

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6SL3120-1TE24-5AA1

45 A SINGLE MOTOR MODULE

Used with the applicable SINAMICS S120 configuration.

REFERENCE PACKAGE

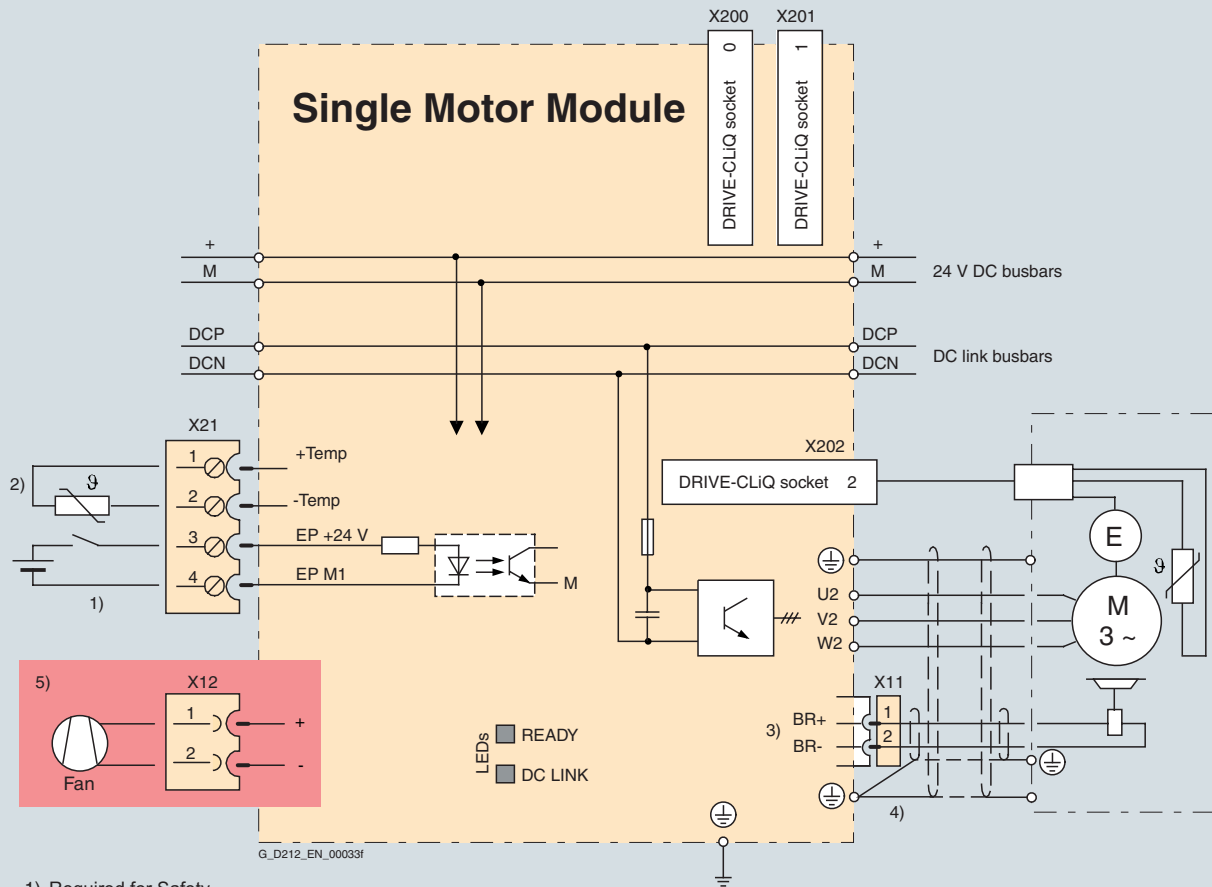
OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens D21.1 2006 English SINAMICS S120 Single Motor Modules, pp.2/107 to 2/111 (PDF pp.3 to 7)

Integration (continued)

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- 1) Required for Safety.
- 2) Temperature sensor terminal for motors without DRIVE-CLiQ interface.
- 3) The braking signal has an integrated overvoltage protection.
An external circuit of the holding brake is not necessary.
- 4) Contacting via shield plate.
- 5) Fan insert for 132 A and 200 A Single Motor Modules.
The fan insert is supplied with the Single Motor Module.

Connection example of Single Motor Modules in booksize format 45 A to 200 A

SINAMICS S120

Motor Modules

Single Motor Modules in booksize format

Technical data

General technical data

Electrical data	
DC link voltage (up to 2000 m (6563 ft) above sea level)	510 V to 720 V DC (line voltage 380 V to 480 V 3 AC)
max. output voltage, line-to-line (fundamental-wave RMS value)	0.67 x DC link voltage
Output frequency	
• Control type Servo	0 Hz to 650 Hz ¹⁾
• Control type Vector	0 Hz to 300 Hz ¹⁾
• Control type V/f	0 Hz to 300 Hz ¹⁾
Electronics power supply	24 V DC – 15%/+ 20%
Radio interference suppression	
• Standard	No radio interference suppression
• in combination with Line Module incl. line filter and line reactor	Class A1 to EN 55011 and Category C2 to EN 61800-3
Ambient conditions	
Type of cooling	Forced air cooling through built-in fan
Permissible ambient and coolant temperature (air) during operation for line-side components, Line Modules and Motor Modules	0 °C to + 40 °C (32 °F to + 104 °F) without derating, > 40 °C to + 55 °C (> 104 °F to + 131 °F) see derating characteristics
Site altitude	Up to 1000 m (1328 ft) above sea level without derating, > 1000 m (1328 ft) to 4000 m (13126 ft) above sea level see derating characteristics
Certificates	
Conformity	CE (low-voltage and EMC Directives)
Approvals	cULus (File No.: E192450)
Certification	Safety Integrity Level 2 (SIL 2) to IEC 61508, control category 3 to EN 954-1 for Safety Integrated – safe standstill (STO = Safe Torque Off) and safe brake control (SBC = Safe Brake Control)

¹⁾ Note correlation between max. output frequency, pulse frequency and current derating, see System Description.

SINAMICS S120

Motor Modules

Single Motor Modules in booksize format

Technical data (continued)

DC link voltage 510 V to 720 V DC		Single Motor Modules in booksize format				
Internal air cooling		6SL3120-1TE24-5AA1	6SL3120-1TE26-0AA1	6SL3120-1TE28-5AA1	6SL3120-1TE31-3AA0	6SL3120-1TE32-0AA0
Internal air cooling with varnished modules		6SL3120-1TE24-5AB0	6SL3120-1TE26-0AB0	6SL3120-1TE28-5AB0	6SL3120-1TE31-3AB0	6SL3120-1TE32-0AB0
External air cooling		6SL3121-1TE24-5AA0	6SL3121-1TE26-0AA0	6SL3121-1TE28-5AA0	6SL3121-1TE31-3AA0	6SL3121-1TE32-0AA0
Rated output current I_{rated}	A	45	60	85	132	200
Base load current I_H	A	38	52	68	105	141
Output current for S6 duty (40%) I_{S6}	A	60	80	110	150	230
Max. output current I_{max}	A	85	113	141	210	282
Rated pulse frequency	kHz	4	4	4	4	4
Rated power for 600 V DC link voltage	kW (HP)	24 (30)	32 (40)	46 (60)	71 (100)	107 (150)
Power based on I_H 600 V DC link voltage	kW (HP)	21 (25)	28 (40)	37 (50)	57 (75)	76 (100)
DC link current $I_d^{1)}$	A	54	72	102	158	200
DC link busbar current capacity	A	100	100	200	200	200
DC link capacitance	μF	1175	1410	1880	2820	3995
Max. current requirement at 24 V DC	A	1.2	1.2	1.5	1.5	1.5
24 V DC busbar current capacity	A	20	20	20	20	20
If, due to a number of Line and Motor Modules being mounted side-by-side, the current carrying capacity exceeds 20 A, an additional 24 V DC connection using a 24 V terminal adapter is required (max. cross section 6 mm ² , max. fuse protection 20 A).						
Efficiency η		0.97	0.97	0.97	0.97	0.97
Power loss with internal air cooling in control cabinet	kW	0.43	0.59	0.75	1.25	2.05
Power loss ²⁾ with external air cooling int./ext.	kW	0.11/0.32	0.135/0.455	0.16/0.59	0.25/1.0	0.4/1.65
Cooling air requirement	m ³ /s (ft ³ /s)	0.031 (1.095)	0.031 (1.095)	0.044 (1.554)	0.144 (5.085)	0.144 (5.085)
Sound pressure level	dB(A)	< 65	< 65	< 60	< 73	< 73
Motor connection U2, V2, W2		M6 screw studs, 2.5 mm ² to 50 mm ² (X1)	M6 screw studs, 2.5 mm ² to 50 mm ² (X1)	M8 screw studs, 2.5 mm ² to 95 mm ² , 2 × 35 mm ² (X1)	M8 screw studs, 2.5 mm ² to 120 mm ² , 2 × 50 mm ² (X1)	M8 screw studs, 2.5 mm ² to 120 mm ² , 2 × 50 mm ² (X1)
Shield connection		see Accessories	see Accessories	see Accessories	see Accessories	see Accessories
PE connection		On housing with M6 screw	On housing with M6 screw	On housing with M6 screw	On housing with M8 screw	On housing with 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
Max. motor cable length	m (ft)	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded	1100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded
Degree of protection		IP20	IP20	IP20	IP20	IP20
Width	mm (inch)	150 (5.91)	150 (5.91)	200 (7.87)	300 (11.81)	300 (11.81)
Height	mm (inch)	380 (14.96)	380 (14.96)	380 (14.96)	380, (14.96) with fan ³⁾ ; 629 (24.8)	380, (14.96) with fan ³⁾ ; 629 (24.8)
Depth with internal air cooling	mm (inch)	270 (10.63)	270 (10.63)	270 (10.63)	270 (10.63)	270 (10.63)
Depth with external air cooling on/behind mounting surface	mm (inch)	226/71 (8.9/2.8)	226/71 (8.9/2.8)	226/92 (8.9/3.6)	226/82 (8.9/3.2)	226/82 (8.9/3.2)
Approx. weight with internal air cooling	kg (lb)	9 (20)	9 (20)	15 (33)	21 (46)	21 (46)
Approx. weight with external air cooling	kg (lb)	13.2 (29)	13.4 (30)	17.2 (38)	27.2 (60)	30 (66)

¹⁾ Rated DC link current for dimensioning an external DC connection. For DC link current calculation for dimensioning the Line Module, see System Description.

²⁾ Power loss of Motor Module at rated output without losses of 24 V DC electronics power supply.

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

Selection and ordering data

Rated output current	Rated power	Single Motor Module in booksize format		
		Internal air cooling	Internal air cooling with varnished modules	External air cooling
A	kW (HP) ¹⁾	Order No.	Order No.	Order No.
DC link voltage 510 V to 720 V DC				
3	1.6 (1.5)	6SL3120-1TE13-0AA0	6SL3120-1TE13-0AB0	6SL3121-1TE13-0AA0
5	2.7 (3)	6SL3120-1TE15-0AA0	6SL3120-1TE15-0AB0	6SL3121-1TE15-0AA0
9	4.8 (5)	6SL3120-1TE21-0AA1	6SL3120-1TE21-0AB0	6SL3121-1TE21-0AA0
18	9.7 (10)	6SL3120-1TE21-8AA1	6SL3120-1TE21-8AB0	6SL3121-1TE21-8AA0
30	16 (20)	6SL3120-1TE23-0AA1	6SL3120-1TE23-0AB0	6SL3121-1TE23-0AA0
45	24 (30)	6SL3120-1TE24-5AA1	6SL3120-1TE24-5AB0	6SL3121-1TE24-5AA0
60	32 (40)	6SL3120-1TE26-0AA1	6SL3120-1TE26-0AB0	6SL3121-1TE26-0AA0
85	46 (60)	6SL3120-1TE28-5AA1	6SL3120-1TE28-5AB0	6SL3121-1TE28-5AA0
132	71 (100)	6SL3120-1TE31-3AA0	6SL3120-1TE31-3AB0	6SL3121-1TE31-3AA0
200	107 (150)	6SL3120-1TE32-0AA0	6SL3120-1TE32-0AB0	6SL3121-1TE32-0AA0

Accessories

Description	Order No.
Power connector (X1) At Motor Module end, with screw-type terminals 1.5 mm ² to 10 mm ² , for Motor Modules with a rated output current of 3 to 30 A	6SL3162-2MA00-0AA0
Shield connection kit for Line/Motor Modules in booksize format • 150 mm (5.91 in) wide for internal air cooling • 150 mm (5.91 in) wide for external air cooling • 200 mm (7.87 in) wide for internal air cooling • 200 mm (7.87 in) wide for external air cooling • 300 mm (11.81 in) wide	6SL3162-1AF00-0AA1 6SL3162-1AF00-0BA0 6SL3162-1AH01-0AA0 6SL3162-1AH01-0BA0 6SL3162-1AH00-0AA0
DC link supply adapter for direct infeed of DC link voltage • Screw-type terminals 0.5 mm² to 10 mm² for Line Modules and Motor Modules in booksize format with a width of 50 mm (1.97 in) or 100 mm (3.84 in) • Screw-type terminals 35 mm² to 95 mm² for Line Modules and Motor Modules in booksize format with a width of 150 mm (5.91 in), 200 mm (7.87 in) and 300 mm (11.81 in)	6SL3162-2BD00-0AA0 6SL3162-2BM00-0AA0
DC link adapters (2x) for multi-tier configuration Screw-type terminals 35 mm ² to 95 mm ² for all Line Modules/Motor Modules in booksize format	6SL3162-2BM01-0AA0
24 V terminal adapter for all Line Modules/Motor Modules in booksize format	6SL3162-2AA00-0AA0
24 V jumper for connection of the 24 V busbars (for booksize format)	6SL3162-2AA01-0AA0
Warning signs in foreign languages This set of foreign language warning signs can be placed on top of the standard German or English signs. One sign in each of the following languages is provided in each set: Chinese Simplified, Danish, Dutch, Finnish, French, Greek, Italian, Japanese, Korean, Portuguese, Spanish and Swedish.	6SL3166-3AB00-0AA0
Plug-in motor brake connector for booksize format Motor Modules with a rated output current of 45 A to 200 A Wago http://www.wago.com	Item No.: 231-102/037-000 (Wago)

¹⁾ Nominal HP based on Asynchronous motors (induction motors).
Match the motor nameplate current for specific sizing.