

## Thermistor monitor S1MS



The S1MS thermistor monitoring relay 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

- ▶ For DC and AC supplies
- ▶ Normally energised mode
- ▶ Automatic reset

### 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.

Features:

- ▶ Relay outputs: 2 auxiliary contacts (2 C/O)
- ▶ Measuring circuit for connecting a temperature sensor (PTC resistor, up to  $R_{\max}$  1.5 k $\Omega$ )
- ▶ Automatic reset
- ▶ LED for supply voltage and fault

The S1MS unit meets the following safety requirements:

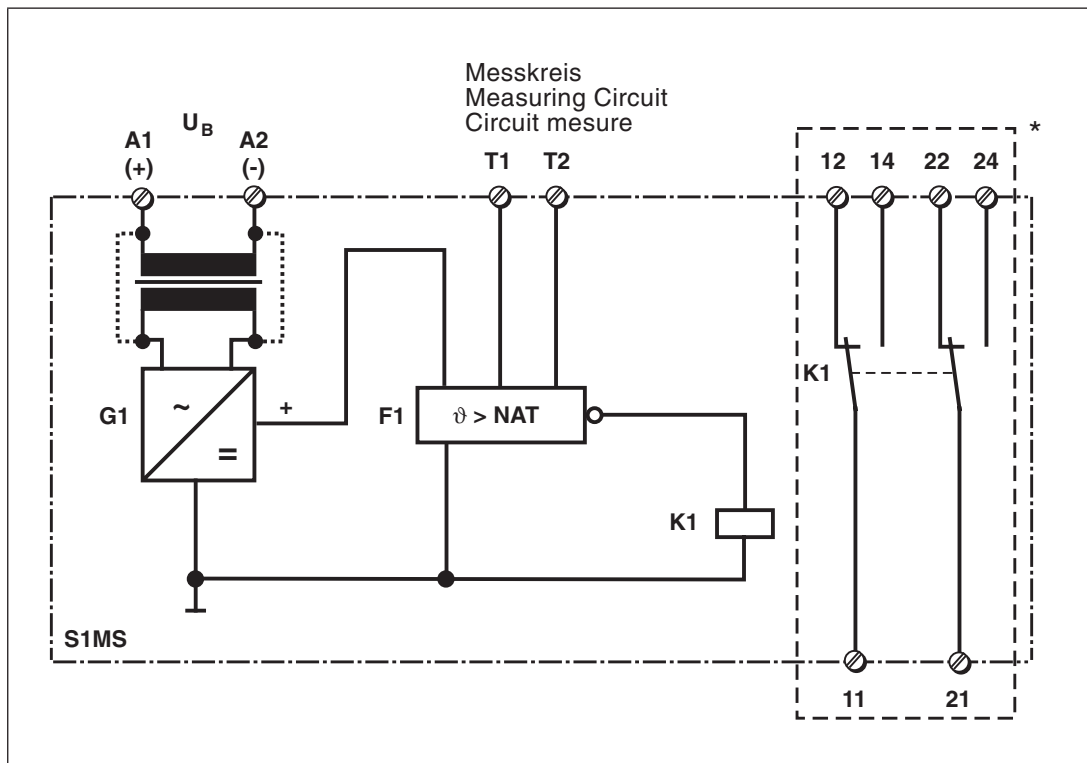
- ▶ Operates to normally energised mode
- ▶ Protection of the monitored unit is guaranteed in the case of:
  - Power supply failure
  - Coil defect
  - Open circuit

A temperature sensor is connected to the S1MS 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 again, i.e. the resistance of the temperature sensor reaches the release value, the auxiliary contacts automatically switch again. The unit is ready for operation.

## Thermistor monitor S1MS

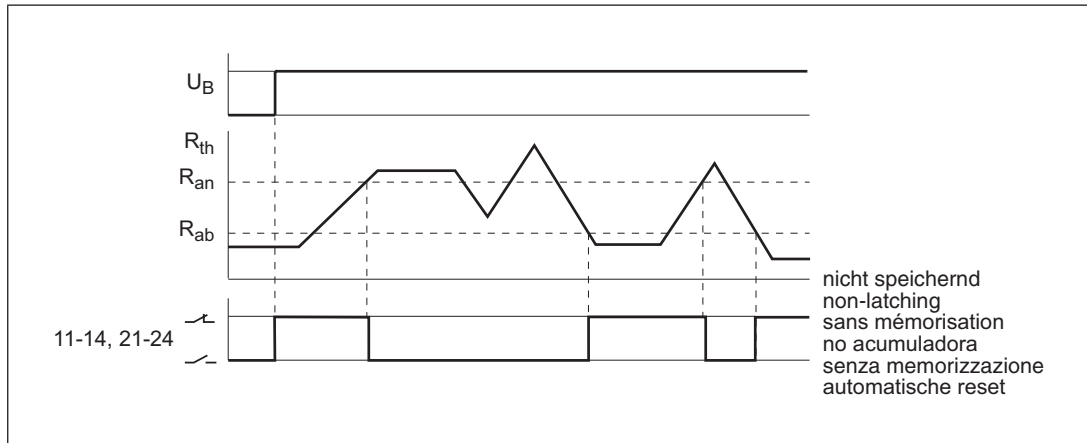
### Internal wiring diagram



\* 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



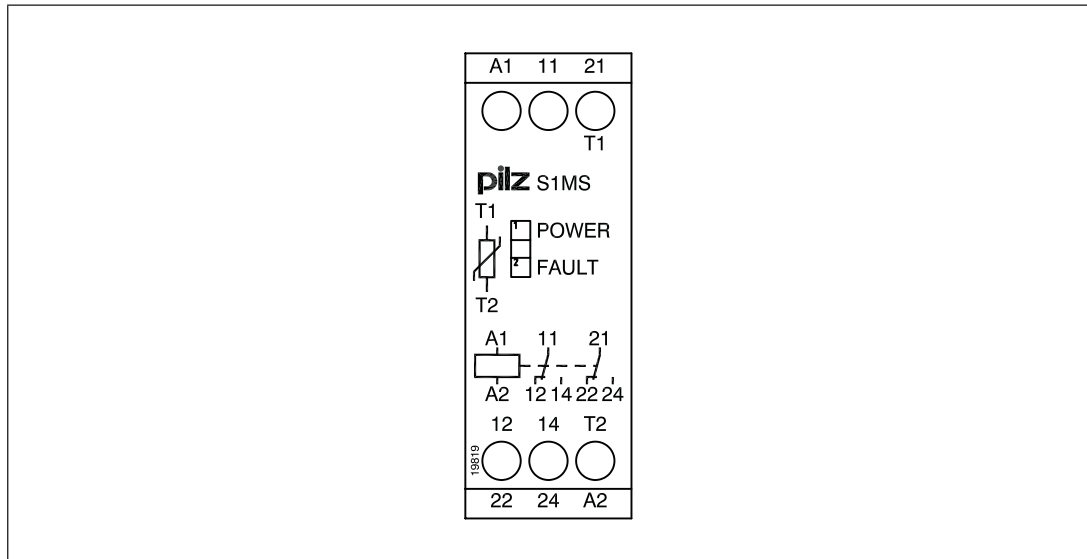
### Legend

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



## Thermistor monitor S1MS

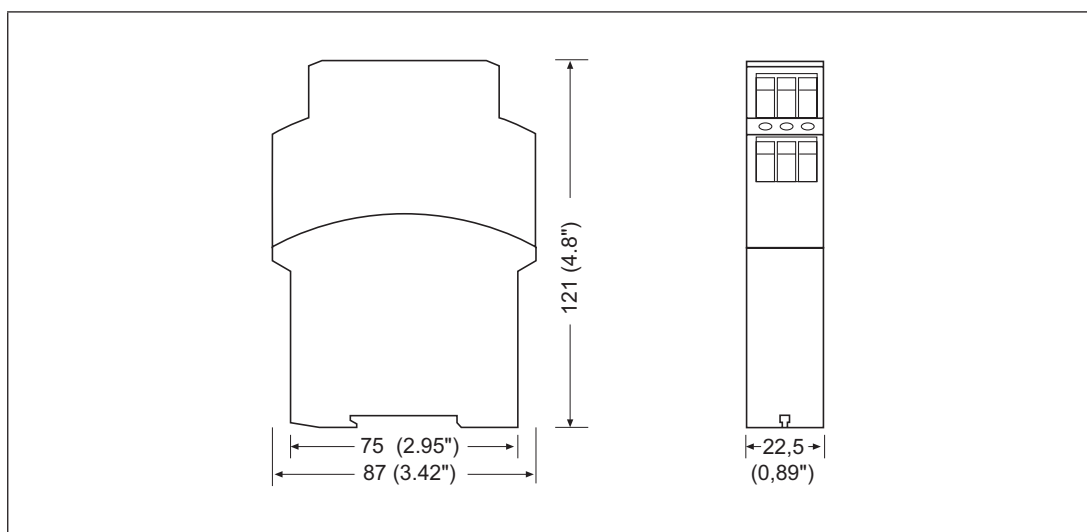
### Terminal configuration



### 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



## Thermistor monitor S1MS

### Technical details

Order no. 839725 – 839760

See below for more order numbers

General	839725	839740	839760
Approvals	CCC, CE, cULus Listed	CCC, CE, cULus Listed	CCC, CE, cULus Listed
Electrical data	839725	839740	839760
Supply voltage			
Voltage	48 V	110 V	230 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. cable cross section	Max. cable cross section	Max. cable cross section
Measuring circuit	839725	839740	839760
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	839725	839740	839760
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	839725	839740	839760
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>839725</b>	<b>839740</b>	<b>839760</b>
Switch-on delay			
Typ. switch-on delay	350 ms	350 ms	350 ms
<b>Environmental data</b>	<b>839725</b>	<b>839740</b>	<b>839760</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
Max. 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

## Thermistor monitor S1MS

<b>Environmental data</b>	<b>839725</b>	<b>839740</b>	<b>839760</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>839725</b>	<b>839740</b>	<b>839760</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>
Cross section of external conductors 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>160 g</b>	<b>160 g</b>	<b>160 g</b>



## Thermistor monitor S1MS

Order no. 839765 – 839775

General	839765	839770	839775
Approvals	CCC, CE, cULus Listed	CCC, CE	CCC, CE, cULus Listed
Electrical data	839765	839770	839775
Supply voltage			
Voltage	240 V	400 V	24 V
Type	AC	AC	AC/DC
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. cable cross section	Max. cable cross section	Max. cable cross section
Measuring circuit	839765	839770	839775
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	839765	839770	839775
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

## Thermistor monitor S1MS

Relay outputs	839765	839770	839775
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>839765</b>	<b>839770</b>	<b>839775</b>
Switch-on delay			
Typ. switch-on delay	350 ms	350 ms	350 ms
<b>Environmental data</b>	<b>839765</b>	<b>839770</b>	<b>839775</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
Max. 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

## Thermistor monitor S1MS

<b>Environmental data</b>	<b>839765</b>	<b>839770</b>	<b>839775</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>839765</b>	<b>839770</b>	<b>839775</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>
Cross section of external conductors 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>160 g</b>	<b>160 g</b>	<b>120 g</b>

## Thermistor monitor S1MS

### Order reference

Order refer- ence					

Type	U <sub>B</sub>				Order no.
S1MS	24 VAC/DC				839 775
S1MS	48 VAC				839 725
S1MS	110 VAC				839 740
S1MS	230 VAC				839 760
S1MS	240 VAC				839 765
S1MS	400 VAC				839 770

U<sub>B</sub>: Supply voltage

Additional versions on request