

Synchronous motors

Torque motors for SIMODRIVE 611

1FW6 standard type built-in torque motors Water cooling

Selection and Ordering Data

Maximum torque	Static torque ¹⁾³⁾	Rated torque ²⁾³⁾	Max. speed at maximum torque ²⁾	Max. speed at rated torque ²⁾	1FW6 built-in torque motors Water cooled Standard type	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}		J	m
Nm (lb _f -in)	Nm (lb _f -in)	Nm (lb _f -in)	rpm	rpm	Order No.	10 ⁻² kgm ² (lb _f -in-s ²)	kg (lb)
179 (1 584)	119 (1 053)	113 (1 000)	46	140	1FW6090-0 ■ B05-0F ■ 2	1.52 (0.1345)	9.2 (20.3)
		109 (965)	140	250	1FW6090-0 ■ B05-0K ■ 2	1.52 (0.1345)	9.2 (20.3)
251 (2 221)	166 (1 469)	154 (1 363)	120	220	1FW6090-0 ■ B07-0K ■ 2	2.2 (0.1947)	12.2 (27)
		142 (1 257)	270	430	1FW6090-0 ■ B07-1J ■ 2	2.2 (0.1947)	12.2 (27)
358 (3 168)	238 (2 106)	231 (2 044)	8.7	82	1FW6090-0 ■ B10-0K ■ 2	3.09 (0.2735)	17.2 (37.9)
		216 (1 912)	170	270	1FW6090-0 ■ B10-1J ■ 2	3.09 (0.2735)	17.2 (37.9)
537 (4 752)	357 (3 159)	338 (2 991)	78	150	1FW6090-0 ■ B15-1J ■ 2	4.65 (0.4116)	27.2 (60)
		319 (2 823)	200	310	1FW6090-0 ■ B15-2J ■ 2	4.65 (0.4116)	27.2 (60)
439 (3 885)	258 (2 283)	241 (2 133)	47	130	1FW6130-0 ■ B05-0K ■ 2	6.37 (0.5638)	13.2 (29.1)
		217 (1 920)	180	310	1FW6130-0 ■ B05-1J ■ 2	6.37 (0.5638)	13.2 (29.1)
614 (5 434)	361 (3 195)	344 (3 044)	21	96	1FW6130-0 ■ B07-0K ■ 2	8.92 (0.7895)	18.2 (40.1)
		324 (2 867)	110	200	1FW6130-0 ■ B07-1J ■ 2	8.92 (0.7895)	18.2 (40.1)
878 (7 770)	516 (4 567)	484 (4 283)	50	120	1FW6130-0 ■ B10-1J ■ 2	12.7 (1.1240)	25.2 (55.6)
		450 (3 983)	150	250	1FW6130-0 ■ B10-2J ■ 2	12.7 (1.1240)	25.2 (55.6)
1 320 (11 682)	775 (6 859)	744 (6 584)	14	78	1FW6130-0 ■ B15-1J ■ 2	19.1 (1.6905)	38.2 (84.2)
		714 (6 319)	77	150	1FW6130-0 ■ B15-2J ■ 2	19.1 (1.6905)	38.2 (84.2)
710 (6 284)	360 (3 186)	338 (2 992)	230	110	1FW6150-0 ■ B05-1J ■ 2	10.1 (0.8939)	21.7 (47.8)
		298 (2 638)	650	340	1FW6150-0 ■ B05-4F ■ 2	10.1 (0.8939)	21.7 (47.8)
994 (8 798)	504 (4 461)	470 (4 160)	260	130	1FW6150-0 ■ B07-2J ■ 2	14.2 (1.2568)	33.5 (73.9)
		444 (3 930)	450	230	1FW6150-0 ■ B07-4F ■ 2	14.2 (1.2568)	33.5 (73.9)
1 420 (12 568)	720 (6 373)	668 (5 912)	170	78	1FW6150-0 ■ B10-2J ■ 2	20.9 (1.8498)	46.5 (103)
		663 (5 868)	300	150	1FW6150-0 ■ B10-4F ■ 2	20.9 (1.8498)	46.5 (103)
2 130 (18 853)	1 080 (9 559)	1 050 (9 294)	100	34	1FW6150-0 ■ B15-2J ■ 2	31.3 (2.7703)	70.8 (156)
		1 030 (9 117)	190	91	1FW6150-0 ■ B15-4F ■ 2	31.3 (2.7703)	70.8 (156)

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

Axial
Radially outwards
Tangential

P
Q
N

Type of connection:

Permanently connected power and signal cables with open core ends
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

Synchronous motors

Torque motors for SIMODRIVE 611

1FW6 standard type built-in torque motors
Water cooling

Selection and Ordering Data

Motor type (continued)	Static current 1)3)	Rated current 2)3)	Maxi- mum current ²⁾	Calculated power	SIMODRIVE 611 power module		Power cable with complete shield Motor connection via power connector ⁵⁾		
	I_0	I_{rated}	I_{max}	$P_{el, max}$	Required rated current	Order No.	Power connec- tor	Cable cross- section ⁶⁾	Pre-assembled basic cable to converter
	A	A	A	kW (HP)	I_{rated}/I_{max}		Size	mm ²	Order No.
1FW6090-0.B05-0F..	5.9	5.6	9.5	6.55 (8.78)	5/10 ⁴⁾	For ordering data, see Converter systems	1	4 x 2.5	6FX8002-5CA11-....
1FW6090-0.B05-0K..	8.2	7.4	13	8.12 (10.88)	9/18		1	4 x 2.5	6FX8002-5CA11-....
1FW6090-0.B07-0K..	10	9.5	16	10.3 (13.8)	9/18 ⁴⁾		1	4 x 2.5	6FX8002-5CA11-....
1FW6090-0.B07-1J..	16	13	26	14.1 (18.9)	18/36		1	4 x 2.5	6FX8002-5CA11-....
1FW6090-0.B10-0K..	8.2	7.9	13	9.43 (12.6)	9/18		1	4 x 2.5	6FX8002-5CA11-....
1FW6090-0.B10-1J..	16	14	26	15.3 (20.5)	18/36		1	4 x 2.5	6FX8002-5CA11-....
1FW6090-0.B15-1J..	16	15	26	17.1 (22.9)	18/36		1	4 x 2.5	6FX8002-5CA11-....
1FW6090-0.B15-2J..	26	23	43	24.1 (32.3)	28/56		1.5	4 x 4	6FX8002-5CA41-....
1FW6130-0.B05-0K..	9.7	9	18	12.2 (16.4)	9/18 ⁴⁾		1	4 x 2.5	6FX8002-5CA11-....
1FW6130-0.B05-1J..	17	14	32	18.3 (24.5)	18/36		1	4 x 2.5	6FX8002-5CA11-....
1FW6130-0.B07-0K..	10	10	20	14.2 (19)	9/18 ⁴⁾		1	4 x 2.5	6FX8002-5CA11-....
1FW6130-0.B07-1J..	17	15	32	19.7 (26.4)	18/36		1	4 x 2.5	6FX8002-5CA11-....
1FW6130-0.B10-1J..	17	16	32	21.4 (28.7)	18/36		1	4 x 2.5	6FX8002-5CA11-....
1FW6130-0.B10-2J..	28	24	53	30.6 (41)	28/56		1.5	4 x 4	6FX8002-5CA41-....
1FW6130-0.B15-1J..	19	18	36	25.4 (34.1)	18/36 ⁴⁾		1	4 x 2.5	6FX8002-5CA11-....
1FW6130-0.B15-2J..	28	26	54	34.1 (45.7)	28/56		1.5	4 x 4	6FX8002-5CA41-....
1FW6150-0.B05-1J..	18	17	44	22.8 (30.6)	18/36		1	4 x 2.5	6FX8002-5CA11-....
1FW6150-0.B05-4F..	44	36	100	39.4 (52.8)	56/112		1.5	4 x 10	6FX8002-5CA61-....
1FW6150-0.B07-2J..	27	25	66	32.0 (42.9)	28/56		1.5	4 x 4	6FX8002-5CA41-....
1FW6150-0.B07-4F..	44	38	100	42.7 (57.3)	56/112		1.5	4 x 10	6FX8002-5CA61-....
1FW6150-0.B10-2J..	27	26	66	36.2 (48.5)	28/56		1.5	4 x 4	6FX8002-5CA41-....
1FW6150-0.B10-4F..	44	40	100	47.3 (63.4)	56/112		1.5	4 x 10	6FX8002-5CA61-....
1FW6150-0.B15-2J..	27	26	66	42.8 (57.4)	28/56		1.5	4 x 4	6FX8002-5CA41-....
1FW6150-0.B15-4F..	44	41	100	54.5 (73.1)	56/112		1.5	4 x 10	6FX8002-5CA61-....

For length code as well as power and signal cables, see Connection system MOTION-CONNECT.

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¹⁾ Torque and current at low speeds.

²⁾ The values refer to a supply voltage of 400 V 3 AC $\pm$ 10 % (converter DC link voltage 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⁾ Selection optimized to size of power module. The next higher power module offers 100 % torque utilization.

⁵⁾ Fixed cable outlet, not pre-assembled, 2 m (6.56 ft) in length. Power and signal connectors are not included in the scope of supply of the motor.

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

Synchronous motors

Torque motors for SIMODRIVE 611

1FW6 standard type built-in torque motors

Water cooling

Selection and Ordering Data

Maximum torque	Static torque ¹⁾³⁾	Rated torque ²⁾³⁾	Max. speed at maximum torque ²⁾	Max. speed at rated torque ²⁾	1FW6 built-in torque motors Water cooled Standard type	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}		J	m
Nm (lb _f -in)	Nm (lb _f -in)	Nm (lb _f -in)	rpm	rpm	Order No.	kgm ² (lb _f -in-s ²)	kg (lb)
716 (6 337)	467 (4 133)	431 (3 814)	84	140	1FW6160-0 ■ B05-1J ■ 2	0.19 (1.682)	36.3 (80.0)
		404 (3 575)	150	250	1FW6160-0 ■ B05-2J ■ 2	0.19 (1.682)	36.3 (80.0)
1 000 (8 850)	653 (5 779)	620 (5 487)	53	96	1FW6160-0 ■ B07-1J ■ 2	0.258 (2.283)	48.3 (106.5)
		594 (5 257)	100	170	1FW6160-0 ■ B07-2J ■ 2	0.258 (2.283)	48.3 (106.5)
1 430 (12 656)	933 (8 257)	903 (7 992)	29	60	1FW6160-0 ■ B10-1J ■ 2	0.36 (3.186)	66.3 (146.2)
		878 (7 770)	65	110	1FW6160-0 ■ B10-2J ■ 2	0.36 (3.186)	66.3 (146.2)
2 150 (19 028)	1 400 (12 390)	1 350 (11 948)	34	66	1FW6160-0 ■ B15-2J ■ 2	0.531 (4.699)	95.3 (210.1)
		1 280 (11 328)	97	160	1FW6160-0 ■ B15-5G ■ 2	0.531 (4.699)	95.3 (210.1)
990 (8 762)	672 (5 947)	633 (5 602)	54	97	1FW6190-0 ■ B05-1J ■ 2	0.358 (3.168)	42.8 (94.4)
		605 (5 354)	96	160	1FW6190-0 ■ B05-2J ■ 2	0.358 (3.168)	42.8 (94.4)
1 390 (12 302)	941 (8 328)	905 (8 009)	33	63	1FW6190-0 ■ B07-1J ■ 2	0.486 (4.142)	55.8 (123)
		879 (7 779)	64	110	1FW6190-0 ■ B07-2J ■ 2	0.486 (4.142)	55.8 (123)
1 980 (17 523)	1 340 (11 859)	1 310 (11 594)	14	38	1FW6190-0 ■ B10-1J ■ 2	0.678 (6.0002)	75.8 (167)
		1 290 (11 417)	39	70	1FW6190-0 ■ B10-2J ■ 2	0.678 (6.0002)	75.8 (167)
2 970 (26 285)	2 020 (17 877)	1 970 (17 435)	17	40	1FW6190-0 ■ B15-2J ■ 2	0.998 (8.832)	107.8 (238)
		1 890 (16 727)	62	100	1FW6190-0 ■ B15-5G ■ 2	0.998 (8.832)	107.8 (238)
1 320 (11 682)	841 (7 443)	799 (7 071)	34	69	1FW6230-0 ■ B05-1J ■ 2	0.622 (5.505)	44.8 (98.8)
		774 (6 850)	59	110	1FW6230-0 ■ B05-2J ■ 2	0.622 (5.505)	44.8 (98.8)
1 840 (16 284)	1 180 (10 443)	1 140 (10 089)	19	45	1FW6230-0 ■ B07-1J ■ 2	0.843 (7.460)	58.8 (130)
		1 120 (9 912)	38	73	1FW6230-0 ■ B07-2J ■ 2	0.843 (7.460)	58.8 (130)
2 630 (23 276)	1 680 (14 868)	1 630 (14 426)	21	46	1FW6230-0 ■ B10-2J ■ 2	1.18 (10.443)	81.8 (180)
		1 520 (13 452)	74	130	1FW6230-0 ■ B10-5G ■ 2	1.18 (10.443)	81.8 (180)
3 950 (34 958)	2 520 (22 302)	2 440 (21 594)	19	43	1FW6230-0 ■ B15-4C ■ 2	1.73 (15.310)	117.8 (260)
		2 380 (21 063)	44	80	1FW6230-0 ■ B15-5G ■ 2	1.73 (15.310)	117.8 (260)
8 570 (75 854)	4 760 (42 126)	4 590 (40 622)	28	53	1FW6290-0 ■ B15-7A ■ 2	4.40 (38.939)	214.6 (473)

Cable outlet for 1FW6160 to 1FW6290 only:

Axial
Radially outwards
Tangential

W
V
T

Type of connection:

Permanently connected power and signal cables with open core ends
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

Synchronous motors

Torque motors for SIMODRIVE 611

1FW6 standard type built-in torque motors
Water cooling

Selection and Ordering Data

Motor type ⁴⁾ (continued)	Static current 1)3)	Rated current 2)3)	Maxi- mum current ²⁾	Calculated power	SIMODRIVE 611 power module		Power cable with complete shield Motor connection via power connector ⁴⁾		
	I_0	I_{rated}	I_{max}	$P_{el, max}$	Required rated current	Order No.	Power connector	Cable cross- section ⁵⁾	Pre-assembled basic cable to converter
	A	A	A	kW (HP)	I_{rated}/I_{max}		Size	mm ²	Order No.
1FW6160-0.B05-1J..	17	16	31	15.1 (20.2)	18/36	For ordering data, see Converter systems	1	4x2.5	6FX8002-5CA11-....
1FW6160-0.B05-2J..	28	24	49	20 (26.8)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6160-0.B07-1J..	17	16	31	16.7 (22.4)	18/36		1	4x2.5	6FX8002-5CA11-....
1FW6160-0.B07-2J..	28	25	49	21.8 (29.2)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6160-0.B10-1J..	17	17	31	19 (25.5)	18/36		1	4x2.5	6FX8002-5CA11-....
1FW6160-0.B10-2J..	28	26	49	24.4 (32.7)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6160-0.B15-2J..	28	26	49	28.2 (37.8)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6160-0.B15-5G..	56	50	98	42.6 (57.1)	56/112		1.5	4x16	6FX8002-5YP02-....
1FW6190-0.B05-1J..	18	17	31	16.3 (21.9)	18/36		1	4x2.5	6FX8002-5CA11-....
1FW6190-0.B05-2J..	27	24	47	20.6 (27.6)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6190-0.B07-1J..	18	17	31	18.2 (24.4)	18/36		1	4x2.5	6FX8002-5CA11-....
1FW6190-0.B07-2J..	27	25	47	22.7 (30.4)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6190-0.B10-1J..	18	17	31	20.7 (27.8)	18/36		1	4x2.5	6FX8002-5CA11-....
1FW6190-0.B10-2J..	27	26	47	25.7 (34.5)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6190-0.B15-2J..	27	26	47	30.1 (40.4)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6190-0.B15-5G..	54	50	95	44.1 (59.1)	56/112		1.5	4x16	6FX8002-5YP02-....
1FW6230-0.B05-1J..	16	15	31	17.3 (23.2)	18/36		1	4x2.5	6FX8002-5CA11-....
1FW6230-0.B05-2J..	24	22	45	21 (28.2)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6230-0.B07-1J..	16	16	31	19.4 (26.0)	18/36		1	4x2.5	6FX8002-5CA11-....
1FW6230-0.B07-2J..	24	22	45	23.6 (31.6)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6230-0.B10-2J..	24	23	45	27.1 (36.3)	28/56		1.5	4x4	6FX8002-5CA41-....
1FW6230-0.B10-5G..	54	48	100	42 (56.3)	56/112		1.5	4x16	6FX8002-5YP02-....
1FW6230-0.B15-4C..	33	32	63	38 (50.9)	42/64		1.5	4x6	6FX8002-5CA51-....
1FW6230-0.B15-5G..	53	49	100	47.4 (63.5)	56/112		1.5	4x16	6FX8002-5YP02-....
1FW6290-0.B15-7A..	64	61	130	65.2 (87.4)	70/140		1.5	4x16	6FX8002-5YP02-....

For length code as well as power and signal cables, see Connection system MOTION-CONNECT.

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Accessories

Designation	Order No.	Designation	Order No.
Cooling connection adapter for		Power connector⁴⁾	
• Torque motors 1FW6160 to 1FW6230	1FW6160-1BA00-0AA0	• Size 1 for 4 x 2.5 mm ²	6FX2003-0LA00
• Torque motors 1FW6290	1FW6290-1BA00-0AA0	• Size 1.5 for 4 x 4/4 x 10/4 x 16 mm ²	6FX2003-0LA10
		Signal connector⁴⁾	
		• M17 (socket) for 6 x 0.5 + 1 x 1.0 mm ²	6FX2003-0SU07

¹⁾ Torque and current at low speeds.

²⁾ The values refer to a supply voltage of 400 V 3 AC ± 10 % (converter DC link voltage 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⁾ Fixed cable outlet, not pre-assembled, 2 m (6.56 ft) in length. Power and signal connectors are not included in the scope of supply of the motor and must be ordered separately.

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