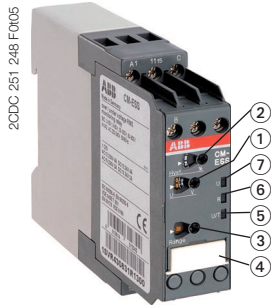


Measuring and monitoring relays CM-ESS.1

Voltage monitoring relays, single-phase AC/DC

Data sheet



CM-ESS.1

- ① Threshold value adjustment
- ② Hysteresis adjustment
- ③ Adjustment of the measuring range
- ④ DIP switches (see DIP switch functions)
- ⑤ U/T: green LED - control supply voltage, timing
- ⑥ R: yellow LED - relay status
- ⑦ U: red LED - over- / undervoltage

Characteristics

- Monitoring of DC and AC voltages from 3-600 V
- RMS measuring principle
- One device includes 4 measuring ranges: 3-30 V, 6-60 V, 30-300 V, 60-600 V
- Over- or undervoltage monitoring configurable
- Hysteresis adjustable from 3-30 %
- 3 supply voltage versions
- 1 c/o contact
- 22.5 mm width
- 3 LEDs for status indication

Approvals

- UL 508, CAN/CSA C22.2 No. 14
- GL (pending)
- GOST
- CB Scheme
- CCC
- RMRS

Marks

- CE
- C-Tick

Order data

Type	Control supply voltage	Order code
Measuring ranges: 3-30 V; 6-60 V; 30-300 V; 60-600 V		
CM-ESS.1	24-240 V AC/DC	1SVR 430 830 R0300
	110-130 V AC	1SVR 430 831 R0300
	220-240 V AC	1SVR 430 831 R1300

Order data (Accessories)

Type	Description	Order code
ADP.01	Adapter for screw mounting	1SVR 430 029 R0100
MAR.01	Marker label	1SVR 366 017 R0100
COV.01	Sealable transparent cover	1SVR 430 005 R0100

Application

Depending on the configuration, the voltage monitoring relays **CM-ESS.1** can be used for over- or undervoltage monitoring in single-phase AC and/or DC systems. The devices work according to the open-circuit principle.

Operating mode

The voltage monitoring relay **CM-ESS.1** has 1 c/o contact. One device includes 4 measuring ranges: 3-30 V, 6-60 V, 30-300 V, and 60-600 V.

The unit is adjusted with potentiometers and switches on the top of the unit. The selection of over- or undervoltage monitoring is made with a DIP switch. A potentiometer, with direct reading scale, allows the adjustment of the threshold value U and of the hysteresis %. The hysteresis % is adjustable within a range of 3 to 30 % of the threshold value.

Measuring and monitoring relays CM-ESS.1

Voltage monitoring relays, single-phase AC/DC

Data sheet

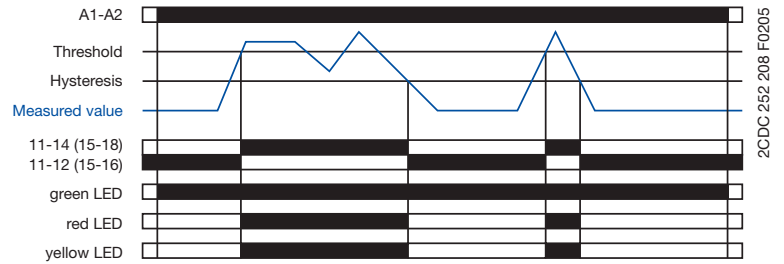
Function diagrams

Overvoltage monitoring

The voltage to be monitored (measured value) is applied to terminals **B-C**. The supply voltage applied to terminals **A1-A2** is displayed by the glowing green LED.


If the measured value exceeds the adjusted threshold value, the output relay energizes and the red LED (overvoltage) and the yellow LED (relay energized) glow.

If the measured value drops below the threshold value minus the adjusted hysteresis, the output relay de-energizes and the red and yellow LEDs turn off.

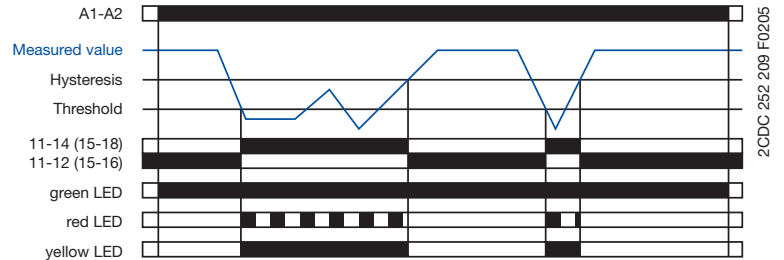


Undervoltage monitoring

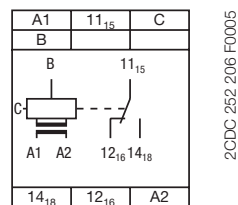
The voltage to be monitored (measured value) is applied to terminals **B-C**. The supply voltage applied to terminals **A1-A2** is displayed by the glowing green LED.

If the measured value drops below the adjusted threshold value, the output relay energizes, the red LED flashes  (undervoltage) and the yellow LED (relay energized) glows.

If the measured value exceeds the threshold value plus the adjusted hysteresis, the output relay de-energizes and the red and yellow LEDs turn off.



Connection diagram







A1-A2 Control supply voltage

B-C Measuring range: 3-30 V; 6-60 V; 30-300 V; 60-600 V

11₁₅-12₁₆/14₁₈ Output contact - open-circuit principle

DIP switch functions

Position	2	1
ON ↑		
OFF		

2CDC 252 275 F0005

1 ON Undervoltage monitoring

OFF Overvoltage monitoring





OFF = Default

Measuring and monitoring relays CM-ESS.1

Voltage monitoring relays, single-phase AC/DC

Data sheet

Technical data

Type		CM-ESS.1																										
Input circuit - Supply circuit		A1-A2																										
Rated control supply voltage U_s		110-130 V AC																										
		220-240 V AC																										
		24-240 V AC/DC																										
Rated control supply voltage tolerance		-15...+10 %																										
Rated frequency	AC versions	50/60 Hz																										
	AC/DC versions	50/60 Hz or DC																										
Current / power consumption		24 V DC	115 V AC	230 V AC																								
	110-130 V AC	-	24 mA / 2.6 VA	-																								
	220-240 V AC	-	-	12 mA / 2.6 VA																								
	24-240 V AC/DC	30 mA / 0.75 W	17 mA / 1.9 VA	11 mA / 2.6 VA																								
On-period		100 %																										
Power failure buffering		20 ms																										
Transient overvoltage protection		Varistors																										
Input circuit - Measuring circuit		B-C																										
Monitoring function		over- or undervoltage monitoring configurable																										
Measuring method		RMS measuring principle																										
Measuring inputs	Terminal connection	<table border="1"> <thead> <tr> <th colspan="4">CM-ESS.1</th> </tr> <tr> <th>B-C</th> <th>B-C</th> <th>B-C</th> <th>B-C</th> </tr> </thead> <tbody> <tr> <td>3-30 V</td> <td>6-60 V</td> <td>30-300 V</td> <td>60-600 V</td> </tr> <tr> <td>600 kΩ</td> <td>600 kΩ</td> <td>600 kΩ</td> <td>600 kΩ</td> </tr> <tr> <td>800 V</td> <td>800 V</td> <td>800 V</td> <td>800 V</td> </tr> <tr> <td>660 V</td> <td>660 V</td> <td>660 V</td> <td>660 V</td> </tr> </tbody> </table>			CM-ESS.1				B-C	B-C	B-C	B-C	3-30 V	6-60 V	30-300 V	60-600 V	600 k Ω	600 k Ω	600 k Ω	600 k Ω	800 V	800 V	800 V	800 V	660 V	660 V	660 V	660 V
	CM-ESS.1																											
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	800 V	800 V	800 V	800 V																								
660 V	660 V	660 V	660 V																									
Measuring range																												
Input resistance																												
Pulse overload capacity $t < 1$ s																												
Continuous capacity																												
Threshold value		adjustable within the indicated measuring range																										
Tolerance of the adjusted threshold value		10 % of the range end value																										
Hysteresis related to the threshold value		3-30 % adjustable																										
Maximum voltage within measuring circuit		factor 1.5 of full-scale																										
Measuring signal frequency range		DC / 15 Hz - 2 kHz																										
Rated measuring signal frequency range		DC / 50-60 Hz																										
Maximum response time		AC: 80 ms, DC: 120 ms																										
Measuring error within the control supply voltage tolerance		≤ 0.5 %																										
Measuring error within the temperature range		≤ 0.06 % / $^{\circ}\text{C}$																										
Transient overvoltage protection		Varistors																										
Timing circuit																												
Delay time T_v		none																										
Repeat accuracy (constant parameters)		± 0.07 % of full scale																										
Tolerance of the adjusted delay time																												
Timing error within control supply voltage tolerance		-																										
Timing error within temperature range		-																										
Indication of operational states																												
Control supply voltage	U/T: green LED	 : control supply voltage applied																										
Measured value	U: red LED	 : overvoltage																										
		 : undervoltage																										
Relay status	R: yellow LED	 : relay energized																										
Output circuits		11-12/14																										
Kind of output		relay, 1 c/o contact																										
Operating principle ¹⁾		open-circuit principle																										
Contact material		AgNi																										
Rated voltage (VDE 0110, IEC 947-1)		250 V																										
Minimum switching voltage / minimum switching current		24 V / 10 mA																										
Maximum switching voltage / maximum switching current		250 V AC / 4 A AC																										

Measuring and monitoring relays CM-ESS.1

Voltage monitoring relays, single-phase AC/DC

Data sheet

Type			CM-ESS.1	
Rated operational current (IEC 60947-5-1)	AC12 (resistive)	at 230 V	4 A	
	AC15 (inductive)	at 230 V	3 A	
	DC12 (resistive)	at 24 V	4 A	
	DC13 (inductive)	at 24 V	2 A	
Mechanical lifetime			30x10 ⁶ switching cycles	
Electrical lifetime (AC12, 230 V, 4 A)			0.1x10 ⁶ switching cycles	
Short-circuit capacity / maximum fuse rating		n/c contact	6 A fast-acting	
		n/o contact	10 A fast-acting	
General data				
MTBF				
Dimensions (W x H x D)			22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 in)	
Mounting			DIN rail (EN 50022)	
Mounting position			any	
Material of enclosure			PA 6	
Degree of protection		enclosure / terminals	IP50 / IP20	
Electrical connection				
Wire size	fine-strand with wire end ferrule		2x0.75 mm ² / 2x2.5 mm ² (2x18 AWG / 2x14 AWG)	
	fine-strand without wire end ferrule		2x0.75 mm ² / 2x2.5 mm ² (2x18 AWG / 2x14 AWG)	
	rigid		2x0.5 mm ² / 2x4 mm ² (2x20 AWG / 2x12 AWG)	
Stripping length			8 mm (0.31 in)	
Tightening torque			0.8 Nm	
Environmental data				
Ambient temperature range		operation	-20...+60 °C	
		storage	-40...+85 °C	
Damp heat (IEC 60068-2-30)			55 °C, 6 cycle	
Vibration (sinusoidal) (IEC/EN 60255-21-1)			Class 2	
Shock (IEC/EN 60255-21-2)			Class 2	
Isolation data				
Insulation voltage (VDE 0110, IEC 947-1, IEC/EN 60255-5)	supply circuit / measuring circuit		600 V	
	supply circuit / output circuit		250 V	
	measuring circuit / output circuit		600 V	
	output circuit 1 / output circuit 2		250 V	
Pollution degree (VDE 0110, IEC 664, IEC/EN 60255-5)			2	
Overvoltage category (VDE 0110, IEC 664, IEC/EN 60255-5)			III	
Test voltage between all isolated circuits (type test)	Rated insulation voltage 250 V		2.0 kV, 50 Hz	
	Rated insulation voltage 600 V		2.5 kV, 50 Hz	
Standards				
Product standard			IEC 255-6, EN 60255-6	
Low Voltage Directive			2006/95/EC	
EMC Directive			2004/108/EC	
Electromagnetic compatibility				
Interference immunity			IEC/EN 61000-6-2	
			electrostatic discharge (ESD)	IEC/EN 61000-4-2 - Level 3
			electromagnetic field	IEC/EN 61000-4-3 - Level 3
			fast transients (Burst)	IEC/EN 61000-4-4 - Level 3
			powerful impulses (Surge)	IEC/EN 61000-4-9 - Level 3
			HF line emission	IEC/EN 61000-4-6 - Level 3
Interference emission			IEC/EN 61000-6-3	
			electromagnetic field	IEC/CISPR 22; EN 55022 - Class B
			HF line emission	IEC/CISPR 22; EN 55022 - Class B

¹⁾ Open-circuit principle: output relay energizes if the measured value exceeds $\overline{\square}$ / falls below $\underline{\square}$ the adjusted threshold value

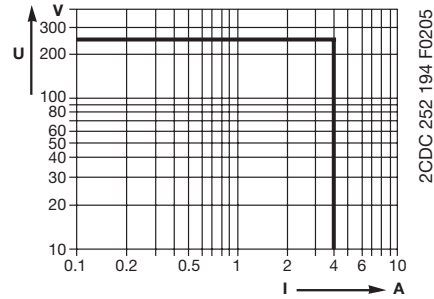
Measuring and monitoring relays CM-ESS.1

Voltage monitoring relays, single-phase AC/DC

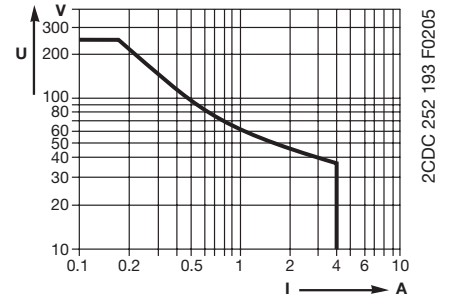
Data sheet

Technical diagrams

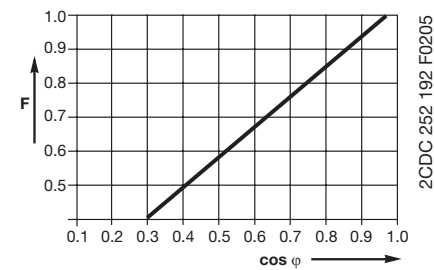
Load limit curves



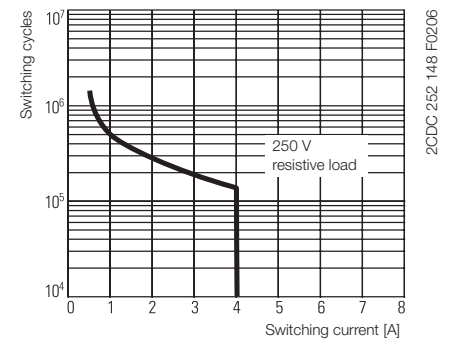
AC load (resistive)



DC load (resistive)

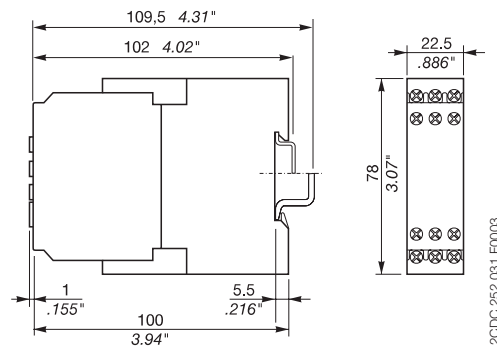


Derating factor F for inductive AC load



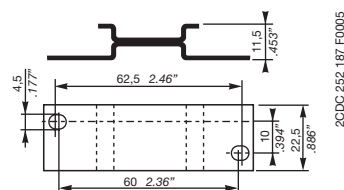
Contact lifetime

Dimensional drawing

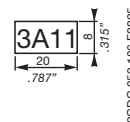


Dimensions in mm

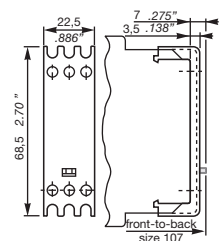
Dimensional drawings (Accessories)



ADP.01 - Adapter for screw mounting



MAR.01 - Marker label



COV.01 - Sealable transparent cover



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