1FK7 motors

Overview

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

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. 1FK7 motors have a high overload capability.

Benefits

1FK7 Compact motors offer:

- Space-saving installation thanks to extremely high power density
- Can be used universally for many applications
- Wide range of motors

1FK7 High Dynamic motors offer:

- Extremely high dynamic response due to low rotor moment of inertia

Application

- Machine tools
- Robots and handling systems
- Wood, glass, ceramics and stone working
- Packaging, plastics and textile machines
- Auxiliary axes

Technical specifications

Product name	1FK7 Compact motor 1FK7 High Dynamic motor
Type of motor	Permanent-magnet-excited synchronous motor
Magnet material	Rare-earth magnet material
Cooling	Natural cooling
Temperature monitoring	KTY 84 temperature sensor in stator winding
Insulation of the stator winding in accordance with EN 60034-1 (IEC 60034-1)	Temperature class 155 (F) for a winding temperature rise of ΔT = 100 K at an ambient temperature of 40 °C (104 °F)
Type 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)	IP64
Shaft extension on the drive end in accordance with DIN 748-3 (IEC 60072-1)	Plain shaft
Shaft and flange accuracy in accordance with DIN 42955 (IEC 60072-1)[1]	Tolerance N
Vibration magnitude in accordance with EN 60034-14 (IEC 60034-14)	Grade A is observed up to rated speed
Sound pressure level in accordance with EN ISO 1680, max.	
• 1FK701 ... 1FK704:	55 dB (A)
• 1FK706:	65 dB (A)
• 1FK708 ... 1FK710:	70 dB (A)
Encoder systems, built-in for motors without DRIVE-CLiQ interface	• Incremental encoder sin/cos 1 V_{pp} 2048 S/R • Absolute encoder, multi-turn (traversingrange 4096 revolutions) with EnDat interface 1FK704 ... 1FK710: 2048 S/R 1FK701 ... 1FK703: 512 S/R 1FK704 ... 1FK710: 32 S/R 1FK701 ... 1FK703: 16 S/R • Multi-pole resolver (number of poles corresponds to number of pole pairs of the motor) • 2-pole resolver
Encoder systems, built-in for motors with DRIVE-CLiQ interface	• Incremental encoder 22 bit (2048 S/R internal) • Absolute encoder single-turn + 12 bit multi-turn (traversing range 4096 revolutions) 1FK704 ... 1FK710: 22 bit single-turn (2048 S/R internal) 1FK701 ... 1FK703: 20 bit single-turn (512 S/R internal) 1FK704 ... 1FK710: 16 bit single-turn (32 S/R internal) 1FK701 ... 1FK703: 15 bit single-turn (16 S/R internal) • 15 bit resolver • 14 bit resolver
Connection	Connectors for signals and power can be rotated (270°)
Paint finish	Unpainted
2nd rating plate	Attached in the NDE cover
3rd rating plate	Enclosed separately
Options[2]	• Shaft extension on the drive end with fitted key and keyway (half-key balancing) • Built-in holding brake • Degree of protection IP65, plus DE flange IP67 • Planetary gearbox, built-on (requires: plain shaft extension, degree of protection IP64 for LP+ and IP65 for SP+) • Anthracite paint finish

S/R = signals/revolution

[1] Shaft extension run-out, concentricity of spigot and shaft and perpendicularity of mounting face of flange to shaft.

[2] 1FK701 only available in degree of protection IP54 and anthracite paint finish, separately packed rating plate, planetary gearbox not available.

1FK7 Compact motors
Natural cooling

Selection and Ordering Data

Rated speed	Shaft height	Rated power	Static torque	Rated torque[1]	Rated current	**1FK7 Compact synchronous motor Natural cooling**	Number of pole pairs	Rotor moment of inertia (without brake)	Weight (without brake)
n_{rated}	SH	P_{rated} at ΔT=100 K	M_0 at ΔT=100 K	M_{rated} at ΔT=100 K	I_{rated} at ΔT=100 K	Order No.		J	m
rpm		kW (HP)	Nm (lb_f-in)	Nm (lb_f-in)	A			10^{-4} kgm^2 (10^{-3} x lb_f-in-s^2)	kg (lb)
2000	100	7.75 (10.4)	48 (425)	37 (327)	16	**1FK7105 - 5AC71- 1■ ■ ■**	4	156 (138)	39 (86.0)
3000	48	0.82 (1.10)	3 (26.6)	2.6 (23.0)	1.95	**1FK7042 - 5AF71- 1■ ■ ■**	4	3.01(2.66)	4.9 (10.8)
	63	1.48 (1.98)	6 (53.1)	4.7 (41.6)	3.7	**1FK7060 - 5AF71- 1■ ■ ■**	4	7.95(7.04)	7 (15.4)
		2.29 (3.07)	11 (97.4)	7.3 (64.6)	5.6	**1FK7063 - 5AF71- 1■ ■ ■**	4	15.1 (13.4)	11.5 (25.4)
	80	2.14 (2.87)	8 (70.8)	6.8 (60.2)	4.4	**1FK7080 - 5AF71- 1■ ■ ■**	4	15 (13.3)	10 (22.1)
		3.3 (4.43)	16 (142)	10.5 (92.9)	7.4	**1FK7083 - 5AF71- 1■ ■ ■**	4	27.3 (24.2)	14 (30.9)
	100	3.77 (5.06)	18 (159)	12 (106)	8	**1FK7100 - 5AF71- 1■ ■ ■**	4	55.3 (48.9)	19 (41.9)
		4.87 (6.53)	27 (239)	15.5 (137)	11.8	**1FK7101 - 5AF71- 1■ ■ ■**	4	79.9 (70.7)	21 (46.3)
		5.37 (7.20)[2]	36 (319)	20.5 (181)[2]	16.5[2]	**1FK7103 - 5AF71- 1■ ■ ■**	4	105 (92.9)	29 (63.9)
		8.17 (11.0)	48 (425)	26 (230)	18	**1FK7105 - 5AF71- 1■ ■ ■**	4	156 (138)	39 (86.0)

Encoder systems for motors without DRIVE-CLiQ interface:	Incremental encoder sin/cos 1 V_{pp}, 2048 S/R Absolute encoder EnDat 2048 S/R[1] Absolute encoder EnDat 32 S/R[1] Multi-pole resolver 2-pole resolver	**A** **E** **G** **S** **T**
Encoder systems for motors with DRIVE-CLiQ interface:	Incremental encoder 22 bit Absolute encoder 22 bit single-turn + 12 bit multi-turn[1] Absolute encoder 16 bit single-turn + 12 bit multi-turn[1] 15 bit resolver 14 bit resolver	**D** **F** **K** **U** **P**

Shaft extension:	**Shaft and flange accuracy:**	**Holding brake:**	
Fitted key and keyway	Tolerance N	without	**A**
Fitted key and keyway	Tolerance N	with	**B**
Plain shaft	Tolerance N	without	**G**
Plain shaft	Tolerance N	with	**H**

Degree of protection:	IP64 (not for 1FK701)	**0**
	IP65 and DE flange IP67 (not for 1FK701)	**2**
	IP64 (IP54 with 1FK701) and anthracite paint finish	**3**
	IP65 and DE flange IP67, anthracite paint finish (not for 1FK701)	**5**
	IP65 and DE flange IP67, anthracite paint finish and metal rating plate on motor (not for 1FK701)	**8**

To select the degree of protection and type, see Selection guides.

Selection and Ordering Data

Motor type (continued)	Static current	Calculated power	SINAMICS S120 Motor Module		Power cable with complete shield Motor connection (and brake connection) via power connector		
			Rated output current[4]	**Booksize format**			
	I_0 at M_0 ΔT=100 K	P_{calc} for M_0 ΔT=100 K	I_{rated}	Order No.	Power connector	Motor cable cross-section[3]	Order No. Pre-assembled cable
	A	kW (HP)	A		Size	mm²	
1FK7105-5AC71...	20	10 (13.4)	30	**6SL312■ - ■TE23 - 0AA3**	1.5	4 x 2.5	**6FX■ 002 - 5■S31 - ....**
1FK7042-5AF71...	2.2	0.9 (1.21)	3	**6SL312■ - ■TE13 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7060-5AF71...	4.5	1.9 (2.55)	5	**6SL312■ - ■TE15 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7063-5AF71...	8	3.5 (4.69)	9	**6SL312■ - ■TE21 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7080-5AF71...	4.8	2.5 (3.35)	5	**6SL312■ - ■TE15 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7083-5AF71...	10.4	5.0 (6.71)	9[3]	**6SL312■ - ■TE21 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7100-5AF71...	11.2	5.7 (7.64)	18	**6SL312■ - ■TE21 - 8AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7101-5AF71...	19	8.5 (11.4)	18[3]	**6SL312■ - ■TE21 - 8AA3**	1.5	4 x 2.5	**6FX■ 002 - 5■S31 - ....**
1FK7103-5AF71...	27.5	11.3 (15.2)	30	**6SL312■ - 1TE23 - 0AA3**	1.5	4 x 4	**6FX■ 002 - 5■S41 - ....**
1FK7105-5AF71...	31	15 (20.1)	30[3]	**6SL312■ - 1TE23 - 0AA3**	1.5	4 x 10	**6FX■ 002 - 5■S61 - ....**

Cooling:	
Internal air cooling	**0**
External air cooling	**1**
Motor Module:	
Single Motor Module	**1**
Double Motor Module	**2**
Type of power cable:	
MOTION-CONNECT 800	**8**
MOTION-CONNECT 500	**5**
Without brake cores	**C**
With brake cores	**D**
For length code as well as power and signal cables, see Connection system MOTION-CONNECT.	**....**

[1] If the absolute encoder is used, M_{rated} is reduced by 10%.

[2] These values refer to n = 2500 rpm.

[3] The current carrying capacity of the power cables complies with IEC 60204-1 for installation type C under continuous operating conditions at an ambient air temperature of 40 °C (104 °F), designed for I_0 (100 K), PVC/PUR-insulated cable.

[4] With default setting of the pulse frequency.

[5] $P_{calc}\,[kW] = \frac{M_0\,[Nm] \times n_{rated}}{9550}$ $P_{calc}\,[HP] = \frac{M_0\,[lb_f\text{-in}] \times n_{rated}}{63000}$

1FK7 Compact motors
Natural cooling

Selection and Ordering Data

Rated speed	Shaft height	Rated power	Static torque	Rated torque[1]	Rated current	1FK7 Compact synchronous motor Natural cooling	Number of pole pairs	Rotor moment of inertia (without brake)	Weight (without brake)
n_{rated}	SH	P_{rated} at ΔT=100 K	M_0 at ΔT=100 K	M_{rated} at ΔT=100 K	I_{rated} at ΔT=100 K	Order No.		J	m
rpm		kW (HP)	Nm (lb_f-in)	Nm (lb_f-in)	A			10^{-4} kgm^2 (10^{-3} x lb_f-in-s^2)	kg (lb)
4500	63	1.74 (2.33)	6 (53.1)	3.7 (32.7)	4.1	**1FK7060 - 5AH71- 1■■■**	4	7.95 (7.04)	7 (15.4)
		2.09 (2.80)[2]	11 (97.4)	5 (44.3)[2]	6.1[2]	**1FK7063 - 5AH71- 1■■■**	4	15.1 (13.4)	11.5 (25.4)
	80	2.39 (3.20)[2]	8 (70.8)	5.7 (50.5)[2]	5.6[2]	**1FK7080 - 5AH71- 1■■■**	4	15 (13.3)	10 (22.1)
		3.04 (4.08)[3]	16 (142)	8.3 (73.5)[3]	9[3]	**1FK7083 - 5AH71- 1■■■**	4	27.3 (24.2)	14 (30.9)
6000	20	0.05 (0.07)	0.18 (1.59)	0.08 (0.71)	0.85	**1FK7011 - 5AK71- 1■■3**	4	0.064 (0.06)	0.9 (1.98)
		0.10 (0.13)	0.35 (3.10)	0.16 (1.42)	0.85	**1FK7015 - 5AK71- 1■■3**	4	0.083 (0.07)	1.1 (2.43)
	28	0.43 (0.58)	0.85 (7.52)	0.6 (5.31)	1.4	**1FK7022 - 5AK71- 1■■■**	3	0.28 (0.25)	1.8 (3.97)
	36	0.50 (0.67)	1.1 (9.74)	0.8 (7.08)	1.3	**1FK7032 - 5AK71- 1■■■**	3	0.61 (0.54)	2.7 (5.95)
		0.63 (0.84)	1.6 (14.2)	1 (8.85)	1.3	**1FK7034 - 5AK71- 1■■■**	3	0.9 (0.80)	3.7 (8.16)
	48	0.69 (0.93)	1.6 (14.2)	1.1 (9.74)	1.7	**1FK7040 - 5AK71- 1■■■**	4	1.69 (1.50)	3.5 (7.72)
		1.02 (1.37)[4]	3 (26.6)	1.95 (17.3)[4]	3.1[4]	**1FK7042 - 5AK71- 1■■■**	4	3.01 (2.66)	4.9 (10.8)

Encoder systems for motors without DRIVE-CLiQ interface:	Incremental encoder sin/cos 1V_{pp} 2048 S/R	A
	Absolute encoder EnDat 2048 S/R (not for 1FK701...1FK703)[1]	E
	Absolute encoder EnDat 512 S/R (only for 1FK701...1FK703)[1]	H
	Absolute encoder EnDat 32 S/R (not for 1FK701...1FK703)[1]	G
	Absolute encoder EnDat 16 S/R (only for 1FK701...1FK703)[1]	J
	Multi-pole resolver	S
	2-pole resolver	T
Encoder systems for motors with DRIVE-CLiQ interface:[5]	Incremental encoder 22 bit (not for 1FK701)	D
	Absolute encoder 22 bit single-turn + 12 bit multi-turn[1] (not for 1FK701 ... 1FK703)	F
	Absolute encoder 20 bit single-turn + 12 bit multi-turn[1] (only for 1FK701 ... 1FK703)	L
	Absolute encoder 16 bit single-turn + 12 bit multi-turn[1] (not for 1FK701 ... 1FK703)	K
	Absolute encoder 15 bit single-turn + 12 bit multi-turn[1] (only for 1FK701 ... 1FK703)	V
	15 bit resolver (not for 1FK701)	U
	14 bit resolver (not for 1FK701)	P

Shaft extension:	Shaft and flange accuracy:	Holding brake:	
Fitted key and keyway	Tolerance N	without	A
Fitted key and keyway	Tolerance N	with	B
Plain shaft	Tolerance N	without	G
Plain shaft	Tolerance N	with	H

Degree of protection:	IP64 (not for 1FK701)	0
	IP65 and DE flange IP67 (not for 1FK701)	2
	IP64 (IP54 with 1FK701) and anthracite paint finish	3
	IP65 and DE flange IP67, anthracite paint finish (not for 1FK701)	5
	IP65 and DE flange IP67, anthracite paint finish and metal rating plate on motor (not for 1FK701)	8

To select the degree of protection and type, see Selection guides.

Selection and Ordering Data

Motor type (continued)	Static current	Calculated power	SINAMICS S120 Motor Module		Power cable with complete shield Motor connection (and brake connection) via power connector		
			Rated output current[7]	Booksize format			
	I_0 at M_0 ΔT=100 K	P_{calc} for M_0 ΔT=100 K	I_{rated}	Order No.	Power connector	Motor cable cross-section[6]	Order No. Pre-assembled cable
	A	kW (HP)	A		Size	mm²	
1FK7060-5AH71...	6.2	2.8 (3.75)	9	**6SL312■ - ■TE21 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7063-5AH71...	12	5.2 (6.97)	18	**6SL312■ - ■TE21 - 8AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7080-5AH71...	7.4	3.8 (5.10)	9	**6SL312■ - ■TE21 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7083-5AH71...	15	7.5 (10.1)	18	**6SL312■ - ■TE21 - 8AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7011-5AK71...	1.5	0.11 (0.15)	3	**6SL312■ - ■TE13 - 0AA3**	0.5	4 x 1.5	**6FX5 002 - 5DA20 - ....**
1FK7015-5AK71...	1.5	0.22 (0.30)	3	**6SL312■ - ■TE13 - 0AA3**	0.5	4 x 1.5	**6FX5 002 - 5DA20 - ....**
1FK7022-5AK71...	1.8	0.5 (0.67)	3	**6SL312■ - ■TE13 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7032-5AK71...	1.7	0.7 (0.94)	3	**6SL312■ - ■TE13 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7034-5AK71...	1.9	1 (1.34)	3	**6SL312■ - ■TE13 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7040-5AK71...	2.25	1.0 (1.34)	3	**6SL312■ - ■TE13 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7042-5AK71...	4.4	1.9 (2.55)	5	**6SL312■ - ■TE15 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**

Cooling: Internal air cooling External air cooling	**0** **1**
Motor Module: Single Motor Module Double Motor Module	**1** **2**
Type of power cable: MOTION-CONNECT 800 MOTION-CONNECT 500	**8** **5**
Without brake cores With brake cores	**C** **D**
For length code as well as power and signal cables, see Connection system MOTION-CONNECT.	**....**

[1] If the absolute encoder is used, M_{rated} is reduced by 10%.

[2] These values refer to n = 4000 rpm.

[3] These values refer to n = 3500 rpm.

[4] These values refer to n = 5000 rpm.

[5] Motors with shaft height 20 are not available with a DRIVE-CLiQ interface. The encoder systems are connected via the SMC (Sensor Module Cabinet-Mounted).

[6] The current carrying capacity of the power cables complies with IEC 60204-1 for installation type C under continuous operating conditions at an ambient air temperature of 40 °C (104 °F), designed for I_0 (100 K), PVC/PUR-insulated cable.

[7] With default setting of the pulse frequency.

[8] $P_{calc}\,[kW] = \frac{M_0\,[Nm] \times n_{rated}}{9550}$ $P_{calc}\,[HP] = \frac{M_0\,[lb_f\text{-in}] \times n_{rated}}{63000}$

1FK7 High Dynamic motors
Natural cooling

Selection and Ordering Data

Rated speed	Shaft height	Rated power	Static torque	Rated torque[1]	Rated current	1FK7 High Dynamic synchronous motor Natural cooling	Number of pole pairs	Rotor moment of inertia (without brake)	Weight (without brake)
n_{rated}	SH	P_{rated} at ΔT=100 K	M_0 at ΔT=100 K	M_{rated} at ΔT=100 K	I_{rated} at ΔT=100 K	Order No.		J	m
rpm		kW (HP)	Nm (lb_f-in)	Nm (lb_f-in)	A			10^{-4} kgm^2 (10^{-3} x lb_f-in-s^2)	kg (lb)
3000	48	1.1 (1.48)	4 (35.4)	3.5 (31.0)	4	**1FK7044 - 7AF71- 1■■■**	3	1.28 (1.13)	7.7 (17.0)
	63	1.7 (2.28)	6.4 (56.6)	5.4 (47.8)	5.3	**1FK7061 - 7AF71- 1■■■**	3	3.4 (3.01)	10 (22.1)
		2.51 (3.37)	12 (106)	8 (70.8)	7.5	**1FK7064 - 7AF71- 1■■■**	3	6.5 (5.75)	15.5 (34.2)
	80	3.14 (4.21)[2]	22 (195)	12 (106)[2]	12.5[2]	**1FK7085 - 7AF71- 1■■■**	4	23 (20.4)	23.5 (51.8)
		3.77 (5.06)[3]	28 (248)	18 (159)[3]	14.5[3]	**1FK7086 - 7AF71- 1■■■**	4	23 (20.4)	23.5 (51.8)
4500	48	1.23 (1.65)	3.1 (27.4)	2.6 (23.0)	4	**1FK7043 - 7AH71- 1■■■**	3	1 (0.89)	6.3 (13.9)
		1.41 (1.89)	4 (35.4)	3 (26.6)	4.9	**1FK7044 - 7AH71- 1■■■**	3	1.28 (1.13)	7.7 (17.0)
	63	2.03 (2.72)	6.4 (56.6)	4.3 (38.1)	5.9	**1FK7061 - 7AH71- 1■■■**	3	3.4 (3.01)	10 (22.1)
		2.36 (3.16)	12 (106)	5 (44.3)	7	**1FK7064 - 7AH71- 1■■■**	3	6.5 (5.75)	15.5 (34.2)
6000	36	0.57 (0.76)	1.3 (11.5)	0.9 (7.97)	1.5	**1FK7033 - 7AK71- 1■■■**	3	0.27 (0.24)	3.1 (6.84)
	48	1.26 (1.69)	3.1 (27.4)	2 (17.7)	4.4	**1FK7043 - 7AK71- 1■■■**	3	1 (0.89)	6.3 (13.9)

Encoder systems for motors without DRIVE-CLiQ interface:	Incremental encoder sin/cos 1 V_{pp} 2048 S/R	A
	Absolute encoder EnDat 2048 S/R (not for 1FK703)[1]	E
	Absolute encoder EnDat 512 S/R (only for 1FK703)[1]	H
	Absolute encoder EnDat 32 S/R (not for 1FK703)[1]	G
	Absolute encoder EnDat 16 S/R (only for 1FK703)[1]	J
	Multi-pole resolver	S
	2-pole resolver	T
Encoder systems for motors with DRIVE-CLiQ interface:	Incremental encoder 22 bit	D
	Absolute encoder 22 bit single-turn + 12 bit multi-turn[1] (not for 1FK703)	F
	Absolute encoder 20 bit single-turn + 12 bit multi-turn[1] (only for 1FK703)	L
	Absolute encoder 16 bit single-turn + 12 bit multi-turn[1] (not for 1FK703)	K
	Absolute encoder 15 bit single-turn + 12 bit multi-turn[1] (only for 1FK703)	V
	15 bit resolver	U
	14 bit resolver	P

Shaft extension:	Shaft and flange accuracy:	Holding brake:	
Fitted key and keyway	Tolerance N	without	A
Fitted key and keyway	Tolerance N	with	B
Plain shaft	Tolerance N	without	G
Plain shaft	Tolerance N	with	H

Degree of protection:	IP64	0
	IP65 and drive end flange IP67	2
	IP64 and anthracite paint finish	3
	IP65 and DE flange IP67, anthracite paint finish	5
	IP65 and DE flange IP67, anthracite paint finish and metal rating plate on motor	8

To select the degree of protection and type, see Selection guides.

Selection and Ordering Data

Motor type (continued)	Static current	Calculated power P_{calc} [6]	SINAMICS S120 Motor Module		Power cable with complete shield Motor connection (and brake connection) via power connector		
			Rated output current [5]	Booksize format			
	I_0 at M_0 ΔT=100 K	P_{calc} for M_0 ΔT=100 K	I_{rated}	Order No.	Power connector	Motor cable cross-section [4]	Order No. Pre-assembled cable
	A	kW (HP)	A		Size	mm²	
1FK7044-7AF71...	4.5	1.3 (1.74)	5	**6SL312■ - ■TE15 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7061-7AF71...	6.1	2.0 (2.68)	9	**6SL312■ - ■TE21 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7064-7AF71...	11	3.8 (5.10)	18	**6SL312■ - ■TE21 - 8AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7085-7AF71...	22.5	6.9 (9.25)	30	**6SL312■ - 1TE23 - 0AA3**	1.5	4 x 4	**6FX■ 002 - 5■S41 - ....**
1FK7086-7AF71...	21	8.8 (11.8)	30	**6SL312■ - 1TE23 - 0AA3**	1.5	4 x 4	**6FX■ 002 - 5■S41 - ....**
1FK7043-7AH71...	4.5	1.5 (2.01)	5	**6SL312■ - ■TE15 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7044-7AH71...	6.3	1.9 (2.55)	9	**6SL312■ - ■TE21 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7061-7AH71...	8	3.0 (4.02)	9	**6SL312■ - ■TE21 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7064-7AH71...	15	5.7 (7.64)	18	**6SL312■ - ■TE21 - 8AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7033-7AK71...	2.2	0.8 (1.07)	3	**6SL312■ - ■TE13 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**
1FK7043-7AK71...	6.4	1.9 (2.55)	9	**6SL312■ - ■TE21 - 0AA3**	1	4 x 1.5	**6FX■ 002 - 5■S01 - ....**

Cooling:	
Internal air cooling	**0**
External air cooling	**1**
Motor Module:	
Single Motor Module	**1**
Double Motor Module	**2**
Type of power cable:	
MOTION-CONNECT 800	**8**
MOTION-CONNECT 500	**5**
Without brake cores	**C**
With brake cores	**D**
For length code as well as power and signal cables, see Connection system MOTION-CONNECT.	**....**

[1] If the absolute encoder is used, M_{rated} is reduced by 10%.

[2] These values refer to n = 2500 rpm.

[3] These values refer to n = 2000 rpm.

[4] The current carrying capacity of the power cables complies with IEC 60204-1 for installation type C under continuous operating conditions at an ambient air temperature of 40 °C (104 °F), designed for I_0 (100 K), PVC/PUR-insulated cable.

[5] With default setting of the pulse frequency.

[6] $P_{calc}\,[kW] = \frac{M_0\,[Nm] \times n_{rated}}{9550}$ $P_{calc}\,[HP] = \frac{M_0\,[lb_f\text{-in}] \times n_{rated}}{63000}$

1FK7 Compact/High Dynamic motors
Natural cooling for Power Modules

Selection and Ordering Data

Rated speed	Shaft height	Rated power	Static torque	Rated torque[1]	Rated current	1FK7 Compact/ 1FK7 High Dynamic synchronous motor Natural cooling Connection to SINAMICS 230 V 1 AC	Number of pole pairs	Rotor moment of inertia (without brake)	Weight (without brake)
n_{rated}	SH	P_{rated} at ΔT=100 K	M_0 at ΔT=100 K	M_{rated} at ΔT=100 K	I_{rated} at ΔT=100 K	Order No.		J	m
rpm		kW (HP)	Nm (lb_f-in)	Nm (lb_f-in)	A			10^{-4}kgm^2 (10^{-3} x lb_f-in-s^2)	kg (lb)
3000	36	0.31 (0.42)	1.15 (10.2)	1.0 (8.85)	1.6	**1FK7032 - 5AF21- 1■ ■ ■**	3	0.61 (0.54)	2.7 (5.95)
		0.38 (0.51)	1.3 (11.5)	1.2 (10.6)	2	**1FK7033 - 7AF21- 1■ ■ ■**	3	0.27 (0.24)	3.1 (6.84)
		0.46 (0.62)	1.6 (14.2)	1.45 (12.8)	1.8	**1FK7034 - 5AF21- 1■ ■ ■**	3	0.9 (0.80)	3.7 (8.16)
	48	0.82 (1.10)	3 (26.6)	2.6 (23.0)	3.5	**1FK7042 - 5AF21- 1■ ■ ■**	4	3.01 (2.66)	4.9 (10.8)
		0.79 (1.06)	2.7 (23.9)	2.5 (22.1)	3.8	**1FK7043 - 7AF21- 1■ ■ ■**	3	1 (0.89)	6.3 (13.9)
6000	20	0.05 (0.07)	0.18 (1.59)	0.08 (0.71)	0.5	**1FK7011 - 5AK21-1■ ■ 3**	4	0.064 (0.06)	0.9 (1.98)
		0.10 (0.13)	0.35 (3.10)	0.16 (0.42)	0.5	**1FK7015 - 5AK21-1■ ■ 3**	4	0.083 (0.07)	1.1 (2.43)
	28	0.38 (0.51)	0.85 (7.52)	0.6 (5.31)	1.4	**1FK7022 - 5AK21-1■ ■ ■**	3	0.28 (0.25)	1.8 (3.97)

Synchronous motor:	1FK7 Compact	**5**
	1FK7 High Dynamic	**7**
Encoder systems for motors without DRIVE-CLiQ interface:	Incremental encoder sin/cos 1 V_{pp} 2048 S/R	**A**
	Absolute encoder EnDat 2048 S/R (only for 1FK704)[1]	**E**
	Absolute encoder EnDat 512 S/R (not for 1FK704)[1]	**H**
	Absolute encoder EnDat 32 S/R (only for 1FK704)[1]	**G**
	Absolute encoder EnDat 16 S/R (not for 1FK704)[1]	**J**
	Multi-pole resolver	**S**
	2-pole resolver	**T**
Encoder systems for motors with DRIVE-CLiQ interface:[4]	Incremental encoder 22 bit (not for 1FK701)	**D**
	Absolute encoder 22 bit single-turn + 12 bit multi-turn[1] (only for 1FK704)	**F**
	Absolute encoder 20 bit single-turn + 12 bit multi-turn[1] (only for 1FK702/1FK703)	**L**
	Absolute encoder 16 bit single-turn + 12 bit multi-turn[1] (only for 1FK704)	**K**
	Absolute encoder 15 bit single-turn + 12 bit multi-turn[1] (not for 1FK704)	**V**
	15 bit resolver (not for 1FK701)	**U**
	14 bit resolver (not for 1FK701)	**P**

Shaft extension:	Shaft and flange accuracy:	Holding brake:	
Fitted key and keyway	Tolerance N	without	**A**
Fitted key and keyway	Tolerance N	with	**B**
Plain shaft	Tolerance N	without	**G**
Plain shaft	Tolerance N	with	**H**

Degree of protection:	IP64 (not for 1FK701)	**0**
	IP65 and DE flange IP67 (not for 1FK701)	**2**
	IP64 (IP54 with 1FK701) and anthracite paint finish	**3**
	IP65 and DE flange IP67, anthracite paint finish (not for 1FK701)	**5**
	IP65 and DE flange IP67, anthracite paint finish and metal rating plate on motor (not for 1FK701)	**8**

To select the degree of protection and type, see Selection guides.

Selection and Ordering Data

Motor type (continued)	Static current	Calculated power P_{calc} [6]	SINAMICS S120 Power Module		Power cable with complete shield Motor connection (and brake connection) via power connector		
			Rated output current [5]	**Blocksize format without line filter**			
	I_0 at M_0 ΔT=100 K	P_{calc} for M_0 ΔT=100 K	I_{rated}	Order No.	Power connector	Motor cable cross-section [3]	Order No. Pre-assembled cable
	A	kW (HP)	A		Size	mm²	
1FK7032-5AF21...	1.7	0.36 (0.48)	2.3	**6SL3210-1SB12-3UA0**	1	4 x 1.5	**6FX■ 002 - 5■G01 - ....**
1FK7033-7AF21...	2.1	0.41 (0.55)	2.3	**6SL3210-1SB12-3UA0**	1	4 x 1.5	**6FX■ 002 - 5■G01 - ....**
1FK7034-5AF21...	1.9	0.5 (0.67)	2.3	**6SL3210-1SB12-3UA0**	1	4 x 1.5	**6FX■ 002 - 5■G01 - ....**
1FK7042-5AH21...	3.9	0.94 (1.26)	3.9	**6SL3210-1SB14-0UA0**	1	4 x 1.5	**6FX■ 002 - 5■G01 - ....**
1FK7043-7AH21...	3.9	0.85 (1.14)	3.9	**6SL3210-1SB14-0UA0**	1	4 x 1.5	**6FX■ 002 - 5■G01 - ....**
1FK7011-5AK21...	0.85	0.11 (0.15)	0.9	**6SL3210-1SB11-0UA0**	0.5	4 x 1.5	**6FX5 002 - 5DA30 - ....** [2]
1FK7015-5AK21...	0.85	0.22 (0.30)	0.9	**6SL3210-1SB11-0UA0**	0.5	4 x 1.5	**6FX5 002 - 5DA30 - ....** [2]
1FK7022-5AK21...	1.8	0.53 (0.71)	2.3	**6SL3210-1SB12-3UA0**	1	4 x 1.5	**6FX■ 002 - 5■G01 - ....**

Type of power cable: MOTION-CONNECT 800 MOTION-CONNECT 500	**8 5**	
Without brake cores	**C**	
With brake cores	**D**	
For length code as well as power and signal cables, see Connection system MOTION-CONNECT.		**....**

[1] If the absolute encoder is used, M_{rated} is reduced by 10%.

[2] This power cable is fitted with a connector with M17 thread at the motor end and brake cores as standard (4 x 1.5 mm² + 2 x 1.5 mm²).

[3] The current carrying capacity of the power cables complies with IEC 60204-1 for installation type C under continuous operating conditions at an ambient air temperature of 40 °C (104 °F), designed for I_0 (100 K), PVC/PUR-insulated cable.

[4] Motors with shaft height 20 are not available with a DRIVE-CLiQ interface. The encoder systems are connected via the SMC (Sensor Module Cabinet-Mounted).

[5] With default setting of the pulse frequency.

[6] $P_{calc}\,[kW] = \frac{M_0\,[Nm] \times n_{rated}}{9550}$ $P_{calc}\,[HP] = \frac{M_0\,[lb_f\text{-in}] \times n_{rated}}{63000}$