

Direct drives

Torque motors for SINAMICS S120

1FW6 built-in torque motors Water cooling

Selection and ordering data

Maximum torque	Static torque ¹⁾³⁾	Rated torque ²⁾³⁾	Speed at maximum torque, max. ²⁾	Speed at rated torque, max. ²⁾	1FW6 built-in torque motors	Moment of inertia of rotor	Weight, approx. stator + rotor
M_{\max}	M_0	M_{rated}	n_{\max} at M_{\max}	n_{\max} at M_{rated}	Order No.	J	m
Nm (lb _f -ft)	Nm (lb _f -ft)	Nm (lb _f -ft)	rpm	rpm		10 ⁻² kgm ² (lb _f -in-s ²)	kg (lb)
Water cooling							
179 (132)	119 (87.8)	113 (83.3)	46	140	1FW6090-0B05-0F2	1.52 (0.13)	9.2 (20.3)
		109 (80.4)	140	250	1FW6090-0B05-0K2		
251 (185)	166 (122)	154 (114)	120	220	1FW6090-0B07-0K2	2.2 (0.19)	12.2 (27)
		142 (105)	270	430	1FW6090-0B07-1J2		
358 (264)	238 (176)	231 (170)	8.7	82	1FW6090-0B10-0K2	3.09 (0.27)	17.2 (37.9)
		216 (159)	170	270	1FW6090-0B10-1J2		
537 (396)	357 (263)	338 (249)	78	150	1FW6090-0B15-1J2	4.65 (0.41)	27.2 (60)
		319 (235)	200	310	1FW6090-0B15-2J2		
439 (324)	258 (190)	241 (178)	47	130	1FW6130-0B05-0K2	6.37 (0.56)	13.2 (29.1)
		217 (160)	180	310	1FW6130-0B05-1J2		
614 (453)	361 (266)	344 (254)	21	96	1FW6130-0B07-0K2	8.92 (0.79)	18.2 (40.1)
		324 (239)	110	200	1FW6130-0B07-1J2		
878 (648)	516 (381)	484 (357)	50	120	1FW6130-0B10-1J2	12.7 (1.12)	25.2 (55.6)
		450 (332)	150	250	1FW6130-0B10-2J2		
1320 (974)	775 (572)	744 (549)	14	78	1FW6130-0B15-1J2	19.1 (1.69)	38.2 (84.2)
		714 (527)	77	150	1FW6130-0B15-2J2		
710 (524)	360 (266)	338 (249)	110	230	1FW6150-0B05-1J2	10.1 (0.8939)	21.7 (47.8)
		298 (220)	330	650	1FW6150-0B05-4F2		
994 (733)	504 (372)	470 (347)	130	260	1FW6150-0B07-2J2	14.2 (1.2568)	33.5 (73.9)
		445 (328)	230	450	1FW6150-0B07-4F2		
1420 (1047)	720 (531)	688 (507)	76	170	1FW6150-0B10-2J2	20.9 (1.8498)	47.5 (105)
		664 (490)	150	300	1FW6150-0B10-4F2		
2130 (1571)	1080 (797)	1050 (774)	32	100	1FW6150-0B15-2J2	31.3 (2.7703)	70.8 (156)
		1030 (760)	89	190	1FW6150-0B15-4F2		

Cable outlet only for 1FW6090/1FW6130/1FW6150:

Axial
Radially outwards
Tangential

P
Q
N

Type of connection:

Permanently connected power and signal cables with exposed core ends⁵⁾

Length: 2 m (6.56 ft)

Permanently connected power and signal cables pre-assembled with connectors

Length: 0.5 m (1.64 ft)

C
D

Direct drives

Torque motors for SINAMICS S120

1FW6 built-in torque motors
Water cooling

Motor type (repeated)	Static current ¹⁾³⁾ I_0 A	Rated current ²⁾³⁾ I_{rated} A	Maximum current ²⁾ I_{max} A	Calculated power $P_{el, max}$ kW (HP)	SINAMICS S120 Motor Module		Power cable with complete shield Motor connection via power connector ⁵⁾		
					Required rated current I_{rated}/I_{max} A	Booksized format For additional versions and components see chapter SINAMICS S120 drive system Order No.	Power connector Size	Cable cross-section ⁶⁾ mm ²	Pre-assembled basic cable to the drive system Order No.
1FW6090-0.B05-0F..	5.9	5.6	9.5	6.55 (8.78)	5/10 ⁴⁾	6SL312-1-TE15-0AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6090-0.B05-0K..	8.2	7.4	13	8.12(10.88)	9/18	6SL312-1-TE21-0AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6090-0.B07-0K..	10	9.5	16	10.3 (13.8)	9/18 ⁴⁾	6SL312-1-TE21-0AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6090-0.B07-1J..	16	13	26	14.1 (18.9)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6090-0.B10-0K..	8.2	7.9	13	9.43 (12.6)	9/18	6SL312-1-TE21-0AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6090-0.B10-1J..	16	14	26	15.3 (20.5)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6090-0.B15-1J..	16	15	26	17.1 (22.9)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6090-0.B15-2J..	26	23	43	24.1 (32.3)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6130-0.B05-0K..	9.7	9	18	12.2 (16.4)	9/18 ⁴⁾	6SL312-1-TE21-0AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6130-0.B05-1J..	17	14	32	18.3 (24.5)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6130-0.B07-0K..	10	10	20	14.2 (19)	9/18 ⁴⁾	6SL312-1-TE21-0AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6130-0.B07-1J..	17	15	32	19.7 (26.4)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6130-0.B10-1J..	17	16	32	21.4 (28.7)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6130-0.B10-2J..	28	24	53	30.6 (41)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6130-0.B15-1J..	19	18	36	25.4 (34.1)	18/36 ⁴⁾	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6130-0.B15-2J..	28	26	54	34.1 (45.7)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6150-0.B05-1J..	18	17	44	22.8 (30.6)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6150-0.B05-4F..	44	36	100	39.4 (52.8)	45/85	6SL312-1-TE24-5AA3	1.5	4 × 10	6FX8002-5CS64-....
1FW6150-0.B07-2J..	27	25	66	32.0 (42.9)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6150-0.B07-4F..	44	38	100	42.7 (57.3)	45/85	6SL312-1-TE24-5AA3	1.5	4 × 10	6FX8002-5CS64-....
1FW6150-0.B10-2J..	27	26	66	36.2 (48.5)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6150-0.B10-4F..	44	40	100	47.3 (63.4)	45/85	6SL312-1-TE24-5AA3	1.5	4 × 10	6FX8002-5CS64-....
1FW6150-0.B15-2J..	27	26	66	42.4 (56.9)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6150-0.B15-4F..	44	41	100	54.5 (73.1)	45/85	6SL312-1-TE24-5AA3	1.5	4 × 10	6FX8002-5CS64-....

Cooling:	
Internal air cooling	0
External air cooling	1
Motor Module:	
Single Motor Module	1
Double Motor Module	2

Length code

Further information about the cables can be found in chapter Connection system MOTION-CONNECT.

1) Torque and current at low speeds.

2) The values refer to a DC link voltage of the drive system of 600 V DC.

3) In case of water cooling with inlet temperature of 35 °C (95 °F) and maximum rotor flange temperature of 60 °C (140 °F).

4) The selection is optimized to size of the Motor Module. The next higher Motor Module offers 100 % torque utilization.

5) For type of connection with exposed core ends, power and signal connectors are not included in the scope of supply of the motor. They must be ordered separately (see chapter Connection system MOTION-CONNECT).

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).

Direct drives

Torque motors for SINAMICS S120

1FW6 built-in torque motors Water cooling

Selection and ordering data

Maximum torque	Static torque ¹⁾³⁾	Rated torque ²⁾³⁾	Speed at maximum torque, max. ²⁾	Speed at rated torque, max. ²⁾	1FW6 built-in torque motors	Moment of inertia of rotor	Weight, approx. stator + rotor	
M_{\max}	M_0	M_{rated}	n_{\max} at M_{\max}	n_{\max} at M_{rated}	Order No.	J	m	
Nm (lb _f -ft)	Nm (lb _f -ft)	Nm (lb _f -ft)	rpm	rpm		10 ⁻² kgm ² (lb _f -in-s ²)	kg (lb)	
Water cooling								
716 (528)	467 (344)	431 (318)	84	140	1FW6160-0B05-1J 2	19.0 (1.68)	36.3 (80.0)	
		404 (298)	150	250	1FW6160-0B05-2J 2			
		314 (232)	320	590	1FW6160-0B05-5G 2			
1000 (738)	653 (482)	620 (457)	53	96	1FW6160-0B07-1J 2	25.8 (2.28)	48.3 (107)	
		594 (438)	100	170	1FW6160-0B07-2J 2			
		514 (379)	230	390	1FW6160-0B07-5G 2			
		432 (319)	330	610	1FW6160-0B07-8FB 2			
1430 (1055)	933 (688)	903 (666)	29	60	1FW6160-0B10-1J 2	36.0 (3.19)	66.3 (146)	
		878 (648)	65	110	1FW6160-0B10-2J 2			
		804 (593)	160	260	1FW6160-0B10-5G 2			
		732 (540)	230	390	1FW6160-0B10-8FB 2			
		622 (459)	330	600	1FW6160-0B10-2PB 2			67.4 (149)
2150 (1586)	1400 (1033)	1350 (996)	34	66	1FW6160-0B15-2J 2	53.1 (4.70)	95.3 (210)	
		1280 (944)	97	160	1FW6160-0B15-5G 2			
		1220 (900)	150	240	1FW6160-0B15-8FB 2			
		1120 (826)	220	360	1FW6160-0B15-2PB 2			96.4 (213)
		961 (709)	320	560	1FW6160-0B15-0WB 2			
2860 (2110)	1870 (1379)	1750 (1291)	68	110	1FW6160-0B20-5G 2	70.1 (6.20)	124.3 (274)	
		1690 (1247)	110	170	1FW6160-0B20-8FB 2			
		1600 (1180)	160	260	1FW6160-0B20-2PB 2			125.4 (277)
		1460 (1077)	240	400	1FW6160-0B20-0WB 2			

Cable outlet only for 1FW6160 to 1FW6290:

Axial
Radially outwards
Tangential (only for types of connection C and D)

W
V
T

Type of connection:

Permanently connected power and signal cables with exposed core ends⁴⁾
Length: 2 m (6.56 ft)
Permanently connected power and signal cables pre-assembled with connectors
Length: 0.5 m (1.64 ft)

C
D

Type of connection only for specific motors (Not selectable):

Permanently connected power and signal cables with exposed core ends⁴⁾
Length: 1 m (3.28 ft)

B

Direct drives

Torque motors for SINAMICS S120

1FW6 built-in torque motors
Water cooling

Motor type (repeated)	Static current 1)3)		Rated current 2)3)		Maximum current ²⁾	Calculated power $P_{el, max}$ kW (HP)	SINAMICS S120 Motor Module		Power cable with complete shield Motor connection via power connector ⁴⁾			
	I_0 A	I_{rated} A	I_{max} A	Required rated current I_{rated}/I_{max} A			Booksize format For additional versions and components see chapter SINAMICS S120 drive system Order No.	Power con- nector Size	Cable cross- section ⁵⁾ mm ²	Pre-assembled basic cable to the drive system Order No.		
1FW6160-0.B05-1J..	17	16	31	15.1 (20.2)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....			
1FW6160-0.B05-2J..	28	24	49	20 (26.8)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....			
1FW6160-0.B05-5G..	56	36	98	33.1 (44.4)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....			
1FW6160-0.B07-1J..	17	16	31	16.7 (22.4)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....			
1FW6160-0.B07-2J..	28	25	49	21.8 (29.2)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....			
1FW6160-0.B07-5G..	56	43	98	35.2 (47.2)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....			
1FW6160-0.B07-8FB.	80	51	140	46.7 (62.6)	85/141	6SL312-1-TE28-5AA3	–	–	–			
1FW6160-0.B10-1J..	17	17	31	19 (25.5)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....			
1FW6160-0.B10-2J..	28	26	49	24.4 (32.7)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....			
1FW6160-0.B10-5G..	56	47	98	38.1 (51.1)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....			
1FW6160-0.B10-8FB.	80	61	140	49.8 (66.8)	85/141	6SL312-1-TE28-5AA3	–	–	–			
1FW6160-0.B10-2PB.	110	73	190	64.6 (86.6)	132/210	6SL312-1-TE31-3AA3	–	–	–			
1FW6160-0.B15-2J..	28	26	49	28.2 (37.8)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....			
1FW6160-0.B15-5G..	56	50	98	42.6 (57.1)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....			
1FW6160-0.B15-8FB.	80	68	140	54.6 (73.2)	85/141	6SL312-1-TE28-5AA3	–	–	–			
1FW6160-0.B15-2PB.	110	88	190	69.5 (93.2)	132/210	6SL312-1-TE31-3AA3	–	–	–			
1FW6160-0.B15-0WB.	160	100	280	92.8 (124)	200/282	6SL312-1-TE32-0AA3	–	–	–			
1FW6160-0.B20-5G..	56	52	98	46.9 (62.9)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....			
1FW6160-0.B20-8FB.	80	72	140	59.2 (79.4)	85/141	6SL312-1-TE28-5AA3	–	–	–			
1FW6160-0.B20-2PB.	110	95	190	74.2 (99.5)	132/210	6SL312-1-TE31-3AA3	–	–	–			
1FW6160-0.B20-0WB.	160	120	280	97.7 (131)	200/282	6SL312-1-TE32-0AA3	–	–	–			

Cooling:	
Internal air cooling	0
External air cooling	1
Motor Module:	
Single Motor Module	1
Double Motor Module	2

Length code
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Further information about the cables can be found in chapter Connection system MOTION-CONNECT.

1) Torque and current at low speeds.

2) The values refer to a DC link voltage of the drive system of 600 V DC.

3) In case of water cooling with inlet temperature of 35 °C (95 °F) and maximum rotor flange temperature of 60 °C (140 °F).

4) For type of connection with exposed core ends, power and signal connectors are not included in the scope of supply of the motor. They must be ordered separately (see chapter Connection system MOTION-CONNECT).

5) 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).

Direct drives

Torque motors for SINAMICS S120

1FW6 built-in torque motors Water cooling

Selection and ordering data

Maximum torque	Static torque ¹⁾³⁾	Rated torque ²⁾³⁾	Speed at maximum torque, max. ²⁾	Speed at rated torque, max. ²⁾	1FW6 built-in torque motors	Moment of inertia of rotor	Weight, approx. stator + rotor	
M_{\max}	M_0	M_{rated}	n_{\max} at M_{\max}	n_{\max} at M_{rated}	Order No.	J	m	
Nm (lb _f -ft)	Nm (lb _f -ft)	Nm (lb _f -ft)	rpm	rpm		10^{-2}kgm^2 (lb _f -in-s ²)	kg (lb)	
Water cooling								
990 (730)	672 (496)	633 (467)	54	97	1FW6190-0B05-1J2	35.8 (3.17)	42.8 (94.4)	
		605 (446)	96	160	1FW6190-0B05-2J2			
		509 (375)	210	380	1FW6190-0B05-5G2			
1390 (1025)	941 (694)	905 (668)	33	63	1FW6190-0B07-1J2	48.6 (4.30)	55.8 (123)	
		879 (648)	64	110	1FW6190-0B07-2J2			
		791 (583)	150	250	1FW6190-0B07-5G2			
		704 (519)	220	390	1FW6190-0B07-8FB2			
1980 (1460)	1340 (988)	1310 (966)	14	38	1FW6190-0B10-1J2	67.8 (6.0)	75.8 (167)	
		1290 (952)	39	70	1FW6190-0B10-2J2			
		1210 (892)	100	170	1FW6190-0B10-5G2			
		1130 (833)	150	260	1FW6190-0B10-8FB2			
		955 (704)	250	450	1FW6190-0B10-2PB2			77.1 (170)
2970 (2191)	2020 (1490)	1970 (1453)	17	40	1FW6190-0B15-2J2	99.8 (8.83)	107.8 (238)	
		1890 (1394)	62	100	1FW6190-0B15-5G2			
		1820 (1342)	97	160	1FW6190-0B15-8FB2			
		1670 (1232)	160	270	1FW6190-0B15-2PB2			109.1 (241)
		1540 (1136)	210	370	1FW6190-0B15-0WB2			
3960 (2921)	2690 (1984)	2570 (1896)	42	73	1FW6190-0B20-5G2	132.0 (11.68)	136.2 (300)	
		2500 (1844)	68	110	1FW6190-0B20-8FB2			
		2360 (1741)	120	200	1FW6190-0B20-2PB2			137.5 (303)
		2250 (1660)	160	260	1FW6190-0B20-0WB2			

Cable outlet only for 1FW6160 to 1FW6290:

Axial
Radially outwards
Tangential (only for types of connection C and D)

W
V
T

Type of connection:

Permanently connected power and signal cables with exposed core ends⁴⁾
Length: 2 m (6.56 ft)
Permanently connected power and signal cables pre-assembled with connectors
Length: 0.5 m (1.64 ft)

C
D

Type of connection only for specific motors (Not selectable):

Permanently connected power and signal cables with exposed core ends⁴⁾
Length: 1 m (3.28 ft)

B

Direct drives

Torque motors for SINAMICS S120

1FW6 built-in torque motors
Water cooling

Motor type (repeated)	Static current 1)3)	Rated current 2)3)	Maxi- mum current ²⁾	Calcu- lated power	SINAMICS S120 Motor Module		Power cable with complete shield Motor connection via power connector ⁴⁾		
					Required rated current	Booksize format For additional versions and components see chapter SINAMICS S120 drive system	Power con- nector	Cable cross- section ⁵⁾	Pre-assembled basic cable to the drive system
I_0	I_{rated}	I_{max}	$P_{el, max}$	A					
	A	A	A	kW (HP)	A				
1FW6190-0.B05-1J..	18	17	31	16.3 (21.9)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6190-0.B05-2J..	27	24	47	20.6 (27.6)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6190-0.B05-5G..	54	40	95	32.9 (44.1)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6190-0.B07-1J..	18	17	31	18.2 (24.4)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6190-0.B07-2J..	27	25	47	22.7 (30.4)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6190-0.B07-5G..	54	44	95	35.4 (47.5)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6190-0.B07-8FB.	78	56	130	46.3 (62.1)	85/141	6SL312-1-TE28-5AA3	–	–	–
1FW6190-0.B10-1J..	18	17	31	20.7 (27.8)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6190-0.B10-2J..	27	26	47	25.7 (34.5)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6190-0.B10-5G..	54	48	95	38.7 (51.9)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6190-0.B10-8FB.	78	64	130	49.9 (66.9)	85/141	6SL312-1-TE28-5AA3	–	–	–
1FW6190-0.B10-2PB.	120	84	210	69.9 (93.7)	132/210	6SL312-1-TE31-3AA3	–	–	–
1FW6190-0.B15-2J..	27	26	47	30.1 (40.4)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6190-0.B15-5G..	54	50	95	44.1 (59.1)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6190-0.B15-8FB.	78	69	130	55.6 (74.6)	85/141	6SL312-1-TE28-5AA3	–	–	–
1FW6190-0.B15-2PB.	120	99	210	75.8 (102)	132/210	6SL312-1-TE31-3AA3	–	–	–
1FW6190-0.B15-0WB.	150	110	270	91.5 (123)	200/282	6SL312-1-TE32-0AA3	–	–	–
1FW6190-0.B20-5G..	54	51	95	49 (54.7)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6190-0.B20-8FB.	78	71	130	61.1 (81.9)	85/141	6SL312-1-TE28-5AA3	–	–	–
1FW6190-0.B20-2PB.	120	100	210	81.5 (109)	132/210	6SL312-1-TE31-3AA3	–	–	–
1FW6190-0.B20-0WB.	150	120	270	97.4 (131)	200/282	6SL312-1-TE32-0AA3	–	–	–

Cooling:	
Internal air cooling	0
External air cooling	1
Motor Module:	
Single Motor Module	1
Double Motor Module	2

Length code
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Further information about the cables can be found in chapter Connection system MOTION-CONNECT.

1) Torque and current at low speeds.

2) The values refer to a DC link voltage of the drive system of 600 V DC.

3) In case of water cooling with inlet temperature of 35 °C (95 °F) and maximum rotor flange temperature of 60 °C (140 °F).

4) For type of connection with exposed core ends, power and signal connectors are not included in the scope of supply of the motor. They must be ordered separately (see chapter Connection system MOTION-CONNECT).

5) 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).

Direct drives

Torque motors for SINAMICS S120

1FW6 built-in torque motors Water cooling

Selection and ordering data

Maximum torque	Static torque ¹⁾³⁾	Rated torque ²⁾³⁾	Speed at maximum torque, max. ²⁾	Speed at rated torque, max. ²⁾	1FW6 built-in torque motors	Moment of inertia of rotor	Weight, approx. stator + rotor
M_{\max}	M_0	M_{rated}	n_{\max} at M_{\max}	n_{\max} at M_{rated}	Order No.	J	m
Nm (lb _f -ft)	Nm (lb _f -ft)	Nm (lb _f -ft)	rpm	rpm		10 ⁻² kgm ² (lb _f -in-s ²)	kg (lb)
Water cooling							
1320 (974)	841 (620)	799 (589)	34	69	1FW6230-0B05-1J ■ 2	62.2 (5.51)	44.8 (98.8)
		774 (571)	59	110	1FW6230-0B05-2J ■ 2		
		660 (487)	160	290	1FW6230-0B05-5G ■ 2		
1840 (1357)	1180 (870)	1140 (841)	19	45	1FW6230-0B07-1J ■ 2	84.3 (7.46)	58.8 (130)
		1120 (826)	38	73	1FW6230-0B07-2J ■ 2		
		1010 (745)	110	190	1FW6230-0B07-5G ■ 2		
		923 (681)	160	290	1FW6230-0B07-8FB2		
2630 (1940)	1680 (1239)	1630 (1202)	21	46	1FW6230-0B10-2J ■ 2	118.0 (10.4)	81.8 (180)
		1520 (1121)	74	130	1FW6230-0B10-5G ■ 2		
		1450 (1070)	110	190	1FW6230-0B10-8FB2		
		1320 (974)	160	290	1FW6230-0B10-2PB2		
3950 (2914)	2520 (1859)	2440 (1800)	19	43	1FW6230-0B15-4C ■ 2	173.0 (15.3)	117.8 (260)
		2380 (1755)	44	80	1FW6230-0B15-5G ■ 2		
		2310 (1704)	67	120	1FW6230-0B15-8FB2		
		2190 (1615)	100	180	1FW6230-0B15-2PB2		
		2020 (1490)	150	270	1FW6230-0B15-0WB2		
5260 (3880)	3360 (2478)	3230 (2382)	29	56	1FW6230-0B20-5G ■ 2	228.0 (20.2)	153.8 (339)
		3160 (2331)	47	84	1FW6230-0B20-8FB2		
		3050 (2250)	74	130	1FW6230-0B20-2PB2		
		2890 (2132)	110	190	1FW6230-0B20-0WB2		

Cable outlet only for 1FW6160 to 1FW6290:

Axial

Radially outwards

Tangential (only for types of connection C and D)

W
V
T

Type of connection:

Permanently connected power and signal cables with exposed core ends⁴⁾

Length: 2 m (6.56 ft)

Permanently connected power and signal cables pre-assembled with connectors

Length: 0.5 m (1.64 ft)

C
D

Type of connection only for specific motors (Not selectable):

Permanently connected power and signal cables with exposed core ends⁴⁾

Length: 1 m (3.28 ft)

B

Direct drives

Torque motors for SINAMICS S120

1FW6 built-in torque motors
Water cooling

Motor type (repeated)	Static current 1)3)	Rated current 2)3)	Maxi- mum current ²⁾	Calculated power $P_{el, max}$	SINAMICS S120 Motor Module		Power cable with complete shield Motor connection via power connector ⁴⁾		
					Required rated current	Booksize format For additional versions and components see chapter SINAMICS S120 drive system Order No.	Power con- nector	Cable cross- section ⁵⁾	Pre-assembled basic cable to the drive system
					I_{rated}/I_{max}				
	I_0	I_{rated}	I_{max}	kW (HP)	A		mm ²		
1FW6230-0.B05-1J..	16	15	31	17.3 (23.2)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6230-0.B05-2J..	24	22	45	21 (28.2)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6230-0.B05-5G..	53	40	100	34.1 (45.7)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6230-0.B07-1J..	16	16	31	19.4 (26.0)	18/36	6SL312-1-TE21-8AA3	1	4 × 2.5	6FX8002-5CS11-....
1FW6230-0.B07-2J..	24	22	45	23.6 (31.6)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6230-0.B07-5G..	53	44	100	36.9 (49.5)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6230-0.B07-8FB.	74	56	130	46.3 (62.1)	85/141	6SL312-1-TE28-5AA3	–	–	–
1FW6230-0.B10-2J..	24	23	45	27.1 (36.3)	30/56	6SL312-1-TE23-0AA3	1.5	4 × 4	6FX8002-5CS41-....
1FW6230-0.B10-5G..	54	48	100	42 (56.3)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6230-0.B10-8FB.	74	62	130	50.6 (67.9)	85/141	6SL312-1-TE28-5AA3	–	–	–
1FW6230-0.B10-2PB.	100	80	190	65.4 (87.7)	132/210	6SL312-1-TE31-3AA3	–	–	–
1FW6230-0.B15-4C..	33	32	63	38 (50.9)	45/85	6SL312-1-TE24-5AA3	1.5	4 × 6	6FX8002-5CS54-....
1FW6230-0.B15-5G..	53	49	100	47.4 (63.5)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6230-0.B15-8FB.	74	66	130	57.3 (76.8)	85/141	6SL312-1-TE28-5AA3	–	–	–
1FW6230-0.B15-2PB.	100	90	190	72.5 (97.2)	132/210	6SL312-1-TE31-3AA3	–	–	–
1FW6230-0.B15-0WB.	140	110	270	91.2 (122)	200/282	6SL312-1-TE32-0AA3	–	–	–
1FW6230-0.B20-5G..	53	51	100	53.5 (71.7)	60/113	6SL312-1-TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6230-0.B20-8FB.	74	69	130	63.7 (85.4)	85/141	6SL312-1-TE28-5AA3	–	–	–
1FW6230-0.B20-2PB.	100	94	190	79.4 (106)	132/210	6SL312-1-TE31-3AA3	–	–	–
1FW6230-0.B20-0WB.	140	120	270	98.1 (132)	200/282	6SL312-1-TE32-0AA3	–	–	–

Cooling:	
Internal air cooling	0
External air cooling	1
Motor Module:	
Single Motor Module	1
Double Motor Module	2

Length code
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Further information about the cables can be found in chapter Connection system MOTION-CONNECT.

1) Torque and current at low speeds.

2) The values refer to a DC link voltage of the drive system of 600 V DC.

3) In case of water cooling with inlet temperature of 35 °C (95 °F) and maximum rotor flange temperature of 60 °C (140 °F).

4) For type of connection with exposed core ends, power and signal connectors are not included in the scope of supply of the motor. They must be ordered separately (see chapter Connection system MOTION-CONNECT).

5) 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).

Direct drives

Torque motors for SINAMICS S120

1FW6 built-in torque motors Water cooling

Selection and ordering data

Maximum torque	Static torque ¹⁾³⁾	Rated torque ²⁾³⁾	Speed at maximum torque, max. ²⁾	Speed at rated torque, max. ²⁾	1FW6 built-in torque motors	Moment of inertia of rotor	Weight, approx. stator + rotor
M_{\max}	M_0	M_{rated}	n_{\max} at M_{\max}	n_{\max} at M_{rated}	Order No.	J	m
Nm (lb _f -ft)	Nm (lb _f -ft)	Nm (lb _f -ft)	rpm	rpm		10 ⁻² kgm ² (lb _f -in-s ²)	kg (lb)
Water cooling							
4000 (2950)	2220 (1637)	2060 (1519)	59	110	1FW6290-0B07-5G B2	228 (20.2)	103.6 (228)
		1910 (1409)	110	210	1FW6290-0B07-0LB2		
		1810 (1335)	150	270	1FW6290-0B07-2PB2		108.8 (240)
6280 (4632)	3490 (2574)	3320 (2449)	40	73	1FW6290-0B11-7A B2	334 (29.6)	159 (351)
		3200 (2360)	71	130	1FW6290-0B11-0LB2		
		3100 (2287)	93	170	1FW6290-0B11-2PB2		164.2 (362)
8570 (6321)	4760 (3511)	4590 (3386)	28	53	1FW6290-0B15-7A B2	440 (38.9)	214.6 (473)
		4480 (3304)	50	89	1FW6290-0B15-0LB2		
		4390 (3238)	67	120	1FW6290-0B15-2PB2		219.8 (485)
10900 (8040)	6030 (4448)	5760 (4249)	38	68	1FW6290-0B20-0LB2	546 (48.3)	260.6 (575)
		5670 (4182)	51	91	1FW6290-0B20-2PB2		265.8 (586)

Cable outlet only for 1FW6160 to 1FW6290:

Axial
Radially outwards
Tangential (only for types of connection C and D)

W
V
T

Type of connection:

Permanently connected power and signal cables with exposed core ends⁴⁾
Length: 2 m (6.56 ft) **C**
Permanently connected power and signal cables pre-assembled with connectors
Length: 0.5 m (1.64 ft) **D**

Type of connection only for specific motors (Not selectable):

Permanently connected power and signal cables with exposed core ends⁴⁾
Length: 1 m (3.28 ft) **B**

Direct drives

Torque motors for SINAMICS S120

1FW6 built-in torque motors
Water cooling

Motor type (repeated)	Static current 1)3)	Rated current 2)3)	Maxi- mum current ²⁾	Calculated power $P_{el, max}$	SINAMICS S120 Motor Module		Power cable with complete shield Motor connection via power connector ⁴⁾		
					Required rated current	Booksized format For additional versions and components see chapter SINAMICS S120 drive system Order No.	Power con- nector	Cable cross- section ⁵⁾	Pre-assembled basic cable to the drive system
					I_{rated}/I_{max}				
A	A	A	kW (HP)	A					
1FW6290-0.B07-5G..	56	52	110	47.7 (64.0)	60/113	6SL312-1TE26-0AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6290-0.B07-0LB.	100	86	210	70.6 (94.7)	132/210	6SL312-1TE31-3AA3	–	–	–
1FW6290-0.B07-2PB.	120	100	270	85.4 (115)	200/282	6SL312-1TE32-0AA3	–	–	–
1FW6290-0.B11-7A..	62	59	130	58 (77.8)	85/141	6SL312-1TE28-5AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6290-0.B11-0LB.	100	91	210	78.2 (105)	132/210	6SL312-1TE31-3AA3	–	–	–
1FW6290-0.B11-2PB.	120	110	270	93.2 (125)	200/282	6SL312-1TE32-0AA3	–	–	–
1FW6290-0.B15-7A..	64	61	130	65.2 (87.4)	85/141	6SL312-1TE28-5AA3	1.5	4 × 16	6FX8002-5CS24-....
1FW6290-0.B15-0LB.	100	94	210	85.2 (114)	132/210	6SL312-1TE31-3AA3	–	–	–
1FW6290-0.B15-2PB.	120	110	270	101 (135)	200/282	6SL312-1TE32-0AA3	–	–	–
1FW6290-0.B20-0LB.	100	95	210	91.9 (123)	132/210	6SL312-1TE31-3AA3	–	–	–
1FW6290-0.B20-2PB.	120	120	270	107 (144)	200/282	6SL312-1TE32-0AA3	–	–	–

Cooling:	
Internal air cooling	0
External air cooling	1
Motor Module:	
Single Motor Module	1

Length code
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Further information about the cables can be found in chapter Connection system MOTION-CONNECT.

Accessories

Description	Order No.
Cooling connection adapter for	
• Torque motors 1FW6160 to 1FW6230	1FW6160-1BA00-0AA0
• Torque motors 1FW6290	1FW6290-1BA00-0AA0

1) Torque and current at low speeds.

2) The values refer to a DC link voltage of the drive system of 600 V DC.

3) In case of water cooling with inlet temperature of 35 °C (95 °F) and maximum rotor flange temperature of 60 °C (140 °F).

4) For type of connection with exposed core ends, power and signal connectors are not included in the scope of supply of the motor. They must be ordered separately (see chapter Connection system MOTION-CONNECT).

5) 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).