

# SINAMICS S120 drive system

## Booksize format for Line and Motor Modules

### Active Line Modules in booksize format

#### Overview



The self-commutated feed/feedback units (with IGBTs in infeed and regenerative feedback directions) generate a regulated DC link voltage. This means that the connected Motor Modules are decoupled from the line voltage. Line voltage fluctuations within the permissible supply tolerances have no effect on the motor voltage. Active Line Modules are designed for connection to grounded-neutral (TN, TT) and non-grounded (IT) supply systems.

The DC link is pre-charged via integrated precharging resistors.

In order to operate an Active Line Module, it is absolutely essential to use the appropriate Active Interface Module or matching line reactor.

#### Design

The Active Line Modules in booksize format feature the following interfaces as standard:

- 1 line connection via screw-type terminals
- 1 connection for the 24 V DC electronics power supply via the 24 V terminal adapter included in the scope of supply
- 1 DC link connection via integrated DC link busbars
- 3 DRIVE-CLiQ sockets
- 2 PE (protective earth) connections

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

On the 100 mm (3.94 in) wide Active Line Module, the shield for the power supply cable can be connected to the integrated shield connection plate via a shield connection terminal or tube clip, e.g. Weidmüller type KLBÜ CO 4. The shield connection terminal must not be used for strain relief. Shield connection plates are available for the 150 mm (5.91 in), 200 mm (7.87 in) and 300 mm (11.81 in) wide modules.

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

#### Design (continued)

The scope of supply of the Active Line Modules includes:

- DRIVE-CLiQ cable for connection to the Control Unit for drive control on the immediate left
- DRIVE-CLiQ cable (length depends on module width) to connect Active Line Module to adjacent Motor Module
- 2 blanking plugs for sealing unused DRIVE-CLiQ sockets
- Jumper for connecting the 24 V DC busbar to the adjacent Motor Module
- 24 V terminal adapter
- Connector X21 for digital inputs
- Fan insert for the 80 kW (100 HP) and 120 kW (150 HP) Active Line Modules is supplied with the modules. The voltage for the fan insert is supplied by the Active Line Module.
- 1 set of warning signs in foreign languages

#### Integration

The Active Line Module communicates via DRIVE-CLiQ with the CU320 Control Unit, SINUMERIK 802D sl, SINUMERIK 840D sl with NCU 710.1/NCU 720.2/NCU 730.1/NCU 730.2 PN or with the Numeric Control Extensions NX10/NX15 and receives its control information from these sources.

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## Booksize format for Line and Motor Modules

### Active Line Modules in booksize format

#### Technical specifications

##### General technical specifications

<b>Line connection voltage</b> Up to 2000 m (6562 ft) above sea level	380 ... 480 V 3 AC ± 10% (-15% < 1 min)
<b>Line frequency</b>	47 ... 63 Hz
<b>Power factor</b>	
• Active mode	
- Fundamental power factor (cos $\phi$ 1)	1.0 (factory setting), can be altered by input of a reactive current setpoint
- Total ( $\lambda$ )	1.0 (factory setting)
• Smart mode	
- Fundamental mode	> 0.96
- Total	0.65 ... 0.90
<b>DC link voltage <math>V_d</math></b>	In Active Mode, the DC link voltage is regulated and can be adjusted as a voltage decoupled from the line voltage.  In Smart Mode, the DC link voltage is regulated in proportion to the line voltage to the mean rectified line voltage value.  Factory setting for DC link voltage: 380 ... 400 V 3 AC: 600 V (Active Mode) 400 ... 415 V 3 AC: 625 V (Active Mode) 416 ... 480 V 3 AC: 1.35 x line voltage (Smart Mode)
<b>Electronics power supply</b>	24 V DC -15%/+20%
<b>Radio interference suppression</b>	
• Active Line Module 16 kW (18 HP) and 36 kW (40 HP)	
- Standard (Active Line Module + line reactor)	no radio interference suppression
- with line filter package	Class A1 to EN 55011 and Category C2 to EN 61800-3
• Active Line Module 55 kW (60 HP), 80 kW (100 HP) and 120 kW (150 HP)	
- Standard (Active Line Module + Active Interface Module)	Category C3 to EN 61800-3 up to 350 m (1148 ft) total cable length
- with Basic Line Filter	Class A1 to EN 55011 and Category C2 to EN 61800-3 up to 350 m (1148 ft) total cable length Category C3 to EN 61800-3 from 350 m to 1000 m (1148 ft to 3281 ft) total cable length

##### General technical specifications (continued)

<b>Type of cooling</b>	Internal air cooling, power units with increased air cooling provided by integrated fan Built-on fan (with 80 kW (100 HP) and 120 kW (150 HP) Active Line Modules).
<b>Permissible ambient or coolant temperature (air)</b> in operation for line-side components, Line Modules and Motor Modules	0 ... 40 °C (32 ... 104 °F) without derating, > 40 ... 55 °C (104 ... 131 °F), see derating characteristics
<b>Installation altitude</b>	Up to 1000 m (3281 ft) above sea level without derating, > 1000 ... 4000 m (3281 ... 13124 ft) above sea level, see derating characteristics
<b>Conformity</b>	CE (low-voltage and EMC directives)
<b>Approvals</b>	cULus (File No.: E192450)

# SINAMICS S120 drive system

## Booksized format for Line and Motor Modules

### Active Line Modules in booksized format

#### Technical specifications (continued)

Line voltage 380 ... 480 V 3 AC

#### Order No.

- Internal air cooling
- External air cooling

	6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
• Internal air cooling					
• External air cooling					

#### Product name

Active Line Modules in booksized format

#### Feed/feedback power

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
• Rated power $P_{rated}$	kW	16	36	55	80	120
- with 380 V 3 AC	(HP)	(18)	(40)	(60)	(100)	(150)
- with 460 V 3 AC <sup>4)</sup>	kW	21	47	71	106	158
• for S6 duty (40%) $P_{S6}$	kW	35	70	91	131	175
• $P_{max}$	kW	27	60	92	134	200
• $P_{max, maximum}$	kW					

#### DC link current

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
• at 600 V DC	V	35	79	121	176	244
• for S6 duty (40%)	A	59	117	152	218	292

#### Input current

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
• Rated current at 380 V 3 AC	A	26	58	88	128	192
• for S6 duty (40%)	A	35	79	121	176	244
• Maximum	A	59	117	152	195	292

#### Current requirement

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
24 V DC electronics power supply, max.	A	1.1	1.5	1.9	2.0	2.5

#### Current capacity

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
• of 24 V DC busbars	A	20	20	20	20	20
• DC link busbars	A	100	200	200	200	200

#### DC link capacitance

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
• Smart Line Module	μF	710	1410	1880	2820	3995
• Drive group, max.	μF	20000	20000	20000	20000	20000

#### Efficiency $\eta$

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
		0.98	0.98	0.98	0.98	0.98

#### Power loss<sup>1)</sup>

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
• with internal air cooling	kW	0.26	0.63	0.90	1.35	2.20
• with external air cooling int./ext.	kW	0.06/0.2	0.135/0.495	0.2/0.7	0.305/1.045	0.49/1.71

#### Cooling air requirement

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
	m <sup>3</sup> /s (ft <sup>3</sup> /s)	0.016 (0.565)	0.031 (1.095)	0.044 (1.554)	0.144 (5.085)	0.144 (5.085)

#### Sound pressure level

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
	dB (A)	< 60	< 65	< 60	< 75	< 75

#### Line connection

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
U1, V1, W1		Screw-type terminals (X1)	M6 screw studs for ring terminal ends (X1)	M8 screw studs for ring terminal ends (X1)	M8 screw studs for ring terminal ends (X1)	M8 screw studs for ring terminal ends (X1)
• Conductor cross-section	mm <sup>2</sup>	2.5 ... 10	2.5 ... 50	2.5 ... 95, 2 x 35	2.5 ... 120, 2 x 50	2.5 ... 120, 2 x 50

#### Shield connection

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
		Integrated into the connector	See Accessories	See Accessories	See Accessories	See Accessories

#### PE connection

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
		On housing with M5 screw	On housing with M6 screw	On housing with M6 screw	On housing with M8 screw	On housing with M8 screw

#### Cable length, max.

(total of all motor cables and DC link)

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
• Shielded	m (ft)	350 <sup>3)</sup> (1150)	350 <sup>3)</sup> (1150)	1000 (3281)	1000 (3281)	1000 (3281)
• Unshielded	m (ft)	560 <sup>3)</sup> (1840)	560 <sup>3)</sup> (1840)	1500 (4922)	1500 (4922)	1500 (4922)

#### Degree of protection

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
		IP20	IP20	IP20	IP20	IP20

#### Dimensions

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
• Width	mm (in)	100 (3.94)	150 (5.91)	200 (7.87)	300 (11.81)	300 (11.81)
• Height	mm (in)	380 (14.96)	380 (14.96)	380 (14.96)	380, (14.96) with fan <sup>2)</sup> : 629 (24.8)	380, (14.96) with fan <sup>2)</sup> : 629 (24.8)
• Depth						
- with internal air cooling	mm (in)	270 (10.63)	270 (10.63)	270 (10.63)	270 (10.63)	270 (10.63)
- with external air cooling on/behind mounting surface	mm (in)	226/66.5 (8.9/2.6)	226/71 (8.9/2.8)	226/92 (8.9/3.6)	226/82 (8.9/3.2)	226/82 (8.9/3.2)

#### Weight

		6SL3130-7TE21-6AA3	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
• with internal air cooling, approx.	kg (lb)	7 (15)	10.3 (23)	17 (38)	23 (51)	23 (51)
• with external air cooling, approx.	kg (lb)	8.8 (19)	13.8 (30)	18.5 (41)	27.7 (61)	30.7 (68)

<sup>1)</sup> Power loss of Active Line Module at rated power without losses of 24 V DC electronics power supply.

<sup>2)</sup> The fan is supplied with the Active Line Module and must be installed before the Active Line Module is commissioned.

<sup>3)</sup> Max. cable lengths in conjunction with HFD line reactors, see derating characteristics.

<sup>4)</sup> Nominal HP ratings are provided for ease of assigning components only. The Line Module power is dependent on the Motor Module loading and is to be dimensioned accordingly.

# SINAMICS S120 drive system

## Booksize format for Line and Motor Modules

### Active Line Modules in booksize format

#### Selection and Ordering Data

Rated infeed power	Active Line Module in booksize format	
	Internal air cooling	External air cooling
	Order No.	Order No.
Line voltage 380 ... 480 V 3 AC		
16 kW (18 HP)	<b>6SL3130-7TE21-6AA3</b>	<b>6SL3131-7TE21-6AA3</b>
36 kW (40 HP)	<b>6SL3130-7TE23-6AA3</b>	<b>6SL3131-7TE23-6AA3</b>
55 kW (60 HP)	<b>6SL3130-7TE25-5AA3</b>	<b>6SL3131-7TE25-5AA3</b>
80 kW (100 HP)	<b>6SL3130-7TE28-0AA3</b>	<b>6SL3131-7TE28-0AA3</b>
120 kW (150 HP)	<b>6SL3130-7TE31-2AA3</b>	<b>6SL3131-7TE31-2AA3</b>

#### Accessories

Designation	Order No.
<b>Shield connection kit</b> For Line Modules and Motor Modules in booksize format <ul style="list-style-type: none"> <li>• 150 mm (5.91 in) wide for internal air cooling</li> <li>• 150 mm (5.91 in) wide for external air cooling</li> <li>• 200 mm (7.87 in) wide for internal air cooling</li> <li>• 200 mm (7.87 in) wide for external air cooling</li> <li>• 300 mm (11.81 in) wide for internal/external air cooling</li> </ul>	<b>6SL3162-1AF00-0AA1</b>  <b>6SL3162-1AF00-0BA0</b>  <b>6SL3162-1AH01-0AA0</b>  <b>6SL3162-1AH01-0BA0</b>  <b>6SL3162-1AH00-0AA0</b>
<b>DC link rectifier adapter</b> For direct infeed of DC link voltage <ul style="list-style-type: none"> <li>• Screw-type terminals 0.5 ... 10 mm<sup>2</sup> for Line Modules and Motor Modules in booksize format with a width of 50 mm (1.97 in) or 100 mm (3.94 in)</li> <li>• Screw-type terminals 35 ... 95 mm<sup>2</sup> for Line Modules and Motor Modules in booksize format with a width of 150 mm, 200 mm and 300 mm (5.91 in, 7.87 in and 11.81 in)</li> </ul>	<b>6SL3162-2BD00-0AA0</b>  <b>6SL3162-2BM00-0AA0</b>
<b>DC link adapters</b> (2 units) For multi-tier configuration Screw-type terminals 35 ... 95 mm <sup>2</sup> For all Line Modules and Motor Modules in booksize format	<b>6SL3162-2BM01-0AA0</b>
<b>24 V terminal adapter</b> For all Line Modules and Motor Modules in booksize format	<b>6SL3162-2AA00-0AA0</b>
<b>24 V jumper</b> For connection of the 24 V busbars (for booksize format)	<b>6SL3162-2AA01-0AA0</b>
<b>Warning signs in foreign languages</b> This set of foreign language warning signs can be placed on top of the standard English or German signs. A set of signs is supplied with the units. One sign in each of the following languages is provided in each set: Chinese, Czech, Danish, Dutch, Finnish, French, Greek, Italian, Japanese, Korean, Polish, Portuguese, Russian, Spanish, Swedish and Turkish.	<b>6SL3166-3AB00-0AA0</b>

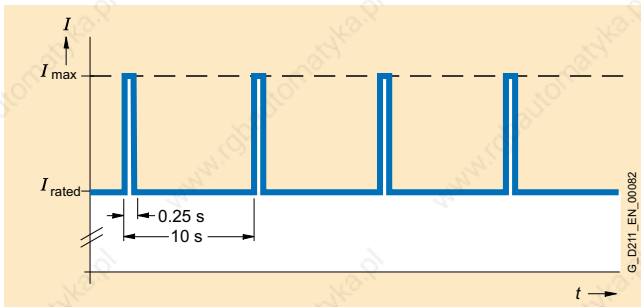
# SINAMICS S120 drive system

## Booksize format for Line and Motor Modules

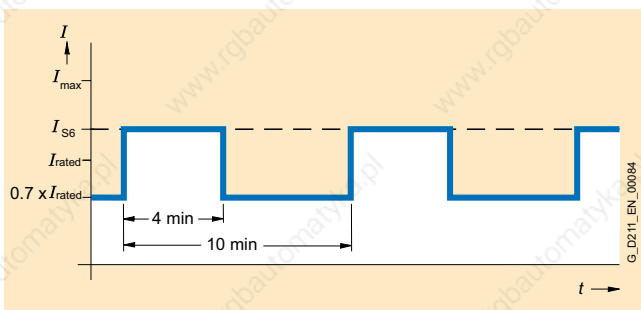
Active Line Modules in booksize format

### Characteristic curves

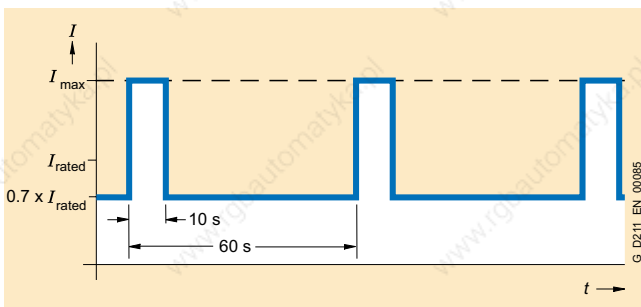
#### Overload capability



Duty cycle with previous load

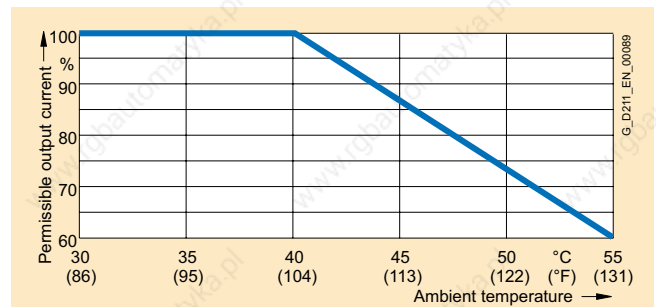


S6 duty cycle with previous load

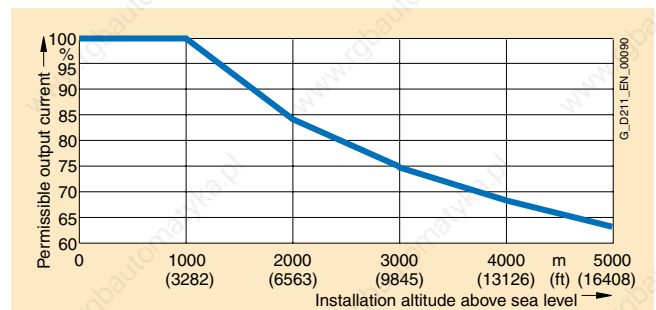


S6 duty cycle with previous load

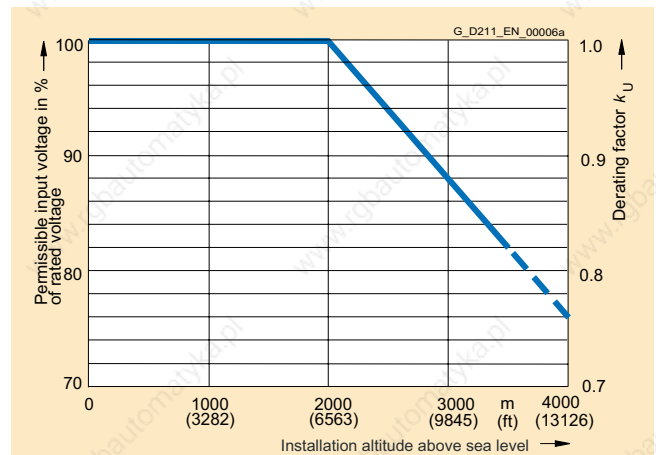
#### Derating characteristics



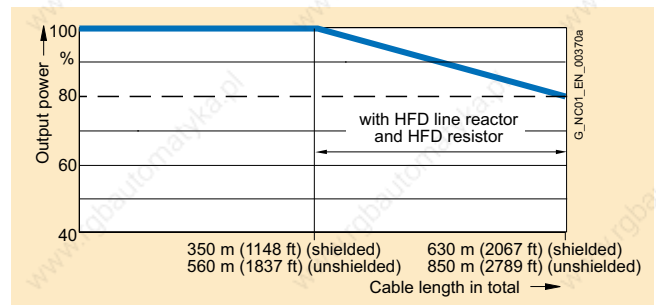
Output power dependent on ambient temperature



Output power dependent on installation altitude



Voltage derating dependent on installation altitude



Output power with Active Line Module dependent on total cable length

# SINAMICS S120 drive system

## Booksize format for Line and Motor Modules

### Active Line Modules in booksize format HF/HFD line reactors

#### Overview



Line reactors with HF properties are essential for operation of Active Line Modules. The use of other makes of line reactor can lead to malfunctions or irreparable damage to equipment.

The HFD line reactors must be used in combination with the HFD resistor (or alternatively the braking resistor Plus, see braking resistors for booksize format) when there are direct drives in the drive group, such as linear motors, torque motors, spindle motors as well as non-Siemens motors, or when resonant effects are to be expected. The risk of failures due to premature ageing of drive components can be reduced in this way.

#### Benefits

- Limitation of mains and HF harmonic effects
- Stores energy for boosting voltage for step-up converter mode at high frequency with Active Line Modules

#### Application

HF/HFD line reactors can be used for 400 V 3 AC -10% to 480 V 3 AC +10%; 50/60 Hz  $\pm$ 10%.

#### Selection and Ordering Data

Rated infeed power of the Active Line Module	Suitable for Active Line Module	HF line reactor
	Order No.	Order No.
Line voltage 380 ... 480 V 3 AC		
16 kW (18 HP)	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	<b>6SN1111-0AA00-0BA1</b>
36 kW (40 HP)	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	<b>6SN1111-0AA00-0CA1</b>
55 kW (60 HP)	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	<b>6SN1111-0AA00-0DA1</b>
80 kW (100 HP)	6SL3130-7TE28-0AA3 6SL3131-7TE28-0AA3	<b>6SN1111-0AA00-1EA0</b>
120 kW (150 HP)	6SL3130-7TE31-2AA3 6SL3131-7TE31-2AA3	<b>6SL3000-0DE31-2BA0</b>

#### Technical specifications

Line voltage 380 ... 480 V 3 AC

Order No.	6SN1111-0AA00-0BA1	6SN1111-0AA00-0CA1	6SN1111-0AA00-0DA1	6SN1111-0AA00-1EA0	6SL3000-0DE31-2BA0
<b>Product name</b>	HF line reactor				
<b>Rated current</b>	A 30	67	103	150	225
<b>Power loss</b>	kW 0.17	0.25	0.35	0.45	0.59
<b>Line/load connection</b>	Screw-type terminals 16 mm <sup>2</sup>	Screw-type terminals 35 mm <sup>2</sup>	Screw-type terminals 70 mm <sup>2</sup>	M10 connection lugs	M10 connection lugs
<b>PE connection</b>	Screw-type terminals 16 mm <sup>2</sup>	Screw-type terminals 35 mm <sup>2</sup>	Screw-type terminals 70 mm <sup>2</sup>	M10 connection lugs	M10 connection lugs
<b>Degree of protection</b>	IP20	IP20	IP20	IP00	IP00
<b>Dimensions</b>					
• Width	mm (in) 150 (5.91)	150 (5.91)	150 (5.91)	225 (8.86)	275 (10.83)
• Height	mm (in) 125 (4.92)	217 (8.54)	277 (10.91)	220 (8.66)	265 (10.43)
• Length	mm (in) 330 (12.99)	330 (12.99)	330 (12.99)	380 (14.96)	480 (18.90)
<b>Weight, approx.</b>	kg (lb) 13 (28.67)	20 (44.10)	27 (59.54)	35 (77.18)	67 (147.74)
<b>Approvals</b>	cURus (File No.: E257852)	cURus (File No.: E257852)	cURus (File No.: E257852)	cURus (File No.: E257852)	cURus (File No.: E257852)
<b>Suitable for Active Line Module in booksize format</b>	Type 6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	6SL3130-7TE28-0AA3 6SL3131-7TE28-0AA3	6SL3130-7TE31-2AA3 6SL3131-7TE31-2AA3
• Rated infeed power of the Active Line Module	kW (HP) 16 (18)	36 (40)	55 (60)	80 (100)	120 (150)

# SINAMICS S120 drive system

## Booksize format for Line and Motor Modules

Active Line Modules in booksize format  
HF/HFD line reactors

### Technical specifications (continued)

Line voltage 380 ... 480 V 3 AC

Order No.	6SL3000-0DE21-6AA0	6SL3000-0DE23-6AA0	6SL3000-0DE25-5AA0	6SL3000-0DE28-0AA0	6SL3000-0DE31-2AA0	
<b>Product name</b>	HFD line reactor					
<b>Rated current</b>	A	30	67	103	150	225
<b>Power loss</b>	kW	0.17	0.25	0.35	0.45	0.59
<b>Line/load connection</b> 1U1, 1V1, 1W1/ 1U2, 1V2, 1W2	Screw-type terminals 16 mm <sup>2</sup>	Screw-type terminals 35 mm <sup>2</sup>	Screw-type terminals 70 mm <sup>2</sup>	M10 connection lugs	M10 connection lugs	
<b>PE connection</b>	Screw-type terminals 16 mm <sup>2</sup>	Screw-type terminals 35 mm <sup>2</sup>	Screw-type terminals 70 mm <sup>2</sup>	M10 connection lugs	M10 connection lugs	
<b>Degree of protection</b>	IP20	IP20	IP20	IP00	IP00	
<b>Dimensions</b>						
• Width	mm (in)	150 (5.91)	150 (5.91)	150 (5.91)	200 (7.87)	275 (10.83)
• Height	mm (in)	125 (4.92)	235 (9.25)	290 (11.42)	210 (8.27)	265 (10.43)
• Length	mm (in)	330 (12.99)	330 (12.99)	330 (12.99)	380 (14.96)	480 (18.90)
<b>Weight, approx.</b>	kg (lb)	13 (29)	21 (46)	27 (60)	37 (82)	67 (148)
<b>Suitable for Active Line Module in booksize format</b>	Type	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	6SL3130-7TE28-0AA3 6SL3131-7TE28-0AA3	6SL3130-7TE31-2AA3 6SL3131-7TE31-2AA3
• Rated infeed power of the Active Line Module	kW (HP)	16 (18)	36 (40)	55 (60)	80 (100)	120 (150)

### Selection and Ordering Data

Rated infeed power of the Active Line Module	Suitable for Active Line Module	HFD line reactor
	Order No.	Order No.
Line voltage 380 ... 480 V 3 AC		
16 kW (18 HP)	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	<b>6SL3000-0DE21-6AA0</b>
36 kW (40 HP)	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	<b>6SL3000-0DE23-6AA0</b>
55 kW (60 HP)	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	<b>6SL3000-0DE25-5AA0</b>
80 kW (100 HP)	6SL3130-7TE28-0AA3 6SL3131-7TE28-0AA3	<b>6SL3000-0DE28-0AA0</b>
120 kW (150 HP)	6SL3130-7TE31-2AA3 6SL3131-7TE31-2AA3	<b>6SL3000-0DE31-2AA0</b>

### HFD line reactor

For vibration damping, the HFD line reactor must be used in combination with the HFD resistor.

### Technical specifications

Order No.	6SL3100-1BE21-3AA0
<b>Product name</b>	HFD resistor 15R 800 W for HFD line reactor only
<b>Power</b>	0.8 kW
<b>Dimensions</b>	
• Width	270 mm (10.6 in)
• Height	75 mm (2.95 in)
• Depth	555 mm (21.8 in)
<b>Degree of protection to EN 60529 (IEC 60529)</b>	IP51
<b>Connecting cable</b> Included in scope of supply	5 m (16.4 ft)

### Selection and Ordering Data

Designation	Order No.
<b>HFD resistor 15R 800 W</b> Suitable for all HFD line reactors	<b>6SL3100-1BE21-3AA0</b>

# SINAMICS S120 drive system

## Booksize format for Line and Motor Modules

### Active Line Modules in booksize format

#### Line filters

#### Overview



In plants which have strict EMC requirements, line filters work together with line reactors to restrict the conducted interference emanating from the power modules to the limit values of Class A1 as defined in EN 55011 and Category C2 as defined in EN 61800-3. Line filters are suited only for direct connection to TN (grounded) systems.

Optional line filter ranges that are coordinated with the power range are available for the SINAMICS S120 drive system:

- Wideband Line Filters
- Basic Line Filters

These line filters differ with regard to the frequency range in which they reduce the conducted emissions.

#### Note:

According to product standard IEC 61800-3 or EN 50370-1, radio interference suppression commensurate with the relevant operating conditions must be provided and is a legal requirement in the EU (EMC Directive). Line filters and line reactors are required for this purpose. The use of filters of other makes can lead to limit value violations, resonance, overvoltages and irreparable damage to motors or other equipment. The machine manufacturer must provide verification that the machinery to be operated with the drive products and the installed suppression elements, e.g. line filters, are CE/EMC-compliant before the machines are approved for delivery.



# SINAMICS S120 drive system

## Booksize format for Line and Motor Modules

Active Line Modules in booksize format  
Line filters – Wideband Line Filters/Adapter set

### Overview



The damping characteristics of Wideband Line Filters for 16 kW and 36 kW (18 HP and 40 HP) Active Line Modules not only conform with the requirements of EMC standards for the frequency range of 150 kHz to 30 MHz but also include low frequencies of 2 kHz and above. As a result, these line filters have an extended functional range, allowing a certain independence with respect to the machine installation location in cases where the line properties are generally unknown (e.g., line impedance).

Line filter packages are available for Active Line Modules in booksize format. These line filter packages that must be installed by the customer comprise a Wideband Line Filter and an HF/HFD commutating reactor.

#### Note:

Radio interference suppression is required in accordance with EMC standards (product standard IEC 61800-3, EN 61800-3; VDE 0160 T 100). In the EU, this is mandatory by law. The line filter packages consisting of commutating reactor and line filter are required for this purpose. The Wideband Line Filter with the commutating reactor forms a unit specially matched to the step-up converter principle of the Active Line Modules. Use of other filters can lead to exceeding of limit values, resonances, over-voltages and irreparable damage to motor or other equipment.

### Technical specifications

Line voltage 380 ... 480 V 3 AC

Order No.		6SL3000-0FE21-6AA0	6SL3000-0FE23-6AA0	6SL3000-0FE25-5AA0	6SL3000-0FE28-0AA0	6SL3000-0FE31-2AA1
<b>Product name</b>		Wideband Line Filter included in each line filter package				
<b>Rated current</b>	A	30	67	103	150	225
<b>Power loss</b>	kW	0.07	0.09	0.11	0.15	0.20
<b>Line/load connection</b> L1, L2, L3/U, V, W		Screw-type terminals 10 mm <sup>2</sup>	Screw-type terminals 50 mm <sup>2</sup>	Screw-type terminals 50 mm <sup>2</sup>	Screw-type terminals 95 mm <sup>2</sup>	M10 connection lugs
<b>PE connection</b>		On housing with M5 bolt	On housing with M8 bolt	On housing with M8 bolt	On housing with M8 bolt	On housing with M8 bolt
<b>Degree of protection</b>		IP20	IP20	IP20	IP20	IP00
<b>Dimensions</b>						
• Width	mm (in)	130 (5.12)	130 (5.12)	130 (5.12)	200 (7.87)	300 (11.81)
• Height	mm (in)	480 (18.9)	480 (18.9)	480 (18.9)	480 (18.9)	480 (18.9)
• Depth	mm (in)	150 (5.91)	245 (9.65)	260 (10.24)	260 (10.24)	260 (10.24)
<b>Weight, approx.</b>	kg (lb)	9 (20)	16 (35)	19 (42)	22 (49)	32 (71)
<b>Approvals</b>		cURus	cURus	cURus	cURus	cURus
<b>Suitable for Active Line Module in booksize format</b>	Type	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	6SL3130-7TE28-0AA3 6SL3131-7TE28-0AA3	6SL3130-7TE31-2AA3 6SL3131-7TE31-2AA3
• Rated infeed power of the Active Line Module	kW (HP)	16 (18)	36 (40)	55 (60)	80 (100)	120 (150)

# SINAMICS S120 drive system

## Booksized format for Line and Motor Modules

### Active Line Modules in booksized format

#### Line filters – Wideband Line Filters/Adapter set

#### Selection and Ordering Data

Line filters for Active Line Modules in booksized format should be ordered in combination with the appropriate line reactor as a line filter package. The order number for the line filter package includes the Wideband Line Filter and the line reactor.

Rated infeed power of the Active Line Module	Suitable for Active Line Module Order No.	<b>HF line filter package</b> Wideband Line Filter and HF line reactor Order No.
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Line voltage 380 ... 480 V 3 AC

16 kW (18 HP)	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	<b>6SL3000-0FE21-6AA0</b>
36 kW (40 HP)	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	<b>6SL3000-0FE23-6AA0</b>
55 kW (60 HP)	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	<b>6SL3000-0FE25-5AA0</b>
80 kW (100 HP)	6SL3130-7TE28-0AA3 6SL3131-7TE28-0AA3	<b>6SL3000-0FE28-0AA0</b>
120 kW (150 HP)	6SL3130-7TE31-2AA3 6SL3131-7TE31-2AA3	<b>6SL3000-0FE31-2AA1</b>

Rated infeed power of the Active Line Module	Suitable for Active Line Module Order No.	<b>HFD line filter package</b> Wideband Line Filter and HFD line reactor Order No.
--	--	--

Line voltage 380 ... 480 V 3 AC

16 kW (18 HP)	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	<b>6SL3000-0FE21-6BA0</b>
36 kW (40 HP)	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	<b>6SL3000-0FE23-6BA0</b>
55 kW (60 HP)	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	<b>6SL3000-0FE25-5BA0</b>
80 kW (100 HP)	6SL3130-7TE28-0AA3 6SL3131-7TE28-0AA3	<b>6SL3000-0FE28-0BA0</b>
120 kW (150 HP)	6SL3130-7TE31-2AA3 6SL3131-7TE31-2AA3	<b>6SL3000-0FE31-2BA0</b>

#### Accessories



Line filter package assembled with an adapter set

The adapter sets for booksized format units are designed for very compact assembly. They enable line filters and line reactors to be installed compactly one above the other in the control cabinet.

#### Selection and Ordering Data

Active Line Module power output	Suitable for HF line filter package Order No.	<b>Adapter set</b> Order No.
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Line voltage 380 ... 480 V 3 AC

16 kW (18 HP)	6SL3000-0FE21-6AA0	<b>6SL3060-1FE21-6AA0</b>
36 kW (40 HP)	6SL3000-0FE23-6AA0	<b>6SN1162-0GA00-0CA0</b>

# SINAMICS S120 drive system

## Booksize format for Line and Motor Modules

Active Line Modules in booksize format  
Basic Line Filters

### Overview



Basic Line Filters are designed for use on machines on which conducted interference emissions in the frequency range between 150 kHz and 30 MHz need to be damped in accordance with the requirements of CE EMC legislation.

The use of Basic Line Filters is subject to the following general conditions:

- The machine/system must only be used in industrial power systems
- No. of axes < 12
- Total cable length < 150 m (492 ft)
- The machine manufacturer (OEM) must have the CE conformity of the machine/system confirmed by an accredited EMC test laboratory (e.g. by EPCOS; e-mail: emv.labor@epcos.com).

### Technical specifications

Line voltage 380 ... 480 V 3 AC

Order No.		6SL3000-0BE21-6DA0	6SL3000-0BE23-6DA0	6SL3000-0BE25-5DA0
<b>Product name</b>		Basic Line Filter		
<b>Rated current</b>	A	36	65	105
<b>Power loss</b>	kW	0.006	0.010	0.015
<b>Line/load connection</b> L1, L2, L3/U, V, W		Screw-type terminals		Screw-type terminals
• Conductor cross-section	mm <sup>2</sup>	10	35	50
<b>PE connection</b>		On housing with M6 screw stud	On housing with M6 screw stud	On housing with M8 screw stud
<b>Degree of protection</b>		IP20	IP20	IP20
<b>Dimensions</b>				
• Width	mm (in)	50 (1.97)	75 (2.95)	100 (3.94)
• Height	mm (in)	420 (16.54)	420 (16.54)	420 (16.54)
• Depth	mm (in)	226 (8.9)	226 (8.9)	226 (8.9)
<b>Weight, approx.</b>	kg (lb)	5 (11)	6.5 (14)	11.5 (25)
<b>Approvals</b>		cURus (File No.: E70122)	cURus (File No.: E70122)	cURus (File No.: E70122)
<b>Suitable for Active Line Module in booksize format</b>	Type	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3
• Rated infeed power of the Active Line Module	kW (HP)	16 (18)	36 (40)	55 (60)

### Selection and Ordering Data

Rated infeed power of the Active Line Module	Suitable for Active Line Module	Basic Line Filter
	Order No.	Order No.
Line voltage 380 ... 480 V 3 AC		
16 kW (18 HP)	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	<b>6SL3000-0BE21-6DA0</b>
36 kW (40 HP)	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	<b>6SL3000-0BE23-6DA0</b>
55 kW (60 HP)	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	<b>6SL3000-0BE25-5DA0</b>

### More information

You must follow the instructions in the Equipment Manual when using Basic Line Filters in conjunction with 16 kW to 55 kW (18 HP to 60 HP) Active Line Modules: SINAMICS S120 – Power units in booksize format.

# SINAMICS S120 drive system

## Booksized format for Line and Motor Modules

### Active Line Modules in booksized format Recommended line-side components

#### Overview

Suitable line-side power components are assigned depending on the power rating of the Active Line Modules.

The tables below list recommended components.

Further information about the main contactors, switch disconnectors, fuses and circuit-breakers specified in the tables can be found in Catalogs LV 1, LV 1 T.

#### Assignment of line-side power components to Active Line Modules in booksized format

Rated infeed power	Assignment to Active Line Module	Main contactor	Output interface for main contactor	Main switch	Leading auxiliary circuit switch for main switch
		Type	Order No.	Order No.	Order No.
Line voltage 380 ... 480 V 3 AC					
16 kW (18 HP)	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	<b>3RT1035-...</b>	<b>3TX7004-1LB00</b>	<b>3LD2504-0TK51</b>	<b>3LD9200-5B</b>
36 kW (40 HP)	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	<b>3RT1045-...</b>	<b>3TX7004-1LB00</b>	<b>3LD2704-0TK51</b>	<b>3LD9200-5B</b>
55 kW (60 HP)	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	<b>3RT1054-...</b>	<b>3TX7004-1LB00</b>	<b>3KA5330-1EE01</b>	<b>3KX3552-3EA01</b>
80 kW (100 HP)	6SL3130-7TE28-0AA3 6SL3131-7TE28-0AA3	<b>3RT1056-...</b>	<b>3TX7004-1LB00</b>	<b>3KA5330-1EE01</b>	<b>3KX3552-3EA01</b>
120 kW (150 HP)	6SL3130-7TE31-2AA3 6SL3131-7TE31-2AA3	<b>3RT1065-...</b>	<b>3TX7004-1LB00</b>	<b>3KA5730-1EE01</b>	<b>3KX3552-3EA01</b>

Rated infeed power	Assignment to Active Line Module	Circuit-breaker	Fuse switch disconnecter	Switch disconnector with fuse holders	Leading auxiliary switch for switch disconnector with fuse holders
		Type	Order No.	Order No.	Order No.
Line voltage 380 ... 480 V 3 AC					
16 kW (18 HP)	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	<b>3RV1031-4FA10</b>	<b>3NP4010-0CH01</b>	<b>3KL5030-1EB01</b>	<b>3KX3552-3EA01</b>
36 kW (40 HP)	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	<b>3RV1041-4LA10</b>	<b>3NP4010-0CH01</b>	<b>3KL5230-1EB01</b>	<b>3KX3552-3EA01</b>
55 kW (60 HP)	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	<b>3VL2712-3DC33-0AA0</b>	<b>3NP4270-0CA01</b>	<b>3KL5530-1EB01</b>	<b>3KX3552-3EA01</b>
80 kW (100 HP)	6SL3130-7TE28-0AA3 6SL3131-7TE28-0AA3	<b>3VL2716-3DC33-0AA0</b>	<b>3NP4270-0CA01</b>	<b>3KL5530-1EB01</b>	<b>3KX3552-3EA01</b>
120 kW (150 HP)	6SL3130-7TE31-2AA3 6SL3131-7TE31-2AA3	<b>3VL3725-3DC36-0AA0</b>	<b>3NP5360-0CA00</b>	<b>3KL5730-1EB01</b>	<b>3KX3552-3EA01</b>

Rated infeed power	Assignment to Active Line Module	NEOZED fuse (gL/gG)			DIAZED fuse (gL/gG)			LVHRC fuse (gL/gG)			UL/CSA fuse, Class J Available from: Ferraz Shawmut <a href="http://www.ferrazshawmut.com">http://www.ferrazshawmut.com</a>		
		Order No.	Rated current	Size	Order No.	Rated current	Size	Order No.	Rated current	Size	Reference No.	Rated current	Size
Line voltage 380 ... 480 V 3 AC													
16 kW (18 HP)	6SL3130-7TE21-6AA3 6SL3131-7TE21-6AA3	<b>5SE2335</b>	35 A	D02	<b>5SB411</b>	35 A	DIII	<b>3NA3814</b>	35 A	000	<b>AJT35</b>	35 A	27 × 60
36 kW (40 HP)	6SL3130-7TE23-6AA3 6SL3131-7TE23-6AA3	–			<b>5SC211</b>	80 A	DIVH	<b>3NA3824</b>	80 A	000	<b>AJT80</b>	80 A	29 × 117
55 kW (60 HP)	6SL3130-7TE25-5AA3 6SL3131-7TE25-5AA3	–			–			<b>3NA3132</b>	125 A	1	<b>AJT125</b>	125 A	41 × 146
80 kW (100 HP)	6SL3130-7TE28-0AA3 6SL3131-7TE28-0AA3	–			–			<b>3NA3136</b>	160 A	1	<b>AJT175</b>	175 A	41 × 146
120 kW (150 HP)	6SL3130-7TE31-2AA3 6SL3131-7TE31-2AA3	–			–			<b>3NA3144</b>	250 A	1	<b>AJT250</b>	250 A	54 × 181