

MOTION-CONNECT connection systems

Power cables for SINAMICS S120/Hybrid cables for SINAMICS S120M

Overview



Power cable for connecting a SIMOTICS motor to a SINAMICS S120 Motor Module, C/D type

Power cables

The synchronous and asynchronous motors are connected to the Motor Modules or Power Modules by means of MOTION-CONNECT power cables.

The pre-assembled MOTION-CONNECT power cables are of high quality and offer safety with problem-free functioning.

Depending on the design, the MOTION-CONNECT power cables are either pre-assembled at one end or at both ends.

If pre-assembled power cables are to be installed in a cable carrier in such a way that the connector would inhibit assembly, pre-assembled cables without assembled connector can also be supplied. In this case, the contacts of the cables are crimped and the connector is supplied separately. After installing the cables, the customer assembles the connector.

The 6FX.002-5....-.... power cables are available with crimped contacts and with the connector supplied separately as an option (not applicable to power cables with open core ends or cable lugs).

Power cables with separately supplied **module-end** connector: in this case, the 6th position of the Article No. must be changed from **0** to **1**: 6FX.012-5....-.... (not for power cables for SINAMICS S120 Power Modules or Motor Modules in booksize compact format).

Power cables without **module-end** connector: in this case, the 6th position of the Article No. must be changed from **0** to **2**: 6FX.022-5....-.... The connector can be ordered separately (see page 12/53).

Power cables with separately supplied **motor-end** connector: in this case, the 6th position of the Article No. must be changed from **0** to **4**: 6FX.042-5....-.... (not for power cables with open core ends on the motor end).

Type of delivery for pre-assembled power cables

Pre-assembled power cables can be ordered in units of 10 cm (3.94 in) up to a maximum length of 299 m (981 ft).

The cables are supplied on reels up to 30 kg (66.1 lb) or 100 m (328 ft). Above 30 kg or 100 m (66.1 lb or 328 ft), cable drums are used instead of reels. This applies to both pre-assembled power cables and for cables sold by the meter.



Power cable with separately supplied connector for connecting a SIMOTICS motor to a SINAMICS S120 Motor Module, C/D type

Type of delivery for power cables sold by the meter

Fixed lengths

Cross-section	Brake cores	MOTION-CONNECT 500 MOTION-CONNECT 800PLUS
1.5 mm ²	without/with	50 m (164 ft), 100 m (328 ft), 200 m (656 ft), 500 m (1641 ft)
2.5 mm ²	without/with	50 m (164 ft), 100 m (328 ft), 200 m (656 ft), 500 m (1641 ft)

Variable length, available in exact meter lengths

Cross-section	Brake cores	MOTION-CONNECT 500	MOTION-CONNECT 800PLUS
4 mm ²	without/with	≤ 500 m (1641 ft)	≤ 500 m (1641 ft)
6 mm ²	without/with	≤ 500 m (1641 ft)	≤ 500 m (1641 ft)
10 mm ²	without/with	≤ 500 m (1641 ft)	≤ 500 m (1641 ft)
16 mm ²	without/with	≤ 200 m (656 ft)	≤ 200 m (656 ft)
25 mm ²	without with	≤ 200 m (656 ft) ≤ 200 m (656 ft)	– ≤ 200 m (656 ft)
35 mm ²	without with	≤ 200 m (656 ft) ≤ 200 m (656 ft)	– ≤ 200 m (656 ft)
50 mm ²	without with	≤ 200 m (656 ft) ≤ 200 m (656 ft)	– ≤ 200 m (656 ft)
70 mm ²	without	≤ 100 m (328 ft)	–
95 mm ²	without	≤ 100 m (328 ft)	–
120 mm ²	without	≤ 100 m (328 ft)	–

Hybrid cables

Hybrid cables connect AM600 Adapter Modules to the distributed components Hybrid Cabinet Bushings, DRIVE-CLiQ Extension and SINAMICS S120M, as well as the distributed components to one another. Hybrid cables are only delivered pre-assembled.

Type of delivery for pre-assembled hybrid cables

The pre-assembled cables can be delivered in length units of 10 cm (3.94 in) up to 75 m (246 ft) to suit the system.

MOTION-CONNECT connection systems

Power cables for SINAMICS S120/Hybrid cables for SINAMICS S120M

Technical specifications

Power cables	MOTION-CONNECT 500 6FX50...-.....-....	MOTION-CONNECT 800PLUS 6FX80...-.....-....	MOTION-CONNECT 800PLUS ¹⁾ 6FX8002-7HY...-....
Certificate of suitability			
• VDE ²⁾	Yes	Yes	Yes
• cURus or UR/CSA	UL 758, CSA-C22.2-N.210.2-M90	UL 758, CSA-C22.2-N.210.2-M90	UL 758, CSA-C22.2-N.210.2-M90
• UR-CSA File No. ³⁾	Yes	Yes	Yes
• RoHS conformity	Yes	Yes	Yes
Rated voltage U_0/U according to EN 50395			
• Power conductors	600 V/1000 V	600 V/1000 V	4 mm ² : 600 V/1000 V 2.5 mm ² : 48 V (EN), 1000 V (UL/CSA)
• Signal conductors	24 V (EN), 1000 V (UL/CSA)	24 V (EN), 1000 V (UL/CSA)	AWG22: 30 V (EN), 1000 V (UL/CSA)
Test voltage, rms			
• Power conductors	4 kV	4 kV	4 kV
• Signal conductors	2 kV	2 kV	4 kV
Operating temperature on the surface			
• Fixed installation	-20 ... +80 °C (-4 ... +176 °F)	-50 ... +80 °C (-58 ... +176 °F)	-50 ... +80 °C (-58 ... +176 °F)
• Flexible installation	0 ... 60 °C (32 ... 140 °F)	-20 ... +60 °C (-4 ... +140 °F)	-20 ... +60 °C (-4 ... +140 °F)
Tensile stress, max.			
• Fixed installation	50 N/mm ² (7252 lb _f /in ²)	50 N/mm ² (7252 lb _f /in ²)	50 N/mm ² (7252 lb _f /in ²)
• Flexible installation	20 N/mm ² (2901 lb _f /in ²)	20 N/mm ² (2901 lb _f /in ²)	20 N/mm ² (2901 lb _f /in ²)
Smallest bending radius			
• Fixed installation	5 × D _{max}	4 × D _{max}	4 × D _{max}
• Flexible installation	See selection and ordering data	See selection and ordering data	See selection and ordering data
Torsional stress	Absolute 30°/m	Absolute 30°/m	Absolute 30°/m
Bending	100000	10 million	10 million
Traversing velocity	30 m/min (98.4 ft/min)	Up to 300 m/min (984 ft/min)	Up to 300 m/min (984 ft/min)
Acceleration	2 m/s ² (6.56 ft/s ²)	Up to 50 m/s ² (164 ft/s ²), see characteristics on page 12/5	Up to 50 m/s ² (164 ft/s ²), see characteristics on page 12/5
Insulation material, incl. jacket	CFC/silicone-free	CFC/halogen-free/silicon-free IEC 60754-1/DIN VDE 0472-815	CFC/halogen-free/silicon-free IEC 60754-1/DIN VDE 0472-815
Oil resistance	EN 60811-2-1 (mineral oil only)	EN 60811-2-1	EN 60811-2-1
Outer jacket	PVC DESINA color orange RAL 2003	PUR, HD22.10 S2 (VDE 0282, Part 10) DESINA color orange RAL 2003	PUR, HD22.10 S2 (VDE 0282, Part 10) DESINA color orange RAL 2003
Flame-retardant	EN 60332-1-1 to 1-3	EN 60332-1-1 to 1-3	EN 60332-1-1 to 1-3

Degree of protection of the pre-assembled power cables and their extensions when closed and inserted: IP67.

¹⁾ Hybrid cables

²⁾ The respective registration number is printed on the cable jacket (only applies to power cables).

³⁾ The File No. is printed on the cable jacket.

MOTION-CONNECT connection systems

Power cables for SINAMICS S120

Power cables for SIMOTICS S-1FT7/S-1FK7/M-1PH8 motors with full-thread connector

Selection and ordering data (continued)

For SIMOTICS S-1FK7/1FT7 motors without holding brake/SIMOTICS M-1PH808-1PH810-1PH813 motors with full-thread connector on SINAMICS S120 Motor Modules in booksize compact format and Power Modules

Connection method, Power Module end	No. of cores x cross-section	Conncetor size, motor end	Pre-assembled cable without brake cores	Cable sold by the meter without brake cores ¹⁾	D_{max}	Weight (without connector)		Smallest bending radius ²⁾		
	mm ²					Article No.	Article No.	6FX5 mm (in)	6FX8 mm (in)	6FX5 kg/m (lb/ft)
Exposed core ends	4 × 1.5	1	6FX002-5CG01-....	6FX008-1BB11-....	8.4 (0.33)	9.5 (0.37)	0.12 (0.08)	0.15 (0.10)	155 (6.10)	75 (2.95)
		1.5	6FX002-5CG21-....							
	4 × 2.5	1	6FX002-5CG11-....	6FX008-1BB21-....	10.0 (0.39)	11.0 (0.43)	0.21 (0.14)	0.20 (0.13)	180 (7.09)	90 (3.54)
		1.5	6FX002-5CG31-....							
	4 × 4	1.5	6FX002-5CG41-....	6FX008-1BB31-....	11.4 (0.45)	12.3 (0.48)	0.27 (0.18)	0.27 (0.18)	210 (8.27)	100 (3.94)
	4 × 6	1.5	6FX002-5CG51-....	6FX008-1BB41-....	13.6 (0.54)	14.9 (0.59)	0.37 (0.25)	0.41 (0.28)	245 (9.65)	120 (4.72)
	4 × 10	1.5	6FX002-5CG61-....	6FX008-1BB51-....	20.0 (0.79)	18.2 (0.72)	0.73 (0.49)	0.62 (0.42)	360 (14.17)	140 (5.51)
		3	6FX002-5CG13-....							
	4 × 16	3	6FX002-5CG23-....	6FX008-1BB61-....	24.2 (0.95)	22.3 (0.88)	1.10 (0.74)	1.01 (0.68)	440 (17.32)	170 (6.69)
	MOTION-CONNECT 500			5		5				
MOTION-CONNECT 800PLUS			8		8					
Power cable										
Pre-assembled			0							
Connector at motor end supplied separately			4							
Length code										

For SIMOTICS S-1FK7/1FT7 motors with holding brake and with full-thread connector on SINAMICS S120 Motor Modules in booksize compact format and Power Modules

Connection method, Power Module end	No. of cores x cross-section mm ²	Connector size, motor end	Pre-assembled cable with brake cores Article No.	Cable sold by the meter ¹⁾ with brake cores Article No.	D_{max}		Weight (without connector)		Smallest bending radius ²⁾	
					6FX5 mm (in)	6FX8 mm (in)	6FX5 kg/m (lb/ft)	6FX8 kg/m (lb/ft)	6FX5 mm (in)	6FX8 mm (in)
Exposed core ends	4 × 1.5+2 × 1.5	0.5	6FX5002-5DA30-....	6FX5008-1BA11-....	10.8 (0.43)	–	0.22 (0.15)	–	195 (7.68)	–
		1	6FX5002-5DG01-....	6FX008-1BA11-....	10.8 (0.43)	12.0 (0.47)	0.22 (0.15)	0.23 (0.15)	195 (7.68)	90 (3.54)
		1.5	6FX5002-5DG21-....							
	4 × 2.5+2 × 1.5	1	6FX5002-5DG11-....	6FX008-1BA21-....	12.4 (0.49)	13.8 (0.54)	0.25 (0.17)	0.30 (0.20)	225 (8.86)	105 (4.13)
		1.5	6FX5002-5DG31-....							
	4 × 4+2 × 1.5	1.5	6FX5002-5DG41-....	6FX008-1BA31-....	14.0 (0.55)	15.2 (0.60)	0.35 (0.24)	0.38 (0.26)	255 (10.04)	115 (4.53)
	4 × 6+2 × 1.5	1.5	6FX5002-5DG51-....	6FX008-1BA41-....	16.1 (0.63)	17.3 (0.68)	0.49 (0.33)	0.50 (0.33)	290 (11.42)	130 (5.12)
	4 × 10+2 × 1.5	1.5	6FX5002-5DG61-....	6FX008-1BA51-....	21.7 (0.85)	20.1 (0.79)	0.81 (0.54)	0.71 (0.48)	395 (15.55)	150 (5.91)
		3	6FX5002-5DG13-....							
	4 × 16+2 × 1.5	3	6FX5002-5DG23-....	6FX008-1BA61-....	25.0 (0.98)	23.8 (0.94)	1.12 (0.75)	1.03 (0.69)	450 (17.72)	180 (7.09)
	4 × 25+2 × 1.5	3	6FX5002-5DG33-....	6FX008-1BA25-....	29.4 (1.16)	27.6 (1.09)	1.62 (1.09)	1.47 (0.99)	530 (20.87)	280 (11.02)
	4 × 35+2 × 1.5	3	6FX5002-5DG43-....	6FX008-1BA35-....	32.6 (1.28)	31.9 (1.26)	2.06 (1.38)	1.92 (1.29)	590 (23.23)	320 (12.60)
	4 × 50+2 × 1.5	3	6FX5002-5DG53-....	6FX008-1BA50-....	38.0 (1.50)	35.0 (1.38)	3.04 (2.04)	2.56 (1.72)	685 (26.97)	350 (13.78)
MOTION-CONNECT 500			5	5						
MOTION-CONNECT 800PLUS			8	8						
Power cable										
Pre-assembled			0							
Connector at motor end supplied separately			4							
Length code										

¹⁾ Note type of delivery.

²⁾ Valid for installation in a cable carrier.

Overview

Power cables, pre-assembled

Data position in Article No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MOTION-CONNECT 500	6	F	X	5	0	■	2	–	5	■	■	■	■	–	.	.
MOTION-CONNECT 800PLUS	6	F	X	8	0	■	2	–	5	■	■	■	■	–	.	.
Pre-assembled at motor and module ends					0											
Pre-assembled at motor end, connector at module end supplied separately					1											
Pre-assembled at motor end, connector at module end not supplied					2											
Connector at motor end supplied separately, pre-assembled at module end					4											
Without brake cores									C							
With brake cores									D							
<u>Basic cable between</u>																
<u>and</u>																
SINAMICS S120 Motor Module C/D type, booksize format, up to 30 A									D	A	2	7				
Motor connector, full-thread, size 0.5										S		6				
Motor connector, full-thread, size 1 or 1.5										S	1	7				
Motor connector, full-thread, size 3										W		2				
Motor with terminal box (exposed core ends)										D	N	2	7			
Motor connector, SPEED-CONNECT, size 0.5										N		6				
Motor connector, SPEED-CONNECT, size 1 or 1.5																
SINAMICS S120 Motor Module, booksize format, 45 A or higher										S		4				
Motor connector, full-thread, size 1 or 1.5										S	2	3				
Motor connector, full-thread, size 3										N		4				
Motor connector, SPEED-CONNECT, size 1 or 1.5																
SINAMICS S120 Power Module/ Motor Module, booksize compact format									D	A	3	0				
Motor connector, full-thread, size 0.5										G		1				
Motor connector, full-thread, size 1 or 1.5										G		3				
Motor connector, full-thread, size 3									D	N	3	0				
Motor connector, SPEED-CONNECT, size 0.5										G	1					
Motor connector, SPEED-CONNECT, size 1										G	2					
Motor connector, SPEED-CONNECT, size 1.5																
SINAMICS S120 Power Module, Combi format ¹⁾										F						
Motor connector, SPEED-CONNECT, size 1 or 1.5										C	R					
SINAMICS S120 Power Module/ Motor Module, booksize format										C	E					
SINAMICS S120 Power Module, Combi format ¹⁾																
SIMOTICS M-1PH8 with terminal box																
SIMOTICS M-1PH8 with terminal box																
<u>Extension between basic cable with connector</u>																
<u>and motor connector</u>																
Full-thread, size 0.5									M	E	0	5				
Full-thread, size 1										A		5				
Full-thread, size 1.5										A		8				
Full-thread, size 3										X		8				
SPEED-CONNECT, size 0.5									M	N	0	5				
SPEED-CONNECT, size 1										Q		5				
SPEED-CONNECT, size 1.5										Q		8				
Adapter cable for SIMOTICS L-1FN3	6	F	X	7	0	0	2	–	5	L	M	.	.	–	.	.
Cross-section												.	.			
Length code																
Units of 10 cm (3.94 in) or 1 meter (3.28 ft) or in fixed lengths																

¹⁾ See Industry Mall for MOTION-CONNECT connection system for SINAMICS S120 Combi.

MOTION-CONNECT connection systems

Article number code

Length code

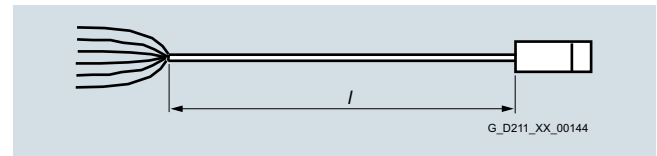
Overview

Description	Article No.	supplement
Length code for pre-assembled cables		
	6FX.0.2-.....-	■ ■ ■ ■
0 m	1	
100 m (328 ft)	2	
200 m (656 ft)	3	
0 m	A	
10 m (32.8 ft)	B	
20 m (65.6 ft)	C	
30 m (98.4 ft)	D	
40 m (131 ft)	E	
50 m (164 ft)	F	
60 m (197 ft)	G	
70 m (230 ft)	H	
80 m (262 ft)	J	
90 m (295 ft)	K	
0 m	A	
1 m (3.28 ft)	B	
2 m (6.56 ft)	C	
3 m (9.84 ft)	D	
4 m (13.1 ft)	E	
5 m (16.4 ft)	F	
6 m (19.7 ft)	G	
7 m (23.0 ft)	H	
8 m (26.2 ft)	J	
9 m (29.5 ft)	K	
0 m	0	
0.1 m (3.94 in)	1	
0.2 m (7.87 in)	2	
0.3 m (11.81 in)	3	
0.4 m (15.75 in)	4	
0.5 m (19.96 in)	5	
0.6 m (23.62 in)	6	
0.7 m (27.56 in)	7	
0.8 m (31.5 in)	8	
Examples:	1.0 m (3.28 ft): 1 A B 0	
	2.2 m (7.22 ft): 1 A C 2	
	8.0 m (26.3 ft): 1 A J 0	
	299.0 m (981 ft): 3 K K 0	

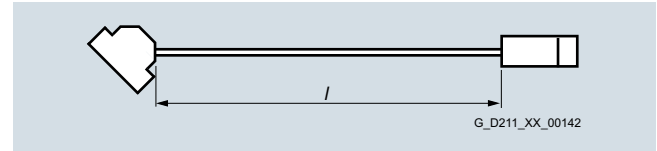
Description	Article No.	supplement
Length code for power and signal cables, sold by the meter ¹⁾		
	6FX.008-.....-	■ ■ ■ A 0
50 m (164 ft)	1	F
100 m (328 ft)	2	A
200 m (656 ft)	3	A
500 m (1641 ft)	6	A

More information

Definition of lengths for pre-assembled cables



Cable with exposed core ends and pre-assembled connector



Cable with pre-assembled connectors at both ends

Tolerance:

- Cable lengths up to 10 m (32.8 ft): $\pm 2\%$
- Cable lengths of 10 m (32.8 ft) and longer: $\pm 1\%$

¹⁾ Note type of delivery. Cables with core cross-section $4 \times 4 \text{ mm}^2$ or $4 \times 4 \text{ mm}^2$ with brake cores can be delivered in units of 1 m (3.28 ft).