

Single-phase current and voltage monitoring relays CM range



2CDC 255 242 F0005

Applications of current and voltage monitoring relays in single-phase mains



For the monitoring of currents and voltages in single-phase AC/DC systems, ABB's CM range comprises a wide selection of powerful and compact devices, all featuring only 22.5 mm width. This range includes current and voltage monitoring relays for over- and undercurrent protection, over- and undervoltage protection and phase loss monitoring – from 3 mA to 15 A and from 3 V to 600 V. Incorporating ABB's long-term experience, the CM range provides your electric installation with the highest safety and reliability.



Approvals / Marks

- UL 508, CAN/GSA C22.2 No.14; (pending);
- GOST; CB scheme; CCC; RMRS /
- C-Tick



Sealable transparent covers

The products can be protected against unauthorized change of time and threshold values (available as an accessory).

2CDC 253 009 F0005



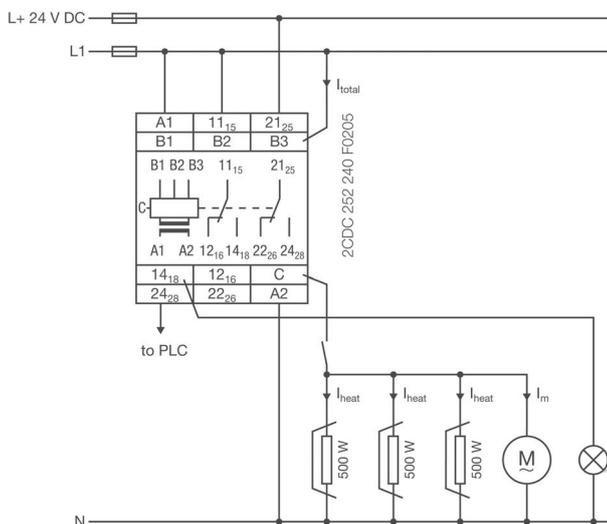
Characteristics of the ABB single-phase monitoring relays

- Multifunctional and single-functional devices
- Devices with 1 or 2 c/o (SPDT) contacts
- Measuring range up to 15 A / 600 V AC/DC
- Configurable monitoring of falling below or exceeding threshold values or window monitoring ¹⁾
- Open or closed-circuit principle selectable ¹⁾
- Adjustable ON or OFF-tripping delay T_v (0; 0.1-30 s) ¹⁾
- Adjustable start-up delay T_s (0; 0.1-30 s) ¹⁾
- Adjustable switching hysteresis 3-30 % ¹⁾
- Single or wide-range supply voltage
- LEDs for status indication
- Adjustment of threshold values, switching hysteresis and times via direct reading scales
- Setting and operation via front-face operating controls
- Configurable latching function ¹⁾
- RMS measuring principle (any wave form)

¹⁾ depending on device

2CDC 255 241 F0005

Example of application



The shown heating system with three infra-red heating elements and an additional ventilator has to be controlled for correct function. If any of the heaters or the ventilator fails, the drying process of a paint-spray line must be stopped immediately. For this task, the multifunctional current monitoring relay CM-SRS.M2 is used. It directly monitors the current consumption of 6.94 A. When this current falls below the adjusted threshold value of 6.7 A, the output relays de-energize (closed-circuit principle) and thus signal the malfunction.

Application parameters

- Current consumption of each heating element
 $I_{heat} = 2.17 \text{ A (500 W)}$
- Current consumption of the ventilator motor $I_m = 0.43 \text{ A}$
- Total current consumption $I_{total} = 3 \times I_{heat} + I_m = 3 \times 2.17 \text{ A} + 0.43 \text{ A} = 6.94 \text{ A}$

Settings

- Adjusted threshold value = 6.7 A
- Measuring function = undercurrent monitoring (UC)
- Adjusted start-up delay $T_s = 5 \text{ s}$
- Adjusted tripping delay $T_v = 0 \text{ s}$
- No latching function
- Closed-circuit principle

Monitoring the parameters of single-phase mains



Electric devices can be damaged when operated in mains with out-of-range voltages or currents. Thus, it is advisable to monitor the current and voltage values with the ABB single-phase monitoring relays of the CM range.

■ Current monitoring, single-phase

The ABB current monitoring relays CM-SRS.xx reliably monitor the occurrence of currents that exceed or falls below the selected threshold value. The functions overcurrent or undercurrent monitoring can be preselected. Single- and multifunction devices for the monitoring of direct or alternating currents from 3 mA to 15 A are available.

■ Current window monitoring (I_{\min} , I_{\max})

The window monitoring relay CM-SFS.2x is available if the application requires the simultaneous monitoring of over- and undercurrents.

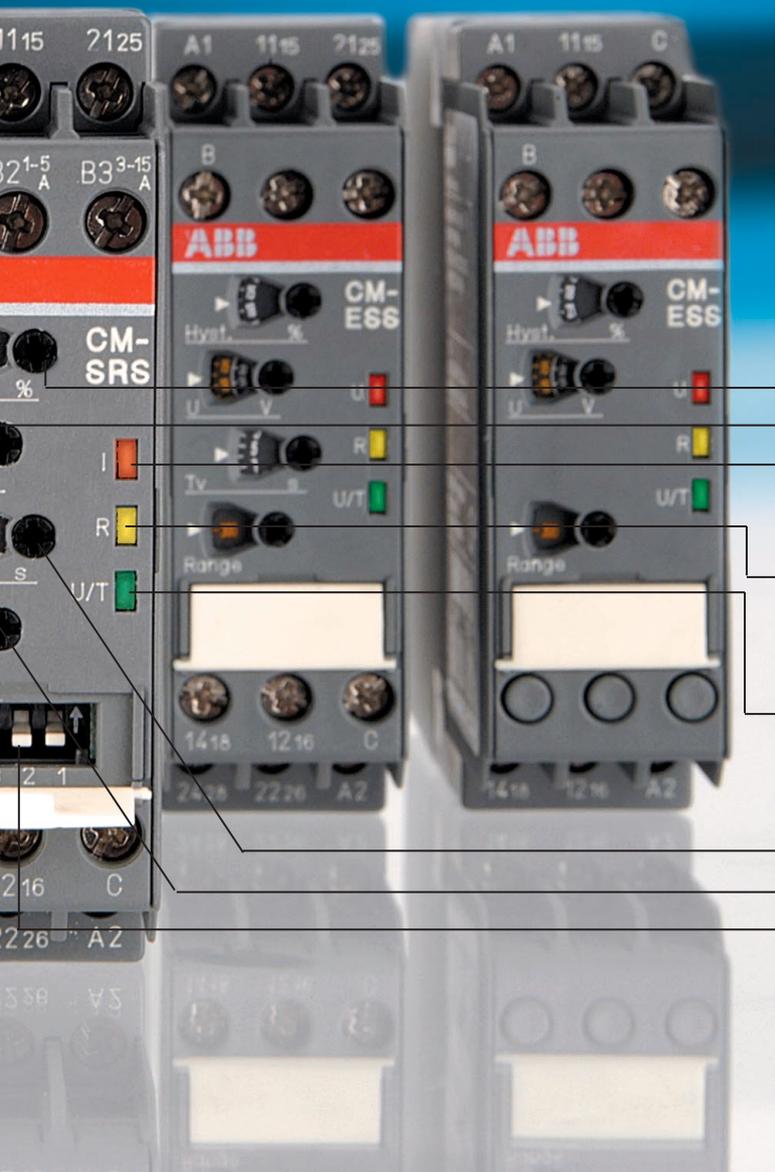
■ Voltage monitoring, single-phase

The ABB voltage monitoring relays CM-ESS.xx are used to monitor direct and alternating voltages within a range of 3-600 V. Over- or undervoltage detection can be preselected.

■ Voltage window monitoring (U_{\min} , U_{\max})

For the simultaneous detection of over- and undervoltages, the window monitoring relay CM-EFS.2 can be used.





Current monitoring relay CM-SRS.M2

Adjustment of the switching hysteresis

Adjustment of the threshold value I

I: red LED – Status indication of the measured current
 Switch position – overcurrent
 Switch position – undercurrent

R: yellow LED – Status indication of the output relays
 energized
 energized, de-energized

U/T: green LED – Status indication of supply voltage and timing
 Supply voltage applied
 Start-up delay T_s active
 Tripping delay T_v active

Adjustment of tripping delay T_v (0; 0.1-30 s)

Adjustment of start-up delay T_s (0; 0.1-30 s)

DIP switch for the selection of:

- (1) ON = undercurrent monitoring
 OFF = overcurrent monitoring
- (2) ON = closed-circuit principle
 OFF = open-circuit principle
- (3) ON = latching function on
 OFF = latching function off
- (4) No function

The multifunction current monitoring relay CM-SRS.M2 is used for monitoring of over- and undercurrents (OC or UC). The monitored current is fed to the terminals B1, B2 or B3 and C. When the current falls below (function undercurrent) or exceeds (function overcurrent) the adjusted threshold value, the output relays energize (open-circuit principle) or de-energize (closed-circuit principle).

Falls the monitored current again below (function OC) or exceeds (function UC) the threshold value minus (OC) / plus (UC) the hysteresis, the output relays energize or de-energize again. The hysteresis is adjustable from 3-30 %. As a protection against interference, the measuring, output and supply circuits are galvanically isolated.

Single-phase monitoring relays CM range and current transformers CM-CT



Current monitoring, single-phase

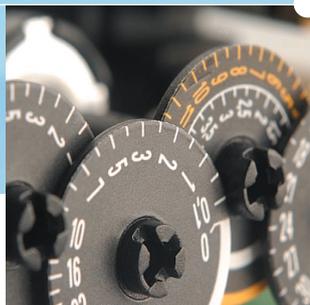
Type		CM-SRS.11	CM-SRS.12	CM-SRS.21	CM-SRS.22	CM-SRS.M1	CM-SRS.M2
Rated control supply voltage U_S / Order code	110 - 130 V AC	1SVR 430 841 R0200	1SVR 430 841 R0300	1SVR 430 841 R0400	1SVR 430 841 R0500	-	-
	220 - 240 V AC	1SVR 430 841 R1200	1SVR 430 841 R1300	1SVR 430 841 R1400	1SVR 430 841 R1500	-	-
	24 - 240 V AC/DC	1SVR 430 840 R0200	1SVR 430 840 R0300	1SVR 430 840 R0400	1SVR 430 840 R0500	1SVR 430 840 R0600	1SVR 430 840 R0700
Function		AC/DC current monitoring					
Principle of measurement		RMS					
Measuring ranges AC/DC		3-30 mA	0.3-1.5 A	3-30 mA	0.3-1.5 A	3-30 mA	0.3-1.5 A
		10-100 mA	1-5 A	10-100 mA	1-5 A	10-100 mA	1-5 A
		0.1-1 A	3-15 A ¹⁾	0.1-1 A	3-15 A ¹⁾	0.1-1 A	3-15 A ¹⁾
Settings	Threshold value	one threshold value, adjustable within the indicated measuring range					
	Hysteresis	adjustable, 3-30 % of threshold value					
	Monitoring function	over- or undercurrent monitoring selectable					
	Tripping delay T_V	none	adjustable 0; 0.1-30 s				
	Timing function T_V	none	ON-delay				
	Start-up delay T_S	none				adjustable 0; 0.1-30 s	
	Latching function	none				configurable, reset function via supply voltage	
Kind of output		1 c/o (SPDT)		2 c/o (SPDT)			
		open-circuit principle				open- or closed-circuit principle selectable	
Operating principle		open-circuit principle				open- or closed-circuit principle selectable	
Width of enclosure		22.5 mm					

¹⁾ with measuring currents > 10 A a spacing of 10 mm is necessary

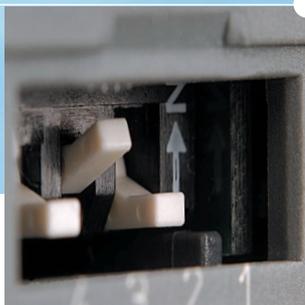
Current transformers as accessories for current monitoring relays



Type	Primary current	Power	Secondary current	Order code
CM-CT 50/1	50 A	1 VA	1 A (class 1)	1SVR 450 116 R1000
CM-CT 75/1	75 A	1.5 VA	1 A (class 1)	1SVR 450 116 R1100
CM-CT 100/1	100 A	2.5 VA	1 A (class 1)	1SVR 450 116 R1200
CM-CT 150/1	150 A	2.5 VA	1 A (class 1)	1SVR 450 116 R1300
CM-CT 200/1	200 A	2.5 VA	1 A (class 1)	1SVR 450 116 R1400
CM-CT 50/5	50 A	1 VA	5 A (class 1)	1SVR 450 116 R5000
CM-CT 75/5	75 A	1.5 VA	5 A (class 1)	1SVR 450 116 R5100
CM-CT 100/5	100 A	2.5 VA	5 A (class 1)	1SVR 450 116 R5200
CM-CT 150/5	150 A	2.5 VA	5 A (class 1)	1SVR 450 116 R5300
CM-CT 200/5	200 A	5 VA	5 A (class 1)	1SVR 450 116 R5400
CM-CT 300/1	300 A	5 VA	1 A (class 1)	1SVR 450 117 R1100
CM-CT 400/1	400 A	5 VA	1 A (class 1)	1SVR 450 117 R1200



2CDC 253 260 F0005



2CDC 253 259 F0005

Voltage monitoring, single-phase

CM-SFS.21	CM-SFS.22	CM-ESS.1	CM-ESS.2	CM-ESS.M	CM-EFS.2
-	-	1SVR 430 831 R0300	1SVR 430 831 R0400	-	-
-	-	1SVR 430 831 R1300	1SVR 430 831 R1400	-	-
1SVR 430 760 R0400	1SVR 430 760 R0500	1SVR 430 830 R0300	1SVR 430 830 R0400	1SVR 430 830 R0500	1SVR 430 750 R0400
AC/DC current monitoring		AC/DC voltage monitoring			
RMS		RMS			
3-30 mA	0.3-1.5 A	3-30 V, 6-60 V, 30-300 V, 60-600 V AC/DC, selection via rotary switch			
10-100 mA	1-5 A				
0.1-1 A	3-15 A ¹⁾				
two threshold values I_{min} and I_{max}		one threshold value, adjustable within the indicated measuring range		two threshold values U_{min} and U_{max}	
fixed, 5 % of threshold values		adjustable, 3-30 % of threshold value		fixed, 5 % of threshold values	
window monitoring I_{min} and I_{max}		over- or undervoltage monitoring selectable		window monitoring U_{min} and U_{max}	
adjustable 0; 0.1-30 s		none	adjustable 0; 0.1-30 s		
ON- or OFF-delay selectable		none	ON-delay		ON- or OFF-delay selectable
adjustable 0; 0.1-30 s		none			
configurable, reset function via supply voltage		none		configurable, reset function via supply voltage	
2 c/o (SPDT) or 2 x 1 c/o (SPDT) (1 c/o each for I_{min} and I_{max})		1 c/o (SPDT)	2 c/o (SPDT)		2 c/o (SPDT) or 2 x 1 c/o (SPDT) (1 c/o each for U_{min} and U_{max})
open- or closed-circuit principle selectable		open-circuit principle		open- or closed-circuit principle selectable	
22.5 mm		22.5 mm			

Type	Primary current	Power	Secondary current	Order code
CM-CT 500/1	500 A	5 VA	1 A (class 1)	1SVR 450 117 R1300
CM-CT 600/1	600 A	5 VA	1 A (class 1)	1SVR 450 117 R1400
CM-CT 300/5	300 A	5 VA	5 A (class 1)	1SVR 450 117 R5100
CM-CT 400/5	400 A	5 VA	5 A (class 1)	1SVR 450 117 R5200
CM-CT 500/5	500 A	5 VA	5 A (class 1)	1SVR 450 117 R5300
CM-CT 600/5	600 A	5 VA	5 A (class 1)	1SVR 450 117 R5400



2CDC 251 159 F0b06

Type	Description	Order code
CM-CT-A	Snap-on mounting for CM-CT on DIN rail	1SVR 450 118 R1000



As part of the on-going product improvement, ABB reserves the right to modify the characteristics or the products described in this document. The information given is not-contractual. For further details please contact the ABB company marketing these products in your country.

Druckschrift-Nr. 2CDC 110 038 B0204 (01/08)
Printed in the Federal Republic of Germany

ABB STOTZ-KONTAKT GmbH

<http://www.abb.com/lowvoltage>
→ Control Products → Electronic Relays and Controls
→ Single Phase Monitors

Contact: www.abb.com/contacts