

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.



Sealable transparent covers

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

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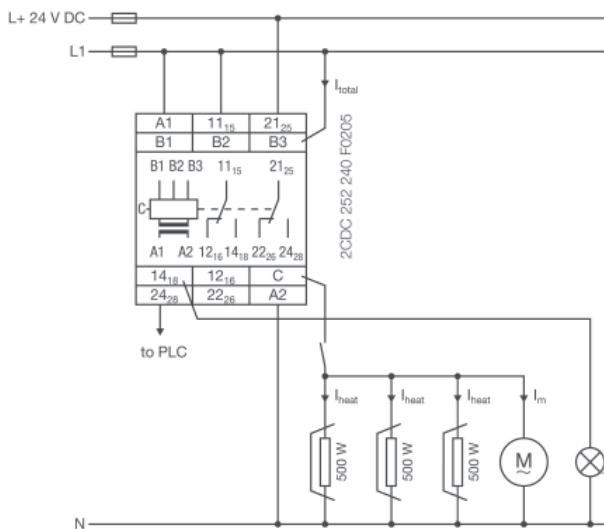


Characteristics of the ABB single-phase monitoring relays

- Multifunctional and single-functional devices
- Devices with 1 or 2 c/o contacts
- Measuring range up to 15 A / 600 V AC/DC
- Configurable monitoring of falling below or exceeding threshold values; or window monitoring*
- Open or closed-circuit principle selectable*
- Adjustable ON or OFF-tripping delay (0; 0.1 - 30 s)*
- Adjustable start-up delay (0; 0.1 - 30 s)*
- Adjustable switching hysteresis 3 - 30 %*
- 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*
- RMS measuring principle (any wave form)
- Approvals*: pending
- Marks:

*depending on device

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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 rated current 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), directly signalling the malfunction.

Application parameters

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

Settings

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

Monitoring the parameters of a single-phase network



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

■ Current monitoring, single-phase

The ABB current monitoring relays CM-SRS 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 is available if the application requires the simultaneous monitoring of over- and undercurrents.

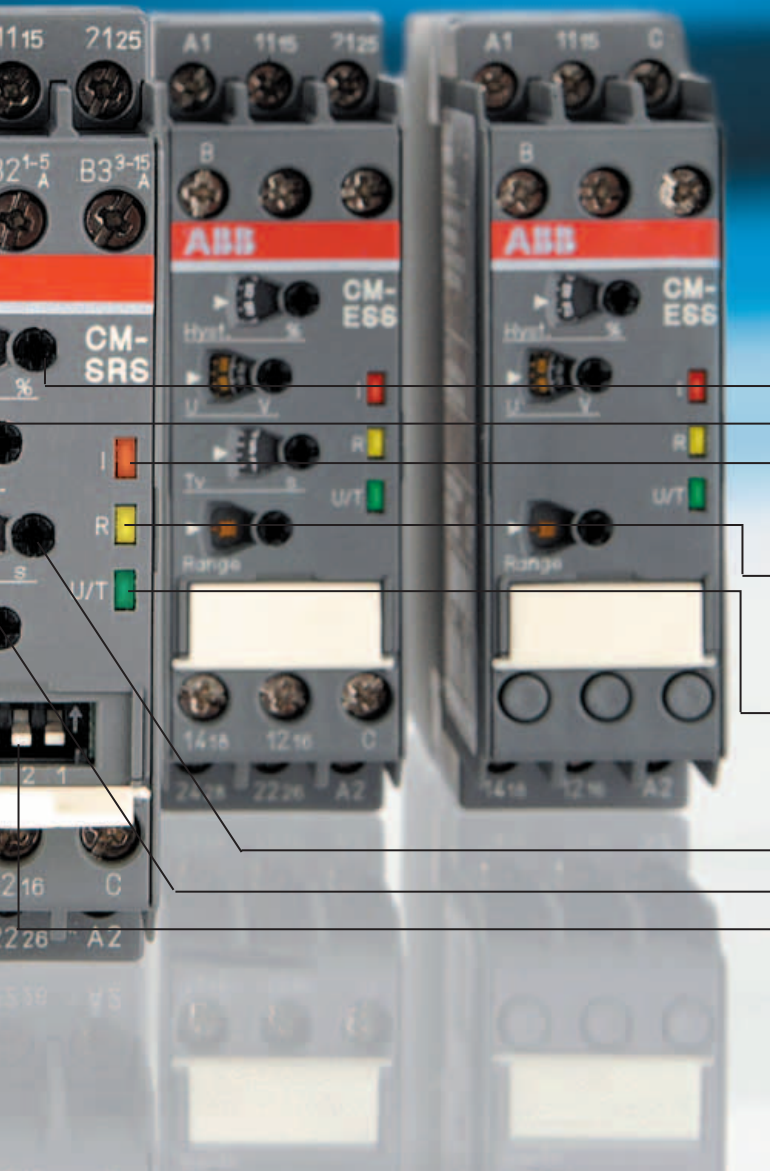
■ Voltage monitoring, single-phase

The ABB voltage monitoring relays CM-ESS 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 is to 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 relay

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

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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 relay energizes (open-circuit principle) or de-energizes (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 relay is energized or de-energized again. The hysteresis is adjustable from 3 - 30 %. As a protection against interferences, the measuring, output and input circuits are galvanically isolated.

Selection guides and order references for single-phase monitoring relays and current transformers CM-CT



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2CDC 253 258 F0005



2CDC 253 257 F0005

Current and voltage monitoring, single-phase

Type		CM-SRS.11	CM-SRS.12	CM-SRS.21	CM-SRS.22	CM-SRS.M1
Function		AC/DC current monitoring				
Principle of measurement					RMS	
Measuring ranges AC/DC		3 - 30 mA 10 - 100 mA 0.1 - 1 A	0.3 - 1.5 A 1 - 5 A 3 - 15 A ¹⁾	3 - 30 mA 10 - 100 mA 0.1 - 1 A	0.3 - 1.5 A 1 - 5 A 3 - 15 A ¹⁾	3 - 30 mA 10 - 100 mA 0.1 - 1 A
Functions	Threshold value	one threshold value adjustable via direct reading scales within measuring range				
	Hysteresis	adjustable, 3 - 30 % of threshold value				
	Over- / undervoltage monitoring	selectable, over- or undercurrent monitoring				
	Tripping delay T _v	none			adjustable	
	Timing function T _v	none			ON-delay	
	Start-up delay T _s	none				
Output contacts	Latching function	none				
	Number / Type	1 c/o			2 c/o	
	Operating principle	open-circuit principle				
Width						
Supply voltages and 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

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



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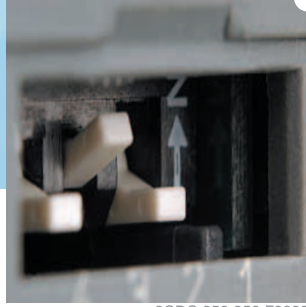
Current transformers as accessories for current monitoring relays

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
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

CM range



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CM-SRS.M2	CM-SFS.21	CM-SFS.22	CM-ESS.1	CM-ESS.2	CM-ESS.M	CM-EFS.2
AC/DC voltage monitoring						
RMS						
0.3 - 1.5 A 1 - 5 A 3 - 15 A ¹⁾	3 - 30 mA 10 - 100 mA 0.1 - 1 A	0.3 - 1.5 A 1 - 5 A 3 - 15 A ¹⁾	3 - 30 V, 6 - 60 V, 30 - 300 V, 60 - 600 V AC/DC, selection via rotary switch			
	two threshold values I_{min} and I_{max}		one threshold value adjustable via direct reading scales within measuring range			two threshold values U_{min} and U_{max}
	fixed, 5 % of threshold value		adjustable, 3 - 30 % of threshold value			fixed, 5 % of threshold value
	window monitoring I_{min} and I_{max}		selectable, over- or undervoltage monitoring			window monitoring U_{min} and U_{max}
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 or 2×1 c/o (1 c/o each for I_{min} and I_{max})		1 c/o	2 c/o		2 c/o or 2×1 c/o (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					
-	-	-	1SVR 430 831 R0300	1SVR 430 831 R0400	-	-
-	-	-	1SVR 430 831 R1300	1SVR 430 831 R1400	-	-
1SVR 430 840 R0700	1SVR 430 760 R0400	1SVR 430 760 R0500	1SVR 430 830 R0300	1SVR 430 830 R0400	1SVR 430 830 R0500	1SVR 430 750 R0400



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