



SINAMICS S120 drive system SINAMICS S120

Booksize format – Motor Modules – Single Motor Modules

■ Design



Single Motor Module in booksize format

The Single Motor Modules in booksize format feature the following connections and interfaces as standard:

- 2 DC link connections via integrated DC link busbars
- 1 electronics power supply connection via integrated 24 V DC bars
- 3 DRIVE-CLiQ sockets
- 1 motor connection, plug-in (not included in scope of supply) or screw-stud depending on rated output current
- 1 safe standstill input (Enable Pulses)
- 1 safe motor brake control
- 1 temperature sensor input (KTY84-130 or PTC)
- 2 PE/protective conductor connections

The status of the Motor Modules is indicated via two multi-color LEDs.

The motor cable shield is inside the connector on 50 mm and 100 mm wide Motor Modules. A shield connection plate can be supplied for 150 mm, 200 mm and 300 mm wide Motor Modules. On these modules, the motor cable shield can be connected using a hose clip.

The signal cable shield can be connected to the Motor Module by means of a shield terminal, e.g. Weidmüller type KLBÜ 3-8 SC.

■ Design (continued)

The scope of supply of the Motor Modules includes:

- DRIVE-CLiQ cable appropriate to the width of the Motor Module for connection to the adjacent Motor Module, length = width of Motor Module + 0.06 m
- Jumper for connecting the 24 V DC busbar to the adjacent Motor Module
- Connector X21
- Connector X11 for the motor brake connection (for Motor Modules with a rated output current of 45 A to 200 A)
- 2 blanking plugs for sealing unused DRIVE-CLiQ sockets
- Fan insert for the 132 A and 200 A Motor Modules (the voltage for the fan insert is supplied by the Motor Module)
- 1 set of warning labels in 30 languages
- 1 heat conducting foil (for Motor Modules with cold plate cooling only)

■ Integration

The Single Motor Module receives its control information via DRIVE-CLiQ from:

- SINUMERIK 828D BASIC
- SINUMERIK 828D
 - Numeric Control Extensions NX10.3



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■ Technical specifications (continued)

Product name	Single Motor Module in booksize format					
Internal air cooling	6SL3120-...	1TE24-5AA3	1TE26-0AA3	1TE28-5AA3	1TE31-3AA3	1TE32-0AA4
External air cooling	6SL3121-...	1TE24-5AA3	1TE26-0AA3	1TE28-5AA3	1TE31-3AA3	1TE32-0AA4
Cold plate cooling	6SL3126-...	1TE24-5AA3	1TE26-0AA3	1TE28-5AA3	1TE31-3AA3	1TE32-0AA4
Liquid cooling	6SL3125-...	–	–	–	–	1TE32-0AA4
DC link voltage 510 ... 720 V DC						
Output current						
• Rated current I_{rated}	A	45	60	85	132 (105 ¹⁾)	200 (140 ¹⁾)
• Base-load current I_H	A	38	52	68	105 (84)	141 (99)
• For S6 duty I_{S6} (40 %)	A	60	80	110	150 (120)	230 (161)
• I_{max}	A	85	113	141	210	282
Rated pulse frequency	kHz	4	4	4	4	4
Power²⁾						
At 600 V						
DC link voltage						
• Rated power	kW	24	32	46	71 (57)	107 (75)
• Based on I_H	kW	21	28	37	57	76
DC link current $I_{d,d}$	A	54	72	102	158	200
Current carrying capacity						
• DC link busbars	A	200	200	200	200	200
• 24 V DC busbars	A	20	20	20	20	20
DC link capacitance	µF	1175	1410	1880	2820	3995
Current requirement	A	1.2	1.2	1.5	1.5	1.5
At 24 V DC, max.						
Internal/external air cooling						
• Power loss ⁴⁾						
- Maximum power loss with internal air cooling in control cabinet	kW	0.46	0.62	0.79	1.29	2.09
- Typical losses with internal air cooling in control cabinet ⁵⁾	kW	0.38	0.55	0.77	1.26	2.03
- With external air cooling, int./ext. ⁴⁾	kW	0.14/0.32	0.16/0.46	0.2/0.59	0.29/1.0	0.47/1.62
• Cooling air requirement	m ³ /s	0.031	0.031	0.044	0.144	0.144
• Sound pressure level L_{pA} (1 m)	dB	< 65	< 65	< 60	< 73	< 73
Cold plate cooling						
• Power loss, int./ext. ⁴⁾	kW	0.11/0.34	0.13/0.48	0.15/0.62	0.24/1.05	0.39/1.7
• Thermal resistance R_{th}	K/W	0.055	0.055	0.05	0.028	0.028

¹⁾ In the case of cold plate cooling, derating is necessary due to heat transfer to the external heatsink.

²⁾ Rated power of a typical standard asynchronous motor at 400 V 3 AC

³⁾ Rated DC link current for dimensioning an external DC connection.

⁴⁾ Power loss of Motor Module at rated power including losses of 24 V DC electronics power supply.

⁵⁾ At max. motor cable length 30 m, pulse frequency 4 kHz and DC link voltage 540 ... 600 V.



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Technical specifications (continued)

Product name	Single Motor Module in booksize format					
Internal air cooling	6SL3120-...	1TE24-5AA3	1TE26-0AA3	1TE28-5AA3	1TE31-3AA3	1TE32-0AA4
External air cooling	6SL3121-...	1TE24-5AA3	1TE26-0AA3	1TE28-5AA3	1TE31-3AA3	1TE32-0AA4
Cold plate cooling	6SL3126-...	1TE24-5AA3	1TE26-0AA3	1TE28-5AA3	1TE31-3AA3	1TE32-0AA4
Liquid cooling	6SL3125-...	–	–	–	–	1TE32-0AA4
DC link voltage 510 ... 720 V DC						
Liquid cooling¹⁾						
• Power loss, int./ext.	kW	–	–	–	–	0.39/1.7
- Rated volumetric flow for water at 70 kPa pressure drop ²⁾	l/min	–	–	–	–	8
- Volume of liquid, internal	ml	–	–	–	–	100
- Coolant temperature, max.						
- Without derating	°C	–	–	–	–	45
- With derating	°C	–	–	–	–	50
- Sound pressure level	dB	–	–	–	–	< 73
L_{pA} (1 m)						
Motor connection U2, V2, W2		M6 screw studs (X1)	M6 screw studs (X1)	M8 screw studs (X1)	M8 screw studs (X1)	M8 screw studs (X1)
• Conductor cross-section, max.	mm ²	2.5 ... 50	2.5 ... 50	2.5 ... 95, 2 × 35	2.5 ... 120, 2 × 50	2.5 ... 120, 2 × 50
Shield connection		See Accessories	See Accessories	See Accessories	See Accessories	See Accessories
PE connection		M6 screw	M6 screw	M6 screw	M8 screw	M8 screw
Motor brake connection		Plug-in connector (X11), 24 V DC, 2 A	Plug-in connector (X11), 24 V DC, 2 A	Plug-in connector (X11), 24 V DC, 2 A	Plug-in connector (X11), 24 V DC, 2 A	Plug-in connector (X11), 24 V DC, 2 A
Motor cable length, max.						
• Shielded	m	100	100	100	100	100
• Unshielded	m	150	150	150	150	150
Degree of protection		IP20	IP20	IP20	IP20	IP20
Dimensions						
• Width	mm	150	150	200	300	300
• Height	mm	380	380	380	380	380
- With fan ³⁾	mm	–	–	–	629	629
- With screwed fitting	mm	–	–	–	–	553 ¹⁾
• Depth						
- With internal air cooling	mm	270	270	270	270	270
- With external air cooling, on/behind mounting surface	mm	226/71	226/71	226/92	226/82	226/82
- With cold plate cooling	mm	226	226	226	226	226
- With liquid cooling	mm	–	–	–	–	226
Weight, approx.						
• With internal air cooling	kg	9	9	15	21	21
• With external air cooling	kg	13.2	13.4	17.2	27.2	30
• With cold plate cooling	kg	9.1	9.1	12.5	18	18
• With liquid cooling	kg	–	–	–	–	21

1) The coolant connections are located on the lower side of the components. All connection elements can be accessed using an appropriate tool. Thread type of water connections: Pipe thread ISO 228 G ½ B.

2) This value applies to water as coolant; for other coolants, refer to the 01/2012 Manual.

3) The fan is supplied with the Motor Module and must be installed before the Motor Module is commissioned.



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Booksize format – Motor Modules – Single Motor Modules

Selection and ordering data

Rated output current	Type rating kW	Single Motor Module in booksize format			
		Internal air cooling Article No.	External air cooling Article No.	Cold plate cooling Article No.	Liquid cooling Article No.
DC link voltage 510 ... 720 V DC					
3	1.6	6SL3120-1TE13-0AA4	6SL3121-1TE13-0AA4	6SL3126-1TE13-0AA4	–
5	2.7	6SL3120-1TE15-0AA4	6SL3121-1TE15-0AA4	6SL3126-1TE15-0AA4	–
9	4.8	6SL3120-1TE21-0AA4	6SL3121-1TE21-0AA4	6SL3126-1TE21-0AA4	–
18	9.7	6SL3120-1TE21-8AA4	6SL3121-1TE21-8AA4	6SL3126-1TE21-8AA4	–
30	16	6SL3120-1TE23-0AA3	6SL3121-1TE23-0AA3	6SL3126-1TE23-0AA3	–
45	24	6SL3120-1TE24-5AA3	6SL3121-1TE24-5AA3	6SL3126-1TE24-5AA3	–
60	32	6SL3120-1TE26-0AA3	6SL3121-1TE26-0AA3	6SL3126-1TE26-0AA3	–
85	46	6SL3120-1TE28-5AA3	6SL3121-1TE28-5AA3	6SL3126-1TE28-5AA3	–
132	71	6SL3120-1TE31-3AA3	6SL3121-1TE31-3AA3	6SL3126-1TE31-3AA3	–
200	107	6SL3120-1TE32-0AA4	6SL3121-1TE32-0AA4	6SL3126-1TE32-0AA4	6SL3125-1TE32-0AA4

4

Description	Article No.	Description	Article No.
Accessories		Accessories (continued)	
Power connector (X1) At Motor Module end, with screw-type terminals 1.5 ... 10 mm ² , For Motor Modules with rated output current of 3 ... 30 A	6SL3162-2MA00-0AA0	Reinforced DC link busbar set For replacement of DC link busbars for 5 modules in booksize format	
		• 50 mm wide	6SL3162-2DB00-0AA0
		• 100 mm wide	6SL3162-2DD00-0AA0
Shield connection plate For Line Modules and Motor Modules in booksize format		Warning labels in 30 languages This set of foreign language warning labels can be placed on top of the standard German or English signs. A set of labels is supplied with the units. One sign in each of the following languages is provided in each set: BG, CN, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, JP, KR, LT, LV, MT, NL, NO, PL, PT, RO, RU, SE, SI, SK, TR	6SL3166-3AB00-0AA0
• 150 mm wide for internal air cooling	6SL3162-1AF00-0AA1	Accessories for re-ordering	
• 150 mm wide for external air cooling and cold plate cooling	6SL3162-1AF00-0BA1	Accessories pack (plug-in terminals, DRIVE-CLiQ jumper, dust-proof blanking plugs) For DRIVE-CLiQ port	
• 200 mm wide for internal air cooling	6SL3162-1AH01-0AA0	• For Motor Modules 50 mm wide, int./ext. air cooling	6SL3162-8AB00-0AA0
• 200 mm wide for external air cooling and cold plate cooling	6SL3162-1AH01-0BA0	• For Motor Modules 100 mm wide, int./ext. air cooling	6SL3162-8BD00-0AA0
• 300 mm wide for all cooling types	6SL3162-1AH00-0AA0	• For Motor Modules 150 mm wide, int./ext. air cooling	6SL3162-8CF00-0AA0
DC link rectifier adapter For direct infeed of DC link voltage		• For Motor Modules 200 mm wide, int./ext. air cooling	6SL3162-8DH00-0AA0
• Screw-type terminals 0.5 ... 10 mm ² For Line Modules and Motor Modules in booksize format with a width of 50 mm or 100 mm	6SL3162-2BD00-0AA0	• For Motor Modules 300 mm wide, int./ext. air cooling	6SL3162-8EM00-0AA0
• Screw-type terminals 35 ... 95 mm ² For Line Modules and Motor Modules in booksize format with a width of 150 mm, 200 mm and 300 mm	6SL3162-2BM00-0AA0	SINAMICS/SINUMERIK/SIMOTION dust-proof blanking plugs (50 units) For DRIVE-CLiQ port	6SL3066-4CA00-0AA0
DC link adapter (2 units) For multi-tier configuration Screw-type terminals 35 ... 95 mm ² For all Line Modules and Motor Modules in booksize format	6SL3162-2BM01-0AA0		
24 V terminal adapter For all Line Modules/Motor Modules in booksize format	6SL3162-2AA00-0AA0		