CU310 PN Control Unit

Overview

The CU310 PN Control Unit is designed for the communication and open-loop/closed-loop control functions of a Power Module. The CU310 PN combined with a Power Module and CompactFlash card creates a powerful single axis AC drive. The communication link to the higher-level control is provided by PROFINET IO.

Design

CU310 PN Control Unit features the following interfaces as standard:

- 1 DRIVE-CLiQ socket for communication with other DRIVE-CLiQ devices, e.g. Sensor or Terminal Modules
- 1 PM-IF interface for communication with Power Modules in blocksize format
- 1 interface to the BOP20 Basic Operator Panel
- 2 x PROFINET interfaces (RJ45 sockets) with PROFIdrive V4 profile
- 1 HTL/TTL encoder evaluation circuit
- 4 parameterizable digital inputs (floating)
- 4 parameterizable bidirectional digital inputs/digital outputs (non-floating)
- 1 serial RS232 interface
- 1 slot for the CompactFlash card on which firmware and parameters are stored
- 3 test sockets and one reference ground for commissioning support
- 1 connection for the electronics power supply via the 24 V DC power supply connector
- 1 PE (protective earth) connection

The status of the CU310 PN Control Unit is indicated via multi-color LEDs.

A BOP20 Basic Operator Panel can also be snapped directly onto the CU310 PN Control Unit for diagnostic purposes.

As the firmware and parameter settings are stored on a plug-in CompactFlash card, the Control Unit can be changed without the need for tools.

Selection and ordering data

Description	Order No.
CU310 PN Control Unit (without CompactFlash card)	**6SL3040-0LA01-0AA0**

Accessories

Description	Order No.
STARTER commissioning tool	**6SL3072-0AA00-0AG0**
Industrial Ethernet FC RJ45 plug 180 (1x)	**6GK1901-1BB10-2AA0**
Industrial Ethernet FC RJ45 plug 180 (10x)	**6GK1901-1BB10-2AB0**
Industrial Ethernet FC stripping tool	**6GK1901-1GA00**
Industrial Ethernet FC standard cable GP 2x2	**6XV1840-2AH10**
Industrial Ethernet FC flexible cable GP 2x2	**6XV1870-2B**
Industrial Ethernet FC trailing cable GP 2x2	**6XV1870-2D**
Industrial Ethernet FC trailing cable 2x2	**6XV1840-3AH10**
Industrial Ethernet FC marine cable 2x2	**6XV1840-4AH10**

Further details about plugs and cables are available in the IK PI catalog.

Integration

The CU310 PN Control Unit drives Power Modules in blocksize format via the PM-IF interface. In this case, other DRIVE-CLiQ components such as Sensor or Terminal Modules can be connected to the DRIVE-CLiQ socket on the CU310 PN Control Unit.

Power Modules in chassis format are driven by the CU310 DP Control Unit via the DRIVE-CLiQ interface. With this option, Sensor and Terminal Modules must be connected to the free DRIVE-CLiQ sockets on the Power Module.

Parameter settings can be changed with the BOP20 Basic Operator Panel. The BOP20 panel can also be snapped onto the CU310 PN Control Unit during operation to perform trouble-shooting procedures.

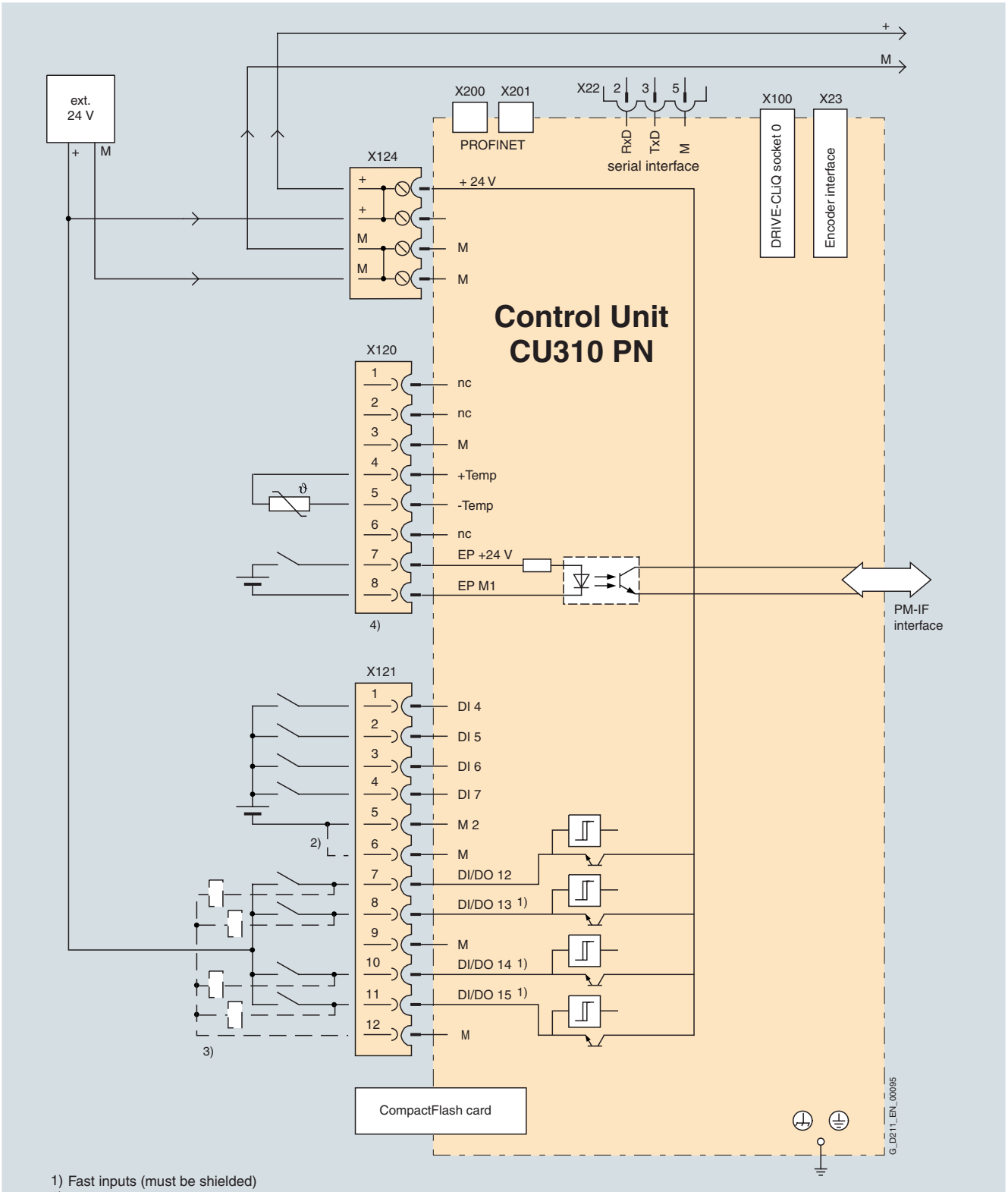
The CU310 PN Control Unit and other connected components are commissioned and diagnosed with the STARTER commissioning tool.

A CU310 PN Control Unit communicates with the higher-level control system using PROFINET IO and the PROFIdrive V4 profile.

The integrated safety functions such as e.g. "Safe Torque Off" (= "Safe standstill") must be selected in two channels. Two digital inputs on the CU310 PN Control Unit are required for this purpose.

An external 24 V supply can be connected to the CU310 to power the control unit when the incoming supply to the Power Module is not energized.

Integration (continued)



1) Fast inputs (must be shielded)
2) Jumper open, isolation for digital inputs (DI)
3) Can be parameterized individually as input/output
4) Required for Safety

Connection example of CU310 PN Control Unit

CU310 PN Control Unit

Technical data

CU310 PN Control Unit	
Max. current requirement (at 24 V DC) without taking account of digital outputs and DRIVE-CLiQ supply	0.9 A
Max. connectable cross section	2.5 mm^2
Max. fuse protection	20 A
Digital inputs	4 x floating digital inputs 4 bidirectional non-floating digital inputs/digital outputs
• Voltage	– 3 V to + 30 V
• Low level (an open digital input is interpreted as "low")	– 3 V to + 5 V
• High level	15 V to 30 V
• Current consumption (typ. at 24 V DC)	10 mA
• Signal propagation delays for digital inputs [1]	L → H: approx. 50 µs H → L: approx. 100 µs
• Signal propagation delays for high-speed digital inputs[1] (high-speed digital inputs can be used for position detection)	L → H: approx. 5 µs H → L: approx. 50 µs
• Max. connectable cross section	0.5 mm^2
Digital outputs (continued-short-circuit-proof)	4 bidirectional non-floating digital inputs/digital outputs
• Voltage	24 V DC
• Max. load current per digital output [2]	500 mA
• Max. connectable cross section	0.5 mm^2
Encoder evaluation	TTL or HTL incremental encoders (with adjustable parameters)
• Cut-off frequency	500 kHz
• Max. cable length for TTL incremental encoder	100 m (328 ft) (only bipolar signals permitted)
• Max. cable length for HTL incremental encoder	100 m (328 ft) for unipolar signals 300 m (984 ft) for bipolar signals
Power loss	< 20 W
PE connection	On housing with M5 screw
Width	73 mm (2.9 in)
Height	183.2 mm (7.2 in)
Depth	89.6 mm (3.5 in)
Weight, approx.	0.95 kg (2 lb)
Approvals	cULus (File No.: E164110)

[1] The specified signal propagation delays refer to the hardware. The actual reaction time depends on the time slot in which the digital input or output is processed.

[2] In order to use the digital outputs, an external 24 V power supply must be connected to terminal X124.

CompactFlash Card for CU310 and CU320

Overview

The CompactFlash card contains the firmware and parameter settings. It is inserted into the appropriate slot on the CU310 or CU320 Control Unit.

Design

A CU320 Control Unit can perform the communication, open-loop and closed-loop control functions for several Motor Modules. The computing capacity requirement increases in proportion to the number of connected Motor Modules and system components and in relation to the dynamic response required. The full computing capacity of the CU320 Control Unit is only available on systems with perfomance expansion 1.

The computing capacity requirement and utilization of the CU320 Control Unit can be calculated with the SIZER configuration tool. The firmware options are supplied in license form, which are written to the CompactFlash card in the factory as license codes.

The firmware options can also be enabled on-site, for example, if the performance expansions required are not known at the time of placing the order. You will need the serial number of the CompactFlash card and the order number of the firmware option to be enabled. With this information, you can purchase the associated license code from a license database and enable the firmware option. The license code is only valid for the CompactFlash card declared and cannot be transferred to other CompactFlash cards.

The CU310 Control Unit has been designed to control only single axes. Performance expansion 1 is not required in this case.

Selection and ordering data

Description	Order No.
CompactFlash card for CU310 DP, CU310 PN, CU320 Control Units	
with current firmware version including certificate of license	
• without performance expansion	**6SL3054-0AA00-1AA0**
• with performance expansion 1 firmware option	**6SL3054-0AA01-1AA0**
Firmware license	**6SL3074-0AA01-0AA0**
Performance expansion 1 firmware option for CompactFlash card including certificate of license	

Further information

Firmware version

The firmware version is encoded in the order (part) number of the CompactFlash card supplied. For the above order number the most recent firmware version is always installed on shipped CompactFlash cards, i.e. the order number on the shipped CompactFlash cards may not necessarily match the order number of the ordered CompactFlash cards.

The firmware version is encoded as follows in the order number:

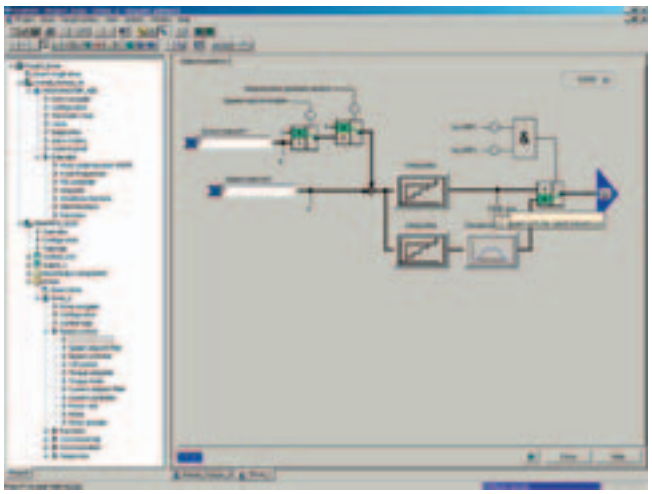
Order No.		**6SL3054-**	**0 ■ ■ 0 ■ -1AA0**
Firmware version			↑
	1		**B**
	2		**C**
	3		**D**
	4		**E**
Version			↑
	.1		**B**
	.2		**C**
	.3		**D**
	.4		**E**
	.5		**F**
	.6		**G**
without performance expansion			↑ **0**
with performance expansion 1			**1**

Example: A CompactFlash card with the order number 6SL3054-0AA00-1AA0 is ordered (as specified in the catalog). The CompactFlash card with the most recent firmware version is confirmed and shipped, e.g. order number 6SL3054-0CE00-1AA0 for firmware version 2.4. In this way, it is possible to specify a specific firmware version or the most recent firmware version in a replacement part order.

STARTER drive/commissioning software

2

Overview



The easy-to-use STARTER drive/commissioning software can be used for:

- commissioning,
- optimization and
- diagnostics.

This software can be operated either as a standalone PC application or can be integrated into the SCOUT engineering system (on SIMOTION) or STEP 7 (with Drive ES Basic). The basic functions and handling are the same in both cases.

In addition to the SINAMICS drives, the current version of STARTER also supports MICROMASTER 4 devices and inverters for the SIMATIC ET 200S FC distributed I/O system.

The project wizards can be used to create the drives within the structure of the project tree.

First-time users are supported by solution-based dialog menu, whereby a standard graphics-based display maximizes clarity when setting the drive parameters.

First commissioning is guided by wizards, which make all the basic settings in the drive. This enables a drive to be up and running after only setting a small number of parameters within the drive configuration process.

The individual settings required are made using graphics-based parameterization screenforms, which also display the mode of operation.

Examples of individual settings that can be made include:

- terminals
- bus interface
- setpoint channel (e.g. fixed setpoints)
- speed control (e.g. ramp-function generator, limits)
- BICO interconnections
- diagnostics

Experts can gain rapid access to the individual parameters via the expert list and do not have to navigate dialogs.

In addition, the following functions are available for optimization purposes:

- self-optimization
- trace (depending on drive)

Diagnostics functions provide information about:

- control/status words
- parameter status
- operating conditions
- communication states

Performance

- Easy to use: only a small number of settings need to be made for successful first commissioning: axis turning
- Solution-based dialog-based user guidance simplifies commissioning
- Self-optimization functions reduce manual effort for optimization.
- The built-in trace function provides optimum support during commissioning, optimization and troubleshooting.

Minimum hardware and software requirements

PG or PC with Pentium™ II 400 MHz (Windows™ 2000), Pentium™ III 500 MHz (Windows™ XP)

256 MB RAM (512 MB recommended)

Monitor resolution, 1024 × 768 pixels

Windows™ 2000 SP3, XP Professional SP1

Microsoft Internet Explorer 5.01

Integration

A PROFIBUS Communication Module and a connection cable are required to make the communication link between the PG/PC and a Control Unit.

For example, PROFIBUS Communication Module CP 5512 (PCMCIA type 2 card + adapter with 9-pole SUB-D socket for connection to PROFIBUS). For Windows 2000/XP Professional and PCMCIA 32)
Order No.: 6GK1551-2AA00

and connection cable between CP 5512 and PROFIBUS
Order No.: 6ES7901-4BD00-0XA0

PC converter connection sets are available for MICROMASTER 4, SINAMICS G110 and SINAMICS G120 for a safe point-to-point connection to the PC.
Order No. for MICROMASTER 4: 6SE6400-1PC00-0AA0
(the scope of supply includes a 9-pole SUB-D connector and an RS 232 standard cable, 3 m (9.8 ft))

Order No. for SINAMICS G110 and SINAMICS G120:
6SL3255-0AA00-2AA1
(the scope of supply includes a 9-pole SUB-D connector and an RS 232 standard cable, 3 m (9.8 ft), and the STARTER startup tool on CD-ROM)

Selection and ordering data

Description	Order No.
STARTER commissioning tool for SINAMICS and MICROMASTER English/German/French/Italian	**6SL3072-0AA00-0AG0**

Design

PM340 Power Modules in blocksize format, frame sizes FSA to FSF

The PM340 Power Modules in blocksize format feature the following connection as standard:

- Supply Connection
- DCP/R1 and DCN DC link terminal
- Terminals DCP/R1 and R2 for connection of an external braking resistor
- PM-IF interface for connection of the PM340 Power Module and CU310 Control Unit or CUA31 Control Unit Adapter. The PM340 Power Module also supplies power to the CU310 Control Unit or CUA31 Control Unit Adapter by means of an integrated power supply
- Motor connection made with screw terminals or screw studs
- Control circuit for the Brake Relay or Safe Brake Relay to control a holding brake
- 2 PE (protective earth) connections

Power Modules without integrated line filter are suitable for connection to both grounded-neutral (TN, TT) and non-grounded (IT) systems.
Power Modules with integrated line filter are suitable only for connection to TN systems.

When utilizing the integrated Braking Unit (Braking Chopper), the temperature of the external braking resistor must be monitored (i.e. thermostatic switch) to provide protection against thermal overloading.

Integration

PM340 Power Module in blocksize format with CU310 DP Control Unit

PM340 Power Module in blocksize format with CUA31 Control Unit Adapter

Power Modules in blocksize format

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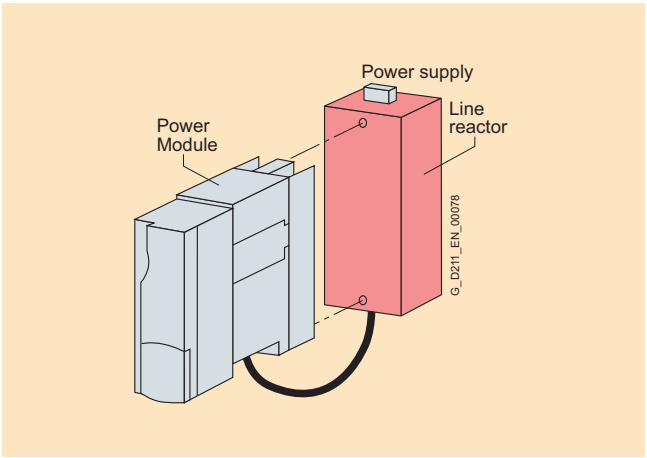
Integration (continued)

Many system components for PM340 Power Modules are designed as base components, i.e. the component is mounted on the baseplate and the PM340 Power Module in front of them in a space-saving construction. Up to two base components can be mounted in front of one another.

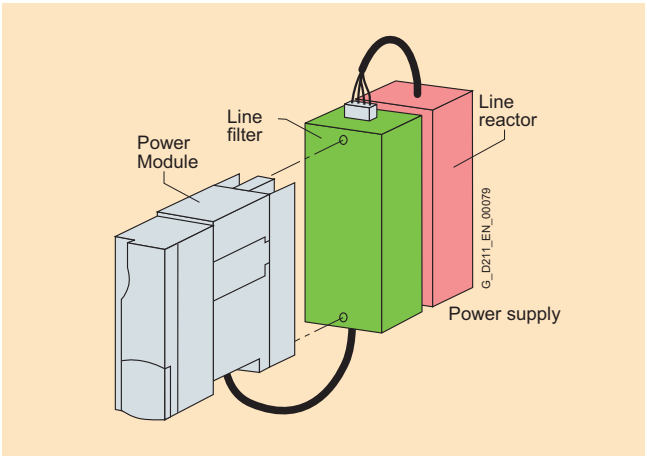
	FSA	FSB	FSC	FSD	FSE	FSF
Line filter	✓					
Line reactor	✓	✓	✓	✓	✓	–
Braking resistor	✓	✓	–	–	–	–
Motor reactor	✓	✓	✓	–	–	–

✓ suitable as base type
– not suitable as base type
not available



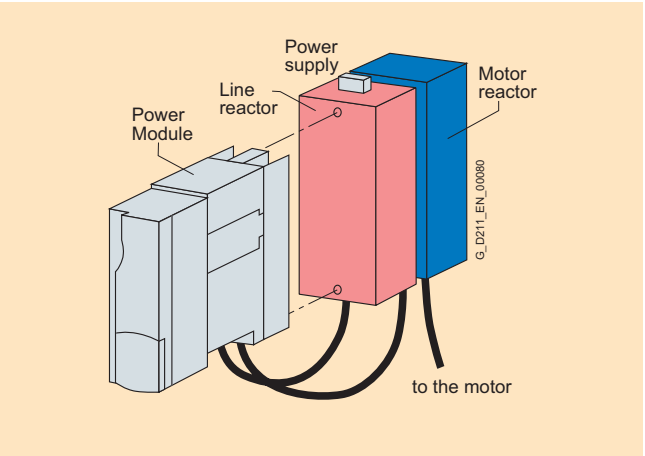
Basic layout of a PM340 Power Module with line reactor as base component

The line-side reactors are equipped with terminals on the line side and with a pre-assembled cable on the Power Module side. When installed, the mains terminals are at the top on frame sizes FSA to FSC, and at the bottom on frame sizes FSD and FSE.



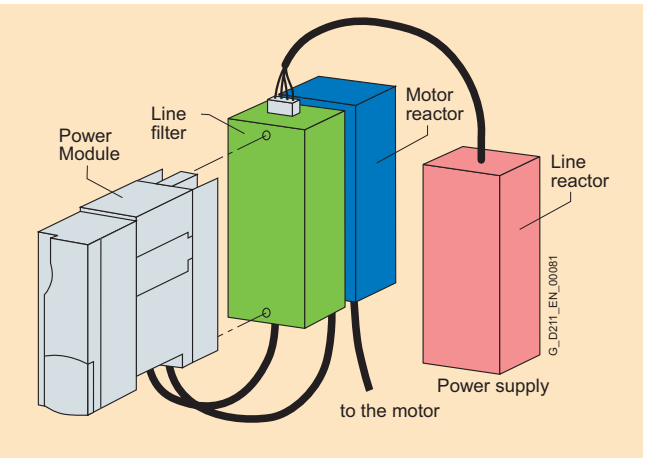
Power Module PM340 frame size FSA with line reactor and line filter

If a line filter is installed in addition to the line reactor on frame size FSA, the components must be arranged as shown in the diagram above. In this case, the mains connection is at the bottom.



Power Module PM340 frame size FSA with line reactor and motor reactor

Power Modules of frame size FSB and higher are available with integrated line filters, alleviating the need for an external line filter.

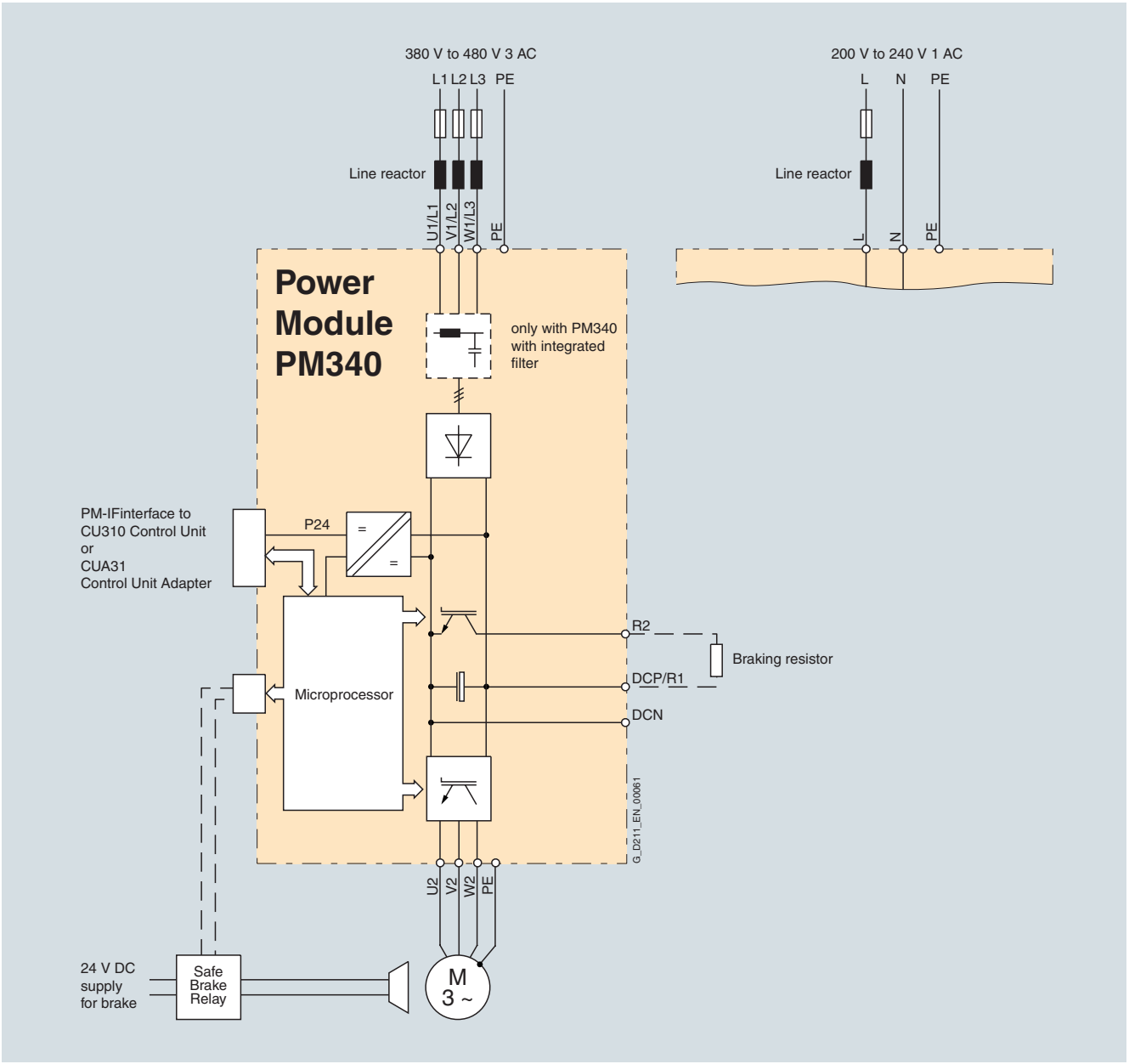


For configurations involving more than two base-type system components, e.g. line reactor + motor reactor + braking resistor, individual components must be mounted to the side of the Power Module. In this instance, the line and motor reactors must be installed behind the Power Module and the braking resistor to the side.

2

Integration (continued)

The PM340 Power Modules in blocksize format communicate with the CU310 Control Unit or the CUA31 Control Unit Adapter via the PM-IF interface.



Connection example of PM340 Power Module in blocksize format

Power Modules in blocksize format

2

Technical data

General technical data

Electrical data	
Line connection voltage (up to 2000 m (6563 ft) above sea level)	200 V to 240 V 1 AC ±10% (– 15% < 1 min) or 380 V to 480 V 3 AC ±10% (– 15% < 1 min)
Power frequency	47 Hz to 63 Hz
Line power factor at rated output	
• Fundamental Power Factor	> 0.96
• Total (λ)	
- 200 V to 240 V 1 AC	0.45 to 0.7
- 380 V to 480 V 3 AC	0.65 to 0.95
Overvoltage category	Class III to EN 60664-1
DC link precharging frequency	max. 1× every 30 s
DC link voltage	approx. 1.35 x line 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
• With line filter	Class A1 to EN 55011 and Category C2 to EN 61800-3
Ambient conditions	
Type of cooling	Forced air cooling through a 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°C) see derating characteristics
Site altitude	Up to 1000 m (3282 ft) above sea level without derating, > 1000 m to 4000 m (> 3280 ft to 13126 ft) above sea level see derating characteristics
Conformity	CE (low-voltage and EMC Directives)
Approvals	cULus
- 200 V to 240 V 1 AC	Frame size FSA (File No.: E192450)
- 380 V to 480 V 3 AC	Frame sizes FSA to FSC: (File No.: E121068) Frame sizes FSD to FSF: (File No.: E192450)
Certification (in preparation)	Safety Integrity Level 2 (SIL 2) to IEC 61508, control category 3 to EN 954-1 for Safety Integrated – safe standstill (SH) (STO = Safe Torque Off) and safe brake control (SBC) in conjunction with Safe Brake Relay

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

Technical data (continued)

Line voltage 200 V to 240 V 1 AC		PM340 Power Modules in blocksize format 6SL3210-1SB11-0...	6SL3210-1SB12-3...	6SL3210-1SB14-0...
Rated output current I_{rated}	A	0.9	2.3	3.9
Base load current I_H	A	0.8	2.0	3.4
Output current for S6 duty (40%) I_{S6}	A	1.4	3.3	5.5
Max. output current I_{max}	A	2.0	4.6	7.8
Rated power based on I_{rated}	kW (HP)[3]	0.12 (0.2)	0.37 (0.5)	0.75 (0.75)
Rated pulse frequency	kHz	4	4	4
Efficiency η		0.88	0.93	0.93
Power loss	kW	0.06	0.075	0.11
Cooling air requirement	m^3/s (ft^3/s)	0.005 (0.02)	0.005 (0.02)	0.005 (0.02)
Sound pressure level	dB(A)	< 45	< 45	< 45
24 V DC power supply for the Control Unit	A	1.0	1.0	1.0
Rated input current [1] with/without line reactor	A	1.4/2.2	4/6	6.5/10
Resistance value of the external braking resistor	Ohm	≥ 180	≥ 180	≥ 180
Max. cable length to braking resistor	m (ft)	15 (49)	15 (49)	15 (49)
Line supply connection L, N		Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2
Motor connection U2, V2, W2		Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2
DC link connection, connection for braking resistor DCP/R1, DCN, R2		Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2
PE connection		On housing with M4 screw	On housing with M4 screw	On housing with M4 screw
Max. motor cable length [2] (without external options)	m (ft)	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded
Degree of protection		IP20	IP20	IP20
Width	mm (inch)	73 (2.87)	73 (2.87)	73 (2.87)
Height	mm (inch)	173 (6.81)	173 (6.81)	173 (6.81)
Depth				
• PM340 Power Module	mm (inch)	145 (5.7)	145 (5.7)	145 (5.7)
• PM340 with CU310	mm (inch)	234.6 (9.24)	234.6 (9.24)	234.6 (9.24)
• PM340 with CUA31	mm (inch)	175.3 (6.9)	175.3 (6.9)	175.3 (6.9)
Size		FSA	FSA	FSA
Weight, approx.	kg (lb)	1.2 (3)	1.3 (3)	1.3 (3)

1) The input current depends on the motor load and line impedance. The input currents apply for rated power loading (based on I_{rated}) for a line impedance corresponding to u_k = 1%.

2) Max. motor cable length 15 m (49 ft) (shielded) for PM340 Power Modules with integrated line filter to maintain the limit values of EN 61800-3 Category C2.

3) Nominal HP based on Asynchronous motors (induction motors). For specific sizing select drive based on motor nameplate current and overload.

Power Modules in blocksize format

2

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		PM340 Power Modules in blocksize format				
		6SL3210-1SE11-3UA0	6SL3210-1SE11-7UA0	6SL3210-1SE12-2UA0	6SL3210-1SE13-1UA0	6SL3210-1SE14-1UA0
Rated output current I_{rated}	A	1.3	1.7	2.2	3.1	4.1
Base load current I_H	A	1.1	1.5	1.9	2.7	3.6
Output current for S6 duty (40%) I_{S6}	A	1.3	2.0	2.5	3.5	4.5
Max. output current I_{max}	A	2.6	3.4	4.4	6.2	8.2
Rated power based on I_{rated}	kW (HP) [3]	0.37 (0.5)	0.55 (0.75)	0.75 (1)	1.1 (1.5)	1.5 (2)
Rated power based on I_H	kW (HP) [3]	0.37 (0.5)	0.55 (0.5)	0.75 (0.75)	1.1 (1)	1.5 (2)
Rated pulse frequency	kHz	4	4	4	4	4
Efficiency η		0.90	0.92	0.94	0.95	0.96
Power loss	kW	0.10	0.10	0.10	0.11	0.11
Cooling air requirement	m^3/s (ft^3/s)	0.005 (0.02)	0.005 (0.02)	0.005 (0.02)	0.005 (0.02)	0.005 (0.02)
Sound pressure level	dB(A)	< 45	< 45	< 45	< 45	< 45
24 V DC power supply for the Control Unit	A	1.0	1.0	1.0	1.0	1.0
Rated input current [1] with/without line reactor	A	1.3/1.7	1.7/2.2	2.2/2.6	3.1/3.9	4.1/4.8
Resistance value of the external braking resistor	Ohm	≥ 390	≥ 390	≥ 390	≥ 390	≥ 390
Max. cable length to braking resistor	m (ft)	15 (49)	15 (49)	15 (49)	15 (49)	15 (49)
Line supply connection L, N		Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2
Motor connection U2, V2, W2		Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2
DC link connection, connection for braking resistor DCP/R1, DCN, R2		Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 2.5 mm^2
PE connection		On housing with M4 screw	On housing with M4 screw	On housing with M4 screw	On housing with M4 screw	On housing with M4 screw
Max. motor cable length [2]	m (ft)	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded
Degree of protection		IP20	IP20	IP20	IP20	IP20
Width	mm (inch)	73 (2.87)	73 (2.87)	73 (2.87)	73 (2.87)	73 (2.87)
Height	mm (inch)	173 (6.81)	173 (6.81)	173 (6.81)	173 (6.81)	173 (6.81)
Depth						
• PM340 Power Module	mm (inch)	145 (5.7)	145 (5.7)	145 (5.7)	145 (5.7)	145 (5.7)
• PM340 with CU310	mm (inch)	234.6 (9.24)	234.6 (9.24)	234.6 (9.24)	234.6 (9.24)	234.6 (9.24)
• PM340 with CUA31	mm (inch)	175.3 (6.9)	175.3 (6.9)	175.3 (6.9)	175.3 (6.9)	175.3 (6.9)
Size		FSA	FSA	FSA	FSA	FSA
Weight, approx.	kg (lb)	1.2 (3)	1.2 (3)	1.2 (3)	1.2 (3)	1,2 (3)

1) The input current depends on the motor load and line impedance. The input currents apply for rated power loading (based on I_{rated}) for a line impedance corresponding to u_k = 1%.

2) Max. motor cable length 25 m (82 ft) (shielded) for PM340 Power Modules with integrated line filter to maintain the limit values of EN 61800-3 Category C2.

3) Nominal HP based on Asynchronous motors (induction motors) and 460 V AC. For specific sizing select drive based on motor nameplate current and overload.

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		PM340 Power Modules in blocksize format					
		6SL3210-1SE16-0...	6SL3210-1SE17-7...	6SL3210-1SE21-0...	6SL3210-1SE21-8...	6SL3210-1SE22-5...	6SL3210-1SE23-2...
Rated output current I_{rated}	A	5.9	7.7	10.2	18	25	32
Base load current I_H	A	5.2	6.8	9.1	14	21	27
Output current for S6 duty (40%) I_{S6}	A	6.4	8.3	10.8	19.6	27.8	37.1
Max. output current I_{max}	A	11.8	15.4	20.4	26.4	38	52
Rated power based on I_{rated}	kW (HP) [3]	2.2 (3)	3 (5)	4 (5)	7.5 (10)	11 (15)	15 (20)
Rated power based on I_H	kW (HP) [3]	2.2 (3)	3 (4)	4 (5)	5.5 (10)	7.5 (15)	11 (20)
Rated pulse frequency	kHz	4	4	4	4	4	4
Efficiency η		0.96	0.97	0.97	0.98	0.98	0.98
Power loss	kW	0.14	0.16	0.18	0.24	0.30	0.40
Cooling air requirement	m^3/s (ft^3/s)	0.009 (0.03)	0.009 (0.03)	0.009 (0.03)	0.038 (0.12)	0.038 (0.12)	0.038 (0.12)
Sound pressure level	dB(A)	< 50	< 50	< 50	< 60	< 60	< 60
24 V DC power supply for the Control Unit	A	1.0	1.0	1.0	1.0	1.0	1.0
Rated input current [1] with/without line reactor	A	5.6/6.7	7.5/8.9	9.8/12.4	17.1/23.1	24.6/32.6	33/39
Resistance value of the external braking resistor	Ohm	≥ 160	≥ 160	≥ 160	≥ 56	≥ 56	≥ 56
Max. cable length to braking resistor	m (ft)	15 (49)	15 (49)	15 (49)	15 (49)	15 (49)	15 (49)
Line supply connection L, N		Screw-type terminals for cable cross section 1.0 mm^2 to 6 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 6 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 6 mm^2	Screw-type terminals for cable cross section 2.5 mm^2 to 10 mm^2	Screw-type terminals for cable cross section 2.5 mm^2 to 10 mm^2	Screw-type terminals for cable cross section 2.5 mm^2 to 10 mm^2
Motor connection U2, V2, W2		Screw-type terminals for cable cross section 1.0 mm^2 to 6 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 6 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 6 mm^2	Screw-type terminals for cable cross section 2.5 mm^2 to 10 mm^2	Screw-type terminals for cable cross section 2.5 mm^2 to 10 mm^2	Screw-type terminals for cable cross section 2.5 mm^2 to 10 mm^2
DC link connection, connection for braking resistor DCP/R1, DCN, R2		Screw-type terminals for cable cross section 1.0 mm^2 to 6 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 6 mm^2	Screw-type terminals for cable cross section 1.0 mm^2 to 6 mm^2	Screw-type terminals for cable cross section 2.5 mm^2 to 10 mm^2	Screw-type terminals for cable cross section 2.5 mm^2 to 10 mm^2	Screw-type terminals for cable cross section 2.5 mm^2 to 10 mm^2
PE connection		On housing with M5 screw	On housing with M5 screw	On housing with M5 screw	On housing with M5 screw	On housing with M5 screw	On housing with M5 screw
Max. motor cable length [2]	m (ft)	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded	50 (164) shielded 75 (246) unshielded
Degree of protection		IP20	IP20	IP20	IP20	IP20	IP20
Width	mm (inch)	153 (6.02)	153 (6.02)	153 (6.02)	188.4 (7.42)	188.4 (7.42)	188.4 (7.42)
Height	mm (inch)	270 (10.63)	270 (10.63)	270 (10.63)	333.4 (13.13)	333.4 (13.13)	333.4 (13.13)
Depth							
• PM340 Power Module	mm (inch)	165 (6.5)	165 (6.5)	165 (6.5)	185 (7.28)	185 (7.28)	185 (7.28)
• PM340 with CU310	mm (inch)	254.6 (10.02)	254.6 (10.02)	254.6 (10.02)	274.6 (10.81)	274.6 (10.81)	274.6 (10.81)
• PM340 with CUA31	mm (inch)	195.3 (7.69)	195.3 (7.69)	195.3 (7.69)	215.3 (8.48)	215.3 (8.48)	215.3 (8.48)
Size		FSB	FSB	FSB	FSC	FSC	FSC
Weight, approx.	kg (lb)	4.0 (9)	4.0 (9)	4.0 (9)	6.5 (14)	6.5 (14)	6.5 (14)

1) The input current depends on the motor load and line impedance. The input currents apply for rated power loading (based on I_{rated}) for a line impedance corresponding to u_k = 1%.

2) Max. motor cable length 25 m (82 ft) (shielded) for PM340 Power Modules with integrated line filter to maintain the limit values of EN 61800-3 Category C2.

3) Nominal HP based on Asynchronous motors (induction motors) and 460 V AC. For specific sizing select drive based on motor nameplate current and overload.

Power Modules in blocksize format

2

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		PM340 Power Modules in blocksize format 6SL3210-1SE23-8...	6SL3210-1SE24-5...	6SL3210-1SE26-0...	6SL3210-1SE27-5...	6SL3210-1SE31-0...
Rated output current I_{rated}	A	38	45	60	75	90
Base load current I_H	A	33	40	48	65	80
Output current for S6 duty (40%) I_{S6}	A	49	58	78	98	117
Max. output current I_{max}	A	64	76	90	124	150
Rated power based on I_{rated}	kW (HP) [3]	18.5 (25)	22 (30)	30 (40)	37 (50)	45 (60)
Rated power based on I_H	kW (HP) [3]	15 (20)	18.5 (30)	22 (30)	30 (50)	37 (60)
Rated pulse frequency	kHz	4	4	4	4	4
Efficiency η		0.98	0.98	0.98	0.98	0.98
Power loss	kW	0.38	0.51	0.69	0.99	1.21
Cooling air requirement	m^3/s (ft^3/s)	0.022 (0.07)	0.022 (0.07)	0.039 (0.13)	0.022 (0.07)	0.039 (0.13)
Sound pressure level	dB(A)	< 60	< 60	< 61	< 60	62
24 V DC power supply for the Control Unit	A	1.0	1.0	1.0	1.0	1.0
Rated input current [1] with/without line reactor	A	40/46	47/53	63/72	78/88	94/105
Resistance value of the external braking resistor	Ohm	≥ 27	≥ 27	≥ 27	≥ 15	≥ 15
Max. cable length to braking resistor	m (ft)	15 (49)	15 (49)	15 (49)	15 (49)	15 (49)
Line supply connection L, N		Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2
Motor connection U2, V2, W2		Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2
DC link connection, connection for braking resistor DCP/R1, DCN, R2		Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2	Stud M6, cable cross section that can be connected 10 mm^2 to 35 mm^2
PE connection		On housing with M6 screw	On housing with M6 screw	On housing with M6 screw	On housing with M6 screw	On housing with M6 screw
Max. motor cable length [2]	m (ft)	70 (230) shielded 100 (328) unshielded	70 (230) shielded 100 (328) unshielded	70 (230) shielded 100 (328) unshielded	70 (230) shielded 100 (328) unshielded	70 (230) shielded 100 (328) unshielded
Degree of protection		IP20	IP20	IP20	IP20	IP20
Width	mm (inch)	275 (10.83)	275 (10.83)	275 (10.83)	275 (10.83)	275 (10.83)
Height PM340 without/with integrated filter	mm (inch)	418.3/511 (16.47/20.12)	418.3/511 (16.47/20.12)	418.3/511 (16.47/20.12)	498.3/633 (19.62/24.92)	498.3/633 (19.62/24.92)
Depth						
• PM340 Power Module	mm (inch)	203.5 (8.01)	203.5 (8.01)	203.5 (8.01)	203.5 (8.01)	203.5 (8.01)
• PM340 with CU310	mm (inch)	293.1 (11.54)	293.1 (11.54)	293.1 (11.54)	293.1 (11.54)	293.1 (11.54)
• PM340 with CUA31	mm (inch)	233.8 (9.2)	233.8 (9.2)	233.8 (9.2)	233.8 (9.2)	233.8 (9.2)
Size		FSD	FSD	FSD	FSE	FSE
Weight, approx. PM340 without/with integrated filter	kg (lb)	15.9/19.3 (35/43)	15.9/19.3 (35/43)	15.9/19.3 (35/43)	19.8/27.1 (44/60)	19.8/27.1 (44/60)

1) The input current depends on the motor load and line impedance. The input currents apply for rated power loading (based on I_{rated}) for a line impedance corresponding to u_k = 1%.

2) Max. motor cable length 25 m (82 ft) (shielded) for PM340 Power Modules with integrated line filter to maintain the limit values of EN 61800-3 Category C2.

3) Nominal HP based on Asynchronous motors (induction motors) and 460 V AC. For specific sizing select drive based on motor nameplate current and overload.

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		PM340 Power Modules in blocksize format 6SL3210-1SE31-1...	6SL3210-1SE31-5...	6SL3210-1SE31-8...
Rated output current I_{rated}	A	110	145	178
Base load current I_H	A	95	115	155
Output current for S6 duty (40%) I_{S6}	A	143	188	231
Max. output current I_{max}	A	180	220	290
Rated power based on I_{rated}	kW (HP) [3]	55 (75)	75 (100)	90 (125)
Rated power based on I_H	kW (HP) [3]	45 (60)	55 (75)	75 (100)
Rated pulse frequency	kHz	4	4	4
Efficiency η		0.98	0.98	0.98
Power loss	kW	1.42	1.93	2.31
Cooling air requirement	m^3/s (ft^3/s)	0.094 (0.31)	0.094 (0.31)	0.117 (0.38)
Sound pressure level	dB(A)	< 60	< 60	65
24 V DC power supply for the Control Unit	A	1.0	1.0	1.0
Rated input current [1] with/without line reactor	A	115/129	151/168	186/204
Resistance value of the external braking resistor	Ohm	≥ 8.2	≥ 8.2	≥ 8.2
Max. cable length to braking resistor	m (ft)	15 (49)	15 (49)	15 (49)
Line supply connection U1/L1, V1/L2, W1/L3		Stud M8, max. cable cross section that can be connected 120 mm^2 or 2 x 50 mm^2	Stud M8, max. cable cross section that can be connected 120 mm^2 or 2 x 50 mm^2	Stud M8, max. cable cross section that can be connected 120 mm^2 or 2 x 50 mm^2
Motor connection U2, V2, W2		Stud M8, max. cable cross section that can be connected 120 mm^2 or 2 x 50 mm^2	Stud M8, max. cable cross section that can be connected 120 mm^2 or 2 x 50 mm^2	Stud M8, max. cable cross section that can be connected 120 mm^2 or 2 x 50 mm^2
DC link connection, connection for braking resistor DCP/R1, DCN, R2		Stud M8, max. cable cross section that can be connected 120 mm^2 or 2 x 50 mm^2	Stud M8, max. cable cross section that can be connected 120 mm^2 or 2 x 50 mm^2	Stud M8, max. cable cross section that can be connected 120 mm^2 or 2 x 50 mm^2
PE connection		On housing with M8 screw	On housing with M8 screw	On housing with M8 screw
Max. motor cable length [2]	m (ft)	70 (230) shielded 100 (328) unshielded	70 (230) shielded 100 (328) unshielded	70 (230) shielded 100 (328) unshielded
Degree of protection		IP20	IP20	IP20
Width	mm (inch)	350 (13.78)	350 (13.78)	350 (13.78)
Height PM340 without/with integrated filter	mm (inch)	634/934 (24.96/36.77)	634/934 (24.96/36.77)	634/934 (24.96/36.77)
Depth				
• PM340 Power Module	mm (inch)	315.5 (12.42)	315.5 (12.42)	315.5 (12.42)
• PM340 with CU310	mm (inch)	405.1 (15.95)	405.1 (15.95)	405.1 (15.95)
• PM340 with CUA31	mm (inch)	345.8 (13.61)	345.8 (13.61)	345.8 (13.61)
Size		FSF	FSF	FSF
Weight, approx. PM340 without/with integrated filter	kg (lb)	50.7/66.7 (112/147)	50.7/66.7 (112/147)	50.7/66.7 (112/147)

1) The input current depends on the motor load and line impedance. The input currents apply for rated power loading (based on I_{rated}) for a line impedance corresponding to u_k = 1%.

2) Max. motor cable length 25 m (82 ft) (shielded) for PM340 Power Modules with integrated line filter to maintain the limit values of EN 61800-3 Category C2.

3) Nominal HP based on Asynchronous motors (induction motors) and 460 V AC. For specific sizing select drive based on motor nameplate current and overload.

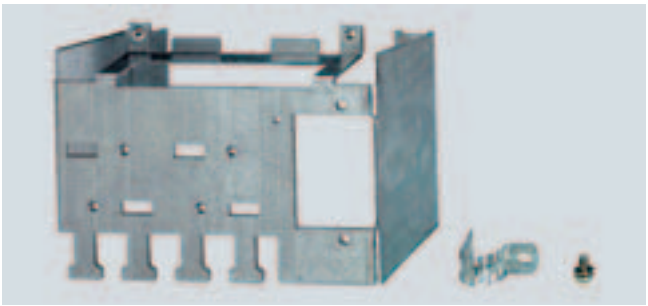
Power Modules in blocksize format

2

Selection and ordering data

Rated output current	Rated power	Size	PM340 Power Module in blocksize format without line filter	PM340 Power Module in blocksize format with integrated line filter
A	kW (HP) [1]		Order No.	Order No.
Line voltage 200 V to 240 V 1 AC				
0.9	0.12 (0.2)	FSA	**6SL3210-1SB11-0UA0**	**6SL3210-1SB11-0AA0**
2.3	0.37 (0.5)	FSA	**6SL3210-1SB12-3UA0**	**6SL3210-1SB12-3AA0**
3.9	0.75 (0.75)	FSA	**6SL3210-1SB14-0UA0**	**6SL3210-1SB14-0AA0**
Line voltage 380 V to 480 V 3 AC				
1.3	0.37 (0.5)	FSA	**6SL3210-1SE11-3UA0**	–
1.7	0.55 (0.75)	FSA	**6SL3210-1SE11-7UA0**	–
2.2	0.75 (1)	FSA	**6SL3210-1SE12-2UA0**	–
3.1	1.1 (1.5)	FSA	**6SL3210-1SE13-1UA0**	–
4.1	1.5 (2)	FSA	**6SL3210-1SE14-1UA0**	–
5.9	2.2 (3)	FSB	**6SL3210-1SE16-0UA0**	**6SL3210-1SE16-0AA0**
7.7	3 (5)	FSB	**6SL3210-1SE17-7UA0**	**6SL3210-1SE17-7AA0**
10.2	4 (5)	FSB	**6SL3210-1SE21-0UA0**	**6SL3210-1SE21-0AA0**
18	7.5 (10)	FSC	**6SL3210-1SE21-8UA0**	**6SL3210-1SE21-8AA0**
25	11 (15)	FSC	**6SL3210-1SE22-5UA0**	**6SL3210-1SE22-5AA0**
32	15 (20)	FSC	**6SL3210-1SE23-2UA0**	**6SL3210-1SE23-2AA0**
38	18.5 (25)	FCD	**6SL3210-1SE23-8UA0**	**6SL3210-1SE23-8AA0**
45	22 (30)	FCD	**6SL3210-1SE24-5UA0**	**6SL3210-1SE24-5AA0**
60	30 (40)	FCD	**6SL3210-1SE26-0UA0**	**6SL3210-1SE26-0AA0**
75	37 (50)	FSE	**6SL3210-1SE27-5UA0**	**6SL3210-1SE27-5AA0**
90	45 (60)	FSE	**6SL3210-1SE31-0UA0**	**6SL3210-1SE31-0AA0**
110	55 (75)	FSF	**6SL3210-1SE31-1UA0**	**6SL3210-1SE31-1AA0**
145	75 (100)	FSF	**6SL3210-1SE31-5UA0**	**6SL3210-1SE31-5AA0**
178	90 (125)	FSF	**6SL3210-1SE31-8UA0**	**6SL3210-1SE31-8AA0**

Accessories



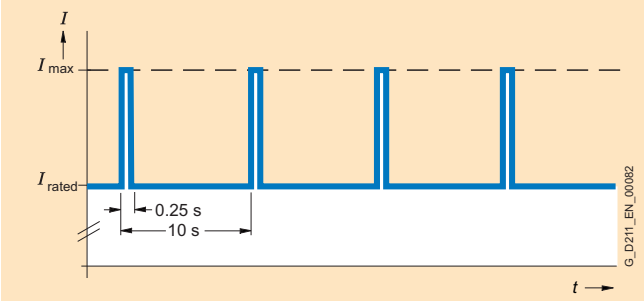
Example of shield connection kit for PM340 frame size FSB

Description	Order No.
Shield connection kit for PM340	
• Frame size FSA	**6SL3262-1AA00-0BA0**
• Frame size FSB	**6SL3262-1AB00-0DA0**
• Frame size FSC	**6SL3262-1AC00-0DA0**
• Frame sizes FSD and FSE	**6SL3262-1AD00-0DA0**
• Frame size FSF	**6SL3262-1AF00-0DA0**

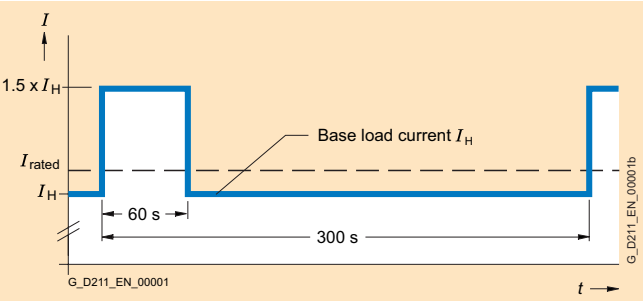
[1] Nominal HP based on Asynchronous motors (induction motors). See technical data for specific sizing.

Characteristics

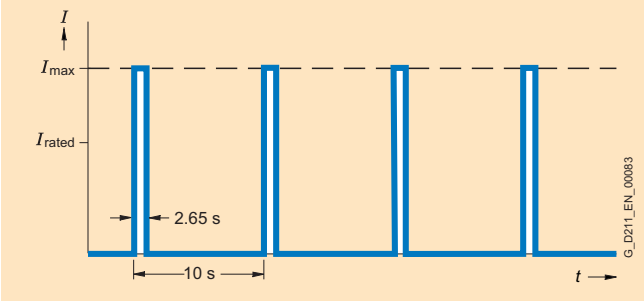
Overload capability



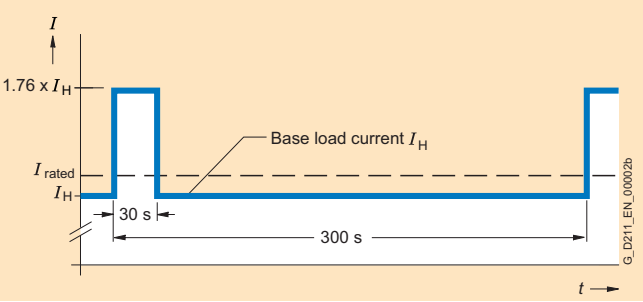
Load cycle with previous load



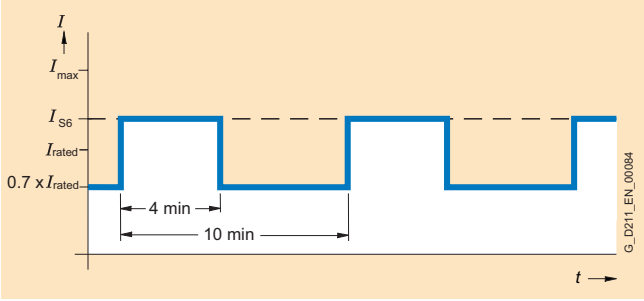
Load cycle with 60 s overload with a load cycle period of 300 s



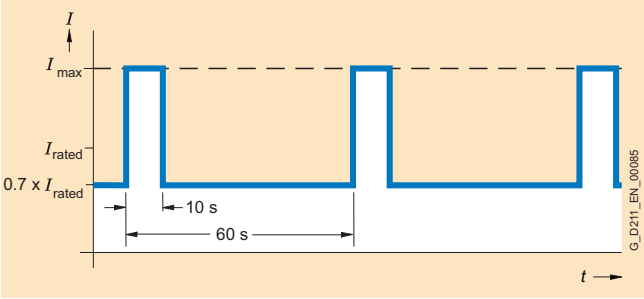
Load cycle without previous load



Load cycle with 30 s overload with a load cycle period of 300 s



S6 load cycle with previous load with a load cycle period of 600 s



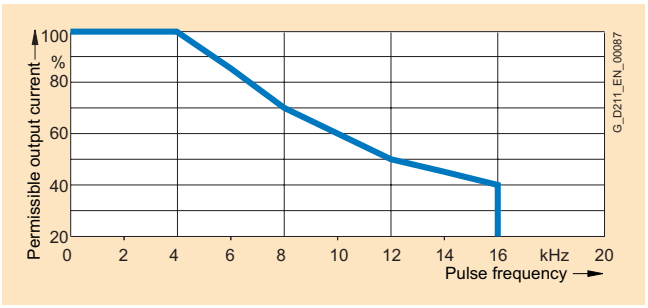
S6 load cycle with previous load with a load cycle period of 60 s

2

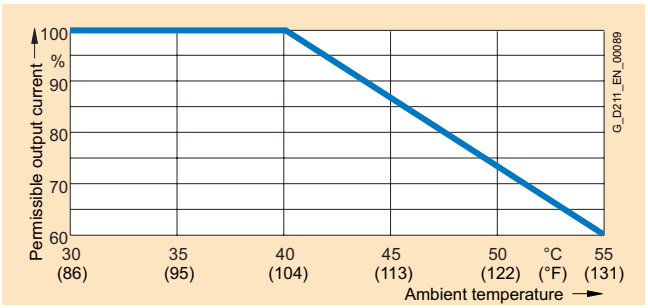
Characteristics (continued)

Derating characteristics

- Frame sizes FSA to FSE

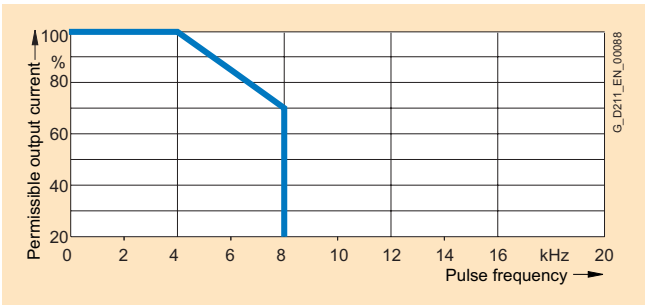


Output current dependent on pulse frequency

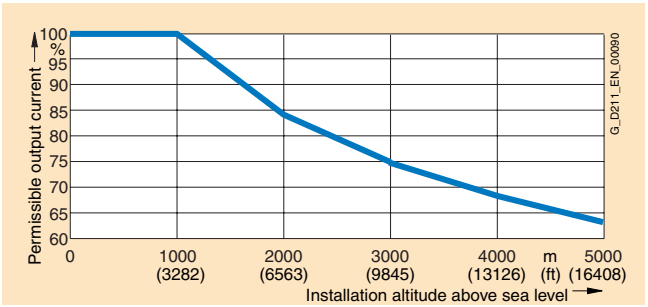


Output current dependent on ambient temperature

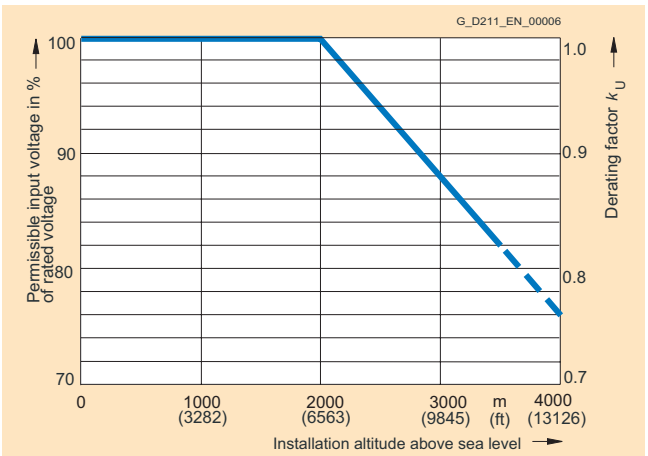
- Frame sizes FSF



Output current dependent on pulse frequency



Output current dependent on installation altitude



Voltage derating dependent on installation altitude

Overview

Line reactor for PM340 Power Modules frame sizes FSA to FSE

Line reactor for PM340 Power Modules frame size FSF

Line reactors limit the low-frequency harmonic effects and reduce the load on the rectifiers of the Power Modules. A line reactor is not required where the effective supply impedance equals $u_k \geq 1\%$. For further information see System Description.

Integration

The line reactors for PM340 Power Modules of frame sizes FSA to FSE are designed as base components. The line reactor is attached to the mounting surface and the Power Module is mounted directly on the line reactor. The cables to the Power Module are already connected at the line reactor.

The line reactor is connected to the line supply through terminals.

PM340 Power Module frame size FSB with base line reactor and shield connection kit

Power Modules in blocksize format
Line reactors

2

Technical data

Line voltage 200 V to 240 V 1 AC		Line reactor 6SE6400-3CC00-4AB3	6SE6400-3CC01-0AB3
Rated current	A	3.4	8.1
Power loss, approx. at 50 Hz/60 Hz	W	12.5/15	11.5/14.5
Power connection U1, V1, W1		6 mm^2 screw-type terminals	6 mm^2 screw-type terminals
Load connection		Cable 3 x AWG16 (1.5 mm^2) Length approx. 0.38 m (1.25 ft)	Cable 3 x AWG16 (1.5 mm^2) Length approx. 0.38 m (1.25 ft)
PE connection		M5 bolt	M5 bolt
Degree of protection		IP20	IP20
Width	mm (inch)	75.5 (2.97)	75.5 (2.97)
Height	mm (inch)	201 (7.91)	201 (7.91)
Depth	mm (inch)	50 (1.97)	50 (1.97)
Weight, approx.	kg (lb)	1.3 (3)	1.3 (3)
Suitable for PM340 Power Module	Type	6SL3210-1SB11-0... 6SL3210-1SB12-3...	6SL3210-1SB14-0...

Line voltage 380 V to 480 V 3 AC		Line reactor 6SE6400-3CC00-2AD3	6SE6400-3CC00-4AD3	6SE6400-3CC00-6AD3	6SL3203-0CD21-0AA0	6SL3203-0CD21-4AA0	6SL3203-0CD22-2AA0
Rated current	A	1.9	3.5	4.8	9	11.6	25
Power loss at 50 Hz/60 Hz	W	6/7	12.5/15	7.5/9	9/11	27/32	98/118
Power connection U1, V1, W1		6 mm^2 screw-type terminals	6 mm^2 screw-type terminals	6 mm^2 screw-type terminals	6 mm^2 screw-type terminals	6 mm^2 screw-type terminals	6 mm^2 screw-type terminals
Load connection		Cable 4 x AGW 16 (1.5 mm^2) length approx. 0.38 m (1.25 ft)	Cable 4 x AGW 16 (1.5 mm^2) length approx. 0.38 m (1.25 ft)	Cable 4 x AGW 16 (1.5 mm^2) length approx. 0.38 m (1.25 ft)	Cable 4 x AGW 16 (1.5 mm^2) length approx. 0.46 m (1.51 ft)	Cable 4 x AGW 16 (1.5 mm^2) length approx. 0.46 m (1.51 ft)	Cable 4 x AGW 10 (2.5 mm^2) length approx. 0.49 m (1.61 ft)
PE connection		On housing with M5 bolt	On housing with M5 bolt	On housing with M5 bolt	On housing with M5 bolt	On housing with M5 bolt	On housing with M5 bolt
Degree of protection[1)]		IP20	IP20	IP20	IP20	IP20	IP20
Width	mm (inch)	75.5 (2.97)	75.5 (2.97)	75.5 (2.97)	153 (6.02)	153 (6.02)	190 (7.48)
Height	mm (inch)	201 (7.91)	201 (7.91)	201 (7.91)	290 (11.42)	290 (11.42)	370 (14.57)
Depth	mm (inch)	50 (1.97)	50 (1.97)	50 (1.97)	70 (2.76)	70 (2.76)	50 (1.97)
Weight, approx.	kg (lb)	1.2 (3)	1.3 (3)	1.3 (3)	3.4 (7)	3.4 (7)	6.3 (14)
Suitable for PM340 Power Module	Type	6SL3210-1SE11-3... 6SL3210-1SE11-7...	6SL3210-1SE12-2... 6SL3210-1SE13-1...	6SL3210-1SE14-1...	6SL3210-1SE16-0... 6SL3210-1SE17-7...	6SL3210-1SE21-0...	6SL3210-1SE21-8... 6SL3210-1SE22-5...

1) With correctly connected load connection cable.

Technical data (continued)

Line voltage 380 V to 480 V 3 AC		Line reactor 6SL3203-0CD23-5AA0	6SL3203-0CJ24-5AA0	6SL3203-0CD25-3AA0	6SL3203-0CJ28-6AA0	6SE6400-3CC11-2FD0	6SE6400-3CC11-7FD0
Rated current	A	31.3	54	71	105	178	225
Power loss at 50 Hz/60 Hz	W	37/44	90/115	90/115	170/215	280/360	280/360
Power connection U1, V1, W1		6 mm^2 screw-type terminals	16 mm^2 screw-type terminals	16 mm^2 screw-type terminals	50 mm^2 screw-type terminals	Flat connector for M10 cable lug	Flat connector for M10 cable lug
Load connection		Cable 4 x AWG10 (2.5 mm^2) Length approx. 0.49 m (1.61 ft)	Cable 4 x 16 mm^2 length approx. 0.7 m (2.3 ft)	Cable 4 x 16 mm^2 length approx. 0.7 m (2.3 ft)	Cable 4 x 35 mm^2 length approx. 0.7 m (2.3 ft)	Flat connector for M10 cable lug	Flat connector for M10 cable lug
PE connection		On housing with M5 bolt	On housing with M8 screw	On housing with M8 screw	On housing with M8 screw	On housing with M8 bolt	On housing with M8 bolt
Degree of protection[1)]		IP20	IP20	IP20	IP20	IP00	IP00
Width	mm (inch)	190 (7.48)	275 (10.83)	275 (10.83)	275 (10.83)	240 (9.45)	240 (9.45)
Height	mm (inch)	370 (14.57)	455 (17.91)	455 (17.91)	577 (22.72)	228 (8.98)	228 (8.98)
Depth	mm (inch)	50 (1.97)	83.5 (3.29)	83.5 (3.29)	93.5 (3.68)	141 (5.55)	141 (5.55)
Weight, approx.	kg (lb)	6.4 (14)	13 (29)	13 (29)	19 (42)	25 (55)	25 (55)
Suitable for PM340 Power Module	Type	6SL3210-1SE23-2...	6SL3210-1SE23-8... 6SL3210-1SE24-5...	6SL3210-1SE26-0...	6SL3210-1SE27-5... 6SL3210-1SE31-0...	6SL3210-1SE31-1... 6SL3210-1SE31-5...	6SL3210-1SE31-8...

Selection and ordering data

Rated output current	Rated power	Suitable for PM340 Power Module		Line reactor
A	kW (HP)	Type	Size	Order No.
Line voltage 200 V to 240 V 1 AC				
0.9	0.12 (0.2)	6SL3210-1SB11-0...	FSA	**6SE6400-3CC00-4AB3**
2.3	0.37 (0.5)	6SL3210-1SB12-3...	FSA	**6SE6400-3CC00-4AB3**
3.9	0.75 (0.75)	6SL3210-1SB14-0...	FSA	**6SE6400-3CC01-0AB3**
Line voltage 380 V to 480 V 3 AC				
1.3	0.37 (0.5)	6SL3210-1SE11-3UA0	FSA	**6SE6400-3CC00-2AD3**
1.7	0.55 (0.75)	6SL3210-1SE11-7UA0	FSA	**6SE6400-3CC00-2AD3**
2.2	0.75 (1)	6SL3210-1SE12-2UA0	FSA	**6SE6400-3CC00-4AD3**
3.1	1.1 (1.5)	6SL3210-1SE13-1UA0	FSA	**6SE6400-3CC00-4AD3**
4.1	1.5 (2)	6SL3210-1SE14-1UA0	FSA	**6SE6400-3CC00-6AD3**
5.9	2.2 (3)	6SL3210-1SE16-0...	FSB	**6SL3203-0CD21-0AA0**
7.7	3 (5)	6SL3210-1SE17-7...	FSB	**6SL3203-0CD21-0AA0**
10	4 (5)	6SL3210-1SE21-0...	FSB	**6SL3203-0CD21-4AA0**
18	7.5 (10)	6SL3210-1SE21-8...	FSC	**6SL3203-0CD22-2AA0**
25	11 (15)	6SL3210-1SE22-5...	FSC	**6SL3203-0CD22-2AA0**
32	15 (20)	6SL3210-1SE23-2...	FSC	**6SL3203-0CD23-5AA0**
38	18.5 (25)	6SL3210-1SE23-8...	FCD	**6SL3203-0CJ24-5AA0**
45	22 (30)	6SL3210-1SE24-5...	FCD	**6SL3203-0CJ24-5AA0**
60	30 (40)	6SL3210-1SE26-0...	FCD	**6SL3203-0CD25-3AA0**
75	37 (50)	6SL3210-1SE27-5...	FSE	**6SL3203-0CJ28-6AA0**
90	45 (60)	6SL3210-1SE31-0...	FSE	**6SL3203-0CJ28-6AA0**
110	55 (75)	6SL3210-1SE31-1...	FSF	**6SE6400-3CC11-2FD0**
145	75 (100)	6SL3210-1SE31-5...	FSF	**6SE6400-3CC11-2FD0**
178	90 (125)	6SL3210-1SE31-8...	FSF	**6SE6400-3CC11-7FD0**

1) With correctly connected load connection cable.

Overview

A Braking Module and the matching external braking resistor are required to bring drives to a controlled standstill in the event of a power failure (e.g. emergency retraction or EMERGENCY OFF category 1) or limit the DC link voltage for brief periods of generator operation, e.g. when the regenerative feedback capability of the Line Module is deactivated. The Braking Module houses the power electronics and the associated control circuit. During operation, the DC link energy is converted to heat loss in an external braking resistor. Braking Modules function autonomously. A number of braking modules can be operated in parallel. In this case, each Braking Module must have its own braking resistor.

Braking Modules in booksize format can also be used for rapid discharge of the DC link.

Design

The Braking Module in booksize format features the following interfaces as standard:

- 2 DC link connections via integrated DC link busbars
- 2 electronics power supply connections via integrated 24 V DC bars
- Terminals for connecting the braking resistor
- 2 digital inputs (disable Braking Module/acknowledge faults and rapid discharge of DC link)
- 2 digital outputs (Braking Module disabled and prewarning – $I \times t$ monitoring)
- 2 PE (protective earth) connections

The status of the Braking Module is indicated via two 2-color LEDs.

Selection and ordering data

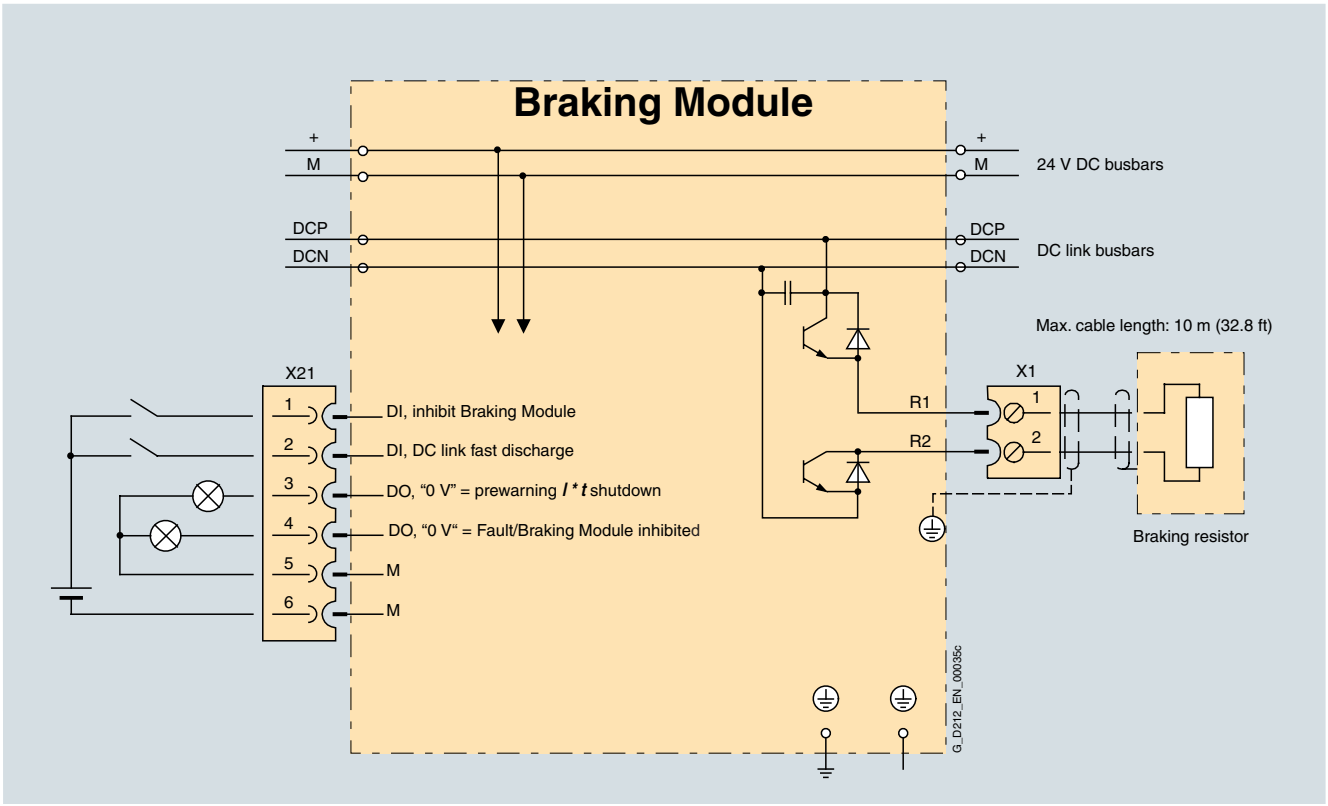
Description	Order No.
DC link voltage 510 V to 720 V DC	
Braking Module in booksize format (varnished) 1.5 kW/100 kW	**6SL3100-1AE31-0AB0**

Accessories

Description	Order No.
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, Danish, Dutch, Finnish, French, Greek, Italian, Japanese, Korean, Portuguese, Spanish and Swedish.	**6SL3166-3AB00-0AA0**

Braking Modules in booksize format

Integration

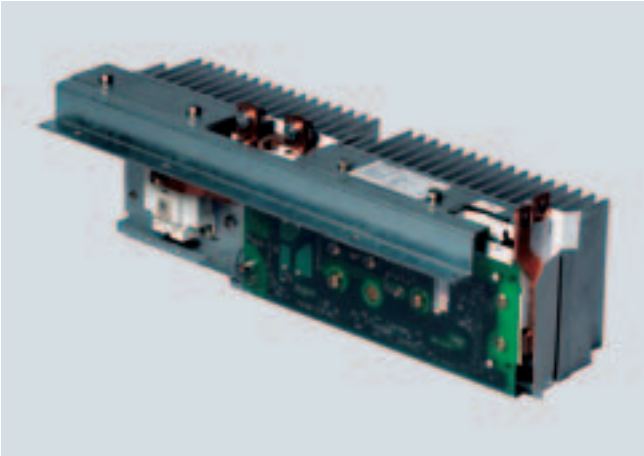


Connection example of Braking Module in booksize format

Technical data

DC link voltage 510 V to 720 V DC	Braking Module in booksize format (varnished)
Rated power P_{DB}	1.5 kW
Peak power P_{max}	100 kW
Activation threshold	770 V
Max. permissible cable length to braking resistor	10 m (32.8 ft)
DC link capacitance	110 µF
Max. current requirements at 24 V DC	0.5 A
Digital inputs	
• Voltage	– 3 V to + 30 V
• Low level (an open digital input is interpreted as "low")	– 3 V to + 5 V
• High level	15 V to 30 V
• Current consumption (typ. at 24 V DC)	10 mA
• Max. connectable cross section	1.5 mm^2
Digital outputs (continued-short-circuit-proof)	
• Voltage	24 V DC
• Max. load current per digital output	100 mA
• Max. connectable cross section	1.5 mm^2
24 V DC busbar current capacity	20 A
DC link busbar current capacity	100 A
PE connection	On housing with M5 screw
Width	50 mm (1.97 in)
Height	380 mm (14.96 in)
Depth, with spacer (included in scope of supply)	270 mm (10.63 in)
Weight, approx.	4.1 kg (9 lb)

Overview



A Braking Module and the matching external braking resistor are required to bring drives to a controlled standstill in the event of a power failure (e.g. emergency retraction or EMERGENCY OFF category 1) or limit the DC link voltage for brief periods of generator operation, e.g. when the regenerative feedback capability of the Line Module is deactivated. The Braking Module houses the power electronics and the associated control circuit. During operation, the DC link energy is converted to power loss in an external braking resistor. Braking Modules function autonomously. A number of braking modules can be operated in parallel. In this case, each Braking Module must have its own braking resistor.

The Braking Module in chassis format is inserted in a mounting location inside the Motor Module, Line Module or Power Module and is force cooled by the fan. The supply voltage for the electronics is drawn from the DC link. The Braking Module is connected to the DC link by means of the busbar sets and flexible cables, which are supplied as standard.

The activation threshold of the Braking Module can be adjusted by means of a DIP switch. The braking power values specified in the technical data apply to the upper activation threshold.

Design

The Braking Modules in chassis format feature the following interfaces as standard:

- 1 DC link connection
- 1 braking resistor connection
- 1 digital input (inhibit Braking Module/acknowledge error)
- 1 digital output (Braking Module inhibited)
- 1 DIP switch for adjusting the application threshold

Selection and ordering data

Description	Order No.
DC link voltage 510 V to 720 V DC	
Braking Module in chassis format	
• Frame size FX, 25 kW/125 kW	**6SL3300-1AE31-3AA0**
• Frame size GX, 50 kW/250 kW	**6SL3300-1AE32-5AA0**
• Frame sizes HX and JX, 50 kW/250 kW	**6SL3300-1AE32-5BA0**
DC link voltage 890 V to 1035 V DC	
Braking Module in chassis format	
• Frame size FX, 25 kW/125 kW	**6SL3300-1AH31-3AA0**
• Frame size GX, 50 kW/250 kW	**6SL3300-1AH32-5AA0**
• Frame sizes HX and JX, 50 kW/250 kW	**6SL3300-1AH32-5BA0**

Warning signs in foreign languages

Warning signs in other languages can be placed on top of the standard warning signs in German or English.

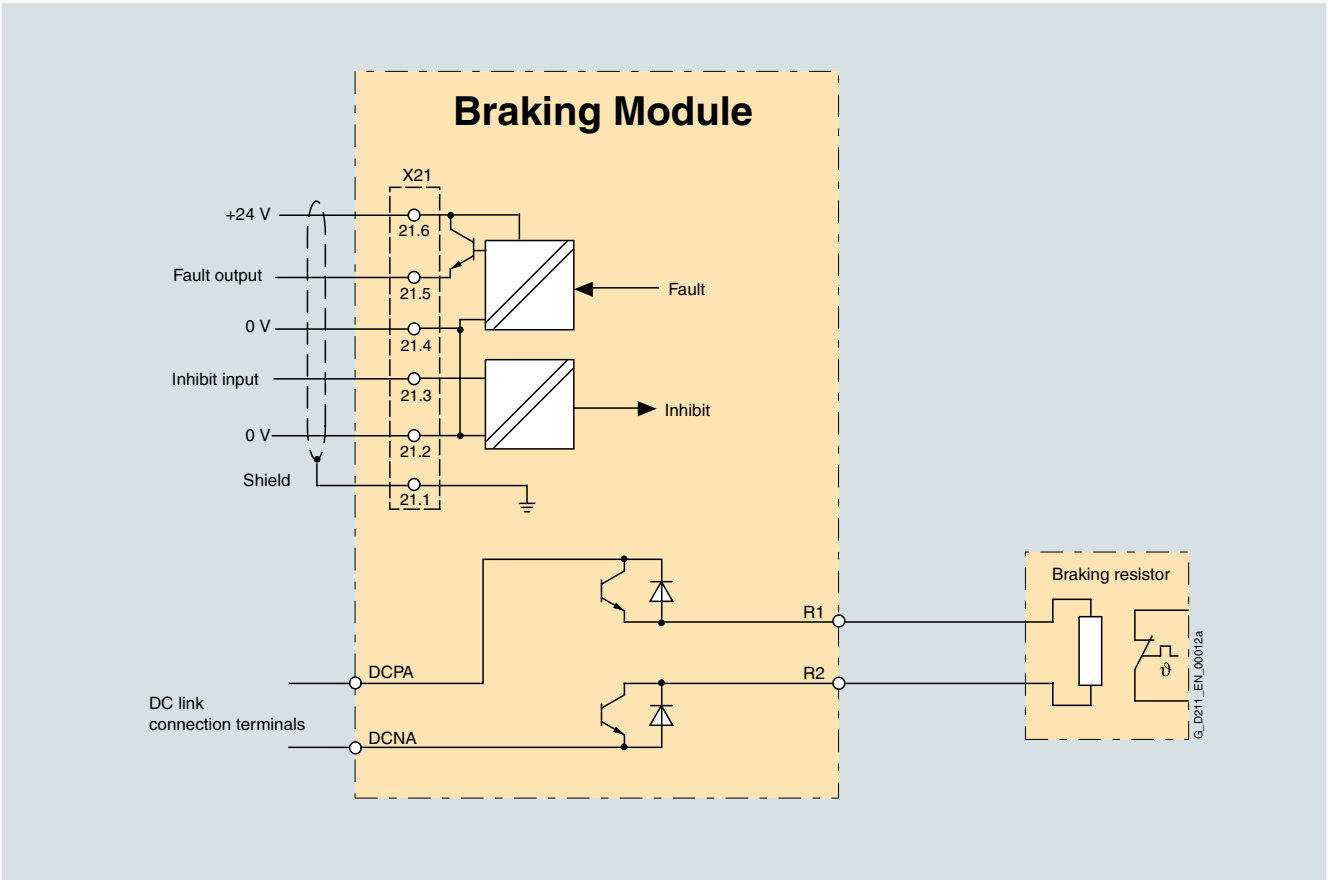
The following signs are supplied with chassis format units: Chinese, Danish, Finnish, French, Greek, Italian, Japanese, Korean, Dutch, Polish, Portuguese, Russian, Swedish, Spanish, Czech and Turkish.

Accessories

Description	Order No.
Cable harness set for mounting of Braking Modules frame size GX into a Basic Line Module frame size GB	**6SL3366-2NG00-0AA0**

Braking Modules in chassis format

Integration



Connection example of Braking Module in chassis format

Technical data

DC link voltage 510 V to 720 V DC		Braking Module in chassis format 6SL3300-1AE31-3AA0	6SL3300-1AE32-5AA0	6SL3300-1AE32-5BA0
P_{DB} rated power	kW	25	50	50
P_{15} peak power	kW	125	250	250
P_{20} power	kW	100	200	200
P_{40} power	kW	50	100	100
Activation thresholds (adjustable via DIP switch)	V	774 (factory setting) or 673	774 (factory setting) or 673	774 (factory setting) or 673
Max. permissible cable length to braking resistor	m (ft)	50 (164)	50 (164)	50 (164)
Digital inputs				
• Voltage	V	– 3 to + 30	– 3 to + 30	– 3 to + 30
• Low level (an open digital input is interpreted as "low")	V	– 3 to + 5	– 3 to + 5	– 3 to + 5
• High level	V	15 to 30	15 to 30	15 to 30
• Current consumption (typ. at 24 V DC)	mA	10	10	10
• Max. connectable cross section	mm^2	1.5	1.5	1.5
Digital outputs (continued-short-circuit-proof)				
• Voltage	V	DC 24	DC 24	DC 24
• Max. load current per digital output	mA	500	500	500
• Max. connectable cross section	mm^2	1.5	1.5	1.5
Terminal/screw R1/R2		M8	M8	M8
Max. connectable cross section R1/R2	mm^2	35	50	50
Weight, approx.	kg (lb)	3.6 (8)	7.3 (16)	7,5 (17)
Suitable for installation in a Moto Module/ Active Line Module/Basic Line Module frame size	Frame size	FX/FB	GX/GB [1]	HX/JX

DC link voltage 890 V to 1035 V DC		Braking Module in chassis format 6SL3300-1AH31-3AA0	6SL3300-1AH32-5AA0	6SL3300-1AH32-5BA0
P_{DB} rated power	kW	25	50	50
P_{15} peak power	kW	125	250	250
P_{20} power	kW	100	200	200
P_{40} power	kW	50	100	100
Activation thresholds (adjustable via DIP switch)	V	1153 (factory setting) or 1070	1153 (factory setting) or 1070	1153 (factory setting) or 1070
Max. permissible cable length to braking resistor	m (ft)	50 (164)	50 (164)	50 (164)
Digital inputs				
• Voltage	V	– 3 to + 30	– 3 to + 30	– 3 to + 30
• Low level (an open digital input is interpreted as "low")	V	– 3 to + 5	– 3 to + 5	– 3 to + 5
• High level	V	15 to 30	15 to 30	15 to 30
• Current consumption (typ. at 24 V DC)	mA	10	10	10
• Max. connectable cross section	mm^2	1.5	1.5	1.5
Digital outputs (continued-short-circuit-proof)				
• Voltage	V	DC 24	DC 24	DC 24
• Max. load current per digital output	mA	500	500	500
• Max. connectable cross section	mm^2	1.5	1.5	1.5
Terminal/screw R1/R2		M8	M8	M8
Max. connectable cross section R1/R2	mm^2	35	50	50
Weight, approx.	kg (lb)	3.6 (8)	7.3 (16)	7.5 (17)
Suitable for installation in a Motor Module/ Active Line Module/Basic Line Module frame size	Frame size	FX/FB	GX/GB [1]	HX/JX

[1] Cable harness set 6SL3366-2NG00-0AA0 is required to connect the Braking Module to a Basic Line Module of frame size GB.

Braking resistors for blocksize format

Overview

Braking resistor for blocksize format, frame sizes FSA and FSC

The PM340 Power Modules cannot regenerate into the line supply. For regenerative operation, e.g. the braking of a rotating mass, a braking resistor must be connected to convert the resulting energy into heat.

The braking resistor is connected at terminals DCP/R1 and R2.

The braking resistors can be installed at the side next to the PM340 Power Modules. The braking resistors for the FSA and FSB frame sizes are designed as base components. If the PM340 Power Modules of the FSA or FSB frame size are operated without line reactor, the braking resistors can also be installed under the Power Modules.

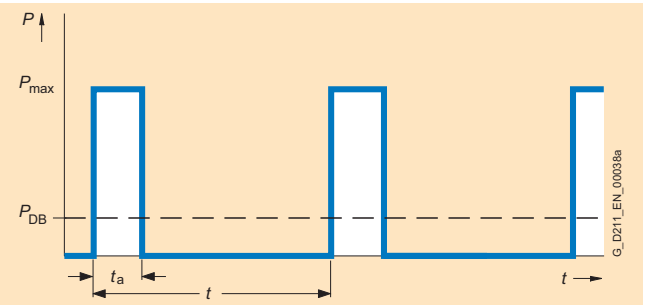
The braking resistors for the Power Modules of the FSC to FSF frame sizes should be placed outside the control cabinet or the switchgear room in order to direct the resulting heat loss away from the Power Modules, thereby allowing a corresponding reduction in the level of air conditioning required.

The braking resistors are designed with a temperature switch. The temperature switch must be evaluated to prevent consequential damage if the braking resistor overheats.

Selection and ordering data

Description	Suitable for Power Module, blocksize format	Order No.
DC link voltage 240 V to 360 V DC (line voltage 200 V to 240 V 1 AC)		
Braking resistor		
• 180 ohm	Frame size FSA	**6SE6400-4BC05-0AA0**
DC link voltage 510 V to 720 V DC (line voltage 380 V to 480 V 3 AC)		
Braking resistor		
• 390 ohm	Frame size FSA	**6SE6400-4BD11-0AA0**
• 160 ohm	Frame size FSB	**6SL3201-0BE12-0AA0**
• 56 ohm	Frame size FSC	**6SE6400-4BD16-5CA0**
• 27 ohm	Frame size FSD	**6SE6400-4BD21-2DA0**
• 15 ohm	Frame size FSE	**6SE6400-4BD22-2EA0**
• 8.2 ohm	Frame size FSF	**6SE6400-4BD24-0FA0**

Characteristics



Load diagram for braking resistors in blocksize format

t_a = 12 s

t = 240 s

Technical data

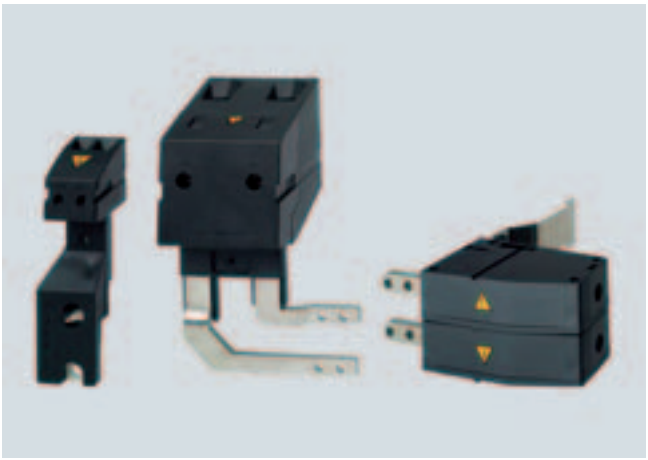
DC link voltage 240 V to 360 V DC	Braking resistor for Power Modules in blocksize format 6SE6400-4BC05-0AA0
Resistor	180 ohm
Rated power P_{DB}	0.05 kW
Peak power P_{max}	1 kW
Degree of protection[1]	IP20
Power connections	3 × 1.5 mm² (shielded) length 0.5 m (1.64 ft)
Thermostatic switch (NC contact)	
• Switching capacity	250 V AC/max. 2.5 A
• Connectable cable cross section	0.5 mm² to 2.5 mm²
Width	72 mm (2.83 in)
Height	230 mm (9.05 in)
Depth	43.5 mm (1.71 in)
Weight, approx.	1.0 kg (2)

DC link voltage 510 V to 720 V DC		Braking resistors for Power Modules in blocksize format 6SE6400-4BD11-0AA0	6SL3201-0BE12-0AA0	6SE6400-4BD16-5CA0	6SE6400-4BD21-2DA0	6SE6400-4BD22-2EA0	6SE6400-4BD24-0FA0
Resistor	Ohm	390	160	56	27	15	8.2
Rated power P_{DB}	kW	0.1	0.2	0.65	1.2	2.2	4.0
Peak power P_{max}	kW	1.7	4.1	12	24	44	80
Degree of protection[1]		IP20	IP20	IP20	IP20	IP20	IP20
Power connections		3 × 1.5 mm² (shielded) length 0.5 m (1.64 ft)	3 × 1.5 mm² (shielded) length 0.5 m (1.64 ft)	3 × 1.5 mm² (shielded) length 0.9 m (2.95 ft)	M6 screw studs	M6 screw studs	M6 screw studs
Thermostatic switch (NC contact)							
• Switching capacity		250 V AC/ max. 2.5 A	250 V AC/ max. 2.5 A	250 V AC/ max. 2.5 A	250 V AC/ max. 2.5 A	250 V AC/ max. 2.5 A	250 V AC/ max. 0.2 A
• Connectable cable cross section		0.5 mm² to 2.5 mm²	0.5 mm² to 2.5 mm²	0.5 mm² to 2.5 mm²	0.5 mm² to 2.5 mm²	0.5 mm² to 2.5 mm²	0.5 mm² to 2.5 mm²
Width	mm (inch)	72 (2.83)	153 (6.02)	185 (7.28)	270 (10.63)	270 (10.63)	400 (15.75)
Height	mm (inch)	230 (9.05)	329 (12.95)	285 (11.22)	515 (20.28)	645 (25.39)	650 (25.59)
Depth	mm (inch)	43.5 (1.71)	43.5 (1.71)	150 (5.9)	175 (6.89)	175 (6.89)	315 (12.4)
Weight, approx.	kg (lb)	1.0 (2)	1.6 (3)	3.8 (8)	7.4 (16)	10.6 (23)	16.7 (37)

[1] With correctly connected load connection cable.

DC link supply adapter for booksize format

Overview



If the internal Motor Module DC link busbars are not to be used, the DC link voltage can be provided externally via a DC link power supply adapter. Two versions are available depending on cable cross section. The DC link power supply adapter is mounted on the DC link busbars of the Motor Module. The DC link cables are routed from above.

If a multi-tier Motor Module configuration is used, a DC link power supply adapter set can be provided for linking the DC links of two drive groups. The DC link power supply adapters are mounted on the DC link busbars of the Motor Modules to the far right of each group. The DC link cables are routed from behind.

Technical data

		DC link supply adapter for booksize format		
		6SL3162-2BD00-0AA0	**6SL3162-2BM00-0AA0**	**6SL3162-2BM01-0AA0**
Connectable cross section (screw-type terminals)	mm^2	0.5 to 10	35 to 95	35 to 95
Current carrying capacity	A	36	240	240
Weight, approx.	kg (lb)	0.06 (0.1)	0.48 (1.1)	0.76 (1.7)

Selection and ordering data

Description	Order No.
DC link supply adapter for direct infeed of DC link voltage for Line Modules and Motor Modules in booksize format	
• 50 mm (1.97 in) and 100 mm (3.94 in) wide	**6SL3162-2BD00-0AA0**
• 150 mm (5.91 in), 200 mm (7.87 in) and 300 mm (11.81 in) wide	**6SL3162-2BM00-0AA0**
DC link adapters (2x) for multi-tier configuration for all Line Modules and Motor Modules in booksize format	**6SL3162-2BM01-0AA0**

Motor reactors for blocksize format

Overview

Motor reactors for blocksize format, frame sizes FSA and FSB

Motor reactors reduce the voltage loading on the motor windings. At the same time, the capacitive charge/discharge currents that place an additional load on the power unit when long motor cables are used are reduced. The maximum permissible output frequency when a motor reactor is used is 150 Hz.

The motor reactors are designed for a pulse frequency of 4 kHz. Higher pulse frequencies are not permissible.

The motor reactor must be installed as close as possible to the Power Module.

Motor reactors are approved for use only in conjunction with "Vector" and "*V/f* control" modes.

Technical data

DC link voltage 510 V to 720 V DC or line voltage 380 V to 480 V 3 AC		**Motor reactor (for a 4 kHz pulse frequency)**				
		6SE6400-3TC00-4AD2				
Rated current	A	4.5	4.5	4.5	4.5	4.5
Power loss	kW	0.005	0.005	0.005	0.005	0.005
Connection to the Power Module		Cable 4 x AWG16 (1.5 mm^2) length approx. 0.3 m (0.98 ft)	Cable 4 x AWG16 (1.5 mm^2) length approx. 0.3 m (0.98 ft)	Cable 4 x AWG16 (1.5 mm^2) length approx. 0.3 m (0.98 ft)	Cable 4 x AWG16 (1.5 mm^2) length approx. 0.3 m (0.98 ft)	Cable 4 x AWG16 (1.5 mm^2) length approx. 0.3 m (0.98 ft)
Motor connection		Screw-type terminals for conductor cross section 6 mm^2	Screw-type terminals for conductor cross section 6 mm^2	Screw-type terminals for conductor cross section 6 mm^2	Screw-type terminals for conductor cross section 6 mm^2	Screw-type terminals for conductor cross section 6 mm^2
PE connection		M5 bolt	M5 bolt	M5 bolt	M5 bolt	M5 bolt
Max. permissible cable length between motor reactor and motor	m (ft)	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded
Width	mm (inch)	75.5 (2.97)	75.5 (2.97)	75.5 (2.97)	75.5 (2.97)	75.5 (2.97)
Height	mm (inch)	201 (7.91)	201 (7.91)	201 (7.91)	201 (7.91)	201 (7.91)
Depth	mm (inch)	110 (4.33)	110 (4.33)	110 (4.33)	110 (4.33)	110 (4.33)
Degree of protection[1)]		IP20	IP20	IP20	IP20	IP20
Weight, approx.	kg (lb)	2 (4)	2 (4)	2 (4)	2 (4)	2 (4)
Suitable for Power Module, blocksize format	Type	6SL3210-1SE11-3UA0	6SL3210-1SE11-7UA0	6SL3210-1SE12-2UA0	6SL3210-1SE13-1UA0	6SL3210-1SE14-1UA0
Rated current of the Power Module	A	1.3	1.7	2.2	3.1	4.1
Size		FSA	FSA	FSA	FSA	FSA

1) With correctly connected connection cable to the Power Module.

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Technical data (continued)

DC link voltage 510 V to 720 V DC or line voltage 380 V to 480 V 3 AC		Motor reactor (for a 4 kHz pulse frequency)					
		6SL3202-0AE21-0CA0			6SL3202-0AJ23-2CA0		
Rated current	A	10	10	10	32	32	32
Power loss	kW	0.02	0.02	0.02	0.06	0.06	0.06
Connection to the Power Module		Cable 4 x AWG14 (1.5 mm²) length approx. 0.4 m (1.31 ft)	Cable 4 x AWG14 (1.5 mm²) length approx. 0.4 m (1.31 ft)	Cable 4 x AWG14 (1.5 mm²) length approx. 0.4 m (1.31 ft)	Cable 4 x 6 mm² length approx. 0.35 m (1.15 ft)	Cable 4 x 6 mm² length approx. 0.35 m (1.15 ft)	Cable 4 x 6 mm² length approx. 0.35 m (1.15 ft)
Motor connection		Screw-type terminals for conductor cross section 6 mm²	Screw-type terminals for conductor cross section 6 mm²	Screw-type terminals for conductor cross section 6 mm²	Screw-type terminals for conductor cross section 6 mm²	Screw-type terminals for conductor cross section 6 mm²	Screw-type terminals for conductor cross section 6 mm²
PE connection		M5 bolt	M5 bolt	M5 bolt	M5 bolt	M5 bolt	M5 bolt
Max. permissible cable length between motor reactor and motor	m (ft)	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded	100 (328) shielded 150 (492) unshielded
Width	mm (inch)	153 (6.02)	153 (6.02)	153 (6.02)	189 (7.44)	189 (7.44)	189 (7.44)
Height	mm (inch)	285 (11.22)	285 (11.22)	285 (11.22)	351 (13.82)	351 (13.82)	351 (13.82)
Depth	mm (inch)	70 (2.76)	70 (2.76)	70 (2.76)	80 (3.15)	80 (3.15)	80 (3.15)
Degree of protection[1)]		IP20	IP20	IP20	IP20	IP20	IP20
Weight, approx.	kg (lb)	4.5 (10)	4.5 (10)	4.5 (10)	9 (20)	9 (20)	9 (20)
Suitable for Power Module, blocksize format	Type	6SL3210-1SE16-0 . A0	6SL3210-1SE17-7 . A0	6SL3210-1SE21-0 . A0	6SL3210-1SE21-8 . A0	6SL3210-1SE22-5 . A0	6SL3210-1SE23-2 . A0
Rated current of the Power Module	A	5.9	7.7	10	18	25	32
Size		FSB	FSB	FSB	FSC	FSC	FSC

DC link voltage 510 V to 720 V DC or line voltage 380 V to 480 V 3 AC		Motor reactor (for a 4 kHz pulse frequency)				
		6SE6400-3TC05-4DD0	6SE6400-3TC03-8DD0	6SE6400-3TC05-4DD0	6SE6400-3TC08-0ED0	6SE6400-3TC07-5ED0
Rated current	A	68	45	68	104	90
Power loss	kW	0.2	0.2	0.2	0.17	0.27
Connection to the Power Module		Flat terminator for M6 cable lug	Flat terminator for M6 cable lug	Flat terminator for M6 cable lug	Flat terminator for M6 cable lug	Flat terminator for M6 cable lug
Motor connection		Flat terminator for M6 cable lug	Flat terminator for M6 cable lug	Flat terminator for M6 cable lug	Flat terminator for M6 cable lug	Flat terminator for M6 cable lug
PE connection		M6 screw	M6 screw	M6 screw	M6 screw	M6 screw
Max. permissible cable length between motor reactor and motor	m (ft)	200 (656) shielded 300 (984) unshielded	200 (656) shielded 300 (984) unshielded	200 (656) shielded 300 (984) unshielded	200 (656) shielded 300 (984) unshielded	200 (656) shielded 300 (984) unshielded
Width	mm (inch)	225 (8.86)	225 (8.86)	225 (8.86)	225 (8.86)	270 (10.63)
Height	mm (inch)	210 (8.27)	210 (8.27)	210 (8.27)	210 (8.27)	248 (9.76)
Depth	mm (inch)	140 (5.51)	140 (5.51)	140 (5.51)	140 (5.51)	189 (7.44)
Degree of protection		IP00	IP00	IP00	IP00	IP00
Weight, approx.	kg (lb)	11.5 (25)	19 (42)	11.5 (25)	12 (26)	27 (59)
Suitable for Power Module, blocksize format	Type	6SL3210-1SE23-8 . A0	6SL3210-1SE24-5 . A0	6SL3210-1SE26-0 . A0	6SL3210-1SE27-5 . A0	6SL3210-1SE31-0 . A0
Rated current of the Power Module	A	38	45	60	75	90
Size		FSD	FSD	FSD	FSE	FSE

1) With correctly connected connection cable to the Power Module.

Motor reactors for blocksize format

Technical data (continued)

DC link voltage 510 V to 720 V DC or line voltage 380 V to 480 V 3 AC		Motor reactor (for a 4 kHz pulse frequency)		
		6SE6400-3TC14-5FD0	6SE6400-3TC14-5FD0	6SE6400-3TC14-5FD0
Rated current	A	178	178	178
Power loss	kW	0.47	0.25	0.47
Connection to the Power Module		Flat terminator for M8 cable lug	Flat terminator for M8 cable lug	Flat terminator for M8 cable lug
Motor connection		Flat terminator for M8 cable lug	Flat terminator for M8 cable lug	Flat terminator for M8 cable lug
PE connection		M8 screw	M8 screw	M8 screw
Max. permissible cable length between motor reactor and motor	m (ft)	200 (656) shielded 300 (984) unshielded	200 (656) shielded 300 (984) unshielded	200 (656) shielded 300 (984) unshielded
Width	mm (inch)	357 (14.05)	270 (10.63)	357 (14.05)
Height	mm (inch)	321 (12.64)	248 (9.76)	321 (12.64)
Depth	mm (inch)	221 (8.7)	189 (7.44)	221 (8.7)
Degree of protection		IP00	IP00	IP00
Weight, approx.	kg (lb)	57 (126)	24 (53)	57 (126)
Suitable for Power Module, blocksize format	Type	6SL3210-1SE31-1 . A0	6SL3210-1SE31-5 . A0	6SL3210-1SE31-8 . A0
Rated current of the Power Module	A	110	145	178
Size		FSF	FSF	FSF

Selection and ordering data

Rated output current	Rated power	Suitable for PM340 Power Module		Motor reactor
A	kW (HP)	Type	Size	Order No.
Line voltage 380 V to 480 V 3 AC				
1.3	0.37 (0.5)	6SL3210-1SE11-3UA0	FSA	**6SE6400-3TC00-4AD2**
1.7	0.55 (1)	6SL3210-1SE11-7UA0	FSA	**6SE6400-3TC00-4AD2**
2.2	0.75 (1)	6SL3210-1SE12-2UA0	FSA	**6SE6400-3TC00-4AD2**
3.1	1.1 (1.5)	6SL3210-1SE13-1UA0	FSA	**6SE6400-3TC00-4AD2**
4.1	1.5 (2)	6SL3210-1SE14-1UA0	FSA	**6SE6400-3TC00-4AD2**
5.9	2.2 (3)	6SL3210-1SE16-0...	FSB	**6SL3202-0AE21-0CA0**
7.7	3 (4)	6SL3210-1SE17-7...	FSB	**6SL3202-0AE21-0CA0**
10	4 (5)	6SL3210-1SE21-0...	FSB	**6SL3202-0AE21-0CA0**
18	7.5 (10)	6SL3210-1SE21-8...	FSC	**6SL3202-0AJ23-2CA0**
25	11 (15)	6SL3210-1SE22-5...	FSC	**6SL3202-0AJ23-2CA0**
32	15 (20)	6SL3210-1SE23-2...	FSC	**6SL3202-0AJ23-2CA0**
38	18.5 (25)	6SL3210-1SE23-8...	FCD	**6SE6400-3TC05-4DD0**
45	22 (30)	6SL3210-1SE24-5...	FCD	**6SE6400-3TC03-8DD0**
60	30 (40)	6SL3210-1SE26-0...	FCD	**6SE6400-3TC05-4DD0**
75	37 (50)	6SL3210-1SE27-5...	FSE	**6SE6400-3TC08-0ED0**
90	45 (60)	6SL3210-1SE31-0...	FSE	**6SE6400-3TC07-5ED0**
110	55 (70)	6SL3210-1SE31-1...	FSF	**6SE6400-3TC14-5FD0**
145	75 (100)	6SL3210-1SE31-5...	FSF	**6SE6400-3TC15-4FD0**
178	90 (120)	6SL3210-1SE31-8...	FSF	**6SE6400-3TC14-5FD0**