Voltage monitoring relays CM-EFS.2
For single-phase AC/DC voltages

The CM-EFS.2 is an electronic voltage monitoring relay that provides reliable monitoring of voltages as well as detection of phase loss.

All devices are available with two different terminal versions. You can choose between the proven screw connection technology (double-chamber cage connecting terminals) and the completely tool-free Easy Connect Technology (push-in terminals).

Characteristics

– Monitoring of DC and AC voltages (3-600 V)
– TRMS measuring principle
– One device includes 4 measuring ranges
– Over- and undervoltage monitoring
– ON- or OFF-delay configurable
– Latching function configurable
– Threshold values for >U and <U adjustable
– Fixed hysteresis (5 %)
– Precise adjustment by front-face operating controls
– Screw connection technology or Easy Connect Technology available
– Housing material for highest fire protection classification UL 94 V-0
– Tool-free mounting on DIN rail as well as demounting
– Tripping delay T_V adjustable (0 s; 0.1-30 s)
– 1x2 c/o (SPDT) contacts (common signal) or 2x1 c/o (SPDT) contact (separate signals for >U and <U) configurable
– 22.5 mm (0.89 in) width
– 3 LEDs for status indication

Approvals

c(UL)us LISTED	UL 508, CAN/CSA C22.2 No.14
GL	GL
EAC	EAC
CCC	CCC
RMRS	RMRS

Marks

CE	CE
RCM	RCM

Order data

Voltage monitoring relays

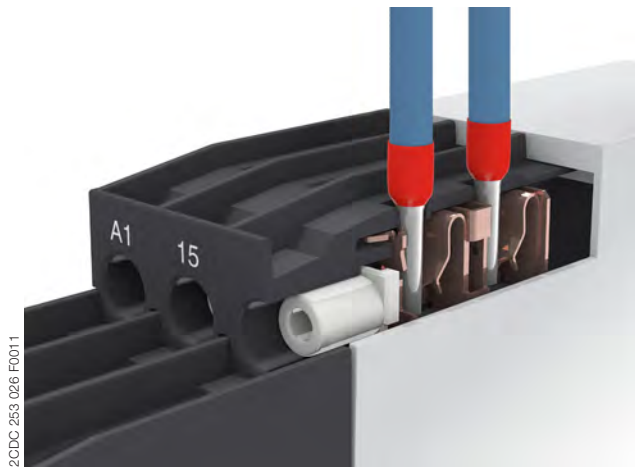| Type	Rated control supply voltage	Connection technology	Measuring ranges	Order code
CM-EFS.2P	24-240 V AC/DC	Push-in terminals	3-30 V, 6-60 V, 30-300 V, 60-600 V	1SVR740750R0400
CM-EFS.2S	24-240 V AC/DC	Screw type terminals	3-30 V, 6-60 V, 30-300 V, 60-600 V	1SVR730750R0400

Accessories

Type	Description	Order code
ADP.01	Adapter for screw mounting	1SVR430029R0100
MAR.12	Marker label for devices with DIP switches	1SVR730006R0000
COV.11	Sealable transparent cover	1SVR730005R0100

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ABB

Connection technology

Maintenance free Easy Connect Technology with push-in terminals

Type designation CM-xxS.yyP

Approved screw connection technology with double-chamber cage connecting terminals

Type designation CM-xxS.yyS
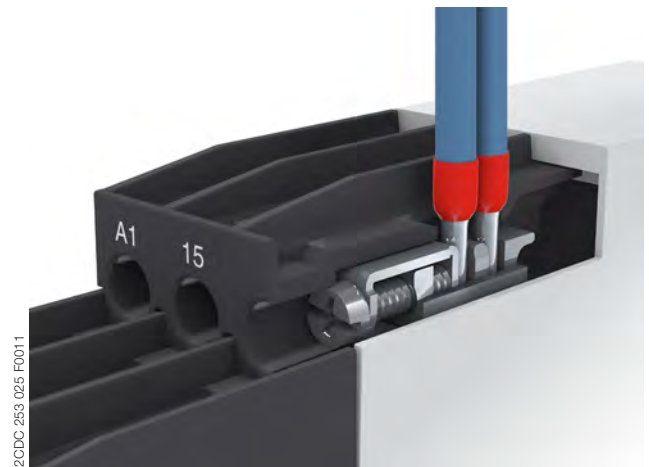

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2CDC 253 025 F0011

Push-in terminals

– Tool-free connection of rigid and flexible wires with wire end ferrule
– Easy connection of flexible wires without wire end ferrule by opening the terminals
– No retightening necessary
– One operation lever for opening both connecting terminals
– For triggering the lever and disconnecting of wires you can use the same tool (Screwdriver according to DIN ISO 2380-1 Form A 0.8 x 4 mm (0.0315 x 0.157 in), DIN ISO 8764-1 PZ1 ø 4.5 mm (0.177 in))
– Constant spring force on terminal point independent of the applied wire type, wire size or ambient conditions (e. g. vibrations or temperature changes)
– Opening for testing the electrical contacting
– Gas-tight

Double-chamber cage connecting terminals

– Terminal spaces for different wire sizes
– One screw for opening and closing of both cages
– Pozidrive screws for pan- or crosshead screwdrivers according to DIN ISO 2380-1 Form A 0.8 x 4 mm (0.0315 x 0.157 in), DIN ISO 8764-1 PZ1 ø 4.5 mm (0.177 in)

Both the Easy Connect Technology with push-in terminals and screw connection technology with double-chamber cage connecting terminals have the same connection geometry as well as terminal position.

## Functions

Operating controls

1 Adjustment of the threshold value >U for overvoltage

2 Adjustment of the threshold value <U for undervoltage

3 Indication of operational states

   U/T: green LED – control supply voltage/timing

   R: yellow LED – relay status

   U: red LED – over- / undervoltage

4 Adjustment of the measuring range

5 Adjustment of the tripping delay T_V

6 DIP switches (see DIP switch functions)

Application

The voltage monitoring relays CM-EFS.2 are designed for use in single-phase AC and/or DC systems for the simultaneous monitoring of over- and undervoltages as well as detection of phase loss. Depending on the configuration, one c/o (SPDT) contact each or both c/o (SPDT) contacts in parallel can be used for the over- and undervoltage monitoring. The devices operate over an universal range of supply voltages, provide an adjustable tripping delay and work according to the open- or closed-circuit principle.

Operating mode

The CM-EFS.2 have 2 c/o (SPDT) contacts and include 4 measuring ranges: 3-30 V, 6-60 V, 30-300 V and 60-600 V.

The units are adjusted with front-face operating controls. The selection of: ON-delay ⊠ or OFF-delay ▬, open- ▭ or closed-circuit principle ▭, latching function ON ▭ or OFF ⊠ and 2x1 c/o ▭ or 1x2 c/o (SPDT) contacts ▭ is made with DIP switches. Potentiometers, with direct reading scale, allow the adjustment of the threshold value$_{max}$ (>U) for overvoltage, the threshold value$_{min}$ (<U) for undervoltage and the tripping delay T_V. The tripping delay T_V is adjustable over a range of instantaneous to a 30 s delay. The hysteresis is fixed at 5 %. Timing is displayed by a flashing green LED labelled U/T.

Function diagrams

Voltage window monitoring 1x2 c/o (SPDT) contacts ⬚1x2 c/o ON-delayed ✖ without latching ✖

Open-circuit principle ⬚open

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

If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the tripping delay T_V starts and the red LED glows (overvoltage), or flashes ⎍⎍ (undervoltage) respectively.

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$_{max}$ minus the fixed hysteresis (5 %) or is still below the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relays energize and the yellow LED (relay energized) glows.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relays de-energize and the red and yellow LEDs turn off.

If control supply voltage is interrupted, the green LED turns off.

Closed-circuit principle ⬚closed

The voltage to be monitored (measured value) is applied to terminals B-C. When control supply voltage is applied to terminals A1-A2, the output relays energize and the green and yellow LED (relays energized) glow.
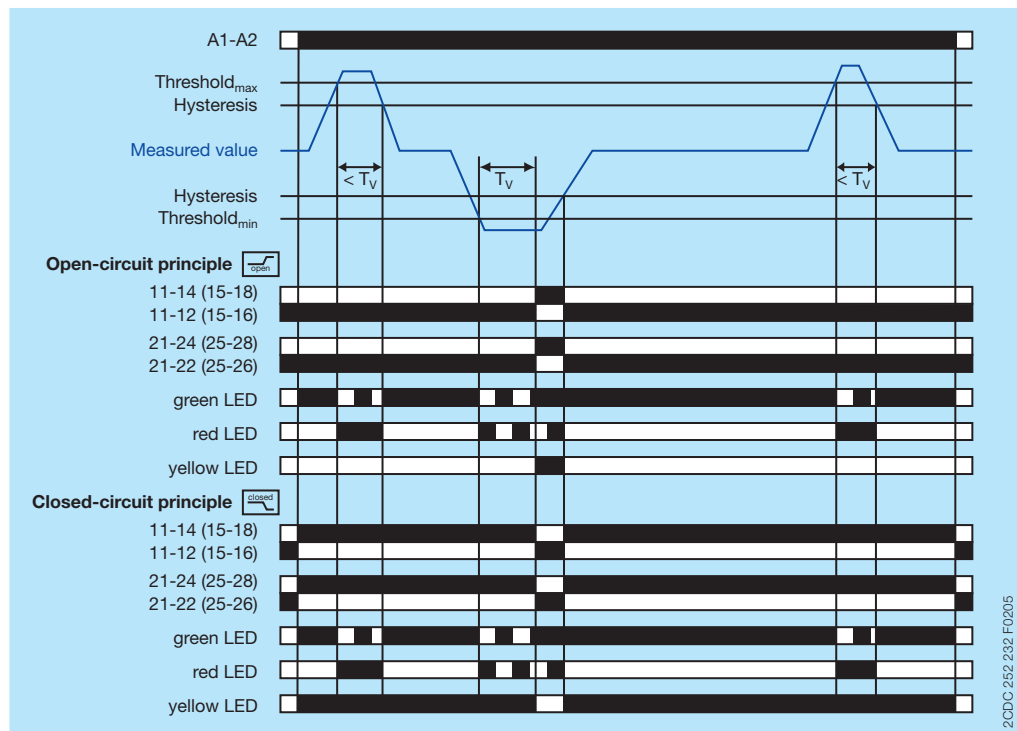
If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the tripping delay T_V starts and the red LED glows (overvoltage), or flashes ⎍⎍ (undervoltage) respectively.

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$_{max}$ minus the fixed hysteresis (5 %) or is still below the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relays de-energize and the yellow LED (relays energized) turns off.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relays re-energize, the yellow LED glows and the red LED turns off.

If control supply voltage is interrupted, the output relays de-energize and the yellow and green LEDs turn off.

2CDC 252 232 F0205

Voltage window monitoring 1x2 c/o (SPDT) contacts `1x2 c/o` OFF-delayed ▬ without latching ✕

Open-circuit principle `open`

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

If the measured value exceeds the threshold $value_{max}$ (>U) or drops below the threshold $value_{min}$ (<U), the output relays energize, the yellow LED (relays energized) glows and the red LED glows (overvoltage), or flashes ⎍⎍ (undervoltage) respectively.

If the measured value decreases below the threshold $value_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold $value_{min}$ plus the fixed hysteresis (5 %), the tripping delay T_V starts and the red LED turns off.

Timing of T_V is displayed by the flashing ⎍⎍ green LED. When T_V is complete, the output relays de-energize and the yellow LED (relay energized) turns off.

If control supply voltage is interrupted, the green LED turns off.
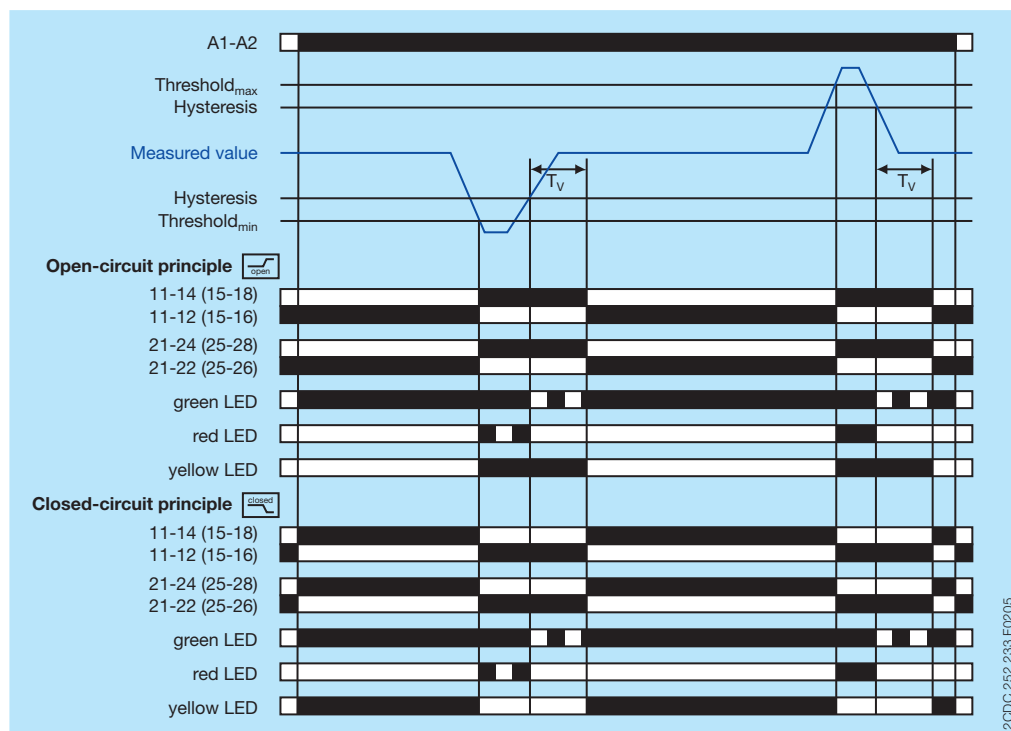
Closed-circuit principle `closed`

The voltage to be monitored (measured value) is applied to terminals B-C. When control supply voltage is applied to terminals A1-A2, the output relays energize and the green and yellow LED (relays energized) glow.

If the measured value exceeds the threshold $value_{max}$ (>U) or drops below the threshold $value_{min}$ (<U), the output relays de-energize, the yellow LED turns off and the red LED glows (overvoltage), or flashes ⎍⎍ (undervoltage) respectively.

If the measured value decreases below the threshold $value_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold $value_{min}$ plus the fixed hysteresis (5 %), the tripping delay T_V starts and the red LED turns off.

Timing of T_V is displayed by the flashing ⎍⎍ green LED. When T_V is complete, the output relays energize and the yellow LED (relay energized) glows.

If control supply voltage is interrupted, the output relays de-energize and the yellow and green LEDs turn off.

Voltage window monitoring 1x2 c/o (SPDT) contacts `1x2 c/o` ON-delayed ⊠ with latching ▭

Open-circuit principle `open`

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

If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the tripping delay T_V starts and the red LED glows (overvoltage), or flashes ⊓⊔⊓⊔ (undervoltage) respectively.

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$_{max}$ minus the fixed hysteresis (5 %) or is still below the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relays energize and the yellow LED (relay energized) flashes ⊓⊓⊓⊓.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the red LED turns off. The output relays remain energized (latching function).

If control supply voltage is interrupted (reset), the output relays de-energize and the yellow and green LEDs turn off.

Closed-circuit principle `closed`

The voltage to be monitored (measured value) is applied to terminals B-C. When control supply voltage is applied to terminals A1-A2, the output relays energize and the green and yellow LED (relays energized) glow.
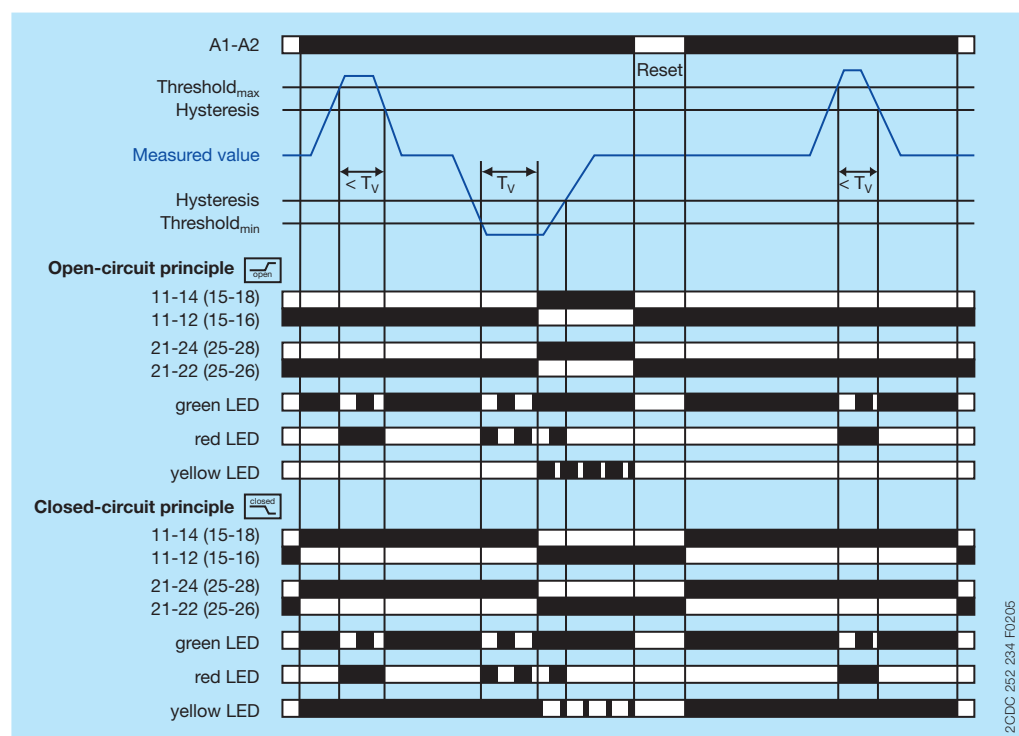
If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the tripping delay T_V starts and the red LED glows (overvoltage), or flashes ⊓⊔⊓⊔ (undervoltage) respectively.

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$_{max}$ minus the fixed hysteresis (5 %) or is still below the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relays de-energize and the yellow LED (relays energized) flashes ⊔⊔⊔⊔.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the red LED turns off. The output relays remain de-energized (latching function).

If control supply voltage is interrupted (reset), the yellow and green LEDs turn off. The output relays energize again when control supply voltage is re-applied.

Voltage window monitoring 1x2 c/o (SPDT) contacts 1x2 c/o OFF-delayed ▬ with latching ⬚

Open-circuit principle ⬚open

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

If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the output relays energize, the yellow LED (relays energized) flashes ⊓⊓⊓⊓ and the red LED glows (overvoltage), or flashes ⎍⎍⎍ (undervoltage) respectively.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the red LED turns off. The output relays remain energized (latching function).

If control supply voltage is interrupted (reset), the output relays de-energize and the yellow and green LEDs turn off.
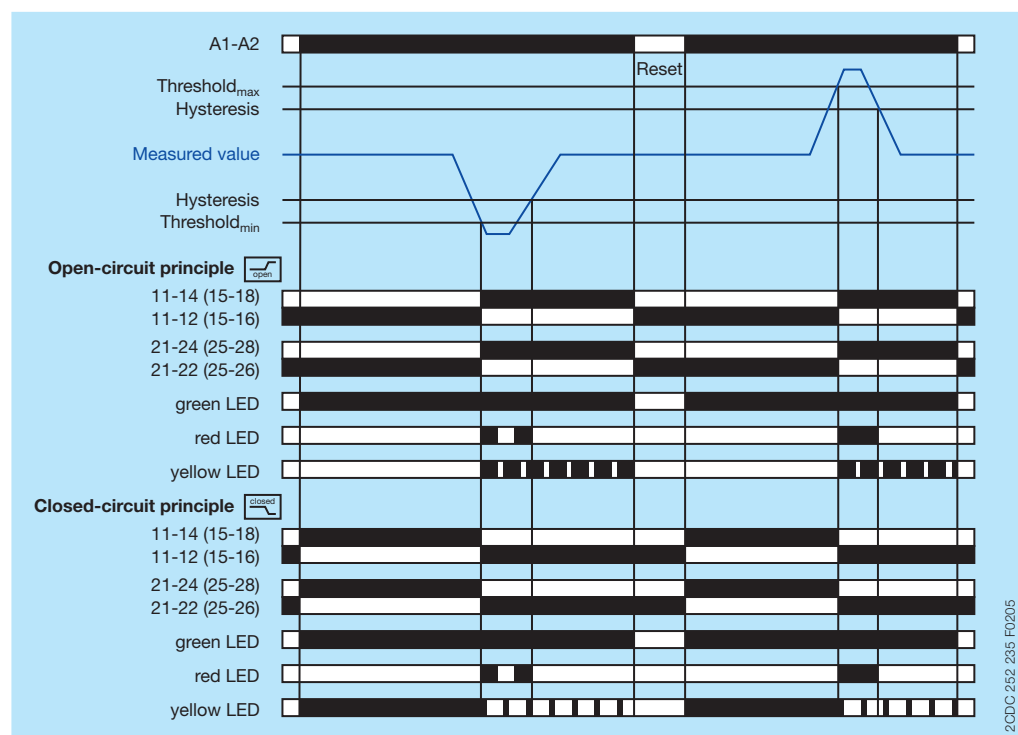
Closed-circuit principle ⬚closed

The voltage to be monitored (measured value) is applied to terminals B-C. When control supply voltage is applied to terminals A1-A2, the output relays energize and the green and yellow LED (relays energized) glow.

If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the output relays de-energize, the yellow LED (relays energized) flashes ⊔⊔⊔⊔ and the red LED glows (overvoltage), or flashes ⎍⎍⎍ (undervoltage) respectively.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the red LED turns off. The output relays remain de-energized (latching function).

If control supply voltage is interrupted (reset), the yellow and green LEDs turn off. The output relays energize again when control supply voltage is re-applied.

2CDC 252 235 F0205

Voltage window monitoring 2x1 c/o (SPDT) contact [2x1 c/o] ON-delayed ⊠ without latching ⊠

Open-circuit principle [open]

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

If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the tripping delay T_V starts and the red LED glows (overvoltage), or flashes ⎍⎍ (undervoltage) respectively.

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$_{max}$ minus the fixed hysteresis (5 %) or is still below the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, energizes and the yellow LED (relay energized) glows.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, de-energizes and the red and yellow LEDs turn off.

If control supply voltage is interrupted, the green LED turns off.

Closed-circuit principle [closed]

The voltage to be monitored (measured value) is applied to terminals B-C. When control supply voltage is applied to terminals A1-A2, the output relays energize and the green and yellow LED (relays energized) glow.
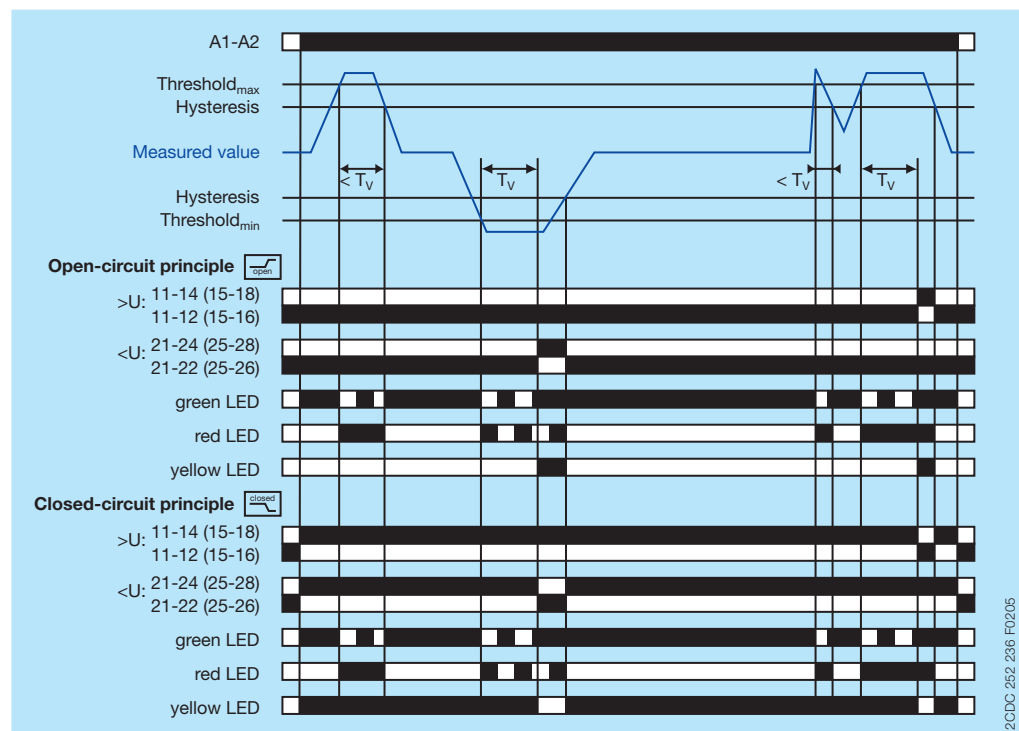
If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the tripping delay T_V starts and the red LED glows (overvoltage), or flashes ⎍⎍ (undervoltage) respectively.

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$_{max}$ minus the fixed hysteresis (5 %) or is still below the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, de-energizes and the yellow LED (relays energized) turns off.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, re-energizes, the yellow LED glows and the red LED turns off.

If control supply voltage is interrupted, the output relays de-energize and the yellow and green LEDs turn off.

Voltage window monitoring 2x1 c/o (SPDT) contact `2x1 c/o` OFF-delayed ▬ without latching ✕

Open-circuit principle `open`

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

If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, energizes, the yellow LED (relays energized) glows and the red LED glows (overvoltage), or flashes ⎍⎍ (undervoltage) respectively.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the tripping delay T_V starts and the red LED turns off.

Timing of T_V is displayed by the flashing ⎍⎍ green LED. When T_V is complete, the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, de-energizes and the yellow LED (relay energized) turns off.

If control supply voltage is interrupted, the green LED turns off.
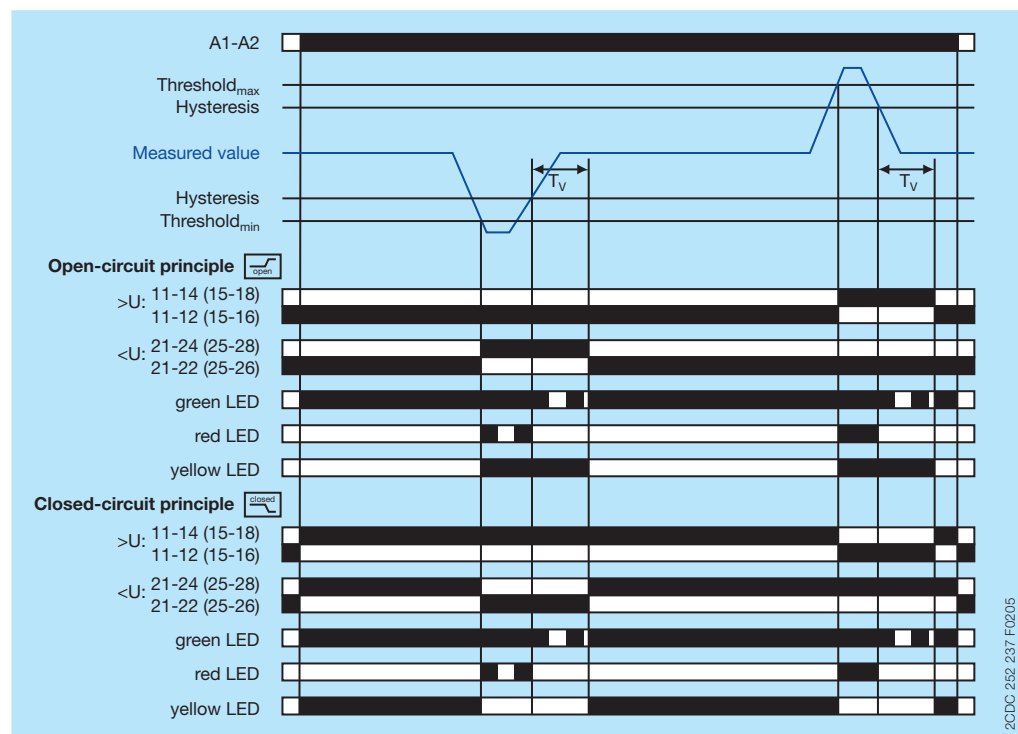
Closed-circuit principle `closed`

The voltage to be monitored (measured value) is applied to terminals B-C. When control supply voltage is applied to terminals A1-A2, the output relays energize and the green and yellow LED (relays energized) glow.

If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, de-energizes, the yellow LED turns off and the red LED glows (overvoltage), or flashes ⎍⎍ (undervoltage) respectively.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the tripping delay T_V starts and the red LED turns off.

Timing of T_V is displayed by the flashing ⎍⎍ green LED. When T_V is complete, the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, energizes and the yellow LED (relay energized) glows.

If control supply voltage is interrupted, the output relays de-energize and the yellow and green LEDs turn off.

2CDC 252 237 F0205

Voltage window monitoring 2x1 c/o (SPDT) contact [2x1 c/o] ON-delayed ⊠ with latching ▬

Open-circuit principle [open]

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

If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the tripping delay T_V starts and the red LED glows (overvoltage), or flashes ⌐_⌐_ (undervoltage) respectively.

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$_{max}$ minus the fixed hysteresis (5 %) or is still below the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, energizes and the yellow LED (relay energized) flashes ⊓⊓⊓⊓.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the red LED turns off. The output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, remains energized (latching function).

If control supply voltage is interrupted (reset), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, de-energizes and the yellow and green LEDs turn off.

Closed-circuit principle [closed]

The voltage to be monitored (measured value) is applied to terminals B-C. When control supply voltage is applied to terminals A1-A2, the output relays energize and the green and yellow LED (relays energized) glow.
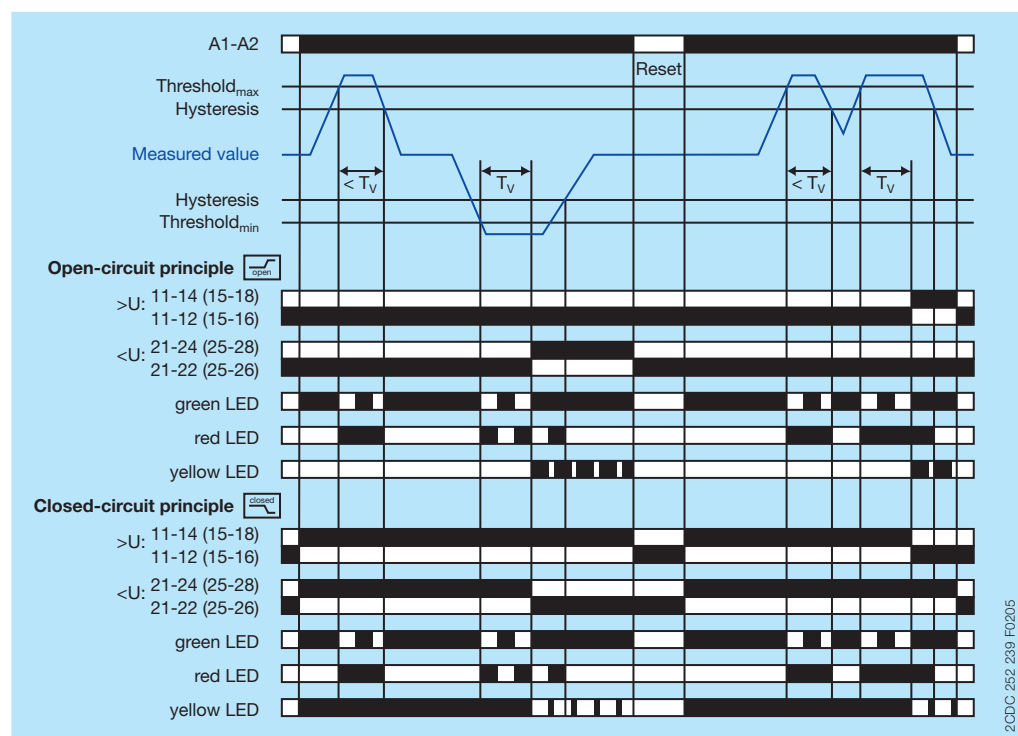
If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the tripping delay T_V starts and the red LED glows (overvoltage), or flashes ⌐_⌐_ (undervoltage) respectively.

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$_{max}$ minus the fixed hysteresis (5 %) or is still below the threshold value$_{min}$ plus the fixed hysteresis (5 %), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, de-energizes and the yellow LED (relays energized) flashes ⌐⊔⌐⊔.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the red LED turns off. The output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, remains de-energized (latching function).

If control supply voltage is interrupted (reset), the yellow and green LEDs turn off. The output relays energize again when control supply voltage is re-applied.

Voltage window monitoring 2x1 c/o (SPDT) contact `2x1 c/o` OFF-delayed ▬ with latching ⬒

Open-circuit principle `open`

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

If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, energizes, the yellow LED (relays energized) flashes ⊓⊓⊓⊓ and the red LED glows (overvoltage), or flashes ⊓_⊓_ (undervoltage) respectively.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the red LED turns off. The output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, remains energized (latching function).

If control supply voltage is interrupted (reset), the output relays de-energize and the yellow and green LEDs turn off.
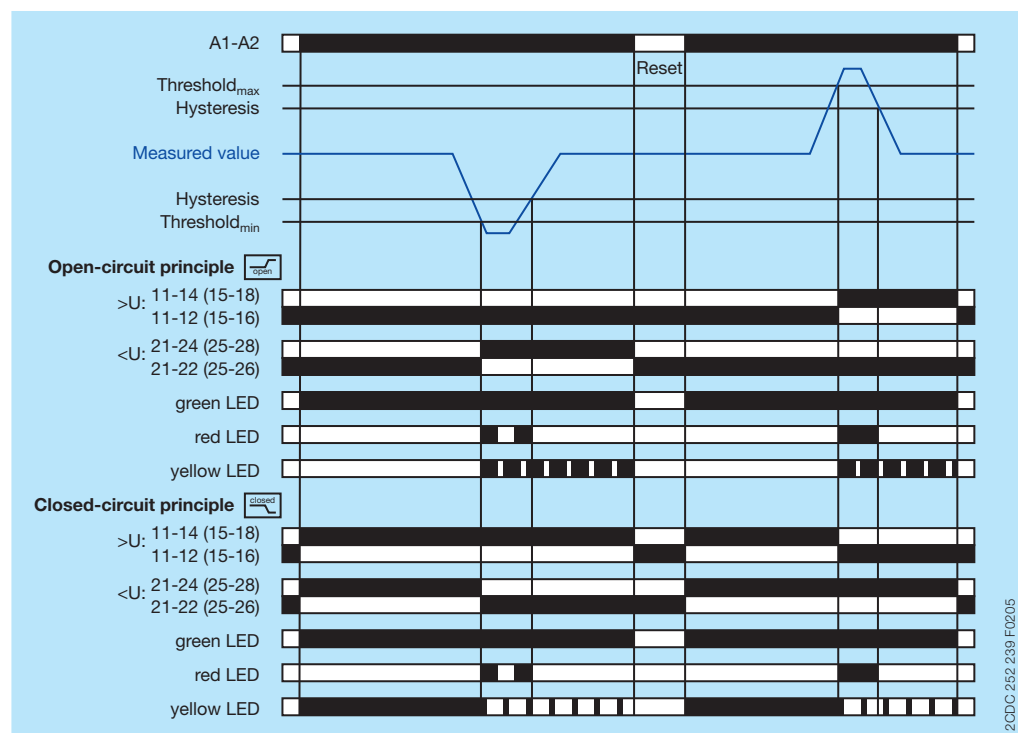
Closed-circuit principle `closed`

The voltage to be monitored (measured value) is applied to terminals B-C. When control supply voltage is applied to terminals A1-A2, the output relays energize and the green and yellow LED (relays energized) glow.

If the measured value exceeds the threshold value$_{max}$ (>U) or drops below the threshold value$_{min}$ (<U), the output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, de-energizes, the yellow LED (relays energized) flashes ⎁⎁⎁⎁ and the red LED glows (overvoltage), or flashes ⊓_⊓_ (undervoltage) respectively.

If the measured value decreases below the threshold value$_{max}$ minus the fixed hysteresis (5 %) or exceeds the threshold value$_{min}$ plus the fixed hysteresis (5 %), the red LED turns off. The output relay 11_{15}-12_{16}/14_{18} (>U), or 21_{25}-22_{26}/24_{28} (<U) respectively, remains de-energized (latching function).

If control supply voltage is interrupted (reset), the yellow and green LEDs turn off. The output relays energize again when control supply voltage is re-applied.

2CDC 252 239 F0205

Electrical connection

A1	11₁₅	21₂₅
B		

Connection diagram (2CDC 252 207 F0005)

A1-A2	Rated control supply voltage
B-C	Measuring ranges: 3-30 V, 6-60 V, 30-300 V, 60-600 V
11₁₅-12₁₆/14₁₈ 21₂₅-22₂₆/24₂₈	Output contacts - open- or closed-circuit principle

DIP switches

(2CDC 252 274 F0005)

Position	4	3	2	1
ON ↑	2x1 c/o		closed	
OFF	1x2 c/o		open	

| 1	ON	OFF-delay
	OFF	ON-delay
2	ON	Closed-circuit principle
	OFF	Open-circuit principle
3	ON	Latching function activated
	OFF	Latching function not activated
4	ON	2x1 c/o (SPDT) contact
	OFF	1x2 c/o (SPDT) contacts

OFF = Default

Technical data

Data at T_a = 25 °C and rated values, unless otherwise indicated

Input circuits

Supply circuit	A1-A2
Rated control supply voltage U_s	24-240 V AC/DC
Rated control supply voltage U_s tolerance	-15...+10 %
Rated frequency	50/60 Hz
Typical current / power consumption 24 V DC	30 mA / 0.75 W
115 V AC	17 mA / 1.9 VA
230 V AC	11 mA / 2.6 VA
Power failure buffering time	20 ms
Transient overvoltage protection	varistors

Measuring circuit	B-C
Monitoring function	Over- and undervoltage monitoring
Measuring method	TRMS measuring principle
Measuring inputs terminal connection	B-C
measuring range	3-30 V, 6-60 V, 30-300 V, 60-600 V
input resistance	600 kΩ
pulse overload capacity t < 1 s	800 V
continuous capacity	660 V
Threshold value	>U and <U adjustable within the indicated measuring range
Tolerance of the adjusted threshold value	10 % of the range end value
Hysteresis related to the threshold value	5 % fixed
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
Accuracy within the rated control supply voltage tolerance	ΔU ≤ 0.5 %
Accuracy within the temperature range	ΔU ≤ 0.06 % / °C
Transient overvoltage protection	varistors

Timing circuit	
Time delay T_V	0 s or 0.1-30 s adjustable
Repeat accuracy (constant parameters)	±0.07 % of full scale
Tolerance of the adjusted time delay	-
Accuracy within the rated control supply voltage tolerance	Δt ≤ 0.5 %
Accuracy within temperature range	Δt ≤ 0.06 % / °C

User interface

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	⎍: output relay energized, no latching function
	⊓⊓⊓⊔: output relay energized, active latching function
	⊔⊔⊔⊔: output relay de-energized, active latching function

Output circuits

Kind of output	11-12/14	relay, 1st c/o (SPDT) contact
	21-22/24	relay, 2nd c/o (SPDT) contact
		1 x 2 c/o (SPDT) contacts (common signal) or
		2 x 1 c/o (SPDT) contact (separate signal for >U and <U) configurable
Operating principle		open- or closed-circuit principle configurable (open-circuit principle: output relays energize if the measured value exceeds ⊿ / falls below ⊼ the adjusted threshold value, closed-circuit principle: output relays de-energize if measured value exceeds ⊿ / falls below ⊼ the adjusted threshold value)
Contact material		AgNi
Rated operational voltage U_e		250 V
Minimum switching voltage / Minimum switching current		24 V / 10 mA
Maximum switching voltage / Maximum switching current		250 V AC / 4 A AC
Rated operational current I_e	AC-12 (resistive) at 230 V	4 A
	AC-15 (inductive) at 230 V	3 A
	DC-12 (resistive) at 24 V	4 A
	DC-13 (inductive) at 24 V	2 A
AC rating (UL 508)	utilization category (Control Circuit Rating Code)	B 300
	max. rated operational voltage	300 V AC
	max. continuous thermal current at B 300	5 A
	max. making/breaking apparent power at B 300	3600/360 VA
Mechanical lifetime		30×10^6 switching cycles
Electrical lifetime	AC-12, 230 V, 4 A	0.1×10^6 switching cycles
Maximum fuse rating to achieve short-circuit protection	n/c contact	6 A fast-acting
	n/o contact	10 A fast-acting

General data

		Screw connection technology	Easy Connect Technology (Push-in)
MTBF		on request	
Duty time		100 %	
Dimensions (W x H x D)	product dimensions	22.5 x 85.6 x 103.7 mm (0.89 x 3.37 x 4.08 in)	
	packaging dimensions	97 x 109 x 30 mm (3.82 x 4.29 x 1.18 in)	
Weight	Net weight	0.157 kg (0.346 lb)	0.146 kg (0.322 lb)
	Gross weight	0.179 kg (0.395 lb)	0.168 kg (0.370 lb)
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool	
Mounting position		any	
Material of housing		UL 94 V-0	
Degree of protection	housing	IP50	
	terminals	IP20	

Electrical connection

		Screw connection technology	Easy Connect Technology (Push-in)
Connecting capacity	fine-strand with(out) wire end ferrule	1 x 0.5-2.5 mm² (1 x 18-14 AWG) 2 x 0.5-1.5 mm² (2 x 18-16 AWG)	2 x 0.5-1.5 mm² (2 x 18-16 AWG)
	rigid	1 x 0.5-4 mm² (1 x 20-12 AWG) 2 x 0.5-2.5 mm² (2 x 20-14 AWG)	2 x 0.5-1.5 mm² (2 x 20-16 AWG)
Stripping length		8 mm (0.32 in)	
Tightening torque		0.6 - 0.8 Nm (7.08 lb.in)	-

Environmental data

Ambient temperature ranges	operation	-25...+60 °C (-13...+140 °F)
	storage	-40...+85 °C (-40...+185 °F)
Damp heat, cyclic (IEC/EN 60068-2-30)		55 °C, 6 cycles
Vibration, sinusoidal		Class 2
Shock		Class 2

Isolation data

Rated insulation voltage U_i	supply / measuring circuit / output	600 V
	output 1 / output 2	250 V
Rated impulse withstand voltage U_{imp}	supply / measuring circuit / output	6 kV 1.2/50 µs
	output 1 / output 2	4 kV 1.2/50 µs
Pollution degree		3
Overvoltage category		III

Standards / Directives

|	
Standards	IEC/EN 60947-5-1, IEC/EN 60255-27, EN 50178
Low Voltage Directive	2014/35/EU
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU

Electromagnetic compatibility

|		
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3
surge	IEC/EN 61000-4-5	Level 3
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3
Interference emission		IEC/EN 61000-6-3
high-frequency radiated	IEC/CISPR 22, EN 55022	Class B
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B

Technical diagrams

Load limit curves
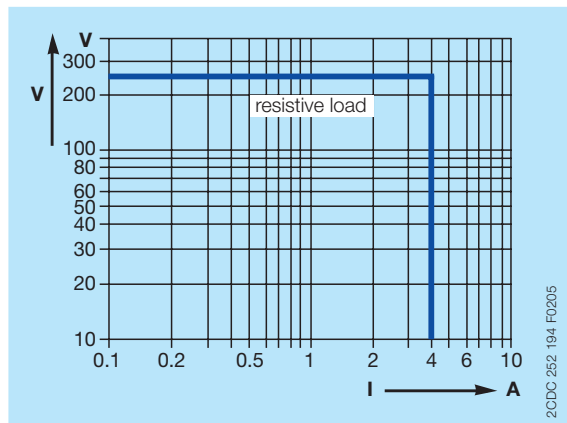
AC load (resistive)
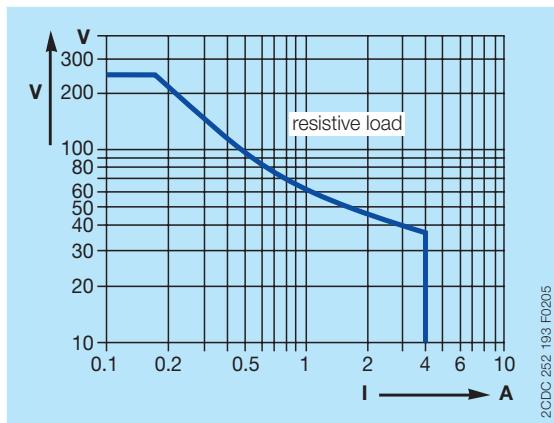
DC load (resistive)
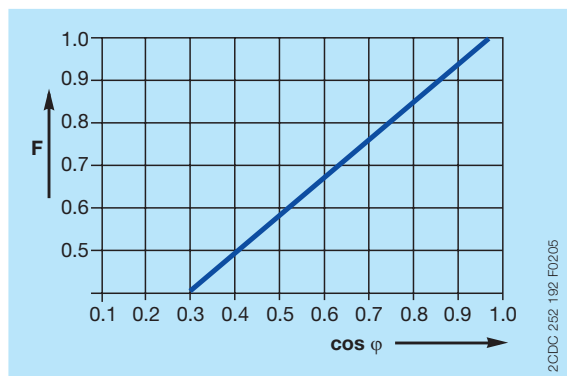
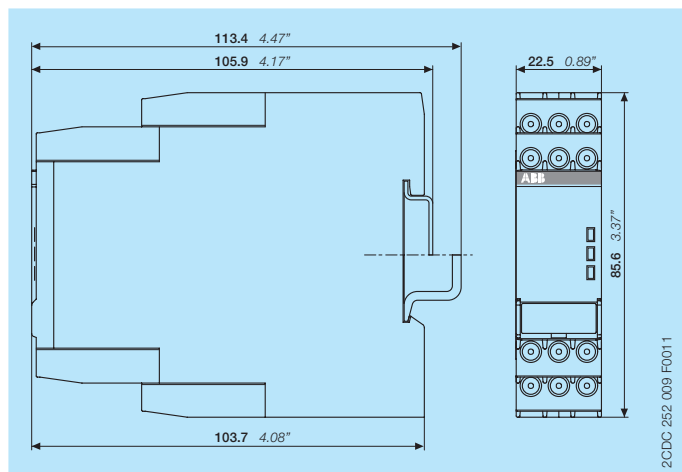Derating factor F for inductive AC load
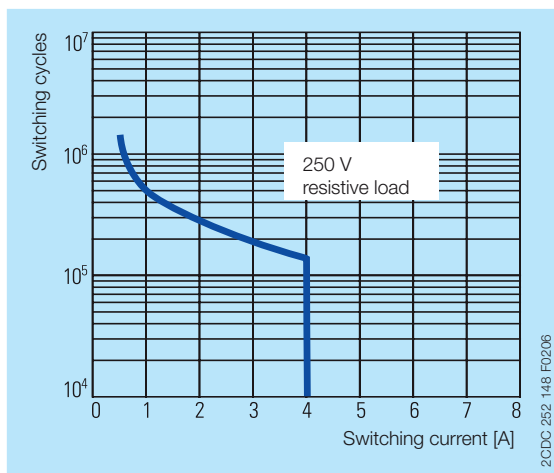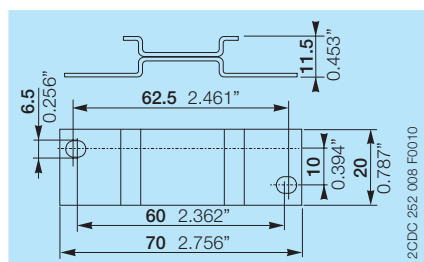

Contact lifetime

Dimensions

in **mm** and inches

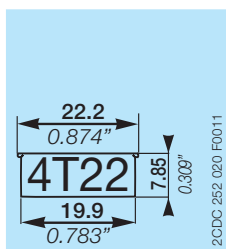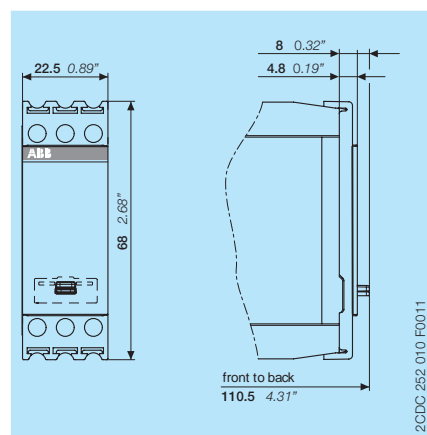
Accessories

in **mm** and inches

ADP.01 - Adapter for screw mounting

MAR.12 - Marker label for devices with DIP switches

COV.11 - Sealable transparent cover

Further documentation

Document title	Document type	Document number
Electronic products and relays	Technical catalogue	2CDC 110 004 C02xx
CM-EFS.2	Instruction manual	1SVC 730 570 M0000

You can find the documentation on the internet at www.abb.com/lowvoltage
-> Automation, control and protection -> Electronic relays and controls -> Measuring and monitoring relays.

CAD system files

You can find the CAD files for CAD systems at http://abb-control-products.partcommunity.com
-> Low Voltage Products & Systems -> Control Products -> Electronic Relays and Controls.

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