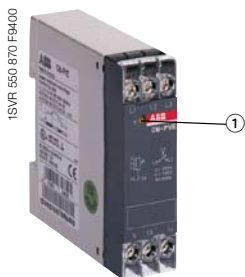


Three-phase monitoring relay

CM-PVE

Data sheet








CM-PVE

① R: yellow LED - relay status



Features

- Monitoring of three-phase mains for phase failure, over- and undervoltage
- Device with possibility of neutral monitoring available
- Device with suitability for monitoring single-phase mains available
- Powered by the measuring circuit
- 1 n/o 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	Neutral monitoring	Order code
CM-PVE	3x320-460 V AC, 185-265 V AC	yes	1SVR 550 870 R9400
CM-PVE	3x320-460 V AC	no	1SVR 550 871 R9500

Application

The CM-PVE are used to monitor supply voltages for over- and undervoltage and phase failure. The CM-PVE with neutral monitoring is also suitable for monitoring single-phase mains. For this, all three external conductors (L1, L2, L3) have to be jumpered and connected as one single conductor.

Operating mode

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

LED

Function	R: yellow LED
Output contact closed	┌───┐

Three-phase monitoring relay

CM-PVE

Data sheet

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 failure monitoring

Applying control supply voltage begins the fixed start-up delay t_s . When t_s is complete and all phases are present with correct voltage, the output relay energizes and the yellow LED R glows.

If a phase failure occurs, the output relay de-energizes instantaneously and the LED R turns off.

As soon as the voltage returns to the tolerance range t_s starts again. After t_s is complete, the output relay re-energizes automatically and the LED R glows.

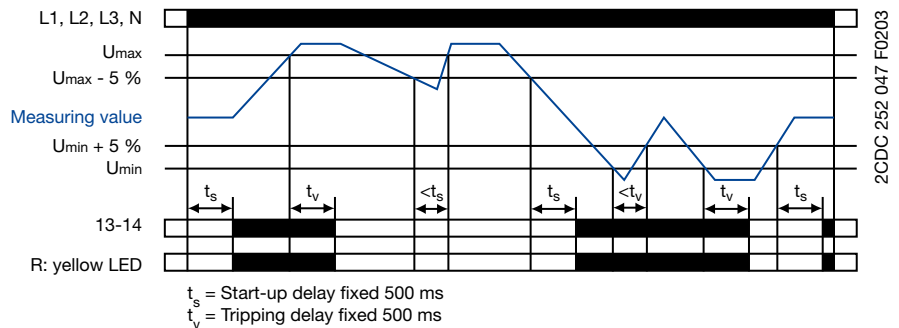
Over- and undervoltage monitoring

Applying control supply voltage begins the fixed start-up delay t_s . When t_s is complete and all phases are present with correct voltage and with correct phase sequence, the output relay energizes and the LED R glows.

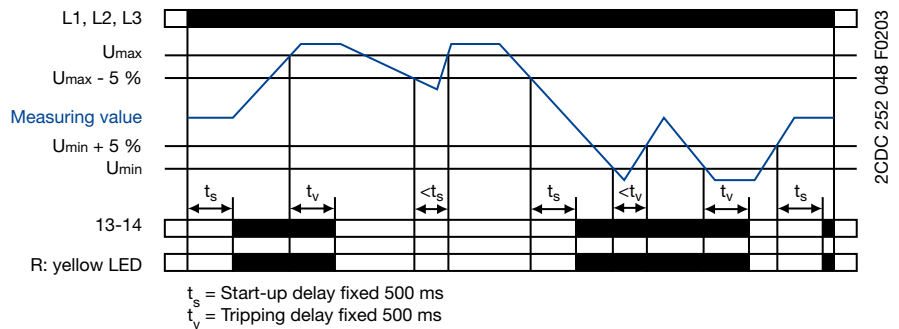
If the voltage to be monitored exceeds or falls below the fixed threshold value, the output relay de-energizes after the fixed tripping delay t_v is complete and the LED R turns off.

As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 5 %, t_s starts again. After t_s is complete, the output relay re-energizes automatically and the LED R glows.

CM-PVE with neutral monitoring



CM-PVE without neutral monitoring

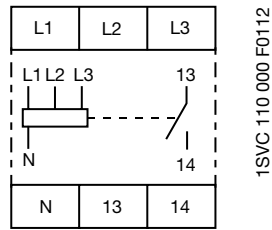


Three-phase monitoring relay

CM-PVE

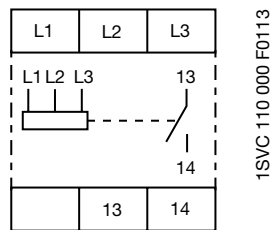
Data sheet

Connection diagrams



L1, L2, L3, N Control supply voltage = measuring voltage
13-14 Output contact - closed-circuit principle

CM-PVE with neutral monitoring



L1, L2, L3 Control supply voltage = measuring voltage
13-14 Output contact - closed-circuit principle

CM-PVE without neutral monitoring

Three-phase monitoring relay

CM-PVE

Data sheet

Type		CM-PVE ¹⁾	CM-PVE
Supply circuit = measuring circuit		L1-L2-L3-N	L1-L2-L3
Rated control supply voltage U_s = measuring voltage		3x320-460 V AC, 185-265 V AC	3x320-460 V AC
Power consumption			
Rated control supply voltage U_s tolerance		-15...+10 %	
Rated frequency		50/60 Hz (-10...+10 %)	
Duty time		100 %	
Measuring circuit		L1-L2-L3-N	L1-L2-L3
Monitoring functions			
	phase failure		■
	over- / undervoltage	■	■
	neutral	■	-
Measuring ranges		3x320-460 V AC, 185-265 V AC	3x320-460 V AC
Thresholds			
	U_{min}	fixed 185 V / 320 V	fixed 320 V
	U_{max}	fixed 265 V / 460 V	fixed 460 V
Hysteresis related to the threshold value		fixed 5 %	
Measuring voltage frequency		50/60 Hz (-10 %...+10 %)	
Response time		80 ms	
Measuring error within rated control supply voltage tolerance			
Measuring error within temperature range		≤ 0.06 % / °C	
Timing circuit			
Start-up delay t_s		fixed 500 ms (±20 %)	
Tripping t_t		at over-/undervoltage fixed 500 ms (±20 %)	
Indication of operational states			
Relay status		R: yellow LED	┌───┐ Output relay energized
Output circuits		13-14	
Kind of output		1 n/o contact	
Operating principle ²⁾		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			
	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,			
	n/c contact	10 A fast-acting	
	n/o contact	10 A fast-acting	
AC rating			
	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		IP50 / IP20	
Mounting		DIN rail (EN 50022)	
Electrical connection			
Wire size			
	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 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	

Three-phase monitoring relay

CM-PVE

Data sheet

Type	CM-PVE ¹⁾	CM-PVE
Isolation data		
Rated insulation volt. between supply, measuring and output circuits (VDE 0110, IEC 60947-1)	400 V	
Rated impulse withstand voltage U_{imp} between all isolated circuits (VDE 0110, IEC 664)	4 kV / 1.2 - 50 μ s	
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 kV-L	
HF line emission IEC 1000-4-6, EN 61000-4-6	Level 3 - 10 V	
Interference emission	EN 61000-6-4	

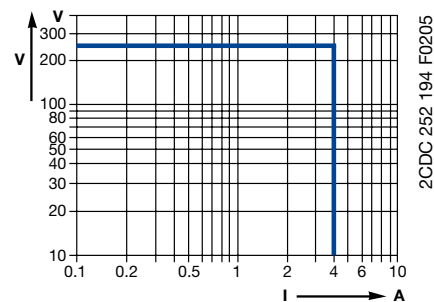
¹⁾ Device with neutral monitoring: The external conductor voltage towards the neutral conductor is measured.

²⁾ Closed-circuit principle: Output relay is de-energized if the measured value exceeds/drops below the adjusted threshold.

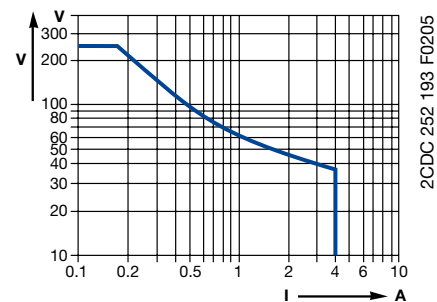
Technical diagrams

Load limit curves

AC load (resistive)

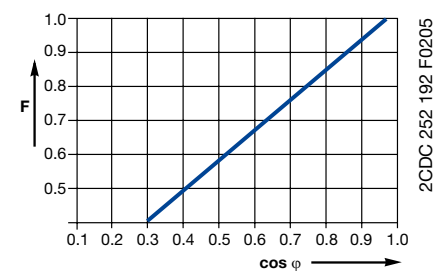


DC load (resistive)

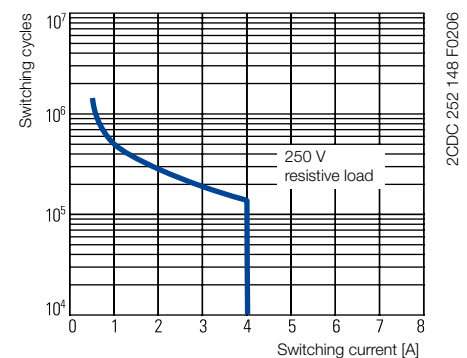


Derating factor F

at inductive AC load



Contact lifetime



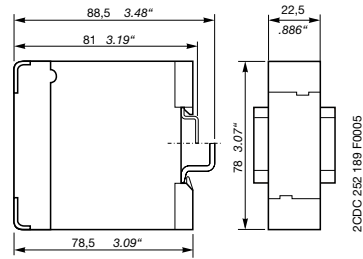
Three-phase monitoring relay

CM-PVE

Data sheet

Dimensions

in mm



Further documentation

Document title	Document type	Document number
Electronic Products and Relays	Technical catalogue	2CDC 110 004 C020x

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



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