

# Electronic monitoring relays PMDsrange

## Thermistor monitor S1MO



The thermistor monitoring relay S1MO is used as a protection device in temperature monitoring circuits in accordance with EN 44081. It protects motors, generators, storage areas, etc. from overheating.

### Unit features

- ▶ Relay outputs:  
2 auxiliary contacts (C/O)
- ▶ Measuring circuit for connecting a temperature sensor (PTC resistor)
- ▶ Monitors the temperature sensor for short circuit
- ▶ Reset button
- ▶ Connection option for external reset button
- ▶ Manual reset with non-volatile reset latch
- ▶ LED as supply voltage indicator
- ▶ LED as fault indicator

### Unit description

The thermistor monitoring relay is enclosed in an S-95 slimline housing. There are 5 versions available for AC operation and one for AC and DC operation.

A temperature sensor is connected to the S1MO measuring circuit. If the temperature exceeds a defined value, i.e. the resistance of the temperature sensor reaches the response value, the output contacts switch. Contacts 11-14 and 21-24 open, contacts 11-12 and 21-22 close. If the temperature then falls, i.e. the resistance of the temperature sensor reaches the release value, the unit can only be switched back on by pressing the reset button S1 (or the external reset button). The non-volatile reset latch prevents the unit from starting up again automatically after a fault, when the voltage fails and is then restored.

# Electronic monitoring relays PMDsrange

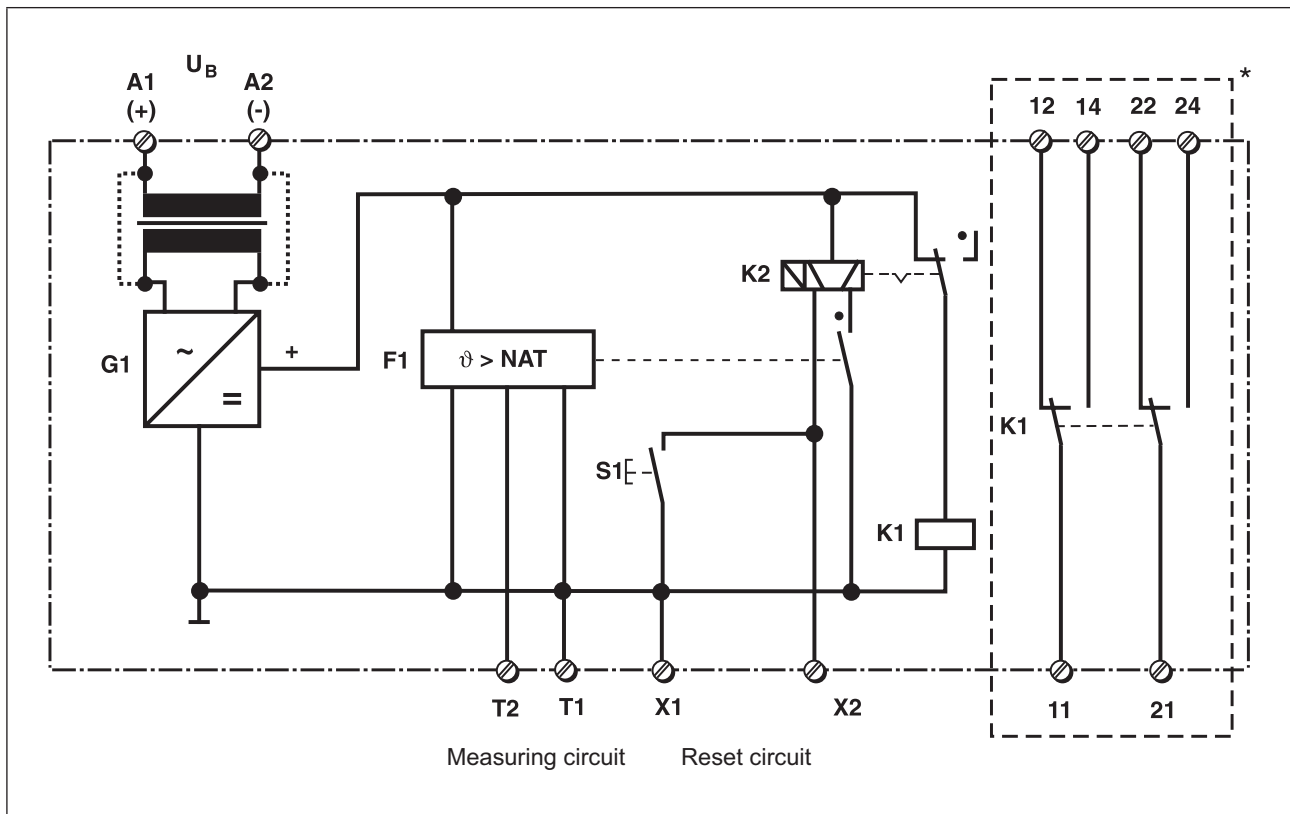
## Thermistor monitor S1MO

### Safety features

The unit meets the following safety requirements:

- ▶ Operates to normally energised mode
- ▶ Protection of the monitored unit is maintained in the following cases:
  - Power failure
  - Coil defect
  - Open circuit
  - Short-circuit of the temperature sensor

### Internal wiring diagram

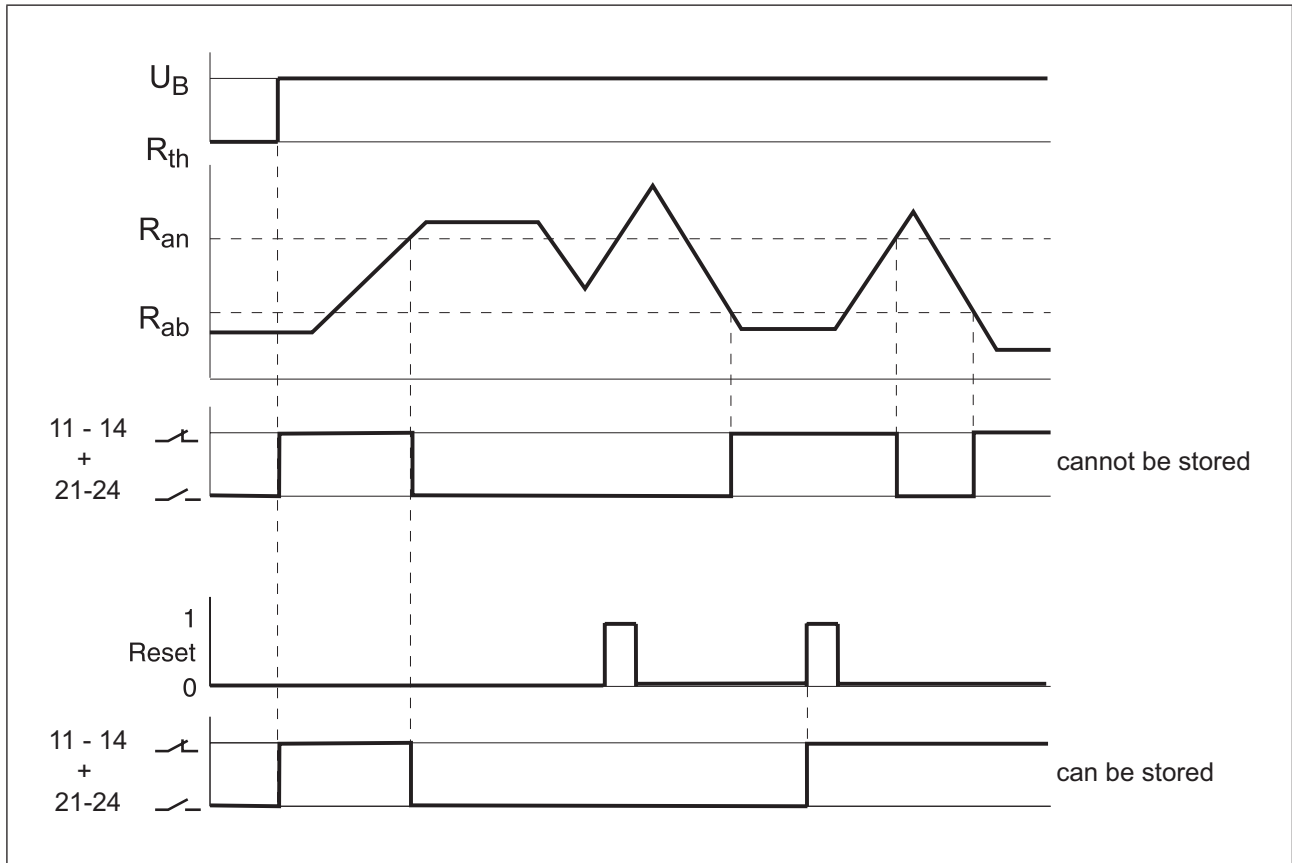


\* Insulation between the non-marked area and the relay contacts: Basic insulation (over-voltage category III), safe separation (over-voltage category II)

# Electronic monitoring relays PMDsrangle

## Thermistor monitor S1MO

Timing diagram



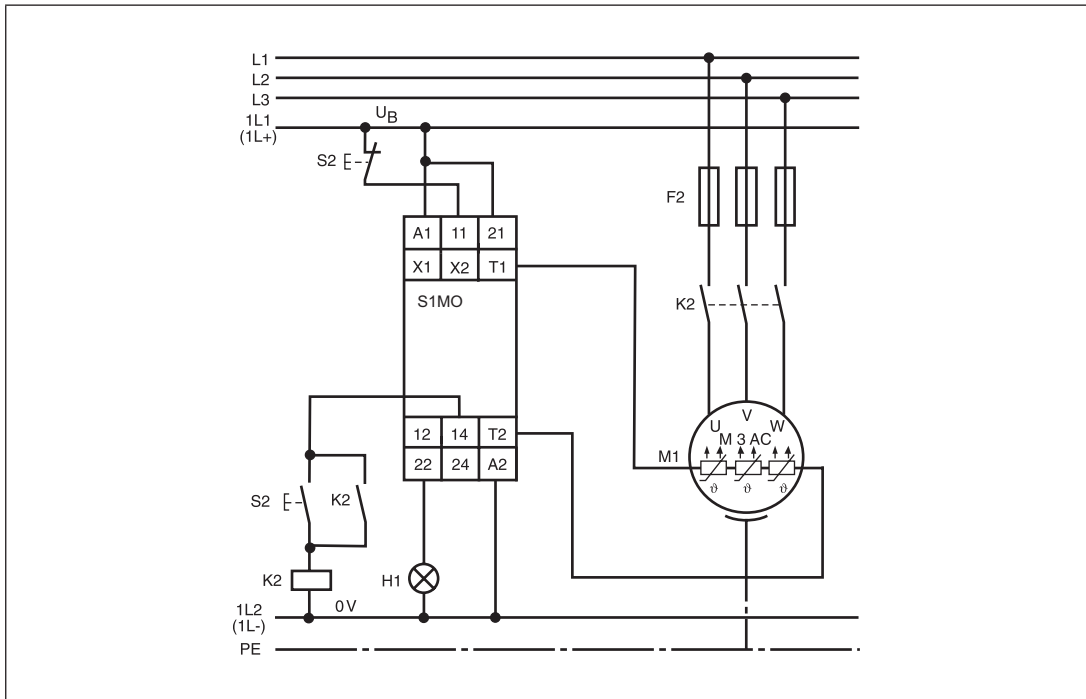
**Legend:**

- ▶  $U_B$  Supply voltage
- ▶  $R_{on}$  Response value
- ▶  $R_{off}$  Release value
- ▶  $R_{th}$  PTC resistor

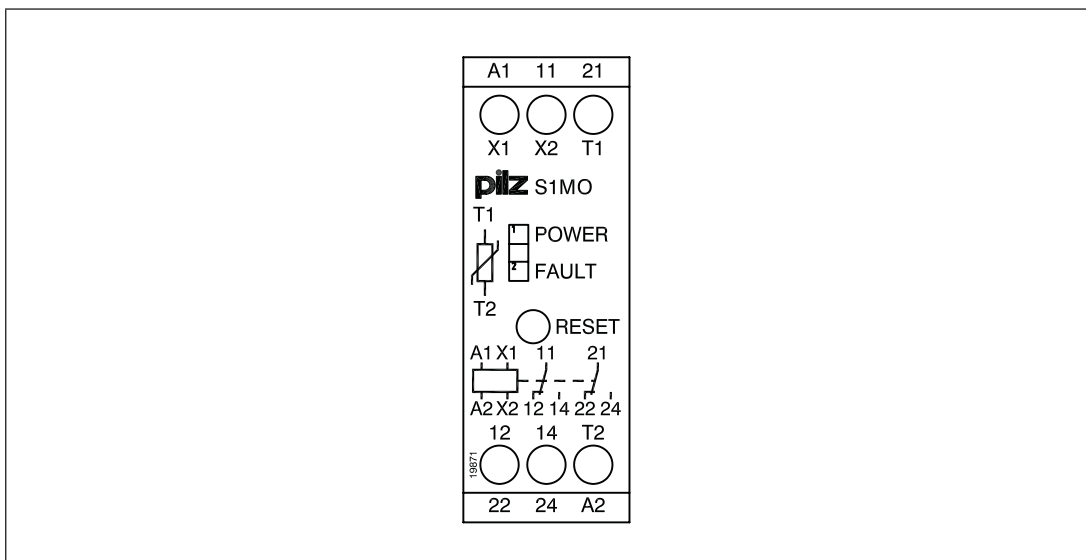
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## Thermistor monitor S1MO

### Connection example



### Terminal configuration



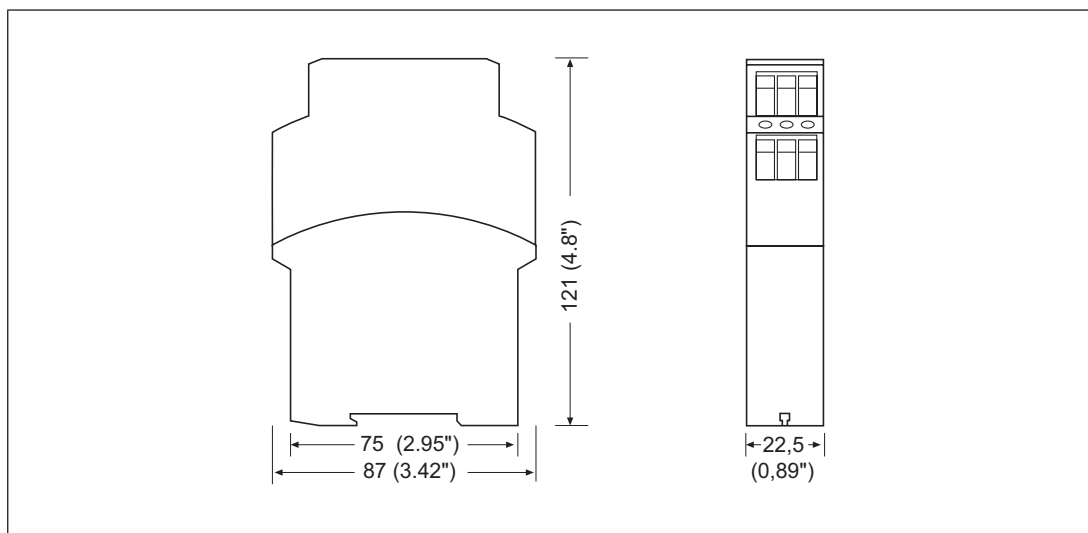
# Electronic monitoring relays PMDsrange

## Thermistor monitor S1MO

### Installation

- ▶ The unit should be installed in a control cabinet with a protection type of at least IP54.
- ▶ Use the notch on the rear of the unit to attach it to a DIN rail.
- ▶ Ensure the unit is mounted securely on a vertical DIN rail (35 mm) by using a fixing element (e.g. retaining bracket or an end angle).

### Dimensions



# Electronic monitoring relays PMDsrangle

## Thermistor monitor S1MO

### Technical details

Order no. 840600, 840620, 840630

See below for more order numbers

General	840600	840620	840630
Approvals	CCC, CE, cULus Listed	CCC, CE, cULus Listed	CCC, CE, cULus Listed
Electrical data	840600	840620	840630
Supply voltage			
Voltage	24 V	48 V	110 V
Type	AC/DC	AC	AC
Voltage tolerance	-15 %/+10 %	-15 %/+10 %	-15 %/+10 %
Output of external power supply (AC)	3,5 VA	3,5 VA	3,5 VA
Output of external power supply (DC)	2,0 W	–	–
Frequency range AC	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Max. inrush current at UB	10,00 A	10,00 A	10,00 A
Continuous duty	100 %	100 %	100 %
Min. unit fuse protection	1,00 A	1,00 A	1,00 A
Max. unit fuse protection F1	Max. conductor cross section	Max. conductor cross section	Max. conductor cross section
Measuring circuit	840600	840620	840630
Response value Ron	3,6 kOhm, ±10 %	3,6 kOhm, ±10 %	3,6 kOhm, ±10 %
Release value Rab	1,8 kOhm, ±10 %	1,8 kOhm, ±10 %	1,8 kOhm, ±10 %
Cold resistance at 20 °C	1,5 kOhm	1,5 kOhm	1,5 kOhm
Relay outputs	840600	840620	840630
Utilisation category			
In accordance with the standard	EN 60947-4-1	EN 60947-4-1	EN 60947-4-1
Auxiliary contacts, AC1 at	240 V	240 V	240 V
Min. current	0,10 A	0,10 A	0,10 A
Max. current	5,0 A	5,0 A	5,0 A
Max. power	1200 VA	1200 VA	1200 VA
Auxiliary contacts, DC1 at	24 V	24 V	24 V
Min. current	0,10 A	0,10 A	0,10 A
Max. current	5,0 A	5,0 A	5,0 A
Max. power	120 W	120 W	120 W

# Electronic monitoring relays PMDsrangle

## Thermistor monitor S1MO

Relay outputs	840600	840620	840630
Utilisation category			
In accordance with the standard	EN 60947-5-1	EN 60947-5-1	EN 60947-5-1
Auxiliary contacts, AC15 at	230 V	230 V	230 V
Max. current	2,0 A	2,0 A	2,0 A
Auxiliary contacts, DC13 (6 cycles/min) at	24 V	24 V	24 V
Max. current	1,5 A	1,5 A	1,5 A
Contact fuse protection, external auxiliary contacts			
Blow-out fuse, quick	6 A	6 A	6 A
Blow-out fuse, slow	4 A	4 A	4 A
Circuit breaker, 24 V AC/DC, characteristic B/C	4 A	4 A	4 A
Contact material	AgCdO + 3,0 µm Au	AgCdO + 3,0 µm Au	AgCdO + 3,0 µm Au
<b>Times</b>	<b>840600</b>	<b>840620</b>	<b>840630</b>
Switch-on delay			
Typ. switch-on delay	350 ms	350 ms	350 ms
<b>Environmental data</b>	<b>840600</b>	<b>840620</b>	<b>840630</b>
Climatic suitability	EN 60068-2-78	EN 60068-2-78	EN 60068-2-78
Ambient temperature			
Temperature range	-10 - 55 °C	-10 - 55 °C	-10 - 55 °C
Storage temperature			
Temperature range	-40 - 85 °C	-40 - 85 °C	-40 - 85 °C
EMC	EN 60947-5-1, EN 61000-6-2	EN 60947-5-1, EN 61000-6-2	EN 60947-5-1, EN 61000-6-2
Vibration			
In accordance with the standard	EN 60068-2-6	EN 60068-2-6	EN 60068-2-6
Frequency	10,0 - 55,0 Hz	10,0 - 55,0 Hz	10,0 - 55,0 Hz
Amplitude	0,35 mm	0,35 mm	0,35 mm
Airgap creepage			
In accordance with the standard	EN 60947-1	EN 60947-1	EN 60947-1
Overvoltage category	III / II	III / II	III / II
Pollution degree	2	2	2
Rated insulation voltage	250 V	250 V	250 V
Rated impulse withstand voltage	4,00 kV	4,00 kV	4,00 kV

# Electronic monitoring relays PMDsrangle

## Thermistor monitor S1MO

<b>Environmental data</b>	<b>840600</b>	<b>840620</b>	<b>840630</b>
Protection type			
Mounting (e.g. cabinet)	<b>IP54</b>	<b>IP54</b>	<b>IP54</b>
Housing	<b>IP40</b>	<b>IP40</b>	<b>IP40</b>
Terminals	<b>IP20</b>	<b>IP20</b>	<b>IP20</b>
<b>Mechanical data</b>	<b>840600</b>	<b>840620</b>	<b>840630</b>
Mounting position	<b>Any</b>	<b>Any</b>	<b>Any</b>
Mechanical life	<b>10,000,000 cycles</b>	<b>10,000,000 cycles</b>	<b>10,000,000 cycles</b>
Material			
Bottom	<b>PPO UL 94 V0</b>	<b>PPO UL 94 V0</b>	<b>PPO UL 94 V0</b>
Front	<b>ABS UL 94 V0</b>	<b>ABS UL 94 V0</b>	<b>ABS UL 94 V0</b>
Top	<b>PPO UL 94 V0</b>	<b>PPO UL 94 V0</b>	<b>PPO UL 94 V0</b>
Conductor cross section with screw terminals			
1 core flexible	<b>0,20 - 4,00 mm<sup>2</sup>, 24 - 10 AWG</b>	<b>0,20 - 4,00 mm<sup>2</sup>, 24 - 10 AWG</b>	<b>0,20 - 4,00 mm<sup>2</sup>, 24 - 10 AWG</b>
2 core with the same cross section, flexible with crimp connectors, no plastic sleeve	<b>0,20 - 2,50 mm<sup>2</sup>, 24 - 14 AWG</b>	<b>0,20 - 2,50 mm<sup>2</sup>, 24 - 14 AWG</b>	<b>0,20 - 2,50 mm<sup>2</sup>, 24 - 14 AWG</b>
2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors	<b>0,20 - 2,50 mm<sup>2</sup>, 24 - 14 AWG</b>	<b>0,20 - 2,50 mm<sup>2</sup>, 24 - 14 AWG</b>	<b>0,20 - 2,50 mm<sup>2</sup>, 24 - 14 AWG</b>
Torque setting with screw terminals	<b>0,60 Nm</b>	<b>0,60 Nm</b>	<b>0,60 Nm</b>
Connection type	<b>Screw terminal</b>	<b>Screw terminal</b>	<b>Screw terminal</b>
Mounting type	<b>Fixed</b>	<b>Fixed</b>	<b>Fixed</b>
Dimensions			
Height	<b>87,0 mm</b>	<b>87,0 mm</b>	<b>87,0 mm</b>
Width	<b>22,5 mm</b>	<b>22,5 mm</b>	<b>22,5 mm</b>
Depth	<b>121,0 mm</b>	<b>121,0 mm</b>	<b>121,0 mm</b>
Weight	<b>120 g</b>	<b>165 g</b>	<b>165 g</b>



# Electronic monitoring relays PMDsrangle

## Thermistor monitor S1MO

Order no. 840650, 840655, 839660

General	840650	840655	839660
Approvals	CCC, CE, cULus Listed	CCC, CE, cULus Listed	CCC, CE
Electrical data	840650	840655	839660
Supply voltage			
Voltage	230 V	240 V	400 V
Type	AC	AC	AC
Voltage tolerance	-15 %/+10 %	-15 %/+10 %	-15 %/+10 %
Output of external power supply (AC)	3,5 VA	3,5 VA	3,5 VA
Frequency range AC	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Max. inrush current at UB	10,00 A	10,00 A	10,00 A
Continuous duty	100 %	100 %	100 %
Min. unit fuse protection	1,00 A	1,00 A	1,00 A
Max. unit fuse protection F1	Max. conductor cross section	Max. conductor cross section	Max. conductor cross section
Measuring circuit	840650	840655	839660
Response value Ron	3,6 kOhm, ±10 %	3,6 kOhm, ±10 %	3,6 kOhm, ±10 %
Release value Rab	1,8 kOhm, ±10 %	1,8 kOhm, ±10 %	1,8 kOhm, ±10 %
Cold resistance at 20 °C	1,5 kOhm	1,5 kOhm	1,5 kOhm
Relay outputs	840650	840655	839660
Utilisation category			
In accordance with the standard	EN 60947-4-1	EN 60947-4-1	EN 60947-4-1
Auxiliary contacts, AC1 at	240 V	240 V	240 V
Min. current	0,10 A	0,10 A	0,10 A
Max. current	5,0 A	5,0 A	5,0 A
Max. power	1200 VA	1200 VA	1200 VA
Auxiliary contacts, DC1 at	24 V	24 V	24 V
Min. current	0,10 A	0,10 A	0,10 A
Max. current	5,0 A	5,0 A	5,0 A
Max. power	120 W	120 W	120 W
Utilisation category			
In accordance with the standard	EN 60947-5-1	EN 60947-5-1	EN 60947-5-1
Auxiliary contacts, AC15 at	230 V	230 V	230 V
Max. current	2,0 A	2,0 A	2,0 A
Auxiliary contacts, DC13 (6 cycles/min) at	24 V	24 V	24 V
Max. current	1,5 A	1,5 A	1,5 A

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## Thermistor monitor S1MO

Relay outputs	840650	840655	839660
Contact fuse protection, external auxiliary contacts			
Blow-out fuse, quick	6 A	6 A	6 A
Blow-out fuse, slow	4 A	4 A	4 A
Circuit breaker, 24 V AC/DC, characteristic B/C	4 A	4 A	4 A
Contact material	AgCdO + 3,0 µm Au	AgCdO + 3,0 µm Au	AgCdO + 3,0 µm Au
Times	840650	840655	839660
Switch-on delay			
Typ. switch-on delay	350 ms	350 ms	350 ms
Environmental data	840650	840655	839660
Climatic suitability	EN 60068-2-78	EN 60068-2-78	EN 60068-2-78
Ambient temperature			
Temperature range	-10 - 55 °C	-10 - 55 °C	-10 - 55 °C
Storage temperature			
Temperature range	-40 - 85 °C	-40 - 85 °C	-40 - 85 °C
EMC	EN 60947-5-1, EN 61000- 6-2	EN 60947-5-1, EN 61000- 6-2	EN 60947-5-1, EN 61000- 6-2
Vibration			
In accordance with the standard	EN 60068-2-6	EN 60068-2-6	EN 60068-2-6
Frequency	10,0 - 55,0 Hz	10,0 - 55,0 Hz	10,0 - 55,0 Hz
Amplitude	0,35 mm	0,35 mm	0,35 mm
Airgap creepage			
In accordance with the standard	EN 60947-1	EN 60947-1	EN 60947-1
Overvoltage category	III / II	III / II	III / II
Pollution degree	2	2	2
Rated insulation voltage	250 V	250 V	250 V
Rated impulse withstand voltage	4,00 kV	4,00 kV	4,00 kV
Protection type			
Mounting (e.g. cabinet)	IP54	IP54	IP54
Housing	IP40	IP40	IP40
Terminals	IP20	IP20	IP20
Mechanical data	840650	840655	839660
Mounting position	Any	Any	Any
Mechanical life	10,000,000 cycles	10,000,000 cycles	10,000,000 cycles
Material			
Bottom	PPO UL 94 V0	PPO UL 94 V0	PPO UL 94 V0
Front	ABS UL 94 V0	ABS UL 94 V0	ABS UL 94 V0
Top	PPO UL 94 V0	PPO UL 94 V0	PPO UL 94 V0

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## Thermistor monitor S1MO

Mechanical data	840650	840655	839660
Conductor cross section with screw terminals			
1 core flexible	0,20 - 4,00 mm <sup>2</sup> , 24 - 10 AWG	0,20 - 4,00 mm <sup>2</sup> , 24 - 10 AWG	0,20 - 4,00 mm <sup>2</sup> , 24 - 10 AWG
2 core with the same cross section, flexible with crimp connectors, no plastic sleeve	0,20 - 2,50 mm <sup>2</sup> , 24 - 14 AWG	0,20 - 2,50 mm <sup>2</sup> , 24 - 14 AWG	0,20 - 2,50 mm <sup>2</sup> , 24 - 14 AWG
2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors	0,20 - 2,50 mm <sup>2</sup> , 24 - 14 AWG	0,20 - 2,50 mm <sup>2</sup> , 24 - 14 AWG	0,20 - 2,50 mm <sup>2</sup> , 24 - 14 AWG
Torque setting with screw terminals	0,60 Nm	0,60 Nm	0,60 Nm
Connection type	Screw terminal	Screw terminal	Screw terminal
Mounting type	Fixed	Fixed	Fixed
Dimensions			
Height	87,0 mm	87,0 mm	87,0 mm
Width	22,5 mm	22,5 mm	22,5 mm
Depth	121,0 mm	121,0 mm	121,0 mm
Weight	165 g	165 g	165 g

### Order reference

Order reference				
Product type	Features		Terminals	Order no.
S1MO	24 VAC/DC		Screw terminals	840 600
S1MO	48 VAC		Screw terminals	840 620
S1MO	110 VAC		Screw terminals	840 630
S1MO	230 VAC		Screw terminals	840 650
S1MO	240 V AC		Screw terminals	840 655
S1MO	400 VAC		Screw terminals	839 660