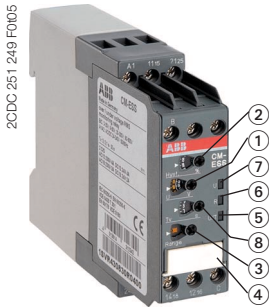


Measuring and monitoring relays CM-ESS.2

Voltage monitoring relays, single-phase AC/DC

Data sheet



CM-ESS.2

- 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
- ⑧ Adjustment of the tripping delay T_V

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 %
- Tripping delay T_V adjustable 0; 0.1-30 s
- 3 supply voltage versions
- 2 c/o contacts
- 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
------	------------------------	------------

Messbereiche: 3-30 V; 6-60 V; 30-300 V; 60-600 V

CM-ESS.2	24-240 V AC/DC	1SVR 430 830 R0400
	110-130 V AC	1SVR 430 831 R0400
	220-240 V AC	1SVR 430 831 R1400

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.2** 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.2** has 2 c/o contacts. 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. There are also adjustments for the hysteresis % and the tripping delay T_V . The hysteresis % is adjustable within a range of 3 to 30 % of the threshold value, and the tripping delay T_V over a range of instantaneous to a 30 s delay.

Measuring and monitoring relays CM-ESS.2


Voltage monitoring relays, single-phase AC/DC

Data sheet

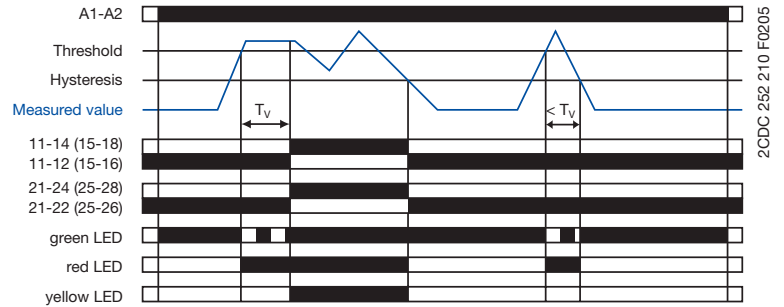
Function diagrams

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 tripping delay T_V starts and the red LED (overvoltage) glows. Timing of T_V is displayed by the flashing  green LED. When T_V is complete and the measured value still exceeds the threshold value minus the adjusted hysteresis, the output relays energize and the yellow LED (relay energized) glows.

If the measured value decreases below the threshold value minus the adjusted hysteresis, the output relays de-energize and the red and yellow LEDs turn off.

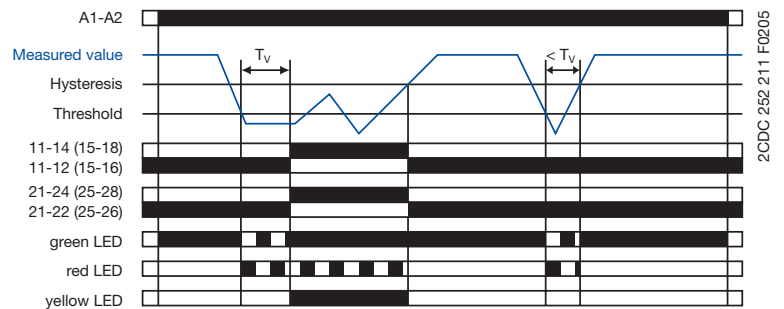


Undervoltage monitoring

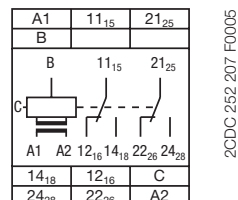
The voltage to be monitored (measured value) is applied to terminals **B-C**. The supply voltage applied to terminals A1-A2 is displayed by the glowing green LED.

If the measured value decreases below the adjusted threshold value, the tripping delay T_V starts and the red LED (undervoltage) flashes . Timing of T_V is displayed by the flashing  green LED. When T_V is complete and the measured value is still below the threshold value plus the adjusted hysteresis, the output relays energize and the yellow LED (relay energized) glows.

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

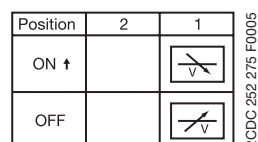


Connection diagram



- 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 contacts - open-circuit principle
- 21₂₅-22₂₆/24₂₈

DIP switch functions








- 1 ON Undervoltage monitoring
- OFF Overvoltage monitoring
- OFF = Default

Measuring and monitoring relays CM-ESS.2

Voltage monitoring relays, single-phase AC/DC

Data sheet

Technical data

Type		CM-ESS.2																											
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		<table border="1"> <thead> <tr> <th colspan="4">CM-ESS.2</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.2				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.2																												
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	800 V	800 V	800 V	800 V																									
660 V	660 V	660 V	660 V																										
	Terminal connection																												
	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		0 or 0.1-30 s adjustable																											
Repeat accuracy (constant parameters)		± 0.07 % of full scale																											
Tolerance of the adjusted delay time																													
Timing error within control supply voltage tolerance		≤ 0.5 %																											
Timing error within temperature range		≤ 0.06 % / $^{\circ}\text{C}$																											
Indication of operational states																													
Control supply voltage	U/T: green LED	 : control supply voltage applied  : tripping delay T_v active																											
Measured value	U: red LED	 : overvoltage  : undervoltage																											
Relay status	R: yellow LED	 : relay energized																											
Output circuits		11-12/14, 21-22/24																											
Kind of output		relays, 2 c/o contacts																											
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.2

Voltage monitoring relays, single-phase AC/DC

Data sheet

Type			CM-ESS.2
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	10 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.

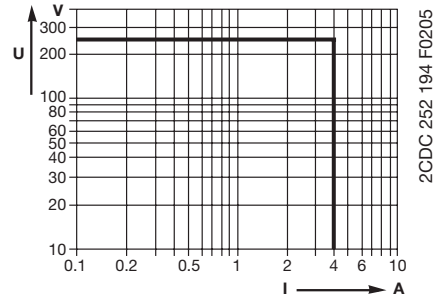
Measuring and monitoring relays CM-ESS.2

Voltage monitoring relays, single-phase AC/DC

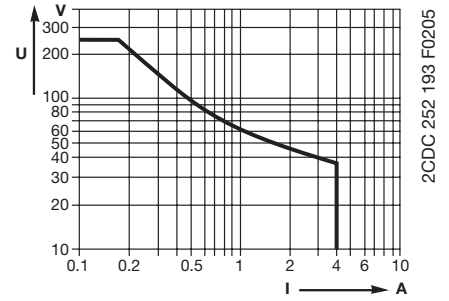
Data sheet

Technical diagrams

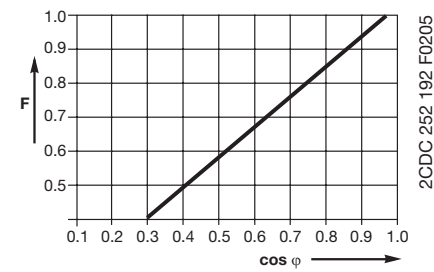
Load limit curves



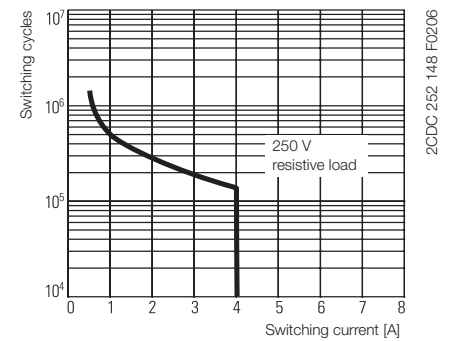
AC load (resistive)



DC load (resistive)



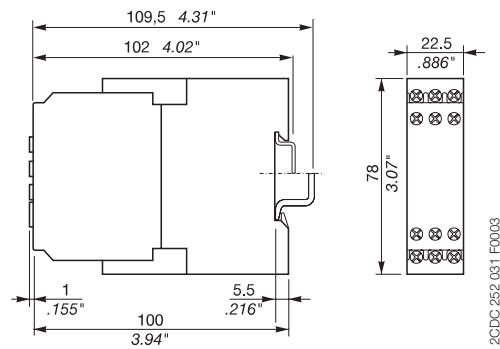
Derating factor F for inductive AC load



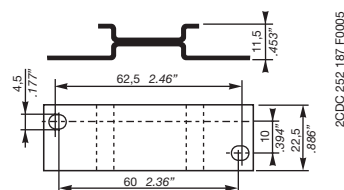
Contact lifetime

Dimensional drawing

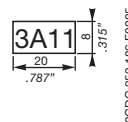
Dimensions in mm



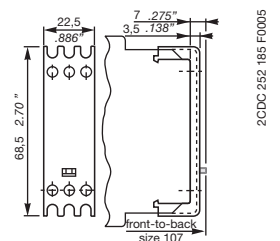
Dimensional drawings (Accessories)



ADP.01 - Adapter for screw mounting



MAR.01 - Marker label



COV.01 - Sealable transparent cover



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