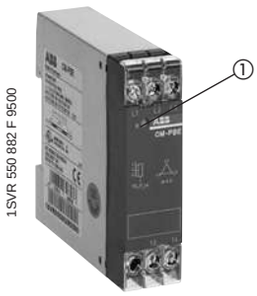
Phase loss monitor CM-PBE
Phasemonitor for over and undervoltage CM-PVE

Ordering details



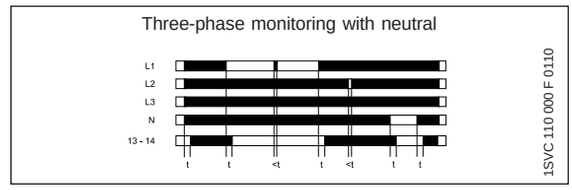
CM-PBE

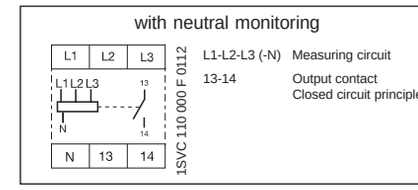
① Yellow LED - state of relay

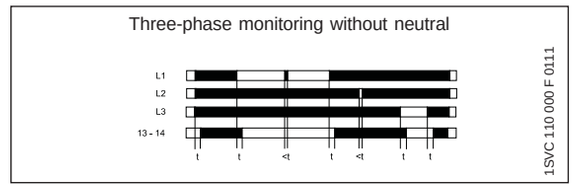
- Monitors three-phase supply voltage and single-phase supply voltage for phase failure
- Monitoring of neutral at option
- 1n/o contact
- Without phase sequence monitoring
- Voltage monitoring range L1-L2-L3: 3x380-440VAC L-N: 220-240VAC
- Approvals

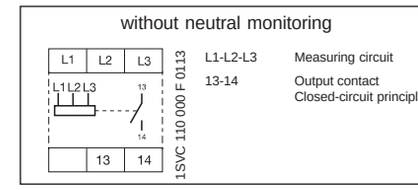
The CM-PBE monitors supply voltage for phase failure ($V_{meas.}$ <60%x V_{nom}).
If the above fault occurs the output relay de-energizes and the yellow LED turns off.
When all three phases are present, the output relay is energized. It will automatically energize as soon as the voltage returns to the nominal range, a fixed hysteresis is included.
The product with neutral monitoring can also be used in single-phase mains by jumpering the three terminals (L1, L2, L3) and connecting only one phase.

2 Functions









Type		Order code	Pack. unit piece		
CM-PBE	with neutral monitoring	**1SVR 550 881 R 9400**	1		RS 442-9455
	without neutral monitoring	**1SVR 550 882 R 9500**	1		RS 442-9001



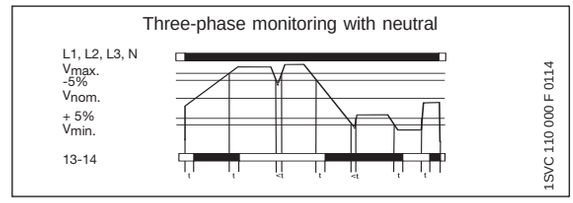
CM-PVE

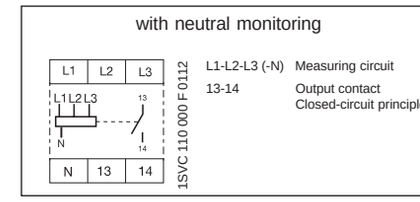
① Yellow LED - state of relay

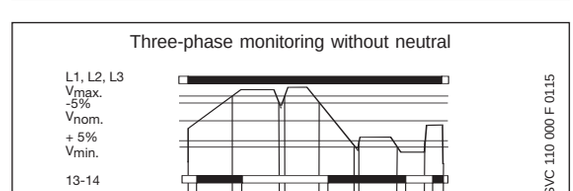
- Monitors three-phase supply voltage and single-phase supply voltage for phase loss as well as overvoltage and undervoltage
- Monitoring of neutral is an option
- Without phase sequence monitoring
- 1n/o contact
- Voltage monitoring range L1-L2-L3: 3x260-480VAC L-N: 150-275VAC
- Approvals

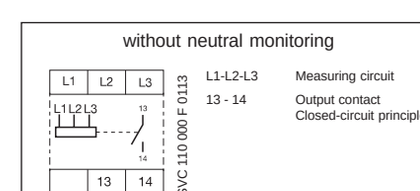
The CM-PVE monitors supply voltage for undervoltage, overvoltage and phase loss. If one of the above faults occurs, the output relay de-energizes and the yellow LED turns off. When all three phases are present, with correct voltage the output relay is energized.
If the voltage [L-L (L-N)] exceeds the voltage value V_{max} (460V/265V) or falls below the voltage value V_{min} (320V/185V) the output relay de-energizes. It will automatically energize as soon as the voltage returns to the monitoring range, a hysteresis of 5% is included. The product with neutral monitoring can also be used in single-phase mains by jumpering the three terminals (L1, L2, L3) and connecting only one phase.

2 Functions







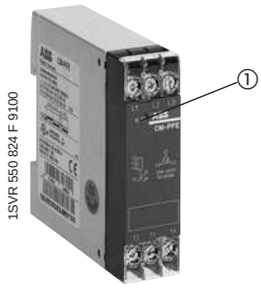


Type		Order code	Pack. unit piece		
CM-PVE	with neutral monitoring	**1SVR 550 870 R 9400**	1		RS 442-9427
	without neutral monitoring	**1SVR 550 871 R 9500**	1		RS 442-9449

Remark: 1c/o = SPDT; 2c/o = DPDT

Phase sequence monitors CM-PFE/CM-PFS

Ordering details



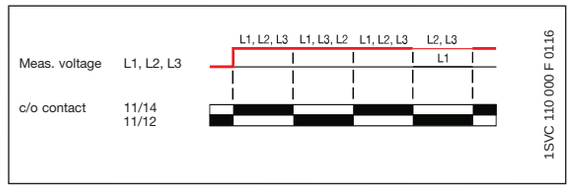
CM-PFE

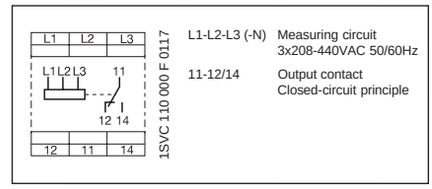
① Yellow LED - state of relay

- Monitors three-phase supply voltage for incorrect phase sequence and phase failure
- Without delay on "ON"
- 1c/o contact
- LED to indicate state of relay
- Continuous voltage range covering 3x208-440V 50/60Hz
- Approvals

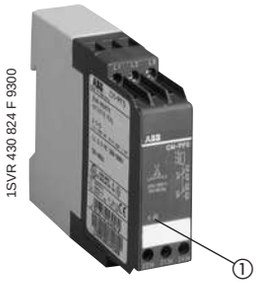
The CM-PFE monitors three-phase supply voltage for incorrect phase sequence.
The output relay remains energized with correct phase sequence.
It resets and the yellow LED turns off in the case of incorrect phase sequence or phase loss.
In case of motors running on two phases only, the CM-PFE monitors the phase loss if the re-generated is less than 60% of the nominal voltage. For applications in which a re-generated voltage < 60% is expected we recommend the phase unbalance monitor CM-ASS or CM-ASN.

1 Function





Type	Supply voltage = Measuring voltage	Order code	Pack. unit piece		
CM-PFE	3x208-440VAC 50/60Hz	**1SVR 550 824 R 9100**	1		RS 442-9411



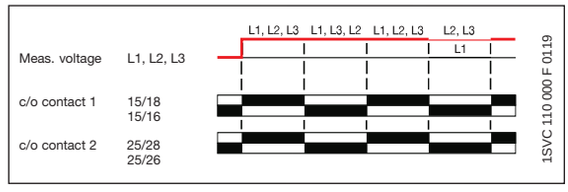
CM-PFS

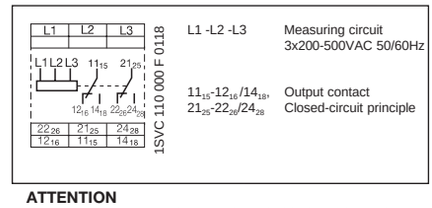
① Yellow LED - state of relay

- Monitors three-phase supply voltage for incorrect phase sequence and phase failure
- Without delay on "ON"
- 2c/o contacts
- LED to indicate state of relay
- Continuous voltage range covering 3x200-500V 50/60Hz
- Approvals

The CM-PFS monitors three-phase input power supply mains voltage for incorrect phase sequence and phase loss. The output relay remains energized with correct phase sequence.
It resets and the yellow LED turns off in the case of incorrect phase sequence or phase loss.
With motors running on two phases the CM-PFS is able to monitor regenerated voltage up to 60% of the original voltage. If the voltage is higher the output relay can not de-energize. For such application, we recommend the use of phase unbalance monitor CM-ASS or CM-ASN.

1 Function





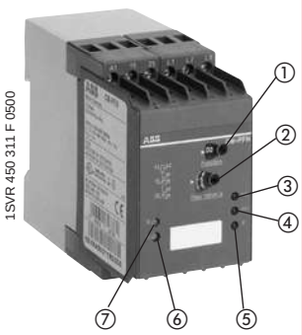
ATTENTION
If several CM-PFS-units are placed side by side and supply voltage is higher than 415V, spacing between the individual units must be 10mm minimum.

Type	Supply voltage = Measuring voltage	Order code	Pack. unit piece		
CM-PFS	3x200-500VAC 50/60 HZ	**1SVR 430 824 R 9300**	1		RS 442-9124

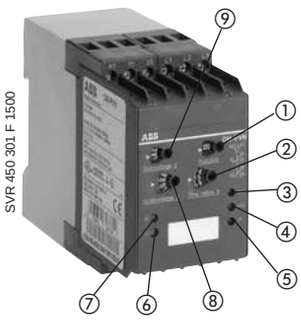
Remark: 1c/o = SPDT; 2c/o = DPDT

3-phase monitors CM-PFN, CM-PVN

Ordering details



CM-PFN



CM-PVN

① Timing function ⊠ / ■
② Time setting
③ >U: Red LED - overvoltage
④ <U: Red LED - undervoltage
⑤ P: Red LED - phase failure
⑥ U: Green LED supply voltage
⑦ R: Yellow LED - state of relay
⑧ Threshold value undervoltage
⑨ Threshold value overvoltage

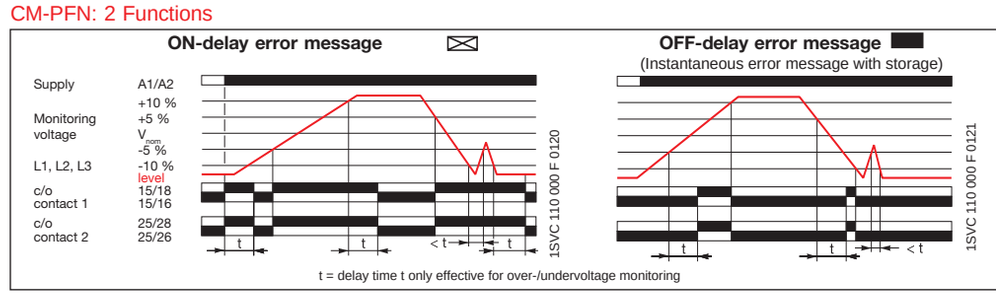
- Monitors three-phase supply voltage for incorrect phase sequence, over-, undervoltage
- CM-PFN: Voltage monitoring range: 0.9-1.1 V_N
- CM-PVN: 3 Voltage monitoring ranges: von 160-580V
- CM-PVN: 3 phases voltage section monitoring, V_{min} and V_{max} adjustable
- Fixed switching hysteresis of 5%
- Selectable delay on operate or on release of 0.1-10s on over or undervoltage
- 2c/o contacts / 5 LEDs to indicate all operational states
- 3 three-phase voltage monitoring versions: 220V, 400V, 500V
- 3 supply voltages: 110-30V, 220-240V, 380-415V
- Approvals

The CM-PFN, CM-PVN monitor the three-phase supply voltage for incorrect phase sequence, overvoltage, undervoltage, and phase loss. The output relay de-energizes if one of the above faults occurs. The LEDs indicate nature of the fault. The output relay remains energized when the correct phase sequence and voltage are present.

CM-PFN: If the voltage exceeds 1.1 times the rated value or falls below 0.9 times the rated value, the output relay will de-energize. A delay on operate or delay on release time can be set for the overvoltage and undervoltage monitoring functions. The delay time is adjusted with a potentiometer.

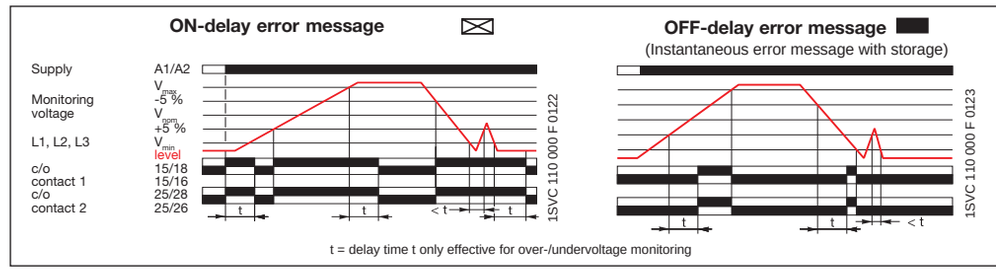
CM-PVN: If the voltage exceeds the rated value V_{max} or if it falls below V_{min}, the output relay will de-energize. Selector switch ⊠/■ is used to set the time delay. Switch position ⊠: Alarm tripping indicating that voltage that has exceeded or dropped below the set value will be suppressed during the set delay time. Momentary voltage fluctuations will thus not initiate alarm tripping. Switch position ■: Alarm tripping will be instantaneous and will also be stored during the set delay time. Momentary undervoltage conditions will be ignored. The relay will automatically energize again as soon as the voltage returns to nominal. Type CM-PVN includes a hysteresis of 5%.

CM-PFN: 2 Functions



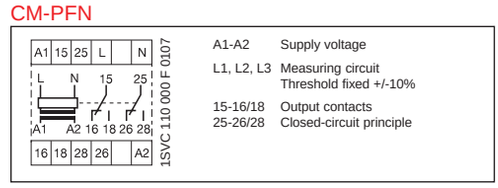
t = delay time t only effective for over-/undervoltage monitoring

CM-PVN: 2 Functions



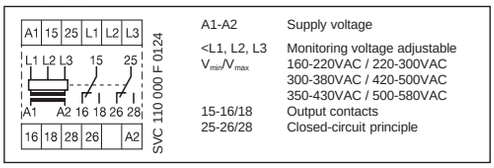
t = delay time t only effective for over-/undervoltage monitoring

CM-PFN



A1-A2	Supply voltage
L1, L2, L3	Measuring circuit Threshold fixed +/-10%
15-16/18 25-26/28	Output contacts Closed-circuit principle

CM-PVN



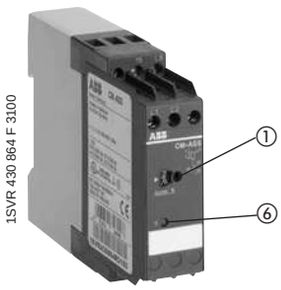
A1-A2	Supply voltage
<L1, L2, L3 V_{min}/V_{max}	Monitoring voltage adjustable 160-220VAC / 220-300VAC 300-380VAC / 420-500VAC 350-430VAC / 500-580VAC
15-16/18 25-26/28	Output contacts Closed-circuit principle

Type	Supply voltage 50/60 Hz	Order code	Pack. unit piece		
Monitoring voltage 3 x 380V/50Hz					
CM-PFN	220 -240VAC	**1SVR 450 311 R 0400**	1		
	380-415VAC	**1SVR 450 312 R 0400**	1		
Monitoring voltage 3 x 400V/50Hz					
CM-PFN	110-130VAC	**1SVR 450 311 R 0500**	1		
	380-240VAC	**1SVR 450 312 R 0500**	1		RS 442-9247
Monitoring voltage: V_{min} 160-220VAC 50/60Hz, V_{max} 220... 300 V AC 50/60 Hz					
CM-PVN	90-145VAC	**1SVR 450 300 R 1200**	1		
	160-300VAC	**1SVR 450 301 R 1200**	1		
Monitoring voltage: V_{min} 300-380VAC 50/60Hz, V_{max} 420-500VAC 50/60Hz					
CM-PVN	90-145VAC	**1SVR 450 300 R 1500**	1		
	160-300VAC	**1SVR 450 301 R 1500**	1		
	300-500VAC	**1SVR 450 302 R 1500**	1		RS 442-9231
Monitoring voltage: V_{min} 350-430VAC 50/60Hz, V_{max} 500-580 VAC 50/60Hz					
CM-PVN	90-145VAC	**1SVR 450 300 R 1700**	1		
	300-500VAC	**1SVR 450 302R 1700**	1		

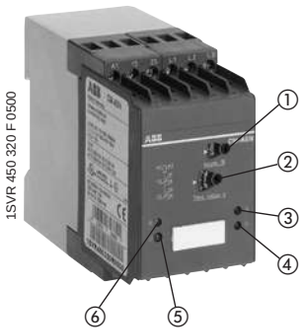
Further voltages on request.Remark: 1 c/o = SPDT; 2 c/o = DPDT

Phase unbalance monitors CM-ASS, CM-ASN

Ordering details



CM-ASS



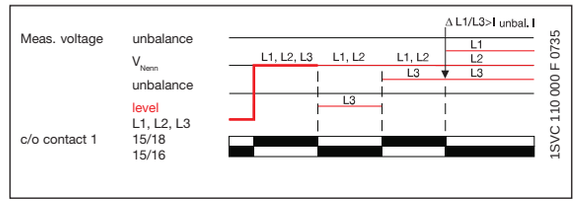
CM-ASN

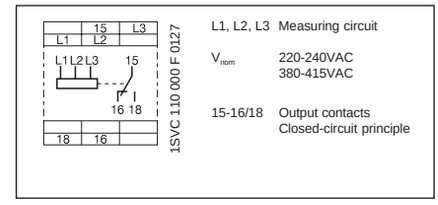
① Threshold unbalance
② Time setting
③ A: Red LED - unbalance
④ P: Red LED - phase loss and phase sequence error
⑤ V: Green LED - supply voltage
⑥ R: Yellow LED - state of relay

- CM-ASS: Fixed response delay: 0.5s
  CM-ASN: adjustable ON-delay : 0.1-10s
- Switching threshold adjustable between 5 and 15%
- CM-ASS: 1c/o contact
  CM-ASN: 2c/o contacts
- CM-ASS: LED to indicate operational status
  CM-ASN: 4 LEDs to indicate all operational states
- CM-ASS: 2 supply and measuring voltage ranges: 220-240V und 380-415V
- CM-ASN: 3 three-phase voltage ranges: 220V, 400V, 500V
- Several supply voltage versions
- Approvals

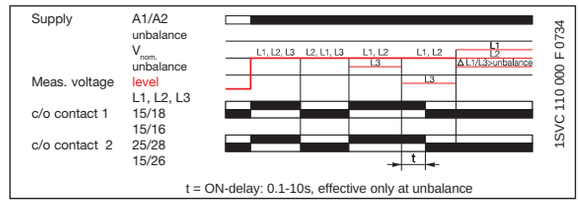
Monitors three phase supply mains for phase unbalance, phase loss, even when of 95% of the voltage is regenerated and phase sequence.
CM-ASS: The output relay de-energizes 500 ms after the set unbalance level has been exceeded or immediately after failure of one of the phases. The energized yellow LED indicates an energized output relay. The switching threshold for permissible unbalance is adjustable between 5 and 15%.
CM-ASN: In case of a fault, the output relay will de-energize. Status of the fault will be indicated by one of the LED´s. The output relay is energized as long as phases are balanced and phase sequence is correct (rotary switch right-handed polarized). It will de-energize as soon as unbalance exceeds the set threshold (adjustable between 5% and 15% unbalance).
A response time delay of 0.1s to 10s can be set on a potentiometer to prevent nuisance tripping of the relay during motor starting. Phase loss and phase sequence cause immediate tripping.
With motors running on two phases, regenerated voltage (of more than 95%) may be produced, so the output relay may not de-energize despite the loss of a phase.

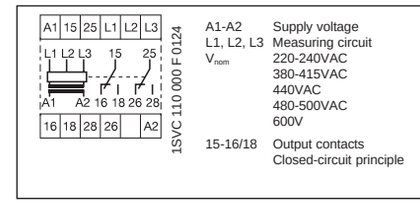
CM-ASS: 1 Function





CM-ASN: 1 Function





Type	Supply voltage = Monitoring voltage	Frequency	Order code	Pack. unit piece		
CM-ASS	3 x 220-240VAC	50Hz	**1SVR 430 864 R 1100**	1		
	3 x 380-415VAC	50Hz	**1SVR 430 864 R 3100**	1		RS 442-9146
	3 x 220-240VAC	60Hz	**1SVR 430 865 R 1100**	1		
	3 x 380-415VAC	60Hz	**1SVR 430 865 R 3100**	1		

Type	Supply voltage	Frequency	Order code	Pack. unit piece		
Monitoring voltage: 3x220-240VAC 50Hz; 3 x 220-240VAC 60Hz						
CM-ASN	110-130VAC	50Hz	**1SVR 450 320 R 0200**	1		
	220-240VAC	50Hz	**1SVR 450 321 R 0200**	1		
	380-415VAC	50Hz	**1SVR 450 322 R 0200**	1		
	220-240VAC	60Hz	**1SVR 450 421 R 0200**	1		
Monitoring voltage: 3x380-415VAC 50Hz; 3x380-415VAC 60Hz						
CM-ASN	110-130VAC	50Hz	**1SVR 450 320 R 0500**	1		
	220-240VAC	50Hz	**1SVR 450 321 R 0500**	1		
	380-415VAC	50Hz	**1SVR 450 322 R 0500**	1		
	220-240VAC	60Hz	**1SVR 450 422 R 0500**	1		
Monitoring voltage: 3x440VAC 60Hz						
CM-ASN	440VAC	60Hz	**1SVR 450 423 R 0600**	1		
Monitoring voltage: 3x480-500VAC 50Hz; 3x480-500 VAC 60Hz						
CM-ASN	110-130VAC	50Hz	**1SVR 450 320 R 0700**	1		
	220-240VAC	50Hz	**1SVR 450 321 R 0700**	1		
	380-415VAC	50Hz	**1SVR 450 322 R 0700**	1		
	500-550VAC	50Hz	**1SVR 450 932 R 0100**	1		
	480-500VAC	60Hz	**1SVR 450 424 R 0700**	1		
Monitoring voltage: 3x600VAC 50Hz; 3x480-500VAC 60Hz						
CM-ASN	600VAC	60Hz	**1SVR 450 426 R 0800**	1		

Remark: 1c/o = SPDT; 2c/o = DPDT

3-phase monitors

Technical data and standards / directives

	CM-PBE	CM-PVE	CM-PFE
Input circuit	**= Meas. circuit L1-L2-L3 (-N)**	**= Meas. circuit L -L2-L3 (-N)**	**=Meas. circuit L1-L2-L3**
Supply voltage - power consumption		Supply voltage = Measuring voltage	
	220-240VAC 50/60Hz	185-265VAC 50/60Hz	3x208-440VAC approx. 15VA
	380-440VAC 50/60Hz	320-460VAC 50/60Hz	
Tolerance of the supply voltage	-15%...+15%	-15%...+10%	-10%...+10%
Supply voltage frequency	50-60Hz	50-60Hz (-10%...+10%)	50-60Hz (-10%...+10%)
Duty cycle	100%		
Measuring circuit	**L1-L2- L3-N L1 - L2 -L3**	**L1-L2- L3-N L1-L2-L3**	**L1-L2-L3**
Monitoring function	Phase loss	Over / undervoltage	Phase seq., Phase loss
Measuring range, min-max.	220-240VAC 380-440VAC	185-265VAC 320-460VAC	3x208-440VAC
Threshold	threshold = 0,6 x Vnom	fix: Vmin: 185V/320V; Vmax: 265V/460V	0.6xVnom
Hysteresis related to threshold value	5% fix (Rückschaltw. = 0.65xVnom)	fix: Vmin: 194V/336V; Vmax: 252V/437V	
Frequency of measuring voltage	50-60Hz (-10%...+10%)	50-60Hz (-10%...+10%)	50-60Hz
Measuring cycle time max.	40 ms	80ms	500ms
Meas. error within the tolerance of supply power			≤ 0.5%
Meas. error within the temperature range		≤ 0.06% / °C	
Time circuit			
Delay time	OFF-delay 500ms (+/-20%), fix ON-delay 100ms (+/-20%)	OFF-delay 500ms (+/-20%), fix ON-delay at V_{min}/V_{max} 500ms (+/-20%)	500ms
Display of operating status			
Supply voltage			
Output relay energized	R, yellow LED		
Over/ undervoltage			
Phase loss, phase sequence, unbalance			
Output circuits	**13-14**		**11-12/14**
No. of contacts	1 n/o contact		1 c/o contact
Operating principle [1]	closed-circuit principle		
Contact material	AgCdo		
Rated voltage acc. to VDE0110, IEC947-1	250V		
Switching voltage min.			
Switching voltage max.	250VAC, 250VDC		
Switching current min.			
Rated switching current acc. to IEC941-x AC12 (resistive) 230V	4A		
IEC941-x AC15 (inductive) 230V	3A		
IEC941-x DC12 (resistive) 24V	4A		
IEC941-x DC13 (inductive) 24V	2A		
Max. mechanical life	$30x10^6$		
Max. electrical life (acc. to AC12, 230V, 4A)	$0.1x10^6$		
Short circuit proof, max. fuse rating n/c contact			10A fast, operating class gL
n/o contact	10A fast, operating class gL		
General Data			
Width of enclosure	22.5mm		
Wire size	2x1.5mm² (2x16 AWG) stranded with wire end ferrule		
Installation position	any		
Degree of protection enclosure / terminals	IP50 / IP20		
Operating temperature	-20°C...+60°C		
Storage temperature	-40°C...+85°C		
Mounting	DIN rail (EN50022)		
Mechanical shock resistance acc. to IEC68-2...6	10G		
Standards			
Product standard	IEC255-6		
Electromagnetic compatibility	93/68/EWG		
EMC-tests acc. to EN50082-2			
ESD acc. to IEC1000-4-2, EN61000-4-2	level 3 - 6kV/8kV		
HF-radiation resistance acc. to IEC1000-4-3, EN61000-4-3	level 3 - 10V/m		
Burst acc. to IEC1000-4-4, EN61000-4-4	level 3 - 2kV/5 kHz		
Surge acc. to IEC1000-4-5, EN61000-4-5	level 4 - 2kVL-L		
HF-line emission acc. to IEC1000-4-6, EN61000-4-6	level 3 - 10V		
Low voltage directive	93/68/EWG		
Resistance to vibration	10G, f = 55Hz, a = 0.95mm, t = 2h per level		
Approvals	**cULus, GOST**		
Isolation data			
Rated insulation voltage to VDE0110, IEC947-1 between supply-, measuring- and output circuit	400V	400V	500V
Rated impulse withstand voltage to VDE0110, IEC664 -between all isolated circuits	4kV / 1.2 - 50µs		
Test voltage between all isolated circuits	2.5kV, 50Hz, 1min.		
Pollution category acc. to VDE0110, IEC664 / IEC255-5	III / C		
Overvoltage category acc. to VDE0110, IEC664 / IEC255-5	III / C		
Environmental tests acc. to IEC68-2...30	24h cycle, 55°C, 93% rel., 96h		

[1] Open-circuit principle: Output relay energizes when the adjusted threshold value is exceeded or dropped below the measured value
Closed-circuit principle: Output relay de-energizes when the adjusted threshold value is exceeded or dropped below the measured value

Remark: 1c/o = SPDT; 2c/o = DPDT

3-phase monitors

Technical data, standards / directives

	CM-PFS	CM-PFN	CM-PVN
Input circuit	**= Meas. circuit L1-L2-L3**		
Supply voltage - power consumption	Supply voltage = Meas. voltage		
	3x208-440VAC 50/60Hz approx. 15VA	110-130VAC 50/6 0Hz approx. 3VA	90-145VAC approx. 3VA
		220-240VAC 50/6 0Hz approx. 3VA	160-300VAC approx. 3VA
		380-440VAC 50/6 0Hz approx. 3VA	
Tolerance of the supply voltage	-15%...+10%		
Supply voltage frequency	50-60Hz		
Duty cycle	100%		
Measuring circuit	**L1 - L2 -L3**	**L1-L2-L3**	**L1-L2-L3**
Monitoring function	Phase sequence, phase loss	Over / undervoltage, phasen sequence, phase loss	
Measuring range, min-max.	3x200-500VAC	3x380VAC 50Hz, 3x400VAC 50Hz	160-300/300-500/350-580VAC
Threshold	0.6 x V_{nom}	over and undervoltage-fix,0.85/1.1xV_{nom}	over and undervoltage tripping point adjustable
Hysteresis related to threshold value		5% fix (0.9/1.05 V_{nom})	5% fix
Frequency of measuring voltage	50-60Hz	50Hz	50-60Hz
Measuring cycle time max.	500ms	80ms	
Meas. error within the tolerance of supply power	≤ 0.5%		
Meas. error within the temperature range	≤ 0.06 % / °C		
Time circuit		Error message of over and undervoltage	
Delay time	500ms	0.1-10s, adjustable, ON-delay or OFF-delay (failure storage)	
Timing error within the tolerance of supply voltage	-	≤5%	
Timing error within temperature range	-	≤0.06%/°C	
Display of operating status			
Supply voltage	U, green LED		
Output relay energized	R, yellow LED		
Overvoltage	> U, red LED		
Undervoltage	< U, red LED		
Phase loss	P, red LED		
Phase sequence			
Unbalance			
Output circuits	**11(15)-12(16)/14(18), 21(25)-22(26)/24(28)**	**15-16/18, 25-26/28**	
No. of contacts	2 c/o contacts		
Operating principle [1]	closed circuit principle		
Contact material	AgCdo		
Rated voltage acc. to VDE0110, IEC947-1	250V	400V	
Switching voltage min.			
Switching voltage max.	250VAC, 250VDC	400VAC, 400VDC	
Switching current min.			
Rated switching current acc. to IEC941-x AC12 (resistive) 230V	4A	5A	
IEC941-x AC15 (inductive) 230V	3A	3A	
IEC941-x DC12 (resistive) 24V	4A	5A	
IEC941-x DC13 (inductive) 24V	2A	2.5A	
Max. mechanical life	30 x 10^6		
Max. electrical life (acc. to AC12, 230V, 4A)	0.1 x 10^6		
Short circuit proof, n/c contact	10A fast, operation class gL	5A fast, operation class gL	
max. fuse rating n/o contact	10A fast, operation class gL	5A fast, operation class gL	
General Data			
Width of enclosure	22.5mm	45mm	
Wire size	2 x 1.5mm² (2 x 16 AWG) stranded with wire end ferrule		
Installation position	any		
Degree of protection housing / terminals	IP50 / IP20		
Operating temperature	-20°C...+60°C	-25°C...+65°C	
Storage temperature	-40°C...+85°C		
Mounting	DIN rail (EN50022)		
Mechanical shock resistance acc. to IEC68-2...6	6G	10G	
Standards			
Product standard	IEC255-6		
Electromagnetic compatibility	93/68/EWG		
EMC-tests acc. to EN50082-2	level 3 - 6kV/8kV		
HF radiation resistance acc. to IEC1000-4-3, EN61000-4-3	level 3 - 10V/m		
Burst acc. to IEC1000-4-4, EN61000-4-4	level 3 - 2kV/5kHz		
Surge acc. to IEC1000-4-5, EN61000-4-5	level 4 - 2kVL-L		
HF line emission acc. to IEC1000-4-6, EN61000-4-6	level 3 - 10V		
Low voltage directive	93/68/EWG		
Resistance to vibration	10G, f = 55Hz, a = 0.95mm, t = 2h per level		
Approvals	**cULus, GL, GOST**		
Isolation data			
Rated insulation voltage to VDE0110, IEC947-1 between supply-, measuring- and output circuit	500V		
Rated impulse withstand voltage to VDE0110, IEC664 -between all isolated circuits	4 kV / 1.2 - 50µs		
Test voltage between all isolated circuits	2.5 kV, 50Hz, 1min.		
Pollution category acc. to VDE0110, IEC664 / IEC255-5	III / C		
Overvoltage category acc. to VDE0110, IEC664 / IEC255-5	III / C		
Environmental tests acc. to IEC68-2...30	24h cycle, 55°C, 93% rel., 96h		

[1] Open circuit principle: Output relay energizes when the adjusted threshold value is exceeded or dropped below the measured value
Closed circuit principle: Output relay de-energizes when the adjusted threshold value is exceeded or dropped below the measured value

Remark: 1c/o = SPDT; 2c/o = DPDT

3-phase monitors

Technical data, standards / directives

CM-ASS	CM-ASN	CM-MPS
= Meas. circuit L1-L2-L3		**= Meas. circuit L1-L2-L3**
Supply voltage = Measuring voltage		
3x220-240VAC 50Hz /3x220-240VAC 60Hz approx. 2VA	110-130/220-240VAC 50/60Hz approx. 3VA	160-300VAC 50/60Hz
3x380-440VAC 50Hz/3x380-440VAC 60Hz approx. 2VA	380-415/440/480-500VAC 50/60Hz approx. 3VA	300-500VAC 50/60Hz
	500-550/600VAC 50/60Hz approx. 3VA	
-20%...+20%	-15%...+10%	
50Hz or 60Hz	50-60Hz	
100%	100%	
L1-L2-L3	**L1-L2-L3**	**L1-L2-L3**
voltage unbalance, phase sequence, phase loss		over and undervoltage/ph. loss/ph. seq./ph. unbalance
220-240VAC or 380-415VAC	220-240/380-415/440/ 480-500/600VAC	160-300VAC/300-500VAC / 2-15%
5-15% adjustable for unbalance		adjustable over and undervoltage threshold value adjustable unbalance
fix, 20%		fix, 5%
50 oder 60Hz		50-60Hz
500ms	< 100ms	80ms
≤ 0,5%		
≤ 0.06 % / °C		
Error message of phase unbalance	Error message of over and undervoltage, phase loss, phase sequence, phase unbalance	
500ms for error message of phase unbalance	0.1-10s, adjustable, ON-delay	0.1-10s, adjustable
≤ 0.5%		
≤ 0.06% / °C		
	U, green LED	U/R/T, green LED flashing while timing
R, yellow LED		U/R/T, green LED flashing while timing
	F, red LED	
	F, red LED	
	P, red LED	F, red LED
	F, red LED	
	A, red LED	F, red LED
15-16/18	**15-16/18, 25-26/28**	**15-16/18, 25-26/28**
1c/o	2c/o	
closed-circuit principle		
AgCdo		
250V	400V	250V
250 V AC, 250 V DC	400VAC, 400VDC	250VAC, 250VDC
4A	5A	4A
3A	3A	3A
4A	5A	4A
2A	2.5A	2A
30 x 10^6	30 x 10^6	30 x 10^6
0,1 x 10^6	0,1 x 10^6	0,1 x 10^6
10A fast, operating class gL	5A fast, operating class gL	10A fast, operating class gL
10A fast, operating class gL	5A fast, operating class gL	10A fast, operating class gL
22.5 mm	45mm	22.5mm
2x2,5mm² (2x14AWG) stranded with wire end ferrule		
any		
IP50 / IP20		
-20°C...+60°C	-25°C...+65°C	
-40°C...+85°C		
DIN rail (EN50022)		
6G	10G	6G
IEC255-6		
93/68/EWG		
level 3-6kV/8 kV		
level 3 - 10V/m		
level 3 - 2kV / 5 kHz		
level 4 - 2kV L-L		
level 3 - 10V		
93/68/EWG		
10G, f = 55Hz, a = 0.95mm, t = 2h per level		
cULus, GL, GOST	**cULus, GL, GOST**	**cULus, GL** (pending)**, GOST**
500V		
4 kV/1.2-50µs		
2.5 kV, 50Hz, 1min.		
III / C		
III / C		
24h cycle, 55°C, 93% rel., 96h		

[1] Open-circuit principle: Output relay energizes when the adjusted threshold value is exceeded or below the measured value
Closed-circuit principle: Output relay de-energizes when the adjusted threshold vlaue is exceeded or below the measured value

Remark: 1c/o = SPDT; 2c/o = DPDT