Data sheet

Three-phase monitoring relay
CM-PFE

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

2CDC 251 005 S0012

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

Approvals

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

Marks

- CE
- C-Tick

Order data

Three-phase monitoring relay

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

Functions

Operating controls

2CDC 251 005 S0012

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.

The CM-PFE works according to the closed-circuit principle.

Indication of operational states

LEDs, status information and fault messages

Operational state	R: LED yellow
Output relay energized	⎍

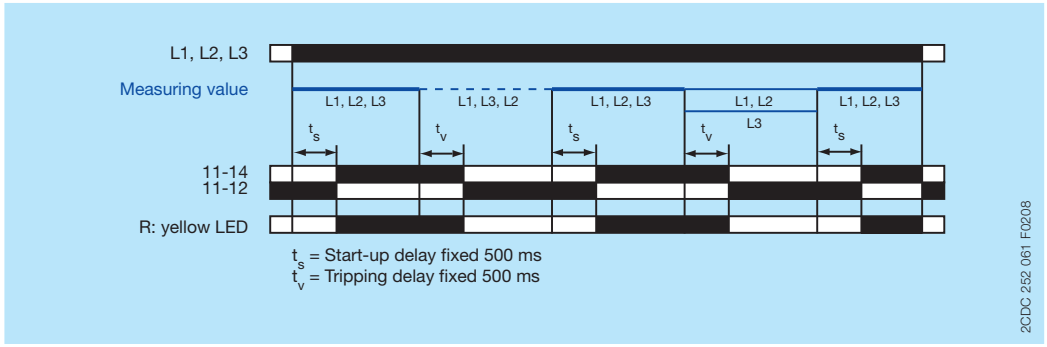
Function descriptions / diagrams

Phase sequence and phase failure monitoring

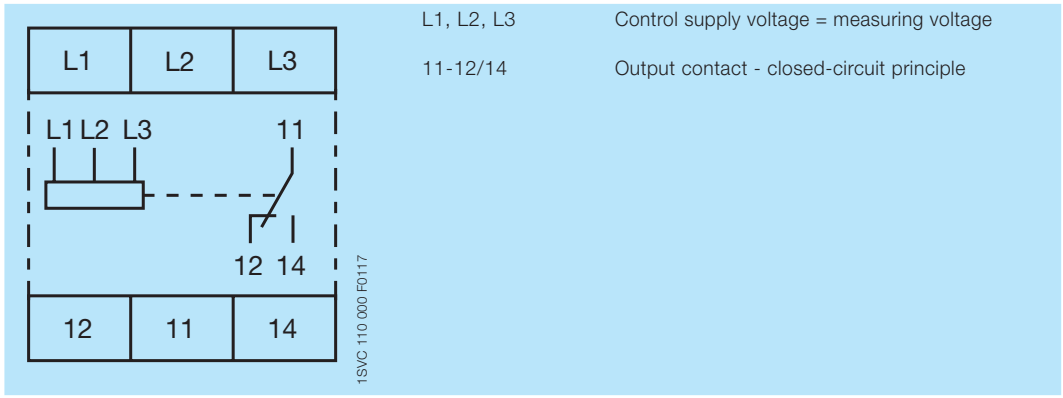
If all phases are present with the correct phase sequence, the output relay energizes after the fixed start-up delay t_s is complete.

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 °C and rated values, unless otherwise indicated

Input circuits

Supply circuit = measuring circuit	**L1, L2, L3**
Rated control supply voltage U_s = measuring voltage	3 x 208-440 V AC
Rated control supply voltage U_s tolerance	-10...+10 %
Rated frequency	50/60 Hz (-10...+10 %)
Typical current / power consumption	approx. 15 VA

Measuring circuit		**L1, L2, L3**
Monitoring functions	Phase failure	■
	Phase sequence	■
Measuring ranges		3 x 208-440 V AC
Thresholds	U_{min}	0.6 x U_n
	U_{max}	
Rated frequency of the measuring signal		50/60 Hz
Response time		500 ms
Accuracy within the rated control supply voltage tolerance		$\Delta U \leq 0.5$ %
Accuracy within the temperature range		$\Delta U \leq 0.06$ % / °C

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

Details see table ‚LEDs, status information and fault messages‘ on page 2 and ‚Function descriptions / diagrams‘ on page 3.

Output circuits

Kind of output		1 c/o (SPDT) contact
Operating principle		closed-circuit principle [1]
Contact material		AgCdO
Rated operational voltage U_e (IEC/EN 60947-1)		250 V
Maximum switching voltage		250 V DC, 250 V AC
Rated operational current I_e (IEC/EN 60947-5-1)	AC12 (resistive) at 230 V	4 A
	AC15 (inductive) at 230 V	3 A
	DC12 (resistive) at 24 V	4 A
	DC13 (inductive) at 24 V	2 A
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
Mechanical lifetime		30 x 10^6 switching cycles
Electrical lifetime	AC12, 230 V, 4 A	0.1 x 10^6 switching cycles
Maximum fuse rating to achieve short-circuit protection	n/c contact	10 A fast-acting
	n/o contact	10 A fast-acting

[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 time		100 %
Dimensions (W x H x D)	product dimensions	22.5 x 78 x 78.5 mm (0.89 x 3.07 x 3.09 in)
	packaging dimensions	24 x 83 x 25 mm (0.94 x 3.27 x 0.98 in)
Weight	net weight	0.068 kg (0.150 lb)
	gross weight	0.080 kg (0.176 lb)
Mounting		DIN rail (IEC/EN 60715)
Mounting position		any
Degree of protection	housing	IP50
	terminals	IP20

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 in)
Tightening torque		0.6 - 0.8 Nm (5.31 - 7.08 lb.in)

Environmental data

Ambient temperature ranges	operation	-20...+60 °C
	storage	-40...+85 °C
Damp heat, cyclic (IEC 60068-2-30)		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

Isolation data

Rated insulation voltage U_i (VDE 0110, IEC/EN 60947-1)	supply circuit / measuring circuit / output circuit	500 V
Rated impulse withstand voltage U_{imp} (VDE 0110, IEC/EN 60664)	all isolated circuits	4 kV, 1.2/50 µs
Test voltage between all isolated circuits (routine test)		2.5 kV, 50 Hz, 1 min.
Pollution degree (VDE 0110, IEC/EN 60664, IEC/EN 60255-5)		3
Overvoltage category (VDE 0110, IEC/EN 60664, IEC/EN 60255-5)		III

Standards

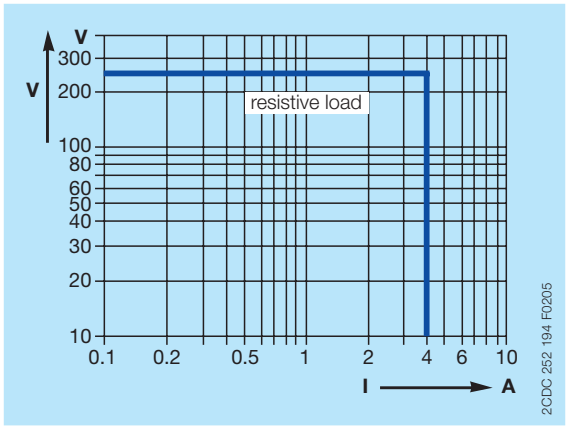
Product standard	IEC/EN 60255-6
Low Voltage Directive	2006/95/EC
EMC directive	2004/108/EC

Electromagnetic compatibility

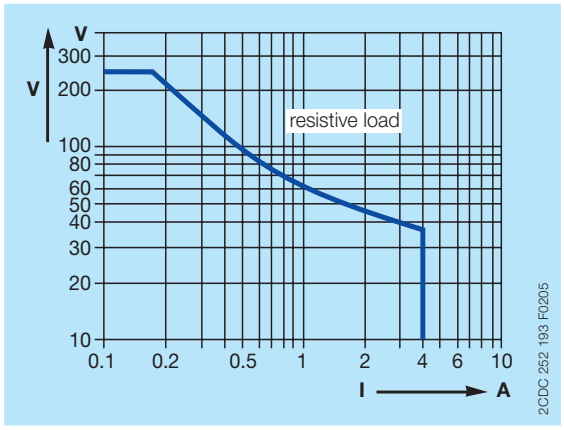
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3 (6 kV / 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3 (10 V/m)
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3 (2 kV / 5 kHz)
surge	IEC/EN 61000-4-5	Level 4 (2 kV L-L)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

Technical diagrams

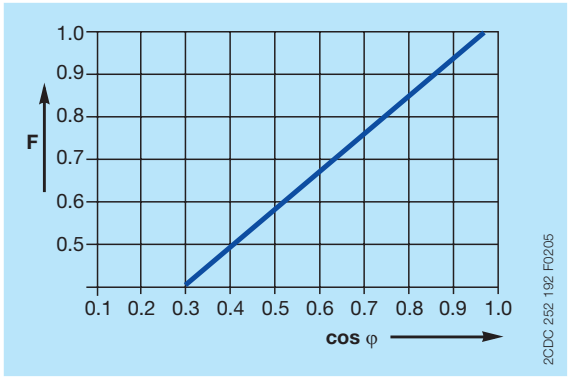
Load limit curves



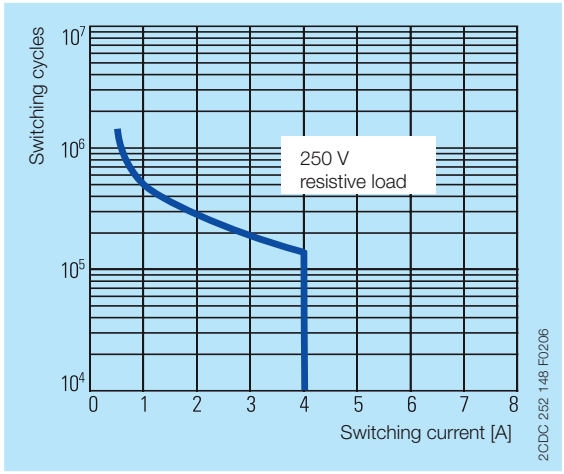
AC load (resistive)



DC load (resistive)



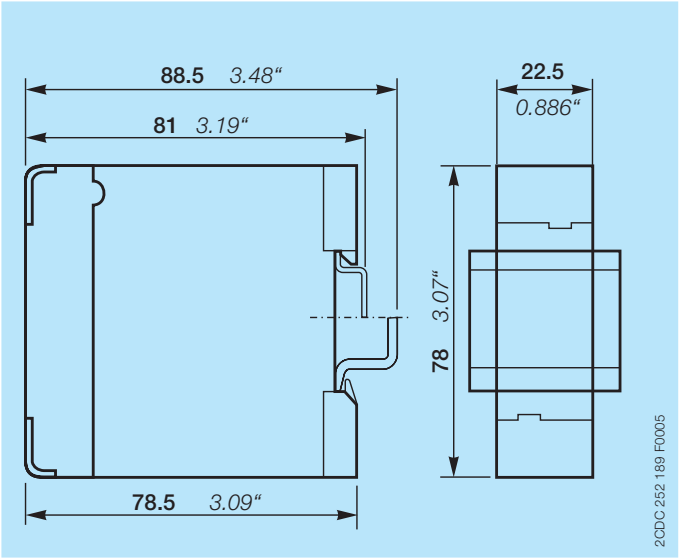
Derating factor F for inductive AC load



Contact lifetime

Dimensions

in **mm** and inches



Further documentation

Document title	Document type	Document number
Electronic products and relays	Technical catalogue	2CDC 110 004 C020x

You can find the documentation on the internet at www.abb.com/lowvoltage -> Control Products -> Electronic Relays and Controls -> Three Phase Monitors.

CAD system files

You can find the CAD files for CAD systems at http://abb-control-products.partcommunity.com/PARTcommunity/Portal/abb-control-products -> Low Voltage Products & Systems -> Control Products -> Electronic Relays and Controls -> Three Phase Monitors -> CM-PFx - Three Phase Monitors.

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