

# Measuring and Monitoring Relays

## Single-phase current monitoring relays

	Type	Order number
	CM-SFS.11S	1SVR730840R0200
	CM-SFS.11P	1SVR740840R0200
	CM-SFS.11S	1SVR730841R0200
	CM-SFS.11P	1SVR740841R0200
	CM-SFS.11S	1SVR730841R1200
	CM-SFS.11P	1SVR740841R1200
	CM-SFS.12S	1SVR730840R0300
	CM-SFS.12S	1SVR730841R0300
	CM-SFS.21S	1SVR730841R1300
	CM-SFS.21S	1SVR730840R0400
	CM-SFS.21P	1SVR740840R0400
	CM-SFS.21S	1SVR730841R0400
	CM-SFS.21P	1SVR740841R0400
	CM-SFS.21S	1SVR730841R1400
	CM-SFS.21P	1SVR740841R1400
	CM-SFS.22S	1SVR730840R0500
	CM-SFS.22S	1SVR730841R0500
	CM-SFS.M1S	1SVR730840R0600
	CM-SFS.M1P	1SVR740840R0600
	CM-SFS.M2S	1SVR730840R0700
	CM-SFS.21S	1SVR730760R0400
	CM-SFS.21P	1SVR740760R0400
	CM-SFS.22S	1SVR730760R0500

Rated control supply voltage $U_s$	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.12S	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	CM-SFS.M1S	CM-SFS.M1P	CM-SFS.M2S	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	
24 - 240 V AC/DC	■	■					■	■	■					■		■	■	■	■	■	■
110 - 130 V AC			■	■			■			■	■			■							
220 - 240 V AC					■	■		■				■	■				■				

Measuring ranges AC/DC	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.12S	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	CM-SFS.M1S	CM-SFS.M1P	CM-SFS.M2S	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S
3 - 30 mA	■	■	■	■	■	■		■	■	■	■	■	■		■	■		■	■	■
10 - 100 mA	■	■	■	■	■	■		■	■	■	■	■	■		■	■		■	■	■
0.1 - 1 A	■	■	■	■	■	■		■	■	■	■	■	■		■	■		■	■	■
0.3 - 1.5 A							■	■	■					■	■	■		■		■
1 - 5 A							■	■	■					■	■	■		■		■
3 - 15 A							■	■	■					■	■	■		■		■

Monitoring function	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.12S	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	CM-SFS.M1S	CM-SFS.M1P	CM-SFS.M2S	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	
Over- or undercurrent	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
Windows current monitoring																		■	■	■	
Latching															sel	sel	sel	sel	sel	sel	
Open circuit or closed circuit principle															sel	sel	sel	sel	sel	sel	

Timing functions for tripping delay	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.12S	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	CM-SFS.M1S	CM-SFS.M1P	CM-SFS.M2S	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	
ON delay, 0 or 0.1 - 30 s								adj	adj	adj	adj	adj	adj	adj	adj	adj	adj				
ON or OFF delay																			sel	sel	sel

Output	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.12S	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	CM-SFS.M1S	CM-SFS.M1P	CM-SFS.M2S	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	
c/o contact	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2

Connection type	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.11S	CM-SFS.11P	CM-SFS.12S	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	CM-SFS.M1S	CM-SFS.M1P	CM-SFS.M2S	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S	
Push-in terminals	■	■	■	■	■	■		■	■	■	■	■	■		■	■		■	■	■	
Double-chamber cage connection terminals	■		■		■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

adj: adjustable  
sel: selectable

# Measuring and Monitoring Relays

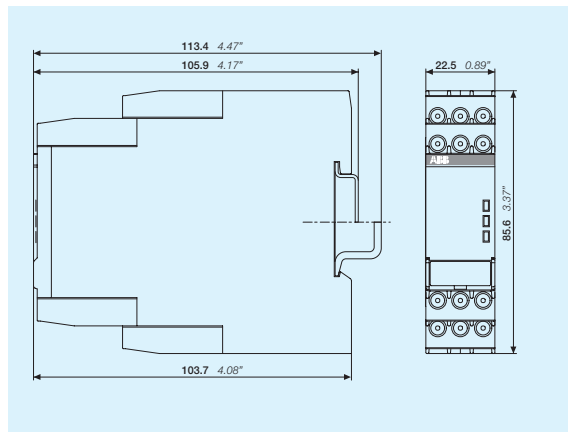
## Single-phase voltage monitoring relays

Type	Order number																	
CM-ESS.1S	1SVR730830R0300																	
CM-ESS.1P	1SVR740830R0300																	
CM-ESS.1S	1SVR730831R0300																	
CM-ESS.1P	1SVR740831R0300																	
CM-ESS.1S	1SVR730831R1300																	
CM-ESS.1P	1SVR740831R1300																	
CM-ESS.2S	1SVR730830R0400																	
CM-ESS.2P	1SVR740830R0400																	
CM-ESS.2S	1SVR730831R0400																	
CM-ESS.2P	1SVR740831R0400																	
CM-ESS.2S	1SVR730831R1400																	
CM-ESS.2P	1SVR740831R1400																	
CM-ESS.MS	1SVR730830R0500																	
CM-ESS.MP	1SVR740830R0500																	
CM-EFS.2S	1SVR730750R0400																	
CM-EFS.2P	1SVR740750R0400																	
<b>Rated control supply voltage U<sub>s</sub></b>																		
24 - 240 V AC/DC		■	■							■	■						■	■
110 - 130 V AC				■	■							■	■					
220 - 240 V AC								■	■							■	■	
<b>Measuring ranges AC/DC</b>																		
3 - 30 V		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
6 - 60 V		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
30 - 300 V		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
60 - 600 V		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
<b>Monitoring function</b>																		
Over- or undervoltage		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Windows voltage monitoring																	■	■
Latching																	sel	sel
Open circuit or closed circuit principle																	sel	sel
<b>Timing functions for tripping delay</b>																		
ON delay, 0 or 0.1 - 30 s										adj	adj	adj	adj	adj	adj	adj	adj	adj
ON or OFF delay																	sel	sel
<b>Output</b>																		
c/o contact		1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
<b>Connection type</b>																		
Push-in terminals			■			■		■		■		■		■		■		■
Double-chamber cage connection terminals		■		■		■		■		■		■		■		■		■

adj: adjustable  
sel: selectable

### Dimensional drawings

dimensions in mm



# Measuring and Monitoring Relays

## Three Phase Monitors - Singlefunctional

Rated control supply voltage $U_s$	Type	Order number
	CM-PBE	1SVR550881R9400
	CM-PBE	1SVR550882R9500
	CM-PVE	1SVR550870R9400
	CM-PVE	1SVR550871R9500
	CM-PFE	1SVR550824R9100
	CM-PFS.S	1SVR730824R9300
	CM-PFS.P	1SVR740824R9300
	CM-PSS.31S	1SVR730784R2300
	CM-PSS.31P	1SVR740784R2300
	CM-PSS.41S	1SVR730784R3300
	CM-PSS.41P	1SVR740784R3300
	CM-PVS.31S	1SVR730794R1300
	CM-PVS.31P	1SVR730794R1300
	CM-PVS.41S	1SVR730794R3300
	CM-PVS.41P	1SVR740794R3300
	CM-PVS.81S	1SVR730794R2300
	CM-PVS.81P	1SVR740794R2300
	CM-PAS.31S	1SVR730774R1300
	CM-PAS.31P	1SVR740774R1300
	CM-PAS.41S	1SVR730774R3300
	CM-PAS.41P	1SVR740774R3300

Phase to Phase	CM-PBE	CM-PBE	CM-PVE	CM-PVE	CM-PFE	CM-PFS.S	CM-PFS.P	CM-PSS.31S	CM-PSS.31P	CM-PSS.41S	CM-PSS.41P	CM-PVS.31S	CM-PVS.31P	CM-PVS.41S	CM-PVS.41P	CM-PVS.81S	CM-PVS.81P	CM-PAS.31S	CM-PAS.31P	CM-PAS.41S	CM-PAS.41P	
160-300 V AC																						
200-400 V AC																						
200-500 V AC																						
208-440 V AC																						
300-500 V AC																						
320-460 V AC																						
380 V AC																						
380-440 V AC																						
400 V AC																						

Phase to Neutral	CM-PBE	CM-PBE	CM-PVE	CM-PVE	CM-PFE	CM-PFS.S	CM-PFS.P	CM-PSS.31S	CM-PSS.31P	CM-PSS.41S	CM-PSS.41P	CM-PVS.31S	CM-PVS.31P	CM-PVS.41S	CM-PVS.41P	CM-PVS.81S	CM-PVS.81P	CM-PAS.31S	CM-PAS.31P	CM-PAS.41S	CM-PAS.41P	
185-265 V AC																						
220-240 V AC																						

Rated frequency	CM-PBE	CM-PBE	CM-PVE	CM-PVE	CM-PFE	CM-PFS.S	CM-PFS.P	CM-PSS.31S	CM-PSS.31P	CM-PSS.41S	CM-PSS.41P	CM-PVS.31S	CM-PVS.31P	CM-PVS.41S	CM-PVS.41P	CM-PVS.81S	CM-PVS.81P	CM-PAS.31S	CM-PAS.31P	CM-PAS.41S	CM-PAS.41P	
50/60 Hz																						

Suitable for monitoring	CM-PBE	CM-PBE	CM-PVE	CM-PVE	CM-PFE	CM-PFS.S	CM-PFS.P	CM-PSS.31S	CM-PSS.31P	CM-PSS.41S	CM-PSS.41P	CM-PVS.31S	CM-PVS.31P	CM-PVS.41S	CM-PVS.41P	CM-PVS.81S	CM-PVS.81P	CM-PAS.31S	CM-PAS.31P	CM-PAS.41S	CM-PAS.41P	
Single-phase mains																						
Three-phase mains																						

Monitoring function	CM-PBE	CM-PBE	CM-PVE	CM-PVE	CM-PFE	CM-PFS.S	CM-PFS.P	CM-PSS.31S	CM-PSS.31P	CM-PSS.41S	CM-PSS.41P	CM-PVS.31S	CM-PVS.31P	CM-PVS.41S	CM-PVS.41P	CM-PVS.81S	CM-PVS.81P	CM-PAS.31S	CM-PAS.31P	CM-PAS.41S	CM-PAS.41P	
Phase failure																						
Phase sequence																						
Automatic phase sequence correction																						
Overvoltage																						
Undervoltage																						
Unbalance																						
Neutral <sup>1)</sup>																						

Thresholds	CM-PBE	CM-PBE	CM-PVE	CM-PVE	CM-PFE	CM-PFS.S	CM-PFS.P	CM-PSS.31S	CM-PSS.31P	CM-PSS.41S	CM-PSS.41P	CM-PVS.31S	CM-PVS.31P	CM-PVS.41S	CM-PVS.41P	CM-PVS.81S	CM-PVS.81P	CM-PAS.31S	CM-PAS.31P	CM-PAS.41S	CM-PAS.41P	
fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix	fix

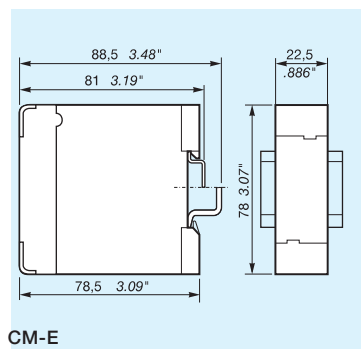
Timing functions for tripping delay	CM-PBE	CM-PBE	CM-PVE	CM-PVE	CM-PFE	CM-PFS.S	CM-PFS.P	CM-PSS.31S	CM-PSS.31P	CM-PSS.41S	CM-PSS.41P	CM-PVS.31S	CM-PVS.31P	CM-PVS.41S	CM-PVS.41P	CM-PVS.81S	CM-PVS.81P	CM-PAS.31S	CM-PAS.31P	CM-PAS.41S	CM-PAS.41P	
ON delay																						
On and OFF delay																						

Connection type	CM-PBE	CM-PBE	CM-PVE	CM-PVE	CM-PFE	CM-PFS.S	CM-PFS.P	CM-PSS.31S	CM-PSS.31P	CM-PSS.41S	CM-PSS.41P	CM-PVS.31S	CM-PVS.31P	CM-PVS.41S	CM-PVS.41P	CM-PVS.81S	CM-PVS.81P	CM-PAS.31S	CM-PAS.31P	CM-PAS.41S	CM-PAS.41P	
Push-in terminals																						
Double-chamber cage connection terminals																						

<sup>1)</sup> The external conductor voltage towards the neutral conductor is measured.

adj: adjustable  
 sel: selectable  
 fix: fixed



# Measuring and Monitoring Relays

## Three Phase Monitors - Multifunctional

Rated control supply voltage $U_c$	Type	Order number
	CM-MPS.11S	1SVR730885R1300
	CM-MPS.11P	1SVR740885R1300
	CM-MPS.21S	1SVR730885R3300
	CM-MPS.21P	1SVR740885R3300
	CM-MPS.31S	1SVR730884R1300
	CM-MPS.31P	1SVR740884R1300
	CM-MPS.41S	1SVR730884R3300
	CM-MPS.41P	1SVR740884R3300
	CM-MPS.23S	1SVR730885R4300
	CM-MPS.23P	1SVR740885R4300
	CM-MPS.43S	1SVR730884R4300
	CM-MPS.43P	1SVR740884R4300
	CM-MPN.52S	1SVR750487R8300
	CM-MPN.52P	1SVR760487R8300
	CM-MPN.62S	1SVR750488R8300
	CM-MPN.62P	1SVR760488R8300
	CM-MPN.72S	1SVR750489R8300
	CM-MPN.72P	1SVR760489R8300

Phase to Phase	CM-MPS.11S	CM-MPS.11P	CM-MPS.21S	CM-MPS.21P	CM-MPS.31S	CM-MPS.31P	CM-MPS.41S	CM-MPS.41P	CM-MPS.23S	CM-MPS.23P	CM-MPS.43S	CM-MPS.43P	CM-MPN.52S	CM-MPN.52P	CM-MPN.62S	CM-MPN.62P	CM-MPN.72S	CM-MPN.72P	
160-300 V AC					■	■													
300-500 V AC							■	■											
350-580 V AC											■	■							
450-720 V AC													■	■					
530-820 V AC															■	■	■	■	■

Phase to Neutral	CM-MPS.11S	CM-MPS.11P	CM-MPS.21S	CM-MPS.21P	CM-MPS.31S	CM-MPS.31P	CM-MPS.41S	CM-MPS.41P	CM-MPS.23S	CM-MPS.23P	CM-MPS.43S	CM-MPS.43P	CM-MPN.52S	CM-MPN.52P	CM-MPN.62S	CM-MPN.62P	CM-MPN.72S	CM-MPN.72P	
90-170 V AC	■	■																	
180-280 V AC			■	■					■	■									

Rated frequency	CM-MPS.11S	CM-MPS.11P	CM-MPS.21S	CM-MPS.21P	CM-MPS.31S	CM-MPS.31P	CM-MPS.41S	CM-MPS.41P	CM-MPS.23S	CM-MPS.23P	CM-MPS.43S	CM-MPS.43P	CM-MPN.52S	CM-MPN.52P	CM-MPN.62S	CM-MPN.62P	CM-MPN.72S	CM-MPN.72P	
50/60 Hz	■	■	■	■	■	■	■	■					■	■	■	■	■	■	■
50/60/400 Hz									■	■	■	■							

Suitable for monitoring	CM-MPS.11S	CM-MPS.11P	CM-MPS.21S	CM-MPS.21P	CM-MPS.31S	CM-MPS.31P	CM-MPS.41S	CM-MPS.41P	CM-MPS.23S	CM-MPS.23P	CM-MPS.43S	CM-MPS.43P	CM-MPN.52S	CM-MPN.52P	CM-MPN.62S	CM-MPN.62P	CM-MPN.72S	CM-MPN.72P	
Single-phase mains	■	■	■	■	■	■			■	■									
Three-phase mains	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Monitoring function	CM-MPS.11S	CM-MPS.11P	CM-MPS.21S	CM-MPS.21P	CM-MPS.31S	CM-MPS.31P	CM-MPS.41S	CM-MPS.41P	CM-MPS.23S	CM-MPS.23P	CM-MPS.43S	CM-MPS.43P	CM-MPN.52S	CM-MPN.52P	CM-MPN.62S	CM-MPN.62P	CM-MPN.72S	CM-MPN.72P	
Phase failure	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Phase sequence	sel	sel	sel	sel	sel	sel	sel	sel	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj
Automatic phase sequence correction									adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj
Overtoltage	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Undervoltage	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Unbalance	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Neutral <sup>1)</sup>	■ <sup>2)</sup>	■ <sup>2)</sup>	■ <sup>2)</sup>	■ <sup>2)</sup>					■ <sup>2)</sup>	■ <sup>2)</sup>									

Thresholds	CM-MPS.11S	CM-MPS.11P	CM-MPS.21S	CM-MPS.21P	CM-MPS.31S	CM-MPS.31P	CM-MPS.41S	CM-MPS.41P	CM-MPS.23S	CM-MPS.23P	CM-MPS.43S	CM-MPS.43P	CM-MPN.52S	CM-MPN.52P	CM-MPN.62S	CM-MPN.62P	CM-MPN.72S	CM-MPN.72P	
adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj

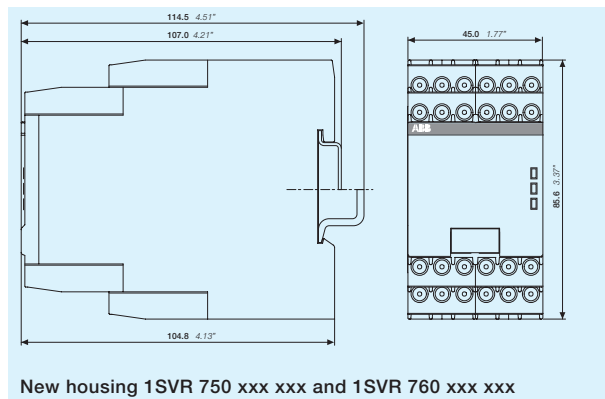
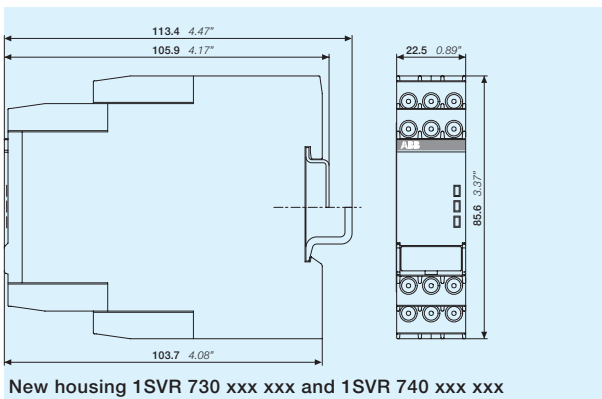
Timing functions for tripping delay	CM-MPS.11S	CM-MPS.11P	CM-MPS.21S	CM-MPS.21P	CM-MPS.31S	CM-MPS.31P	CM-MPS.41S	CM-MPS.41P	CM-MPS.23S	CM-MPS.23P	CM-MPS.43S	CM-MPS.43P	CM-MPN.52S	CM-MPN.52P	CM-MPN.62S	CM-MPN.62P	CM-MPN.72S	CM-MPN.72P	
On and OFF delay	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj

Connection type	CM-MPS.11S	CM-MPS.11P	CM-MPS.21S	CM-MPS.21P	CM-MPS.31S	CM-MPS.31P	CM-MPS.41S	CM-MPS.41P	CM-MPS.23S	CM-MPS.23P	CM-MPS.43S	CM-MPS.43P	CM-MPN.52S	CM-MPN.52P	CM-MPN.62S	CM-MPN.62P	CM-MPN.72S	CM-MPN.72P	
Push-in terminals		■		■		■		■		■		■		■		■		■	
Double-chamber cage connection terminals	■		■		■		■		■		■		■		■		■		■

<sup>1)</sup> The external conductor voltage towards the neutral conductor is measured.  
<sup>2)</sup> Interrupted neutral monitoring

adj: adjustable  
 sel: selectable



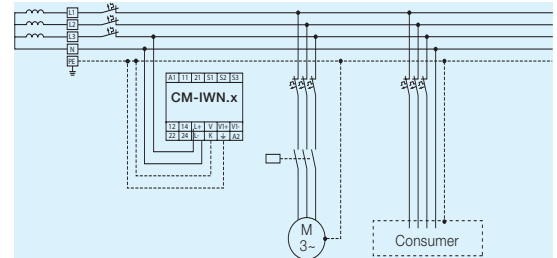
# Measuring and Monitoring Relays

## Insulation Monitoring Relays & Grid feeding monitoring relays

Type	Order number	CM-IWS.2S	CM-IWS.2P	CM-IWS.1S	CM-IWS.1P	CM-IWN.1S	CM-IWN.1P	CM-IWN.4S	CM-IWN.4P	CM-IWN.5S	CM-IWN.5P	CM-IWN.6S	CM-IWN.6P
CM-IWS.2S	1SVR730670R0200												
CM-IWS.2P	1SVR740670R0200												
CM-IWS.1S	1SVR730660R0100												
CM-IWS.1P	1SVR740660R0100												
CM-IWN.1S	1SVR750660R0200												
CM-IWN.1P	1SVR760660R0200												
CM-IWN.4S	1SVR750660R0300												
CM-IWN.4P	1SVR760660R0300												
CM-IWN.5S	1SVR750660R0400												
CM-IWN.5P	1SVR760660R0400												
CM-IWN.6S	1SVR750660R0500												
CM-IWN.6P	1SVR760660R0500												
<b>Rated control supply voltage <math>U_s</math></b>													
24 - 240 VAC/DC													
<b>Measuring voltages</b>													
250 V AC (L-PE)													
400 V AC (L-PE)													
690 V AC (L-PE)													
300 V DC (L-PE)													
600 V DC (L-PE)													
1000 V DC (L-PE)													
<b>Measuring range</b>													
1 - 100 k $\Omega$													
2 - 200 k $\Omega$													
<b>System leakage capacitance, max.</b>													
10 $\mu$ F													
20 $\mu$ F													
500 $\mu$ F													
1000 $\mu$ F													
2000 $\mu$ F													
<b>Output</b>													
1 c/o													
1 x 2 c/o or 2 x 1 c/o													
<b>Operating principle</b>													
Open-circuit principle													
Open- or closed-circuit principle adjustable													
<b>Test</b>													
Front face button or control input													
<b>Reset</b>													
Front-face button or control input													
Fault storage / latching configurable													
Non volatile storage configurable													
Interrupted wire detection													
Threshold values configurable													

1) With coupling unit CM-IVN	screw version	CM-IVN.S: 1SVR750669R9400
	push-in version	CM-IVN.P: 1SVR760669R9400

Insulation monitors for unearthed supply systems (IT-Systems)



Type	Order number	CM-UFD.M21	CM-UFD.M22	CM-UFS.1
		1SVR510730R0300	1SVR560730F3400	1SVR630736R0300
<b>Rated control supply voltage <math>U_s</math></b>				
24-240 V AC/DC				
3 x 400 V AC (L-L) / 230 V AC (L-N)				
<b>Rated frequency</b>				
DC and 50/60 Hz respectively				
50 Hz				
DC or 50 Hz				
<b>Standards</b>				
VDE AR-N 4105				
DIN V VDE V 0126-1-1: Feb. 2006				
CEI 0-21				
<b>Suitable for monitoring</b>				
Single-phase mains				
Three-phase mains				
<b>Monitoring function</b>				
Over-/undervoltage				
Over-/underfrequency				
ROCOF (rate of change of frequency)				
10 minutes average value over-/undervoltage,				
10 minutes average value overvoltage				
Phase failure				
Vector shift				
<b>Thresholds</b>				
adj adj adj				