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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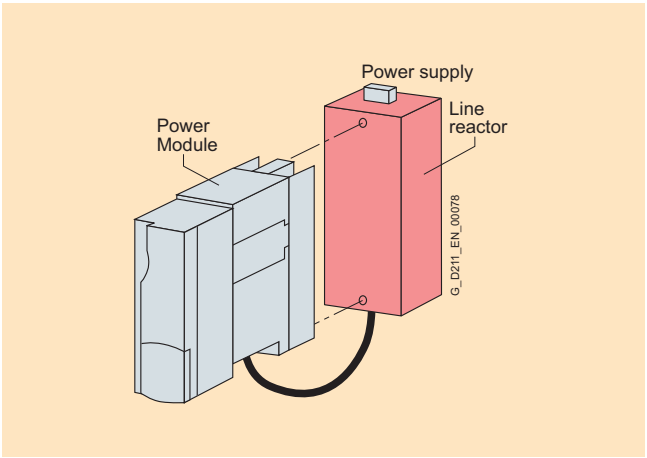
Integration (continued)

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.

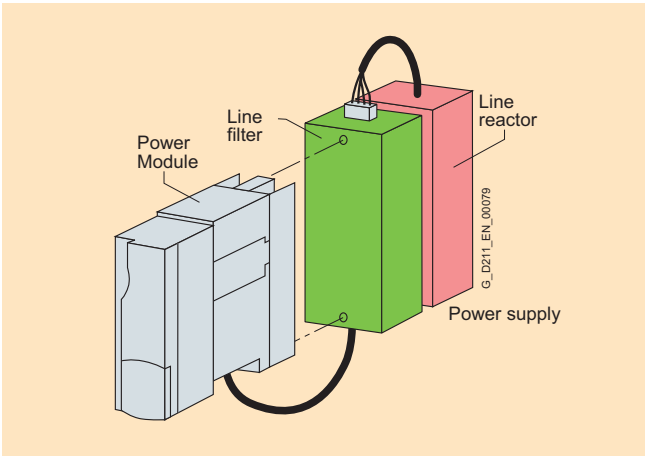
	FSA	FSB	FSC	FSD	FSE	FSF
Line filter	✓					
Line reactor	✓	✓	✓	✓	✓	–
Braking resistor	✓	✓	–	–	–	–
Motor reactor	✓	✓	✓	–	–	–

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



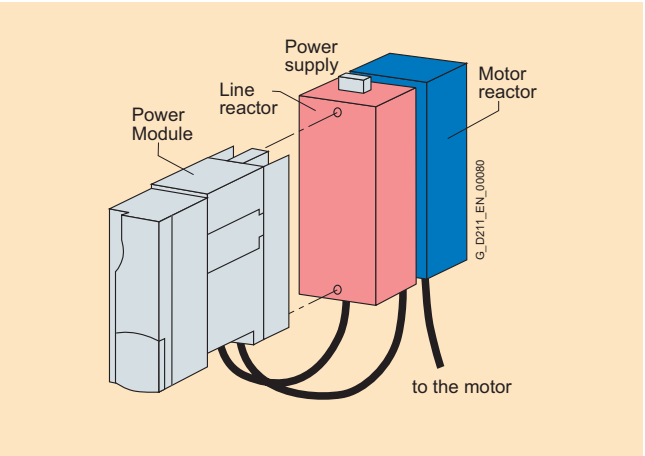
Basic layout of a PM340 Power Module with line reactor as base component

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.



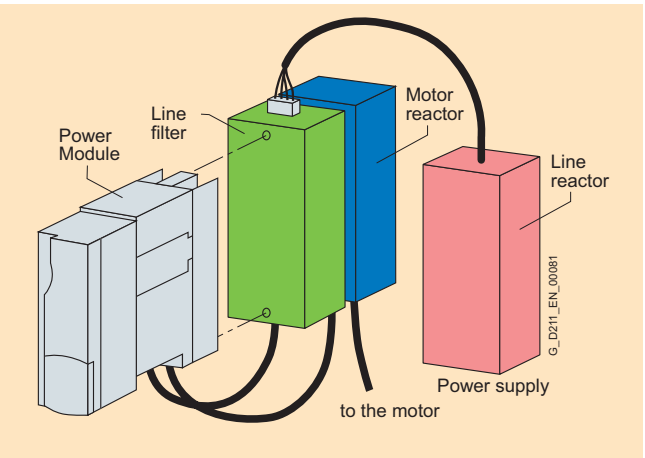
Power Module PM340 frame size FSA with line reactor and line filter

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.

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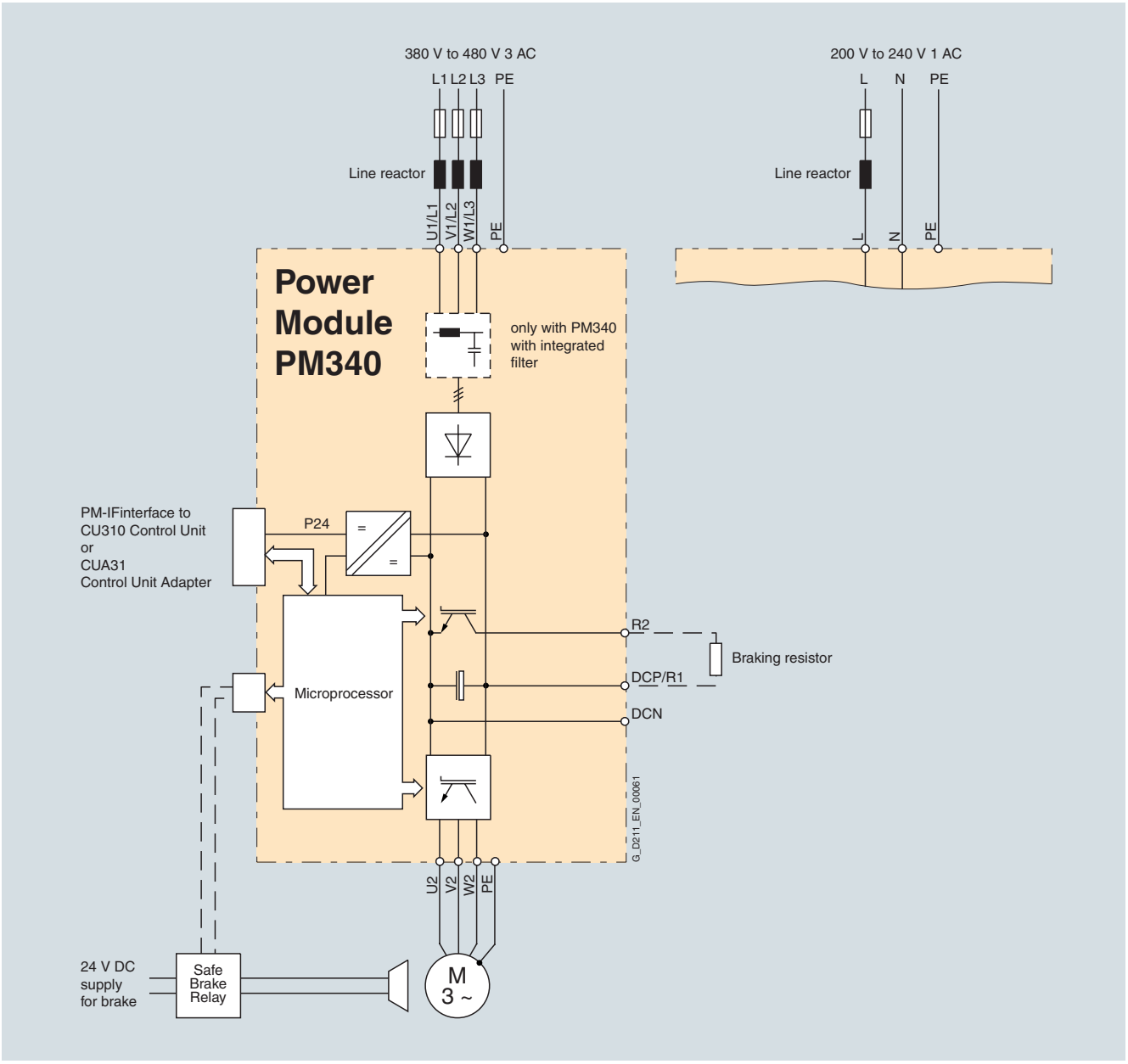
Integration (continued)

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

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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.