DATA SHEET

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.

2CDC 251 006 S0015

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

Indication of operational states
R: yellow LED – Relay status

Application / Operating mode

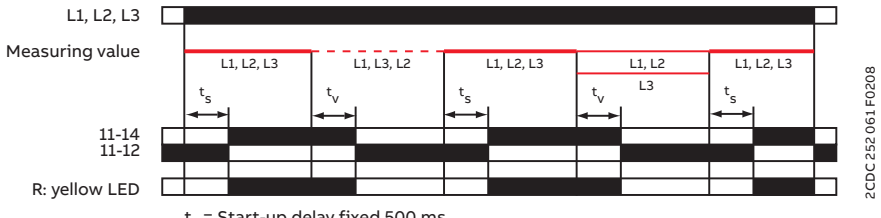
The CM-PFE is designed for use in three-phase mains for monitoring the phase parameters phase sequence and phase failure. It works according to the closed-circuit principle.

Function descriptions / diagrams

Phase sequence and phase failure monitoring

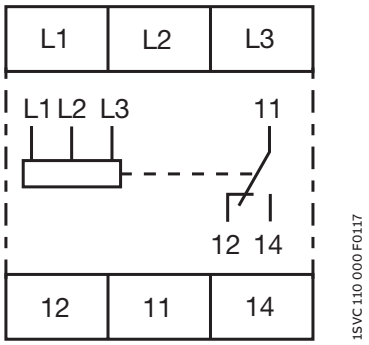
If all phases are present with the correct phase sequence, the output relay energizes after the fixed start-up delay t_s is complete.

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.



t_s = Start-up delay fixed 500 ms
t_v = Tripping delay fixed 500 ms

Electrical connection



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Connection diagram CM-PFE

L1, L2, L3	Control supply voltage = measuring voltage
11-12/14	Output contacts - closed-circuit principle

Technical data

Data at T_a = 25 °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
Threshold value for phase failure	U_{min}	0.6 x 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 x 10^6 switching cycles
Electrical lifetime		AC-12, 230 V, 4 A	0.1 x 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	IP50
	terminals	IP20

Electrical connection

Connecting capacity	fine-strand with wire end ferrule	2 x 0.75-1.5 mm² (2 x 18-16 AWG)
	fine-strand without wire end ferrule	2 x 1-1.5 mm² (2 x 18-16 AWG)
	rigid	2 x 0.75-1.5 mm² (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	IEC/EN 60721-3-3	3K3
Damp heat, cyclic	IEC/EN 60068-2-30	6 x 24 h cycle, 55 °C, 95 % RH
Vibration, sinusoidal	IEC/EN 60255-21-1	Class 2
Shock	IEC/EN 60255-21-2	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

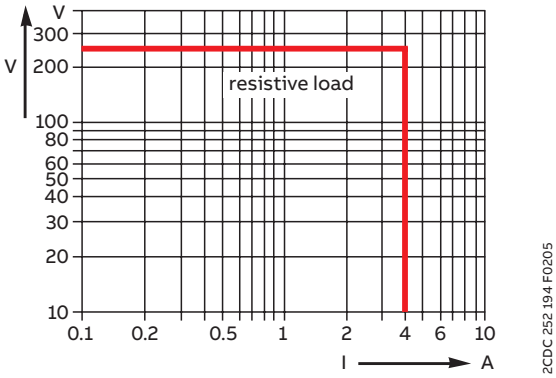
Standards	IEC/EN 60255-27, IEC/EN 60947-5-1, EN 50178
Low Voltage Directive	2014/35/EU
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU

Electromagnetic compatibility

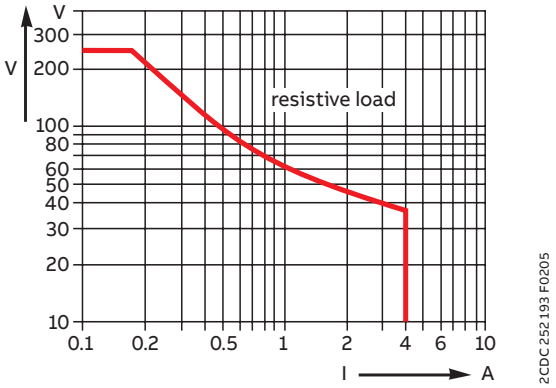
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3 (6 kV / 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3 (10 V/m)
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3 (2 kV / 5 kHz)
surge	IEC/EN 61000-4-5	Level 4 (2 kV L-L)
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

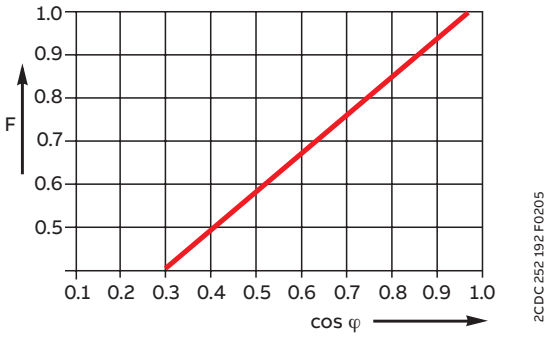
Load limit curves



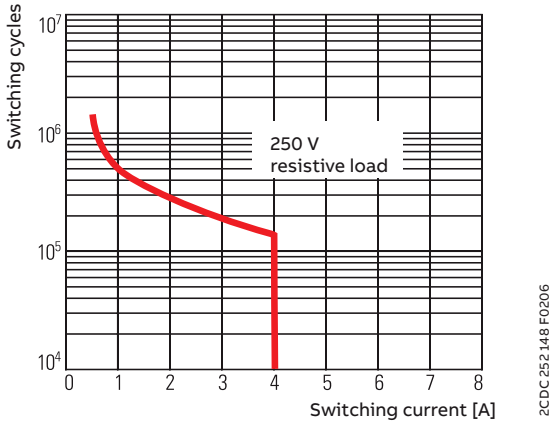
AC load (resistive)



DC load (resistive)



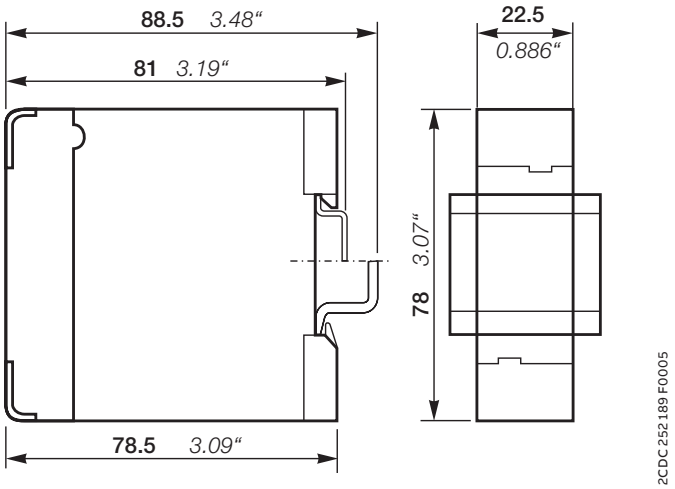
Derating factor F for inductive AC load



Contact lifetime

Dimensional drawings

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.

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