

Current monitoring relays, single-phase AC/DC - CM-SRS.1 and CM-SRS.2

Ordering details

2



CM-SRS.1



CM-SRS.2

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

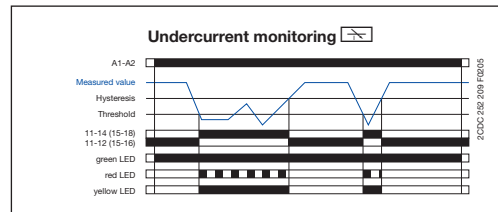
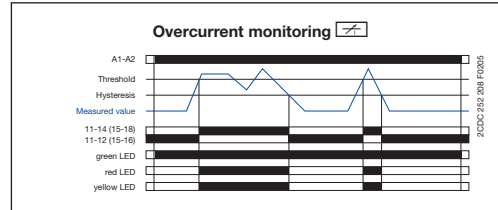
- Monitoring of DC- and AC-currents
- **CM-SRS.x1:** 3 mA - 1 A
- **CM-SRS.x2:** 0.3-15 A
- TRMS measuring principle
- One device includes 3 measuring ranges
- Over- or undercurrent monitoring configurable
- Hysteresis adjustable from 3-30 %
- **CM-SRS.2:** Tripping delay T_V adjustable 0; 0.1-30 s
- 3 supply voltage versions
- **CM-SRS.1:** 1 c/o contact
- **CM-SRS.2:** 2 c/o contacts
- 22.5 mm width
- 3 LEDs for status indication

Depending on the configuration, the current monitoring relays **CM-SRS.1** and **CM-SRS.2** can be used for over- or undercurrent monitoring in single-phase AC and/or DC systems. The current to be monitored (measured value) is applied to terminals B1/B2/B3-C. The devices work according to the open-circuit principle.

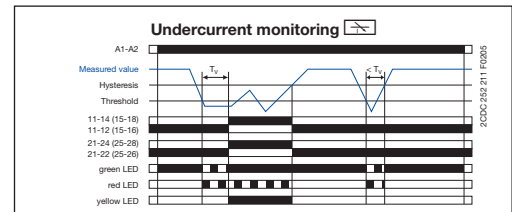
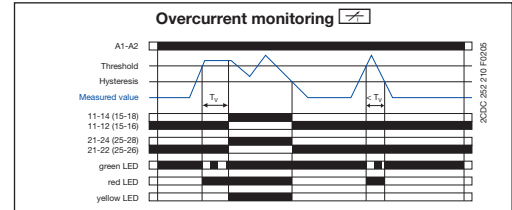
If the measured value exceeds resp. drops below the adjusted threshold value, the output relay(s) energize(s): on the CM-SRS.1 immediately, on the CM-SRS.2 after the set tripping delay T_V . If the measured value exceeds resp. drops below the threshold value plus resp. minus the adjusted hysteresis, the output relay(s) de-energize(s).

The hysteresis is adjustable within a range of 3-30 % of the threshold value.

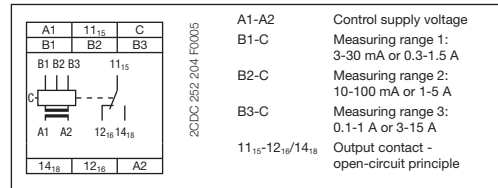
Function diagrams CM-SRS.1



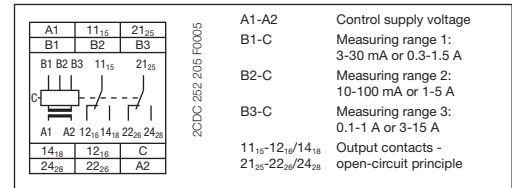
Function diagrams CM-SRS.2



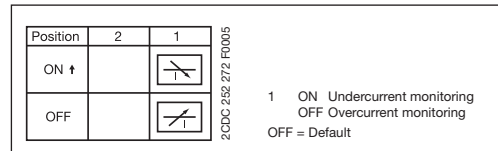
Connection diagram CM-SRS.1



Connection diagram CM-SRS.2



DIP switch functions CM-SRS.1, CM-SRS.2



Type	Control supply voltage 50/60 Hz	Tripping delay T_V	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg / lb
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Measuring ranges AC/DC: 3-30 mA; 10-100 mA; 0.1-1 A

CM-SRS.11	24-240 V AC/DC	without	1SVR 430 840 R0200	1		0.12 / 0.26
	110-130 V AC		1SVR 430 841 R0200	1		0.15 / 0.33
	220-240 V AC		1SVR 430 841 R1200	1		0.15 / 0.33

Measuring ranges AC/DC: 0.3-1.5 A; 1-5 A; 3-15 A

CM-SRS.12	24-240 V AC/DC	without	1SVR 430 840 R0300	1		0.12 / 0.26
	110-130 V AC		1SVR 430 841 R0300	1		0.15 / 0.33
	220-240 V AC		1SVR 430 841 R1300	1		0.15 / 0.33

Measuring ranges AC/DC: 3-30 mA; 10-100 mA; 0.1-1 A

CM-SRS.21	24-240 V AC/DC	adjustable	1SVR 430 840 R0400	1		0.12 / 0.26
	110-130 V AC		1SVR 430 841 R0400	1		0.15 / 0.33
	220-240 V AC		1SVR 430 841 R1400	1		0.15 / 0.33

Measuring ranges AC/DC: 0.3-1.5 A; 1-5 A; 3-15 A

CM-SRS.22	24-240 V AC/DC	adjustable	1SVR 430 840 R0500	1		0.12 / 0.26
	110-130 V AC		1SVR 430 841 R0500	1		0.15 / 0.33
	220-240 V AC		1SVR 430 841 R1500	1		0.15 / 0.33

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• Accessories	2/104	• Current transformers	2/105

Current monitoring relays, single-phase AC/DC, multifunctional - CM-SRS.M

Ordering details

2CDC 251.247 F005



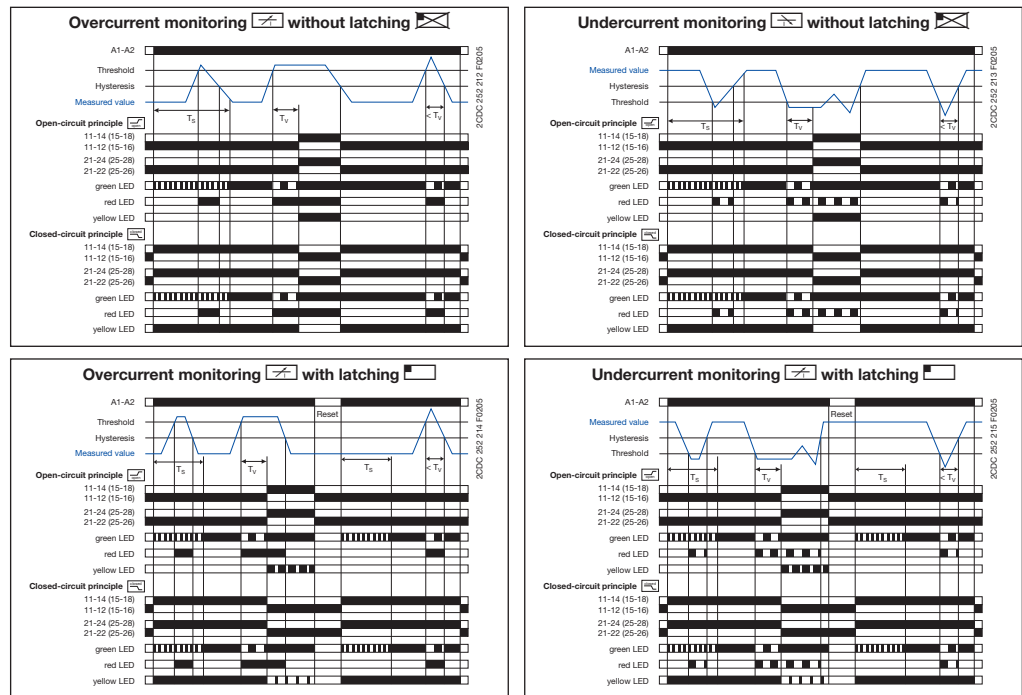
CM-SRS.M

- ① Threshold value adjustment
- ② Hysteresis adjustment
- ③ Adjustment of the tripping delay T_V
- ④ Adjustment of the start-up delay T_S
- ⑤ DIP switches (see DIP switch functions)
- ⑥ U/T: green LED - control supply voltage, timing
- ⑦ R: yellow LED - relay status
- ⑧ I: red LED - over- / undercurrent

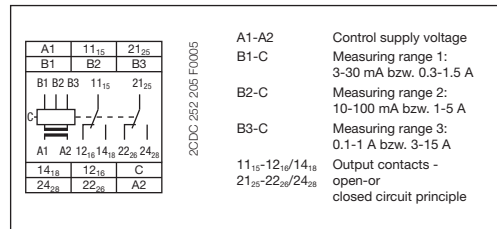
- Monitoring of DC- and AC-currents
- **CM-SRS.M1:** 3 mA - 1 A
- **CM-SRS.M2:** 0.3-15 A
- TRMS measuring principle
- One device includes 3 measuring ranges
- Over- or undercurrent monitoring configurable
- Open- or closed circuit principle configurable
- Latching function configurable
- Hysteresis adjustable from 3-30 %
- Start-up delay T_S adjustable 0; 0.1-30 s
- Tripping delay T_V adjustable 0; 0.1-30 s
- 2 c/o contacts
- 22.5 mm width
- 3 LEDs for status indication

Depending on the configuration, the current monitoring relays **CM-SRS.M** can be used for over- or undercurrent monitoring in single-phase AC and/or DC systems. The current to be monitored (measured value) is applied to terminals B1/B2/B3-C. Open or closed-circuit principle are configurable. If the measured value exceeds resp. drops below the adjusted threshold value before the set start-up delay T_S is complete, the output relays do not change their actual state. If the measured value exceeds resp. drops below the adjusted threshold value when T_S is complete, the tripping delay T_V starts. If T_V is complete and the measured value is still exceeding resp. below the threshold value plus resp. minus the set hysteresis, the output relays energize / de-energize. If the measured value exceeds resp. drops below the threshold value minus resp. plus the set hysteresis and the latching function is not activated, the output relays de-energize / energize. With activated latching function the output relays remain energized and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized and energize only, when the supply voltage is switched off and then again switched on = Reset. The hysteresis is adjustable within a range of 3-30 % of the threshold value.

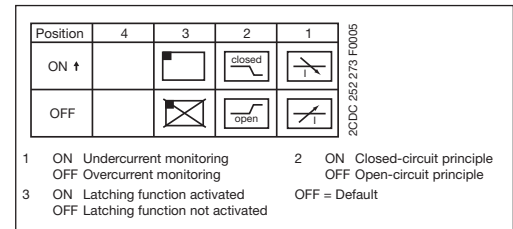
Function diagrams CM-SRS.M



Connection diagram CM-SRS.M



DIP switch functions CM-SRS.M



Type	Control supply voltage	Tripping delay	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg / lb
	50/60 Hz	T_V				

Measuring ranges AC/DC: 3-30 mA; 10-100 mA; 0.1-1 A

CM-SRS.M1	24-240 V AC/DC	0 or 0.1-30 s	1SVR 430 840 R0600	1		0.12 / 0.26
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Measuring ranges AC/DC: 0.3-1.5 A; 1-5 A; 3-15 A

CM-SRS.M2	24-240 V AC/DC	0 or 0.1-30 s	1SVR 430 840 R0700	1		0.12 / 0.26
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• Approvals and marks	2/6	• Technical data	2/14
• Technical diagrams	2/102	• Dimensional drawings	2/103
• Accessories	2/104	• Current transformers	2/105

Current monitoring relay, single-phase AC/DC, window monitoring - CM-SFS.2

Ordering details

2



CM-SFS.2

- ① Threshold value adjustment >I for overcurrent
- ② Threshold value adjustment <I for undercurrent
- ③ Adjustment of the tripping delay T_V
- ④ Adjustment of the start-up delay T_S
- ⑤ DIP switches (see DIP switch functions)
- ⑥ U/T: green LED - control supply voltage, timing
- ⑦ R: yellow LED - relay status
- ⑧ I: red LED - over- / undercurrent

- Monitoring of DC- and AC-currents
- **CM-SFS.21:** 3 mA - 1 A
- **CM-SFS.22:** 0.3-15 A
- TRMS measuring principle
- One device includes 3 measuring ranges
- Over- and undercurrent monitoring
- ON- or OFF-delay configurable
- Open- or closed circuit principle configurable
- Latching function configurable
- Thresholds for I_{min} and I_{max} adjustable
- Fixed hysteresis of 5 %
- Start-up delay T_S adjustable 0; 0.1-30 s
- Tripping delay T_V adjustable 0; 0.1-30 s
- 1x2 c/o contacts (common signal) or 2x1 c/o contact (separate signals for I_{min} and I_{max})
- 22.5 mm width
- 3 LEDs for status indication

The current window monitoring relays **CM-SFS.2** can be used for the simultaneous monitoring of over- (>I) and undercurrents (<I) in single-phase AC and/or DC systems. Depending on the configuration, one c/o contact each [2x1 c/o] or both c/o contacts in parallel [1x2 c/o] can be used for the over- and undercurrent monitoring. The current to be monitored (measured value) is applied to terminals B1/B2/B3-C. Open- [] or closed-circuit principle [] as well as an adjustable ON [] or OFF tripping [] delay are configurable.

ON-delayed [] current window monitoring with parallel switching c/o contacts [1x2 c/o]:

If the measured value exceeds resp. drops below the adjusted threshold value before the set start-up delay T_S is complete, the output relays do not change their actual state.

If the measured value exceeds resp. drops below the adjusted threshold value when T_S is complete, the tripping delay T_V starts, when [] is configured. If T_V is complete and the measured value is still exceeding resp. below the threshold value minus resp. plus the fixed hysteresis (5%), the output relays energize [] / de-energize [].

If the measured value exceeds resp. drops below the threshold value plus resp. minus the hysteresis and the latching function is not activated [], the output relays de-energize [] / energize []. With activated latching function [] the output relays remain energized [] and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized [] and energize only, when the supply voltage is switched off and then again switched on = Reset.

OFF-delayed [] current window monitoring with parallel switching c/o contacts [1x2 c/o]:

If the measured value exceeds resp. drops below the adjusted threshold value when the set start-up delay T_S is complete, the output relays energize [] / de-energize [], when [] is configured, and remain in this position during the set tripping delay T_V .

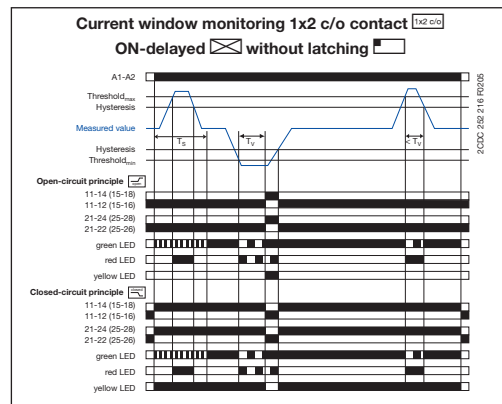
If the measured value exceeds resp. drops below the threshold value plus resp. minus the fixed hysteresis (5%) and the latching function is not activated [], the tripping delay T_V starts.

After completion of T_V , the output relays de-energize [] / energize [], provided that the latching function is not activated []. With activated latching function [] the output relays remain energized [] and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized [] and energize only, when the supply voltage is switched off and then again switched on = Reset.

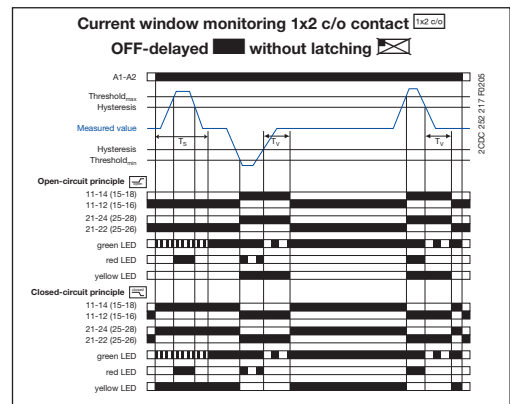
When [2x1 c/o] is adjusted on the device, the functionality is equivalent to the one described above. There is only to consider that in this case, instead of both output relays, only one output relay each will be switched.

">I" = 11₁₅-12₁₆/14₁₈ ; "<I" = 21₂₅-22₂₆/24₂₈

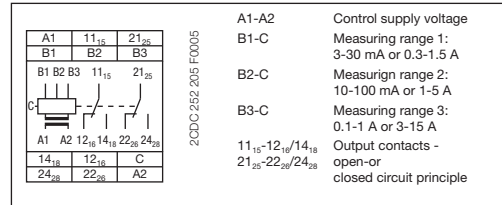
Function diagrams CM-SFS.2



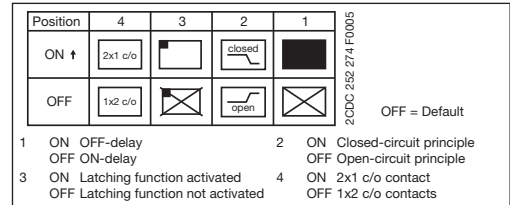
Further function diagrams see data sheet.



Connection diagram CM-SFS.2



DIP switch function CM-SFS.2



Type	Control supply voltage	Tripping delay	Order code	Pack. unit	Price 1 piece	Weight 1 piece
	50/60 Hz	T_V		piece		kg / lb

Measuring ranges AC/DC: 3-30 mA; 10-100 mA; 0.1-1 A

CM-SFS.21	24-240 V AC/DC	0 or 0.1-30 s	1SVR 430 760 R0400	1		0.12 / 0.26
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Measuring ranges AC/DC: 0.3-1.5 A; 1-5 A; 3-15 A

CM-SFS.22	24-240 V AC/DC	0 or 0.1-30 s	1SVR 430 760 R0500	1		0.12 / 0.26
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• Accessories/2/104	• Current transformers/2/105

Voltage monitoring relays, single-phase AC/DC - CM-ESS.1 and CM-ESS.2

Ordering details



CM-ESS.1



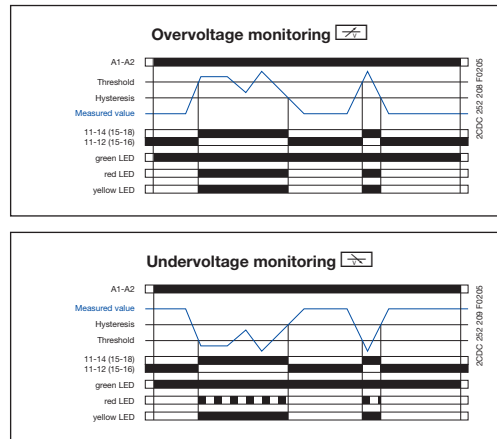
CM-ESS.2

- 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

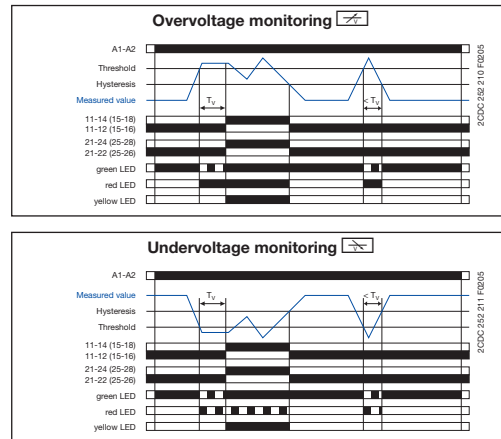
- Monitoring of DC- and AC-voltages from 3-600 V
- TRMS measuring principle
- One device includes 4 measuring ranges: 3-30 V, 6-60 V, 30-300 V, 60-600 V
- Over- or undervoltage monitoring configurable
- Hysteresis adjustable from 3-30 %
- **CM-ESS.2:** Tripping delay T_V adjustable 0; 0.1-30 s
- 3 supply voltage versions
- **CM-ESS.1:** 1 c/o contact
- **CM-ESS.2:** 2 c/o contacts
- 22.5 mm width
- 3 LEDs for status indication

Depending on the configuration, the voltage monitoring relays **CM-ESS.1** and **CM-ESS.2** can be used for over- or undervoltage monitoring in single-phase AC and/or DC systems. The voltage to be monitored (measured value) is applied to terminals B-C. The devices work according to the open-circuit principle. If the measured value exceeds resp. drops below the adjusted threshold value, the output relay(s) energize(s): on the CM-ESS.1 immediately, on the CM-ESS.2 after the set tripping delay T_V . If the measured value exceeds resp. drops below the threshold value plus resp. minus the adjusted hysteresis, the output relay(s) de-energize(s). The hysteresis is adjustable within a range of 3-30 % of the threshold value.

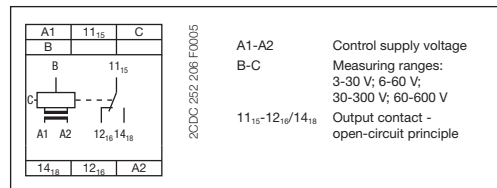
Function diagrams CM-ESS.1



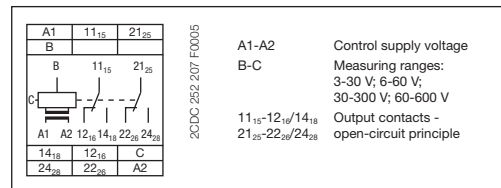
Function diagrams CM-ESS.2



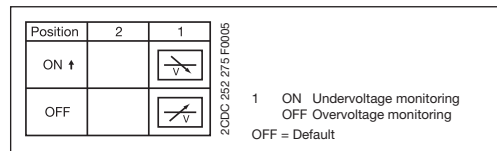
Connection diagram CM-ESS.1



Connection diagram CM-ESS.2



DIP switch functions CM-ESS.1, CM-ESS.2



Type	Control supply voltage	Tripping delay	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg / lb
	50/60 Hz	T_V				

Measuring ranges AC/DC: 3-30 V; 6-60 V; 30-300 V; 60-600 V

CM-ESS.1	24-240 V AC/DC		1SVR 430 830 R0300	1		0.12 / 0.26
	110-130 V AC	without	1SVR 430 831 R0300	1		0.15 / 0.33
	220-240 V AC		1SVR 430 831 R1300	1		0.15 / 0.33
CM-ESS.2	24-240 V AC/DC	adjustable	1SVR 430 830 R0400	1		0.12 / 0.26
	110-130 V AC	0 or	1SVR 430 831 R0400	1		0.15 / 0.33
	220-240 V AC	0.1-30 s	1SVR 430 831 R1400	1		0.15 / 0.33

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Voltage monitoring relay, single-phase AC/DC, multifunctional - CM-ESS.M

Ordering details

2



CM-ESS.M

- ① Threshold value adjustment
- ② Hysteresis adjustment
- ③ Adjustment of the tripping delay T_V
- ④ Adjustment of the measuring range
- ⑤ DIP switches (see DIP switch functions)
- ⑥ U/T: green LED - control supply voltage
- ⑦ R: yellow LED - relay status
- ⑧ U: red LED - over- / undervoltage

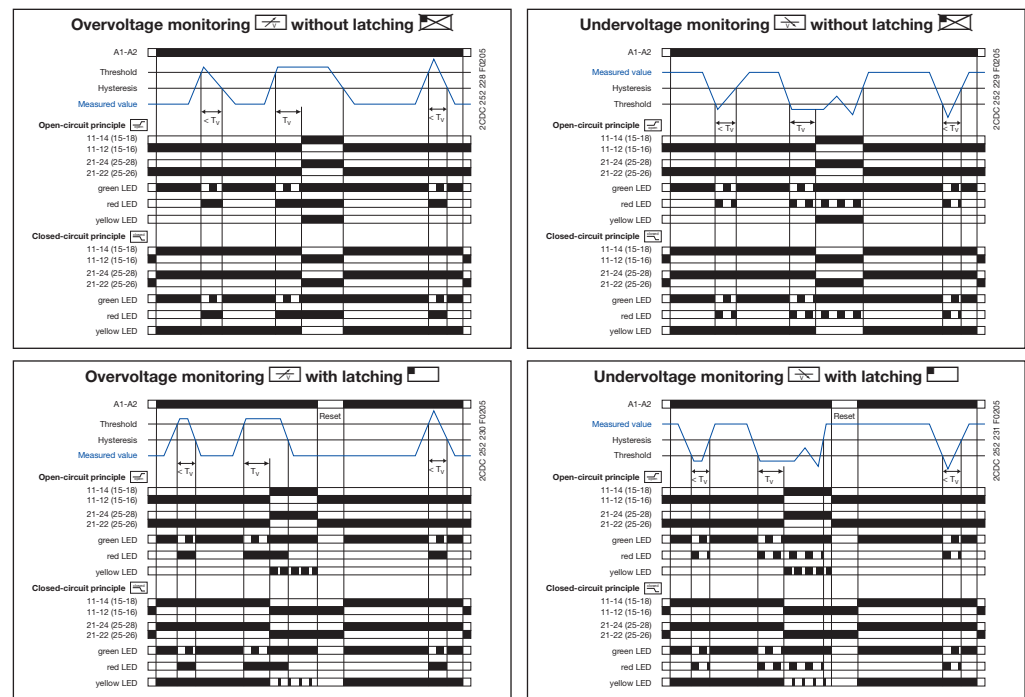
Depending on the configuration, the voltage monitoring relay **CM-ESS.M** can be used for over- or undervoltage monitoring in single-phase AC and/or DC systems. The voltage to be monitored (measured value) is applied to terminals B-C. Open or closed-circuit principle are selectable.

If the measured value exceeds resp. drops below the adjusted threshold value, the tripping delay T_V starts. If T_V is complete and the measured value is still exceeding resp. below the threshold value plus resp. minus the set hysteresis, the output relays energize / de-energize .

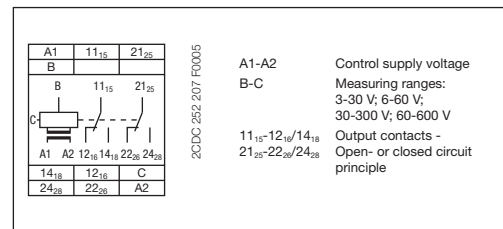
If the measured value exceeds resp. drops below the threshold value plus resp. minus the set hysteresis and the latching function is not activated , the output relays de-energize / energize . With activated latching function the output relays remain energized and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized and energize only, when the supply voltage is switched off and then again switched on = Reset.

The hysteresis is adjustable within a range of 3-30 % of the threshold value.

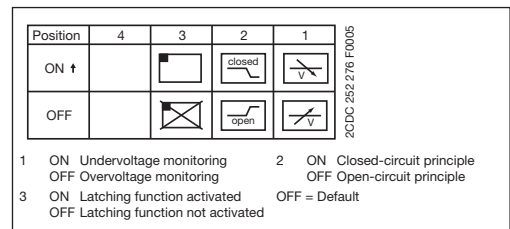
Function diagrams CM-ESS.M



Connection diagram CM-ESS.M



DIP switch functions CM-ESS.M



- Monitoring of DC- and AC-voltages from 3-600 V
- TRMS 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
- Open- or closed circuit principle configurable
- Latching function configurable
- Hysteresis adjustable from 3-30 %
- Tripping delay T_V adjustable 0; 0.1-30 s
- 2 c/o contacts
- 22.5 mm width
- 3 LEDs for status indication

Type	Control supply voltage	Tripping delay	Order code	Pack. unit piece	Price	Weight
	50/60 Hz	T_V			1 piece	1 piece kg / lb

Measuring ranges AC/DC: 3-30 V; 6-60 V; 30-300 V; 60-600 V

CM-ESS.M	24-240 V AC/DC	0 or 0.1-30 s	1SVR 430 830 R0500	1	0.12 / 0.26
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• Approvals and marks	2/6	• Technical data	2/16
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• Accessories	2/104		

Voltage monitoring relay, single-phase AC/DC, window monitoring - CM-EFS.2

Ordering details

2CDC 251 251 F0005



CM-EFS.2

- ① Threshold value adjustment >U for overvoltage
- ② Threshold value adjustment <U for undervoltage
- ③ Adjustment of the tripping delay T_V
- ④ Adjustment of the measuring range
- ⑤ DIP switches (see DIP switch functions)
- ⑥ U/T: green LED - control supply voltage, timing
- ⑦ R: yellow LED - relay status
- ⑧ U: red LED - over- / undervoltage

- Monitoring of DC- and AC-voltages from 3-600 V
- T RMS measuring principle
- One device includes 4 measuring ranges: 3-30 V; 6-60 V; 30-300 V; 60-600 V
- Over- and undervoltage monitoring
- ON- or OFF-delay configurable
- Open- or closed circuit principle configurable
- Latching function configurable
- Thresholds for U_{min} and U_{max} adjustable
- Fixed hysteresis of 5 %
- Tripping delay T_V adjustable 0; 0.1-30 s
- 1x2 c/o contacts (common signal) or 2x1 c/o contact (separate signals for U_{min} and U_{max})
- 22.5 mm width
- 3 LEDs for status indication

The voltage window monitoring relay **CM-EFS.2** can be used for the simultaneous monitoring of over- (>U) and undervoltages (<U) in single-phase AC and/or DC systems. Depending on the configuration, one c/o contact each [1x2 c/o] or both c/o contacts in parallel [2x1 c/o] can be used for the over- and undervoltage monitoring. The voltage to be monitored (measured value) is applied to terminals B-C. Open- [] or closed-circuit principle [] as well as an adjustable ON [] or OFF tripping [] delay are configurable.

ON-delayed [] voltage window monitoring with parallel switching c/o contacts [1x2 c/o]:

If the measured value exceeds resp. drops below the adjusted threshold value, the tripping delay T_V starts, when [] is configured. If T_V is complete and the measured value is still exceeding resp. below the threshold value minus resp. plus the fixed hysteresis (5%), the output relays energize [] / de-energize [].

If the measured value exceeds resp. drops below the threshold value plus resp. minus the hysteresis and the latching function is not activated [], the output relays de-energize [] / energize []. With activated latching function [] the output relays remain energized [] and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized [] and energize only, when the supply voltage is switched off and then again switched on = Reset.

OFF-delayed [] voltage window monitoring with parallel switching c/o contacts [1x2 c/o]:

If the measured value exceeds resp. drops below the adjusted threshold value, the output relays energize [] / de-energize [], when [] is configured, and remain in this position during the set tripping delay T_V .

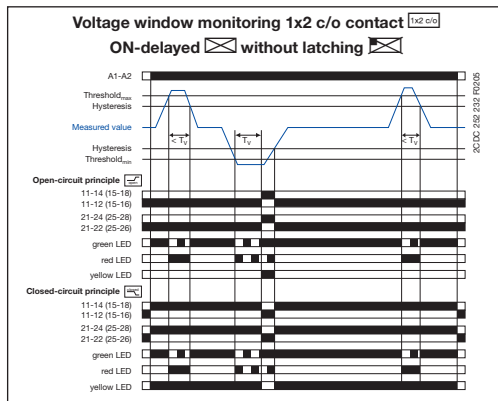
If the measured value exceeds resp. drops below the threshold value plus resp. minus the fixed hysteresis (5%) and the latching function is not activated [], the tripping delay T_V starts.

After completion of T_V , the output relays de-energize [] / energize [], provided that the latching function is not activated []. With activated latching function [] the output relays remain energized [] and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized [] and energize only, when the supply voltage is switched off and then again switched on = Reset.

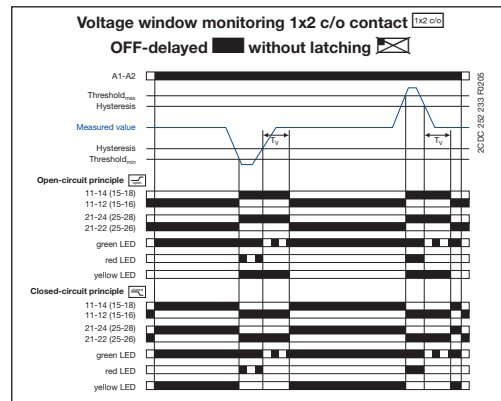
When [1x2 c/o] is adjusted on the device, the functionality is equivalent to the one described above. There is only to consider that in this case, instead of both output relays, only one output relay each will be switched.

">U" = 11₁₅-12₁₆/14₁₈ ; "<U" = 21₂₅-22₂₆/24₂₈

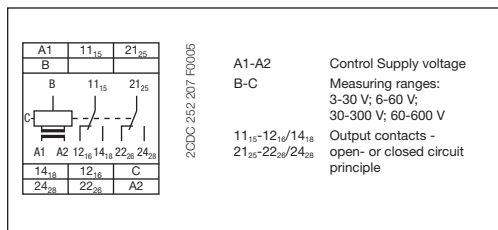
Function diagrams CM-EFS.2



Further function diagrams see data sheet.



Connection diagram CM-EFS.2



DIP switch functions CM-EFS.2

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

OFF = Default

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 contact
OFF 1x2 c/o contacts

Type	Control supply voltage	Tripping delay	Order code	Pack. unit piece	Price	Weight
	50/60 Hz	T_V adjustable			1 piece	1 piece kg / lb

Measuring ranges AC/DC: 3-30 V; 6-60 V; 30-300 V; 60-600 V

CM-EFS.2	24-240 V AC/DC	0 or 0.1-30 s	1SVR 430 750 R0400	1		0.12 / 0.26
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• Technical diagrams2/102	• Dimensional drawings2/103
• Accessories2/104		

Current monitoring relays, single-phase CM-SRS.1, CM-SRS.2, CM-SRS.M and CM-SFS.2

Technical data

2

Type		CM-SRS.1	CM-SRS.2	CM-SRS.M	CM-SFS.2	
Input circuit - Supply circuit		A1-A2				
Rated control supply voltage U_s	A1-A2	110-130 V AC				
	A1-A2	220-240 V AC				
	A1-A2	24-240 V AC/DC				
Rated control supply voltage U_s 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 time		20 ms				
Transient overvoltage protection		Varistors				
Input circuit - Measuring circuit		B1/B2/B3-C				
Monitoring function		over- or undercurrent monitoring configurable			over- and under- current monitoring	
Measuring method		True RMS measuring principle				
Measuring in- puts	Terminal connection	CM-SxS.x1			CM-SxS.x2	
	Measuring ranges AC/DC	B1-C	B2-C	B3-C	B1-C	B2-C B3-C
	Input resistance	3-30 mA	10-100 mA	0.1-1 A	0.3-1.5 A	1-5 A 3-15 A ²⁾
	Pulse overload capacity $t < 1$ s	3.3 Ω	1 Ω	0.1 Ω	0.05 Ω	0.01 Ω 0.0025 Ω
	Continous capacity	500 mA	1 A	10 A	15 A	50 A 100 A
		50 mA	150 mA	1.5 A	2 A	7 A 17 A
Threshold value(s)		adjustable within the indicated measuring range				
Setting accuracy of threshold value		10 %				
Repeat accuracy (constant parameters)		± 0.07 % of full scale				
Hysteresis related to the threshold value		3-30 % adjustable			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 control supply voltage tolerance		$\Delta U \leq 0.5$ %				
Accuracy within the temperature range		$\Delta U \leq 0.06$ % / $^{\circ}\text{C}$				
Timing circuit						
Start-up delay T_s		none		0 or 0.1-30 s adjustable		
Tripping delay T_v		none	0 or 0.1-30 s adjustable			
Repeat accuracy (constant parameters)		± 0.07 % of full scale				
Accuracy within the control supply voltage tolerance		-	$\Delta t \leq 0.5$ %			
Accuracy within the temperature range		-	$\Delta t \leq 0.06$ % / $^{\circ}\text{C}$			
Indication of operational states						
Control supply voltage	U/T: green LED	: control supply voltage applied, : start-up delay T_s active, : tripping delay T_v active				
Measured value	I: red LED	: overcurrent, : undercurrent				
Relay status	R: yellow LED	: relay energized, no latching function : relay energized, active latching function : relay de-energized, active latching function				
Output circuits		11(15)-12(16)/14(18), 21(25)-22(26)/24(28) - Relays				
Kind of output		1 c/o contact	2 c/o contacts		1x2 c/o contacts or 2x1 c/o contact configurable	
Operating principle ¹⁾		open-circuit principle		open- or closed-circuit principle configurable		
Contact material		AgNi				
Rated operational voltage U_o	IEC/EN 60947-1	250 V				
Minimum switching voltage / minimum switching current		24 V / 10 mA				
Maximum switching voltage / maximum switching current		250 V AC / 4 A AC				

Current monitoring relays, single-phase CM-SRS.1, CM-SRS.2, CM-SRS.M and CM-SFS.2

Technical data










Type		CM-SRS.1	CM-SRS.2	CM-SRS.M	CM-SFS.2
Rated operational current I _e (IEC/EN 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	
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 (Make/Break) at B 300			3600/360 VA	
Mechanical lifetime			30x10 ⁶ switching cycles		
Electrical lifetime (AC12, 230 V, 4 A)			0.1x10 ⁶ switching cycles		
Max. fuse rating to achieve short circuit protection	n/c contact	6 A fast-acting		10 A fast-acting	6 A fast-acting
	n/o contact			10 A fast-acting	
General data					
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 (IEC/EN 60715)			
Mounting position		any			
Degree of protection	enclosure / terminals	IP50 / IP20			
Electrical connection					
Wire size	fine-strand with(out) wire end ferrule	2 x 0.75-2.5 mm ² (2 x 18-14 AWG)			
	rigid	2 x 0.5-4 mm ² (2 x 20-12 AWG)			
Stripping length		7 mm (0.28 in)			
Tightening torque		0.6-0.8 Nm			
Environmental data					
Ambient temperature range	operation / storage	-20...+60 °C / -40...+85 °C			
Damp heat (IEC 60068-2-30)		55 °C, 6 cycles			
Vibration (sinusoidal) (IEC/EN 60255-21-1)		Class 2			
Shock (IEC/EN 60255-21-2)		Class 2			
Isolation data					
Rated insulation voltage (VDE 0110, IEC 60947-1, IEC/EN 60255-5)	supply / measuring circuit / output	600 V			
	supply / output 1 / output 2	250 V			
Rated impulse withstand voltage U _{imp} (IEC/EN 60947-1, IEC/EN 60255-5)	supply / measuring circuit / output	6 kV 1.2/50 µs			
	supply / output 1 / output 2	4 kV 1.2/50 µs			
Pollution degree (VDE 0110, IEC 664, IEC/EN 60255-5)		3			
Overvoltage category (VDE 0110, IEC 664, IEC/EN 60255-5)		III			
Standards					
Product standard		IEC/EN 60255-6			
Low Voltage Directive		2006/95/EC			
EMC Directive		2004/108/EC			
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			

¹⁾ Open-circuit principle: output relay energizes if the measured value exceeds \geq / falls below \leq the adjusted threshold value
 Closed-circuit principle: output relay de-energizes if measured value exceeds \geq / falls below \leq the adjusted threshold value
²⁾ In case of measured currents > 10 A, lateral spacing has to be min. 10 mm

Voltage monitoring relays, single-phase CM-ESS.1, CM-ESS.2, CM-ESS.M and CM-EFS

Technical data

2

Type		CM-ESS.1	CM-ESS.2	CM-ESS.M	CM-EFS.2																				
Input circuit - Supply circuit		A1-A2																							
Rated control supply voltage U_s	A1-A2	110-130 V AC																							
	A1-A2	220-240 V AC																							
	A1-A2	24-240 V AC/DC																							
Rated control supply voltage U_s 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 time		20 ms																							
Transient overvoltage protection		Varistors																							
Input circuit - Measuring circuit		B-C																							
Monitoring function		over- or undervoltage monitoring configurable																							
Measuring method		True RMS measuring principle																							
Measuring inputs	Terminal connection	<table border="1"> <thead> <tr> <th colspan="4">CM-ExS</th> </tr> <tr> <th>B-C</th> <th>B-C</th> <th>B-C</th> <th>B-C</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Ω</td> <td>Ω</td> <td>Ω</td> <td>Ω</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				CM-ExS				B-C	B-C	B-C	B-C					Ω	Ω	Ω	Ω				
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	B-C	B-C	B-C	B-C																					
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Measuring range AC/DC																									
Input resistance																									
Pulse overload capacity $t < 1$ s																									
Continous capacity																									
Threshold value(s)		adjustable within the indicated measuring range																							
Setting accuracy of threshold value		10 %																							
Repeat accuracy (constant parameters)		± 0.07 % of full scale																							
Hysteresis related to the threshold value		3-30 % adjustable			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 control supply voltage tolerance		$\Delta U \leq 0.5$ %																							
Accuracy within the temperature range		$\Delta U \leq 0.06$ % / °C																							
Transient overvoltage protection		Varistors																							
Timing circuit																									
Delay time T_v		none	0 or 0.1-30 s adjustable																						
Repeat accuracy (constant parameters)		± 0.07 % of full scale																							
Accuracy within the control supply voltage tolerance		-	$\Delta t \leq 0.5$ %																						
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Control supply voltage	U/T: green LED	 : control supply voltage applied,  : tripping delay T_v active																							
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Output circuits		11(15)-12(16)/14(18), 21(25)-22(26)/24(28) - Relays																							
Kind of output		1 c/o contact	2 c/o contacts		1x2 c/o contacts or 2x1 c/o contact configurable																				
Operating principle ¹⁾		open-circuit principle		open- or closed-circuit principle configurable																					
Contact material		AgNi																							
Rated operational voltage U_o	IEC/EN 60947-1	250 V																							
Minimum switching voltage / minimum switching current		24 V / 10 mA																							
Maximum switching voltage / maximum switching current		250 V AC / 4 A AC																							

Voltage monitoring relays, single-phase CM-ESS.1, CM-ESS.2, CM-ESS.M and CM-EFS

Technical data

Type	CM-ESS.1	CM-ESS.2	CM-ESS.M	CM-EFS.2
Rated operational current I _e (IEC/EN 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	
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 (Make/Break) at B 300		3600/360 VA	
Mechanical lifetime		30x10 ⁶ switching cycles		
Electrical lifetime (AC12, 230 V, 4 A)		0.1x10 ⁶ switching cycles		
Max. fuse rating to achieve short circuit protection	n/c contact	6 A fast-acting	10 A fast-acting	6 A fast-acting
	n/o contact		10 A fast-acting	
General data				
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 (IEC/EN 60715)			
Mounting position	any			
Degree of protection	enclosure / terminals	IP50 / IP20		
Electrical connection				
Wire size	fine-strand with(out) wire end ferrule	2 x 0.75-2.5 mm ² (2 x 18-14 AWG)		
	rigid	2 x 0.5-4 mm ² (2 x 20-12 AWG)		
Stripping length	7 mm (0.28 in)			
Tightening torque	0.6-0.8 Nm			
Environmental data				
Ambient temperature range	operation / storage	-20...+60 °C / -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				
Rated insulation voltage (VDE 0110, IEC 60947-1, IEC/EN 60255-5)	supply / measuring circuit / output	600 V		
	supply / output 1 / output 2	250 V		
Rated impulse withstand voltage U _{imp} (IEC/EN 60947-1, IEC/EN 60255-5)	supply / measuring circuit / output	6 kV 1.2/50 μs		
	supply / output 1 output 2	4 kV 1.2/50 μs		
Pollution degree (VDE 0110, IEC 664, IEC/EN 60255-5)		3		
Overvoltage category (VDE 0110, IEC 664, IEC/EN 60255-5)		III		
Standards				
Product standard	IEC/EN 60255-6			
Low Voltage Directive	2006/95/EC			
EMC Directive	2004/108/EC			
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		

¹⁾ Open-circuit principle: output relay energizes if the measured value exceeds / falls below the adjusted threshold value
 Closed-circuit principle: output relay de-energizes if measured value exceeds / falls below the adjusted threshold value²⁾