

Electronic monitoring relays PMDsrange

Thermistor monitor S1MN



The thermistor monitoring relay S1MN 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 (2 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
- ▶ LED as supply voltage indicator
- ▶ LED as fault indicator
- ▶ Two operating modes:
 - automatic reset
 - manual reset (reset latch)

Unit description

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

A temperature sensor is connected to the measuring circuit of the unit. If the temperature exceeds a defined value, i.e. the resistance of the temperature sensor reaches the response value, the output contacts switch. If the temperature then falls again, i.e. the resistance of the temperature sensor reaches the release value, the auxiliary contacts switch again if automatic reset is selected. The unit is ready for operation. If manual reset is selected, an internal/external button must be operated. The unit can also be reset by interrupting the supply voltage.

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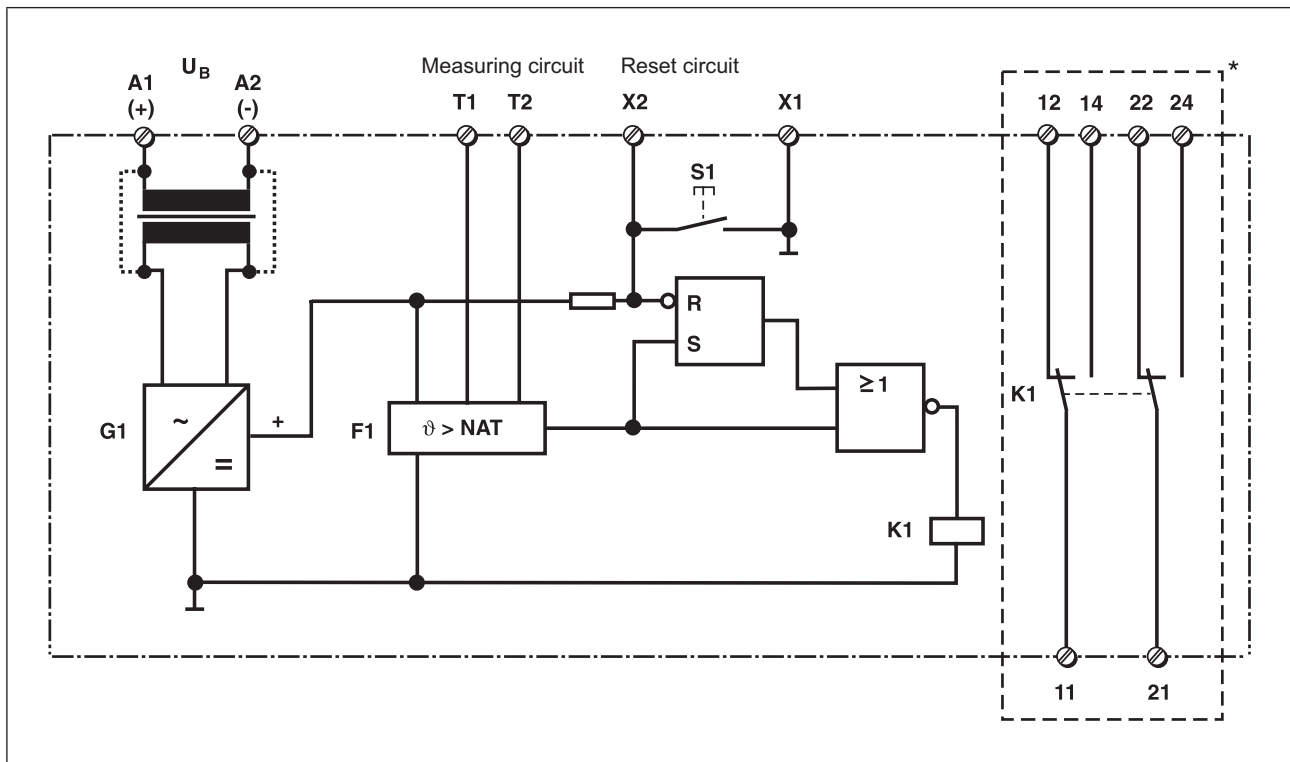
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Safety features

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

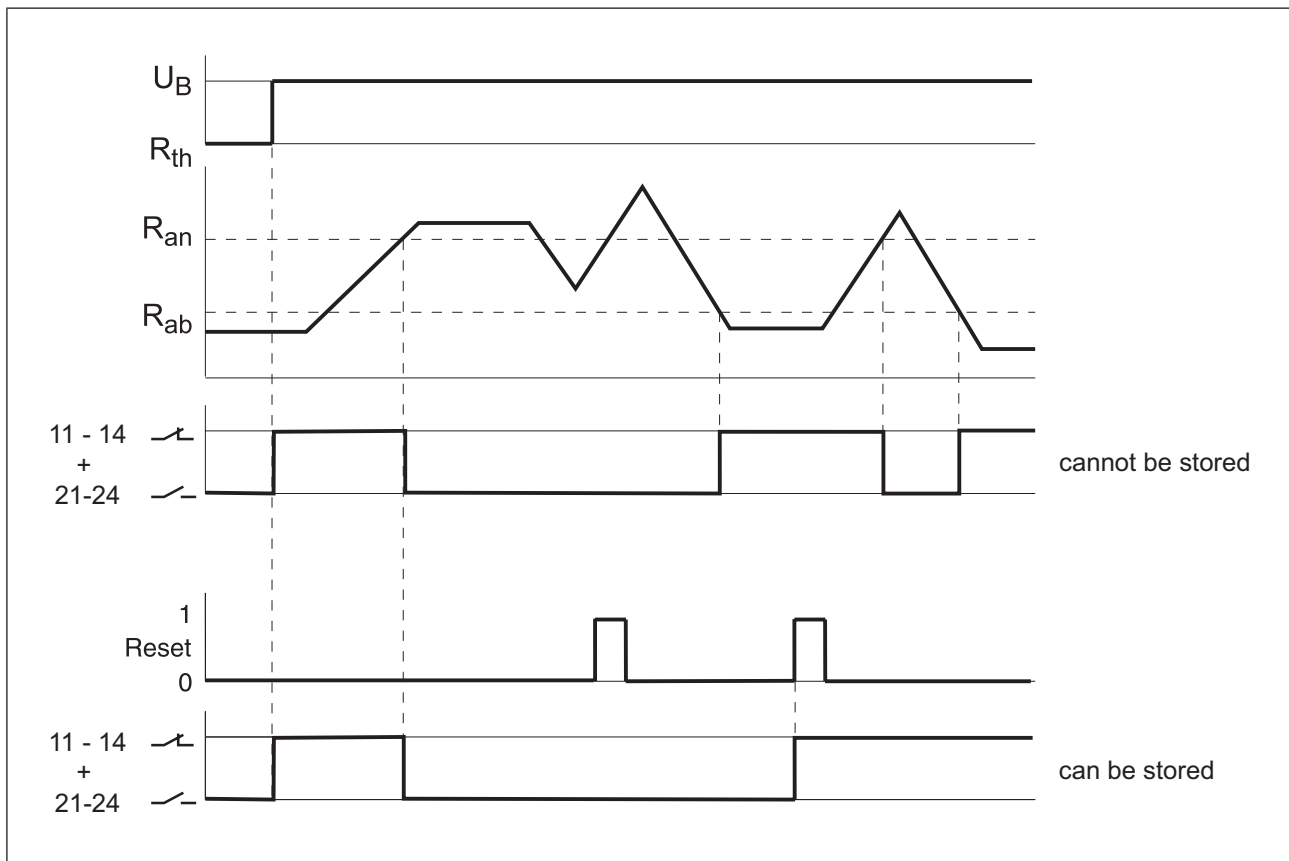


* Insulation between the non-marked area and the relay contacts: Basic insulation (over-voltage category III), safe separation (over-voltage category II)

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Timing diagram



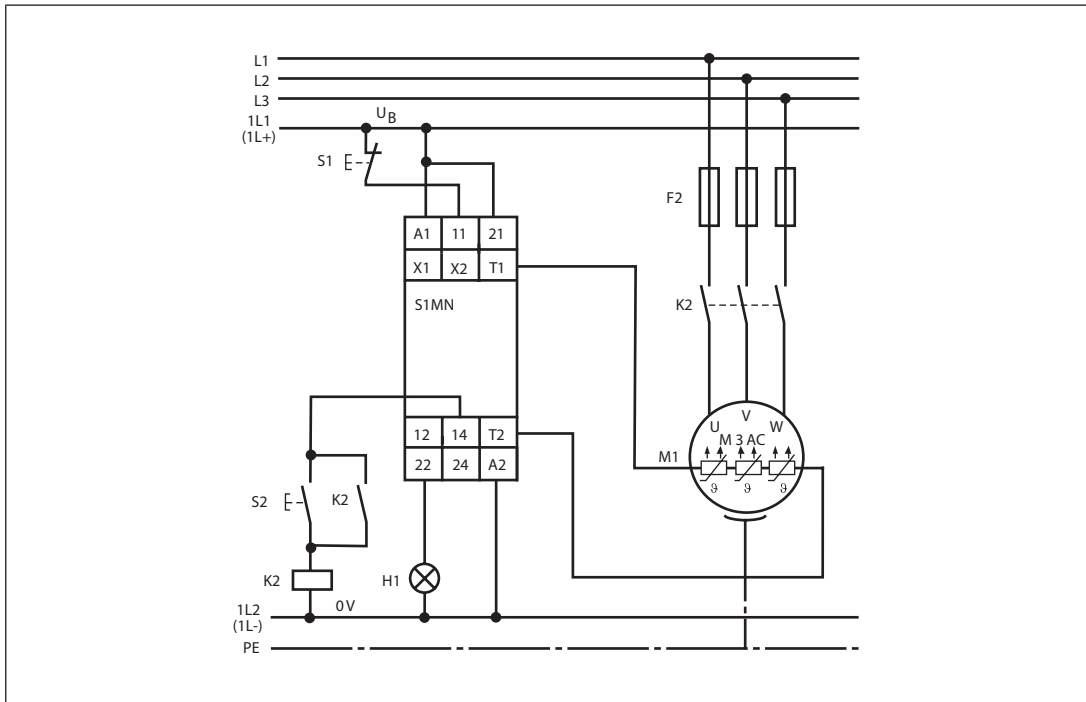
Legend:

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

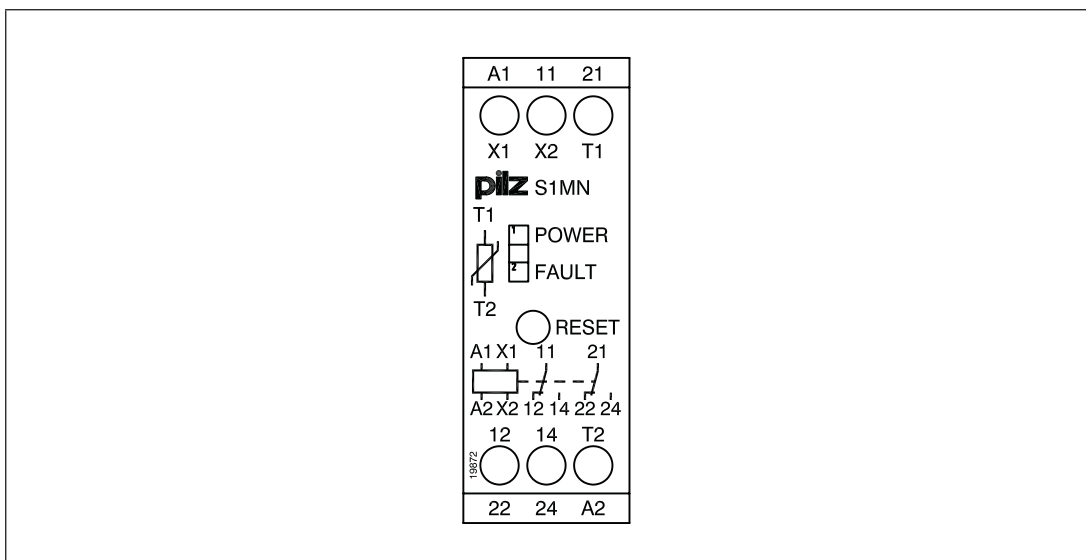
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Connection example



Terminal configuration



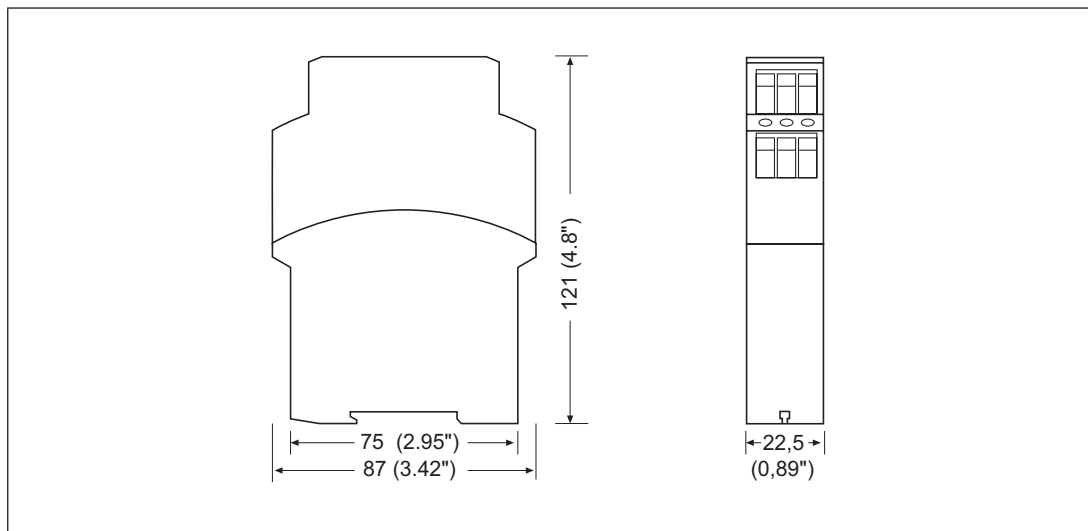
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Installation

- ▶ 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



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Technical details

Order no. 840400, 840405, 840410

See below for more order numbers

General	840400	840405	840410
Approvals	CCC, CE, cULus Listed	CCC, CE, cULus Listed	CCC, CE, cULus Listed
Electrical data	840400	840405	840410
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	840400	840405	840410
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	840400	840405	840410
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

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Relay outputs	840400	840405	840410
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
Times	840400	840405	840410
Switch-on delay			
Typ. switch-on delay	350 ms	350 ms	350 ms
Environmental data	840400	840405	840410
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

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Environmental data	840400	840405	840410
Protection type			
Mounting (e.g. cabinet)	IP54	IP54	IP54
Housing	IP40	IP40	IP40
Terminals	IP20	IP20	IP20
Mechanical data	840400	840405	840410
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
Conductor cross section with screw terminals			
1 core flexible	0,20 - 4,00 mm², 24 - 10 AWG	0,20 - 4,00 mm², 24 - 10 AWG	0,20 - 4,00 mm², 24 - 10 AWG
2 core with the same cross section, flexible with crimp connectors, no plastic sleeve	0,20 - 2,50 mm², 24 - 14 AWG	0,20 - 2,50 mm², 24 - 14 AWG	0,20 - 2,50 mm², 24 - 14 AWG
2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors	0,20 - 2,50 mm², 24 - 14 AWG	0,20 - 2,50 mm², 24 - 14 AWG	0,20 - 2,50 mm², 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	120 g	160 g	160 g

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Order no. 840415, 840420, 839425

General	840415	840420	839425
Approvals	CCC, CE, cULus Listed	CCC, CE, cULus Listed	CCC, CE
Electrical data	840415	840420	839425
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	840415	840420	839425
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	840415	840420	839425
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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Relay outputs	840415	840420	839425
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	840415	840420	839425
Switch-on delay			
Typ. switch-on delay	350 ms	350 ms	350 ms
Environmental data	840415	840420	839425
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	840415	840420	839425
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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Mechanical data	840415	840420	839425
Conductor cross section with screw terminals			
1 core flexible	0,20 - 4,00 mm ² , 24 - 10 AWG	0,20 - 4,00 mm ² , 24 - 10 AWG	0,20 - 4,00 mm ² , 24 - 10 AWG
2 core with the same cross section, flexible with crimp connectors, no plastic sleeve	0,20 - 2,50 mm ² , 24 - 14 AWG	0,20 - 2,50 mm ² , 24 - 14 AWG	0,20 - 2,50 mm ² , 24 - 14 AWG
2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors	0,20 - 2,50 mm ² , 24 - 14 AWG	0,20 - 2,50 mm ² , 24 - 14 AWG	0,20 - 2,50 mm ² , 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	160 g	160 g	160 g

Order reference

Order reference				
Product type	Features		Terminals	Order no.
S1MN	24 VAC/DC		Screw terminals	840 400
S1MN	48 VAC		Screw terminals	840 405
S1MN	110 VAC		Screw terminals	840 410
S1MN	230 VAC		Screw terminals	840 415
S1MN	240 VAC		Screw terminals	840 420
S1MN	400 VAC		Screw terminals	839 425