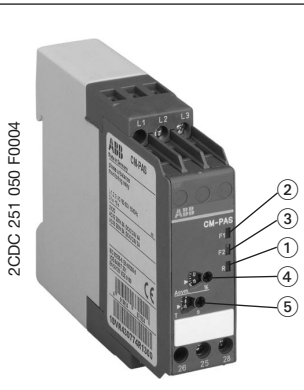


# Measuring and monitoring relay CM-PAS

## Three-phase monitor for phase unbalance

### Data sheet



CM-PAS

- ① R: green LED - supply voltage, relay
- ② F1: red LED - fault signal
- ③ F2: red LED - fault signal
  - phase unbalance: F1 and F2 on
  - phase loss: F1 on, F2 flashes
  - phase sequence: F1 and F2 flash alternately
- ④ Threshold adjustment phase unbalance 2-15 %
- ⑤ Time adjustment 0.1-10 s  
Phase sequence and phase loss are signalled without delay.

#### Features

- Three-phase monitoring of phase sequence, phase loss and phase unbalance
- Adjustable unbalance threshold
- Adjustable ON-delay
- Dual-frequency measuring input 50/60 Hz
- Powered by the measuring circuit
- 2 c/o contacts
- 3 LEDs for status indication

#### Approvals



#### Marks



#### Ordering data

Type	Supply voltage	Order code
CM-PAS	160-300 V AC, 50/60 Hz	1SVR 430 774 R1300
CM-PAS	300-500 V AC, 50/60 Hz	1SVR 430 774 R3300

#### Ordering data - Accessories

Description	Order code
Sealable cover	1SVR 430 005 R0100
Adapter for screw mounting	1SVR 430 029 R0100
Marker	1SVR 366 017 R0100

#### Application

The CM-PAS is a three-phase monitor. It is able to monitor the phase parameters phase sequence, phase loss and phase unbalance.

#### Operating mode

##### Phase unbalance monitoring

If all three phases are present with correct voltage, the output relay is energized.

The output relays are de-energized delayed (0.1-10 s), if the phase unbalance of the phases to be monitored exceeds the set unbalance threshold value. This enables a short-term suppression of fault signals.

The fault type is indicated by LEDs.

The output relays re-energize undelayed, as soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 20%.

##### Phase sequence and phase loss

Phase sequence and phase loss are indicated and reset without time delay.

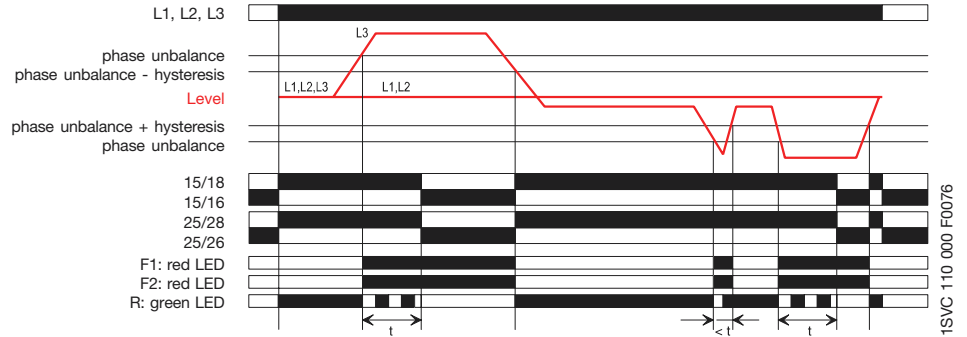
# Measuring and monitoring relay CM-PAS

## Three-phase monitor for phase unbalance

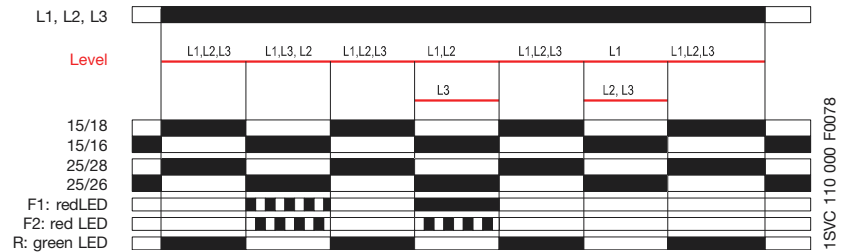
### Data sheet

#### Function diagrams

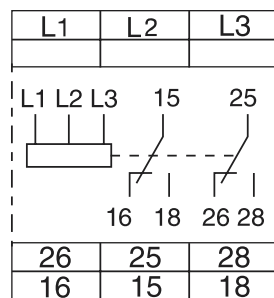
ON-delayed phase unbalance monitoring



Phase sequence and phase loss, signalled without delay



#### Position of connection terminals



L1, L2, L3      Supply voltage =  
                         monitoring voltage  
15-16/18      2 c/o - closed-circuit principle  
25-26/28

# Measuring and monitoring relay CM-PAS

## Three-phase monitor for phase unbalance

### Data sheet

#### Technical data

Input circuit (= monitoring circuit)		L1, L2, L3
Supply voltage - power consumption	L1, L2, L3	160-300 V AC - 20 VA
	L1, L2, L3	300-500 V AC - 20 VA
Supply voltage tolerance		-15 % ... +10 %
Supply voltage frequency		50/60 Hz
Supply voltage frequency tolerance		± 10 %
Duty time		100 %
Monitoring circuit		L1, L2, L3
Monitoring functions		phase sequence, phase loss, phase unbalance
Switch-off value for unbalance		2-15 % of average of phase voltages
Switch-on value for unbalance		adjusted switch off value - 20 %
Hysteresis related to the threshold value		fixed 5 %
Monitoring voltage frequency		50/60 Hz ± 10 %
Max. monitoring time		50 ms
Measuring error within supply voltage tolerance		≤ 0.5 %
Measuring error within temperature range		≤ 0.06 % / °C
Timing circuit		
ON-delay time		200 ms
Delay time (ON- and OFF delay)		0.1-10 s adjustable
Tolerance of the adjusted delay time		± 10 %
Timing error within supply voltage tolerance		≤ 0.5 %
Timing error within temperature range		≤ 0.06 % / °C
Indication of operational states		R: green LED, F1, F2: red LED
Supply voltage		R on
Output relays energized		R flashes during timing
Phase loss		F1 on, F2 flashes
Phase sequence		F1 and F2 flash alternately
Phase unbalance		F1 and F2 on
Output circuits		15-16/18, 25-26/28
Number of contacts		2 c/o (relays)
Operating principle (output relays de-energize in case of fault)		closed-circuit principle
Contact material		AgNi
Rated voltage	acc. to VDE 0110, IEC 60947-1	250 V
Min. switching voltage / min. switching current		24 V / 10 mA
Max. switching voltage		250 V AC, 250 V DC
Rated switching current acc. to IEC 60947-5-1	AC-12 (resistive) 230 V	4 A
	AC-15 (inductive) 230 V	3 A
	DC-12 (resistive) 24 V	4 A
	DC-13 (inductive) 24 V	2 A
Max. lifetime	mechanical	30 x 10 <sup>6</sup> switching cycles
	electrical (AC-12, 230 V, 4 A)	0,1 x 10 <sup>6</sup> switching cycles
Short-circuit proof, max. fuse rating	n/c	10 A fast, operating class gL
	n/o	10 A fast, operating class gL
General data		
Width of enclosure		22.5 mm
Weight		ca. 130 g (0.29 lb)
Wire size	stranded with wire end ferule	2 x 2.5 mm <sup>2</sup> (2 x 14 AWG)
Mounting position		any
Degree of protection	enclosure	IP 50
	terminals	IP 20
Temperature range	operation	-20 °C ... +60 °C
	storage	-40 °C ... +85 °C
Mounting		DIN rail (EN 50022)

# Measuring and monitoring relay CM-PAS

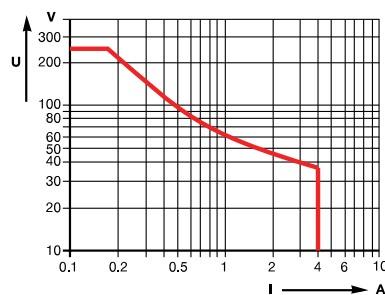
## Three-phase monitor for phase unbalance

### Data sheet

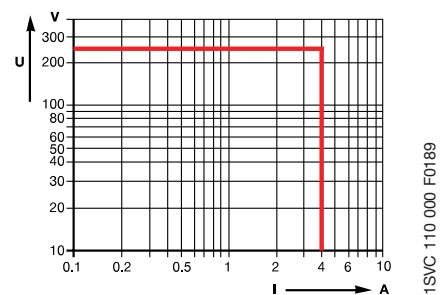
#### Technical data (continued)

Standards		
Product standard		IEC 255-6, EN 60255-6
Low Voltage Directive		73/23/EEC
EMC Directive		89/336/EEC
Electromagnetic Compatibility		
Interference immunity	acc. to EN 61000-6-2	
electrostatic discharge (ESD)	acc. to IEC 61000-4-2, EN 61000-4-2	6 kV / 8 kV
electromagnetic field	acc. to IEC 61000-4-3, EN 61000-4-3	10 V/m
fast transients (Burst)	acc. to IEC 61000-4-4, EN 61000-4-4	2 kV / 5 kHz
powerful impulses (Surge)	acc. to IEC 1000-4-5, EN 61000-4-5	2 kV symmetric
HF line emission	acc. to IEC 1000-4-6, EN 61000-4-6	10 V
Interference emission	acc. to EN 61000-6-4	
Operational reliability	acc. to IEC 68-2-6	4 g
Mechanical resistance	acc. to IEC 68-2-6	6 g
Environmental tests	acc. to IEC 68-2-30	24 h cycle, 55 °C, 93 % rel. 96 h
Approvals / marks		
Approvals		cULus, GL and GOST CCC (pending)
Marks		CE, C-Tick
Isolation data		
Rated insulation voltage between in- and output	acc. to VDE 0110, IEC 60947-1	600 V
Impulse voltage resistance $U_{imp}$	measuring circuit	6 kV
	output circuits	4 kV
Test voltage between all isolated circuits		2.5 kV, 50 Hz, 1 min
Pollution degree	acc. to VDE 0110, IEC 664, IEC 255-5	III
Overvoltage category	acc. to VDE 0110, IEC 664, IEC 255-5	III

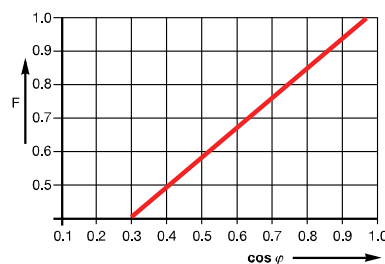
#### Load limit curves



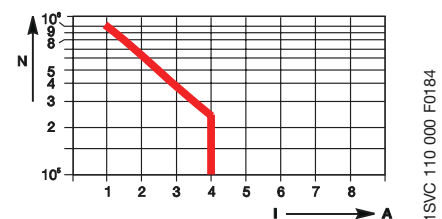
AC load (resistive)



DC load (resistive)



Reduction factor F for inductive AC load



Contact life / number of operations  
220 V 50 Hz 1 AC, 360 operations/h

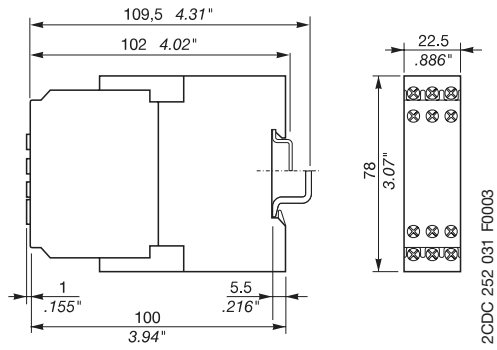
# Measuring and monitoring relay CM-PAS

## Three-phase monitor for phase unbalance

### Data sheet

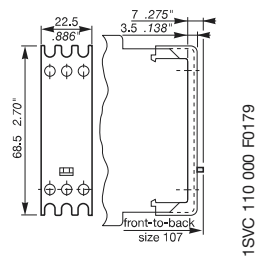
#### Dimensions

in mm

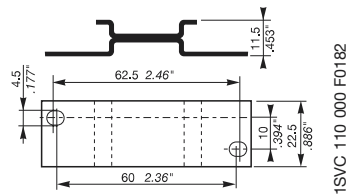


#### Dimensions accessories

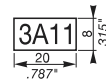
in mm



Sealable cover



Adapter for screw mounting



Marker



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