Three-phase monitoring relay
CM-PFE
Data sheet

CM-PFE

① R: yellow LED - relay status

Features

- Monitoring of three-phase mains for phase sequence and phase failure
- Powered by the measuring circuit
- 1 c/o (SPDT) contact
- 1 LED for status indication

Approvals

UL 508, CAN/CSA C22.2 No.14
GOST
CB scheme
CCC
RMRS

Marks

CE
C-Tick

Order data

Type	Rated control supply voltage = measuring voltage	Order code
CM-PFE	3x208-440 V AC	**1SVR 550 824 R9100**

Application

The CM-PFE is used to monitor three-phase mains for incorrect phase sequence and phase failure.

Operating mode

Signalling is made by means of the front-face LED.

LED

Function	R: yellow LED
Output contact closed	⌐¬

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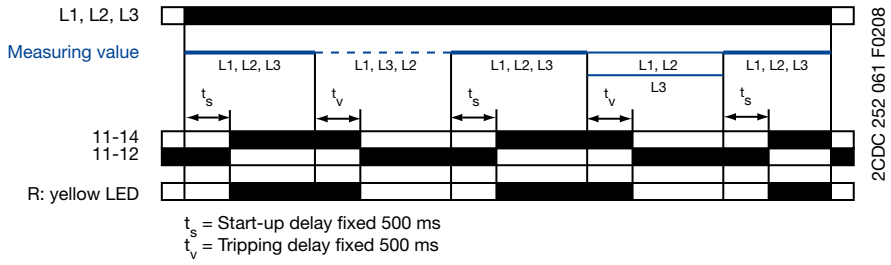
Function descriptions/diagrams

Function diagram legend

Control supply voltage not applied / Output contact open / LED off
Control supply voltage applied / Output contact closed / LED glowing

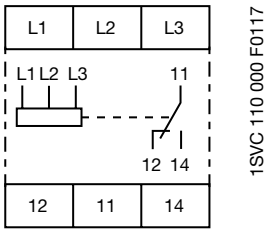
Phase sequence and phase failure monitoring

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

Connection diagram



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

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Type			**CM-PFE**
Supply circuit = measuring circuit			**L1-L2-L3**
Rated control supply voltage U_S = measuring voltage			3x208-440 V AC
Power consumption			approx. 15 VA
Rated control supply voltage U_S tolerance			-10...+10 %
Rated frequency			50/60 Hz (-10...+10 %)
Duty time			100 %
Measuring circuit			**L1-L2-L3**
Monitoring functions		phase failure	■
		phase sequence	■
Measuring ranges			3x208-440 V AC
Thresholds		U_{min}	0.6 x U_N
		U_{max}	
Hysteresis related to the threshold value			
Measuring voltage frequency			50/60 Hz
Response time			500 ms
Measuring error within rated control supply voltage tolerance			≤ 0.5 %
Measuring error within temperature range			≤ 0.06 % / °C
Timing circuit			
Start-up delay t_S			fixed 500 ms
Tripping t_V			fixed 500 ms
Indication of operational states			
Relay status		R: yellow LED	⎍ Output relay energized
Output circuits			**11-12/14**
Kind of output			1 c/o (SPDT) contact
Operating principle [1]			closed-circuit principle
Contact material			AgCdO
Rated voltage (VDE 0110, IEC 60947-1)			250 V
Minimum switching voltage / Minimum switching current			- / -
Maximum switching voltage			250 V AC, 250 V DC
Rated operational current (IEC 60947-5-1)		AC12 (resistive) 230 V	4 A
		AC15 (inductive) 230 V	3 A
		DC12 (resistive) 24 V	4 A
		DC13 (inductive) 24 V	2 A
Mechanical lifetime			30 x 10^6 switching cycles
Electrical lifetime (AC12, 230 V, 4 A)			0.1 x 10^6 switching cycles
Short-circuit proof, max. fuse rating		n/c contact	10 A fast-acting
		n/o contact	10 A fast-acting
AC rating (UL 508)		Utilization category (Control Circuit Rating Code)	B 300
		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
General data			
Dimensions (W x H x D)			22.5 x 78 x 78.5 mm (0.89 x 3.07 x 3.09 inch)
Mounting position			any
Degree of protection		enclosure / terminals	IP50 / IP20
Mounting			DIN rail (EN 50022)
Electrical connection			
Wire size		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 inch)
Tightening torque			0.6-0.8 mm
Environmental data			
Ambient temperature range		operation / storage	-20..+60 °C / -40...+85 °C
Environmental testing (IEC 68-2-30)			24 h cycle time, 55 °C, 93 % rel., 96 h
Operational reliability (IEC 68-2-6)			6 g
Mechanical resistance (IEC 68-2-6)			10 g

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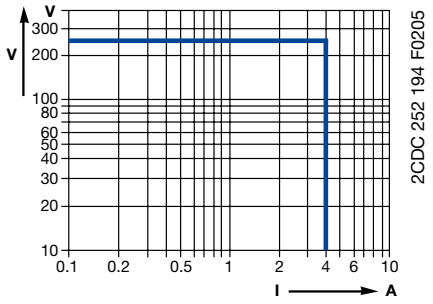
Type		CM-PFE
Isolation data		
Rated insulation volt. between supply, measuring and output circuits (VDE 0110, IEC 60947-1)		500 V
Rated impulse withstand voltage U_{imp} between all isolated circuits (VDE 0110, IEC 664)		4 kV / 1.2 - 50 µs
Test voltage between all isolated circuits		2.5 kV, 50 Hz, 1 min.
Pollution category (VDE 0110, IEC 664, IEC 255-5)		3
Overvoltage category (VDE 0110, IEC 664, IEC 255-5)		III
Standards		
Product standard		IEC 255-6, EN 60255-6
Low Voltage Directive		2006/95/EC
EMC Directive		2004/108/EC
Electromagnetic compatibility		
Interference emission		EN 61000-6-2
electrostatic discharge (ESD)	IEC/EN 61000-4-2	Level 3 - 6 kV/ 8 kV
electromagnetic field (HF radiation resistance)	IEC/EN 61000-4-3	Level 3 - 10 V/m
fast transients (Burst)	IEC/EN 61000-4-4	Level 3 - 2 kV / 5 kHz
powerful impulses (Surge)	IEC 1000-4-5, EN 61000-4-5	Level 4 - 2 kVL-L
HF line emissission	IEC 1000-4-6, EN 61000-4-6	Level 3 - 10 V
Interference emission		EN 61000-6-4

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

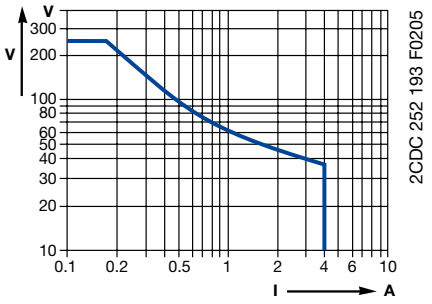
Technical diagrams

Load limit curves

AC load (resistive)

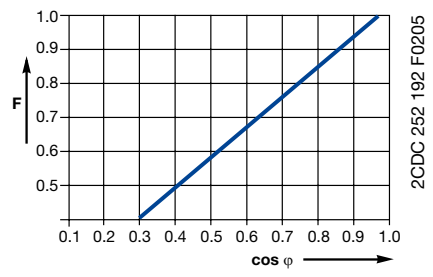


DC load (resistive)

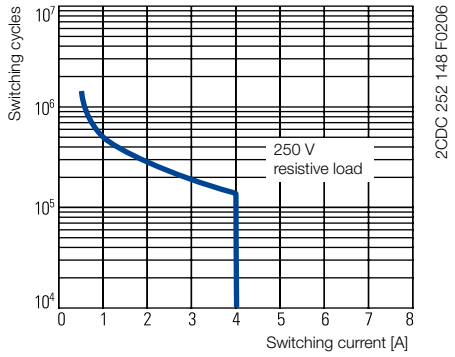


Derating factor F

at inductive AC load



Contact lifetime



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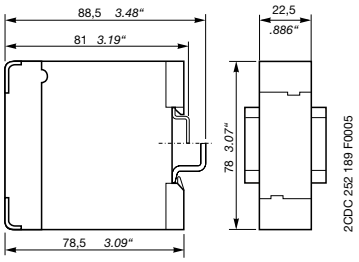
Dimensions
in mm



Further documentation

Document title	Document type	Document number
Electronic Products and Relays	Technical catalogue	2CDC 110 004 C020x
CM-PAS, CM-PFE, CM-PSS, CM-PVS	Instruction manual	1SVC 630 510 M0000

You can find the documentation online at www.abb.com/lowvoltage → Control Products → ...

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