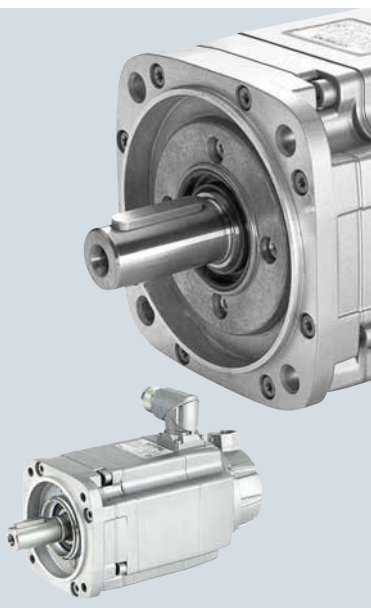



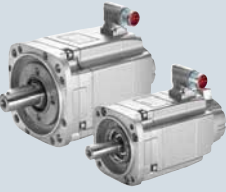
## SIMOTICS servomotors



<b>8/2</b>	<b>Overview</b>
<b>8/4</b>	<b>Technical definitions for AC motors</b>
<b>8/14</b>	<b>SIMOTICS S synchronous motors for SINAMICS S120</b>
8/14	<u>SIMOTICS S-1FT7</u>
8/16	Compact core type – Natural cooling
8/18	Compact – Natural cooling
8/24	Compact – Forced ventilation
8/26	Compact – Water cooling
8/30	High Dynamic – Forced ventilation/ Water cooling
8/32	<u>SIMOTICS S-1FK7</u>
8/36	Compact – Natural cooling
8/42	High Dynamic – Natural cooling
8/44	High Inertia – Natural cooling
8/46	Compact for Power Modules 230 V 1 AC
8/50	High Dynamic for Power Modules 230 V 1 AC
8/52	Built-in holding brakes for SIMOTICS S-1FT7/S-1FK7 motors
<b>8/53</b>	<b>SIMOTICS S geared motors for SINAMICS S120</b>
8/53	Planetary gearbox series SP+ for SIMOTICS S-1FT7
8/58	Planetary gearbox series SP+ for SIMOTICS S-1FK7
8/64	Planetary gearbox series LP+ for SIMOTICS S-1FK7
<b>8/66</b>	<b>Dimensional drawings</b>
8/66	SIMOTICS S-1FT7
8/72	SIMOTICS S-1FK7
8/77	Planetary gearbox
Chap. 13	<b>Drive Technology Configurator</b> Product selection tool <a href="http://www.siemens.com/dt-configurator">www.siemens.com/dt-configurator</a>
Chap. 13	<b>SIZER for Siemens Drives</b> Engineering tool <a href="http://www.siemens.com/sizer">www.siemens.com/sizer</a>
Chap. 13	<b>CAD CREATOR</b> Dimensional drawing and 2D/3D CAD generator <a href="http://www.siemens.com/cadcreator">www.siemens.com/cadcreator</a>
	Siemens D 21.4 · 2017

## SIMOTICS servomotors

### Overview

Motor type	Features	Degree of protection	Type of cooling
<b>SIMOTICS S servomotors – permanent-magnet</b>			
 <b>SIMOTICS S-1FT7</b> Compact	Compact Very high power density	IP64 <sup>1)</sup> (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
 <b>SIMOTICS S-1FK7</b> Compact  Compact for Power Modules 230 V 1 AC	Compact High power density	IP64 (optional IP65)	Natural cooling
	<b>SIMOTICS S-1FK7</b> High Dynamic  High Dynamic for Power Modules 230 V 1 AC	IP64 (optional IP65)	Natural cooling
	<b>SIMOTICS S-1FK7</b> High 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 booksized format by way of example. Other formats are also possible. The SIZER for Siemens Drives engineering tool is available for detailed configuration

<sup>1)</sup> Core type: IP65.

Shaft height	Rated power $P_{\text{rated}}$ for duty type S1 kW (hp)							Rated torque $M_{\text{rated}}$	Selection and ordering data
	0.01	0.1	1	10	100	1000	10000		Page
SH 36/SH 48/SH 63/ SH 80/SH 100/SH 132			0.88 (1.18)	17 (22.8)				1.4 ... 108 Nm (12.4 ... 956 lb <sub>f</sub> -in)	8/16
SH 80/SH 100				5 (6.71)	18.8 (25.2)			21 ... 73 Nm (186 ... 646 lb <sub>f</sub> -in)	
SH 63/SH 80/SH 100				3.1 (4.16)	34.2 (45.9)			9.2 ... 125 Nm (81.4 ... 1106 lb <sub>f</sub> -in)	
SH 63/SH 80				3.8 (5.10)	10.8 (14.5)			11 ... 33 Nm (97.4 ... 292 lb <sub>f</sub> -in)	8/30
SH 63/SH 80				5.7 (7.64)	21.7 (29.1)			16.5 ... 51 Nm (146 ... 451 lb <sub>f</sub> -in)	
SH 20/SH 28/SH 36/ SH 48/SH 63/SH 80/ SH 100	0.05 (0.07)			8.2 (11.0)				0.08 ... 37 Nm (0.71 ... 327 lb <sub>f</sub> -in)	8/36
SH 20/SH 28/SH 36/ SH 48	0.05 (0.07)		0.8 (1.07)					0.08 ... 2.6 Nm (0.71 ... 23 lb <sub>f</sub> -in)	8/46
SH 36/SH 48/SH 63/ SH 80			0.6 (0.80)	3.8 (5.10)				0.9 ... 18 Nm (8.0 ... 159 lb <sub>f</sub> -in)	8/42
SH 36/SH 48			0.4 (0.54)	0.9 (1.21)				1.2 ... 3 Nm (10.6 ... 26.6 lb <sub>f</sub> -in)	8/50
SH 48/SH 63/SH 80/ SH 100			0.9 (1.21)	7.7 (10.3)				1.5 ... 37 Nm (13.3 ... 327 lb <sub>f</sub> -in)	8/44

## 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	<b>IP23</b>	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	<b>IP54</b>	Complete protection against accidental contact	Protection against damaging dust deposits	Splash water from any direction
	<b>IP55</b>			Jet water from any direction
	<b>IP64</b>			Splash water from any direction
	<b>IP65</b> <sup>1)</sup>			Jet water from any direction
	<b>IP67</b> <sup>1)</sup>			Motor under specified pressure and time conditions under water

##### Recommended degrees of protection for AC motors

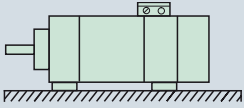
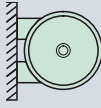
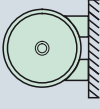
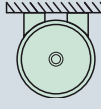
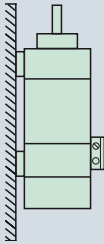
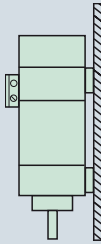
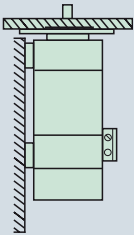
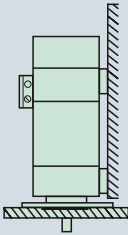
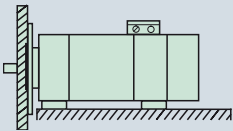
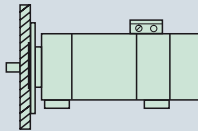
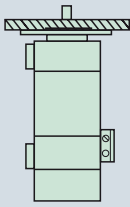
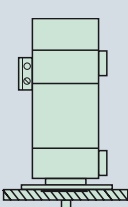
When cooling lubricants are used, protection against water alone is inadequate. The IP rating should only be considered as a guideline in this case. The motors may have to be protected by suitable covers. Attention must be paid to providing suitable sealing of the motor shaft for the selected degree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

<sup>1)</sup> 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
<b>IM B3</b> 	<b>IM B6</b> 
<b>IM B7</b> 	<b>IM B8</b> 
<b>IM V6</b> 	<b>IM V5</b> 
<b>IM V35 <sup>1)</sup></b> 	<b>IM V15 <sup>1)</sup></b> 
<b>IM B35 <sup>1)</sup></b> 	<b>IM B5, IM B 14</b> 
<b>IM V3, IM V19</b> 	<b>IM V1, IM V18</b> 

<sup>1)</sup> Fixing on the flange and feet is necessary.

## SIMOTICS servomotors

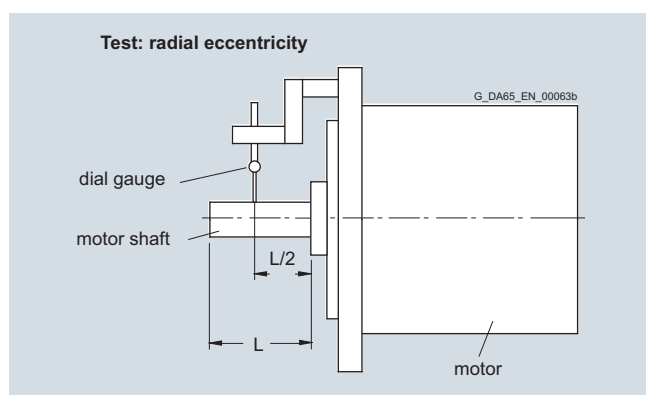
### Technical definitions for AC motors

#### Overview (continued)

#### Radial eccentricity tolerance of shaft in relation to housing axis

referred to cylindrical shaft extensions

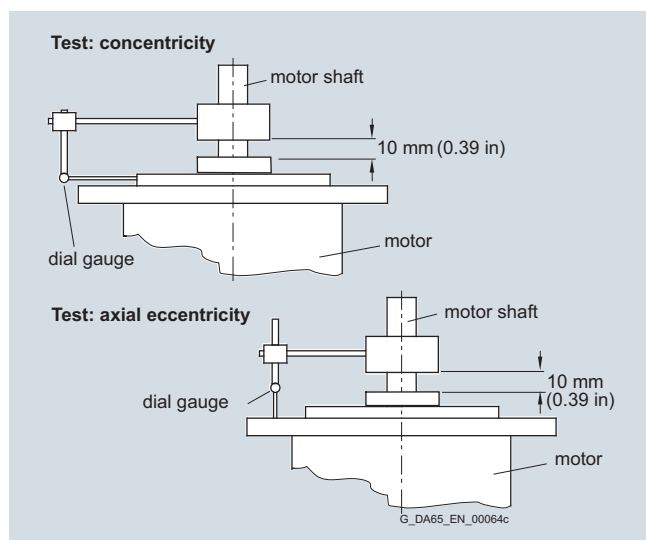
Shaft height SH	Tolerance N mm (in)	Tolerance R mm (in)	Tolerance SPECIAL mm (in)
28/36	0.035 (0.00138)	0.018 (0.00071)	–
48/63	0.04 (0.00157)	0.021 (0.00083)	–
80/100/132	0.05 (0.00197)	0.025 (0.00098)	0.01 (0.00039)
160/180/225	0.06 (0.00236)	0.03 (0.00118)	0.01/–/– (0.00039)/–/–
280	0.07 (0.00276)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

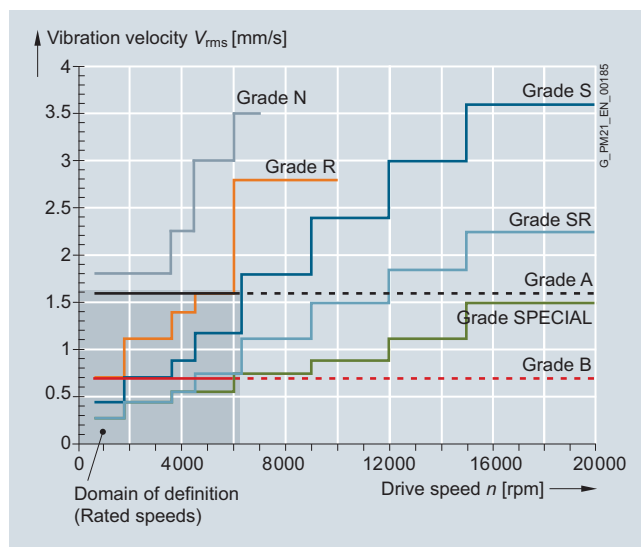
Shaft height SH	Tolerance N mm (in)	Tolerance R mm (in)	Tolerance SPECIAL mm (in)
28/36/48	0.08 (0.00315)	0.04 (0.00157)	–
63/80/100	0.1 (0.00394)	0.05 (0.00197)	–/0.03/0.04 –/(0.00118/0.00157)
132/160/180/225	0.125 (0.00492)	0.063 (0.00248)	0.04/0.04/– (0.00157/0.00157)/–
280/355	0.16 (0.00630)	0.08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

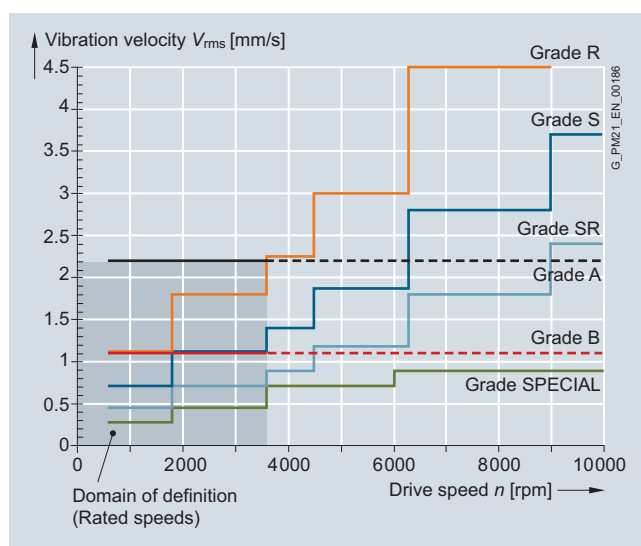
The values indicated refer only to the motor. These values can increase as a result of the overall system vibrational behavior due to installation.



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 $V_{rms}$	$\leq 4.5 \text{ mm/s (0.18 in/s)}$
	Vibration acceleration $a$ axial	$\leq 25 \text{ m/s}^2 (82.0 \text{ ft/s}^2)$
	Vibration acceleration $a$ radial	$\leq 50 \text{ m/s}^2 (164.0 \text{ ft/s}^2)$

For motors with forced ventilation, the limit values for axial and radial acceleration are limited to  $10 \text{ m/s}^2 (32.8 \text{ ft/s}^2)$

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 $s$	$\leq 0.16 \text{ mm (0.006 in)}$
6.3 ... 250 Hz	Vibration velocity $V_{rms}$	$\leq 4.5 \text{ mm/s (0.18 in/s)}$
> 250 Hz	Vibration acceleration $a$	$\leq 10 \text{ m/s}^2 (32.8 \text{ ft/s}^2)$

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

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 $s$	$\leq 0.26 \text{ mm (0.010 in)}$
6.3 ... 63 Hz	Vibration velocity $V_{rms}$	$\leq 7.1 \text{ mm/s (0.28 in/s)}$
> 63 Hz	Vibration acceleration $a$	$\leq 4.0 \text{ m/s}^2 (13.12 \text{ ft/s}^2)$

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

Operation (unrestricted):  $-15^\circ\text{C}$  to  $+40^\circ\text{C}$  ( $+5$  to  $104^\circ\text{F}$ )

The rated power (rated torque) is applicable to continuous duty (S1) in accordance with EN 60034-1 at rated frequency, a coolant temperature of  $40^\circ\text{C}$  ( $104^\circ\text{F}$ ) 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  $5^\circ\text{C}$  ( $41^\circ\text{F}$ ) and 500 m (1640 ft) respectively.

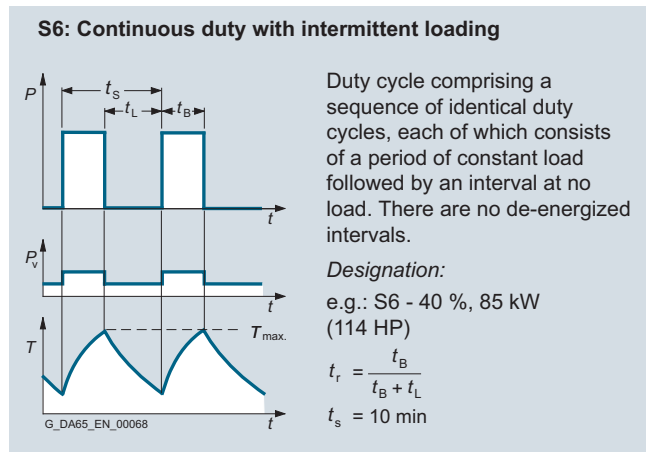
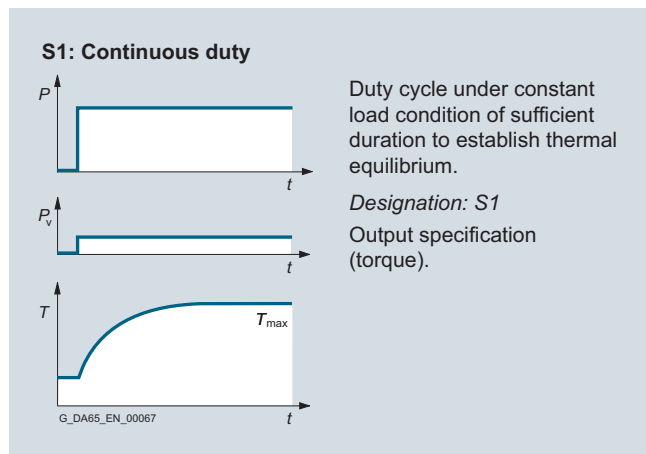
Installation altitude above sea level m (ft)	Coolant temperature (ambient temperature)			
	< $30^\circ\text{C}$ ( $86^\circ\text{F}$ )	$30 \dots 40^\circ\text{C}$ ( $86 \dots 104^\circ\text{F}$ )	$45^\circ\text{C}$ ( $113^\circ\text{F}$ )	$50^\circ\text{C}$ ( $122^\circ\text{F}$ )
1000 (3281)	1.07	1.00	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

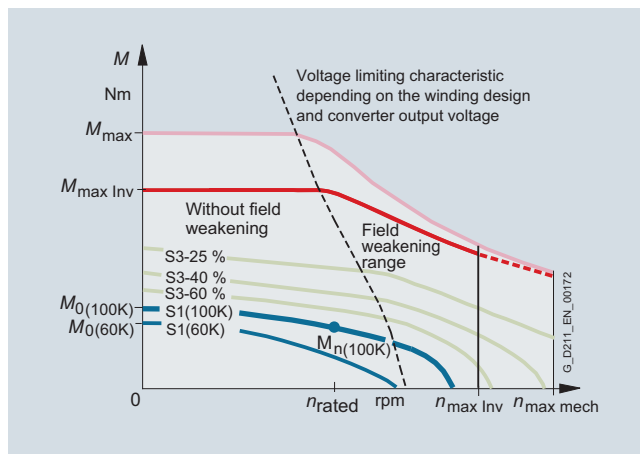
Technical definitions for AC motors

### 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)

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

#### Rated torque

The torque supplied on the shaft is indicated in Nm (lb<sub>F</sub>-ft) in the selection and ordering data.

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

$P_{\text{rated}}$  Rated power in kW

$n_{\text{rated}}$  Rated speed in rpm

$M_{\text{rated}}$  Rated torque in Nm

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

$P_{\text{rated}}$  Rated power in hp

$n_{\text{rated}}$  Rated speed in rpm

$M_{\text{rated}}$  Rated torque in lb<sub>F</sub>-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.

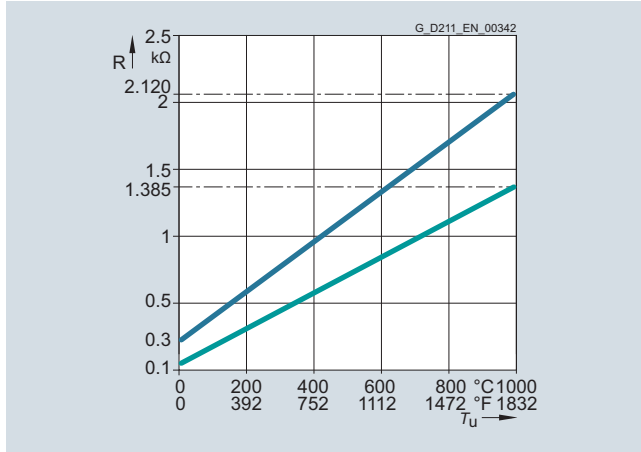
The insulating material system ensures that these motors will have a high mechanical and electrical stability, high service value, and a long service life.

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 characteristics 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](http://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	<b>Moderate</b> (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	<b>Worldwide</b> (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 <sup>1)</sup>
Encoder	Identification letter in the motor article number				Encoder	Identification letter in the motor article number						
	1FT7	1FK7	1FW3	1PH8	Encoder	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

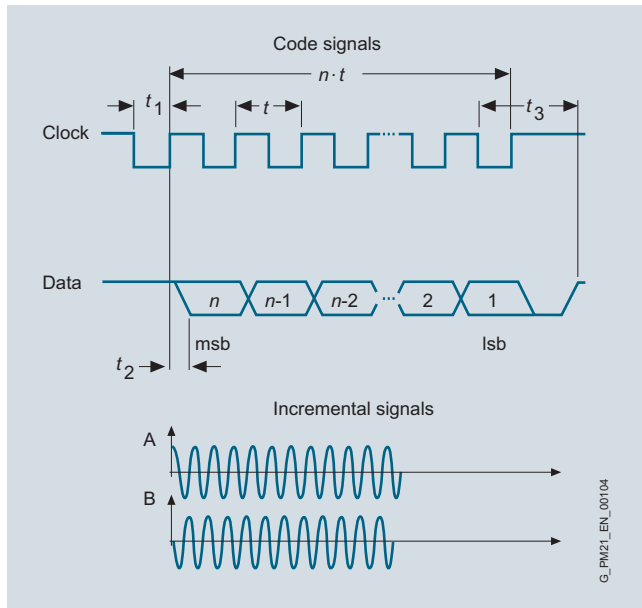
<sup>1)</sup> Not for SIMOTICS T-1FW3.

### 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 <sup>1)</sup>	Absolute encoder, single-turn, 24 bit (resolution 16777216)
AS20DQI encoder <sup>1)</sup>	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) <sup>2)</sup>	4096 revolutions
Incremental signals (sinusoidal 1 V <sub>pp</sub> )	
• 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) <sup>2)</sup>	4096 revolutions

<sup>1)</sup> Not for absolute encoder, single-turn AS

<sup>2)</sup> 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.

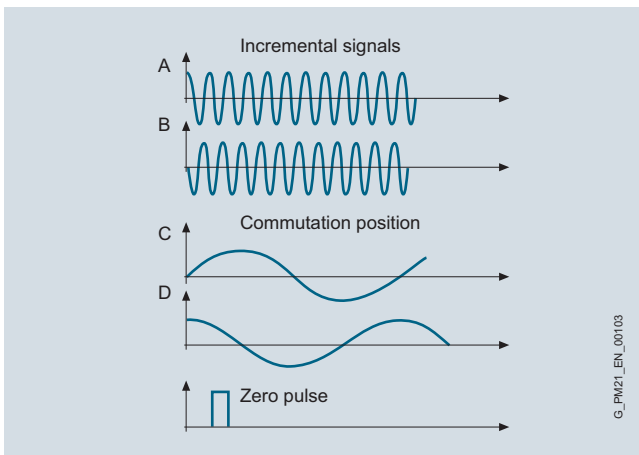
##### Incremental encoder IC/IN (sin/cos)

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.

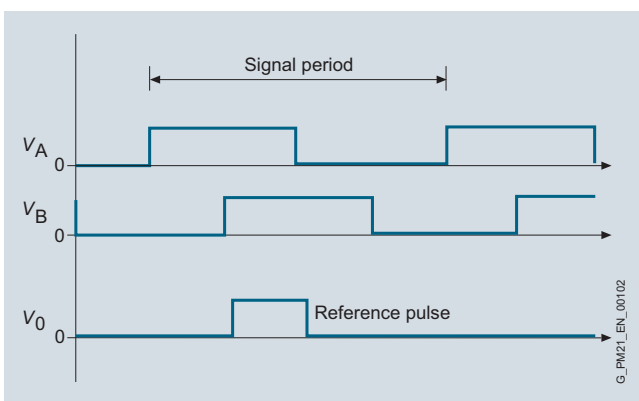
##### Commutation position

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 <sub>pp</sub> 2048 S/R with C and D tracks
Encoder IN2048S/R	Incremental encoder sin/cos 1 V <sub>pp</sub> 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 interface <sup>1)</sup>

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 <sup>22</sup> 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

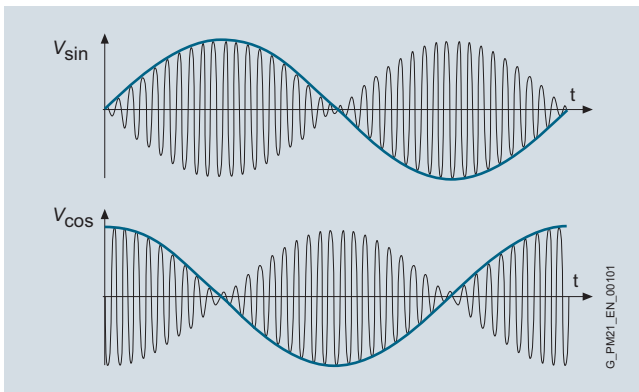
<sup>1)</sup> Instead of the IC22DQ incremental encoder, the AS24DQI single-turn absolute encoder is used for SIMOTICS S-1FK7/1FT7.

## 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 <sup>1)</sup>

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

<sup>1)</sup> 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.

# SIMOTICS servomotors

## SIMOTICS S synchronous motors for SINAMICS S120

### SIMOTICS S-1FT7

#### Technical specifications

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

#### Built-in encoder systems without DRIVE-CLiQ interface

Incremental encoder	
Encoder IC2048S/R	Incremental encoder sin/cos 1 V <sub>pp</sub> 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 <sup>2)</sup>	
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

<sup>1)</sup> Shaft extension run-out, concentricity of centering ring and shaft, and perpendicularity of flange to shaft.

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

<sup>3)</sup> Additional plain text required.

#### Options

Order code	Description
<b>J..</b>	Mounting of SP+ planetary gearbox (see <a href="#">SIMOTICS S geared motors</a> )
<b>K20</b>	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)
<b>L03</b>	Version for increased vibration stress (information about validity and specification can be found in the latest configuration manual)
<b>N05</b>	Alternative shaft geometry
<b>N16</b>	Version for increased chemical resistance
<b>N40</b>	Stainless-steel shaft and coating for increased chemical resistance (information about validity and specification can be found in the latest configuration manual)
<b>Q12</b>	Sealing air connection (Only in conjunction with degree of protection IP67. Not in combination with terminal box)
<b>Y84</b>	Customer specifications on rating plate (max. 30 characters) <sup>3)</sup>
	Paint finish
<b>K23</b>	Special paint finish for "Worldwide" climate group: Primer and paint finish: Anthracite RAL 7016
<b>K23+X..</b>	Special paint finish for "Worldwide" climate group: Primer and other paint finish can be selected from X01 to X09
<b>K24</b>	Primed (unpainted)
<b>X01</b>	Paint finish: Jet black, matt RAL 9005
<b>X02</b>	Paint finish: Cream white RAL 9001
<b>X03</b>	Paint finish: Reseda green RAL 6011
<b>X04</b>	Paint finish: Pebble gray RAL 7032
<b>X05</b>	Paint finish: Sky blue RAL 5015
<b>X06</b>	Paint finish: Light ivory RAL 1015
<b>X08</b>	Paint finish: White aluminum
<b>X09</b>	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	<b>SIMOTICS S-1FT7 Compact synchronous motors</b>	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 $\Delta T=100\text{ K}$	<b>Core type</b>	$p$	$J$	$m$
rpm		kW (hp)	Nm (lb <sub>f</sub> -ft)	Nm (lb <sub>f</sub> -ft)	A	Article No.		$10^{-4}\text{ kgm}^2$ ( $10^{-3}\text{ lb}_f\text{-in-s}^2$ )	kg (lb)
<b>SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Natural cooling</b>									
<b>2000</b>	100	5.03 (6.75)	30 (22.1)	24 (17.7)	10	<b>1FT7102-1AC7-1</b> ■ ■ ■ 1	5	91.4 (80.90)	26.1 (57.5)
		7.96 (10.7)	50 (36.9)	38 (28.0)	15	<b>1FT7105-1AC7-1</b> ■ ■ ■ 1	5	178 (157.55)	44.2 (97.4)
<b>3000</b>	48	1.35 (1.81)	5 (3.69)	4.3 (3.17)	2.6	<b>1FT7044-1AF7-1</b> ■ ■ ■ 1	3	5.43 (4.81)	7.2 (15.9)
	63	1.7 (2.28)	6 (4.43)	5.4 (3.98)	3.9	<b>1FT7062-1AF7-1</b> ■ ■ ■ 1	5	7.36 (6.51)	7.1 (15.7)
		2.39 (3.21)	9 (6.64)	7.6 (5.61)	5.2	<b>1FT7064-1AF7-1</b> ■ ■ ■ 1	5	11.9 (10.53)	9.7 (21.4)
	80	3.24 (4.34)	13 (9.59)	10.3 (7.60)	6.6	<b>1FT7082-1AF7-1</b> ■ ■ ■ 1	5	26.5 (23.46)	14 (30.9)
		4.56 (6.12)	20 (14.8)	14.5 (10.7)	8.5	<b>1FT7084-1AF7-1</b> ■ ■ ■ 1	5	45.1 (39.92)	20.8 (45.9)
		5.65 (7.58)	28 (20.7)	18 (13.3)	11	<b>1FT7086-1AF7-1</b> ■ ■ ■ 1	5	63.6 (56.29)	27.5 (60.6)
<b>4500</b>	80	4.82 (6.46) <sup>1)</sup>	20 (14.8)	11.5 (8.48) <sup>1)</sup>	10.1 <sup>1)</sup>	<b>1FT7084-1AH7-1</b> ■ ■ ■ 1	5	45.1 (39.92)	20.8 (45.9)
		4.71 (6.32)	28 (20.7)	10 (7.38)	10	<b>1FT7086-1AH7-1</b> ■ ■ ■ 1	5	63.6 (56.29)	27.5 (60.6)
<b>6000</b>	36	0.88 (1.18)	2 (1.48)	1.4 (1.03)	2.1	<b>1FT7034-1AK7-1</b> ■ ■ ■ 1	3	0.85 (0.75)	3.8 (8.38)
	63	2.13 (2.86) <sup>2)</sup>	6 (4.43)	3.7 (2.73) <sup>2)</sup>	5.9 <sup>2)</sup>	<b>1FT7062-1AK7-1</b> ■ ■ ■ 1	5	7.36 (6.51)	7.1 (15.7)
		2.59 (3.47) <sup>3)</sup>	9 (6.64)	5.5 (4.06) <sup>3)</sup>	6.1 <sup>3)</sup>	<b>1FT7064-1AK7-1</b> ■ ■ ■ 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

**Without DRIVE-CLiQ interface:**

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

Encoder: IC2048S/R encoder  
AM2048S/R encoder

M23 signal connection  
M23 signal connection

4  
5

N  
M

**Shaft extension:**

Plain shaft  
Plain shaft

**Shaft and flange accuracy:**

Tolerance N  
Tolerance N

**Holding brake:**

Without  
With

G  
H

**Vibration severity:**

Grade A

**Degree of protection:**

IP65

1



**SIMOTICS servomotors**

## SIMOTICS S synchronous motors for SINAMICS S120

## SIMOTICS S-1FT7 Compact &gt; Core type – Natural cooling

Motor type (repeated)	Efficiency 4)	Stall current	Calculated power $P_{calc}$ <sup>8)</sup>	<b>SINAMICS S120 Motor Module</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T = 100$ K	$P_{calc}$ at $M_0$ $\Delta T = 100$ K	Rated output current <sup>5)</sup>	<b>Booksize format</b> Internal air cooling  For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section <sup>6)</sup>	Pre-assembled cable
	%	A	kW (hp)	A	Article No.	Size	mm <sup>2</sup>	Article No.
1FT7102-1AC7...	93	12.5	6.28 (8.42)	18	<b>6SL3120-1 TE21-8AD.</b>	1.5	4 × 1.5	<b>6FX0002-5 N26-....</b>
1FT7105-1AC7...	93	18	10.47 (14.0)	18	<b>6SL3120-1 TE21-8AD.</b>	1.5	4 × 2.5	<b>6FX0002-5 N36-....</b>
1FT7044-1AF7...	92	2.8	1.57 (2.11)	3	<b>6SL3120-1 TE13-0AD.</b>	1	4 × 1.5	<b>6FX0002-5 N06-....</b>
1FT7062-1AF7...	91	3.9	1.88 (2.52)	5	<b>6SL3120-1 TE15-0AD.</b>	1	4 × 1.5	<b>6FX0002-5 N06-....</b>
1FT7064-1AF7...	93	5.7	2.83 (3.80)	9	<b>6SL3120-1 TE21-0AD.</b>	1	4 × 1.5	<b>6FX0002-5 N06-....</b>
1FT7082-1AF7...	93	7.6	4.08 (5.47)	9	<b>6SL3120-1 TE21-0AD.</b>	1	4 × 1.5	<b>6FX0002-5 N06-....</b>
1FT7084-1AF7...	93	11	6.28 (8.42)	18	<b>6SL3120-1 TE21-8AD.</b>	1	4 × 1.5	<b>6FX0002-5 N06-....</b>
1FT7086-1AF7...	93	15.5	8.8 (11.8)	18	<b>6SL3120-1 TE21-8AD.</b>	1.5	4 × 2.5	<b>6FX0002-5 N36-....</b>
1FT7084-1AH7...	93	15.6	9.42 (12.6)	18	<b>6SL3120-1 TE21-8AD.</b>	1.5	4 × 2.5	<b>6FX0002-5 N36-....</b>
1FT7086-1AH7...	91	22.4	13.19 (17.7)	30	<b>6SL3120-1 TE23-0AD.</b>	1.5	4 × 4	<b>6FX0002-5 N46-....</b>
1FT7034-1AK7...	90	2.7	1.26 (1.69)	3	<b>6SL3120-1 TE13-0AD.</b>	1	4 × 1.5	<b>6FX0002-5 N06-....</b>
1FT7062-1AK7...	90	8.4	3.77 (5.06)	9	<b>6SL3120-1 TE21-0AD.</b>	1	4 × 1.5	<b>6FX0002-5 N06-....</b>
1FT7064-1AK7...	91	9	5.65 (7.58)	9	<b>6SL3120-1 TE21-0AD.</b>	1	4 × 1.5	<b>6FX0002-5 N06-....</b>

**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<sup>7)</sup>**C****D**

Length code

....

For information on the cables, refer to  
MOTION-CONNECT connection systems1) 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  $2 \times 1.5$  mm<sup>2</sup>.8)  $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$   $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

**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	<b>SIMOTICS S-1FT7 Compact synchronous motors</b>	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 <sub>f</sub> -ft)	Nm (lb <sub>f</sub> -ft)	A			$10^{-4}\text{ kgm}^2$ ( $10^{-3}\text{ lb}_f\text{-in-s}^2$ )	kg (lb)
<b>SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Natural cooling</b>									
<b>1500</b>	100	4.08 (5.47)	30 (22.1)	26 (19.2)	8	<b>1FT7102-5AB7</b> ■-1 ■ ■ ■	5	91.4 (80.90)	26.1 (57.6)
		6.6 (8.85)	50 (36.9)	42 (31.0)	13	<b>1FT7105-5AB7</b> ■-1 ■ ■ ■	5	178 (158)	44.2 (97.5)
		9.58 (12.8)	70 (51.6)	61 (45.0)	16	<b>1FT7108-5AB7</b> ■-1 ■ ■ ■	5	248 (220)	59 (130)
	132	10.52 (14.1)	90 (66.4)	67 (49.4)	17.4	<b>1FT7132-5AB7</b> ■-1 ■ ■ ■	4	459 (406)	76 (168)
		12.88 (17.3)	118 (87.0)	82 (60.5)	22.0	<b>1FT7134-5AB7</b> ■-1 ■ ■ ■	4	604 (535)	92 (203)
		14.45 (19.4)	140 (103)	92 (67.9)	25.0	<b>1FT7136-5AB7</b> ■-1 ■ ■ ■	4	748 (662)	108 (238)
		16.96 (22.7)	170 (125)	108 (79.7)	28.5	<b>1FT7138-5AB7</b> ■-1 ■ ■ ■	4	896 (793)	124 (273)
	2000	2.39 (3.21)	13 (9.59)	11.4 (8.41)	4.9	<b>1FT7082-5AC7</b> ■-1 ■ ■ ■	5	26.5 (23.5)	14 (30.9)
		3.54 (4.75)	20 (14.8)	16.9 (12.5)	8.4	<b>1FT7084-5AC7</b> ■-1 ■ ■ ■	5	45.1 (39.9)	20.8 (45.9)
		4.71 (6.32)	28 (20.7)	22.5 (16.6)	9.2	<b>1FT7086-5AC7</b> ■-1 ■ ■ ■	5	63.6 (56.3)	27.5 (60.6)
<b>2000</b>	100	5.03 (6.75)	30 (22.1)	24 (17.7)	10	<b>1FT7102-5AC7</b> ■-1 ■ ■ ■	5	91.4 (80.9)	26.1 (57.6)
		7.96 (10.7)	50 (36.9)	38 (28.0)	15	<b>1FT7105-5AC7</b> ■-1 ■ ■ ■	5	178 (158)	44.2 (97.5)
		10.5 (14.1)	70 (51.6)	50 (36.9)	18	<b>1FT7108-5AC7</b> ■-1 ■ ■ ■	5	248 (220)	59 (130)
	132	11.52 (15.4)	90 (66.4)	55 (40.6)	18.7	<b>1FT7132-5AC7</b> ■-1 ■ ■ ■	4	459 (406)	76 (168)
		13.82 (18.5) <sup>5)</sup>	118 (87.0)	66 (48.7) <sup>5)</sup>	21 <sup>5)</sup>	<b>1FT7134-5AC7</b> ■-1 ■ ■ ■	4	604 (535)	92 (203)
		14.87 (19.9) <sup>5)</sup>	140 (103)	71 (52.4) <sup>5)</sup>	23.0 <sup>5)</sup>	<b>1FT7136-5AC7</b> ■-1 ■ ■ ■	4	748 (662)	109 (240)
	1500	4.08 (5.47)	30 (22.1)	26 (19.2)	8	<b>1FT7102-5AB7</b> ■-1 ■ ■ ■	5	91.4 (80.90)	26.1 (57.6)
		6.6 (8.85)	50 (36.9)	42 (31.0)	13	<b>1FT7105-5AB7</b> ■-1 ■ ■ ■	5	178 (158)	44.2 (97.5)
		9.58 (12.8)	70 (51.6)	61 (45.0)	16	<b>1FT7108-5AB7</b> ■-1 ■ ■ ■	5	248 (220)	59 (130)

**With DRIVE-CLiQ interface:**

Flange:	Classic (compatible with 1FT6/1FK7)	
	Recessed (more compact) <sup>7)</sup>	
Encoder:	AS24DQI encoder	RJ45 signal connection
		M17 signal connection
	AM24DQI encoder	RJ45 signal connection
		M17 signal connection

1

0

B

K

C

L

**Without DRIVE-CLiQ interface:**

Flange:	Classic (compatible with 1FT6/1FK7)	
	Recessed (more compact) <sup>7)</sup>	
Encoder:	IC2048S/R encoder	M23 signal connection
	AM2048S/R encoder	M23 signal connection

4

5

N

M

**Connector outlet direction:**

Connector sizes 1 and 1.5	Rotatable connector
Connector size 3 <sup>1)</sup>	Transverse right
	Transverse left
	Axial NDE
	Axial DE

1

1

2

3

4

**Terminal box/  
cable entry: <sup>1)</sup>**

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

5

6

7

8

**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 2)	Stall current	Calculated power $P_{calc}$ <sup>8)</sup>	<b>SINAMICS S120 Motor Module</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T = 100$ K	$P_{calc}$ at $M_0$ $\Delta T = 100$ K	Rated output current <sup>3)</sup>	Booksized format Internal air cooling  For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section <sup>4)</sup>	Pre-assembled cable
	%	A	kW (hp)	$I_{rated}$  A	Article No.	Size	mm <sup>2</sup>	Article No.
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	6FX002-5S14-....
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	6FX002-5S14-....

<b>Motor Module:</b>				
Single Motor Module	1			
Double Motor Module	2			
<b>Version status</b>				

<b>Power cable:</b>				
MOTION-CONNECT 800PLUS	8			
MOTION-CONNECT 500	5			
Without brake cores				
With brake cores <sup>5)</sup>				
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) 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 mm<sup>2</sup>.

7) Only up to SH 100.

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

**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 $\Delta T=100\text{ K}$	$M_0$ at $\Delta T=100\text{ K}$	$M_{rated}$ at $\Delta T=100\text{ K}$	$I_{rated}$ at $\Delta T=100\text{ K}$		$p$	$J$	$m$
rpm		kW (hp)	Nm (lb <sub>F</sub> -ft)	Nm (lb <sub>F</sub> -ft)	A	Article No.		10 <sup>-4</sup> kgm <sup>2</sup> (10 <sup>-3</sup> lb <sub>F</sub> -in-s <sup>2</sup> )	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	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	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	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	8.48 (11.4)	90 (66.4)	27 (19.9)	14	1FT7132-5AF7-1 ■ ■ ■ ■	4	459 (406)	77 (170)
With DRIVE-CLiQ interface:						1 0	B K C L		
Flange:		Classic (compatible with 1FT6/1FK7) Recessed (more compact) <sup>6)</sup>							
Encoder:		AS24DQI encoder  AM24DQI encoder			RJ45 signal connection M17 signal connection  RJ45 signal connection M17 signal connection				
Without DRIVE-CLiQ interface:						4 5	N M		
Flange:		Classic (compatible with 1FT6/1FK7) Recessed (more compact) <sup>6)</sup>							
Encoder:		IC2048S/R encoder AM2048S/R encoder			M23 signal connection M23 signal connection				
Connector outlet direction:			Connector sizes 1 and 1.5 Rotatable connector			1  1 2 3 4			
			Connector size 3 <sup>1)</sup> Transverse right Transverse left Axial NDE Axial DE						
Terminal box/ cable entry: <sup>1)</sup>			Top/transverse from right Top/transverse from left Top/axial from NDE Top/axial from DE			5 6 7 8			
Shaft extension:			Shaft and flange accuracy:			Holding brake:			A  D E  G H  K L
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:						0 1 2  3 4 5
Grade A			IP64						
Grade A			IP65						
Grade A			IP67						
Grade R			IP64						
Grade R			IP65						
Grade R			IP67						



**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	<b>SIMOTICS S-1FT7 Compact synchronous motors</b>	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 <sub>f</sub> -ft)	Nm (lb <sub>f</sub> -ft)	A			$10^{-4}\text{ kgm}^2$ ( $10^{-3}\text{ lb}_f\text{-in-s}^2$ )	kg (lb)
<b>SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Natural cooling</b>									
<b>4500</b>	48	1.32 (1.77) <sup>1)</sup>	7 (5.16)	3.6 (2.66) <sup>1)</sup>	4.7 <sup>1)</sup>	<b>1FT7046-5AH7-1</b> ■ ■ ■	3	7.52 (6.66)	9.3 (20.5)
	63	2.55 (3.42) <sup>2)</sup>	12 (8.85)	6.1 (4.50) <sup>2)</sup>	7.5 <sup>2)</sup>	<b>1FT7066-5AH7-1</b> ■ ■ ■	5	16.4 (14.5)	12.3 (27.1)
	80	3.77 (5.06)	13 (9.59)	8 (5.90)	7.8	<b>1FT7082-5AH7-1</b> ■ ■ ■	5	26.5 (23.5)	14 (30.9)
		4.82 (6.46) <sup>2)</sup>	20 (14.8)	11.5 (8.48) <sup>2)</sup>	10.1 <sup>2)</sup>	<b>1FT7084-5AH7-1</b> ■ ■ ■	5	45.1 (39.9)	20.8 (45.9)
		4.71 (6.32)	28 (20.7)	10 (7.38)	10	<b>1FT7086-5AH7-1</b> ■ ■ ■	5	63.6 (56.3)	27.5 (60.6)
<b>6000</b>	36	0.88 (1.18)	2 (1.48)	1.4 (1.03)	2.1	<b>1FT7034-5AK7-1</b> ■ ■ ■	3	0.85 (0.75)	3.8 (8.38)
		1.07 (1.43)	3 (2.21)	1.7 (1.25)	2.4	<b>1FT7036-5AK7-1</b> ■ ■ ■	3	1.33 (1.18)	5.0 (11.0)
	48	1.26 (1.69)	3 (2.21)	2 (1.48)	3	<b>1FT7042-5AK7-1</b> ■ ■ ■	3	2.81 (2.49)	4.6 (10.1)
		1.41 (1.89) <sup>3)</sup>	5 (3.69)	3 (2.21) <sup>3)</sup>	3.6 <sup>3)</sup>	<b>1FT7044-5AK7-1</b> ■ ■ ■	3	5.43 (4.81)	7.2 (15.9)
	63	2.13 (2.86) <sup>4)</sup>	6 (4.43)	3.7 (2.73) <sup>4)</sup>	5.9 <sup>4)</sup>	<b>1FT7062-5AK7-1</b> ■ ■ ■	5	7.36 (6.51)	7.1 (15.7)
		2.59 (3.47) <sup>3)</sup>	9 (6.64)	5.5 (4.06) <sup>3)</sup>	6.1 <sup>3)</sup>	<b>1FT7064-5AK7-1</b> ■ ■ ■	5	11.9 (10.5)	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

**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:**

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

For footnotes, see next page.

# SIMOTICS servomotors

## SIMOTICS S synchronous motors for SINAMICS S120

### SIMOTICS S-1FT7 Compact – Natural cooling

Motor type (repeated)	Efficiency 5)	Stall current	Calculated power $P_{calc}$ <sup>9)</sup>	<b>SINAMICS S120 Motor Module</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T = 100$ K	$P_{calc}$ at $M_0$ $\Delta T = 100$ K	Rated output current <sup>6)</sup>	Booksized format Internal air cooling For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section <sup>7)</sup>	Pre-assembled cable
	%	A	kW (hp)	A	Article No.	Size	mm <sup>2</sup>	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-....

<b>Motor Module:</b>	
Single Motor Module	1
Double Motor Module	2
<b>Version status</b>	

<b>Power cable:</b>	
MOTION-CONNECT 800PLUS	8
MOTION-CONNECT 500	5
Without brake cores	C
With brake cores <sup>7) 8)</sup>	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  $2 \times 1.5$  mm<sup>2</sup>.

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)
$n_{\text{rated}}$	SH	$P_{\text{rated}}$ at $\Delta T=100\text{ K}$	$M_0$ at $\Delta T=100\text{ K}$	$M_{\text{rated}}$ at $\Delta T=100\text{ K}$	$I_{\text{rated}}$ at $\Delta T=100\text{ K}$		$p$	$J$	$m$
rpm		kW (hp)	Nm (lb <sub>f</sub> -ft)	Nm (lb <sub>f</sub> -ft)	A		Article No.		10 <sup>-4</sup> kgm <sup>2</sup> (10 <sup>-3</sup> lb <sub>f</sub> -in-s <sup>2</sup> )
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 <sup>1)</sup>			1			
			Transverse right			2			
			Transverse left			3			
			Axial NDE			4			
			Axial DE						
Terminal box/ cable entry: <sup>1)</sup>			Top/transverse from right			5			
			Top/transverse from left			6			
			Top/axial from NDE			7			
			Top/axial from DE			8			
Shaft extension:			Shaft and flange accuracy:						
Feather key			Tolerance N				A		
Feather key			Tolerance N				B		
Feather key			Tolerance R				D		
Feather key			Tolerance R				E		
Plain shaft			Tolerance N				G		
Plain shaft			Tolerance N				H		
Plain shaft			Tolerance R				K		
Plain shaft			Tolerance R				L		
Vibration severity:			Degree of protection: <sup>2)</sup>						
Grade A			IP64			0			
Grade A			IP65			1			
Grade R			IP64			3			
Grade R			IP65			4			

For footnotes, see next page.



# 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)	<b>SINAMICS S120 Motor Module</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T = 100$ K	$P_{calc}$ at $M_0$ $\Delta T = 100$ K	Rated output current 4)	Booksize format Internal air cooling  For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section 5)	Pre-assembled cable
	%	A	kW (hp)	A	Article No.	Size	mm <sup>2</sup>	Article No.
1FT7084-5SC7...	93	15	5.7 (7.64)	18	<b>6SL3120-1TE21-8AD.</b>	1.5	4 × 1.5	<b>6FX0002-5N26-....</b>
1FT7086-5SC7...	93	19.5	7.5 (10.1)	30	<b>6SL3120-1TE23-0AD.</b>	1.5	4 × 2.5	<b>6FX0002-5N36-....</b>
1FT7105-5SC7...	93	31	13.6 (18.2)	45	<b>6SL3120-1TE24-5AA.</b>	1.5	4 × 6	<b>6FX0002-5N54-....</b>
1FT7108-5SC7...	93	39	19.1 (25.6)	45	<b>6SL3120-1TE24-5AA.</b>	1.5	4 × 10	<b>6FX0002-5N64-....</b>
1FT7084-5SF7...	94	21	8.5 (11.4)	30	<b>6SL3120-1TE23-0AD.</b>	1.5	4 × 2.5	<b>6FX0002-5N36-....</b>
1FT7086-5SF7...	93	29	11.3 (15.2)	30	<b>6SL3120-1TE23-0AD.</b>	1.5	4 × 6	<b>6FX0002-5N56-....</b>
1FT7105-5SF7...	94	45	20.4 (27.4)	45	<b>6SL3120-1TE24-5AA.</b>	3	4 × 10	<b>6FX0002-5N14-....</b>
1FT7108-5SF7...	94	57	28.6 (38.4)	60	<b>6SL3120-1TE26-0AA.</b>	3	4 × 16	<b>6FX0002-5N23-....</b>
1FT7084-5SH7...	94	30.5	12.7 (17.0)	30	<b>6SL3120-1TE23-0AD.</b>	1.5	4 × 6	<b>6FX0002-5N56-....</b>
1FT7086-5SH7...	93	34	17.0 (22.8)	45	<b>6SL3120-1TE24-5AA.</b>	1.5	4 × 6	<b>6FX0002-5N54-....</b>

<b>Motor Module:</b>	
Single Motor Module	<b>1</b>
Double Motor Module	<b>2</b>
<b>Version status</b>	

<b>Power cable:</b>	
MOTION-CONNECT 800PLUS	<b>8</b>
MOTION-CONNECT 500	<b>5</b>
Without brake cores	<b>C</b>
With brake cores 6)	<b>D</b>
Length code	<b>....</b>

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) 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 mm<sup>2</sup>.

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

**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)
$n_{\text{rated}}$	SH	$P_{\text{at } \Delta T=100 \text{ K}}$	$M_0 \text{ at } \Delta T=100 \text{ K}$	$M_{\text{rated at } \Delta T=100 \text{ K}}$	$I_{\text{rated at } \Delta T=100 \text{ K}}$		$p$	$J$	$m$
rpm		kW (hp)	Nm (lb <sub>f</sub> -ft)	Nm (lb <sub>f</sub> -ft)	A	Article No.		10 <sup>-4</sup> kgm <sup>2</sup> (10 <sup>-3</sup> lb <sub>f</sub> -in-s <sup>2</sup> )	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■-■ ■ ■ ■	5	265 (235)	69.6 (153)
With DRIVE-CLiQ interface:									
Flange:		Classic (compatible with 1FT6/1FK7)				1	B K C L		
		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	N M		
		Recessed (more compact)				5			
Encoder:		IC2048S/R encoder		M23 signal connection					
		AM2048S/R encoder		M23 signal connection					
Connector outlet direction:			Connector sizes 1 and 1.5 Rotatable connector			1	A B D E G H K L		
			Connector size 3 <sup>1)</sup>			1			
			Transverse right			2			
			Transverse left			3			
			Axial NDE			4			
			Axial DE						
Terminal box/ cable entry: <sup>1)</sup>			Top/transverse from right			5			
			Top/transverse from left			6			
			Top/axial from NDE			7			
			Top/axial from DE			8			
Shaft extension:			Shaft and flange accuracy:			Holding brake:		A B D E G H K L	
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:			0			
Grade A		IP64				1			
Grade A		IP65				2			
Grade A		IP67				3			
Grade R		IP64				4			
Grade R		IP65				5			
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 $P_{calc}$ 6)	<b>SINAMICS S120 Motor Module</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T = 100$ K	$P_{calc}$ at $M_0$ $\Delta T = 100$ K	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
	%	A	kW (hp)	A	Article No.	Size	mm <sup>2</sup>	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-....

<b>Motor Module:</b>				
Single Motor Module	1			
Double Motor Module	2			
<b>Version status</b>				

<b>Power cable:</b>				
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 mm<sup>2</sup>.

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	<b>SIMOTICS S-1FT7 Compact synchronous motors</b>	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 <sub>f</sub> -ft)	Nm (lb <sub>f</sub> -ft)	A			$10^{-4}\text{ kgm}^2$ ( $10^{-3}\text{ lb}_f\text{-in-s}^2$ )	kg (lb)
<b>SIMOTICS S-1FT7 Compact for DC link voltage 510 ... 720 V DC – Water cooling</b>									
<b>3000</b>	63	3.1 (4.16)	10 (7.38)	10 (7.38)	7.8	<b>1FT7062-5WF7-1</b> ■ ■ ■ ■	5	8.1 (7.17)	11 (24.3)
		5 (6.71)	16 (11.8)	16 (11.8)	12.5	<b>1FT7064-5WF7-1</b> ■ ■ ■ ■	5	12.9 (11.4)	13.7 (30.2)
		6.2 (8.31)	20 (14.8)	19.6 (14.5)	14.4	<b>1FT7066-5WF7-1</b> ■ ■ ■ ■	5	17.7 (15.7)	16.3 (35.9)
		9.3 (12.5)	30 (22.1)	29.5 (21.8)	19.6	<b>1FT7068-5WF7-1</b> ■ ■ ■ ■	5	24.8 (22.0)	20.1 (44.3)
	80	6.4 (8.58)	21 (15.5)	20.5 (15.1)	16	<b>1FT7082-5WF7-1</b> ■ ■ ■ ■	5	28.9 (25.6)	20.7 (45.6)
		11 (14.8)	35 (25.8)	35 (25.8)	24.2	<b>1FT7084-5WF7-1</b> ■ ■ ■ ■	5	48.3 (42.8)	27.5 (60.6)
		15.4 (20.7)	50 (36.9)	49 (36.1)	36	<b>1FT7086-5WF7-1</b> ■ ■ ■ ■	5	67.8 (60.0)	34.1 (75.2)
	100	14.3 (19.2)	50 (36.9)	45.5 (33.6)	38.8	<b>1FT7102-5WF7-1</b> ■ ■ ■ ■	5	98.9 (87.5)	36.6 (80.7)
		24.8 (33.3)	90 (66.4)	79 (58.3)	49.5	<b>1FT7105-5WF7-1</b> ■ ■ ■ ■	5	164 (145)	55.9 (123)
		34.2 (45.9)	125 (92.2)	109 (80.4)	60	<b>1FT7108-5WF7-1</b> ■ ■ ■ ■	5	265 (235)	69.6 (153)
<b>4500</b>	63	9.1 (12.2)	20 (14.8)	19.4 (14.3)	20.8	<b>1FT7066-5WH7-1</b> ■ ■ ■ ■	5	17.7 (15.7)	16.3 (35.9)
	80	8.95 (12.0)	21 (15.5)	19 (14.0)	23.9	<b>1FT7082-5WH7-1</b> ■ ■ ■ ■	5	28.9 (25.6)	20.7 (45.6)
		15.08 (20.2)	35 (25.8)	32 (23.6)	34.5	<b>1FT7084-5WH7-1</b> ■ ■ ■ ■	5	48.3 (42.8)	27.5 (60.6)
		20.3 (27.2)	50 (36.9)	43 (31.7)	38	<b>1FT7086-5WH7-1</b> ■ ■ ■ ■	5	67.8 (60.0)	34.1 (75.2)
<b>6000</b>	63	5.8 (7.78)	10 (7.38)	9.2 (6.79)	12.7	<b>1FT7062-5WK7-1</b> ■ ■ ■ ■	5	8.1 (7.17)	11 (24.3)
		8.9 (11.9)	16 (11.8)	14.2 (10.5)	20	<b>1FT7064-5WK7-1</b> ■ ■ ■ ■	5	12.9 (11.4)	13.7 (30.2)

**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	

**Without DRIVE-CLiQ interface:**

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

**Connector outlet direction:**

Connector sizes 1 and 1.5	Rotatable connector	1	1 2 3 4
Connector size 3 <sup>1)</sup>	Transverse right	2	
	Transverse left	3	
	Axial NDE	4	

**Terminal box/cable entry:**<sup>1)</sup>

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

**Shaft extension:**

Feather key and keyway	Tolerance N	Without	A B D E G H K L
Feather key and keyway			
Feather key and keyway	Tolerance R	Without	
Feather key and keyway	Tolerance R	With	
Plain shaft	Tolerance N	Without	G H K L
Plain shaft	Tolerance N	With	
Plain shaft	Tolerance R	Without	
Plain shaft	Tolerance R	With	

**Shaft and flange accuracy:**

Tolerance N	Without	A B D E G H K L
Tolerance N		
Tolerance R	Without	
Tolerance R	With	
Tolerance N	Without	G H K L
Tolerance N	With	
Tolerance R	Without	
Tolerance R	With	

**Holding brake:**

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

**Vibration severity:**

Grade A	IP64 IP65 IP67	0 1 2 3 4 5
Grade A		
Grade A		
Grade R	IP64	3 4 5
Grade R	IP65	
Grade R	IP67	

**Degree of protection:**

IP64	0 1 2 3 4 5
IP65	
IP67	
IP64	3 4 5
IP65	
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 $P_{calc}$ <sup>7)</sup>	<b>SINAMICS S120 Motor Module</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T = 100$ K	$P_{calc}$ at $M_0$ $\Delta T = 100$ K	Rated output current <sup>3)</sup>	Booksize format Internal air cooling  For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section <sup>4)</sup>	Pre-assembled cable
	%	A	kW (hp)	A	Article No.	Size	mm <sup>2</sup>	Article No.
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 <sup>5)</sup>	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-....

<b>Motor Module:</b>	
Single Motor Module	1
Double Motor Module	2
<b>Version status</b>	

<b>Power cable:</b>	
MOTION-CONNECT 800PLUS	8
MOTION-CONNECT 500	5
Without brake cores	C
With brake cores <sup>6)</sup>	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  $2 \times 1.5$  mm<sup>2</sup>.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 $\Delta T=100\text{ K}$	$M_0$ at $\Delta T=100\text{ K}$	$M_{rated}$ at $\Delta T=100\text{ K}$	$I_{rated}$ at $\Delta T=100\text{ K}$		$p$	$J$	$m$
rpm		kW (hp)	Nm (lb <sub>F</sub> -ft)	Nm (lb <sub>F</sub> -ft)	A	Article No.		10 <sup>-4</sup> kgm <sup>2</sup> (10 <sup>-3</sup> lb <sub>F</sub> -in-s <sup>2</sup> )	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 F7■-1 ■ ■ ■	5	6.4 (5.66)	19 (41.9)
		4.4 (5.90)	17 (12.5)	14 (10.3)	13	1FT7067-7S F7■-1 ■ ■ ■	5	8.3 (7.35)	23 (50.7)
	80	7.2 (9.66)	34 (25.1)	23 (17.0)	20	1FT7085-7S F7■-1 ■ ■ ■	5	20.7 (18.3)	34 (75.0)
		10.4 (13.9)	48 (35.4)	33 (24.3)	29	1FT7087-7S F7■-1 ■ ■ ■	5	27.4 (24.3)	42 (92.6)
4500	63	5.2 (6.97)	14 (10.3)	11 (8.11)	13.5	1FT7065-7SH7■-1 ■ ■ ■	5	6.4 (5.66)	19 (41.9)
		6.1 (8.18)	17 (12.5)	13 (9.59)	15	1FT7067-7SH7■-1 ■ ■ ■	5	8.3 (7.35)	23 (50.7)
	80	8.2 (11.0)	34 (25.1)	17.5 (12.9)	22.5	1FT7085-7SH7■-1 ■ ■ ■	5	20.7 (18.3)	34 (75.0)
		10.8 (14.5)	48 (35.4)	23 (17.0)	24	1FT7087-7SH7■-■ ■ ■ ■	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	1FT7065-7WF7■-1 ■ ■ ■	5	6.4 (5.66)	16 (35.3)
		7.4 (9.92)	25 (18.4)	23.5 (17.3)	21	1FT7067-7WF7■-1 ■ ■ ■	5	8.3 (7.35)	22 (48.5)
	80	11.9 (16.0)	43 (31.7)	38 (28.0)	32	1FT7085-7WF7■-1 ■ ■ ■	5	20.7 (18.3)	32 (70.6)
		16.0 (21.5)	61 (45.0)	51 (37.6)	43	1FT7087-7WF7■-■ ■ ■ ■	5	27.4 (24.3)	41 (90.4)
4500	63	7.8 (10.5)	19 (14.0)	16.5 (12.2)	20	1FT7065-7WH7■-1 ■ ■ ■	5	6.4 (5.66)	16 (35.3)
		10.4 (14.0)	25 (18.4)	22 (16.2)	25	1FT7067-7WH7■-1 ■ ■ ■	5	8.3 (7.35)	22 (48.5)
	80	15.6 (20.9)	43 (31.7)	33 (24.3)	48	1FT7085-7WH7■-■ ■ ■ ■	5	20.7 (18.3)	32 (70.6)
		21.7 (29.1)	61 (45.0)	46 (33.9)	53	1FT7087-7WH7■-■ ■ ■ ■	5	27.4 (24.3)	41 (90.4)

**With DRIVE-CLiQ interface:**

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

Encoder: AS24DQI encoder

RJ45 signal connection  
M17 signal connection  
(Only for water cooling)

AM24DQI encoder

RJ45 signal connection  
M17 signal connection  
(Only for water cooling)

**Without DRIVE-CLiQ interface:**

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

Encoder: IC2048S/R encoder  
AM2048S/R encoder

M23 signal connection  
M23 signal connection

**Connector outlet direction:**

Connector sizes 1 and 1.5 Rotatable connector

Connector size 3 <sup>1)</sup>

Transverse right  
Transverse left  
Axial NDE  
Axial DE

**Terminal box/  
cable entry: <sup>1)</sup>**

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

Tolerance N  
Tolerance N

Tolerance R  
Tolerance R

**Holding brake:**

Without  
With

Without  
With

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 (only for water cooling)

IP64

IP65

IP67 (only for water cooling)

1

0

B

K

C

L

4

5

N

M

1

1

2

3

4

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 High Dynamic – Forced ventilation/Water cooling**

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

<b>Motor Module:</b>						<b>Power cable:</b>				
Single Motor Module	1					MOTION-CONNECT 800PLUS	8			
Double Motor Module	2					MOTION-CONNECT 500	5			
<b>Version status</b>						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).

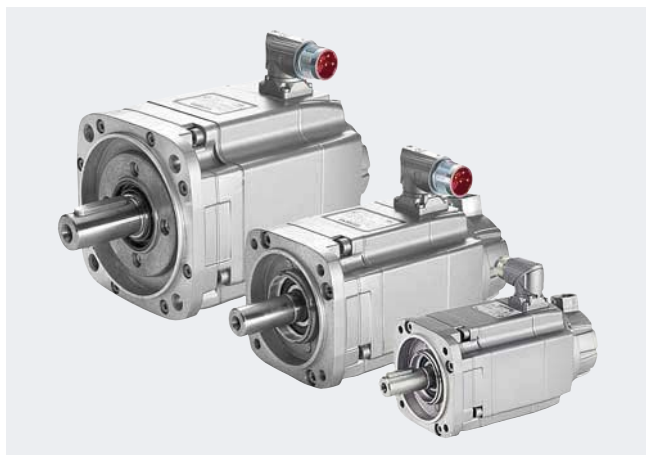
5) Cable cross-section for brake connection 2 × 1.5 mm<sup>2</sup>.6)  $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$   $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$

## 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



# SIMOTICS servomotors

## SIMOTICS S synchronous motors for SINAMICS S120

### SIMOTICS S-1FK7

#### 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) <sup>1)</sup>	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) <sup>2)</sup>	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 <sup>3)</sup>	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 <sub>pp</sub> 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 <sup>4)</sup>	
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

<sup>1)</sup> 1FK701 can be supplied only with IP54 degree of protection.

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

<sup>3)</sup> 1FK702 without a paint finish as standard.

<sup>4)</sup> 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 <sup>1)</sup>
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 <sup>1)</sup>
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) <sup>2)</sup>
X01	Paint finish: Jet black, matt RAL 9005 <sup>3)</sup>
X02	Paint finish: Cream white RAL 9001 <sup>3)</sup>
X03	Paint finish: Reseda green RAL 6011 <sup>3)</sup>
X04	Paint finish: Pebble grey RAL 7032 <sup>3)</sup>
X05	Paint finish: Sky blue RAL 5015 <sup>3)</sup>
X06	Paint finish: Pale ivory RAL 1015 <sup>3)</sup>
X08	Paint finish: Suitable for food grade applications White aluminum RAL 9006 <sup>3)</sup>
X27	Paint finish: Dark pearl grey RAL 9023 <sup>3)</sup>

**-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.

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

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

<sup>3)</sup> 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)	
$n_{\text{rated}}$	SH	$P_{\text{rated}}$ at $\Delta T=100\text{ K}$	$M_0$ at $\Delta T=100\text{ K}$	$M_{\text{rated}}$ at $\Delta T=100\text{ K}$	$I_{\text{rated}}$ at $\Delta T=100\text{ K}$		$p$	J	$m$	
rpm		kW (hp)	Nm (lb <sub>F</sub> -ft)	Nm (lb <sub>F</sub> -ft)	A	Article No.		10 <sup>-4</sup> kgm <sup>2</sup> (10 <sup>-3</sup> lb <sub>F</sub> -in-s <sup>2</sup> )	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)	6.0 (4.43)	5.3 (3.91)	2.95	1FK7060-2AC7-1	4	7.7 (6.82 )	7.1 (15.7)	
		1.5 (2.01)	8.5 (6.27)	7.0 (5.16)	2.65	1FK7062-2AC7-1	4	11.2 (9.91)	9.1 (20.1)	
		1.9 (2.55)	11.0 (8.11)	8.9 (6.56)	4.4	1FK7063-2AC7-1	4	14.7 (13.0)	11.1 (24.5)	
	80	2.1 (2.82)	12.0 (8.85)	10.0 (7.38)	4.4	1FK7081-2AC7-1	4	20 (17.7)	12.9 (28.4)	
		2.6 (3.49)	16.0 (11.8)	12.5 (9.22)	6.3	1FK7083-2AC7-1	4	26 (23.0)	15.6 (34.4)	
		3.1 (4.16)	20.0 (14.8)	15.0 (11.1)	6.7	1FK7084-2AC7-1	4	32.5 (28.8)	18.3 (40.3)	
	100	3 (4.02)	18.0 (13.3)	14.5 (10.7)	7.1	1FK7100-2AC7-1	4	54 (47.8)	17.6 (38.8)	
		4.3 (5.77)	27.0 (19.9)	20.5 (15.1)	9.7	1FK7101-2AC7-1	4	79 (69.9)	23.0 (50.7)	
		5.2 (6.97)	36.0 (26.6)	25.0 (18.4)	11.0	1FK7103-2AC7-1	4	104 (92.1)	28.5 (62.8)	
		7.7 (10.3)	48.0 (35.4)	37.0 (27.3)	16.0	1FK7105-2AC7-1	4	154 (136)	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)	6.0 (4.43)	4.7 (3.47)	3.7	1FK7060-2AF7-1	4	7.7 (6.82)	7.1 (15.7)
			1.9 (2.55)	8.5 (6.27)	6.0 (4.43)	4.0	1FK7062-2AF7-1	4	11.2 (9.91)	9.1 (20.1)
			2.3 (3.08)	11.0 (8.11)	7.3 (5.38)	5.6	1FK7063-2AF7-1	4	14.7 (13.0)	11.1 (24.5)
		80	2.1 (2.82)	8.0 (5.90)	6.8 (5.02)	4.4	1FK7080-2AF7-1	4	14.2 (12.6)	10.3 (22.7)
2.7 (3.62)			12.0 (8.85)	8.7 (6.42)	6.8	1FK7081-2AF7-1	4	20 (17.7)	12.9 (28.4)	
3.3 (4.43)			16.0 (11.8)	10.5 (7.74)	7.2	1FK7083-2AF7-1	4	26 (23.0)	15.6 (34.4)	
3.1 (4.16)			20.0 (14.8)	10.0 (7.38)	6.5	1FK7084-2AF7-1	4	32.5 (28.8)	18.3 (40.3)	
100		3.8 (5.10)	18.0 (13.3)	12.0 (8.85)	8.0	1FK7100-2AF7-1	4	54 (47.8)	17.6 (38.8)	
		4.9 (6.57)	27.0 (19.9)	15.5 (11.4)	11.6	1FK7101-2AF7-1	4	79 (69.9)	23.0 (50.7)	
		4.4 (5.90)	36.0 (26.6)	14.0 (10.3)	11.5	1FK7103-2AF7-1	4	104 (92.1)	28.5 (62.8)	
		8.2 (11.0)	48.0 (35.4)	26.0 (19.2)	18.0	1FK7105-2AF7-1	4	154 (136)	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 Feather key  Plain shaft Plain shaft			Shaft and flange accuracy: Tolerance N Tolerance N  Tolerance N Tolerance N			Holding brake: Without With  Without With			A B  G H	
Degree of protection:			IP64 IP65 IP65 and DE flange IP67			0 1 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 $P_{calc}$ <sup>6)</sup>	<b>SINAMICS S120 Motor Module</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T = 100$ K	$P_{calc}$ at $M_0$ $\Delta T = 100$ K	Rated output current <sup>2)</sup>	Booksize format Internal air cooling For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section <sup>3)</sup>	Pre-assembled cable
	%	A	kW (hp)	$I_{rated}$ A	Article No.			
<b>Line voltage 380 ... 480 V 3 AC</b>						Size	mm <sup>2</sup>	Article No.
1FK7042-2AC71-...	88	1.6	0.6 (0.80)	3	6SL3120-1TE13-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7060-2AC71-...	90	3.15	1.3 (1.74)	3 <sup>4)</sup>	6SL3120-1TE13-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7062-2AC71-...	90	3.0	1.8 (2.41)	3	6SL3120-1TE13-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7063-2AC71-...	91	5.3	2.3 (3.08)	5 <sup>4)</sup>	6SL3120-1TE15-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7081-2AC71-...	93	5.0	2.5 (3.35)	5	6SL3120-1TE15-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7083-2AC71-...	93	7.5	3.4 (4.56)	9	6SL3120-1TE21-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7084-2AC71-...	93	8.5	4.2 (5.63)	9	6SL3120-1TE21-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7100-2AC71-...	92	8.4	3.8 (5.10)	9	6SL3120-1TE21-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7101-2AC71-...	93	12.3	5.7 (7.64)	18	6SL3120-1TE21-8AD.	1.5	4 × 1.5	6FX0002-5N26-...
1FK7103-2AC71-...	93	14.4	7.5 (10.1)	18	6SL3120-1TE21-8AD.	1.5	4 × 1.5	6FX0002-5N26-...
1FK7105-2AC71-...	93	20.0	10.1 (13.5)	30	6SL3120-1TE23-0AD.	1.5	4 × 2.5	6FX0002-5N36-...
1FK7042-2AF71-...	89	2.2	0.9 (1.21)	3	6SL3120-1TE13-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7060-2AF71-...	90	4.45	1.9 (2.55)	5	6SL3120-1TE15-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7062-2AF71-...	91	5.3	2.7 (3.62)	5 <sup>4)</sup>	6SL3120-1TE15-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7063-2AF71-...	91	8.0	3.5 (4.69)	9	6SL3120-1TE21-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7080-2AF71-...	92	4.9	2.5 (3.35)	5	6SL3120-1TE15-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7081-2AF71-...	93	8.7	3.8 (5.10)	9	6SL3120-1TE21-0AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7083-2AF71-...	93	10.1	5 (6.71)	18	6SL3120-1TE21-8AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7084-2AF71-...	93	12.1	6.3 (8.45)	18	6SL3120-1TE21-8AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7100-2AF71-...	92	11.1	5.7 (7.64)	18	6SL3120-1TE21-8AD.	1	4 × 1.5	6FX0002-5N06-...
1FK7101-2AF71-...	93	18.8	8.5 (11.4)	18 <sup>4)</sup>	6SL3120-1TE21-8AD.	1.5	4 × 2.5	6FX0002-5N36-...
1FK7103-2AF71-...	93	26.0	11.3 (15.2)	30	6SL3120-1TE23-0AD.	1.5	4 × 4	6FX0002-5N46-...
1FK7105-2AF71-...	94	31.0	15.1 (20.3)	30 <sup>4)</sup>	6SL3120-1TE23-0AD.	1.5	4 × 6	6FX0002-5N56-...

<b>Motor Module:</b>	
Single Motor Module	1
Double Motor Module	2
<b>Version status</b>	

<b>Power cable:</b>	
MOTION-CONNECT 800PLUS	8
MOTION-CONNECT 500	5
Without brake cores	C
With brake cores <sup>5)</sup>	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  $2 \times 1.5$  mm<sup>2</sup>.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)
$n_{\text{rated}}$	SH	$P_{\text{rated}}$ at $\Delta T=100\text{ K}$	$M_0$ at $\Delta T=100\text{ K}$	$M_{\text{rated}}$ at $\Delta T=100\text{ K}$	$I_{\text{rated}}$ at $\Delta T=100\text{ K}$		$p$	J	$m$
rpm		kW (hp)	Nm (lb <sub>F</sub> -ft)	Nm (lb <sub>F</sub> -ft)	A	Article No.		10 <sup>-4</sup> kgm <sup>2</sup> (10 <sup>-3</sup> lb <sub>F</sub> -in-s <sup>2</sup> )	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 AM2048S/R encoder Multi-pole resolver 2-pole resolver			4 4 4 4	A E S T		
Encoder systems for motors with DRIVE-CLiQ interface:			AS24DQI encoder AM24DQI encoder AS20DQI encoder AM20DQI encoder R15DQ resolver R14DQ resolver			1 1 1 1 1 1	B C Q R U P		
Shaft extension: Feather key Feather key Plain shaft Plain shaft			Shaft and flange accuracy: Tolerance N Tolerance N Tolerance N Tolerance N			Holding brake: Without With Without With			A B G H
Degree of protection:			IP64 IP65 IP65 and DE flange IP67						0 1 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 $P_{calc}$ <sup>5)</sup>	<b>SINAMICS S120 Motor Module</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T=100$ K	$P_{calc}$ at $M_0$ $\Delta T=100$ K	Rated output current <sup>2)</sup>	Booksize format Internal air cooling  For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section <sup>3)</sup>	Pre-assembled cable
	%	A	kW (hp)	$I_{rated}$  A	Article No.	Size	mm <sup>2</sup>	Article No.
				<b>Line voltage 380 ... 480 V 3 AC</b>				
1FK7060-2AH71-...	90	6.3	2.8 (3.75)	9	6SL3120-TE21-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7062-2AH71-...	91	8.0	4 (5.36)	9	6SL3120-TE21-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7063-2AH71-...	90	12.0	5.2 (6.97)	18	6SL3120-TE21-8AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7080-2AH71-...	92	7.4	3.8 (5.10)	9	6SL3120-TE21-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7081-2AH71-...	93	13.1	5.7 (7.64)	18	6SL3120-TE21-8AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7083-2AH71-...	93	15.0	7.5 (10.1)	18	6SL3120-TE21-8AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7032-2AK71-...	88	1.7	0.7 (0.94)	3	6SL3120-TE13-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7034-2AK71-...	88	1.9	1 (1.34)	3	6SL3120-TE13-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7040-2AK71-...	88	2.35	1 (1.34)	3	6SL3120-TE13-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7042-2AK71-...	89	4.4	1.9 (2.55)	5	6SL3120-TE15-0AD.	1	4 × 1.5	6FX0002-5N06-....
				<b>Motor Module:</b> Single Motor Module <b>1</b> Double Motor Module <b>2</b>		<b>Power cable:</b> MOTION-CONNECT 800PLUS <b>8</b> MOTION-CONNECT 500 <b>5</b>		
				<b>Version status</b>		Without brake cores With brake cores <sup>4)</sup> <b>C</b> <b>D</b>		
						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 mm<sup>2</sup>.

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)	
$n_{\text{rated}}$	SH	$P_{\text{at}}$ $\Delta T=100\text{ K}$	$M_0$ $\Delta T=100\text{ K}$	$M_{\text{rated}}$ $\Delta T=100\text{ K}$	$I_{\text{rated}}$ $\Delta T=100\text{ K}$		$p$	J	$m$	
rpm		kW (hp)	Nm (lb <sub>f</sub> -ft)	Nm (lb <sub>f</sub> -ft)	A		Article No.		10 <sup>-4</sup> kgm <sup>2</sup> (10 <sup>-3</sup> lb <sub>f</sub> -in-s <sup>2</sup> )	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: (Only for 1FK702) <sup>1)</sup>			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:		A B G H  0 2 3 5		
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					
IP65 and DE flange IP67 (only for 1FK702)					Without					
IP54 (only for 1FK701), IP64 (only for 1FK702)					With					
IP65 and DE flange IP67 (only for 1FK702)					With					

<sup>1)</sup> 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)	<b>SINAMICS S120 Motor Module</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T=100$ K	$P_{calc}$ at $M_0$ $\Delta T=100$ K	Rated output current 2)	Booksize format Internal air cooling  For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section 3)	Pre-assembled cable
	%	A	kW (hp)	$I_{rated}$  A	Article No.	Size	mm <sup>2</sup>	Article No.
				<b>Line voltage 380 ... 480 V 3 AC</b>				
1FK7011-5AK71-...	62	1.5	0.1 (0.13)	3	<b>6SL3120-TE13-0AD.</b>	0.5	4 × 1.5	<b>6FX5002-5DN26-....</b>
1FK7015-5AK71-...	68	1.5	0.2 (0.27)	3	<b>6SL3120-TE13-0AD.</b>	0.5	4 × 1.5	<b>6FX5002-5DN26-....</b>
1FK7022-5AK71-...	86	1.8	0.5 (0.67)	3	<b>6SL3120-TE13-0AD.</b>	1	4 × 1.5	<b>6FX5002-5DN26-....</b>
				<b>Motor Module:</b> Single Motor Module <b>1</b> Double Motor Module <b>2</b>		<b>Power cable:</b> MOTION-CONNECT 800PLUS <b>8</b> MOTION-CONNECT 500 <b>5</b>		
				<b>Version status</b>		Without brake cores With brake cores 4) <b>C D</b>		
						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 mm<sup>2</sup>.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)
$n_{\text{rated}}$	SH	$P_{\text{rated}}$ at $\Delta T=100\text{ K}$	$M_0$ at $\Delta T=100\text{ K}$	$M_{\text{rated}}$ at $\Delta T=100\text{ K}$	$I_{\text{rated}}$ at $\Delta T=100\text{ K}$		$p$	J	$m$
rpm		kW (hp)	Nm (lb <sub>F</sub> -ft)	Nm (lb <sub>F</sub> -ft)	A	Article No.		10 <sup>-4</sup> kgm <sup>2</sup> (10 <sup>-3</sup> lb <sub>F</sub> -in-s <sup>2</sup> )	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:			A B G H
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			1 2
			IP65						
			IP65 and DE flange IP67						

# 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 $P_{calc}$ <sup>5)</sup>	SINAMICS S120 Motor Module		Power cable with complete shield Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T = 100$ K	$P_{calc}$ at $M_0$ $\Delta T = 100$ K	Rated output current <sup>2)</sup>	Booksize format Internal air cooling For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section <sup>3)</sup>	Pre-assembled cable
	%	A	kW (hp)	$I_{rated}$	Article No.	Size	mm <sup>2</sup>	Article No.
				Line voltage 380 ... 480 V 3 AC				
1FK7064-4CC71-...	93	8.1	2.5 (3.35)	9	6SL3120-1TE21-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7085-4CC71-...	92	13.5	4.6 (6.17)	18	6SL3120-1TE21-8AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7086-4CC71-...	93	13.2	5.9 (7.91)	18	6SL3120-1TE21-8AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7044-4CF71-...	91	4.0	1.4 (1.88)	5	6SL3120-1TE15-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7061-4CF71-...	93	6.1	2 (2.68)	9	6SL3120-1TE21-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7064-4CF71-...	93	10.8	3.8 (5.10)	18	6SL3120-1TE21-8AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7085-4CF71-...	92	22.0	6.9 (9.25)	30	6SL3120-1TE23-0AD.	1.5	4 × 4	6FX0002-5N46-....
1FK7086-4CF71-...	93	21.5	8.8 (11.8)	30	6SL3120-1TE23-0AD.	1.5	4 × 4	6FX0002-5N46-....
1FK7043-4CH71-...	90	4.1	1.6 (2.15)	5	6SL3120-1TE15-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7044-4CH71-...	91	5.4	2.1 (2.82)	9	6SL3120-1TE21-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7061-4CH71-...	93	8.7	3 (4.02)	9	6SL3120-1TE21-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7064-4CH71-...	93	15.0	5.7 (7.64)	18	6SL3120-1TE21-8AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7033-4CK71-...	88	2.1	0.8 (1.07)	3	6SL3120-1TE13-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7043-4CK71-...	90	5.6	2.2 (2.95)	9	6SL3120-1TE21-0AD.	1	4 × 1.5	6FX0002-5N06-....

**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<sup>4)</sup> 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 mm<sup>2</sup>.

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)		
$n_{\text{rated}}$	SH	$P_{\text{rated}}$ at $\Delta T=100\text{ K}$	$M_0$ at $\Delta T=100\text{ K}$	$M_{\text{rated}}$ at $\Delta T=100\text{ K}$	$I_{\text{rated}}$ at $\Delta T=100\text{ K}$		$p$	J	$m$		
rpm		kW (hp)	Nm (lb <sub>f</sub> -ft)	Nm (lb <sub>f</sub> -ft)	A	Article No.		10 <sup>-4</sup> kgm <sup>2</sup> (10 <sup>-3</sup> lb <sub>f</sub> -in-s <sup>2</sup> )	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)		
	100	4.9 (6.57)	27.0 (19.9)	15.5 (11.4)	11.6	1FK7101-3BF7-1	4	127 (112)	25.7 (56.7)		
		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:			A B G H		
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								

# 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 $P_{calc}$ <sup>5)</sup>	<b>SINAMICS S120 Motor Module</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T=100$ K	$P_{calc}$ at $M_0$ $\Delta T=100$ K	Rated output current <sup>2)</sup>	Booksize format Internal air cooling  For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section <sup>3)</sup>	Pre-assembled cable
	%	A	kW (hp)	$I_{rated}$  A	Article No.	Size	mm <sup>2</sup>	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	6FX0002-5N06-....
1FK7100-3BC71-...	92	8.4	3.8 (5.10)	9	6SL3120-TE21-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7101-3BC71-...	93	12.3	5.7 (7.64)	18	6SL3120-TE21-8AD.	1.5	4 × 1.5	6FX0002-5N26-....
1FK7103-3BC71-...	93	14.4	7.5 (10.1)	18	6SL3120-TE21-8AD.	1.5	4 × 1.5	6FX0002-5N26-....
1FK7105-3BC71-...	93	20.0	10.1 (13.5)	30	6SL3120-1TE23-0AD.	1.5	4 × 2.5	6FX0002-5N36-....
1FK7060-3BF71-...	90	4.45	1.9 (2.55)	5	6SL3120-TE15-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7062-3BF71-...	91	5.3	2.7 (3.62)	5	6SL3120-TE15-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7081-3BF71-...	93	8.7	3.8 (5.10)	9	6SL3120-TE21-0AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7084-3BF71-...	93	12.1	6.3 (8.45)	18	6SL3120-TE21-8AD.	1	4 × 1.5	6FX0002-5N06-....
1FK7101-3BF71-...	93	18.8	8.5 (11.4)	18	6SL3120-TE21-8AD.	1.5	4 × 2.5	6FX0002-5N36-....
1FK7103-3BF71-...	93	26.0	11.3 (15.2)	30	6SL3120-1TE23-0AD.	1.5	4 × 4	6FX0002-5N46-....
1FK7042-3BK71-...	89	4.4	1.9 (2.55)	5	6SL3120-TE15-0AD.	1	4 × 1.5	6FX0002-5N06-....

<b>Motor Module:</b>			
Single Motor Module	1		
Double Motor Module	2		
<b>Version status</b>			

<b>Power cable:</b>			
MOTION-CONNECT 800PLUS	8		
MOTION-CONNECT 500	5		
Without brake cores		C	
With brake cores <sup>4)</sup>		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). Cable cross-section for brake connection 2 × 1.5 mm<sup>2</sup>.

4) Cable cross-section for brake connection 2 × 1.5 mm<sup>2</sup>.

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)
$n_{\text{rated}}$	SH	$P_{\text{at}}$ $\Delta T=100\text{ K}$	$M_0$ $\Delta T=100\text{ K}$	$M_{\text{rated}}$ $\Delta T=100\text{ K}$	$I_{\text{rated}}$ $\Delta T=100\text{ K}$		$p$	J	$m$
rpm		kW (hp)	Nm (lb <sub>F</sub> -ft)	Nm (lb <sub>F</sub> -ft)	A		Article No.	$10^{-4}\text{ kgm}^2$ ( $10^{-3}\text{ lb}_F\text{-in-s}^2$ )	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	1FK7032-2AF2-1-1■ ■ ■	3	0.65 (0.58)	2.7 (5.95)
		0.5 (0.67)	1.6 (1.18)	1.45 (1.07)	1.8	1FK7034-2AF2-1-1■ ■ ■	3	0.9 (0.80)	3.5 (7.72)
	48	0.8 (1.07)	3.0 (2.21)	2.6 (1.92)	3.5	1FK7042-2AF2-1-1■ ■ ■	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:			A B G H
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 Compact > for Power Modules 230 V 1 AC – Natural cooling**

Motor type (repeated)	Efficiency 1)	Stall current	Calculated power $P_{calc}$ 5)	<b>SINAMICS S120 Blocksize format</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T=100$ K	$P_{calc}$ at $M_0$ $\Delta T=100$ K	Rated output current 2)	<b>PM240-2 Power Module</b> Air cooling For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section 3)	Pre-assembled cable
	%	A	kW (hp)	$I_{rated}$ A	Article No.	Size	mm <sup>2</sup>	Article No.
				<b>Line voltage 200 ... 240 V 1 AC</b>				
1FK7032-2AF21-...	85	1.7	0.4 (0.54)	3.0	<b>6SL3210-1PB13-0■L0</b>	1	4 × 1.5	<b>6FX■002-5■G10-....</b>
1FK7034-2AF21-...	85	1.9	0.5 (0.67)	3.0	<b>6SL3210-1PB13-0■L0</b>	1	4 × 1.5	<b>6FX■002-5■G10-....</b>
1FK7042-2AF21-...	88	3.95	0.9 (1.21)	5.5	<b>6SL3210-1PB15-5■L0</b>	1	4 × 1.5	<b>6FX■002-5■G10-....</b>
				<b>Line filter:</b> Without Integrated		<b>Power cable:</b> MOTION-CONNECT 800PLUS MOTION-CONNECT 500		
						Without brake cores With brake cores 4)		
						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 mm<sup>2</sup>.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)	
$n_{\text{rated}}$	SH	$P_{\text{at}}^{\text{rated}}$ $\Delta T=100\text{ K}$	$M_0$ at $\Delta T=100\text{ K}$	$M_{\text{at}}^{\text{rated}}$ $\Delta T=100\text{ K}$	$I_{\text{at}}^{\text{rated}}$ $\Delta T=100\text{ K}$		$p$	J	$m$	
rpm		kW (hp)	Nm (lb <sub>f</sub> -ft)	Nm (lb <sub>f</sub> -ft)	A		Article No.		10 <sup>-4</sup> kgm <sup>2</sup> (10 <sup>-3</sup> lb <sub>f</sub> -in-s <sup>2</sup> )	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) <sup>1)</sup>			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		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



**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)	<b>SINAMICS S120 Blocksize format</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T=100$ K	$P_{calc}$ at $M_0$ $\Delta T=100$ K	Rated output current 2)	<b>PM240-2 Power Module</b> Air cooling <a href="#">For other components, see SINAMICS S120 drive system</a>	Power connector	Cable cross- section 3)	Pre-assembled cable
	%	A	kW (hp)	$I_{rated}$  A	Article No.	Size	mm <sup>2</sup>	Article No.
				<b>Line voltage 200 ... 240 V 1 AC</b>				
1FK7011-5AK21-...	62	0.85	0.1 (0.13)	3.0	<b>6SL3210-1PB13-0■L0</b>	0.5	4 × 1.5	<b>6FX5002-5DN30-....</b>
1FK7015-5AK21-...	68	0.85	0.2 (0.27)	3.0	<b>6SL3210-1PB13-0■L0</b>	0.5	4 × 1.5	<b>6FX5002-5DN30-....</b>
1FK7022-5AK21-...	88	1.8	0.5 (0.67)	3.0	<b>6SL3210-1PB13-0■L0</b>	1	4 × 1.5	<b>6FX■002-5■G10-....</b>
				<b>Line filter:</b>		<b>Power cable:</b>		
				Without		MOTION-CONNECT 800PLUS		
				Integrated	<b>U A</b>	MOTION-CONNECT 500		
						Without brake cores		
						With brake cores 4)		
						<b>C D</b>		
						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 mm<sup>2</sup>.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)
$n_{\text{rated}}$	SH	$P_{\text{rated}}$ at $\Delta T=100\text{ K}$	$M_0$ at $\Delta T=100\text{ K}$	$M_{\text{rated}}$ at $\Delta T=100\text{ K}$	$I_{\text{rated}}$ at $\Delta T=100\text{ K}$		$p$	J	$m$
rpm		kW (hp)	Nm (lb <sub>F</sub> -ft)	Nm (lb <sub>F</sub> -ft)	A		Article No.	$10^{-4}\text{ kgm}^2$ ( $10^{-3}\text{ lb}_F\text{-in-s}^2$ )	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:			A B G H
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 > for Power Modules 230 V 1 AC – Natural cooling**

Motor type (repeated)	Efficiency 1)	Stall current	Calculated power $P_{calc}$ 5)	<b>SINAMICS S120 blocksize format</b>		<b>Power cable with complete shield</b> Motor connection (and brake connection) via power connector		
	$\eta$	$I_0$ at $M_0$ $\Delta T = 100$ K	$P_{calc}$ at $M_0$ $\Delta T = 100$ K	Rated output current 2)	<b>PM240-2 Power Module</b> Air cooling  For other components, see SINAMICS S120 drive system	Power connector	Cable cross- section 3)	Pre-assembled cable
	%	A	kW (hp)	$I_{rated}$  A	Article No.	Size	mm <sup>2</sup>	Article No.
				<b>Line voltage 200 ... 240 V 1 AC</b>				
1FK7033-4CF21-...	86	2.1	0.4 (0.54)	3.0	<b>6SL3210-1PB13-0 L0</b>	1	4 × 1.5	<b>6FX 002-5 G10-....</b>
1FK7043-4CF21-...	88	3.9	1 (1.34)	5.5	<b>6SL3210-1PB15-5 L0</b>	1	4 × 1.5	<b>6FX 002-5 G10-....</b>
				<b>Line filter:</b>		<b>Power cable:</b>		
				Without		MOTION-CONNECT 800PLUS		
				Integrated		MOTION-CONNECT 500		
						Without brake cores		
						With brake cores 4)		
						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 mm<sup>2</sup>.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.

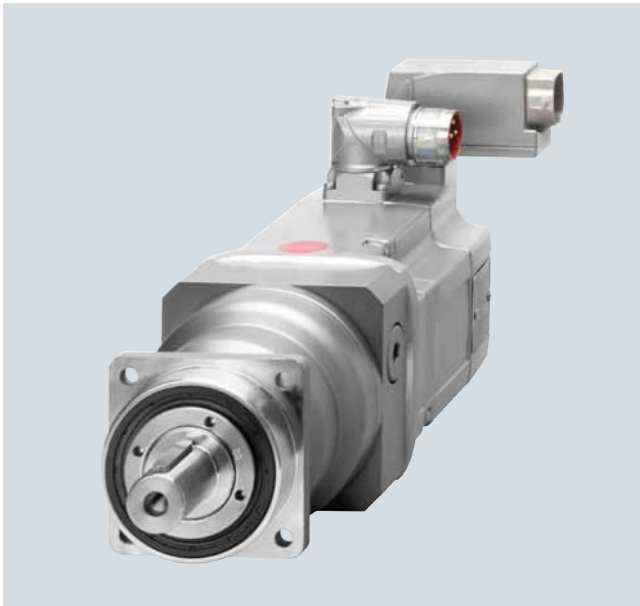
In order to avoid switching overvoltages and any related effects on the plant environment, the brake cables must be connected externally with a varistor. The connection is made via the power connector or the terminal box.

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 <sup>1)</sup>	Direct current	Opening time with varistor	Closing time with varistor	Moment of inertia	Maximum switched energy per brake operation from $n = 3000$ rpm
		Nm (lb <sub>r</sub> -ft)	A	ms	ms	$10^{-4}$ kgm <sup>2</sup> ( $10^{-3}$ lb <sub>r</sub> -in-s <sup>2</sup> )	J
<b>SIMOTICS S-1FT7 with permanent-magnet brake, without backlash, and SIMOTICS S-1FK7 with option N24</b>							
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
<b>SIMOTICS S-1FK7 Compact/High Dynamic/High Inertia motors with permanent magnet brake, without backlash</b>							
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

<sup>1)</sup> 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%	Output torque, max. S3-60%	Radial output shaft loading, max. <sup>1)</sup>	Axial output shaft loading, max. <sup>1)</sup>
	Type	Torsional backlash arcmin	Gearbox weight, approx. kg (lb)	4	5	7	10	$n_{G1}$ ( $n_1$ ) rpm	$M_{G2}$ ( $T_{2B}$ ) Nm (lb <sub>r</sub> -ft)	$F_r$ ( $F_{2Rmax}$ ) N (lb <sub>f</sub> )	$F_a$ ( $F_{2Amax}$ ) N (lb <sub>f</sub> )
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

<sup>1)</sup> 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  <i>i</i>	Motor speed	Output torque	Moments of inertia of gearboxes (referred to the drive)						
		Continuous duty S1 <sup>1)</sup>		1FT703.	1FT704.	1FT706.	1FT708.	1FT710.	1FT713.	
		<i>n</i> <sub>rated1</sub>	<i>M</i> <sub>rated2</sub> ( <i>T</i> <sub>2rated</sub> )	<i>J</i> <sub>1</sub>	<i>J</i> <sub>1</sub>	<i>J</i> <sub>1</sub>	<i>J</i> <sub>1</sub>	<i>J</i> <sub>1</sub>	<i>J</i> <sub>1</sub>	
		rpm	Nm (lb <sub>F</sub> -ft)	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	
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)	

<sup>1)</sup> 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	Planetary gearbox Two-stage			Available gear ratio $i =$					Motor speed, max. S3-60%	Output torque, max. S3-60%	Radial output shaft loading, max. <sup>1)</sup>	Axial output shaft loading, max. <sup>1)</sup>
Type	Type	Torsional backlash	Gearbox weight, approx.	16	20	28	40	50	$n_{G1}$	$M_{G2}$	$F_r$	$F_a$
		arcmin	kg (lb)						$(n_1)$ rpm	$(T_{2B})$ Nm (lb <sub>F</sub> -ft)	$(F_{2Rmax})$ N (lb <sub>F</sub> )	$(F_{2Amax})$ N (lb <sub>F</sub> )
1FT7034 1FT7036	SP 075S-MF2	≤ 6	3.6 (7.94)	✓	✓	✓	–	–	6000	110 (81.1)	4000 (899)	3350 (753)
1FT7042				✓	–	–	–	–				
1FT7034 1FT7036				–	✓	✓	✓	✓				
1FT7042 1FT7044 1FT7046	SP 100S-MF2	≤ 5	7.9 (17.4)	–	–	–	✓	✓	4500	300 (221)	6300 (1416)	5650 (1270)
1FT7036				–	✓	✓	✓	✓				
1FT7042				–	✓	✓	✓	✓				
1FT7044				✓	✓	✓	–	–				
1FT7046				✓	✓	–	–	–				
1FT7062 1FT7064	SP 140S-MF2	≤ 5	17 (37.5)	✓	✓	–	–	–	4000	600 (443)	9450 (2124)	9870 (2219)
1FT7064				✓	–	–	–	–				
1FT7062				–	–	✓	✓	✓				
1FT7064				–	✓	✓	–	–				
1FT7065				✓	✓	–	–	–				
1FT7066				✓	✓	–	–	–				
1FT7067				✓	–	–	–	–				
1FT7068				✓	✓	–	–	–				
1FT7082				✓	✓	–	–	–				
1FT7084				✓	–	–	–	–				
1FT7064 1FT7065 1FT7066 1FT7067 1FT7068	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 1FT7086 1FT7087	SP 210S-MF2	≤ 5	55 (121)	–	–	–	✓	✓	3500	2400 (1770) (2500 (1844) for $i = 20$ )	21000 (4721)	30000 (6744)
1FT7085				–	✓	✓	–	–				
1FT7086				–	–	✓	✓	–				
1FT7087				✓	✓	✓	–	–				
1FT7102 1FT7105 1FT7108	SP 240S-MF2	≤ 5	80.6 (178)	–	–	–	✓	✓	3500	4500 (3319) (4000 (2950) for $i = 40$ 4300 (3172) for $i = 50$ )	30000 (6744)	33000 (7419)
1FT7085				–	–	–	–	✓				
1FT7086				–	–	–	✓	✓				
1FT7102				–	–	–	–	–				
1FT7105				✓	✓	–	–	–				
1FT7108				–	–	–	–	–				
1FT7132				✓	✓	–	–	–				
1FT7134				✓	–	–	–	–				
1FT7136	–	–	–	–	–							
Gear shaft				Order code								
With feather key				J12	J13	J15	J16	J17				
Without feather key				J32	J33	J35	J36	J37				

Preconditions, see page 8/54.

✓ Possible

– Not possible

<sup>1)</sup> 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)							
				Continuous duty S1 <sup>1)</sup>		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 <sub>F</sub> -ft)	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )
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)	–		

<sup>1)</sup> 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%	Output torque, max. S3-60%	Radial output shaft loading, max. <sup>1)</sup>	Axial output shaft loading, max. <sup>1)</sup>
	Type	Torsional backlash	Gearbox weight, approx.	4	5	7	10	$n_{G1}$ ( $n_1$ ) rpm	$M_{G2}$ ( $T_{2B}$ ) Nm (lb <sub>f</sub> -ft)	$F_r$ ( $F_{2Rmax}$ ) N (lb <sub>f</sub> )	$F_a$ ( $F_{2Amax}$ ) N (lb <sub>f</sub> )
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)
<b>Gear shaft</b>				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 0 2 . - 5 A . . . . . G 5**  
**1FK7 0 2 . - 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 single-stage SP+ planetary gearbox  
 with  $i = 7$  and gear shaft without feather key.  
**1FK7042-2AF74-1AG1-Z**  
**J25**

✓ Possible

– Not possible

<sup>1)</sup> 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**

Single-stage Type	Gear ratio <i>i</i>	Motor speed	Output torque	Moments of inertia of gearboxes (referred to the drive)					
		Continuous duty S1 <sup>1)</sup>	1FK702.	1FK703.	1FK704.	1FK706.	1FK708.	1FK710.	
		$n_{rated1}$	$M_{rated2}$ ( $T_{2rated}$ )	$J_1$	$J_1$	$J_1$	$J_1$	$J_1$	$J_1$
		rpm	Nm (lb <sub>F</sub> ft)	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )
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)

<sup>1)</sup> 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%	Output torque, max. S3-60%	Radial output shaft loading, max. <sup>1)</sup>	Axial output shaft loading, max. <sup>1)</sup>
Type	Type	Torsional backlash	Gearbox weight, approx.	16	20	28	40	50	$n_{G1}$	$M_{G2}$	$F_r$	$F_a$
		arcmin	kg (lb)						$(n_1)$ rpm	$(T_{2B})$ Nm (lb <sub>f</sub> -ft)	$(F_{2Rmax})$ N (lb <sub>f</sub> )	$(F_{2Amax})$ N (lb <sub>f</sub> )
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				✓	✓	–	–	–				
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	J17				
	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 0 2 . -5 A . . . . .** ■ 5  
**1FK7 0 2 . -5 A . . . . .** ■ 5

✓ Possible

– Not possible

<sup>1)</sup> 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	Planetary gearbox Two-stage			Available gear ratio $i =$					Motor speed, max. S3-60%	Output torque, max. S3-60%	Radial output shaft loading, max. <sup>1)</sup>	Axial output shaft loading, max. <sup>1)</sup>
Type	Type	Torsional backlash	Gearbox weight, approx.	16	20	28	40	50	$n_{G1}$	$M_{G2}$	$F_r$	$F_a$
		arcmin	kg (lb)						$(n_1)$ rpm	$(T_{2B})$ Nm (lbf·ft)	$(F_{2Rmax})$ N (lbf)	$(F_{2Amax})$ N (lbf)
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				

## 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 0 2 . -5 A . . . . . G 5  
 1FK7 0 2 . -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

<sup>1)</sup> 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>i</i>	Motor speed	Output torque	Moments of inertia of gearboxes (referred to the drive)					
		Continuous duty S1 <sup>1)</sup>		1FK702.	1FK703.	1FK704.	1FK706.	1FK708.	1FK710.
		$n_{rated1}$	$M_{rated2}$ ( $T_{2rated}$ )	$J_1$	$J_1$	$J_1$	$J_1$	$J_1$	$J_1$
		rpm	Nm (lb <sub>F</sub> -ft)	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )	kgcm <sup>2</sup> (lb <sub>F</sub> -in <sup>2</sup> )
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)

<sup>1)</sup> 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.

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.



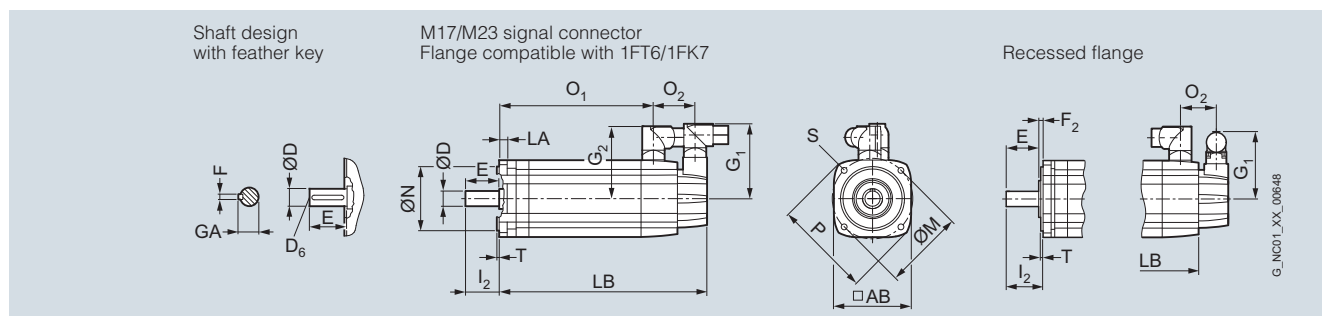


## SIMOTICS servomotors

## Dimensional drawings

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

## Dimensional drawings



For motor

Dimensions in mm (inches)

Shaft height	Type	IEC	P	N	LA	M	AB	T	O <sub>2</sub>	S	G <sub>1</sub>	Signal connector		Connector size		Shaft extension DE				
												M17	M23	Size 1	Size 1.5	D	D <sub>6</sub>	E	GA	F
														G <sub>2</sub>	G <sub>2</sub>					
<b>SIMOTICS S-1FT7 natural cooling, with connector, without/with brake</b>																				
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)	–	<b>14</b> <b>(0.55)</b>		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)	–	<b>19</b> <b>(0.75)</b>		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)	–	<b>24</b> <b>(0.94)</b>		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)	<b>32</b> <b>(1.26)</b>		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)	<b>38</b> <b>(1.50)</b>		M12	80 (3.15)	41 (1.61)	10 (0.39)	

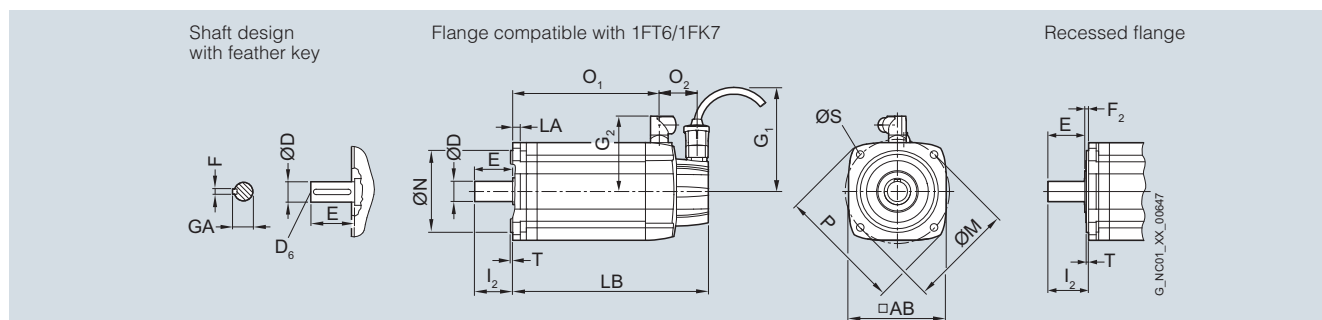
Shaft height	Type	IEC	Recessed flange				Flange compatible with 1FT6/1FK7							
			F <sub>2</sub>	L <sub>2</sub>	without brake LB	with brake O <sub>1</sub>	without brake LB	with brake O <sub>1</sub>	L <sub>2</sub>	without brake LB	with brake O <sub>1</sub>	without brake LB	with brake O <sub>1</sub>	
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 servomotors

## Dimensional drawings

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

#### Dimensional drawings



For motor		Dimensions in mm (inches)											Connector size		Shaft extension DE				
Shaft height	Type	IEC	P	N	LA	M	AB	T	O <sub>2</sub>	S	G <sub>1</sub>	Size 1	Size 1.5	D	D <sub>6</sub>	E	GA	F	
												G <sub>2</sub>	G <sub>2</sub>						
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)	–	<b>14 (0.55)</b>	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)	–	<b>19 (0.75)</b>	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)	–	<b>24 (0.94)</b>	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)	<b>32 (1.26)</b>	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)	<b>38 (1.50)</b>	M12	80 (3.15)	41 (1.61)	10 (0.39)	

Shaft height	Type	IEC	Recessed flange						Flange compatible with 1FT6/1FK7					
			F <sub>2</sub>	l <sub>2</sub>	without brake		with brake		l <sub>2</sub>	without brake		with brake		
					LB	O <sub>1</sub>	LB	O <sub>1</sub>		LB	O <sub>1</sub>	LB	O <sub>1</sub>	
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)	

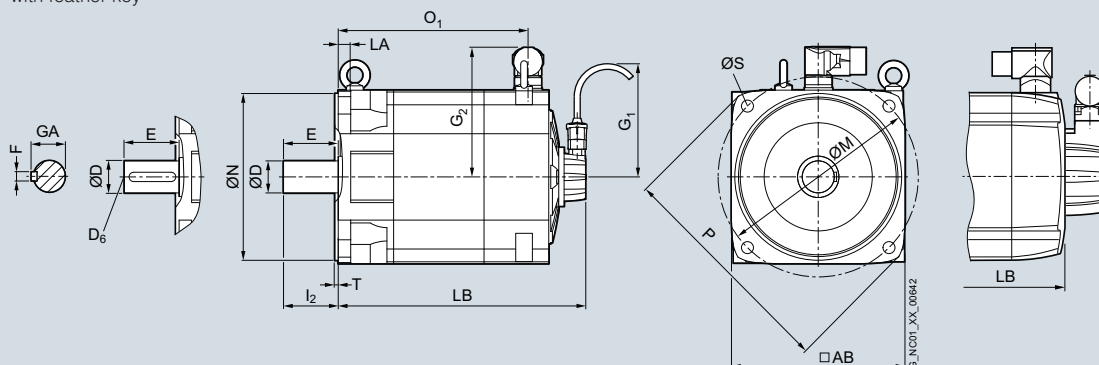
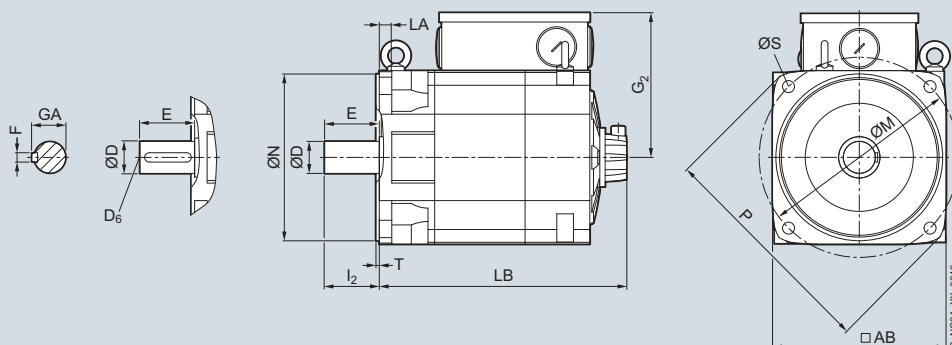
**SIMOTICS servomotors**

## 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

For motor

Dimensions in mm (inches)

		Dimensions in mm (inches)										Connector size		Terminal box	Shaft extension DE				
Shaft height	Type	IEC	P	N	LA	M	AB	T	I <sub>2</sub>	S	Size 1.5	Size 3	G <sub>2</sub>	D	D <sub>6</sub>	E	GA	F	
											G <sub>1</sub>	G <sub>2</sub>							
SIMOTICS S-1FT7 natural cooling, with connector/with terminal box, without/with brake																			
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)	

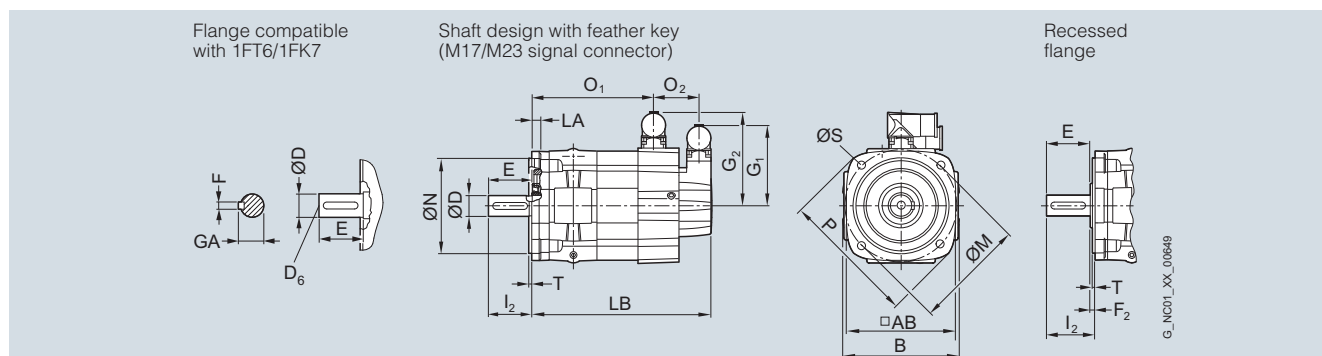
Shaft height	Type	IEC	without brake		with brake		G						
			Signal connector		Signal connector		Connector size		Connector size		RJ45	M17	M23
			RJ45	M17 M23	RJ45	M17 M23	Size 1.5	Size 3	Size 1.5	Size 3			
			LB		LB		O <sub>1</sub>	O <sub>1</sub>	O <sub>1</sub>	O <sub>1</sub>			
132	1FT7132-5A		370.5 (14.59)	375.5 (14.78)	284.5 (11.20)	265.5 (10.45)	431 (16.97)	436 (17.17)	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 servomotors

## Dimensional drawings

### 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 G <sub>2</sub>	Size 1.5 G <sub>2</sub>	Size 3 G <sub>2</sub>	Size 1 O <sub>2</sub>	Size 1.5 O <sub>2</sub>	Size 3 O <sub>2</sub>
<b>SIMOTICS S-1FT7 water cooling, with connector, without/with brake</b>																				
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)			

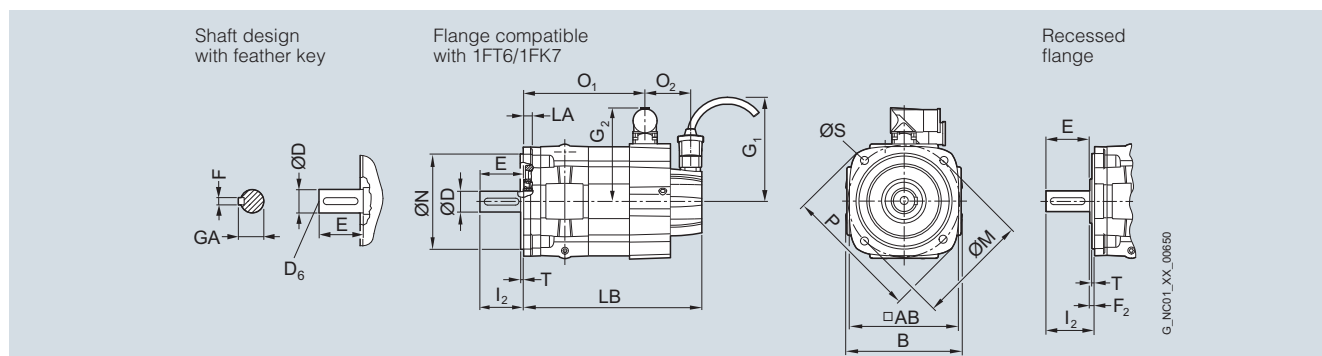
			Flange compatible with 1FT6/1FK7 without/with brake						Recessed flange without/with brake						Shaft extension DE				
			Power connector			Power connector			Power connector			Power connector							
			Size 1	Size 1.5	Size 3	Size 1	Size 1.5	Size 3	Size 1	Size 1.5	Size 3	Size 1	Size 1.5	Size 3	D	D <sub>6</sub>	E	GA	F
Shaft height	Type	IEC	I <sub>2</sub>	LB	O <sub>1</sub>	O <sub>1</sub>	O <sub>1</sub>	F <sub>2</sub>	I <sub>2</sub>	LB	O <sub>1</sub>	O <sub>1</sub>	O <sub>1</sub>	D	D <sub>6</sub>	E	GA	F	
63	1FT7062		50 (1.97)	208 (8.19)	141 (5.55)	–	–	6 (0.24)	56.5 (2.22)	202 (7.95)	135 (5.31)	–	–	<b>24 (0.94)</b>	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)	–	<b>32 (1.26)</b>	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)						
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)	<b>38 (1.50)</b>	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)										Signal connector			Power connector			Connector		
Shaft height	Type	IEC	P	B	N	LA	M	AB	T	S	G <sub>1</sub>	G <sub>2</sub>	G <sub>2</sub>	G <sub>2</sub>	O <sub>2</sub>	O <sub>2</sub>	O <sub>2</sub>	O <sub>2</sub>	O <sub>2</sub>	O <sub>2</sub>
<b>SIMOTICS S-1FT7 water cooling, with connector, without/with brake</b>																				
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)	–	–	–	–

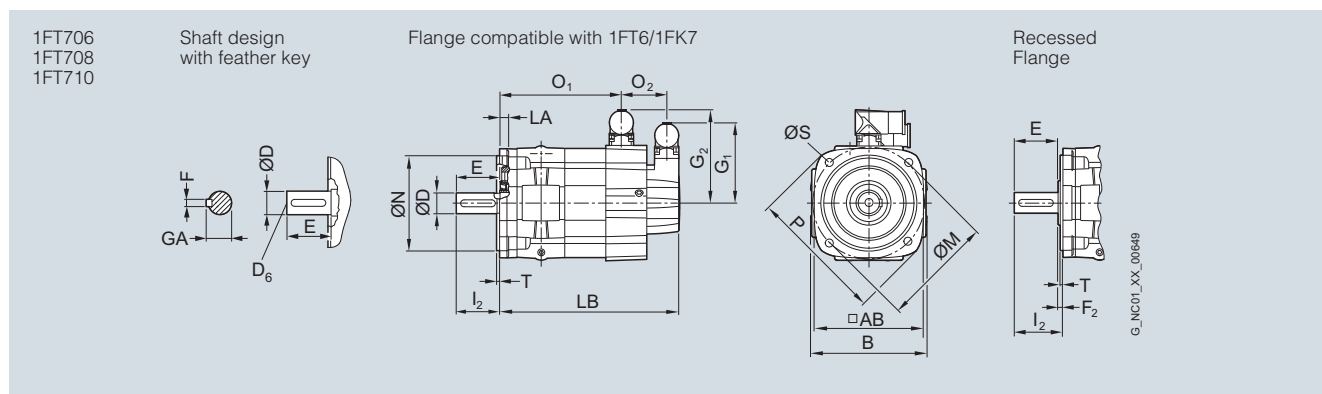
			without/with brake					Flange compatible with 1FT6/1FK7						Shaft extension DE				
			Power connector					without/with brake										
			Size 1   Size 1.5   Size 3					Power connector										
			O <sub>1</sub> O <sub>1</sub> O <sub>1</sub>					Size 1   Size 1.5   Size 3										
Shaft height	Type	IEC	I <sub>2</sub>	LB	O <sub>1</sub>	O <sub>1</sub>	O <sub>1</sub>	F <sub>2</sub>	I <sub>2</sub>	LB	O <sub>1</sub>	O <sub>1</sub>	O <sub>1</sub>	D	D <sub>6</sub>	E	GA	F
63	1FT7062		50 (1.97)	204 (8.03)	141 (5.55)	–	–	6 (0.24)	56.5 (2.22)	197 (7.76)	135 (5.31)	–	–	<b>24 (0.94)</b>	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)	–	<b>32 (1.26)</b>	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)					
	1FT7088																	
100	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)	<b>38 (1.50)</b>	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 servomotors

## Dimensional drawings

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

#### Dimensional drawings

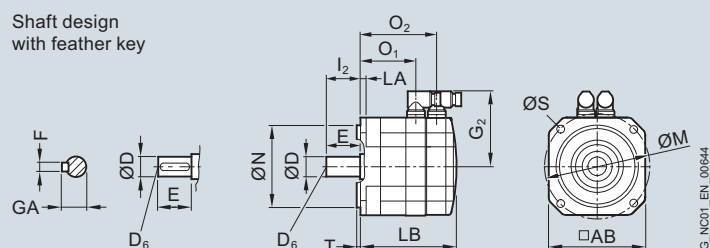


For motor		Dimensions in mm (inches)										Connector size					Fan
Shaft height	Type	IEC	P	B	N	LA	M	AB	T	S	Size 1.5	Size 3	G <sub>1</sub>	H	H <sub>1</sub>	H <sub>2</sub>	
											G <sub>2</sub>	G <sub>2</sub>					
SIMOTICS S-1FT7 forced ventilation, with connector, without/with brake																	
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 . -5S		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 <sub>6</sub>	E	GA	F		
			l <sub>2</sub>	LB	O <sub>1</sub>	LB	O <sub>1</sub>	F <sub>2</sub>	l <sub>2</sub>	LB	O <sub>1</sub>	LB	O <sub>1</sub>										
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**1FK701  
1FK702Shaft design  
with feather key

For motor Dimensions in mm (inches)

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

8

For motor	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					
		Dimensions in mm (inches)											
Shaft height	Type	without brake			with brake			without brake			with brake		
		LB	O <sub>1</sub>	O <sub>2</sub>	LB	O <sub>1</sub>	O <sub>2</sub>	LB	O <sub>1</sub>	O <sub>2</sub>	LB	O <sub>1</sub>	O <sub>2</sub>
20	1FK7011	140 (5.51)	89 (3.50)	118 (4.65)	140 (5.51)	89 (3.50)	118 (4.65)	155 (6.10)	89 (3.50)	118 (4.65)	155 (6.10)	89 (3.50)	118 (4.65)
	1FK7015	165 (6.50)	114 (4.59)	143 (5.63)	165 (6.50)	114 (4.49)	143 (5.63)	180 (7.09)	114 (4.49)	143 (5.63)	180 (7.09)	114 (4.49)	143 (5.63)
28	1FK7022	153 (6.02)	95 (3.74)	128 (5.04)	175 (6.89)	95 (3.74)	150 (5.91)	178 (7.01)	95 (3.74)	128 (5.04)	200 (7.87)	95 (3.74)	150 (5.91)



# SIMOTICS servomotors

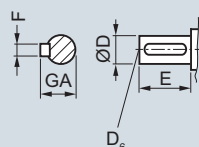
## Dimensional drawings

### SIMOTICS S-1FK7 – Natural cooling

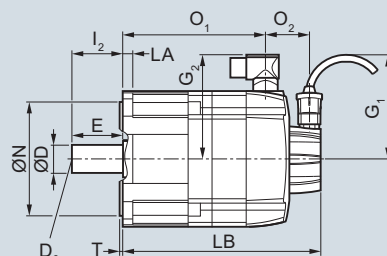
#### Dimensional drawings

1FK703  
1FK704  
1FK706  
1FK708  
1FK710

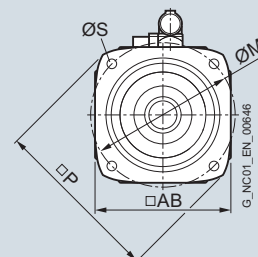
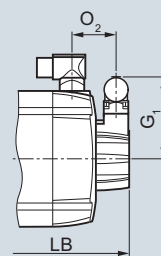
Shaft design  
with feather key



Version  
with DRIVE-CLiQ interface



Version  
without DRIVE-CLiQ interface



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

											Shaft extension DE				
Shaft height	Type	IEC	P	N	LA	M	AB	T	I <sub>2</sub>	S	D	D <sub>6</sub>	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)	<b>14</b> (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)	<b>19</b> (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)	<b>24</b> (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)	<b>32</b> (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)	<b>38</b> (1.50)	M12	80 (3.15)	41 (1.61)	10 (0.39)

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					without brake		with brake						without brake		with brake	
		G <sub>1</sub>	G <sub>2</sub>	O <sub>2</sub>	LB	O <sub>1</sub>	LB	O <sub>1</sub>	G <sub>1</sub>	G <sub>2</sub>	O <sub>2</sub>	LB	O <sub>1</sub>	LB	O <sub>1</sub>		
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 <sub>1</sub>	G <sub>2</sub>	O <sub>2</sub>	without brake		with brake			G <sub>1</sub>	G <sub>2</sub>	O <sub>2</sub>	without brake		with brake		
					LB	O <sub>1</sub>	LB	O <sub>1</sub>					LB	O <sub>1</sub>	LB	O <sub>1</sub>	
<b>SIMOTICS S-1FK7 Compact – Dimensions dependent on overall length</b>																	
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)	
<b>SIMOTICS S-1FK7 High Dynamic – Dimensions dependent on overall length</b>																	
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)						

# SIMOTICS servomotors

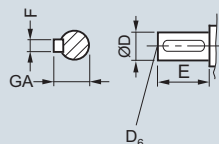
## Dimensional drawings

### SIMOTICS S-1FK7 – Natural cooling

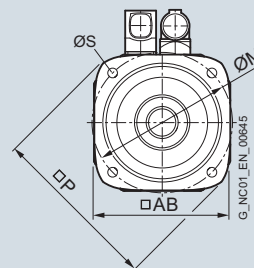
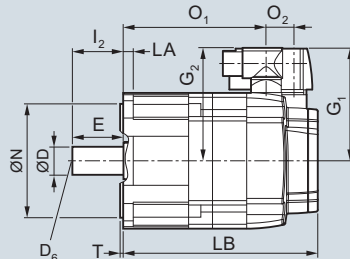
#### Dimensional drawings

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)

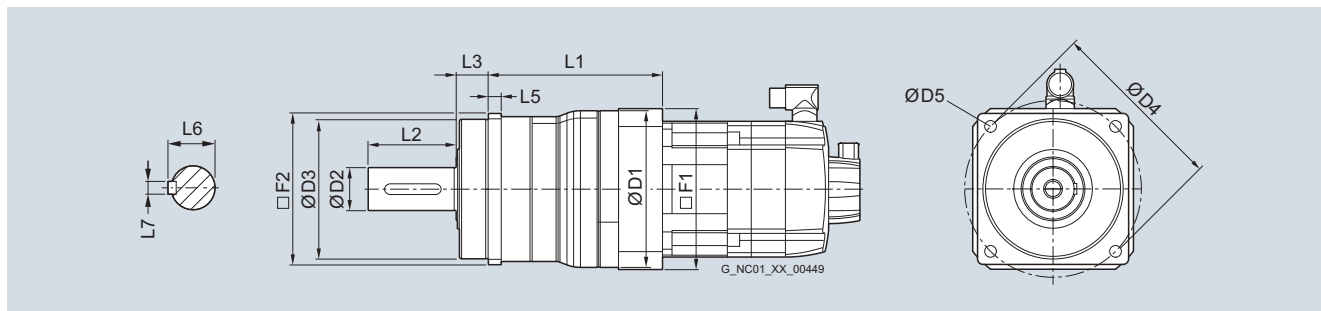
Shaft height	Type										Shaft extension DE				
		IEC	P	N	LA	M	AB	T	I <sub>2</sub>	S	D	D <sub>6</sub>	E	GA	F
SIMOTICS S-1FK7 Compact/High Dynamic, with/without brake – Dimensions dependent on shaft height															
36	1FK703		90 (3.54)	60 (2.36)	8 (0.31)	75 (2.95)	72 (2.83)	3 (0.12)	30 (1.18)	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 <sub>1</sub>	G <sub>2</sub>	O <sub>2</sub>	without brake		with brake		
					LB	O <sub>1</sub>	LB	O <sub>1</sub>	
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
<b>SIMOTICS S-1FT7/1FK7 with SP+ series planetary gearbox single-stage/two-stage</b>										
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

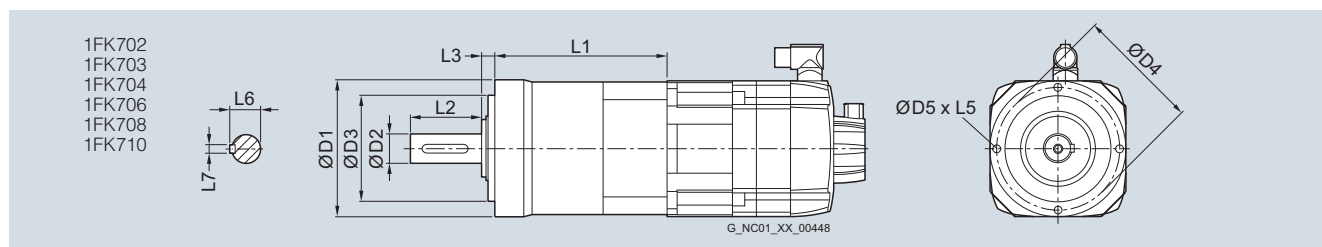
		Dimensions in mm (inches)					
		Planetary gearbox series SP+ single-stage			Planetary gearbox series SP+ two-stage		
		-MF1			-MF2		
Planetary gearbox Type	Motor Type	D1	F1	L1	D1	F1	L1
<b>SIMOTICS S-1FT7/1FK7 with SP+ series planetary gearbox single-stage/two-stage</b>							
<b>SP060S-</b>	1FK702	68 (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)	–	–	–
<b>SP075S-</b>	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)
<b>SP100S-</b>	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)
<b>SP140S-</b>	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)	–	–	–
<b>SP180S-</b>	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)
<b>SP210S-</b>	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)	–	–	–
<b>SP240S-</b>	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)

# SIMOTICS servomotors

## Dimensional drawings

### 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 Motor

Type	Type	L1	L2	L3	L5	L6	L7	D1	D2	D3	D4	D5
<b>SIMOTICS S-1FK7 with LP+ series planetary gearbox</b>												
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)										

## SIMOTICS servomotors

### Notes