

Three-phase monitoring relays CM-PFE and CM-PFE.2

The CM-PFE is a three-phase monitoring relay that monitors the phase parameter phase sequence and phase failure in three-phase mains.



Characteristics

- Monitoring of three-phase mains for phase sequence and phase failure
- Powered by the measuring circuit
- 1 c/o (SPDT) contact
- 22.5 mm (0.89 in) width
- 1 LED for the indication of operational states
- Various certifications and approvals (see overview, document no. [2CDC112246D0201](#))

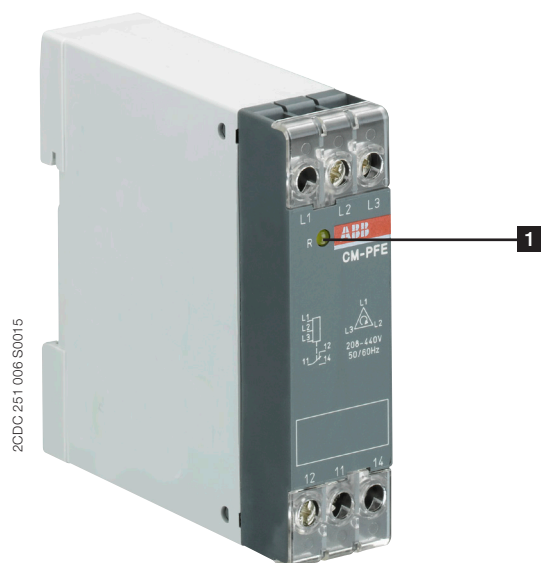
Order data

Three-phase monitoring relay

Type	Rated control supply voltage = measuring voltage	Order code
CM-PFE	3 x 208-440 V AC	1SVR550824R9100
CM-PFE.2	3 x 200-500 V AC	1SVR550826R9100

Functions

Operating controls



1 Indication of operational states

R: yellow LED – Relay status

Application / Operating mode

The CM-PFE is designed for use in three-phase mains for monitoring the phase parameters phase sequence and phase failure.

It works according to the closed-circuit principle.

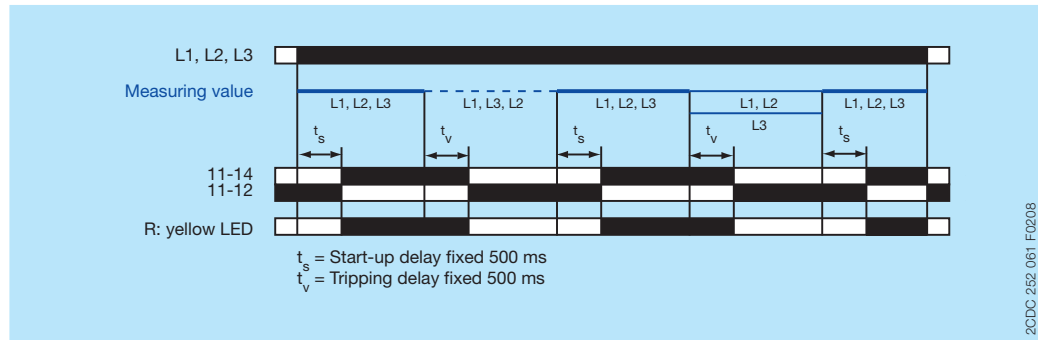
Function descriptions / diagrams

Phase sequence and phase failure monitoring

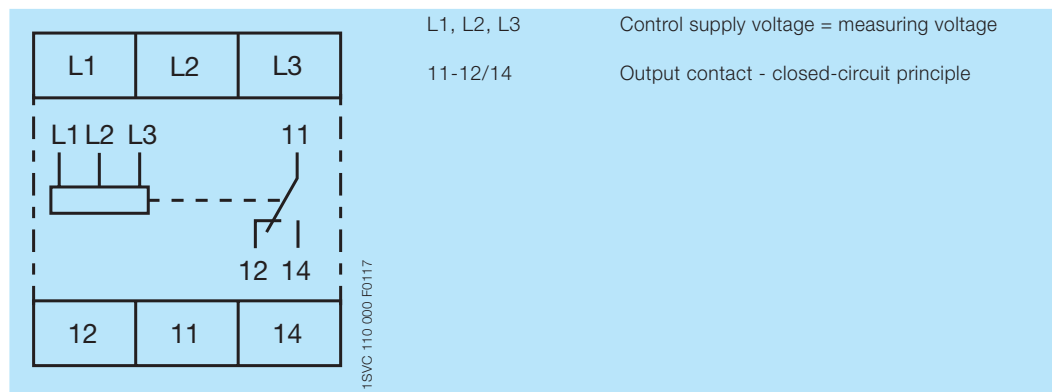
If all phases are present with the correct phase sequence, the output relay energizes after the fixed start-up delay t_s is complete.

If a phase failure or a phase sequence error occurs, the fixed tripping delay t_v starts. When timing is complete, the output relay de-energizes. The LED R glows when the output relay is energized.

In case of motors which continue running with only two phases, the CM-PFE detects phase failure if the reverse fed voltage is less than 60 % of the originally applied voltage.



Electrical connection



Connection diagram CM-PFE


Technical data

Data at $T_a = 25\text{ °C}$ and rated values, unless otherwise indicated

Input circuits

Type	CM-PFE	CM-PFE.2
Supply circuit = measuring circuit	L1, L2, L3	
Rated control supply voltage $U_s =$ measuring voltage	3 x 208-440 V AC	3 x 200-500 V AC
Rated control supply voltage U_s tolerance	-15...+10 %	
Rated frequency	50/60 Hz	
Frequency range	45-65 Hz	
Typical current / power consumption	400 V AC 13 mA / 9 VA	
Measuring circuit	L1, L2, L3	
Monitoring functions	Phase failure	■
	Phase sequence	■
Measuring ranges	3 x 208-440 V AC	3 x 200-500 V AC
Thresholds	U_{min}	$0.6 \times U_N$
Hysteresis related to the threshold value	-	
Response time	500 ms	
Timing circuit		
Start-up delay t_s	fixed 500 ms	
Tripping delay t_v	fixed 500 ms	

User interface

Indication of operational states		
Relay status	R: yellow LED	 output relay energized

Output circuits

Kind of output	11-12/14	relay, 1 c/o (SPDT) contact
Operating principle		closed-circuit principle ¹⁾
Contact material		AgNi alloy, Cd free
Rated operational voltage U_e		250 V
Minimum switching voltage / Minimum switching current		24 V / 10 mA
Maximum switching voltage / Maximum switching current		see "Load limit curves"
Rated operational voltage U_e and rated operational current I_e	AC-12 (resistive) at 230 V	4 A
	AC-15 (inductive) at 230 V	3 A
	DC-12 (resistive) at 24 V	4 A
	DC-13 (inductive) at 24 V	2 A
AC rating (UL 508)	Utilization category (Control Circuit Rating Code)	B 300 pilot duty; general purpose 250 V, 4 A, cos phi 0.75
	max. rated operational voltage	300 V AC
	max. continuous thermal current at B 300	5 A
	max. making/breaking apparent power at B 300	3600/360 VA
Mechanical lifetime		30×10^6 switching cycles
Electrical lifetime	AC-12, 230 V, 4 A	0.1×10^6 switching cycles
Maximum fuse rating to achieve short-circuit protection	n/c contact	6 A fast-acting
	n/o contact	10 A fast-acting
Conventional thermal current I_{th}		4 A

¹⁾ Closed-circuit principle: Output relay is de-energized if the measured value exceeds/drops below the adjusted threshold.

General data

MTBF		on request
Duty cycle		100 %
Dimensions		see "Dimensional drawings"
Weight	net	0.067 kg (0.147 lb)
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool
Mounting position		any
Minimum distance to other units	vertical / horizontal	≥ 10 mm (0.394 in) if ambient temperature > 50 °C and rated operational currents > 2 A
Degree of protection	housing terminals	IP50 IP20

Electrical connection

Connecting capacity	fine-strand with wire end ferrule	2 x 0.75-1.5 mm ² (2 x 18-16 AWG)
	fine-strand without wire end ferrule	2 x 1-1.5 mm ² (2 x 18-16 AWG)
	rigid	2 x 0.75-1.5 mm ² (2 x 18-16 AWG)
Stripping length		10 mm (0.39 in)
Tightening torque		0.6-0.8 Nm (7.08 lb.in)
Recommended screw driver		PZ 1 / Ø 4.5 mm

Environmental data

Ambient temperature ranges	operation	-20...+60 °C
	storage	-40...+85 °C
	transport	-40...+85 °C
Climatic class		3K3
Damp heat, cyclic	IEC/EN 60068-2-30	6 x 24 h cycle, 55 °C, 95 % RH
Vibration, sinusoidal		Class 2
Shock		Class 2

Isolation data

Rated insulation voltage U	input circuit / output circuit	600 V
Rated impulse withstand voltage U _{imp}	input circuit / output circuit	6 kV
Pollution degree		3
Overvoltage category		III

Standards / Directives

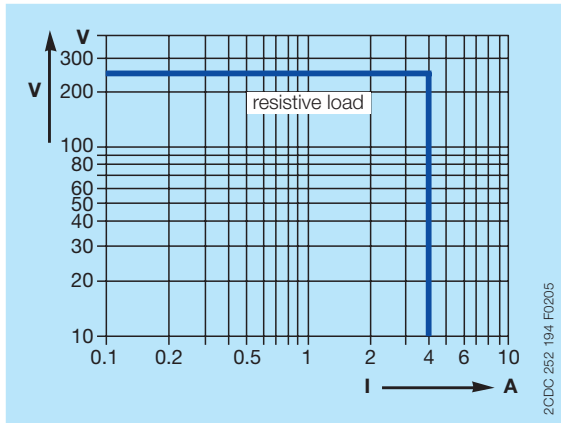
Standards	IEC/EN 60255-27, IEC/EN 60947-5-1, EN 50178
Low Voltage Directive	2014/35/EU
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU

Electromagnetic compatibility

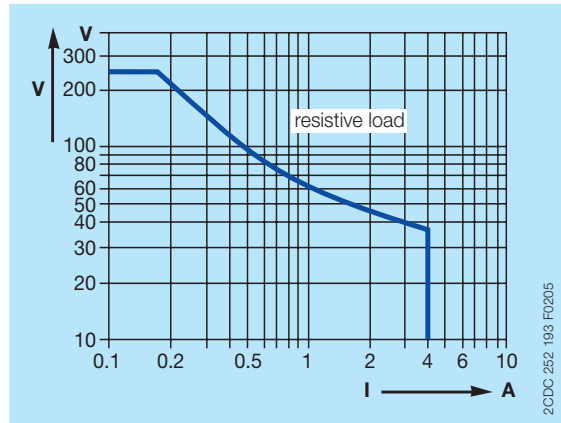
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3 (6 kV / 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3 (10 V/m)
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3 (2 kV / 5 kHz)
surge	IEC/EN 61000-4-5	Level 4 (2 kV L-L)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3 (10 V)
Interference emission		EN 61000-6-3
high-frequency radiated	IEC/CISPR 22, EN 55022	Class B
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B

Technical diagrams

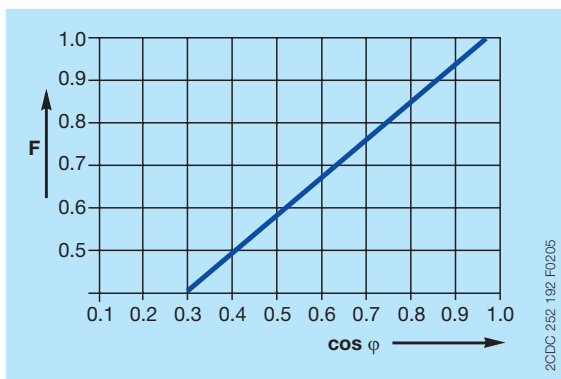
Load limit curves



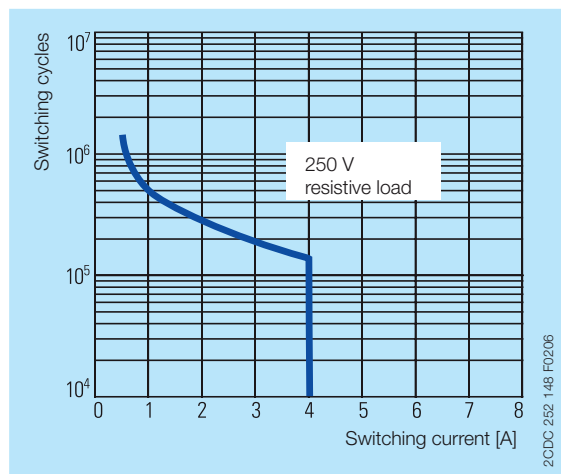
AC load (resistive)



DC load (resistive)



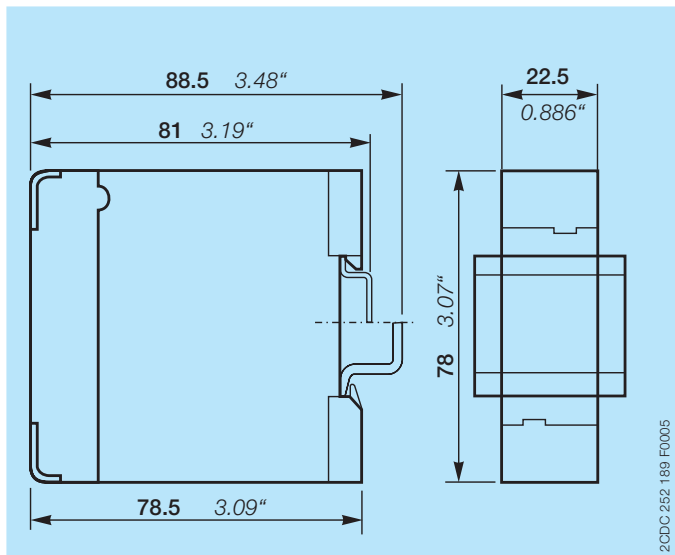
Derating factor F for inductive AC load



Contact lifetime

Dimensions

in **mm** and inches



Further documentation

Document title	Document type	Document number
Electronic relays and controls	Catalog	2CDC 110 004 C02xx

You can find the documentation on the internet at www.abb.com/lowvoltage
-> Automation, control and protection -> Electronic relays and controls -> Measuring and monitoring relays.

CAD system files

You can find the CAD files for CAD systems at <http://abb-control-products.partcommunity.com>
-> Low Voltage Products & Systems -> Control Products -> Electronic Relays and Controls.

Contact us

ABB STOTZ-KONTAKT GmbH

P. O. Box 10 16 80
69006 Heidelberg, Germany
Phone: +49 (0) 6221 7 01-0
Fax: +49 (0) 6221 7 01-13 25
E-mail: info.desto@de.abb.com

You can find the address of your
local sales organisation on the
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