Power Factor Correction

Key Components - Capacitor switching module CSM100 Series

Date: 2026-08-13
Revision: Rev G

DATASHEET | CSM100 Series

Characteristics

- Electronically controlled thyristor switch
- For dynamic power factor correction systems

Features

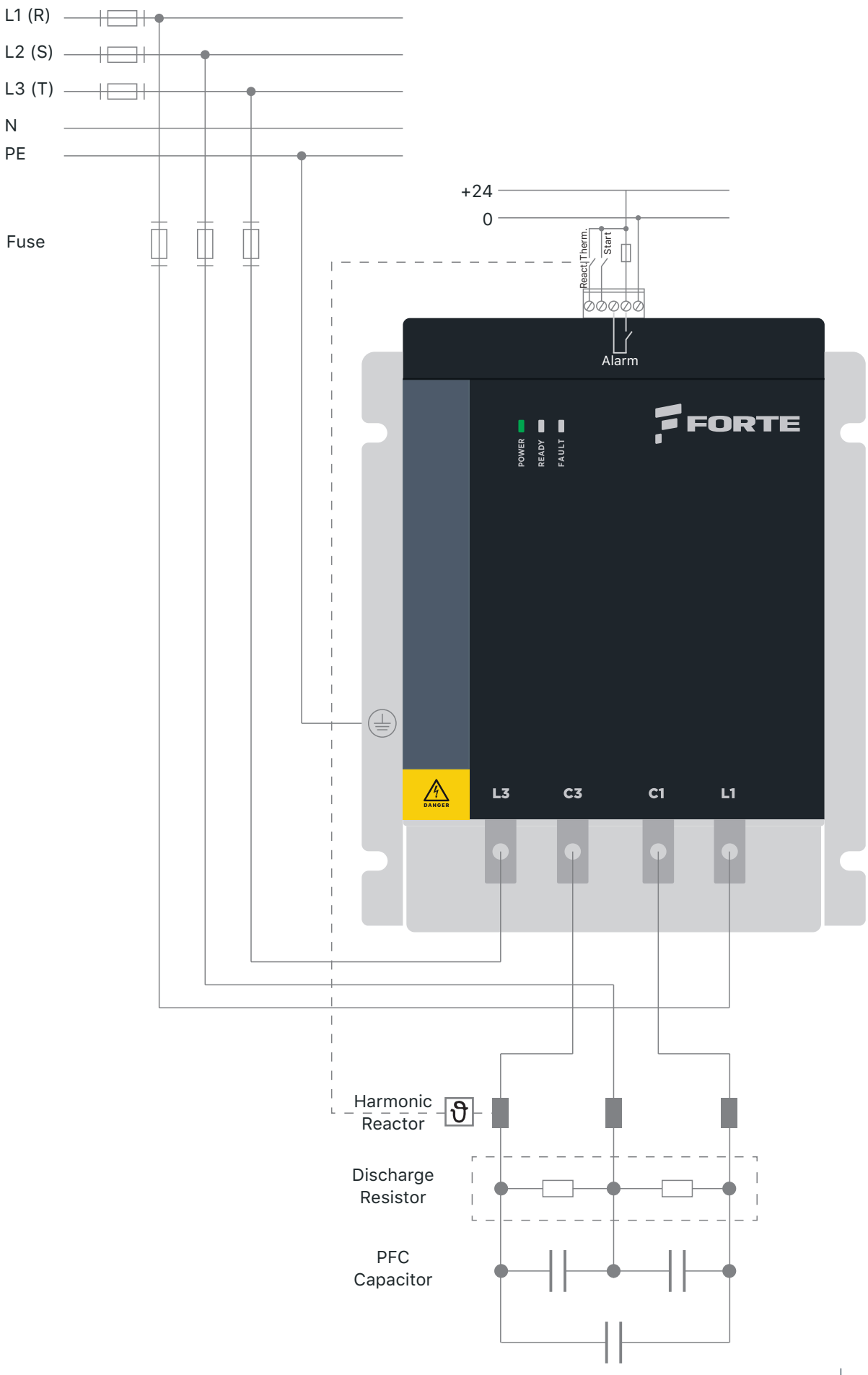
- Diagnostics via LED-displays
- Self-controlling
- Forced cooling by fan, temperature controlled

Technical data and specifications

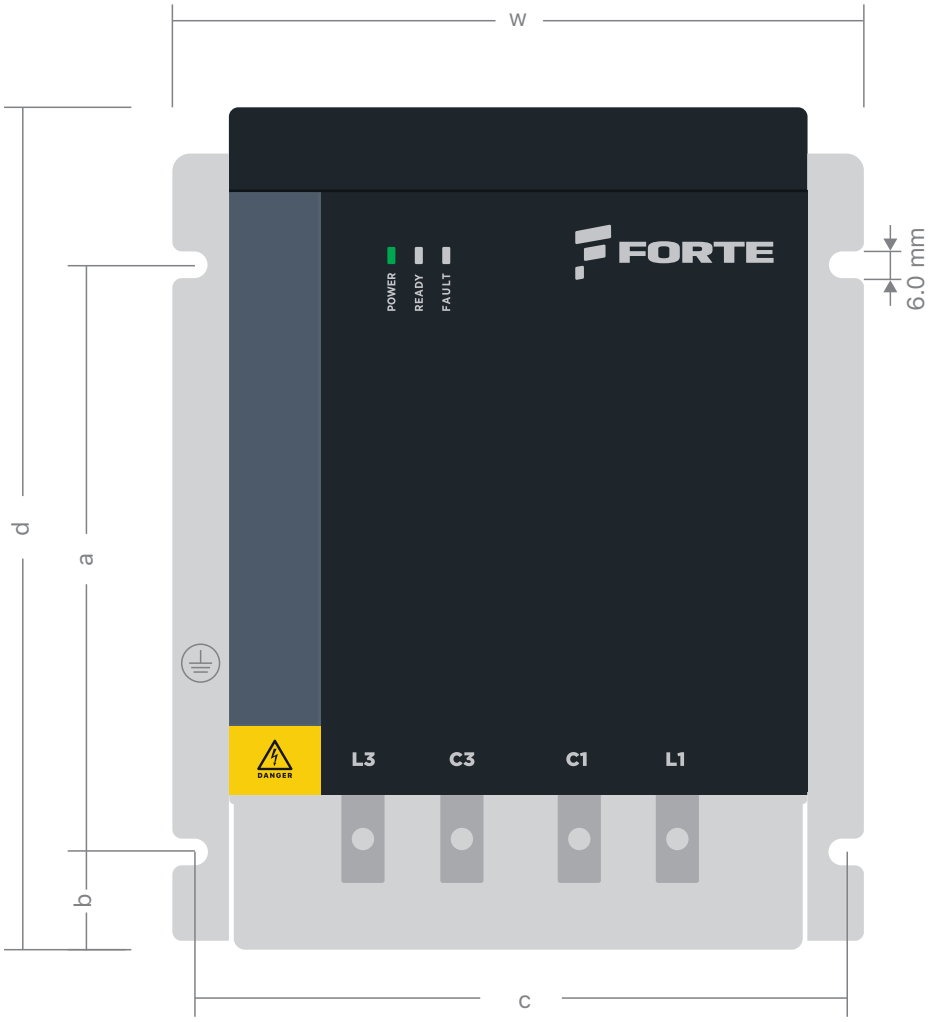
	FSA	FSC
Dimensions (w×d×h)	155.0 × 201.8 × 189.6 mm	155.0 × 201.8 × 243.9 mm
Terminal projection	22.4 mm	21.7 mm
Weight	5.1 kg	6.3 kg
Voltage	400V / 525V / 600V / 690V / 750V	
Maximum Overvoltage	+10%	
Frequency	50Hz	
Response time	3 ms	
Max. reactive power	50 kVAr (@400 V)	100 kVAr (@400 V)
Max. RMS current	75A	145A
Auxiliary supply	24VDC	
Start Signal	Via external potential free contact	
Monitoring	Voltage, temperature and operation status via LEDs Potential-free contact (output) for alarm	
Display	3 LEDs / GREEN: 24 V DC supply OK / YELLOW: module switched on / RED: alarm active	
Power Circuit	Direct connection 4-pole via bus bar cable lug 50 mm2, connection from bottom	
Power Dissipation	144 W	285 W

Dimensions measured from the 3D model. Terminal projection is additional to the height and must be allowed for in the enclosure.
Power dissipation is the conduction loss at maximum RMS current and worst-case junction temperature; auxiliary supply and snubber losses are not included.

Connection Diagram



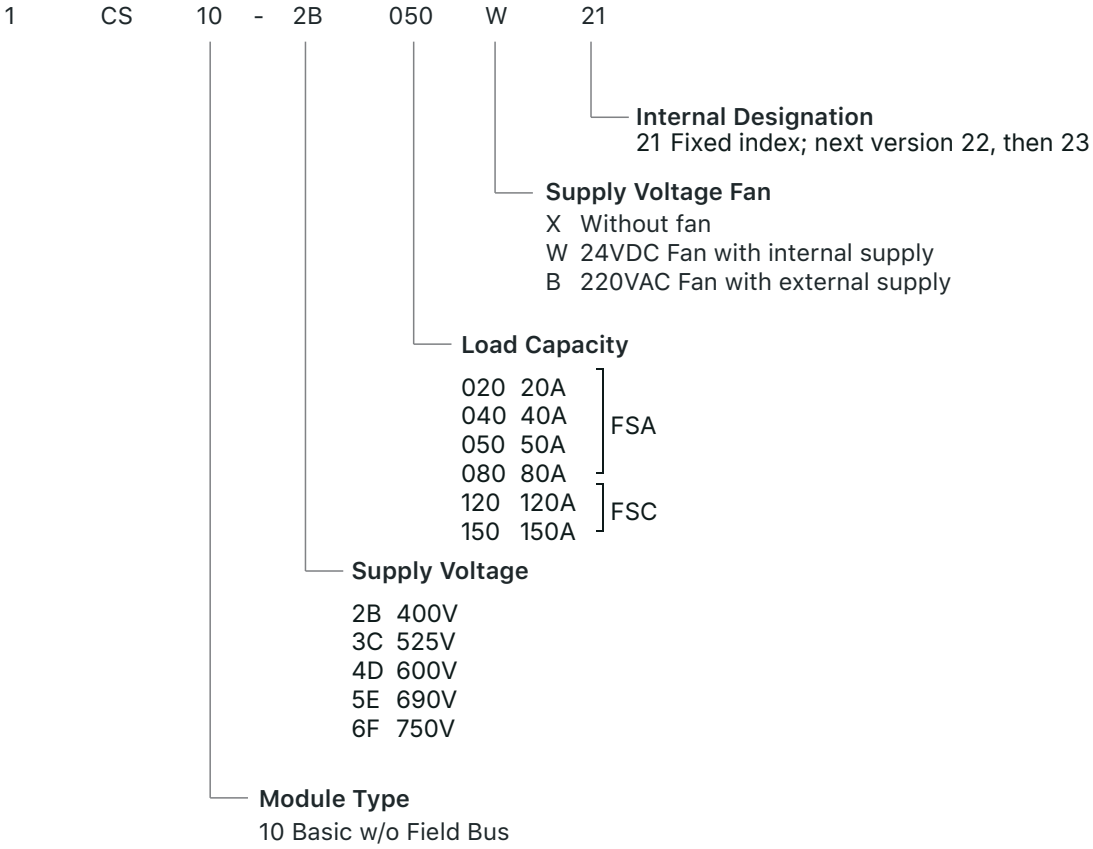
Dimensional Drawing



	FSA	FSC
Dimensions (w×d×h)	155.0 × 201.8 × 189.6 mm	155.0 × 201.8 × 243.9 mm
Mounting holes 4 × Ø4	151.0 × 173.8 mm	151.0 × 223.9 mm
Weight	5.1 kg	6.3 kg
Dimension key		
w Overall width	155.0 mm	155.0 mm
d Overall height including terminal block	212.0 mm	265.6 mm
a Mounting hole spacing, vertical	173.8 mm	223.9 mm
b Lower hole centre to bottom edge	24.4 mm	15.8 mm
c Mounting hole spacing, horizontal	151.0 mm	151.0 mm

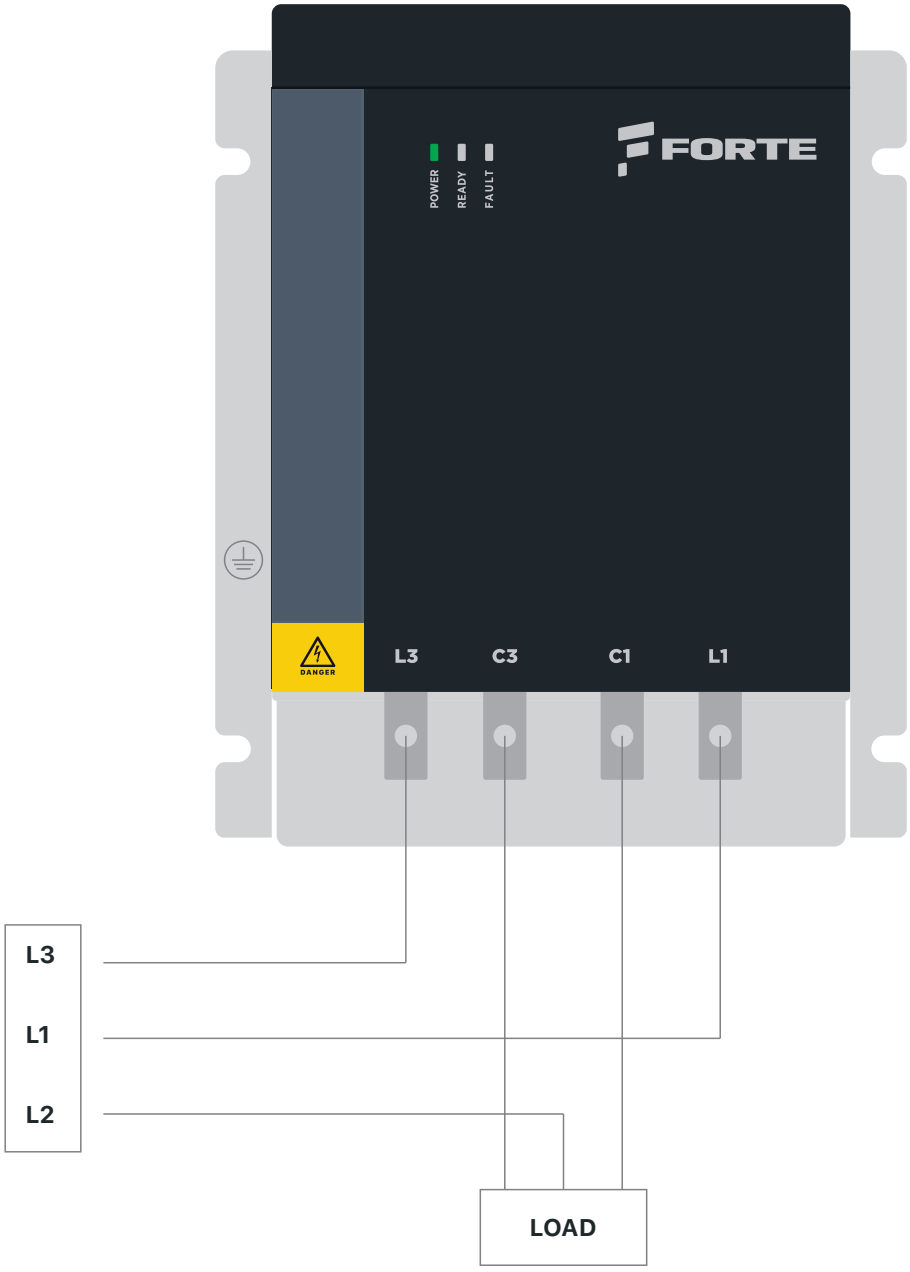
Measured from the CAD (STEP) models. The 4 × Ø4 mounting pattern is centred on the width; clearance to each side is 2.0 mm.

Ordering information / type code



ELECTRICAL CONNECTIONS

The CSM100 module controls power through its own two-phase connection. One phase is directly connected to the load. Two phase inputs to be controlled must be connected to the leftmost and rightmost busbars, labelled L1 and L3. Incorrect phase connections to C1 or C3 will destroy the internal protection varistor. C1 and C3 terminals must be connected to the load.



Control Circuit Connection

T1	T2	T3	T4	T5
⊘	⊘	⊘	⊘	⊘

T1 . Reactor thermostat overheat alarm input 24VDC (should be shorted with T4 if not used)
T2 . Alarm output 24VDC
T3 . Start input from the power factor controller 24VDC (should be from the same power supply with the T4, if not, separate power supplies must be with same reference point connected/not floating)
T4 . Power supply 24VDC +
T5 . Power supply 0VDC

TROUBLESHOOTING

Read the three front-panel LEDs, then find the row below.

off · on · flashing — G green · Y yellow · R red

NORMAL OPERATION

LED (G Y R)		
G on, Y off, R off	**Standby**	Supply healthy, waiting for the start command
G on, Y on, R off	**Running**	Thyristors firing — the module is conducting
G flashing, Y off, R off	**Rest period**	Duty-cycle rest after continuous operation · flash rate not fixed by the timer

FAULT CODES — one fault at a time — the firmware shows the highest priority first

CODE	LED PATTERN	ON / OFF	FAULT	CAUSE	WHAT TO DO
A02 priority 1	G flashing, Y flashing, R flashing	0,1 s on, then off	**NTC sensor broken**	Temperature sensor open circuit or disconnected	Check NTC wiring and connector; replace the sensor if defective
A03 priority 2	G flashing, Y off, R flashing	0,05 s on, then off	**Heatsink over-temperature**	Heatsink temperature exceeded 80 °C	Check the fan, clean the heatsink, reduce load, improve ventilation
A05 priority 3	G flashing, Y off, R off	0,1 s on, then off	**24 V DC supply fault**	Control supply dropped below 21.5 V	Check the 24 V DC supply, input voltage and wiring
A04 priority 4	G flashing, Y off, R flashing	0,1 s on, then off	**Reactor over-temperature**	Reactor thermal switch triggered	Check reactor ventilation, reduce load, verify the thermal switch
A01 priority 5	G flashing, Y off, R flashing	0,1 s on, then off	**Mains not detected**	No zero crossing on either phase for 60 ms	Check the mains supply, fuses and circuit breakers

Flashing means equal on and off time. LED behaviour, thresholds and timings taken from the module firmware (MCS114S00R00) and its 100 µs timer interrupt. 0,1 s on/off = 5 Hz · 0,05 s on/off = 10 Hz.

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