

Motors

Servomotors for SINAMICS S110

1FK7 synchronous motors

Selection and ordering data

Rated speed	Shaft height	Rated power	Static torque	Rated torque	Rated current	1FK7 Compact synchronous motor Natural cooling	Number of pole pairs	Moment of inertia of 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 $\Delta T=100\text{ K}$	Order No.	p	J	m	
rpm		kW (hp)	Nm (lb _r -ft)	Nm (lb _r -ft)	A			10^{-4} kgm^2 ($10^{-3}\text{ lbf-in-s}^2$)	kg (lb)	
1FK7 Compact motors for DC link voltage 720 V DC										
6000	20	0.05 (0.07)	0.18 (0.13)	0.08 (0.06)	0.85	1FK7011-5AK71-1 ■ ■ 3	4	0.064 (0.06)	0.9 (2.0)	
		0.10 (0.13)	0.35 (0.26)	0.16 (0.12)	0.85	1FK7015-5AK71-1 ■ ■ 3	4	0.083 (0.08)	1.1 (2.4)	
	28	0.38 (0.51)	0.85 (0.63)	0.6 (0.44)	1.4	1FK7022-5AK71-1 ■ ■ 3	3	0.28 (0.25)	1.8 (4.0)	
1FK7 Compact motors for DC link voltage 270 ... 325 V DC										
6000	20	0.05 (0.07)	0.18 (0.13)	0.08 (0.06)	0.5	1FK7011-5AK21-1 ■ ■ 3	4	0.064 (0.06)	0.9 (2.0)	
		0.10 (0.13)	0.35 (0.26)	0.16 (0.12)	0.5	1FK7015-5AK21-1 ■ ■ 3	4	0.083 (0.08)	1.1 (2.4)	
	28	0.38 (0.51)	0.85 (0.63)	0.6 (0.44)	1.4	1FK7022-5AK21-1 ■ ■ 3	3	0.28 (0.25)	1.8 (4.0)	
Encoder systems for motors without DRIVE-CLiQ interface:		IC2048S/R encoder					A H J S T			
		AM512S/R encoder (only for 1FK702)								
		AM16S/R encoder								
		Multi-pole resolver 2-pole resolver								
Encoder systems for motors with DRIVE-CLiQ interface:		IC22DQ encoder (only for 1FK702)					D L V U P			
		AM20DQ encoder (only for 1FK702)								
		AM15DQ encoder (only for 1FK702)								
		R15DQ resolver (only for 1FK702)								
		R14DQ resolver (only for 1FK702)								
Shaft extension:		Shaft and flange accuracy:			Holding brake:		G H			
Plain shaft		Tolerance N			Without					
Plain shaft		Tolerance N			With					

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Motor type (repeated)	Efficiency ¹⁾	Static current	Calculated power P_{calc} ⁴⁾	SINAMICS S110 blocksize format		Pre-assembled power cable with complete shield		
	η			Rated output current ²⁾	PM340 Power Module Air cooling	Motor and brake connection via SPEED-CONNECT power connector		
	%	I_0 at M_0 $\Delta T=100$ K	P_{calc} at M_0 $\Delta T=100$ K	I_{rated}	Order No.	Power connector	Cable cross- section ³⁾	Order No.
		A	kW (hp)	A		Size	mm ²	
Line voltage 380 ... 480 V 3 AC								
1FK7011-5AK71...	62	1.5	0.1 (0.13)	1.7	6SL3210-1SE11-7UA0	0.5	4 × 1.5	6FX002-5DN30-....
1FK7015-5AK71...	68	1.5	0.2 (0.27)	1.7	6SL3210-1SE11-7UA0	0.5	4 × 1.5	6FX002-5DN30-....
1FK7022-5AK71...	86	1.8	0.5 (0.67)	2.2	6SL3210-1SE12-2UA0	1	4 × 1.5	6FX002-5G10-....
Line voltage 200 ... 240 V 1 AC								
1FK7011-5AK21...	62	0.85	0.1 (0.13)	0.9	6SL3210-1SB11-0A0	0.5	4 × 1.5	6FX002-5DN30-....
1FK7015-5AK21...	68	0.85	0.2 (0.27)	0.9	6SL3210-1SB11-0A0	0.5	4 × 1.5	6FX002-5DN30-....
1FK7022-5AK21...	85	1.8	0.5 (0.67)	2.3	6SL3210-1SB12-3A0	1	4 × 1.5	6FX002-5G10-....

Line filter:		
Without	U	Power cable:
Integrated	A	
		MOTION-CONNECT 500 5
		Without brake cores C
		With brake cores D
		Length code

You can find further versions and components in SINAMICS S110 servo drives.

Information about the cables can be found in Connection system MOTION-CONNECT.

¹⁾ Optimum efficiency in continuous duty.

²⁾ With default setting of the pulse frequency.

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

⁴⁾ $P_{\text{calc}} [\text{kW}] = \frac{M_0 [\text{Nm}] \times n_{\text{rated}}}{9550}$ $P_{\text{calc}} [\text{hp}] = \frac{M_0 [\text{lb}_f\text{-ft}] \times n_{\text{rated}}}{5250}$

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1FK7 synchronous motors

Selection and ordering data

Rated speed	Shaft height	Rated power	Static torque	Rated torque	Rated current	1FK7 Compact synchronous motor Natural cooling	Number of pole pairs	Moment of inertia of 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 $\Delta T=100\text{ K}$	Order No.	p	J	m	
rpm		kW (hp)	Nm (lb _f -ft)	Nm (lb _f -ft)	A			10^{-4} kgm^2 ($10^{-3}\text{ lbf-in-s}^2$)	kg (lb)	
1FK7 Compact motors for DC link voltage 720 V DC										
2000	48	0.6 (0.80)	3 (2.21)	2.8 (2.07)	1.55	1FK7042-2AC71-1 ■ ■ 0	4	2.9 (2.57)	4.6 (10.1)	
		63	1.1 (1.5)	6 (4.43)	5.3 (3.91)	2.95	1FK7060-2AC71-1 ■ ■ 0	4	7.7 (6.82)	7.1 (15.7)
			1.5 (2.0)	8.5 (6.27)	7 (5.16)	2.65	1FK7062-2AC71-1 ■ ■ 0	4	11.2 (9.91)	9.1 (20.1)
	80		1.9 (2.55)	11 (8.11)	8.9 (6.56)	4.4	1FK7063-2AC71-1 ■ ■ 0	4	14.7 (13.0)	11.1 (24.5)
			2.1 (2.82)	12 (8.85)	10 (7.38)	4.4	1FK7081-2AC71-1 ■ ■ 0	4	20 (17.7)	12.9 (28.4)
			2.6 (3.49)	16 (11.8)	12.5 (9.22)	6.3	1FK7083-2AC71-1 ■ ■ 0	4	26 (23.0)	15.6 (34.4)
	100		3.1 (4.16)	20 (14.7)	15 (11.1)	6.7	1FK7084-2AC71-1 ■ ■ 0	4	32.5 (28.8)	18.3 (40.4)
			3 (4.02)	18 (13.3)	14.5 (10.7)	7.1	1FK7100-2AC71-1 ■ ■ 0	4	54 (47.8)	17.6 (38.8)
			4.3 (5.77)	27 (19.9)	20.5 (15.1)	9.7	1FK7101-2AC71-1 ■ ■ 0	4	79 (69.9)	23 (50.7)
	3000	48	5.2 (6.97)	36 (26.6)	25 (18.4)	11	1FK7103-2AC71-1 ■ ■ 0	4	104 (92.1)	28.5 (62.8)
			7.7 (10.33)	48 (35.4)	37 (27.3)	16	1FK7105-2AC71-1 ■ ■ 0	4	154 (136)	39 (86.0)
			0.8 (1.07)	3 (2.21)	2.6 (1.92)	2	1FK7042-2AF71-1 ■ ■ 0	4	2.9 (2.57)	4.6 (10.1)
63		1.5 (2.01)	6 (4.43)	4.7 (3.47)	3.7	1FK7060-2AF71-1 ■ ■ 0	4	7.7 (6.82)	7.1 (15.7)	
		1.9 (2.55)	8.5 (6.27)	6 (4.43)	4	1FK7062-2AF71-1 ■ ■ 0	4	11.2 (9.91)	9.1 (20.1)	
		2.3 (3.08)	11 (8.11)	7.3 (5.38)	5.6	1FK7063-2AF71-1 ■ ■ 0	4	14.7 (13.0)	11.1 (24.5)	
80	2.1 (2.82)	8 (5.90)	6.8 (5.02)	4.4	1FK7080-2AF71-1 ■ ■ 0	4	14.2 (12.6)	10.3 (22.7)		
	2.7 (3.62)	12 (8.85)	8.7 (6.42)	6.8	1FK7081-2AF71-1 ■ ■ 0	4	20 (17.7)	12.9 (28.4)		
	3.3 (4.43)	16 (11.8)	10.5 (7.74)	7.2	1FK7083-2AF71-1 ■ ■ 0	4	26 (23.0)	15.6 (34.4)		
	3.1 (4.16)	20 (14.7)	10 (7.38)	6.5	1FK7084-2AF71-1 ■ ■ 0	4	32.5 (28.8)	18.3 (40.4)		
100	3.8 (5.10)	18 (13.3)	12 (8.85)	8	1FK7100-2AF71-1 ■ ■ 0	4	54 (47.8)	17.6 (38.8)		
	4.9 (6.57)	27 (19.9)	15.5 (11.4)	11.6	1FK7101-2AF71-1 ■ ■ 0	4	79 (69.9)	23 (50.7)		
	4.4 (5.90)	36 (26.6)	14 (10.3)	11.5	1FK7103-2AF71-1 ■ ■ 0	4	104 (92.1)	28.5 (62.8)		
	8.2 (11.0)	48 (35.4)	26 (19.2)	18	1FK7105-2AF71-1 ■ ■ 0	4	154 (136)	39 (86.0)		
4500	63	1.7 (2.28)	6 (4.43)	3.7 (2.73)	4.3	1FK7060-2AH71-1 ■ ■ 0	4	7.7 (6.82)	7.1 (15.7)	
		1.4 (1.88)	8.5 (6.27)	3 (2.21)	3.3	1FK7062-2AH71-1 ■ ■ 0	4	11.2 (9.91)	9.1 (20.1)	
		1.4 (1.88)	11 (8.11)	3 (2.21)	3.8	1FK7063-2AH71-1 ■ ■ 0	4	14.7 (13.0)	11.1 (24.5)	
	80	2.1 (2.82)	8 (5.90)	4.5 (3.32)	4.8	1FK7080-2AH71-1 ■ ■ 0	4	14.2 (12.6)	10.3 (22.7)	
		1.8 (2.41)	12 (8.85)	3.8 (2.80)	4.9	1FK7081-2AH71-1 ■ ■ 0	4	20 (17.7)	12.9 (28.4)	
		1.4 (1.88)	16 (11.8)	3 (2.21)	3.6	1FK7083-2AH71-1 ■ ■ 0	4	26 (23.0)	15.6 (34.4)	
6000	36	0.5 (0.67)	1.15 (0.85)	0.8 (0.59)	1.3	1FK7032-2AK71-1 ■ ■ 0	3	0.65 (0.58)	2.7 (5.95)	
		0.6 (0.80)	1.6 (1.18)	1 (0.74)	1.3	1FK7034-2AK71-1 ■ ■ 0	3	0.9 (0.80)	3.5 (7.72)	
	48	0.7 (0.94)	1.6 (1.18)	1.1 (0.81)	1.85	1FK7040-2AK71-1 ■ ■ 0	4	1.6 (1.42)	3.2 (7.06)	
	0.9 (1.21)	3 (2.21)	1.5 (1.11)	2.5	1FK7042-2AK71-1 ■ ■ 0	4	2.9 (2.57)	4.6 (10.1)		
1FK7 Compact motors for DC link voltage 270 ... 325 V DC										
3000	36	0.3 (0.40)	1.15 (0.85)	1 (0.74)	1.6	1FK7032-2AF21-1 ■ ■ 0	3	0.65 (0.58)	2.7 (5.95)	
		0.5 (0.67)	1.6 (1.18)	1.45 (1.07)	1.8	1FK7034-2AF21-1 ■ ■ 0	3	0.9 (0.80)	3.5 (7.72)	
	48	0.8 (1.07)	3 (2.21)	2.6 (1.92)	3.5	1FK7042-2AF21-1 ■ ■ 0	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			A E S T				
Encoder systems for motors with DRIVE-CLiQ interface:			AS20DQI encoder AM20DQI encoder R15DQ resolver R14DQ resolver			Q R U P				
Shaft extension: Plain shaft Plain shaft			Shaft and flange accuracy: Tolerance N Tolerance N		Holding brake: Without With		G H			

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Servomotors for SINAMICS S110

1FK7 synchronous motors

Motor type (repeated)	Efficiency ¹⁾ η %	Static current I_0 at M_0 $\Delta T=100$ K A	Calculated power P_{calc} ⁴⁾ P_{calc} at M_0 $\Delta T=100$ K kW (hp)	SINAMICS S110 blocksize format		Pre-assembled power cable with complete shield Motor and brake connection via SPEED-CONNECT power connector		
				Rated output current ²⁾ I_{rated} A	PM340 Power Module Air cooling Order No.	Power connector Size	Cable cross- section ³⁾ mm ²	Order No.
Line voltage 380 ... 480 V 3 AC								
1FK7042-2AC71...	88	1.6	0.6 (0.80)	1.7	6SL3210-1SE11-7UA0	1	4 × 1.5	6FX002-5G10-....
1FK7060-2AC71...	90	3.15	1.3 (1.74)	4.1	6SL3210-1SE14-1UA0	1	4 × 1.5	6FX002-5G10-....
1FK7062-2AC71...	91	3	1.8 (2.41)	3.1	6SL3210-1SE13-1UA0	1	4 × 1.5	6FX002-5G10-....
1FK7063-2AC71...	91	5.3	2.3 (3.08)	5.9	6SL3210-1SE16-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7081-2AC71...	93	5	2.5 (3.35)	5.9	6SL3210-1SE16-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7083-2AC71...	93	7.5	3.4 (4.56)	7.7	6SL3210-1SE17-7A0	1	4 × 1.5	6FX002-5G10-....
1FK7084-2AC71...	93	8.5	4.2 (5.63)	10.2	6SL3210-1SE21-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7100-2AC71...	92	8.4	3.8 (5.10)	10.2	6SL3210-1SE21-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7101-2AC71...	93	12.3	5.7 (7.64)	18	6SL3210-1SE21-8A0	1.5	4 × 1.5	6FX002-5G22-....
1FK7103-2AC71...	93	14.4	7.5 (10.1)	18	6SL3210-1SE21-8A0	1.5	4 × 1.5	6FX002-5G22-....
1FK7105-2AC71...	93	20	10.1 (13.5)	25	6SL3210-1SE22-5A0	1.5	4 × 2.5	6FX002-5G32-....
1FK7042-2AF71...	89	2.2	0.9 (1.21)	2.2	6SL3210-1SE12-2UA0	1	4 × 1.5	6FX002-5G10-....
1FK7060-2AF71...	90	4.45	1.9 (2.55)	5.9	6SL3210-1SE16-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7062-2AF71...	91	5.3	2.7 (3.62)	5.9	6SL3210-1SE16-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7063-2AF71...	91	8	3.5 (4.69)	10.2	6SL3210-1SE21-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7080-2AF71...	92	4.9	2.5 (3.35)	5.9	6SL3210-1SE16-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7081-2AF71...	93	8.7	3.8 (5.10)	10.2	6SL3210-1SE21-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7083-2AF71...	93	10.1	5 (6.71)	10.2	6SL3210-1SE21-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7084-2AF71...	93	12.1	6.3 (8.45)	18	6SL3210-1SE21-8A0	1	4 × 1.5	6FX002-5G10-....
1FK7100-2AF71...	92	11.1	5.7 (7.64)	18	6SL3210-1SE21-8A0	1	4 × 1.5	6FX002-5G10-....
1FK7101-2AF71...	93	18.8	8.5 (11.4)	25	6SL3210-1SE22-5A0	1.5	4 × 2.5	6FX002-5G32-....
1FK7103-2AF71...	93	26	11.3 (15.1)	32	6SL3210-1SE23-2A0	1.5	4 × 4	6FX002-5G42-....
1FK7105-2AF71...	94	31	15.1 (20.2)	32	6SL3210-1SE23-2A0	1.5	4 × 6	6FX002-5G52-....
1FK7060-2AH71...	90	6.3	2.8 (3.75)	7.7	6SL3210-1SE17-7A0	1	4 × 1.5	6FX002-5G10-....
1FK7062-2AH71...	91	8	4 (5.36)	10.2	6SL3210-1SE21-0A0	1	4 × 1.5	6FX002-5G10-....
1FK7063-2AH71...	90	12	5.2 (6.97)	18	6SL3210-1SE21-8A0	1	4 × 1.5	6FX002-5G10-....
1FK7080-2AH71...	92	7.4	3.8 (5.10)	7.7	6SL3210-1SE17-7A0	1	4 × 1.5	6FX002-5G10-....
1FK7081-2AH71...	93	13.1	5.7 (7.64)	18	6SL3210-1SE21-8A0	1	4 × 1.5	6FX002-5G10-....
1FK7083-2AH71...	93	15	7.5 (10.1)	18	6SL3210-1SE21-8A0	1	4 × 1.5	6FX002-5G10-....
1FK7032-2AK71...	88	1.7	0.7 (0.94)	1.7	6SL3210-1SE11-7UA0	1	4 × 1.5	6FX002-5G10-....
1FK7034-2AK71...	88	1.9	1 (1.34)	2.2	6SL3210-1SE12-2UA0	1	4 × 1.5	6FX002-5G10-....
1FK7040-2AK71...	88	2.35	1 (1.34)	3.1	6SL3210-1SE13-1UA0	1	4 × 1.5	6FX002-5G10-....
1FK7042-2AK71...	89	4.4	1.9 (2.55)	5.9	6SL3210-1SE16-0A0	1	4 × 1.5	6FX002-5G10-....
Line voltage 200 ... 240 V 1 AC								
1FK7032-2AF21...	85	1.7	0.4 (0.54)	2.3	6SL3210-1SB12-3A0	1	4 × 1.5	6FX002-5G10-....
1FK7034-2AF21...	85	1.9	0.5 (0.67)	2.3	6SL3210-1SB12-3A0	1	4 × 1.5	6FX002-5G10-....
1FK7042-2AF21...	89	3.95	0.9 (1.21)	3.9	6SL3210-1SB14-0A0	1	4 × 1.5	6FX002-5G10-....

Line filter:

 Without
Integrated

 U
A

 You can find further
versions and components in
SINAMICS S110 servo drives.

Power cable:

 MOTION-CONNECT 800PLUS 8
MOTION-CONNECT 500 5

 Without brake cores
With brake cores

 C
D

Length code

....

 Information about the cables can be found in
Connection system MOTION-CONNECT.

¹⁾ Optimum efficiency in continuous duty.

²⁾ With default setting of the pulse frequency.

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

⁴⁾ $P_{calc} [kW] = \frac{M_0 [Nm] \times n_{rated}}{9550}$ $P_{calc} [hp] = \frac{M_0 [lb-ft] \times n_{rated}}{5250}$