71-... | 91 | 8.0 | 3.5 (4.69) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7080-2AF71-... | 92 | 4.9 | 2.5 (3.35) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7081-2AF71-... | 93 | 8.7 | 3.8 (5.10) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7083-2AF71-... | 93 | 10.1 | 5 (6.71) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7084-2AF71-... | 93 | 12.1 | 6.3 (8.45) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7100-2AF71-... | 92 | 11.1 | 5.7 (7.64) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7101-2AF71-... | 93 | 18.8 | 8.5 (11.4) | 18 ⁴⁾ | 6SL3120-TE21-8AD. | 1.5 | 4 × 2.5 | 6FX002-5N36-... |
| 1FK7103-2AF71-... | 93 | 26.0 | 11.3 (15.2) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX002-5N46-... |
| 1FK7105-2AF71-... | 94 | 31.0 | 15.1 (20.3) | 30 ⁴⁾ | 6SL3120-1TE23-0AD. | 1.5 | 4 × 6 | 6FX002-5N56-... |

| | | |
|--------------------------------|---|------|
| Motor Module: | | |
| Single Motor Module | 1 | |
| Double Motor Module | 2 | |
| Version status | | |
| Power cable: | | |
| MOTION-CONNECT 800PLUS | 8 | |
| MOTION-CONNECT 500 | 5 | |
| Without brake cores | | C |
| With brake cores ⁵⁾ | | D |
| Length code | | |

For information on the cables, refer to MOTION-CONNECT connection systems

1) Optimum efficiency in continuous duty.

2) With default setting of the pulse frequency.

3) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

4) With the specified Motor Module, the motor cannot be fully utilized at M_0 with a winding temperature rise of $\Delta T = 100$ K. If a Motor Module with a higher rating is used, you must check whether the specified power cable can be connected to the larger Motor Module.

5) Cable cross-section for brake connection 2 × 1.5 mm².

6) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 Compact – Natural cooling**Selection and ordering data**

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FK7 Compact synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) | |
|---|--------------|---|---------------------------|---------------------------------|---------------------------------|---|-------------------|--|------------------------|--|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | Article No. | p | J | m | |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | | | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) | |
| SIMOTICS S-1FK7 Compact for DC link voltage 510 ... 720 V DC – Natural cooling | | | | | | | | | | |
| 4500 | 63 | 1.7 (2.28) | 6.0 (4.43) | 3.7 (2.73) | 4.3 | 1FK7060-2AH7-1 | 4 | 7.7 (6.82) | 7.1 (15.7) | |
| | | 1.4 (1.88) | 8.5 (6.27) | 3.0 (2.21) | 3.3 | 1FK7062-2AH7-1 | 4 | 11.2 (9.91) | 9.1 (20.1) | |
| | | 1.4 (1.88) | 11.0 (8.11) | 3.0 (2.21) | 3.8 | 1FK7063-2AH7-1 | 4 | 14.7 (13.01) | 11.1 (24.5) | |
| | 80 | 2.1 (2.82) | 8.0 (5.90) | 4.5 (3.32) | 4.8 | 1FK7080-2AH7-1 | 4 | 14.2 (12.6) | 10.3 (22.7) | |
| | | 1.8 (2.41) | 12.0 (8.85) | 3.8 (2.80) | 4.9 | 1FK7081-2AH7-1 | 4 | 20 (17.70) | 12.9 (28.4) | |
| | | 1.4 (1.88) | 16.0 (11.8) | 3.0 (2.21) | 3.6 | 1FK7083-2AH7-1 | 4 | 26 (23.01) | 15.6 (34.4) | |
| 6000 | 36 | 0.5 (0.67) | 1.15 (0.85) | 0.8 (0.59) | 1.3 | 1FK7032-2AK7-1 | 3 | 0.65 (0.58) | 2.7 (5.95) | |
| | | 0.6 (0.80) | 1.6 (1.18) | 1.0 (0.74) | 1.3 | 1FK7034-2AK7-1 | 3 | 0.9 (0.80) | 3.5 (7.72) | |
| | 48 | 0.7 (0.94) | 1.6 (1.18) | 1.1 (0.81) | 1.85 | 1FK7040-2AK7-1 | 4 | 1.6 (1.42) | 3.2 (7.06) | |
| | | 0.9 (1.21) | 3.0 (2.21) | 1.5 (1.11) | 2.5 | 1FK7042-2AK7-1 | 4 | 2.9 (2.57) | 4.6 (10.1) | |
| | | Encoder systems for motors without DRIVE-CLiQ interface: | | IC2048S/R encoder | 4 | A | | | | |
| | | | | AM2048S/R encoder | 4 | E | | | | |
| | | Multi-pole resolver | 4 | S | | | | | | |
| | | 2-pole resolver | 4 | T | | | | | | |
| Encoder systems for motors with DRIVE-CLiQ interface: | | AS24DQI encoder | 1 | B | | | | | | |
| | | AM24DQI encoder | 1 | C | | | | | | |
| | | AS20DQI encoder | 1 | Q | | | | | | |
| | | AM20DQI encoder | 1 | R | | | | | | |
| | | R15DQ resolver | 1 | U | | | | | | |
| | | R14DQ resolver | 1 | P | | | | | | |
| Shaft extension: | | Shaft and flange accuracy: | | Holding brake: | | | | | | |
| Feather key | | Tolerance N | | Without | | | | A | | |
| Feather key | | Tolerance N | | With | | | | B | | |
| Plain shaft | | Tolerance N | | Without | | | | G | | |
| Plain shaft | | Tolerance N | | With | | | | H | | |
| Degree of protection: | | IP64 | | | | | | 0 | | |
| | | IP65 | | | | | | 1 | | |
| | | IP65 and DE flange IP67 | | | | | | 2 | | |

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 Compact – Natural cooling

| Motor type (repeated) | Efficiency 1) | Stall current | Calculated power P_{calc} ⁵⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--|------------------|--|---|--|---|---|---|---|
| | η % | I_0 at M_0 $\Delta T=100$ K A | P_{calc} at M_0 $\Delta T=100$ K kW (hp) | Rated output current ²⁾ I_{rated} A | Booksize format Internal air cooling For other components, see SINAMICS S120 drive system Article No. | Power connector Size | Cable cross- section ³⁾ mm ² | Pre-assembled cable Article No. |
| Line voltage 380 ... 480 V 3 AC | | | | | | | | |
| 1FK7060-2AH71-... | 90 | 6.3 | 2.8 (3.75) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7062-2AH71-... | 91 | 8.0 | 4 (5.36) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7063-2AH71-... | 90 | 12.0 | 5.2 (6.97) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7080-2AH71-... | 92 | 7.4 | 3.8 (5.10) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7081-2AH71-... | 93 | 13.1 | 5.7 (7.64) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7083-2AH71-... | 93 | 15.0 | 7.5 (10.1) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7032-2AK71-... | 88 | 1.7 | 0.7 (0.94) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7034-2AK71-... | 88 | 1.9 | 1 (1.34) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7040-2AK71-... | 88 | 2.35 | 1 (1.34) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7042-2AK71-... | 89 | 4.4 | 1.9 (2.55) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |

Motor Module:

| | |
|---------------------|---|
| Single Motor Module | 1 |
| Double Motor Module | 2 |

Version status**Power cable:**

| | |
|------------------------|---|
| MOTION-CONNECT 800PLUS | 8 |
| MOTION-CONNECT 500 | 5 |

Without brake cores

With brake cores⁴⁾C
D

Length code

....

For information on the cables, refer to
MOTION-CONNECT connection systems

1) Optimum efficiency in continuous duty.

2) With default setting of the pulse frequency.

3) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

4) Cable cross-section for brake connection 2 × 1.5 mm².5) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 Compact – Natural cooling

Selection and ordering data

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FK7 Compact synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|--|--------------|-----------------------------------|------------------------------------|---------------------------------|---------------------------------|--|---|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | Article No. | 10^{-4} kgm ² (10 ⁻³ lb _f -in-s ²) | kg (lb) | |
| 1FK7 Compact for DC link voltage 510 ... 720 V DC – Natural cooling | | | | | | | | | |
| 6000 | 20 | 0.05 (0.07) | 0.18 (0.13) | 0.08 (0.06) | 0.85 | 1FK7011-5AK7 ■-1 ■ ■ ■ | 4 | 0.064 (0.06) | 0.9 (1.98) |
| | | 0.1 (0.13) | 0.35 (0.26) | 0.16 (0.12) | 0.85 | 1FK7015-5AK7 ■-1 ■ ■ ■ | 4 | 0.083 (0.07) | 1.1 (2.43) |
| | 28 | 0.38 (0.51) | 0.85 (0.63) | 0.6 (0.44) | 1.4 | 1FK7022-5AK7 ■-1 ■ ■ ■ | 3 | 0.28 (0.25) | 1.8 (3.97) |
| Encoder systems for motors without DRIVE-CLiQ interface: | | | IC2048S/R encoder | | | 4 | A | | |
| | | | AM512S/R encoder (only for 1FK702) | | | 4 | H | | |
| | | | AM16S/R encoder | | | 4 | J | | |
| | | | Multi-pole resolver | | | 4 | S | | |
| | | | 2-pole resolver | | | 4 | T | | |
| Encoder systems for motors with DRIVE-CLiQ interface: | | | IC22DQ encoder | | | 1 | D | | |
| (Only for 1FK702) ¹⁾ | | | AM20DQ encoder | | | 1 | L | | |
| | | | AM15DQ encoder | | | 1 | V | | |
| | | | R15DQ resolver | | | 1 | U | | |
| | | | R14DQ resolver | | | 1 | P | | |
| Shaft extension: | | Shaft and flange accuracy: | | Holding brake: | | | | | |
| Feather key | | Tolerance N | | Without | | | | | A |
| Feather key | | Tolerance N | | With | | | | | B |
| Plain shaft | | Tolerance N | | Without | | | | | G |
| Plain shaft | | Tolerance N | | With | | | | | H |
| Degree of protection: | | | | Paint finish: | | | | | |
| IP64 (only for 1FK702) | | | | Without | | | | | 0 |
| IP65 and DE flange IP67 (only for 1FK702) | | | | Without | | | | | 2 |
| IP54 (only for 1FK701), IP64 (only for 1FK702) | | | | With | | | | | 3 |
| IP65 and DE flange IP67 (only for 1FK702) | | | | With | | | | | 5 |

8

¹⁾ 1FK701 motors cannot be equipped with a DRIVE-CLiQ interface. The encoder systems are connected via SMC

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 Compact – Natural cooling

| Motor type (repeated) | Efficiency 1) | Stall current | Calculated power P_{calc} ⁵⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|------------------|--|---|--|---|---|---|---|
| | η % | I_0 at M_0 $\Delta T=100$ K A | P_{calc} at M_0 $\Delta T=100$ K kW (hp) | Rated output current ²⁾ I_{rated} A | Booksize format Internal air cooling For other components, see SINAMICS S120 drive system Article No. | Power connector Size | Cable cross- section ³⁾ mm ² | Pre-assembled cable Article No. |
| | | | | Line voltage 380 ... 480 V 3 AC | | | | |
| 1FK7011-5AK71-... | 62 | 1.5 | 0.1 (0.13) | 3 | 6SL3120-TE13-0AD. | 0.5 | 4 × 1.5 | 6FX5002-5DN26-... |
| 1FK7015-5AK71-... | 68 | 1.5 | 0.2 (0.27) | 3 | 6SL3120-TE13-0AD. | 0.5 | 4 × 1.5 | 6FX5002-5DN26-... |
| 1FK7022-5AK71-... | 86 | 1.8 | 0.5 (0.67) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5IN06-... |

| Motor Module: | | Power cable: | |
|-----------------------|---|--------------------------------|------|
| Single Motor Module | 1 | MOTION-CONNECT 800PLUS | 8 |
| Double Motor Module | 2 | MOTION-CONNECT 500 | 5 |
| Version status | | Without brake cores | C |
| | | With brake cores ⁴⁾ | D |
| | | Length code | |

For information on the cables, refer to [MOTION-CONNECT connection systems](#)

1) Optimum efficiency in continuous duty.

2) With default setting of the pulse frequency.

3) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

4) Cable cross-section for brake connection 2 × 1.5 mm².

5) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 High Dynamic – Natural cooling**Selection and ordering data**

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FK7 High Dynamic synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|--|--------------|-----------------------------------|---------------------------|---------------------------------|---------------------------------|--|-------------------|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | Article No. | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | | | 10^{-4} kgm ² (10 ⁻³ lb _f -in-s ²) | kg (lb) |
| SIMOTICS S-1FK7 High Dynamic for DC link voltage 510 ... 720 V DC – Natural cooling | | | | | | | | | |
| 2000 | 63 | 2.1 (2.82) | 12.0 (8.85) | 10.0 (7.38) | 7.1 | 1FK7064-4CC7-1 | 3 | 7.5 (6.64) | 15.4 (34.0) |
| | 80 | 3.1 (4.16) | 22.0 (16.2) | 15.0 (11.1) | 10.0 | 1FK7085-4CC7-1 | 4 | 22 (19.5) | 23.0 (50.7) |
| | | 3.8 (5.10) | 28.0 (20.7) | 18.0 (13.3) | 9.0 | 1FK7086-4CC7-1 | 4 | 22 (19.5) | 23.0 (50.7) |
| 3000 | 48 | 1.2 (1.61) | 4.5 (3.32) | 3.7 (2.73) | 3.45 | 1FK7044-4CF7-1 | 3 | 1.26 (1.12) | 7.4 (16.3) |
| | 63 | 1.7 (2.28) | 6.4 (4.72) | 5.4 (3.98) | 5.3 | 1FK7061-4CF7-1 | 3 | 4.1 (3.63) | 9.5 (20.9) |
| | | 2.5 (3.35) | 12.0 (8.85) | 8.0 (5.90) | 7.6 | 1FK7064-4CF7-1 | 3 | 7.5 (6.64) | 15.4 (34.0) |
| | 80 | 2 (2.68) | 22.0 (16.2) | 6.5 (4.79) | 7.0 | 1FK7085-4CF7-1 | 4 | 22 (19.5) | 23.0 (50.7) |
| | | 2 (2.68) | 28.0 (20.7) | 6.5 (4.79) | 5.7 | 1FK7086-4CF7-1 | 4 | 22 (19.5) | 23.0 (50.7) |
| 4500 | 48 | 1.2 (1.61) | 3.5 (2.58) | 2.6 (1.92) | 3.3 | 1FK7043-4CH7-1 | 3 | 1 (0.89) | 6.0 (13.2) |
| | | 1.4 (1.88) | 4.5 (3.32) | 3.0 (2.21) | 3.9 | 1FK7044-4CH7-1 | 3 | 1.26 (1.12) | 7.4 (16.3) |
| | 63 | 2 (2.68) | 6.4 (4.72) | 4.3 (3.17) | 6.2 | 1FK7061-4CH7-1 | 3 | 4.1 (3.63) | 9.5 (20.9) |
| | | 2.4 (3.22) | 12.0 (8.85) | 5.0 (3.69) | 7.0 | 1FK7064-4CH7-1 | 3 | 7.5 (6.64) | 15.4 (34.0) |
| 6000 | 36 | 0.6 (0.80) | 1.3 (0.96) | 0.9 (0.66) | 1.6 | 1FK7033-4CK7-1 | 3 | 0.25 (0.22) | 3.0 (6.62) |
| | 48 | 1.3 (1.74) | 3.5 (2.58) | 2.0 (1.48) | 3.5 | 1FK7043-4CK7-1 | 3 | 1 (0.89) | 6.0 (13.2) |
| Encoder systems for motors without DRIVE-CLiQ interface: | | IC2048S/R encoder | 4 | A | | | | | |
| | | AM2048S/R encoder | 4 | E | | | | | |
| | | Multi-pole resolver | 4 | S | | | | | |
| | | 2-pole resolver | 4 | T | | | | | |
| Encoder systems for motors with DRIVE-CLiQ interface: | | AS24DQI encoder | 1 | B | | | | | |
| | | AM24DQI encoder | 1 | C | | | | | |
| | | AS20DQI encoder | 1 | Q | | | | | |
| | | AM20DQI encoder | 1 | R | | | | | |
| | | R15DQ resolver | 1 | U | | | | | |
| | | R14DQ resolver | 1 | P | | | | | |
| Shaft extension: | | Shaft and flange accuracy: | Holding brake: | | | | | | |
| Feather key | | Tolerance N | Without | | | | | | |
| Feather key | | Tolerance N | With | | | | | | |
| Plain shaft | | Tolerance N | Without | | | | | | |
| Plain shaft | | Tolerance N | With | | | | | | |
| Degree of protection: | | IP64 | | | | | | | 0 |
| | | IP65 | | | | | | | 1 |
| | | IP65 and DE flange IP67 | | | | | | | 2 |

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 High Dynamic – Natural cooling

| Motor type (repeated) | Efficiency 1) | Stall current | Calculated power P_{calc} ⁵⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|------------------|---------------------------------------|---|--|--|--|--|------------------------|
| | | | | Rated output current ²⁾ | Booksized format Internal air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ³⁾ | Pre-assembled cable |
| | | | | | | | | |
| % | η | I_0 at M_0 $\Delta T=100$ K | P_{calc} at M_0 $\Delta T=100$ K | A | | | | |
| | | | | Line voltage 380 ... 480 V 3 AC | | | | |
| 1FK7064-4CC71-... | 93 | 8.1 | 2.5 (3.35) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7085-4CC71-... | 92 | 13.5 | 4.6 (6.17) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7086-4CC71-... | 93 | 13.2 | 5.9 (7.91) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7044-4CF71-... | 91 | 4.0 | 1.4 (1.88) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7061-4CF71-... | 93 | 6.1 | 2 (2.68) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7064-4CF71-... | 93 | 10.8 | 3.8 (5.10) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7085-4CF71-... | 92 | 22.0 | 6.9 (9.25) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX002-5N46-... |
| 1FK7086-4CF71-... | 93 | 21.5 | 8.8 (11.8) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX002-5N46-... |
| 1FK7043-4CH71-... | 90 | 4.1 | 1.6 (2.15) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7044-4CH71-... | 91 | 5.4 | 2.1 (2.82) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7061-4CH71-... | 93 | 8.7 | 3 (4.02) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7064-4CH71-... | 93 | 15.0 | 5.7 (7.64) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7033-4CK71-... | 88 | 2.1 | 0.8 (1.07) | 3 | 6SL3120-TE13-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |
| 1FK7043-4CK71-... | 90 | 5.6 | 2.2 (2.95) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5N06-... |

Motor Module:
Single Motor Module 1
Double Motor Module 2

Version status

Power cable:
MOTION-CONNECT 800PLUS 8
MOTION-CONNECT 500 5

Without brake cores
With brake cores⁴⁾ C
D

Length code

....
For information on the cables, refer to
MOTION-CONNECT connection systems

8

1) Optimum efficiency in continuous duty.

2) With default setting of the pulse frequency.

3) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

4) Cable cross-section for brake connection 2 × 1.5 mm².

5) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 High Inertia – Natural cooling

Selection and ordering data

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FK7 High Inertia synchronous motors | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|--|--------------|---------------------------------------|---------------------------------|---------------------------------------|---------------------------------------|---|--|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | Article No. | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) | |
| SIMOTICS S-1FK7 High Inertia for DC link voltage 510 ... 720 V DC – Natural cooling | | | | | | | | | |
| 2000 | 80 | 3.1 (4.16) | 20.0 (14.8) | 15.0 (11.1) | 6.7 | 1FK7084-3BC7-1 | 4 | 99 (87.6) | 23.0 (50.7) |
| | 100 | 3 (4.02) | 18.0 (13.3) | 14.5 (10.7) | 7.1 | 1FK7100-3BC7-1 | 4 | 87 (77.0) | 19.4 (42.8) |
| | | 4.3 (5.77) | 27.0 (19.9) | 20.5 (15.1) | 9.7 | 1FK7101-3BC7-1 | 4 | 127 (112) | 25.7 (56.7) |
| | | 5.2 (6.97) | 36.0 (26.6) | 25.0 (18.4) | 11.0 | 1FK7103-3BC7-1 | 4 | 168 (149) | 32.1 (70.8) |
| | | 7.7 (10.3) | 48.0 (35.4) | 37.0 (27.3) | 16.0 | 1FK7105-3BC7-1 | 4 | 249 (220) | 44.4 (97.9) |
| 3000 | 63 | 1.5 (2.01) | 6.0 (4.43) | 4.7 (3.47) | 3.7 | 1FK7060-3BF7-1 | 4 | 12.5 (11.1) | 7.9 (17.4) |
| | | 1.9 (2.55) | 8.5 (6.27) | 6.0 (4.43) | 4.0 | 1FK7062-3BF7-1 | 4 | 23.5 (20.8) | 10.7 (23.6) |
| | 80 | 2.7 (3.62) | 12.0 (8.85) | 8.7 (6.42) | 6.8 | 1FK7081-3BF7-1 | 4 | 49 (43.4) | 15.2 (33.5) |
| | | 3.1 (4.16) | 20.0 (14.8) | 10.0 (7.38) | 6.5 | 1FK7084-3BF7-1 | 4 | 99 (87.6) | 23.0 (50.7) |
| | | 4.9 (6.57) | 27.0 (19.9) | 15.5 (11.4) | 11.6 | 1FK7101-3BF7-1 | 4 | 127 (112) | 25.7 (56.7) |
| | 100 | 4.4 (5.90) | 36.0 (26.6) | 14.0 (10.3) | 11.5 | 1FK7103-3BF7-1 | 4 | 168 (149) | 32.1 (70.8) |
| | | | | | | | | | |
| 6000 | 48 | 0.9 (1.21) | 3.0 (2.21) | 1.5 (1.11) | 2.5 | 1FK7042-3BK7-1 | 4 | 5.1 (4.51) | 5.1 (11.2) |
| | | | | | | | | | |
| Encoder systems for motors without DRIVE-CLiQ interface: | | | IC2048S/R encoder | | | 4 | A | | |
| | | | AM2048S/R encoder | | | 4 | E | | |
| Encoder systems for motors with DRIVE-CLiQ interface: | | | AS24DQI encoder | | | 1 | B | | |
| | | | AM24DQI encoder | | | 1 | C | | |
| | | | AS20DQI encoder | | | 1 | Q | | |
| | | | AM20DQI encoder | | | 1 | R | | |
| Shaft extension: | | Shaft and flange accuracy: | | Holding brake: | | | | | |
| Feather key | | Tolerance N | | Without | | | | | A |
| Feather key | | Tolerance N | | With | | | | | B |
| Plain shaft | | Tolerance N | | Without | | | | | G |
| Plain shaft | | Tolerance N | | With | | | | | H |
| Degree of protection: | | | IP64 | | | | | | 0 |
| | | | IP65 | | | | | | 1 |
| | | | IP65 and DE flange IP67 | | | | | | 2 |

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 High Inertia – Natural cooling

| Motor type (repeated) | Efficiency 1) | Stall current | Calculated power P_{calc} ⁵⁾ | SINAMICS S120 Motor Module | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|------------------|--|---|--|---|---|---|---|
| | η % | I_0 at M_0 $\Delta T=100$ K A | P_{calc} at M_0 $\Delta T=100$ K kW (hp) | Rated output current ²⁾ I_{rated} A | Booksize format Internal air cooling For other components, see SINAMICS S120 drive system Article No. | Power connector Size | Cable cross- section ³⁾ mm ² | Pre-assembled cable Article No. |
| | | | | Line voltage 380 ... 480 V 3 AC | | | | |
| 1FK7084-3BC71-... | 93 | 8.5 | 4.2 (5.63) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5-N06-.... |
| 1FK7100-3BC71-... | 92 | 8.4 | 3.8 (5.10) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5-N06-.... |
| 1FK7101-3BC71-... | 93 | 12.3 | 5.7 (7.64) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 1.5 | 6FX002-5-N26-.... |
| 1FK7103-3BC71-... | 93 | 14.4 | 7.5 (10.1) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 1.5 | 6FX002-5-N26-.... |
| 1FK7105-3BC71-... | 93 | 20.0 | 10.1 (13.5) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 2.5 | 6FX002-5-N36-.... |
| 1FK7060-3BF71-... | 90 | 4.45 | 1.9 (2.55) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5-N06-.... |
| 1FK7062-3BF71-... | 91 | 5.3 | 2.7 (3.62) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5-N06-.... |
| 1FK7081-3BF71-... | 93 | 8.7 | 3.8 (5.10) | 9 | 6SL3120-TE21-0AD. | 1 | 4 × 1.5 | 6FX002-5-N06-.... |
| 1FK7084-3BF71-... | 93 | 12.1 | 6.3 (8.45) | 18 | 6SL3120-TE21-8AD. | 1 | 4 × 1.5 | 6FX002-5-N06-.... |
| 1FK7101-3BF71-... | 93 | 18.8 | 8.5 (11.4) | 18 | 6SL3120-TE21-8AD. | 1.5 | 4 × 2.5 | 6FX002-5-N36-.... |
| 1FK7103-3BF71-... | 93 | 26.0 | 11.3 (15.2) | 30 | 6SL3120-1TE23-0AD. | 1.5 | 4 × 4 | 6FX002-5-N46-.... |
| 1FK7042-3BK71-... | 89 | 4.4 | 1.9 (2.55) | 5 | 6SL3120-TE15-0AD. | 1 | 4 × 1.5 | 6FX002-5-N06-.... |

| | | | |
|--------------------------------|---|---|------|
| Motor Module: | | | |
| Single Motor Module | 1 | | |
| Double Motor Module | 2 | | |
| Version status | | | |
| Power cable: | | | |
| MOTION-CONNECT 800PLUS | 8 | | |
| MOTION-CONNECT 500 | 5 | | |
| Without brake cores | | C | |
| With brake cores ⁴⁾ | | D | |
| Length code | | | |

For information on the cables, refer to
MOTION-CONNECT connection systems

8

1) Optimum efficiency in continuous duty.

2) With default setting of the pulse frequency.

3) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F). Cable cross-section for brake connection 2 × 1.5 mm².

4) Cable cross-section for brake connection 2 × 1.5 mm².

5) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb\cdot ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 Compact > for Power Modules 230 V 1 AC – Natural cooling

Selection and ordering data

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FK7 Compact synchronous motors for Power Modules 230 V 1 AC | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|---|--------------|---------------------------------|-----------------------------------|---------------------------------|---------------------------------|---|--|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | Article No. | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) | |
| SIMOTICS S-1FK7 Compact for DC link voltage 270 ... 330 V DC – Natural cooling | | | | | | | | | |
| 3000 | 36 | 0.3 (0.40) | 1.15 (0.85) | 1.0 (0.74) | 1.6 | 1FK7032-2AF2-1 ■ ■ ■ ■ | 3 | 0.65 (0.58) | 2.7 (5.95) |
| | | 0.5 (0.67) | 1.6 (1.18) | 1.45 (1.07) | 1.8 | 1FK7034-2AF2-1 ■ ■ ■ ■ | 3 | 0.9 (0.80) | 3.5 (7.72) |
| | 48 | 0.8 (1.07) | 3.0 (2.21) | 2.6 (1.92) | 3.5 | 1FK7042-2AF2-1 ■ ■ ■ ■ | 4 | 2.9 (2.57) | 4.6 (10.1) |
| Encoder systems for motors without DRIVE-CLiQ interface: | | | IC2048S/R encoder | 4 | A | | | | |
| | | | AM2048S/R encoder | 4 | E | | | | |
| | | | Multi-pole resolver | 4 | S | | | | |
| | | | 2-pole resolver | 4 | T | | | | |
| Encoder systems for motors with DRIVE-CLiQ interface: | | | AS24DQI encoder | 1 | B | | | | |
| | | | AM24DQI encoder | 1 | C | | | | |
| | | | AS20DQI encoder | 1 | Q | | | | |
| | | | AM20DQI encoder | 1 | R | | | | |
| | | | R15DQ resolver | 1 | U | | | | |
| | | | R14DQ resolver | 1 | P | | | | |
| Shaft extension: | | | Shaft and flange accuracy: | | | Holding brake: | | | |
| Feather key | | | Tolerance N | | | Without | | | A |
| Feather key | | | Tolerance N | | | With | | | B |
| Plain shaft | | | Tolerance N | | | Without | | | G |
| Plain shaft | | | Tolerance N | | | With | | | H |
| Degree of protection: | | | IP64 | | | 0 | | | |
| | | | IP65 | | | 1 | | | |
| | | | IP65 and DE flange IP67 | | | 2 | | | |

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 Compact > for Power Modules 230 V 1 AC – Natural cooling

| Motor type (repeated) | Efficiency 1) | Stall current | Calculated power P_{calc} ⁵⁾ | SINAMICS S120 Blocksize format | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--|------------------|---------------------------------------|---|---|--|---|--|---------------------------|
| | η | I_0 at M_0 $\Delta T=100$ K | P_{calc} at M_0 $\Delta T=100$ K | Rated output current ²⁾ | PM240-2 Power Module Air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ³⁾ | Pre-assembled cable |
| | % | A | kW (hp) | I_{rated} | Article No. | Size | mm ² | Article No. |
| Line voltage 200 ... 240 V 1 AC | | | | | | | | |
| 1FK7032-2AF21-... | 85 | 1.7 | 0.4 (0.54) | 3.0 | 6SL3210-1PB13-0 L0 | 1 | 4 × 1.5 | 6FX0002-5 G10-.... |
| 1FK7034-2AF21-... | 85 | 1.9 | 0.5 (0.67) | 3.0 | 6SL3210-1PB13-0 L0 | 1 | 4 × 1.5 | 6FX0002-5 G10-.... |
| 1FK7042-2AF21-... | 88 | 3.95 | 0.9 (1.21) | 5.5 | 6SL3210-1PB15-5 L0 | 1 | 4 × 1.5 | 6FX0002-5 G10-.... |
| Line filter: | | | | | | | | |
| Without | | | | | | U | | |
| Integrated | | | | | | A | | |
| Power cable: | | | | | | | | |
| MOTION-CONNECT 800PLUS | | | | | | 8 | | |
| MOTION-CONNECT 500 | | | | | | 5 | | |
| Without brake cores | | | | | | C | | |
| With brake cores ⁴⁾ | | | | | | D | | |
| Length code | | | | | | | | |
| For information on the cables, refer to MOTION-CONNECT connection systems | | | | | | | | |

1) Optimum efficiency in continuous duty.

2) With default setting of the pulse frequency.

3) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

4) Cable cross-section for brake connection 2 × 1.5 mm².

5) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 Compact > for Power Modules 230 V 1 AC – Natural cooling

Selection and ordering data

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FK7 Compact synchronous motors for Power Modules 230 V 1 AC | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|--|--------------|-----------------------------------|------------------------------------|---------------------------------|---------------------------------|---|---|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | Article No. | 10^{-4} kgm ² (10 ⁻³ lb _f -in-s ²) | kg (lb) | |
| SIMOTICS S-1FK7 Compact for DC link voltage 270 ... 330 V DC – Natural cooling | | | | | | | | | |
| 6000 | 20 | 0.05 (0.07) | 0.18 (0.13) | 0.08 (0.06) | 0.5 | 1FK7011-5AK2-1 | 4 | 0.064 (0.06) | 0.9 (1.98) |
| | | 0.1 (0.13) | 0.35 (0.26) | 0.16 (0.12) | 0.5 | 1FK7015-5AK2-1 | 4 | 0.083 (0.07) | 1.1 (2.43) |
| | 28 | 0.38 (0.51) | 0.85 (0.63) | 0.6 (0.44) | 1.4 | 1FK7022-5AK2-1 | 3 | 0.28 (0.25) | 1.8 (3.97) |
| Encoder systems for motors without DRIVE-CLiQ interface: | | | IC2048S/R encoder | 4 | A | | | | |
| | | | AM512S/R encoder (only for 1FK702) | 4 | H | | | | |
| | | | AM16S/R encoder | 4 | J | | | | |
| | | | Multi-pole resolver | 4 | S | | | | |
| | | | 2-pole resolver | 4 | T | | | | |
| Encoder systems for motors with DRIVE-CLiQ interface: (Only for 1FK702) ¹⁾ | | | IC22DQ encoder | 1 | D | | | | |
| | | | AM20DQ encoder | 1 | L | | | | |
| | | | AM15DQ encoder | 1 | V | | | | |
| | | | R15DQ resolver | 1 | U | | | | |
| | | | R14DQ resolver | 1 | P | | | | |
| Shaft extension: | | Shaft and flange accuracy: | | Holding brake: | | | | | |
| Feather key | | Tolerance N | | Without | | | | | |
| Feather key | | Tolerance N | | With | | | | | |
| Plain shaft | | Tolerance N | | Without | | | | | |
| Plain shaft | | Tolerance N | | With | | | | | |
| Degree of protection: | | | | Paint finish: | | | | | |
| IP64 (only for 1FK702) | | | | Without | | | | | 0 |
| IP65 and DE flange IP67 (only for 1FK702) | | | | Without | | | | | 2 |
| IP54 (only for 1FK701), IP64 (only for 1FK702) | | | | With | | | | | 3 |
| IP65 and DE flange IP67 (only for 1FK702) | | | | With | | | | | 5 |

| Motor type (repeated) | Efficiency 1) | Stall current | Calculated power P_{calc} ⁵⁾ | SINAMICS S120 Blocksize format | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|------------------|---------------------------------------|---|---|--|---|--|--------------------------|
| | η | I_0 at M_0 $\Delta T=100$ K | P_{calc} at M_0 $\Delta T=100$ K | Rated output current ²⁾ | PM240-2 Power Module Air cooling For other components, see SINAMICS S120 drive system | Power connector | Cable cross- section ³⁾ | Pre-assembled cable |
| | % | A | kW (hp) | I_{rated} | Article No. | Size | mm ² | Article No. |
| | | | | Line voltage 200 ... 240 V 1 AC | | | | |
| 1FK7011-5AK21-... | 62 | 0.85 | 0.1 (0.13) | 3.0 | 6SL3210-1PB13-0 L0 | 0.5 | 4 × 1.5 | 6FX5002-5DN30-... |
| 1FK7015-5AK21-... | 68 | 0.85 | 0.2 (0.27) | 3.0 | 6SL3210-1PB13-0 L0 | 0.5 | 4 × 1.5 | 6FX5002-5DN30-... |
| 1FK7022-5AK21-... | 88 | 1.8 | 0.5 (0.67) | 3.0 | 6SL3210-1PB13-0 L0 | 1 | 4 × 1.5 | 6FX0002-5 G10-... |
| | | | | Line filter: | | Power cable: | | |
| | | | | Without | U | MOTION-CONNECT 800PLUS | 8 | |
| | | | | Integrated | A | MOTION-CONNECT 500 | 5 | |
| | | | | | | Without brake cores | | C |
| | | | | | | With brake cores ⁴⁾ | | D |
| | | | | | | Length code | | |
| | | | | | | For information on the cables, refer to MOTION-CONNECT connection systems | | |

1) Optimum efficiency in continuous duty.

2) With default setting of the pulse frequency.

3) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

4) Cable cross-section for brake connection 2 × 1.5 mm².5) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 High Dynamic > for Power Modules 230 V 1 AC – Natural cooling

Selection and ordering data

| Rated speed | Shaft height | Rated power | Static torque | Rated torque | Rated current | SIMOTICS S-1FK7 High Dynamic synchronous motors for Power Modules 230 V 1 AC | No. of pole pairs | Moment of inertia Rotor (without brake) | Weight (without brake) |
|--|--------------|---------------------------------------|---------------------------------|---------------------------------------|---------------------------------------|--|--|---|------------------------|
| n_{rated} | SH | P_{rated} at $\Delta T=100$ K | M_0 at $\Delta T=100$ K | M_{rated} at $\Delta T=100$ K | I_{rated} at $\Delta T=100$ K | | p | J | m |
| rpm | | kW (hp) | Nm (lb _f -ft) | Nm (lb _f -ft) | A | Article No. | 10^{-4} kgm ² (10^{-3} lb _f -in-s ²) | kg (lb) | |
| SIMOTICS S-1FK7 High Dynamic for DC link voltage 270 ... 330 V DC – Natural cooling | | | | | | | | | |
| 3000 | 36 | 0.4 (0.54) | 1.3 (0.96) | 1.2 (0.89) | 2.05 | 1FK7033-4CF2-1 | 3 | 0.25 (0.22) | 3.0 (6.61) |
| | 48 | 0.9 (1.21) | 3.3 (2.43) | 3.0 (2.21) | 3.7 | 1FK7043-4CF2-1 | 3 | 1 (0.89) | 6.0 (13.2) |
| Encoder systems for motors without DRIVE-CLiQ interface: | | | IC2048S/R encoder | 4 | A | | | | |
| | | | AM2048S/R encoder | 4 | E | | | | |
| | | | Multi-pole resolver | 4 | S | | | | |
| | | | 2-pole resolver | 4 | T | | | | |
| Encoder systems for motors with DRIVE-CLiQ interface: | | | AS24DQI encoder | 1 | B | | | | |
| | | | AM24DQI encoder | 1 | C | | | | |
| | | | AS20DQI encoder | 1 | Q | | | | |
| | | | AM20DQI encoder | 1 | R | | | | |
| | | | R15DQ resolver | 1 | U | | | | |
| | | | R14DQ resolver | 1 | P | | | | |
| Shaft extension: | | Shaft and flange accuracy: | | Holding brake: | | | | | |
| Feather key | | Tolerance N | | Without | | | | | |
| Feather key | | Tolerance N | | With | | | | | A |
| Plain shaft | | Tolerance N | | Without | | | | | G |
| Plain shaft | | Tolerance N | | With | | | | | H |
| Degree of protection: | | | IP64 | | | | | | 0 |
| | | | IP65 | | | | | | 1 |
| | | | IP65 and DE flange IP67 | | | | | | 2 |

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

SIMOTICS S-1FK7 High Dynamic > for Power Modules 230 V 1 AC – Natural cooling

| Motor type (repeated) | Efficiency 1) | Stall current | Calculated power P_{calc} ⁵⁾ | SINAMICS S120 blocksize format | | Power cable with complete shield Motor connection (and brake connection) via power connector | | |
|--------------------------|------------------|--|---|--|---|---|---|---|
| | η % | I_0 at M_0 $\Delta T=100$ K A | P_{calc} at M_0 $\Delta T=100$ K kW (hp) | Rated output current ²⁾ I_{rated} A | PM240-2 Power Module Air cooling For other components, see SINAMICS S120 drive system Article No. | Power connector Size | Cable cross- section ³⁾ mm ² | Pre-assembled cable Article No. |
| | | | | Line voltage 200 ... 240 V 1 AC | | | | |
| 1FK7033-4CF21-... | 86 | 2.1 | 0.4 (0.54) | 3.0 | 6SL3210-1PB13-0 L0 | 1 | 4 × 1.5 | 6FX0002-5 G10-... |
| 1FK7043-4CF21-... | 88 | 3.9 | 1 (1.34) | 5.5 | 6SL3210-1PB15-5 L0 | 1 | 4 × 1.5 | 6FX0002-5 G10-... |
| | | | | Line filter: | | Power cable: | | |
| | | | | Without | U | MOTION-CONNECT 800PLUS 8 | | |
| | | | | Integrated | A | MOTION-CONNECT 500 5 | | |
| | | | | | | Without brake cores C | | |
| | | | | | | With brake cores ⁴⁾ D | | |
| | | | | | | Length code | | |
| | | | | | | For information on the cables, refer to MOTION-CONNECT connection systems | | |

1) Optimum efficiency in continuous duty.

2) With default setting of the pulse frequency.

3) The current carrying capacity of the power cables complies with EN 60204-1 for installation type C, for continuous duty at an ambient air temperature of 40 °C (104 °F).

4) Cable cross-section for brake connection 2 × 1.5 mm².

5) $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

SIMOTICS servomotors

SIMOTICS S synchronous motors for SINAMICS S120

Built-in holding brakes for SIMOTICS S-1FT7/S-1FK7 motors

Overview

Many drives need a holding brake with an emergency stop function for safety reasons or to meet process requirements.

The permanent magnet single-surface brakes used on the SIMOTICS S-1FT7/S-1FK7 motors function according to the closed-circuit principle. The magnetic field of the permanent-magnet exerts a tension on the brake anchor plate, i.e. in a condition of zero current, the brake is closed and the motor shaft thereby stopped. When the rated voltage of 24 V DC \pm 10% is applied to the brake, current flows through the coil and produces a counter-field that cancels the pull of the permanent-magnet, causing the brake to release.

In the event of an emergency stop or power outage, approximately 2000 braking operations can be performed with maximum switched energy without causing excessive wear on the holding brake (condition: maximum external moment of inertia = moment of inertia of motor and n_{\max} type-specific).

The holding brake is not an operational or safety brake.

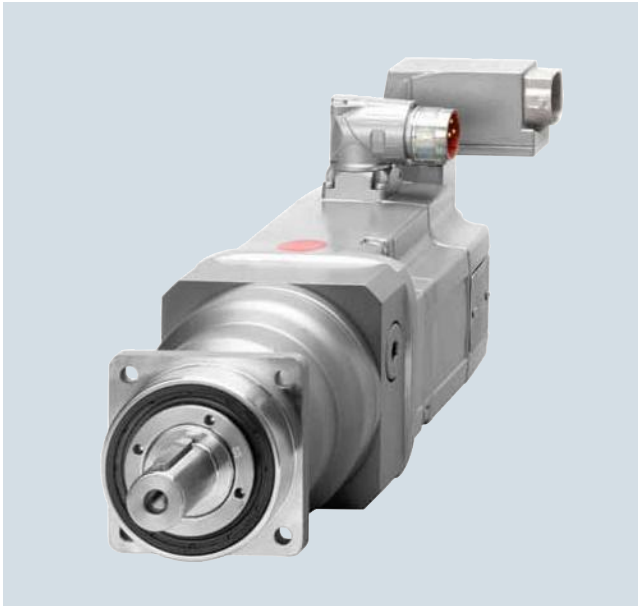
In order to avoid switching overvoltages and any related effects on the plant environment, the brake cables must be connected externally with a varistor. The connection is made via the power connector or the terminal box.

When connected to the SINAMICS S120 drive system, this overvoltage protection is provided by the SINAMICS system.

Technical specifications

| Motor Shaft height SH | Type | Built-in holding brake | | | | | |
|---|-------------------------------|---|---------------------|-------------------------------------|-------------------------------------|---|--|
| | | Holding torque ¹⁾ Nm (lb _f -ft) | Direct current A | Opening time with varistor ms | Closing time with varistor ms | Moment of inertia 10 ⁻⁴ kgm ² (10 ⁻³ lb _f -in ²) | Maximum switched energy per brake operation from $n = 3000$ rpm J |
| SIMOTICS S-1FT7 with permanent-magnet brake, without backlash, and SIMOTICS S-1FK7 with option N24 | | | | | | | |
| 36 | 1FT703 | 3 (2.21) | 0.3 | 60 | 25 | 0.12 (0.11) | 30 |
| 48 | 1FT704 | 8 (5.90) | 0.6 | 90 | 30 | 0.87 (0.77) | 270 |
| 63 | 1FT706 | 18 (13.3) | 0.8 | 150 | 50 | 2.84 (2.51) | 880 |
| 80 | 1FT708 | 48 (35.4) | 1.0 | 220 | 65 | 15.4 (13.6) | 1900 |
| 100 | 1FT710 | 85 (62.7) | 1.6 | 250 | 70 | 27.6 (24.4) | 5300 |
| 132 | 1FT713 | 140 (103) | 1.8 | 350 | 70 | 51.0 (45.1) | 9800 |
| SIMOTICS S-1FK7 Compact/High Dynamic/High Inertia motors with permanent magnet brake, without backlash | | | | | | | |
| 10 | 1FK701 | 0.4 (0.30) | 0.3 | 30 | 20 | 0.019 (0.02) | 2 |
| 28 | 1FK7022 | 1.0 (0.74) | 0.3 | 30 | 20 | 0.07 (0.06) | 8 |
| 36 | 1FK703 | 1.9 (1.40) | 0.3 | 50 | 30 | 0.098 (0.09) | 40 |
| 48 | 1FK704 | 4.0 (2.95) | 0.5 | 70 | 30 | 0.32 (0.28) | 150 |
| 63 | 1FK706 | 13 (9.59) | 0.8 | 100 | 50 | 0.99 (0.88) | 380 |
| 80 | 1FK708 | 22 (16.2) | 0.9 | 200 | 60 | 3.28 (2.90) | 1400 |
| 100 | 1FK7100 | 23 (17.0) | 1.0 | 300 | 70 | 7.5 (6.64) | 3380 |
| 100 | 1FK7101 1FK7103 1FK7105 | 43 (31.7) | 1.0 | 300 | 70 | 7.5 (6.64) | 3380 |

¹⁾ The holding torque is the highest permissible torque with which the closed brake can be loaded in steady-state operation without slip (holding function when motor is stationary).

Overview

SIMOTICS S-1FT7 motor with mounted SP+ series planetary gearbox

SIMOTICS S-1FT7 motors can be combined with planetary gearboxes to form compact coaxial drive units. The gearboxes are flanged directly to the drive end of the motors.

When selecting the gearbox, ensure that its maximum permissible input speed is not exceeded by the maximum speed of the motor. In the case of high operating frequencies, allowance must be made for the factor f_2 (see Configuration Manual, SIMOTICS S-1FT7 synchronous motors). The frictional losses of the gearbox must always be taken into account when engineering geared drives.

The gearboxes are only available in non-balanced design.

Benefits

- High efficiency
Single-stage: > 97%
Two-stage: > 94%
- Minimum torsional backlash
Single-stage: ≤ 4 arcmin
Two-stage: ≤ 6 arcmin
- Power transmission from the central sun wheel via planet wheels
- No shaft deflections in the planet wheel set due to symmetrical force distribution
- Very low moment of inertia and thus short acceleration times of the motors
- Output shaft bearings dimensioned for high cantilever and axial loads with preloaded tapered-roller bearings
- The gearboxes are connected to the motor shaft via an integrated clamping hub. A plain motor shaft extension is necessary for this purpose. Shaft and flange accuracy tolerance N in accordance with DIN 42955 and vibration magnitude grade A in accordance with EN 60034-14 are sufficient. The motor flange is adapted by means of adapter plates.
- Output shaft of gearbox exactly coaxial with the motor
- The gearboxes are enclosed (seal between gearbox and motor) and filled with oil at the factory. They are lubricated and sealed for their service life.
The gearboxes are suitable for all mounting positions.
- Degree of protection of gearbox: IP65
- Small dimensions
- Low weight

Integration

SIMOTICS S-1FT703 to S-1FT713 motors can be supplied ex works (Siemens AG) complete with flange-mounted planetary gearbox.

The gearboxes assigned to the individual motors and gear ratios i available for these motor/gearbox combinations are listed in the subsequent selection table. The maximum permissible input speed of the gearbox (this is the same as the maximum motor speed) must be taken into account when a gearbox is selected.

The motor/gearbox combinations listed in the selection tables are mainly intended for cycle operation S3-60% (ON time ≤ 60 % and ≤ 20 min). Reduced maximum motor speeds and output torques apply for use in S1 continuous duty (ON time > 60 % or > 20 min). The gearbox temperature must not exceed 90 °C (194 °F).

Follow the instructions contained in the Configuration Manual for SIMOTICS S-1FT7 synchronous motors when assigning gearboxes to the motor.

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series SP+ for SIMOTICS S-1FT7

Selection and ordering data

| Motor Type | Planetary gearbox Single-stage | | | Available gear ratio $i =$ | | | | Motor speed, max. S3-60% n_{G1} (n_1) rpm | Output torque, max. S3-60% M_{G2} (T_{2B}) Nm (lb _r -ft) | Radial output shaft loading, max. ¹⁾ F_r (F_{2Rmax}) N (lb _f) | Axial output shaft loading, max. ¹⁾ F_a (F_{2Amax}) N (lb _f) |
|--|-----------------------------------|---------------------------------|--|-------------------------------|------------|------------|------------|--|--|--|---|
| | Type | Torsional backlash arcmin | Gearbox weight, approx. kg (lb) | 4 | 5 | 7 | 10 | | | | |
| 1FT7034 | SP 060S-MF1 | ≤ 4 | 1.9 (4.19) | ✓ | ✓ | ✓ | – | 6000 | 40 (29.5) | 2700 (607) | 2400 (540) |
| 1FT7034 1FT7036 1FT7042 1FT7044 1FT7046 | SP 075S-MF1 | ≤ 4 | 3.9 (8.60) | – | – | – | ✓ | 6000 | 110 (81.1) (90 (66.4) for $i = 10$) | 4000 (899) | 3350 (753) |
| 1FT7046 1FT7062 1FT7064 1FT7065 1FT7066 1FT7067 1FT7068 | SP 100S-MF1 | ≤ 3 | 7.7 (17.0) | – | – | – | ✓ | 4500 | 300 (221) (225 (166) for $i = 10$) | 6300 (1416) | 5650 (1270) |
| 1FT7065 1FT7067 1FT7068 1FT7082 1FT7084 1FT7085 1FT7086 1FT7087 | SP 140S-MF1 | ≤ 3 | 17.2 (37.9) | – | – | – | ✓ | 4000 | 600 (443) (480 (354) for $i = 10$) | 9450 (2124) | 9870 (2219) |
| 1FT7085 1FT7086 1FT7087 1FT7102 1FT7105 1FT7108 | SP 180S-MF1 | ≤ 3 | 34 (75.0) | – | – | – | ✓ | 3500 | 1100 (811) (880 (649) for $i = 10$) | 14700 (3305) | 14150 (3181) |
| 1FT7105 1FT7108 1FT7132 1FT7134 1FT7136 1FT7138 | SP 210S-MF1 | ≤ 3 | 56 (123) | – | – | – | ✓ | 2500 | 2500 (1844) (2400 (1770) for $i = 7$ 1900 (1401) for $i = 10$) | 21000 (4721) | 30000 (6744) |
| 1FT7134 1FT7136 1FT7138 | SP 240S-MF1 | ≤ 3 | 83 (183) | – | – | – | ✓ | 2500 | 4500 (3319) 4300 (3171) for $i = 7$ 3400 (2507) for $i = 10$) | 30000 (6744) | 33000 (7419) |
| Gear shaft | | | | Order code | | | | | | | |
| With feather key | | | | J02 | J03 | J05 | J09 | | | | |
| Without feather key | | | | J22 | J23 | J25 | J29 | | | | |

Preconditions:

SP+ planetary gearboxes can be mounted with the following motor versions:

- Flange compatible with 1FT6/1FK7
- Plain motor shaft extension, shaft and flange accuracy Tolerance N, without/with holding brake
- Vibration severity grade A/IP65 degree of protection

SP+ planetary gearboxes can therefore only be ordered with these motors: **1FT7...-...1-..G1**, **1FT7...-...1-..H1**, **1FT7...-...4-..G1**, **1FT7...-...4-..H1**

✓ Possible

– Not possible

¹⁾ Referred to output shaft center.

When ordering a motor with gearbox, **-Z** must be added to the Article No.

Example:

- 1FT7042 motor without holding brake
- With single-stage SP+ planetary gearbox
- With $i = 5$ and gear shaft without feather key

1FT7042-5AF74-1NG1-**Z**

J23

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series SP+ for SIMOTICS S-1FT7

Technical specifications

| SIMOTICS S-1FT7 motor with SP+ planetary gearbox | | | | | | | | | |
|--|------------|----------------------------------|----------------------------------|---|---|---|---|---|---|
| Single-stage Type | Gear ratio | Motor speed | Output torque | Moments of inertia of gearboxes (referred to the drive) | | | | | |
| Type | <i>i</i> | Continuous duty S1 ¹⁾ | | 1FT703. | 1FT704. | 1FT706. | 1FT708. | 1FT710. | 1FT713. |
| | | n_{rated1} | M_{rated2} (T_{2rated}) | J_1 | J_1 | J_1 | J_1 | J_1 | J_1 |
| | | rpm | Nm (lb _f -ft) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) |
| SP 060S-MF1 | 4 | 3300 | 26 (19.2) | 0.22 (0.08) | – | – | – | – | – |
| | 5 | 3300 | 26 (19.2) | 0.20 (0.07) | – | – | – | – | – |
| | 7 | 4000 | 26 (19.2) | 0.18 (0.06) | – | – | – | – | – |
| SP 075S-MF1 | 4 | 2900 | 75 (55.3) | 0.61 (0.21) | 0.78 (0.27) | – | – | – | – |
| | 5 | 2900 | 75 (55.3) | 0.51 (0.17) | 0.68 (0.23) | – | – | – | – |
| | 7 | 3100 | 75 (55.3) | 0.42 (0.14) | 0.59 (0.20) | – | – | – | – |
| | 10 | 3100 | 52 (38.4) | 0.38 (0.13) | 0.54 (0.19) | – | – | – | – |
| SP 100S-MF1 | 4 | 2500 | 180 (133) | – | – | 3.04 (1.04) | – | – | – |
| | 5 | 2500 | 175 (129) | – | – | 2.61 (0.90) | – | – | – |
| | 7 | 2800 | 170 (125) | – | – | 2.29 (0.78) | – | – | – |
| | 10 | 2800 | 120 (88.5) | – | 1.38 (0.47) | 2.07 (0.71) | – | – | – |
| SP 140S-MF1 | 4 | 2100 | 360 (266) | – | – | – | 11.0 (3.76) | – | – |
| | 5 | 2100 | 360 (266) | – | – | – | 9.95 (3.40) | – | – |
| | 7 | 2600 | 360 (266) | – | – | – | 9.01 (3.08) | – | – |
| | 10 | 2600 | 220 (162) | – | – | 5.28 (1.80) | 8.44 (2.88) | – | – |
| SP 180S-MF1 | 4 | 1500 | 750 (553) | – | – | – | – | 33.9 (11.6) | – |
| | 5 | 1500 | 750 (553) | – | – | – | – | 27.9 (9.53) | – |
| | 7 | 2300 | 750 (553) | – | – | – | – | 22.2 (7.59) | – |
| | 10 | 2300 | 750 (553) | – | – | – | 19.2 (6.56) | 19.2 (6.56) | – |
| SP 210S-MF1 | 4 | 1200 | 1500 (1106) | – | – | – | – | – | 94.3 (32.2) |
| | 5 | 1500 | 1500 (1106) | – | – | – | – | – | 76.9 (26.3) |
| | 7 | 1700 | 1400 (1033) | – | – | – | – | – | 61.5 (21.0) |
| | 10 | 2000 | 1000 (738) | – | – | – | – | 53.1 (18.1) | 53.1 (18.1) |
| SP 240S-MF1 | 10 | 1700 | 1300 (959) | – | – | – | – | – | 70.8 (24.2) |

¹⁾ The limit values in the table apply for S1 continuous duty (ON time > 60 % or > 20 min) for a maximum gearbox temperature of 90 °C (194 °F).

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series SP+ for SIMOTICS S-1FT7

Selection and ordering data

| Motor Type | Planetary gearbox Two-stage | | | Available gear ratio $i =$ | | | | | Motor speed, max. S3-60% n_{G1} (n_1) rpm | Output torque, max. S3-60% M_{G2} (T_{2B}) Nm (lb _f -ft) | Radial output shaft loading, max. 1) F_r (F_{2Rmax}) N (lb _f) | Axial output shaft loading, max. 1) F_a (F_{2Amax}) N (lb _f) | | | | | | | |
|--------------------|--------------------------------|---------------------------------|--|-------------------------------|-----|---------------|----|----|---|--|---|--|---|---|---|------|--|-----------------|-----------------|
| | Type | Torsional backlash arcmin | Gearbox weight, approx. kg (lb) | 16 | 20 | 28 | 40 | 50 | | | | | | | | | | | |
| 1FT7034 1FT7036 | SP 075S-MF2 | ≤ 6 | 3.6 (7.94) | ✓ | ✓ | ✓ | – | – | 6000 | 110 (81.1) | 4000 (899) | 3350 (753) | | | | | | | |
| 1FT7042 | | | | ✓ | – | – | – | – | | | | | | | | | | | |
| 1FT7034 1FT7036 | | | | SP 100S-MF2 | ≤ 5 | 7.9 (17.4) | – | – | | | | | – | ✓ | ✓ | 4500 | 300 (221) | 6300 (1416) | 5650 (1270) |
| 1FT7042 | – | ✓ | ✓ | | | | ✓ | ✓ | | | | | | | | | | | |
| 1FT7044 | ✓ | ✓ | ✓ | | | | – | – | | | | | | | | | | | |
| 1FT7046 | ✓ | ✓ | – | | | | – | – | | | | | | | | | | | |
| 1FT7062 | ✓ | ✓ | – | | | | – | – | | | | | | | | | | | |
| 1FT7064 | ✓ | – | – | | | | – | – | | | | | | | | | | | |
| 1FT7044 1FT7046 | SP 140S-MF2 | ≤ 5 | 17 (37.5) | – | – | – | ✓ | ✓ | 4000 | 600 (443) | 9450 (2124) | 9870 (2219) | | | | | | | |
| 1FT7046 | | | | – | – | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 1FT7062 | | | | – | – | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 1FT7064 | | | | – | ✓ | ✓ | – | – | | | | | | | | | | | |
| 1FT7065 | | | | ✓ | ✓ | – | – | – | | | | | | | | | | | |
| 1FT7066 | | | | ✓ | ✓ | – | – | – | | | | | | | | | | | |
| 1FT7067 | | | | ✓ | ✓ | – | – | – | | | | | | | | | | | |
| 1FT7068 | | | | ✓ | ✓ | – | – | – | | | | | | | | | | | |
| 1FT7082 | | | | ✓ | ✓ | – | – | – | | | | | | | | | | | |
| 1FT7084 | ✓ | – | – | – | – | | | | | | | | | | | | | | |
| 1FT7064 1FT7065 | SP 180S-MF2 | ≤ 5 | 36.4 (80.3) | – | – | – | ✓ | ✓ | 4000 | 1100 (811) | 14700 (3305) | 14150 (3181) | | | | | | | |
| 1FT7066 | | | | – | – | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 1FT7067 | | | | – | ✓ | ✓ | – | – | | | | | | | | | | | |
| 1FT7068 | | | | – | – | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 1FT7082 | | | | – | – | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 1FT7084 | | | | – | ✓ | ✓ | – | – | | | | | | | | | | | |
| 1FT7085 | | | | ✓ | – | – | – | – | | | | | | | | | | | |
| 1FT7086 | | | | ✓ | ✓ | – | – | – | | | | | | | | | | | |
| 1FT7102 | | | | ✓ | ✓ | – | – | – | | | | | | | | | | | |
| 1FT7084 1FT7085 | | | | SP 210S-MF2 | ≤ 5 | 55 (121) | – | – | | | | | – | ✓ | ✓ | 3500 | 2400 (1770) (2500 (1844) for $i = 20$) | 21000 (4721) | 30000 (6744) |
| 1FT7086 | | | | | | | – | ✓ | | | | | ✓ | – | – | | | | |
| 1FT7087 | – | ✓ | ✓ | | | | – | – | | | | | | | | | | | |
| 1FT7102 | – | – | ✓ | | | | – | – | | | | | | | | | | | |
| 1FT7105 | ✓ | ✓ | – | | | | – | – | | | | | | | | | | | |
| 1FT7108 | ✓ | – | – | | | | – | – | | | | | | | | | | | |
| 1FT7085 1FT7086 | SP 240S-MF2 | ≤ 5 | 80.6 (178) | – | – | – | ✓ | ✓ | 3500 | 4500 (3319) (4000 (2950) for $i = 40$ 4300 (3172) for $i = 50$) | 30000 (6744) | 33000 (7419) | | | | | | | |
| 1FT7102 | | | | – | – | – | ✓ | ✓ | | | | | | | | | | | |
| 1FT7105 | | | | – | – | ✓ | ✓ | – | | | | | | | | | | | |
| 1FT7108 | | | | – | ✓ | ✓ | – | – | | | | | | | | | | | |
| 1FT7132 | | | | ✓ | ✓ | – | – | – | | | | | | | | | | | |
| 1FT7134 | | | | ✓ | – | – | – | – | | | | | | | | | | | |
| 1FT7136 | | | | – | – | – | – | – | | | | | | | | | | | |

| Gear shaft | Order code | | | | |
|---------------------|------------------|-----|-----|-----|-----|
| | With feather key | J12 | J13 | J15 | J16 |
| Without feather key | J32 | J33 | J35 | J36 | J37 |

Preconditions, see page 8/54.

✓ Possible

– Not possible

1) Referred to output shaft center.

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series SP+ for SIMOTICS S-1FT7

Technical specifications

| SIMOTICS S-1FT7 motor with SP+ planetary gearbox | | | | | | | | | |
|--|------------|----------------------------------|----------------------------------|---|---|---|---|---|---|
| Two-stage Type | Gear ratio | Motor speed | Output torque | Moments of inertia of gearboxes (referred to the drive) | | | | | |
| Type | i | Continuous duty S1 ¹⁾ | | 1FT703. | 1FT704. | 1FT706. | 1FT708. | 1FT710. | 1FT713. |
| | | n_{rated1} | M_{rated2} (T_{2rated}) | J_1 | J_1 | J_1 | J_1 | J_1 | J_1 |
| | | rpm | Nm (lb _f -ft) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) |
| SP 075S-MF2 | 16 | 3500 | 75 (55.3) | 0.23 (0.08) | 0.55 (0.19) | – | – | – | – |
| | 20 | 3500 | 75 (55.3) | 0.20 (0.07) | – | – | – | – | – |
| | 28 | 3500 | 75 (55.3) | 0.18 (0.06) | – | – | – | – | – |
| SP 100S-MF2 | 16 | 3100 | 180 (133) | – | 0.81 (0.28) | 2.18 (0.75) | – | – | – |
| | 20 | 3100 | 180 (133) | 0.54 (0.19) | 0.70 (0.24) | 2.07 (0.71) | – | – | – |
| | 28 | 3100 | 180 (133) | 0.43 (0.15) | 0.60 (0.21) | – | – | – | – |
| | 40 | 3100 | 180 (133) | 0.38 (0.13) | 0.55 (0.19) | – | – | – | – |
| | 50 | 3500 | 175 (129) | 0.38 (0.13) | 0.54 (0.19) | – | – | – | – |
| SP 140S-MF2 | 16 | 2900 | 360 (266) | – | – | 3.19 (1.09) | 10.3 (3.52) | – | – |
| | 20 | 2900 | 360 (266) | – | – | 2.71 (0.93) | 9.77 (3.34) | – | – |
| | 28 | 2900 | 360 (266) | – | 1.65 (0.56) | 2.34 (0.80) | – | – | – |
| | 40 | 2900 | 360 (266) | – | 1.40 (0.48) | 2.10 (0.72) | – | – | – |
| | 50 | 3200 | 360 (266) | – | 1.39 (0.48) | 2.08 (0.71) | – | – | – |
| SP 180S-MF2 | 16 | 2700 | 750 (553) | – | – | – | 12.4 (4.24) | 13.5 (4.61) | – |
| | 20 | 2700 | 750 (553) | – | – | – | 10.9 (3.73) | 12.0 (4.10) | – |
| | 28 | 2700 | 750 (553) | – | – | 6.32 (2.16) | 9.48 (3.24) | – | – |
| | 40 | 2700 | 750 (553) | – | – | 5.51 (1.88) | 8.67 (2.96) | – | – |
| | 50 | 2900 | 750 (553) | – | – | 5.45 (1.86) | 8.61 (2.94) | – | – |
| SP 210S-MF2 | 16 | 2500 | 1500 (1106) | – | – | – | – | 34.5 (11.8) | – |
| | 20 | 2500 | 1500 (1106) | – | – | – | – | 31.5 (10.8) | – |
| | 28 | 2500 | 1500 (1106) | – | – | – | 30.0 (10.3) | 30.0 (10.3) | – |
| | 40 | 2500 | 1500 (1106) | – | – | – | 28.5 (9.74) | – | – |
| | 50 | 2500 | 1500 (1106) | – | – | – | 28.3 (9.67) | – | – |
| SP 240S-MF2 | 16 | 2300 | 2500 (1844) | – | – | – | – | – | 39.2 (13.4) |
| | 20 | 2500 | 2500 (1844) | – | – | – | – | 34.6 (11.8) | 34.6 (11.8) |
| | 28 | 2500 | 2500 (1844) | – | – | – | – | 30.5 (10.4) | – |
| | 40 | 2500 | 2500 (1844) | – | – | – | – | 28.2 (9.64) | – |
| | 50 | 2500 | 2500 (1844) | – | – | – | 27.9 (9.53) | 27.9 (9.53) | – |

¹⁾ The limit values in the table apply for S1 continuous duty (ON time > 60 % or > 20 min) for a maximum gearbox temperature of 90 °C (194 °F).

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series SP+ for SIMOTICS S-1FK7

Overview



SIMOTICS S-1FK7 motor with mounted SP+ planetary gearbox

SIMOTICS S-1FK7 motors can easily be combined with planetary gearboxes to form compact coaxial drive units. The gearboxes are flanged directly to the drive end of the motors.

When selecting the gearbox, ensure that its maximum permissible input speed is not exceeded by the maximum speed of the motor. In the case of high operating frequencies, allowance must be made for the factor f_2 (see Configuration Manual, SIMOTICS S-1FK7 synchronous motors). The frictional losses of the gearbox must always be taken into account when engineering geared drives.

The gearboxes are only available in non-balanced design.

Benefits

- High efficiency
Single-stage: > 97%
Two-stage: > 94%
- Minimum torsional backlash
Single-stage: ≤ 4 arcmin
Two-stage: ≤ 6 arcmin
- Power transmission from the central sun wheel via planet wheels
- No shaft deflections in the planet wheel set due to symmetrical force distribution
- Very low moment of inertia and thus short acceleration times of the motors
- Output shaft bearings dimensioned for high cantilever and axial loads with preloaded tapered-roller bearings
- The gearboxes are connected to the motor shaft via an integrated clamping hub. A plain motor shaft extension is necessary for this purpose. Shaft and flange accuracy tolerance N in accordance with DIN 42955 and vibration magnitude grade A in accordance with EN 60034-14 are sufficient. The motor flange is adapted by means of adapter plates.
- Output shaft of gearbox exactly coaxial with the motor
- The gearboxes are enclosed (seal between gearbox and motor) and filled with oil at the factory. They are lubricated and sealed for their service life.
The gearboxes are suitable for all mounting positions.
- Degree of protection of gearbox: IP65
- Small dimensions
- Low weight

Integration

SIMOTICS S-1FK7 motors can be supplied ex works (Siemens AG) in the shaft heights 28 to 100, complete with flange-mounted planetary gearbox.

The gearboxes assigned to the individual motors and gear ratios i available for these motor/gearbox combinations are listed in the subsequent selection table. The maximum permissible input speed of the gearbox (this is the same as the maximum motor speed) must be taken into account when a gearbox is selected.

The motor/gearbox combinations listed in the selection table are mainly intended for cycle operation S3-60% (ON time ≤ 60 % and ≤ 20 min). Reduced maximum motor speeds and output torques apply for use in S1 continuous duty (ON time > 60 % or > 20 min). The gearbox temperature must not exceed 90 °C (194 °F).

Follow the instructions contained in the Configuration Manual for SIMOTICS S-1FK7 synchronous motors when assigning gearboxes to the motor.

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series SP+ for SIMOTICS S-1FK7

Selection and ordering data

| Motor | Planetary gearbox Single-stage | | | Available gear ratio $i =$ | | | | Motor speed, max. S3-60% n_{G1} (n_1) rpm | Output torque, max. S3-60% M_{G2} (T_{2B}) Nm (lb _f -ft) | Radial output shaft loading, max. ¹⁾ F_r (F_{2Rmax}) N (lb _f) | Axial output shaft loading, max. ¹⁾ F_a (F_{2Amax}) N (lb _f) |
|---------------------|--------------------------------|------------------------------|------------------------------------|----------------------------|-----|-----|-----|--|--|---|--|
| | Type | Torsional backlash arcmin | Gearbox weight, approx. kg (lb) | 4 | 5 | 7 | 10 | | | | |
| 1FK7022 | SP 060S-MF1 | ≤ 4 | 1.9 (4.19) | ✓ | ✓ | ✓ | ✓ | 6000 | 40 (29.5) (32 (23.6) for $i = 10$) | 2700 (607) | 2400 (540) |
| 1FK7032 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7033 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7034 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7040 | SP 075S-MF1 | ≤ 4 | 3.9 (8.60) | ✓ | ✓ | ✓ | ✓ | 6000 | 110 (81.1) (90 (66.4) for $i = 10$) | 4000 (899) | 3350 (753) |
| 1FK7042 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7043 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7044 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7060 | SP 100S-MF1 | ≤ 3 | 7.7 (17.0) | ✓ | ✓ | ✓ | ✓ | 4500 | 300 (221) (225 (166) for $i = 10$) | 6300 (1416) | 5650 (1270) |
| 1FK7061 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7062 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7063 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7064 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7080 | SP 140S-MF1 | ≤ 3 | 17.2 (37.9) | ✓ | ✓ | ✓ | ✓ | 4000 | 600 (443) (480 (354) for $i = 10$) | 9450 (2124) | 9870 (2219) |
| 1FK7081 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7083 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7084 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7085 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7086 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7100 | SP 180S-MF1 | ≤ 3 | 34 (75.0) | ✓ | ✓ | ✓ | ✓ | 3500 | 1100 (811) (880 (649) for $i = 10$) | 14700 (3305) | 14150 (3181) |
| 1FK7101 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7103 | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7105 | | | | ✓ | ✓ | ✓ | – | | | | |
| 1FK7105 | SP 210S-MF1 | ≤ 3 | 56 (123) | – | – | – | ✓ | 2500 | 2500 (1844) (2400 (1770) for $i = 7$ 1900 (1401) for $i = 10$) | 21000 (4721) | 30000 (6744) |
| Gear shaft | | | | Order code | | | | | | | |
| With feather key | | | | J02 | J03 | J05 | J09 | | | | |
| Without feather key | | | | J22 | J23 | J25 | J29 | | | | |

Preconditions:

SP+ planetary gearboxes can be mounted with the following motor versions:

- Plain motor shaft extension, shaft and flange accuracy tolerance N, without/with holding brake
- IP65 degree of protection and anthracite paint finish

SP+ planetary gearboxes can therefore only be ordered with these motors:

1FK7 . . . -2 A 1 Compact
1FK7 . . . -3 B 1 High Inertia
1FK7 . . . -4 C 1 High Dynamic
G without brake
H with brake

or

1FK7 02 . -5 A G 5
1FK7 02 . -5 A H 5

✓ Possible

– Not possible

¹⁾ Referred to output shaft center.

When ordering a motor with gearbox, **-Z** must be added to the Article No.

Example:

1FK7042 motor without holding brake
 With single-stage SP+ planetary gearbox
 with $i = 7$ and gear shaft without feather key.
1FK7042-2AF74-1AG1-Z
J25

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series SP+ for SIMOTICS S-1FK7

Technical specifications

| SIMOTICS S-1FK7 motor with SP+ planetary gearbox | | | | | | | | | |
|--|---------------------|--|--|---|---|---|---|---|---|
| Single-stage Type | Gear ratio <i>i</i> | Motor speed <i>n</i> _{rated1} rpm | Output torque Continuous duty S1 ¹⁾ <i>M</i> _{rated2} (<i>T</i> _{rated}) Nm (lb _f -ft) | Moments of inertia of gearboxes (referred to the drive) | | | | | |
| | | | | 1FK702. | 1FK703. | 1FK704. | 1FK706. | 1FK708. | 1FK710. |
| | | | | <i>J</i> ₁ | <i>J</i> ₁ | <i>J</i> ₁ | <i>J</i> ₁ | <i>J</i> ₁ | <i>J</i> ₁ |
| | | | | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) | kgcm ² (lb _f -in ²) |
| SP 060S-MF1 | 4 | 3300 | 26 (19.2) | 0.15 (0.05) | 0.22 (0.08) | – | – | – | – |
| | 5 | 3300 | 26 (19.2) | 0.12 (0.04) | 0.20 (0.07) | – | – | – | – |
| | 7 | 4000 | 26 (19.2) | 0.10 (0.03) | 0.18 (0.06) | – | – | – | – |
| | 10 | 4000 | 17 (12.5) | 0.09 (0.03) | 0.17 (0.06) | – | – | – | – |
| SP 075S-MF1 | 4 | 2900 | 75 (55.3) | – | – | 0.78 (0.27) | – | – | – |
| | 5 | 2900 | 75 (55.3) | – | – | 0.68 (0.23) | – | – | – |
| | 7 | 3100 | 75 (55.3) | – | – | 0.59 (0.20) | – | – | – |
| | 10 | 3100 | 52 (38.4) | – | – | 0.54 (0.19) | – | – | – |
| SP 100S-MF1 | 4 | 2500 | 180 (133) | – | – | – | 3.04 (1.04) | – | – |
| | 5 | 2500 | 175 (129) | – | – | – | 2.61 (0.89) | – | – |
| | 7 | 2800 | 170 (125) | – | – | – | 2.29 (0.78) | – | – |
| | 10 | 2800 | 120 (88.5) | – | – | – | 2.07 (0.71) | – | – |
| SP 140S-MF1 | 4 | 2100 | 360 (266) | – | – | – | – | 11.0 (3.76) | – |
| | 5 | 2100 | 360 (266) | – | – | – | – | 9.95 (3.40) | – |
| | 7 | 2600 | 360 (266) | – | – | – | – | 9.01 (3.08) | – |
| | 10 | 2600 | 220 (162) | – | – | – | – | 8.44 (2.88) | – |
| SP 180S-MF1 | 4 | 1500 | 750 (553) | – | – | – | – | – | 33.9 (11.6) |
| | 5 | 1500 | 750 (553) | – | – | – | – | – | 27.9 (9.53) |
| | 7 | 2300 | 750 (553) | – | – | – | – | – | 22.2 (7.59) |
| | 10 | 2300 | 750 (553) | – | – | – | – | – | 19.2 (6.56) |
| SP 210S-MF1 | 10 | 2000 | 1000 (738) | – | – | – | – | – | 53.1 (18.1) |

¹⁾ The limit values in the table apply for S1 continuous duty (ON time > 60 % or > 20 min) for a maximum gearbox temperature of 90 °C (194 °F).

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series SP+ for SIMOTICS S-1FK7

Selection and ordering data

| Motor | Planetary gearbox Two-stage | | | Available gear ratio $i =$ | | | | | Motor speed, max. S3-60% n_{G1} | Output torque, max. S3-60% M_{G2} | Radial output shaft loading, max. ¹⁾ F_r | Axial output shaft loading, max. ¹⁾ F_a |
|---------|-----------------------------|------------------------------|------------------------------------|----------------------------|----|----|----|----|--------------------------------------|--|--|---|
| | Type | Torsional backlash arcmin | Gearbox weight, approx. kg (lb) | 16 | 20 | 28 | 40 | 50 | | | | |
| 1FK7022 | SP 060S-MF2 | ≤ 6 | 2 (4.41) | ✓ | ✓ | ✓ | – | – | 6000 | 40 (29.5) | 2700 (607) | 2400 (540) |
| 1FK7032 | | | | ✓ | ✓ | – | – | – | | | | |
| 1FK7033 | | | | ✓ | ✓ | – | – | – | | | | |
| 1FK7022 | SP 075S-MF2 | ≤ 6 | 3.6 (7.94) | – | – | – | ✓ | ✓ | 6000 | 110 (81.1) | 4000 (899) | 3350 (753) |
| 1FK7032 | | | | – | – | ✓ | ✓ | ✓ | | | | |
| 1FK7033 | | | | – | – | ✓ | ✓ | ✓ | | | | |
| 1FK7034 | | | | ✓ | ✓ | ✓ | – | – | | | | |
| 1FK7040 | | | | ✓ | ✓ | ✓ | – | – | | | | |
| 1FK7042 | | | | ✓ | ✓ | – | – | – | | | | |
| 1FK7043 | | | | ✓ | – | – | – | – | | | | |
| 1FK7034 | SP 100S-MF2 | ≤ 5 | 7.9 (17.4) | – | – | – | ✓ | ✓ | 4500 | 300 (221) | 6300 (1416) | 2400 (540) |
| 1FK7040 | | | | – | – | – | ✓ | ✓ | | | | |
| 1FK7042 | | | | – | – | ✓ | ✓ | ✓ | | | | |
| 1FK7043 | | | | – | ✓ | ✓ | ✓ | ✓ | | | | |
| 1FK7044 | | | | ✓ | ✓ | ✓ | ✓ | – | | | | |
| 1FK7060 | | | | ✓ | ✓ | ✓ | – | – | | | | |
| 1FK7061 | | | | ✓ | ✓ | – | – | – | | | | |
| 1FK7062 | | | | ✓ | ✓ | – | – | – | | | | |
| 1FK7062 | | | | ✓ | ✓ | – | – | – | | | | |
| 1FK7044 | SP 140S-MF2 | ≤ 5 | 17 (37.5) | – | – | – | – | ✓ | 4000 | 600 (443) | 9450 (2124) | 9870 (2219) |
| 1FK7060 | | | | – | – | – | ✓ | ✓ | | | | |
| 1FK7061 | | | | – | – | ✓ | ✓ | ✓ | | | | |
| 1FK7062 | | | | – | – | ✓ | ✓ | – | | | | |
| 1FK7063 | | | | ✓ | ✓ | ✓ | – | – | | | | |
| 1FK7064 | | | | ✓ | ✓ | ✓ | – | – | | | | |
| 1FK7080 | | | | ✓ | ✓ | ✓ | ✓ | – | | | | |
| 1FK7081 | | | | ✓ | ✓ | – | – | – | | | | |
| 1FK7083 | | | | ✓ | ✓ | – | – | – | | | | |
| 1FK7084 | | | | ✓ | – | – | – | – | | | | |

| Gear shaft | Order code | | | | |
|---------------------|------------------|-----|-----|-----|-----|
| | With feather key | J12 | J13 | J15 | J16 |
| Without feather key | J32 | J33 | J35 | J36 | J37 |

Preconditions:

SP+ planetary gearboxes can be mounted with the following motor versions:

- Plain motor shaft extension, shaft and flange accuracy tolerance N, without/with holding brake
- IP65 degree of protection and anthracite paint finish

SP+ planetary gearboxes can therefore only be ordered with these motors:

1FK7 - **2 A** **1** Compact
1FK7 - **3 B** **1** High Inertia
1FK7 - **4 C** **1** High Dynamic
G without brake
H with brake

or

1FK7 02 . . - **5 A** **G 5**
1FK7 02 . . - **5 A** **H 5**

✓ Possible

– Not possible

¹⁾ Referred to output shaft center at 100 rpm.

When ordering a motor with gearbox, **-Z** must be added to the Article No.

Example:

1FK7042 motor without holding brake with two-stage SP+ planetary gearbox with $i = 28$ and gear shaft without feather key
1FK7042-2AF74-1AG1-Z
J35

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series SP+ for SIMOTICS S-1FK7

Selection and ordering data

| Motor Type | Planetary gearbox Two-stage | | Available gear ratio $i =$ | | | | | Motor speed, max. S3-60% n_{G1} (n_1) rpm | Output torque, max. S3-60% M_{G2} (T_{2B}) Nm (lb _t -ft) | Radial output shaft loading, max. ¹⁾ F_r (F_{2Rmax}) N (lb _t) | Axial output shaft loading, max. ¹⁾ F_a (F_{2Amax}) N (lb _t) | | |
|---------------|--------------------------------|---------------------------------|--|----|----|----|----|---|---|--|---|-----------------|---|
| | Type | Torsional backlash arcmin | Gearbox weight, approx. kg (lb) | 16 | 20 | 28 | 40 | | | | | 50 | |
| 1FK7062 | SP 180S-MF2 | ≤ 5 | 36.4 (80.3) | – | – | – | – | ✓ | 4000 | 1100 (811) | 14700 (3305) | 14150 (3181) | |
| 1FK7063 | | | | – | – | – | ✓ | ✓ | | | | | |
| 1FK7064 | | | | – | – | – | ✓ | ✓ | | | | | |
| 1FK7080 | | | | – | – | – | – | – | | | | | ✓ |
| 1FK7081 | | | | – | – | – | – | ✓ | | | | | ✓ |
| 1FK7083 | | | | – | – | – | ✓ | – | | | | | – |
| 1FK7084 | | | | – | ✓ | – | ✓ | – | | | | | – |
| 1FK7085 | | | | – | ✓ | – | – | – | | | | | – |
| 1FK7086 | | | | – | ✓ | – | – | – | | | | | – |
| 1FK7100 | | | | – | – | – | ✓ | – | | | | | – |
| 1FK7101 | – | – | – | ✓ | – | – | | | | | | | |
| 1FK7103 | – | – | – | ✓ | – | – | | | | | | | |
| 1FK7083 | SP 210S-MF2 | ≤ 6 | 55 (121) | – | – | – | ✓ | ✓ | 3500 | 2400 (1770) (2500 (1844) for $i = 20$) | 21000 (4721) | 30000 (6744) | |
| 1FK7084 | | | | – | – | – | ✓ | ✓ | | | | | |
| 1FK7085 | | | | – | – | – | ✓ | – | | | | | |
| 1FK7086 | | | | – | – | – | ✓ | – | | | | | |
| 1FK7100 | | | | – | – | – | – | ✓ | | | | | ✓ |
| 1FK7101 | | | | – | – | – | – | ✓ | | | | | – |
| 1FK7103 | – | – | – | – | – | – | | | | | | | |
| 1FK7105 | – | – | – | ✓ | – | – | | | | | | | |
| 1FK7101 | SP 240S-MF2 | ≤ 6 | 80.6 (178) | – | – | – | ✓ | ✓ | 3500 | 4500 (3319) (4000 (2950) for $i = 40$ 4300 (3172) for $i = 50$) | 30000 (6744) | 33000 (7419) | |
| 1FK7103 | | | | – | – | – | ✓ | – | | | | | |
| 1FK7105 | | | | – | – | – | ✓ | – | | | | | |

| Gear shaft | | Order code | | | | |
|---------------------|--|------------|-----|-----|-----|-----|
| With feather key | | J12 | J13 | J15 | J16 | J17 |
| Without feather key | | J32 | J33 | J35 | J36 | J37 |

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Preconditions:

SP+ planetary gearboxes can be mounted with the following motor versions:

- Plain motor shaft extension, shaft and flange accuracy tolerance N, without/with holding brake
- IP65 degree of protection and anthracite paint finish

SP+ planetary gearboxes can therefore only be ordered with these motors:

1FK7 . . . -2 A 1 Compact
 1FK7 . . . -3 B 1 High Inertia
 1FK7 . . . -4 C 1 High Dynamic
 G without brake
 H with brake

or

1FK7 02 . -5 A G 5
 1FK7 02 . -5 A H 5

When ordering a motor with gearbox, **-Z** must be added to the Article No.

Example:

1FK7042 motor without holding brake with two-stage SP+ planetary gearbox with $i = 16$ and gear shaft without feather key
 1FK7103-2AC74-1AG1-**Z**
J32

✓ Possible

– Not possible

¹⁾ Referred to output shaft center.

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series SP+ for SIMOTICS S-1FK7

Technical specifications

| SIMOTICS S-1FK7 motor with SP+ planetary gearbox | | | | | | | | | |
|--|----------------|------------------------------------|--|---|---|---|---|---|---|
| Two-stage Type | Gear ratio i | Motor speed n_{rated1} rpm | Output torque | Moments of inertia of gearboxes (referred to the drive) | | | | | |
| | | | Continuous duty S1 ¹⁾ M_{rated2} (T_{2rated}) Nm (lb _r -ft) | 1FK702. J_1 kgcm ² (lb _r -in ²) | 1FK703. J_1 kgcm ² (lb _r -in ²) | 1FK704. J_1 kgcm ² (lb _r -in ²) | 1FK706. J_1 kgcm ² (lb _r -in ²) | 1FK708. J_1 kgcm ² (lb _r -in ²) | 1FK710. J_1 kgcm ² (lb _r -in ²) |
| SP 060S-MF2 | 16 | 4400 | 26 (19.2) | 0.08 (0.03) | 0.17 (0.06) | – | – | – | – |
| | 20 | 4400 | 26 (19.2) | 0.07 (0.02) | 0.16 (0.06) | – | – | – | – |
| | 28 | 4400 | 26 (19.2) | 0.06 (0.02) | – | – | – | – | – |
| SP 075S-MF2 | 16 | 3500 | 75 (55.3) | – | 0.23 (0.08) | 0.55 (0.19) | – | – | – |
| | 20 | 3500 | 75 (55.3) | – | 0.20 (0.07) | 0.53 (0.18) | – | – | – |
| | 28 | 3500 | 75 (55.3) | – | 0.18 (0.06) | 0.50 (0.17) | – | – | – |
| | 40 | 3500 | 75 (55.3) | 0.10 (0.03) | 0.17 (0.06) | – | – | – | – |
| | 50 | 3800 | 75 (55.3) | 0.10 (0.03) | 0.16 (0.06) | – | – | – | – |
| SP 100S-MF2 | 16 | 3100 | 180 (133) | – | – | 0.81 (0.28) | 2.18 (0.75) | – | – |
| | 20 | 3100 | 180 (133) | – | – | 0.70 (0.24) | 2.07 (0.71) | – | – |
| | 28 | 3100 | 180 (133) | – | – | 0.60 (0.21) | 1.97 (0.67) | – | – |
| | 40 | 3100 | 180 (133) | – | 0.38 (0.13) | 0.55 (0.19) | – | – | – |
| | 50 | 3500 | 175 (129) | – | 0.38 (0.13) | 0.54 (0.19) | – | – | – |
| SP 140S-MF2 | 16 | 2900 | 360 (266) | – | – | – | 3.19 (1.09) | 10.3 (3.52) | – |
| | 20 | 2900 | 360 (266) | – | – | – | 2.71 (0.93) | 9.77 (3.34) | – |
| | 28 | 2900 | 360 (266) | – | – | – | 2.34 (0.80) | 9.41 (3.22) | – |
| | 40 | 2900 | 360 (266) | – | – | – | 2.10 (0.72) | 9.16 (3.13) | – |
| | 50 | 3200 | 360 (266) | – | – | 1.39 (0.48) | 2.08 (0.71) | – | – |
| SP 180S-MF2 | 16 | 2700 | 750 (553) | – | – | – | – | 12.4 (4.24) | 13.5 (4.61) |
| | 20 | 2700 | 750 (553) | – | – | – | – | 10.9 (3.73) | 12.0 (4.10) |
| | 28 | 2700 | 750 (553) | – | – | – | – | 9.48 (3.24) | 10.6 (3.62) |
| | 40 | 2700 | 750 (553) | – | – | – | 5.51 (1.88) | 8.67 (2.96) | – |
| | 50 | 2900 | 750 (553) | – | – | – | 5.45 (1.86) | 8.61 (2.94) | – |
| SP 210S-MF2 | 16 | 2500 | 1500 (1106) | – | – | – | – | – | 34.5 (11.8) |
| | 20 | 2500 | 1500 (1106) | – | – | – | – | – | 31.5 (10.8) |
| | 28 | 2500 | 1500 (1106) | – | – | – | – | 30.0 (10.3) | 30.0 (10.3) |
| | 40 | 2500 | 1500 (1106) | – | – | – | – | 28.5 (9.74) | 28.5 (9.74) |
| | 50 | 2500 | 1500 (1106) | – | – | – | – | 28.3 (9.67) | 28.3 (9.67) |
| SP 240S-MF2 | 28 | 2500 | 2500 (1844) | – | – | – | – | – | 30.5 (10.4) |
| | 40 | 2500 | 2500 (1844) | – | – | – | – | – | 28.2 (9.64) |
| | 50 | 2500 | 2500 (1844) | – | – | – | – | – | 27.9 (9.53) |

¹⁾ The limit values in the table apply for S1 continuous duty (ON time > 60 % or > 20 min) for a maximum gearbox temperature of 90 °C (194 °F).

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series LP+ for SIMOTICS S-1FK7

Overview



SIMOTICS S-1FK7 motor with mounted LP+ planetary gearbox

SIMOTICS S-1FK7 motors can easily be combined with planetary gearboxes to form compact coaxial drive units. The gearboxes are flanged directly to the drive end of the motors.

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When selecting the gearbox, ensure that its maximum permissible input speed is not exceeded by the maximum speed of the motor. In the case of high operating frequencies, allowance must be made for the factor f_2 (see Configuration Manual, SIMOTICS S-1FK7 synchronous motors). The frictional losses of the gearbox must always be taken into account when engineering geared drives.

The gearboxes are only available in non-balanced design and with feather key.

Benefits

- High efficiency, single-stage: > 97%
- Minimum torsional backlash Single-stage: ≤ 10 arcmin
- Power transmission from the central sun wheel via planet wheels
- No shaft deflections in the planet wheel set due to symmetrical force distribution
- The gearboxes are connected to the motor shaft via an integrated clamping hub. A plain motor shaft extension is necessary for this purpose. Shaft and flange accuracy tolerance N in accordance with DIN 42955 and vibration magnitude grade A in accordance with EN 60034-14 are sufficient. The motor flange is adapted by means of adapter plates.
- Output shaft of gearbox exactly coaxial with the motor
- The gearboxes are suitable for all mounted systems.
- The gearboxes are enclosed (seal between gearbox and motor) and filled with grease in the factory. They are lubricated and sealed for their service life.
- Degree of protection of gearbox: IP64
- Small dimensions
- Low weight

Integration

SIMOTICS S-1FK7 motors can be supplied ex works (Siemens AG) in the shaft heights 36 to 100, complete with flange-mounted planetary gearbox.

The gearboxes assigned to the individual motors and gear ratios i available for these motor/gearbox combinations are listed in the subsequent selection table. The maximum permissible input speed of the gearbox (this is the same as the maximum motor speed) must be taken into account when a gearbox is selected.

The motor/gearbox combinations listed in the selection table are mainly intended for cycle operation S3-60% (ON time ≤ 60 % and ≤ 20 min). Reduced maximum motor speeds and output torques apply for use in S1 continuous duty (ON time > 60 % or > 20 min). The gearbox temperature must not exceed 90 °C (194 °F).

Follow the instructions contained in the Configuration Manual for SIMOTICS S-1FK7 synchronous motors when assigning gearboxes to the motor.

SIMOTICS servomotors

SIMOTICS S geared motors for SINAMICS S120

Planetary gearbox series LP+ for SIMOTICS S-1FK7

Selection and ordering data

| Motor Type | Planetary gearbox LP+ Single-stage Torsional backlash ≤ 12 arcmin | | Available gear ratio $i =$ | | Input speed, max. S3-60% n_{G1} rpm | Output torque, max. S3-60% M_{G2} at $i = 5$ Nm (lb _f -ft) | | Output shaft radial force, max. ¹⁾ F_r N (lb _f) | Gearbox moment of inertia J_G at $i = 5/10$ 10^{-4}kgm^2 ($10^{-3}\text{lb}_f\text{-in-s}^2$) |
|--|--|---|-------------------------------|----------------------------|---|--|--------------|---|---|
| | Type | Gearbox weight, approx. kg (lb) | 5 | 10 | | M_{G2} at $i = 10$ Nm (lb _f -ft) | | | |
| 1FK7022 | LP 050S-MF1 | 0.75 (1.65) | ✓ | – | 8000 | 14 (10.3) | 13 (9.59) | 650 (146) | 0.055 (0.05) |
| 1FK7022 1FK7032 1FK7033 1FK7034 | LP 070S-MF1 | 2 (4.41) | – ✓ ✓ ✓ | ✓ ✓ ✓ ✓ | 6000 | 40 (29.5) | 37 (27.3) | 1450 (326) | 0.28 (0.25) |
| 1FK7040 1FK7042 1FK7043 1FK7044 | LP 090S-MF1 | 4 (8.82) | ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ | 6000 | 100 (73.8) | 90 (66.4) | 2400 (540) | 1.77 (1.57) |
| 1FK7060 1FK7061 1FK7062 1FK7063 1FK7064 | LP 120S-MF1 | 8.6 (19.0) | ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ – | 4800 | 250 (184) | 220 (162) | 4600 (1034) | 5.42 (4.80) |
| 1FK7080 1FK7081 1FK7083 1FK7084 1FK7085 1FK7086 | LP 155S-MF1 | 17 (37.5) | ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ | 3600 | 500 (369) | 400 (295) | 7500 (1686) | 25.7 (22.8) |
| 1FK7100 1FK7101 1FK7103 1FK7105 | | | ✓ ✓ ✓ ✓ | ✓ – – – | | | | | |
| Gear shaft With feather key | | Order code V40 V42 | | | | | | | |

Preconditions:

LP+ planetary gearboxes can be mounted on the following motor versions:

- Plain motor shaft extension, shaft and flange accuracy tolerance N, without/with holding brake
- IP64 degree of protection and anthracite paint finish

LP+ planetary gearboxes can therefore only be ordered with these motors:

1FK7 . . . -2 A . 7 . -1 . 0 Compact
 1FK7 . . . -3 B . 7 . -1 . 0 High Inertia
 1FK7 . . . -4 C . 7 . -1 . 0 High Dynamic
 G without brake
 H with brake

or

1FK7 02 . -5 A . 7 . -1 . G 3
 1FK7 02 . -5 A . 7 . -1 . H 3

When ordering a motor with gearbox, **-Z** must be added to the Article No.

Example:

1FK7042 motor with holding brake
 with single-stage LP+ planetary gearbox
 with $i = 5$ and gear shaft with feather key.
 1FK7042-3BK74-1AH0-Z
V40

✓ Possible

– Not possible

¹⁾ Referred to output shaft center at 100 rpm.

Continuous duty

Continuous duty is permissible at rated speed and rated torque. The gearbox temperature must not exceed 90 °C (194 °F).

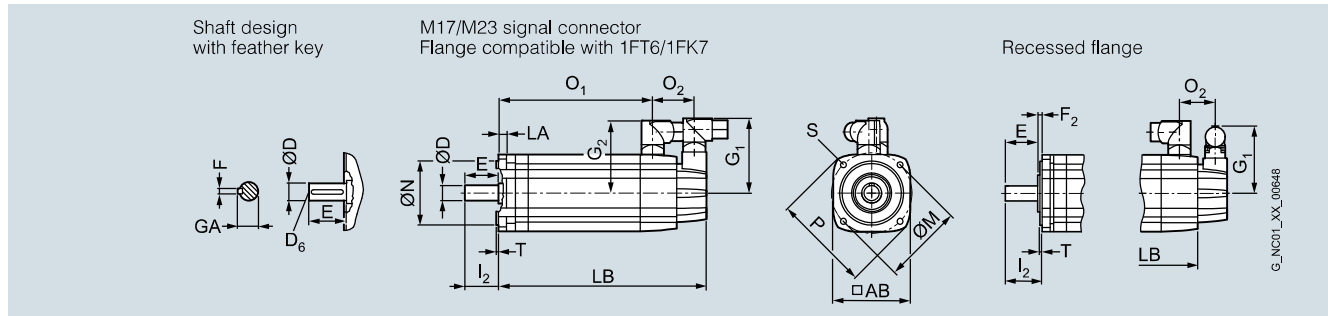
| Planetary gearbox LP+ Single-stage Torsional backlash ≤ 10 arcmin Type | Rated input speed n_{G1} rpm | Rated output torque M_{G2} at $i = 5$ Nm (lb _f -ft) | M_{G2} at $i = 10$ Nm (lb _f -ft) |
|--|---|--|---|
| LP 050S-MF1 | 4000 | 6.5 (4.79) | – |
| LP 070S-MF1 | 3700 | 21 (15.5) | 19 (14.0) |
| LP 090S-MF1 | 3400 | 50 (36.9) | 45 (33.2) |
| LP 120S-MF1 | 2600 | 125 (92.2) | 110 (81.1) |
| LP 155S-MF1 | 2000 | 350 (258) | 200 (148) |

SIMOTICS servomotors

Dimensional drawings

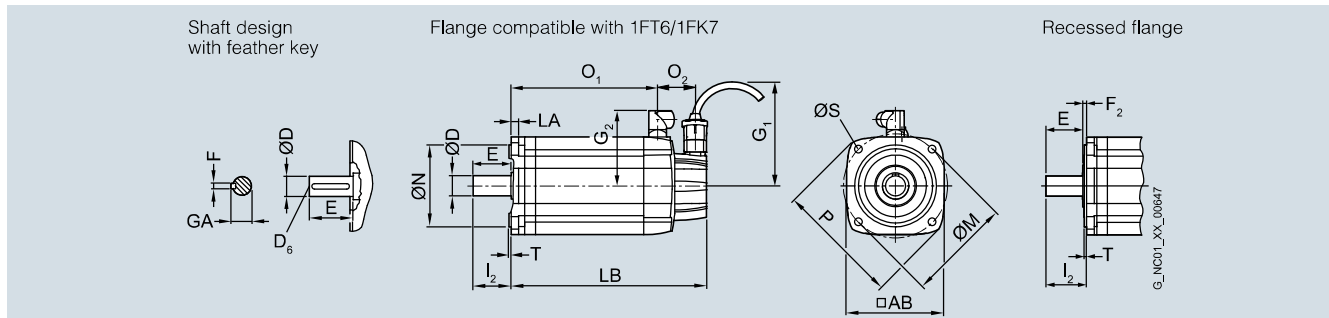
SIMOTICS S-1FT7 with M17 and M23 signal connector – Natural cooling

Dimensional drawings



| For motor | | Dimensions in mm (inches) | | | | | | | | | | | Signal connector | | Connector size | | Shaft extension DE | | | | |
|--|--------------|---------------------------|---------------|----------------|---------------|---------------|---------------|--------------|----------------|--------------|----------------|---------------|--------------------------|----------------------------|----------------|----------------|--------------------|--------------|---|--|--|
| Shaft height | Type | IEC | P | N | LA | M | AB | T | O ₂ | S | G ₁ | M17 M23 | Size 1 G ₂ | Size 1.5 G ₂ | D | D ₆ | E | GA | F | | |
| SIMOTICS S-1FT7 natural cooling, with connector, without/with brake | | | | | | | | | | | | | | | | | | | | | |
| 36 | 1FT703 . -5A | 90 (3.54) | 60 (2.36) | 8 (0.31) | 75 (2.95) | 72 (2.83) | 3 (0.12) | 48 (1.89) | 6.5 (0.26) | 77 (3.03) | 82 (3.23) | 80 (3.15) | - | 14 (0.55) | M5 | 30 (1.18) | 16 (0.63) | 5 (0.20) | | | |
| 48 | 1FT704 . -5A | 120 (4.72) | 80 (3.15) | 10 (0.39) | 100 (3.94) | 96 (3.78) | 3 (0.12) | 53 (2.09) | 6.5 (0.26) | 93 (3.66) | 82 (3.23) | 90 (3.54) | - | 19 (0.75) | M6 | 40 (1.57) | 21.5 (0.85) | 6 (0.24) | | | |
| 63 | 1FT706 . -5A | 155 (6.10) | 110 (4.33) | 10 (0.39) | 130 (5.12) | 126 (4.96) | 3.5 (0.14) | 53 (2.09) | 9 (0.35) | 93 (3.66) | 82 (3.23) | 104 (4.09) | - | 24 (0.94) | M8 | 50 (1.97) | 27 (1.06) | 8 (0.31) | | | |
| 80 | 1FT708 . -5A | 195 (7.68) | 130 (5.12) | 11.5 (0.45) | 165 (6.50) | 155 (6.10) | 3.5 (0.14) | 51 (2.01) | 11 (0.43) | 93 (3.66) | 82 (3.23) | 119 (4.69) | 140 (5.51) | 32 (1.26) | M12 | 58 (2.28) | 35 (1.38) | 10 (0.39) | | | |
| 100 | 1FT710 . -5A | 245 (9.65) | 180 (7.09) | 13 (0.51) | 215 (8.46) | 196 (7.72) | 4 (0.16) | 56 (2.20) | 14 (0.55) | 93 (3.66) | 82 (3.23) | - | 160 (6.30) | 38 (1.50) | M12 | 80 (3.15) | 41 (1.61) | 10 (0.39) | | | |

| Shaft height | Type | IEC | Recessed flange | | | | Flange compatible with 1FT6/1FK7 | | | | | | |
|--------------|---------|-----|-----------------|----------------|---------------------|------------------------------|----------------------------------|------------------------------|----------------|----------------|----------------|----------------|----------------|
| | | | F ₂ | I ₂ | without brake LB | with brake O ₁ | without brake LB | with brake O ₁ | I ₂ | LB | O ₁ | LB | O ₁ |
| 36 | 1FT7034 | | 5.5 (0.22) | 36.5 (1.44) | 189 (7.44) | 127 (5.00) | 216 (8.50) | 154 (6.06) | 30 (1.18) | 195 (7.68) | 133 (5.24) | 222 (8.74) | 160 (6.30) |
| | 1FT7036 | | | | 237 (9.33) | 175 (6.89) | 264 (10.39) | 202 (7.95) | | 243 (9.57) | 181 (7.13) | 270 (10.63) | 208 (8.19) |
| 48 | 1FT7042 | | 5.5 (0.22) | 46 (1.81) | 163 (6.42) | 96 (3.78) | 195 (7.68) | 128 (5.04) | 40 (1.57) | 169 (6.65) | 102 (4.02) | 201 (7.91) | 134 (5.28) |
| | 1FT7044 | | | | 213 (8.39) | 146 (5.75) | 245 (9.65) | 178 (7.01) | | 219 (8.62) | 152 (5.98) | 251 (9.88) | 184 (7.24) |
| | 1FT7046 | | | | 253 (9.96) | 186 (7.32) | 285 (11.22) | 218 (8.58) | | 259 (10.20) | 192 (7.56) | 291 (11.46) | 224 (8.82) |
| 63 | 1FT7062 | | 6 (0.24) | 56.5 (2.22) | 167 (6.57) | 99 (3.90) | 202 (7.95) | 135 (5.31) | 50 (1.97) | 173 (6.81) | 106 (4.17) | 208 (8.19) | 141 (5.55) |
| | 1FT7064 | | | | 198 (7.80) | 131 (5.16) | 233 (9.17) | 166 (6.54) | | 205 (8.07) | 137 (5.39) | 240 (9.45) | 173 (6.81) |
| | 1FT7066 | | | | 230 (9.06) | 162 (6.38) | 265 (10.43) | 198 (7.80) | | 236 (9.29) | 169 (6.65) | 272 (10.71) | 204 (8.03) |
| | 1FT7068 | | | | 277 (10.91) | 210 (8.27) | 312 (12.28) | 245 (9.65) | | 284 (11.18) | 216 (8.50) | 319 (12.56) | 252 (9.92) |
| 80 | 1FT7082 | | 6 (0.24) | 64.5 (2.54) | 184 (7.24) | 124 (4.88) | 241 (9.49) | 176 (6.93) | 58 (2.28) | 196 (7.72) | 130 (5.12) | 248 (9.76) | 183 (7.20) |
| | 1FT7084 | | | | 236 (9.29) | 175 (6.89) | 293 (11.54) | 228 (8.98) | | 247 (9.72) | 182 (7.17) | 299 (11.77) | 234 (9.21) |
| | 1FT7086 | | | | 287 (11.30) | 227 (8.94) | 345 (13.58) | 279 (10.98) | | 299 (11.77) | 234 (9.21) | 351 (13.82) | 286 (11.26) |
| 100 | 1FT7102 | | 6.5 (0.26) | 87 (3.43) | 209 (8.23) | 144 (5.67) | 266 (10.47) | 196 (7.72) | 80 (3.15) | 221 (8.70) | 151 (5.94) | 273 (10.75) | 203 (7.99) |
| | 1FT7105 | | | | 296 (11.65) | 231 (9.09) | 353 (13.90) | 283 (11.14) | | 307 (12.09) | 238 (9.37) | 360 (14.17) | 290 (11.42) |
| | 1FT7108 | | | | 365 (14.37) | 300 (11.81) | 422 (16.61) | 352 (13.86) | | 377 (14.84) | 307 (12.09) | 429 (16.89) | 359 (14.13) |

SIMOTICS S-1FT7 with RJ45 signal connector (DRIVE-CLiQ) – Natural cooling
Dimensional drawings


| For motor | | Dimensions in mm (inches) | | | | | | | | | | | | | | | |
|--|--------------|---------------------------|---------------|----------------|---------------|---------------|---------------|--------------|----------------|-----------------|----------------|----------------|----------------------------|--------------------|----------------|----------------|--------------|
| Shaft height | Type | IEC | P | N | LA | M | AB | T | O ₂ | S | G ₁ | Connector size | | Shaft extension DE | | | |
| | | | | | | | | | | | | Size 1 | Size 1.5 | D | D ₆ | E | GA |
| SIMOTICS S-1FT7 natural cooling, with connector, without/with brake | | | | | | | | | | | | | | | | | |
| 36 | 1FT703 . -5A | 90 (3.54) | 60 (2.36) | 8 (0.31) | 75 (2.95) | 72 (2.83) | 3 (0.12) | 48 (1.89) | 6.5 (0.26) | 104.5 (4.11) | 80 (3.15) | – | 14 (0.55) | M5 | 30 (1.18) | 16 (0.63) | 5 (0.20) |
| 48 | 1FT704 . -5A | 120 (4.72) | 80 (3.15) | 10 (0.39) | 100 (3.94) | 96 (3.78) | 3 (0.12) | 53 (2.09) | 6.5 (0.26) | 104.5 (4.11) | 90 (3.54) | – | 19 (0.75) | M6 | 40 (1.57) | 21.5 (0.85) | 6 (0.24) |
| 63 | 1FT706 . -5A | 155 (6.10) | 110 (4.33) | 10 (0.39) | 130 (5.12) | 126 (4.96) | 3.5 (0.14) | 53 (2.09) | 9 (0.35) | 104.5 (4.11) | 104 (4.09) | – | 24 (0.94) | M8 | 50 (1.97) | 27 (1.06) | 8 (0.31) |
| 80 | 1FT708 . -5A | 195 (7.68) | 130 (5.12) | 11.5 (0.45) | 165 (6.50) | 155 (6.10) | 3.5 (0.14) | 51 (2.01) | 11 (0.43) | 104.5 (4.11) | 119 (4.69) | 140 (5.51) | 32 (1.26) | M12 | 58 (2.28) | 35 (1.38) | 10 (0.39) |
| 100 | 1FT710 . -5A | 245 (9.65) | 180 (7.09) | 13 (0.51) | 215 (8.46) | 196 (7.72) | 4 (0.16) | 56 (2.20) | 14 (0.55) | 104.5 (4.11) | – | 160 (6.30) | 38 (1.50) | M12 | 80 (3.15) | 41 (1.61) | 10 (0.39) |

| Shaft height | Type | IEC | Recessed flange | | | | Flange compatible with 1FT6/1FK7 | | | | | |
|--------------|---------|---------------|-----------------|----------------|---------------------|------------------------------|----------------------------------|------------------------------|----------------|---------------------|------------------------------|----------------|
| | | | F ₂ | I ₂ | without brake LB | with brake O ₁ | without brake LB | with brake O ₁ | I ₂ | without brake LB | with brake O ₁ | |
| 36 | 1FT7034 | 5.5 (0.22) | 36.5 (1.44) | 189 (7.44) | 127 (5.00) | 216 (8.50) | 154 (6.06) | 30 (1.18) | 196 (7.72) | 133 (5.24) | 223 (8.78) | 160 (6.30) |
| | 1FT7036 | | | 237 (9.33) | 175 (6.89) | 264 (10.39) | 202 (7.95) | | 244 (9.61) | 181 (7.13) | 271 (10.67) | 208 (8.19) |
| 48 | 1FT7042 | 5.5 (0.22) | 46 (1.81) | 158 (6.22) | 96 (3.78) | 190 (7.48) | 128 (5.04) | 40 (1.57) | 164 (6.46) | 102 (4.02) | 196 (7.72) | 134 (5.28) |
| | 1FT7044 | | | 208 (8.19) | 146 (5.75) | 240 (9.45) | 178 (7.01) | | 214 (8.43) | 152 (5.98) | 246 (9.69) | 184 (7.24) |
| | 1FT7046 | | | 248 (9.76) | 186 (7.32) | 280 (11.02) | 218 (8.58) | | 254 (10.00) | 192 (7.56) | 286 (11.26) | 224 (8.82) |
| 63 | 1FT7062 | 6 (0.24) | 56.5 (2.22) | 161 (6.34) | 99 (3.90) | 197 (7.76) | 135 (5.31) | 50 (1.97) | 168 (6.61) | 106 (4.17) | 203 (7.99) | 141 (5.55) |
| | 1FT7064 | | | 193 (7.60) | 131 (5.16) | 228 (8.98) | 166 (6.54) | | 200 (7.87) | 137 (5.39) | 235 (9.25) | 173 (6.81) |
| | 1FT7066 | | | 225 (8.86) | 162 (6.38) | 260 (10.24) | 198 (7.80) | | 231 (9.09) | 169 (6.65) | 267 (10.51) | 204 (8.03) |
| | 1FT7068 | | | 272 (10.71) | 210 (8.27) | 307 (12.09) | 245 (9.65) | | 279 (10.98) | 216 (8.50) | 314 (12.36) | 252 (9.92) |
| 80 | 1FT7082 | 6 (0.24) | 64.5 (2.54) | 189 (7.44) | 124 (4.88) | 236 (9.29) | 176 (6.93) | 58 (2.28) | 191 (7.52) | 130 (5.12) | 243 (9.57) | 183 (7.20) |
| | 1FT7084 | | | 236 (9.29) | 175 (6.89) | 288 (11.34) | 228 (8.98) | | 242 (9.53) | 182 (7.17) | 294 (11.57) | 234 (9.21) |
| | 1FT7086 | | | 287 (11.30) | 227 (8.94) | 340 (13.39) | 279 (10.98) | | 294 (11.57) | 234 (9.21) | 346 (13.62) | 286 (11.26) |
| 100 | 1FT7102 | 6.5 (0.26) | 87 (3.43) | 209 (8.23) | 144 (5.67) | 261 (10.28) | 196 (7.72) | 80 (3.15) | 216 (8.50) | 151 (5.94) | 268 (10.55) | 203 (7.99) |
| | 1FT7105 | | | 296 (11.65) | 231 (9.09) | 348 (13.70) | 283 (11.14) | | 303 (11.93) | 238 (9.37) | 355 (13.98) | 290 (11.42) |
| | 1FT7108 | | | 365 (14.37) | 300 (11.81) | 417 (16.42) | 352 (13.86) | | 372 (14.65) | 307 (12.09) | 424 (16.69) | 359 (14.13) |

SIMOTICS servomotors

Dimensional drawings

SIMOTICS S-1FT7 with M17 and M23 signal connector – Natural cooling

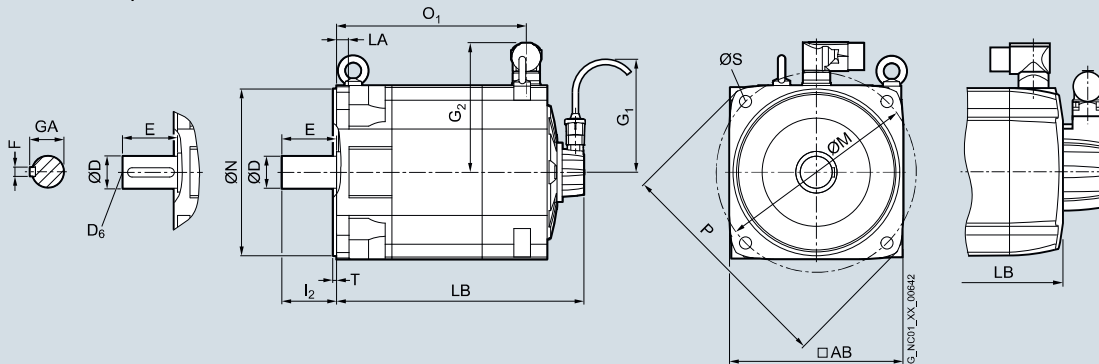
Dimensional drawings

Version with connector

Shaft design
with feather key

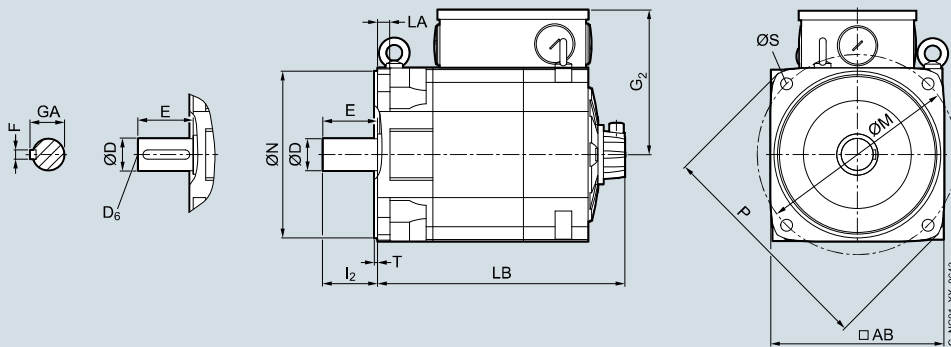
With RJ45 connector

With M17/M23 signal connector



Version with terminal box

Shaft design
with feather key



8

For motor

Dimensions in mm (inches)

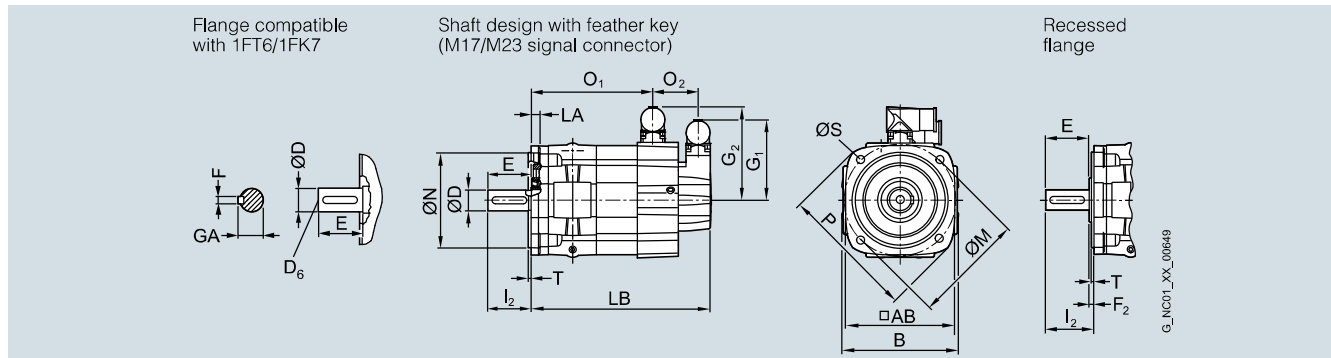
| Shaft height | Type | IEC | P | N | LA | M | AB | T | I ₂ | S | Connector size | | Terminal box | | Shaft extension DE | | | |
|--------------|--------------|-----|----------------|---------------|--------------|----------------|----------------|-------------|----------------|--------------|-----------------|---------------|-----------------|----------------------------|--------------------|----------------|----------------|--------------|
| | | | | | | | | | | | Size 1.5 | Size 3 | G ₁ | G ₂ | D | D ₆ | E | GA |
| 132 | 1FT713...-5A | | 340 (13.39) | 250 (9.84) | 18 (0.71) | 300 (11.81) | 260 (10.24) | 5 (0.20) | 82 (3.23) | 18 (0.71) | 193.5 (7.62) | 203 (7.99) | 215.5 (8.48) | 48 (1.89) | M16 | 82 (3.23) | 51.5 (2.03) | 14 (0.55) |

SIMOTICS S-1FT7 natural cooling, with connector/with terminal box, without/with brake

| Shaft height | Type | IEC | without brake | | with brake | | G | | RJ45 | M17 | M23 | | |
|--------------|------------|-----|------------------|------------------|------------------|------------------|----------------|----------------|----------------|----------------|-----------------|--------------|--------------|
| | | | Signal connector | Connector size | Signal connector | Connector size | RJ45 | M17 | | | | M23 | |
| | | | RJ45 | M17 M23 | Size 1.5 | Size 3 | Size 1.5 | Size 3 | | | | | |
| 132 | 1FT7132-5A | | 370.5 (14.59) | 375.5 (14.78) | 284.5 (11.20) | 265.5 (10.45) | 431 (16.97) | 436 (17.97) | 345 (13.58) | 326 (12.83) | 104.5 (4.11) | 82 (3.23) | 93 (3.65) |
| | 1FT7134-5A | | 415.5 (16.36) | 420.5 (16.56) | 329.5 (12.97) | 310.5 (12.22) | 476 (18.74) | 481 (18.94) | 390 (15.35) | 371 (14.61) | | | |
| | 1FT7136-5A | | 460.5 (18.13) | 465.5 (18.53) | 374.5 (14.74) | 355.5 (14.00) | 521 (20.51) | 526 (20.71) | 435 (17.13) | 416 (16.38) | | | |
| | 1FT7138-5A | | 500.5 (19.70) | 505.5 (19.90) | 414.5 (16.32) | 395.5 (15.57) | 561 (22.09) | 566 (22.28) | 475 (18.70) | 456 (17.95) | | | |

SIMOTICS S-1FT7 with M17 and M23 signal connector – Natural cooling

Dimensional drawings



| For motor | | Dimensions in mm (inches) | | | | | | | | | | Signal connector | | Power connector | | | Connector | | |
|--|--------------|---------------------------|---------------|---------------|----------------|---------------|---------------|---------------|--------------|--------------|----------------|------------------|-----------------|-----------------|----------------|----------------|--------------|--------|---|
| Shaft height | Type | IEC | P | B | N | LA | M | AB | T | S | M17 | M23 | Size 1 | Size 1.5 | Size 3 | Size 1 | Size 1.5 | Size 3 | |
| | | | | | | | | | | | G ₂ | G ₂ | G ₂ | O ₂ | O ₂ | O ₂ | | | |
| SIMOTICS S-1FT7 water cooling, with connector, without/with brake | | | | | | | | | | | | | | | | | | | |
| 63 | 1FT706 .-. W | 155 (6.10) | 135 (5.31) | 110 (4.33) | 10 (0.39) | 130 (5.12) | 126 (4.96) | 3.5 (0.14) | 9 (0.35) | 82 (3.23) | 93 (3.66) | 108 (4.25) | 132.5 (5.22) | - | - | 52 (2.05) | 57 (2.24) | - | - |
| 80 | 1FT708 .-. W | 194 (7.68) | 165 (6.50) | 130 (5.12) | 11.5 (0.45) | 165 (6.50) | 155 (6.10) | 3.5 (0.14) | 11 (0.43) | 82 (3.23) | 93 (3.66) | - | 140.5 (5.53) | 168.5 (6.63) | - | 50 (1.97) | 67 (2.64) | - | - |
| 100 | 1FT710 .-5W | 245 (9.65) | 206 (8.11) | 180 (7.09) | 13 (0.51) | 215 (8.46) | 196 (7.72) | 4 (0.16) | 14 (0.55) | 82 (3.23) | 93 (3.66) | - | 159.5 (6.28) | 187.5 (7.38) | - | 55 (2.17) | 72 (2.83) | - | - |

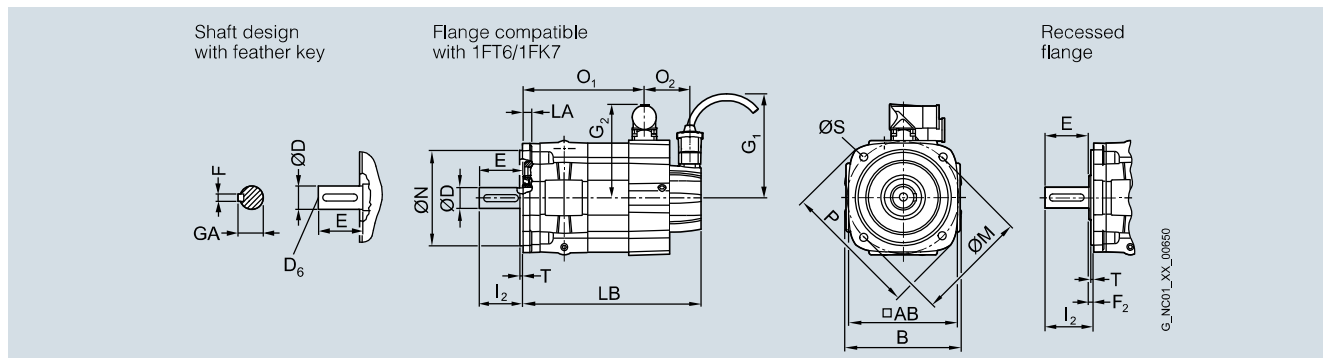
| Shaft height | Type | Flange compatible with 1FT6/1FK7 without/with brake | | | | | Recessed flange without/with brake | | | | | Shaft extension DE | | | | | |
|--------------|---------|---|-----------------|----------------|----------------|----------------|------------------------------------|----------------|------------------|-----------------|----------------|--------------------|----------------------------|----------------|--------------|--------------|--------------|
| | | IEC | Power connector | | | | F ₂ | I ₂ | LB | Power connector | | | D | D ₆ | E | GA | F |
| | | | I ₂ | LB | O ₁ | O ₁ | | | | O ₁ | O ₁ | O ₁ | | | | | |
| 63 | 1FT7062 | 50 (1.97) | 208 (8.19) | 141 (5.55) | - | - | 6 (0.24) | 56.5 (2.22) | 202 (7.95) | 135 (5.31) | - | - | 24 (0.94) | M8 | 50 (1.97) | 27 (1.06) | 8 (0.31) |
| | 1FT7064 | - | 240 (9.45) | 173 (6.81) | - | - | - | - | 233 (9.17) | 166 (6.54) | - | - | - | - | - | - | - |
| | 1FT7065 | - | 292 (11.50) | 220 (8.66) | - | - | - | - | 286 (11.26) | 214 (8.43) | - | - | - | - | - | - | - |
| | 1FT7066 | - | 272 (10.71) | 204 (8.03) | - | - | - | - | 265 (10.43) | 198 (7.80) | - | - | - | - | - | - | - |
| | 1FT7067 | - | 332 (13.07) | 260 (10.24) | - | - | - | - | 325 (12.80) | 254 (10.00) | - | - | - | - | - | - | - |
| | 1FT7068 | - | 319 (12.56) | 252 (9.92) | - | - | - | - | 312 (12.28) | 245 (9.65) | - | - | - | - | - | - | - |
| 80 | 1FT7082 | 58 (2.28) | 248 (9.76) | - | 183 (7.20) | - | 6 (0.24) | 64.5 (2.54) | 241 (9.49) | - | 176 (6.93) | - | 32 (1.26) | M12 | 58 (2.28) | 35 (1.38) | 10 (0.39) |
| | 1FT7084 | - | 299 (11.77) | - | 234 (9.21) | - | - | - | 293 (11.54) | - | 228 (8.98) | - | - | - | - | - | - |
| | 1FT7085 | - | 319 (12.56) | - | 254 (10.00) | 237 (9.33) | - | - | 312.5 (12.30) | - | 247 (9.72) | 231 (9.09) | - | - | - | - | - |
| | 1FT7086 | - | 351 (13.82) | - | 286 (11.26) | - | - | - | 345 (13.58) | - | 279 (10.98) | - | - | - | - | - | - |
| | 1FT7087 | - | 379 (14.92) | - | 314 (12.36) | 297 (11.69) | - | - | 372.5 (14.67) | - | 307 (12.09) | 291 (11.46) | - | - | - | - | - |
| | 1FT7088 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 100 | 1FT7102 | 80 (3.15) | 273 (10.75) | - | 203 (7.99) | 187 (7.36) | 6.5 (0.26) | 87 (3.43) | 266 (10.47) | - | 196 (7.72) | 180 (7.09) | 38 (1.50) | M12 | 80 (3.15) | 41 (1.61) | 10 (0.39) |
| | 1FT7105 | - | 360 (14.17) | - | 290 (11.42) | 273 (10.75) | - | - | 353 (13.90) | - | 283 (11.14) | 266 (10.47) | - | - | - | - | - |
| | 1FT7108 | - | 429 (16.89) | - | 359 (14.13) | 342 (13.46) | - | - | 422 (16.61) | - | 352 (13.86) | 335 (13.19) | - | - | - | - | - |

SIMOTICS servomotors

Dimensional drawings

SIMOTICS S-1FT7 with RJ45 signal connector (DRIVE-CLiQ) – Water cooling

Dimensional drawings



For motor Dimensions in mm (inches)

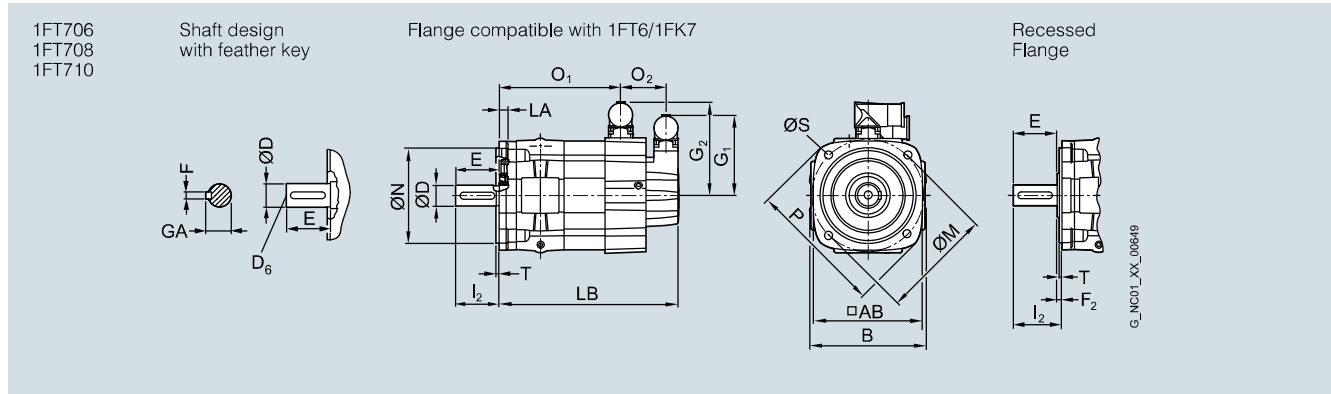
| Shaft height | Type | IEC | P | B | N | LA | M | AB | T | S | Signal connector | | | Power connector | | | Connector | | |
|--|--------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|--------------|-----------------|------------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|--|--|
| | | | | | | | | | | | G ₁ | G ₂ | G ₂ | G ₂ | O ₂ | O ₂ | O ₂ | | |
| SIMOTICS S-1FT7 water cooling, with connector, without/with brake | | | | | | | | | | | | | | | | | | | |
| 63 | 1FT706 .-. W | 155 (6.10) | 135 (5.31) | 110 (4.33) | 10 (0.39) | 130 (5.12) | 126 (4.96) | 3.5 (0.14) | 9 (0.35) | 104.5 (4.11) | 108 (4.25) | 132.5 (5.22) | - | 50 (1.97) | 55 (2.17) | - | | | |
| 80 | 1FT708 .-. W | 194 (7.68) | 165 (6.50) | 130 (5.12) | 11.5 (0.45) | 165 (6.50) | 155 (6.10) | 3.5 (0.14) | 11 (0.43) | 104.5 (4.11) | - | 140.5 (5.53) | 168.5 (6.63) | - | 48 (1.89) | 63 (2.48) | | | |
| 100 | 1FT710 .-5W | 245 (9.65) | 206 (8.11) | 180 (7.09) | 13 (0.51) | 215 (8.46) | 196 (7.72) | 4 (0.16) | 14 (0.55) | 104.5 (4.11) | - | 159.5 (6.28) | 187.5 (7.38) | - | 53 (2.09) | 69 (2.72) | | | |

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| Shaft height | Type | IEC | without/with brake | | | | | Flange compatible with 1FT6/1FK7 | | | | | Shaft extension DE | | | | |
|--------------|---------|----------------|--------------------|----------------|----------------|----------------|----------------|----------------------------------|----------------|----------------|----------------|----------------|---------------------|-----|----------------|--------------|--------------|
| | | | I ₂ | LB | O ₁ | O ₁ | O ₁ | F ₂ | I ₂ | LB | O ₁ | O ₁ | O ₁ | D | D ₆ | E | GA |
| 63 | 1FT7062 | 50 (1.97) | 204 (8.03) | 141 (5.55) | - | - | 6 (0.24) | 56.5 (2.22) | 197 (7.76) | 135 (5.31) | - | - | 24 (0.94) | M8 | 50 (1.97) | 27 (1.06) | 8 (0.31) |
| | 1FT7064 | | 235 (9.25) | 173 (6.81) | - | - | | | 229 (9.02) | 166 (6.54) | - | - | | | | | |
| | 1FT7065 | | 287 (11.30) | 220 (8.66) | - | - | | | 281 (11.06) | 214 (8.43) | - | - | | | | | |
| | 1FT7066 | | 267 (10.51) | 204 (8.03) | - | - | | | 260 (10.24) | 198 (7.80) | - | - | | | | | |
| | 1FT7067 | | 327 (12.87) | 260 (10.24) | - | - | | | 321 (12.64) | 254 (10.00) | - | - | | | | | |
| | 1FT7068 | | 314 (12.36) | 252 (9.92) | - | - | | | 308 (12.13) | 245 (9.65) | - | - | | | | | |
| 80 | 1FT7082 | 58 (2.28) | 243 (9.57) | - | 183 (7.20) | - | 6 (0.24) | 64.5 (2.54) | 237 (9.33) | - | 176 (6.93) | - | 32 (1.26) | M12 | 58 (2.28) | 35 (1.38) | 10 (0.39) |
| | 1FT7084 | | 295 (11.61) | - | 234 (9.21) | - | | | 288 (11.34) | - | 228 (8.98) | - | | | | | |
| | 1FT7085 | | 314 (12.36) | - | 254 (10.00) | 237 (9.33) | | | 308 (12.13) | - | 247 (9.72) | 231 (9.09) | | | | | |
| | 1FT7086 | | 346 (13.62) | - | 286 (11.26) | - | | | 340 (13.39) | - | 279 (10.98) | - | | | | | |
| | 1FT7087 | | 374 (14.72) | - | 314 (12.36) | 297 (11.69) | | | 368 (14.49) | - | 307 (12.09) | 291 (11.46) | | | | | |
| | 1FT7102 | 80 (3.15) | 267 (10.51) | - | 203 (7.99) | 187 (7.36) | 6.5 (0.26) | 87 (3.43) | 262 (10.31) | - | 196 (7.72) | 180 (7.09) | 38 (1.50) | M12 | 80 (3.15) | 41 (1.61) | 10 (0.39) |
| 1FT7105 | | 355 (13.98) | - | 290 (11.42) | 273 (10.75) | | | 348 (13.70) | - | 283 (11.14) | 266 (10.47) | | | | | | |
| 1FT7108 | | 424 (16.69) | - | 359 (14.13) | 342 (13.46) | | | 417 (16.42) | - | 352 (13.86) | 335 (13.19) | | | | | | |

SIMOTICS S-1FT7 with RJ45 (DRIVE-CLiQ) and M23 signal connector – Forced ventilation

Dimensional drawings



For motor Dimensions in mm (inches)

| Shaft height | Type | IEC | P | B | N | LA | M | AB | T | S | Connector size | | G ₁ | H | H ₁ | Fan H ₂ |
|---|--------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|--------------|---------------|-------------------------|-----------------------|----------------|---------------|-----------------|--------------------|
| | | | | | | | | | | | Size 1.5 G ₂ | Size 3 G ₂ | | | | |
| SIMOTICS S-1FT7 forced ventilation, with connector, without/with brake | | | | | | | | | | | | | | | | |
| 63 | 1FT706 .-. S | 155 (6.10) | 158 (6.22) | 110 (4.33) | 10 (0.39) | 130 (5.12) | 126 (4.96) | 3.5 (0.14) | 11 (0.43) | 125 (4.92) | – | 102 (4.02) | 26 (1.02) | 143 (5.36) | 135 (5.31) | |
| 80 | 1FT708 .-. S | 194 (7.68) | 186 (7.32) | 130 (5.12) | 11.5 (0.45) | 165 (6.50) | 155 (6.10) | 3.5 (0.14) | 11 (0.43) | 139 (5.47) | 167 (6.57) | 137.5 (5.41) | 27 (1.06) | 177 (6.97) | 186.5 (7.34) | |
| 100 | 1FT710 .-S | 245 (9.65) | 224 (8.82) | 180 (7.09) | 13 (0.51) | 215 (8.46) | 196 (7.72) | 4 (0.16) | 14 (0.55) | 159 (6.26) | 187 (7.36) | 151 (5.94) | 27 (1.06) | 220 (8.66) | 222 (8.74) | |

| Shaft height | Type | IEC | Flange compatible with 1FT6/1FK7 | | | | Recessed flange | | | | Shaft extension DE | | | | | | | |
|--------------|------------|--------------|----------------------------------|----------------|----------------|----------------|-----------------|----------------|------------------|----------------|--------------------|----------------|----------------|-----|--------------|--------------|--------------|--|
| | | | without brake | | with brake | | without brake | | with brake | | D | D ₆ | E | GA | F | | | |
| | | | I ₂ | LB | O ₁ | LB | O ₁ | F ₂ | I ₂ | LB | O ₁ | LB | O ₁ | | | | | |
| 63 | 1FT7065-7S | 50 (1.97) | 380 (14.96) | 220 (8.66) | 380 (14.96) | 220 (8.66) | 6 (0.24) | 56.5 (2.22) | 373.5 (14.70) | 214 (8.43) | 373.5 (14.70) | 214 (8.43) | 24 (0.94) | M8 | 50 (1.97) | 27 (1.06) | 8 (0.31) | |
| | 1FT7067-7S | | 420 (16.54) | 260 (10.24) | 420 (16.54) | 260 (10.24) | | | 413.5 (16.28) | 254 (10.00) | 413.5 (16.28) | 254 (10.00) | | | | | | |
| 80 | 1FT7084-5S | 58 (2.28) | 342 (13.46) | 182 (7.17) | 394 (15.51) | 234 (9.21) | 6 (0.24) | 64.5 (2.54) | 336 (13.23) | 175 (6.89) | 387 (15.24) | 228 (8.98) | 32 (1.26) | M12 | 58 (2.28) | 35 (1.38) | 10 (0.39) | |
| | 1FT7085-7S | | 414 (16.30) | 254 (10.00) | 414 (16.30) | 254 (10.00) | | | 408 (16.06) | 247 (9.72) | 408 (16.06) | 247 (9.72) | | | | | | |
| | 1FT7086-5S | | 394 (15.51) | 234 (9.21) | 446 (17.56) | 286 (11.26) | | | 387 (15.24) | 227 (8.94) | 440 (17.32) | 379 (14.92) | | | | | | |
| | 1FT7087-7S | | 474 (18.66) | 314 (12.36) | 474 (18.66) | 314 (12.36) | | | 468 (18.43) | 307 (12.09) | 468 (18.43) | 307 (12.09) | | | | | | |
| 100 | 1FT7105 | 80 (3.15) | 404 (15.91) | 238 (9.37) | 456 (17.95) | 290 (11.42) | 6.5 (0.26) | 87 (3.43) | 397 (15.63) | 231 (9.09) | 449 (17.68) | 283 (11.14) | 38 (1.50) | M12 | 80 (3.15) | 41 (1.61) | 10 (0.39) | |
| | 1FT7108 | | 473 (18.62) | 307 (12.09) | 525 (20.67) | 359 (14.13) | | | 466 (18.35) | 300 (11.81) | 518 (20.39) | 352 (13.86) | | | | | | |

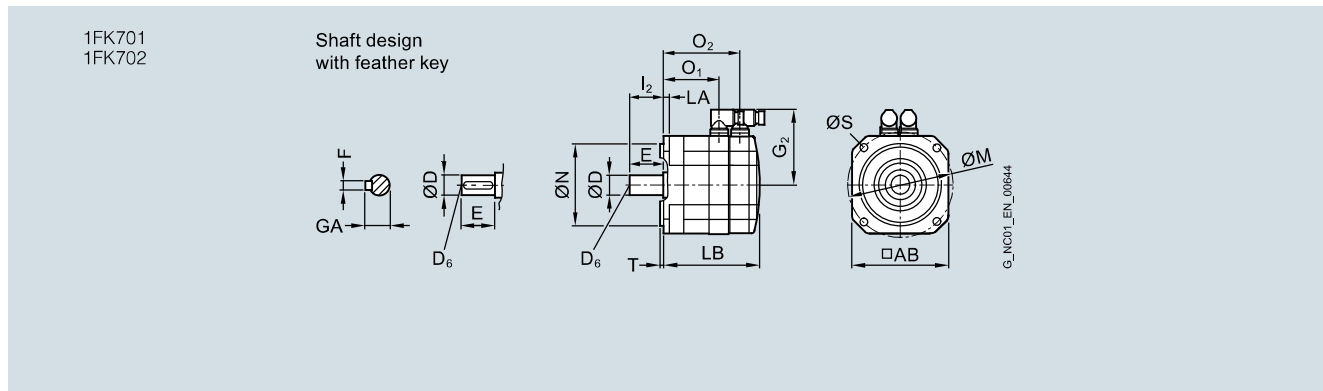


SIMOTICS servomotors

Dimensional drawings

SIMOTICS S-1FK7 – Natural cooling

Dimensional drawings



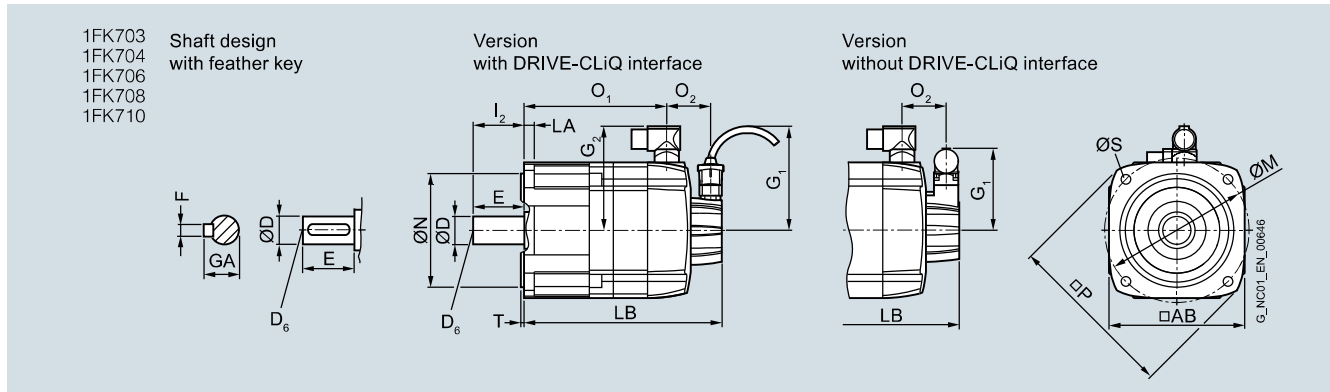
For motor Dimensions in mm (inches)

| Shaft height | Type | IEC | N | LA | M | AB | T | G ₂ | I ₂ | S | Shaft extension DE | | | | |
|--|--------|--------|--------|--------|--------|--------|--------|----------------|----------------|----------|--------------------|----------------|--------|--------|---|
| | | | | | | | | | | | D | D ₆ | E | GA | F |
| SIMOTICS S-1FK7 natural cooling, without/with brake | | | | | | | | | | | | | | | |
| 20 | 1FK701 | 30 | 7 | 46 | 40 | 2.5 | 66 | 18 | 4.5 | 8 | – | 18 | 8.8 | 2 | |
| | | (1.18) | (0.28) | (1.81) | (1.57) | (0.10) | (2.60) | (0.71) | (0.18) | (0.31) | | (0.71) | (0.35) | (0.08) | |
| 28 | 1FK702 | 40 | 10 | 63 | 55 | 2.5 | 75 | 20 | 5.4 | 9 | M3 | 20 | 10.2 | 3 | |
| | | (1.57) | (0.39) | (2.48) | (2.17) | (0.10) | (2.95) | (0.79) | (0.21) | (0.35) | | (0.79) | (0.40) | (0.12) | |

8

| Shaft height | Type | Encoder system: Resolver Absolute encoders AM16S/R / AM15DQ | | | | | | Encoder system: Incremental encoders IC2048S/R / IC22DQ Absolute encoders AM2048S/R AM512S/R / AM20DQ AM32S/R / AM16DQ | | | | | |
|--------------|---------|---|----------------|----------------|------------|----------------|----------------|--|----------------|----------------|------------|----------------|----------------|
| | | without brake | | | with brake | | | without brake | | | with brake | | |
| | | LB | O ₁ | O ₂ | LB | O ₁ | O ₂ | LB | O ₁ | O ₂ | LB | O ₁ | O ₂ |
| 20 | 1FK7011 | 140 | 89 | 118 | 140 | 89 | 118 | 155 | 89 | 118 | 155 | 89 | 118 |
| | | (5.51) | (3.50) | (4.65) | (5.51) | (3.50) | (4.65) | (6.10) | (3.50) | (4.65) | (6.10) | (3.50) | (4.65) |
| | 1FK7015 | 165 | 114 | 143 | 165 | 114 | 143 | 180 | 114 | 143 | 180 | 114 | 143 |
| | | (6.50) | (4.59) | (5.63) | (6.50) | (4.49) | (5.63) | (7.09) | (4.49) | (5.63) | (7.09) | (4.49) | (5.63) |
| 28 | 1FK7022 | 153 | 95 | 128 | 175 | 95 | 150 | 178 | 95 | 128 | 200 | 95 | 150 |
| | | (6.02) | (3.74) | (5.04) | (6.89) | (3.74) | (5.91) | (7.01) | (3.74) | (5.04) | (7.87) | (3.74) | (5.91) |

Dimensional drawings



For motor DQI encoder with DRIVE-CLiQ interface (without resolver)
Encoder system without DRIVE-CLiQ interface (without resolver)
Dimensions in mm (inches)

| Shaft height | Type | IEC | P | N | LA | M | AB | T | I ₂ | S | Shaft extension DE | | | | |
|--------------|------|-----|---|---|----|---|----|---|----------------|---|--------------------|----------------|---|----|---|
| | | | | | | | | | | | D | D ₆ | E | GA | F |

| SIMOTICS S-1FK7 Compact/High Dynamic, without/with brake – Dimensions dependent on shaft height | | | | | | | | | | | | | | | |
|---|--------|--|--------------|--------------|-------------|--------------|--------------|-------------|--------------|---------------|---------------------|----|--------------|--------------|-------------|
| 36 | 1FK703 | | 90 (3.54) | 60 (2.36) | 8 (0.31) | 75 (2.95) | 72 (2.83) | 3 (0.12) | 30 (1.18) | 6.5 (0.26) | 14 (0.55) | M5 | 30 (1.18) | 16 (0.63) | 5 (0.20) |

| SIMOTICS S-1FK7 Compact/High Dynamic/High Inertia, without/with brake – Dimensions dependent on shaft height | | | | | | | | | | | | | | | |
|--|--------|--|---------------|--------------|--------------|---------------|--------------|-------------|--------------|---------------|---------------------|----|--------------|----------------|-------------|
| 48 | 1FK704 | | 120 (4.72) | 80 (3.15) | 10 (0.39) | 100 (3.94) | 96 (3.78) | 3 (0.12) | 40 (1.57) | 6.5 (0.26) | 19 (0.75) | M6 | 40 (1.57) | 21.5 (0.85) | 6 (0.24) |

| | | | | | | | | | | | | | | | |
|----|--------|--|---------------|---------------|----------------|---------------|---------------|---------------|--------------|--------------|---------------------|-----|--------------|--------------|--------------|
| 63 | 1FK706 | | 155 (6.10) | 110 (4.33) | 10 (0.39) | 130 (5.12) | 126 (4.96) | 3.5 (0.14) | 50 (1.97) | 9 (0.35) | 24 (0.94) | M8 | 50 (1.97) | 27 (1.06) | 8 (0.31) |
| 80 | 1FK708 | | 194 (7.64) | 130 (5.12) | 11.5 (0.45) | 165 (6.50) | 155 (6.10) | 3.5 (0.14) | 58 (2.28) | 11 (0.43) | 32 (1.26) | M12 | 58 (2.28) | 35 (1.38) | 10 (0.39) |

| SIMOTICS S-1FK7 Compact/High Inertia, without/with brake – Dimensions dependent on shaft height | | | | | | | | | | | | | | | |
|---|--------|--|---------------|---------------|--------------|---------------|---------------|-------------|--------------|--------------|---------------------|-----|--------------|--------------|--------------|
| 100 | 1FK710 | | 245 (9.65) | 180 (7.09) | 13 (0.51) | 215 (8.46) | 192 (7.56) | 4 (0.16) | 80 (3.15) | 14 (0.55) | 38 (1.50) | M12 | 80 (3.15) | 41 (1.61) | 10 (0.39) |

| Shaft height | Type | DQI encoder with DRIVE-CLiQ interface (without resolver) Dimensions in mm (inches) | | | | | | | | Encoder system without DRIVE-CLiQ interface (without resolver) | | | | | |
|--------------|------|---|----------------|----------------|----|----------------|----|----------------|----------------|--|----------------|----|----------------|----|----------------|
| | | without brake | | | | with brake | | | | without brake | | | with brake | | |
| | | G ₁ | G ₂ | O ₂ | LB | O ₁ | LB | O ₁ | G ₁ | G ₂ | O ₂ | LB | O ₁ | LB | O ₁ |

| SIMOTICS S-1FK7 High Inertia – Dimensions dependent on overall length | | | | | | | | | | | | | | | |
|---|------------|-----------------|---------------|--------------|----------------|---------------|----------------|----------------|--------------|---------------|--------------|----------------|---------------|----------------|----------------|
| 48 | 1FK7042-3B | 104.5 (4.11) | 90 (3.54) | 50 (1.97) | 187 (7.36) | 125 (4.92) | 219 (8.62) | 157 (6.18) | 93 (3.66) | 90 (3.54) | 52 (2.05) | 192 (7.56) | 125 (4.92) | 224 (8.82) | 157 (6.18) |
| 63 | 1FK7060-3B | 104.5 (4.11) | 104 (4.09) | 50 (1.97) | 182 (7.17) | 120 (4.72) | 217 (8.54) | 155 (6.10) | 93 (3.66) | 104 (4.09) | 52 (2.05) | 187 (7.36) | 120 (4.72) | 222 (8.74) | 155 (6.10) |
| | 1FK7062-3B | | | | 216 (8.50) | 153 (6.02) | 251 (9.88) | 189 (7.44) | | | | 221 (8.70) | 153 (6.02) | 256 (10.08) | 189 (7.44) |
| 80 | 1FK7081-3B | 104.5 (4.11) | 119 (4.69) | 48 (1.89) | 211 (8.31) | 151 (5.94) | 264 (10.39) | 203 (7.99) | 93 (3.66) | 119 (4.69) | 50 (1.97) | 216 (8.50) | 151 (5.94) | 269 (10.59) | 203 (7.99) |
| | 1FK7084-3B | | | | 270 (10.63) | 209 (8.23) | 322 (12.68) | 262 (10.31) | | | | 275 (10.83) | 209 (8.23) | 327 (12.87) | 262 (10.31) |
| 100 | 1FK7100-3B | 104.5 (4.11) | 137 (5.39) | 53 (2.09) | 183 (7.20) | 118 (4.65) | 220 (8.66) | 170 (6.69) | 93 (3.66) | 137 (5.39) | 55 (2.17) | 188 (7.40) | 118 (4.65) | 225 (8.86) | 170 (6.69) |
| | 1FK7101-3B | | 158 (6.22) | | 209 (8.23) | 144 (5.67) | 261 (10.28) | 196 (7.72) | | 158 (6.22) | | 214 (8.43) | 144 (5.67) | 266 (10.47) | 196 (7.72) |
| | 1FK7103-3B | | | | 235 (9.25) | 170 (6.69) | 287 (11.30) | 222 (8.74) | | | | 240 (9.45) | 170 (6.69) | 292 (11.50) | 222 (8.74) |
| | 1FK7105-3B | | | | 287 (11.30) | 222 (8.74) | 339 (13.35) | 274 (10.79) | | | | 292 (11.50) | 222 (8.74) | 344 (13.54) | 274 (10.79) |



SIMOTICS servomotors

Dimensional drawings

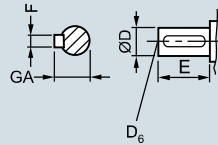
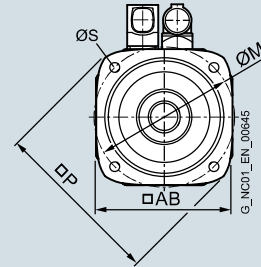
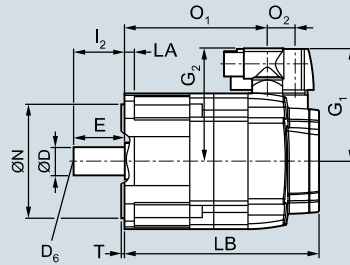
SIMOTICS S-1FK7 – Natural cooling

Dimensional drawings

| For motor | | DQI encoder with DRIVE-CLiQ interface (without resolver) | | | | | | | | Encoder system without DRIVE-CLiQ interface (without resolver) | | | | | | |
|--|-------------|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--|----------------|----------------|----------------|----------------|----------------|--|
| Shaft height | Type | Dimensions in mm (inches) | | | | | | | | | | | | | | |
| | | G ₁ | G ₂ | O ₂ | without brake | | with brake | | G ₁ | G ₂ | O ₂ | without brake | | with brake | | |
| | | | | | LB | O ₁ | LB | O ₁ | | | | LB | O ₁ | LB | O ₁ | |
| SIMOTICS S-1FK7 Compact – Dimensions dependent on overall length | | | | | | | | | | | | | | | | |
| 36 | 1FK7032-2A | 104.5 (4.11) | 78 (3.07) | 50 (1.97) | 173 (6.81) | 111 (4.37) | 200 (7.87) | 138 (5.43) | 77 (3.03) | 78 (3.07) | 47 (1.85) | 173 (6.81) | 111 (4.37) | 200 (7.87) | 138 (5.43) | |
| | 1FK7034-2A | | | | 198 (7.80) | 136 (5.35) | 225 (8.86) | 263 (6.42) | | | | 198 (7.80) | 136 (5.35) | 225 (8.86) | 263 (6.42) | |
| 48 | 1FK7040-2A | 104.5 (4.11) | 90 (4.09) | 50 (1.97) | 147 (6.61) | 85 (4.17) | 179 (7.99) | 117 (5.55) | 93 (3.66) | 90 (4.09) | 52 (2.05) | 152 (6.81) | 85 (4.17) | 184 (8.19) | 117 (5.55) | |
| | 1FK7042-2A | | | | 174 (6.85) | 112 (4.41) | 206 (8.11) | 144 (5.67) | | | | 179 (7.05) | 112 (4.41) | 211 (8.31) | 144 (5.57) | |
| 63 | 1FK7060-2A | 104.5 (4.11) | 104 (4.09) | 50 (1.97) | 168 (6.61) | 106 (4.17) | 203 (7.99) | 141 (5.55) | 93 (3.66) | 104 (4.09) | 52 (2.05) | 173 (6.81) | 106 (4.17) | 208 (8.19) | 141 (5.55) | |
| | 1FK7062-2A | | | | 190 (7.48) | 128 (5.04) | 226 (8.90) | 163 (6.42) | | | | 195 (7.68) | 128 (5.04) | 231 (9.09) | 163 (6.42) | |
| | 1FK7063-2A | | | | 213 (8.39) | 151 (5.94) | 248 (9.76) | 186 (7.32) | | | | 218 (8.58) | 151 (5.94) | 253 (9.96) | 186 (7.32) | |
| 80 | 1FK7080-2A | 104.5 (4.11) | 119 (4.69) | 48 (1.89) | 171 (6.73) | 111 (4.37) | 223 (8.78) | 163 (6.42) | 93 (3.66) | 119 (4.69) | 50 (1.97) | 176 (6.93) | 111 (4.37) | 228 (8.98) | 163 (6.42) | |
| | 1FK7081-2A | | | | 190 (7.48) | 130 (5.12) | 242 (9.53) | 182 (7.17) | | | | 196 (7.68) | 130 (5.12) | 247 (9.72) | 182 (7.17) | |
| | 1FK7083-2A | | | | 209 (8.23) | 149 (5.87) | 261 (10.28) | 201 (7.91) | | | | 214 (8.43) | 149 (5.87) | 266 (10.47) | 201 (7.91) | |
| | 1FK7084-2A | | | | 229 (9.02) | 168 (6.61) | 281 (11.06) | 221 (8.70) | | | | 234 (9.21) | 168 (6.61) | 286 (11.26) | 221 (8.70) | |
| 100 | 1FK7100-2A | 104.5 (4.11) | 137 (5.39) | 53 (2.09) | 183 (7.20) | 118 (4.65) | 220 (8.66) | 170 (6.69) | 93 (3.66) | 137 (5.39) | 55 (2.17) | 188 (7.40) | 118 (4.65) | 225 (8.86) | 170 (6.69) | |
| | 1FK7101-2A | | 158 (6.22) | | 209 (8.23) | 144 (5.67) | 261 (10.28) | 196 (7.72) | | 158 (6.22) | | 214 (8.43) | 144 (5.67) | 266 (10.47) | 196 (7.72) | |
| | 1FK7103-2A | | | | 235 (9.25) | 170 (6.69) | 287 (11.30) | 222 (8.74) | | | | 240 (9.45) | 170 (6.69) | 292 (11.50) | 222 (8.74) | |
| | 1FK7105-2A | | | | 287 (11.30) | 222 (8.74) | 339 (13.35) | 274 (10.79) | | | | 292 (11.50) | 222 (8.74) | 344 (13.54) | 274 (10.79) | |
| SIMOTICS S-1FK7 High Dynamic – Dimensions dependent on overall length | | | | | | | | | | | | | | | | |
| 36 | 1FK7033-4C | 104.5 (4.11) | 78 (3.07) | 50 (1.97) | 183 (7.20) | 121 (4.76) | 210 (8.27) | 148 (5.83) | 77 (3.03) | 78 (3.07) | 47 (1.85) | 183 (7.20) | 121 (4.76) | 210 (8.27) | 148 (5.83) | |
| 48 | 1FK7043-4C | 104.5 (4.11) | 90 (3.54) | 56 (2.20) | 200 (7.87) | 132 (5.20) | 232 (9.13) | 164 (6.46) | 93 (3.66) | 90 (3.54) | 58 (2.28) | 205 (8.07) | 132 (5.20) | 237 (9.33) | 164 (6.46) | |
| | 1FK7044-4C | | | | 225 (8.86) | 157 (6.18) | 257 (10.12) | 189 (7.44) | | | | 230 (9.06) | 157 (6.18) | 262 (10.31) | 189 (7.44) | |
| 63 | 1FK7061-4C | 104.5 (4.11) | 104 (4.09) | 50 (1.97) | 203 (7.99) | 141 (5.55) | 238 (9.37) | 176 (6.93) | 93 (3.66) | 104 (4.09) | 52 (2.05) | 208 (8.19) | 141 (5.55) | 243 (9.57) | 176 (6.93) | |
| | 1FK7064-4C | | | | 267 (10.51) | 205 (8.07) | 302 (11.89) | 240 (9.45) | | | | 272 (10.71) | 205 (8.07) | 307 (12.09) | 240 (9.45) | |
| 80 | 1FK708.-4CC | 104.5 (4.11) | 119 (4.69) | 48 (1.89) | 257 (10.12) | 197 (7.76) | 309 (12.17) | 249 (9.80) | 93 (3.66) | 119 (4.69) | 50 (1.97) | 262 (10.31) | 197 (7.76) | 314 (12.36) | 249 (9.80) | |
| | 1FK708.-4CF | | 139 (5.47) | | | | | | | | | 139 (5.47) | | | | |

Dimensional drawings

 1FK703
 1FK704
 1FK706
 1FK708
 1FK710

 Shaft design
 with feather key

 Version
 with resolver

 For motor Resolver with/without DRIVE-CLiQ interface
 Dimensions in mm (inches)

| Shaft height | Type | | | | | | | | | | | Shaft extension DE | | | | F |
|--|--------|---------------|---------------|----------------|---------------|---------------|---------------|--------------|----------------|---------------------|-----|--------------------|----------------|--------------|--|---|
| | | IEC | P | N | LA | M | AB | T | I ₂ | S | D | D ₆ | E | GA | | |
| SIMOTICS S-1FK7 Compact/High Dynamic, with/without brake – Dimensions dependent on shaft height | | | | | | | | | | | | | | | | |
| 36 | 1FK703 | 90 (3.54) | 60 (2.36) | 8 (0.31) | 75 (2.95) | 72 (2.83) | 3 (0.12) | 30 (1.18) | 6.5 (0.26) | 14 (0.55) | M5 | 30 (1.18) | 16 (0.63) | 5 (0.20) | | |
| 48 | 1FK704 | 120 (4.72) | 80 (3.15) | 10 (0.39) | 100 (3.94) | 96 (3.78) | 3 (0.12) | 40 (1.57) | 6.5 (0.26) | 19 (0.75) | M6 | 40 (1.57) | 21.5 (0.85) | 6 (0.24) | | |
| 63 | 1FK706 | 155 (6.10) | 110 (4.33) | 10 (0.39) | 130 (5.12) | 126 (4.96) | 3.5 (0.14) | 50 (1.97) | 9 (0.35) | 24 (0.94) | M8 | 50 (1.97) | 27 (1.06) | 8 (0.31) | | |
| 80 | 1FK708 | 194 (7.64) | 130 (5.12) | 11.5 (0.45) | 165 (6.50) | 155 (6.10) | 3.5 (0.14) | 58 (2.28) | 11 (0.43) | 32 (1.26) | M12 | 58 (2.28) | 35 (1.38) | 10 (0.39) | | |
| SIMOTICS S-1FK7 Compact, without/with brake – Dimensions dependent on shaft height | | | | | | | | | | | | | | | | |
| 100 | 1FK710 | 245 (9.65) | 180 (7.09) | 13 (0.51) | 215 (8.46) | 192 (7.56) | 4 (0.16) | 80 (3.15) | 14 (0.55) | 38 (1.50) | M12 | 80 (3.15) | 41 (1.61) | 10 (0.39) | | |

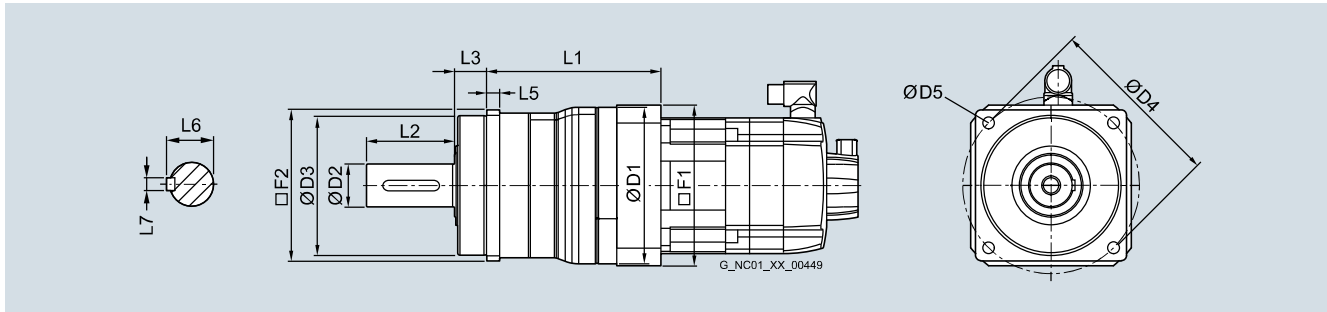
SIMOTICS servomotors

Dimensional drawings

SIMOTICS S-1FK7 – Natural cooling

Dimensional drawings

| For motor | | Resolver with/without DRIVE-CLIQ interface | | | | | | |
|--|-------------|--|----------------|----------------|----------------|----------------|----------------|----------------|
| | | Dimensions in mm (inches) | | | | | | |
| Shaft height | Type | G ₁ | G ₂ | O ₂ | without brake | | with brake | |
| | | | | | LB | O ₁ | LB | O ₁ |
| SIMOTICS S-1FK7 Compact – Dimensions dependent on overall length | | | | | | | | |
| 36 | 1FK7032-2A | 80 (3.15) | 80 (3.15) | 15 (0.59) | 153 (6.02) | 117 (4.61) | 180 (7.09) | 144 (5.67) |
| | 1FK7034-2A | | | | 178 (7.01) | 142 (5.59) | 205 (8.07) | 169 (6.65) |
| 48 | 1FK7040-2A | 90 (3.54) | 90 (3.54) | 23 (0.91) | 132 (5.20) | 85 (3.35) | 164 (6.46) | 117 (4.61) |
| | 1FK7042-2A | | | | 160 (6.30) | 112 (4.41) | 192 (7.56) | 144 (5.67) |
| 63 | 1FK7060-2A | 103 (4.06) | 104 (4.09) | 23 (0.91) | 153 (6.02) | 106 (4.17) | 189 (7.44) | 141 (5.55) |
| | 1FK7062-2A | | | | 176 (6.93) | 128 (5.04) | 211 (8.31) | 163 (6.42) |
| | 1FK7063-2A | | | | 198 (7.80) | 151 (5.94) | 234 (9.21) | 186 (7.32) |
| 80 | 1FK7080-2A | 118 (4.65) | 119 (4.69) | 21 (0.83) | 157 (6.18) | 111 (4.37) | 209 (8.23) | 163 (6.42) |
| | 1FK7081-2A | | | | 176 (6.93) | 130 (5.12) | 228 (8.98) | 182 (7.17) |
| | 1FK7083-2A | | | | 195 (7.68) | 149 (5.87) | 247 (9.72) | 201 (7.91) |
| | 1FK7084-2A | | | | 214 (8.43) | 168 (6.61) | 266 (10.47) | 221 (8.70) |
| 100 | 1FK7100-2A | 136 (5.35) | 137 (5.39) | 26 (1.02) | 169 (6.65) | 118 (4.65) | 206 (8.11) | 155 (6.10) |
| | 1FK7101-2A | | 158 (6.22) | | 195 (7.68) | 144 (5.67) | 247 (9.72) | 196 (7.72) |
| | 1FK7103-2A | | | | 221 (8.70) | 170 (6.69) | 273 (10.75) | 222 (8.74) |
| | 1FK7105-2A | | | | 273 (10.75) | 222 (8.74) | 325 (12.80) | 274 (10.79) |
| SIMOTICS S-1FK7 High Dynamic – Dimensions dependent on overall length | | | | | | | | |
| 36 | 1FK7033-4C | 81 (3.19) | 80 (3.15) | 15 (0.59) | 163 (6.42) | 127 (5.00) | 190 (7.48) | 154 (6.06) |
| 48 | 1FK7043-4C | 90 (3.54) | 90 (3.54) | 23 (0.9) | 186 (7.32) | 138 (5.43) | 218 (8.58) | 170 (6.69) |
| | 1FK7044-4C | | | | 211 (8.31) | 163 (6.42) | 243 (9.57) | 195 (7.68) |
| 63 | 1FK7061-4C | 103 (4.06) | 104 (4.09) | 23 (0.9) | 188 (7.40) | 141 (5.55) | 224 (8.82) | 176 (6.93) |
| | 1FK7064-4C | | | | 252 (9.92) | 205 (8.07) | 288 (11.34) | 240 (9.45) |
| 80 | 1FK708.-4CC | 118 (4.65) | 119 (4.69) | 21 (0.83) | 243 (9.57) | 197 (7.76) | 295 (11.61) | 250 (9.84) |
| | 1FK708.-4CF | | 139 (5.47) | | | | | |

Planetary gearbox series SP+ for SIMOTICS S-1FT7/S-1FK7 synchronous motors
Dimensional drawings


For SP+ series planetary gearboxes on SIMOTICS S-1FT7/S-1FK7 motors

Dimensions in mm (inches)

Planetary gearbox

| Type | D2 | D3 | D4 | D5 | F2 | L2 | L3 | L5 | L6 | L7 |
|--|--------------|---------------|----------------|----------------|---------------|---------------|--------------|--------------|----------------|--------------|
| SIMOTICS S-1FT7/1FK7 with SP+ series planetary gearbox single-stage/two-stage | | | | | | | | | | |
| SP060S-MF1/-MF2 | 16 (0.63) | 60 (2.36) | 68 (2.68) | 5.5 (0.22) | 62 (2.48) | 28 (1.10) | 20 (0.79) | 6 (0.24) | 18 (0.71) | 5 (0.20) |
| SP075S-MF1/-MF2 | 22 (0.87) | 70 (2.76) | 85 (3.35) | 6.6 (0.26) | 76 (2.99) | 36 (1.42) | 20 (0.79) | 7 (0.28) | 24.5 (0.96) | 6 (0.24) |
| SP100S-MF1/-MF2 | 32 (1.26) | 90 (3.54) | 120 (4.72) | 9 (0.35) | 101 (3.98) | 58 (2.28) | 30 (1.18) | 10 (0.39) | 35 (1.38) | 10 (0.39) |
| SP140S-MF1/-MF2 | 40 (1.57) | 130 (5.12) | 165 (6.50) | 11 (0.43) | 141 (5.55) | 82 (3.23) | 30 (1.18) | 12 (0.47) | 43 (1.69) | 12 (0.47) |
| SP180S-MF1/-MF2 | 55 (2.17) | 160 (6.30) | 215 (8.46) | 13.5 (0.53) | 182 (7.17) | 82 (3.23) | 30 (1.18) | 15 (0.59) | 59 (2.32) | 16 (0.63) |
| SP210S-MF1/-MF2 | 75 (2.95) | 180 (7.09) | 250 (9.84) | 17 (0.67) | 215 (8.46) | 105 (4.13) | 38 (1.50) | 17 (0.67) | 79.5 (3.13) | 20 (0.79) |
| SP240S-MF1/-MF2 | 85 (3.35) | 200 (7.87) | 290 (11.42) | 17 (0.67) | 245 (9.65) | 130 (5.12) | 40 (1.57) | 20 (0.79) | 90 (3.54) | 22 (0.87) |

SIMOTICS servomotors

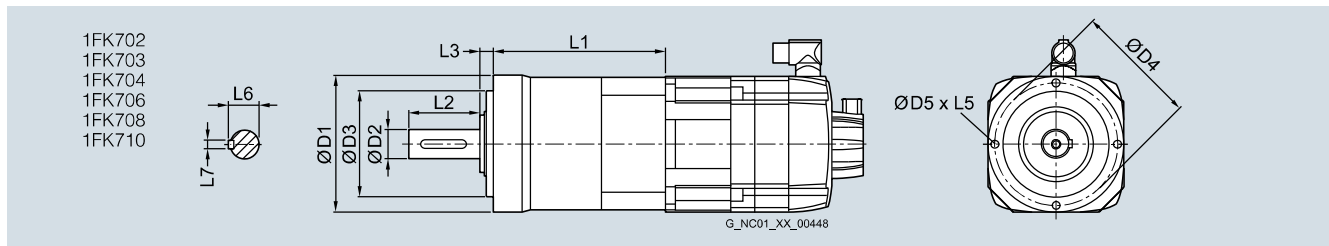
Dimensional drawings

Planetary gearbox series SP+ for SIMOTICS S-1FT7/S-1FK7 synchronous motors

Dimensional drawings

For SP+ series planetary gearboxes on SIMOTICS S-1FT7/S-1FK7 motors

| | | Dimensions in mm (inches) | | | | | |
|--|---------------|---|---------------|-----------------|--|---------------|------------------|
| | | Planetary gearbox series SP+ <u>single-stage</u> | | | Planetary gearbox series SP+ <u>two-stage</u> | | |
| | | -MF1 | | | | | |
| Planetary gearbox | Motor | | | | | | |
| Type | Type | D1 | F1 | L1 | D1 | F1 | L1 |
| SIMOTICS S-1FT7/1FK7 with SP+ series planetary gearbox single-stage/two-stage | | | | | | | |
| SP060S- | 1FK702 | 68 (2.68) | 70 (2.76) | 89.3 (3.52) | 70 (2.76) | 60 (2.36) | 108 (4.25) |
| | 1FT703/1FK703 | 68 (2.68) | 70 (2.76) | 94 (3.70) | 68 (2.68) | 70 (2.76) | 116 (4.57) |
| | 1FT704/1FK704 | 91 (3.58) | 90 (3.54) | 106 (4.17) | – | – | – |
| SP075S- | 1FK702 | 91 (3.58) | 90 (3.54) | 107.8 (4.24) | 95 (3.74) | 70 (2.76) | 119 (4.69) |
| | 1FT703/1FK703 | 91 (3.58) | 90 (3.54) | 107.8 (4.24) | 95 (3.74) | 70 (2.76) | 123.4 (4.86) |
| | 1FT704/1FK704 | 91 (3.58) | 90 (3.54) | 111.5 (4.39) | 91 (3.58) | 90 (3.54) | 135.6 (5.34) |
| SP100S- | 1FK702 | – | – | – | 118 (4.65) | 90 (3.54) | 142.3 (5.60) |
| | 1FT703/1FK703 | – | – | – | 118 (4.65) | 90 (3.54) | 142.3 (5.60) |
| | 1FT704/1FK704 | 115 (4.53) | 120 (4.72) | 122 (4.80) | 118 (4.65) | 90 (3.54) | 146 (5.75) |
| | 1FT704/1FK706 | 115 (4.53) | 120 (4.72) | 129 (5.08) | 115 (4.53) | 120 (4.72) | 164 (6.46) |
| SP140S- | 1FT704/1FK704 | – | – | – | 152 (5.98) | 120 (4.72) | 186.3 (7.33) |
| | 1FT706/1FK706 | 146 (5.75) | 150 (5.91) | 162.3 (6.39) | 152 (5.98) | 120 (4.72) | 193.3 (7.61) |
| | 1FT708/1FK708 | 146 (5.75) | 150 (5.91) | 171.3 (6.74) | 146 (5.75) | 150 (5.91) | 220 (8.66) |
| | 1FT710/1FK710 | 146 (5.75) | 190 (7.48) | 171.3 (6.74) | – | – | – |
| SP180S- | 1FT706/1FK706 | – | – | – | 212 (8.35) | 150 (5.91) | 234 (9.21) |
| | 1FT708/1FK708 | 207 (8.15) | 210 (8.27) | 198 (7.80) | 212 (8.35) | 150 (5.91) | 242.9 (9.56) |
| | 1FT710/1FK710 | 207 (8.15) | 210 (8.27) | 203.5 (8.01) | 212 (8.35) | 190 (7.48) | 242.9 (9.56) |
| SP210S- | 1FT708/1FK708 | – | – | – | 215 (8.46) | 210 (8.27) | 272 (10.71) |
| | 1FT710/1FK710 | 215 (8.46) | 190 (7.48) | 242 (9.53) | 215 (8.46) | 210 (8.27) | 272 (10.71) |
| | 1FT713 | 215 (8.46) | 260 (7.48) | 242 (9.53) | – | – | – |
| SP240S- | 1FT708/1FK708 | – | – | – | 245 (9.65) | 210 (8.27) | 297.5 (11.71) |
| | 1FT710/1FK710 | 245 (9.65) | 240 (9.45) | 273 (10.75) | 245 (9.65) | 210 (8.27) | 297.5 (11.71) |
| | 1FT713 | 245 (9.65) | 260 (9.45) | 273 (10.75) | 245 (9.65) | 260 (8.27) | 297.5 (11.71) |

Planetary gearboxes series LP+ for SIMOTICS S-1FK7 synchronous motors
Dimensional drawings


For LP+ series planetary gearboxes on SIMOTICS S-1FK7 motors

Dimensions in mm (inches)

| Planetary gearbox Type | Motor Type | L1 | L2 | L3 | L5 | L6 | L7 | D1 | D2 | D3 | D4 | D5 |
|--|------------|-----------------|--------------|---------------|--------------|----------------|--------------|---------------|--------------|---------------|---------------|-----|
| SIMOTICS S-1FK7 with LP+ series planetary gearbox | | | | | | | | | | | | |
| LP050S-MF1 | 1FK702 | 63 (2.48) | 18 (0.71) | 6.5 (0.26) | 8 (0.31) | 13.5 (0.53) | 4 (0.16) | 50 (1.97) | 12 (0.47) | 35 (1.38) | 44 (1.73) | M4 |
| LP070S-MF1 | 1FK702 | 83 (3.27) | 28 (1.10) | 8 (0.31) | 10 (0.39) | 18 (0.71) | 5 (0.20) | 70 (2.76) | 16 (0.63) | 52 (2.05) | 62 (2.44) | M5 |
| | 1FK703 | 90 (3.54) | | | | | | | | | | |
| LP090S-MF1 | 1FK704 | 112 (4.41) | 36 (1.42) | 10 (0.39) | 12 (0.47) | 24.5 (0.96) | 6 (0.24) | 90 (3.54) | 22 (0.87) | 68 (2.68) | 80 (3.15) | M6 |
| | 1FK706 | 122 (4.80) | | | | | | | | | | |
| | 1FK708 | 132 (5.20) | | | | | | | | | | |
| LP120S-MF1 | 1FK706 | 140 (5.51) | 58 (2.28) | 12 (0.47) | 16 (0.63) | 35 (1.38) | 10 (0.39) | 120 (4.72) | 32 (1.26) | 90 (3.54) | 108 (4.25) | M8 |
| | 1FK708 | 150 (5.91) | | | | | | | | | | |
| LP155S-MF1 | 1FK708 | 168.5 (6.63) | 82 (3.23) | 15 (0.59) | 20 (0.79) | 43 (1.69) | 12 (0.47) | 155 (6.10) | 40 (1.57) | 120 (4.72) | 140 (5.51) | M10 |
| | 1FK710 | 188.5 (7.42) | | | | | | | | | | |