

Thermistor monitor S1MS



The thermistor monitoring relay S1MS 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)
- ▶ automatic reset
- ▶ 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 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.

Safety features

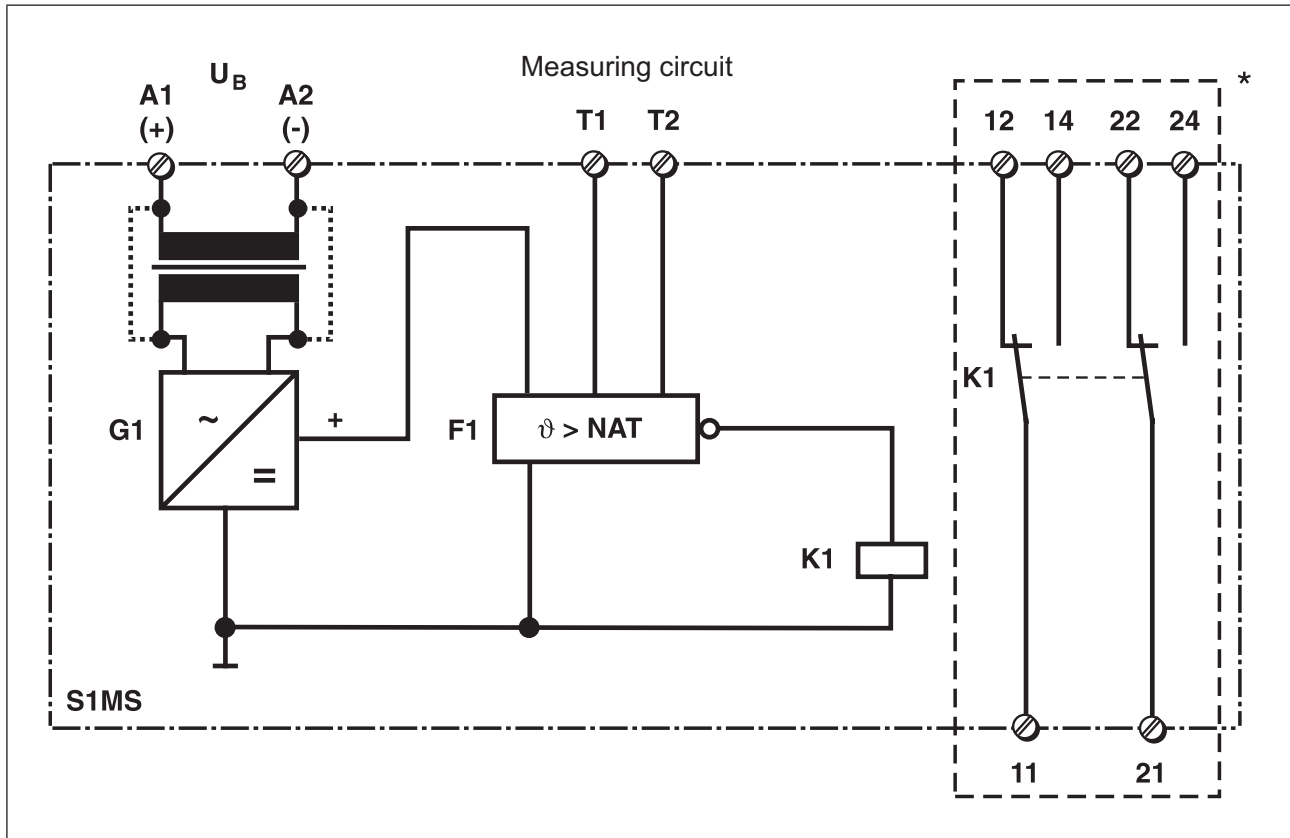
The unit meets the following safety requirements:

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

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Internal wiring diagram

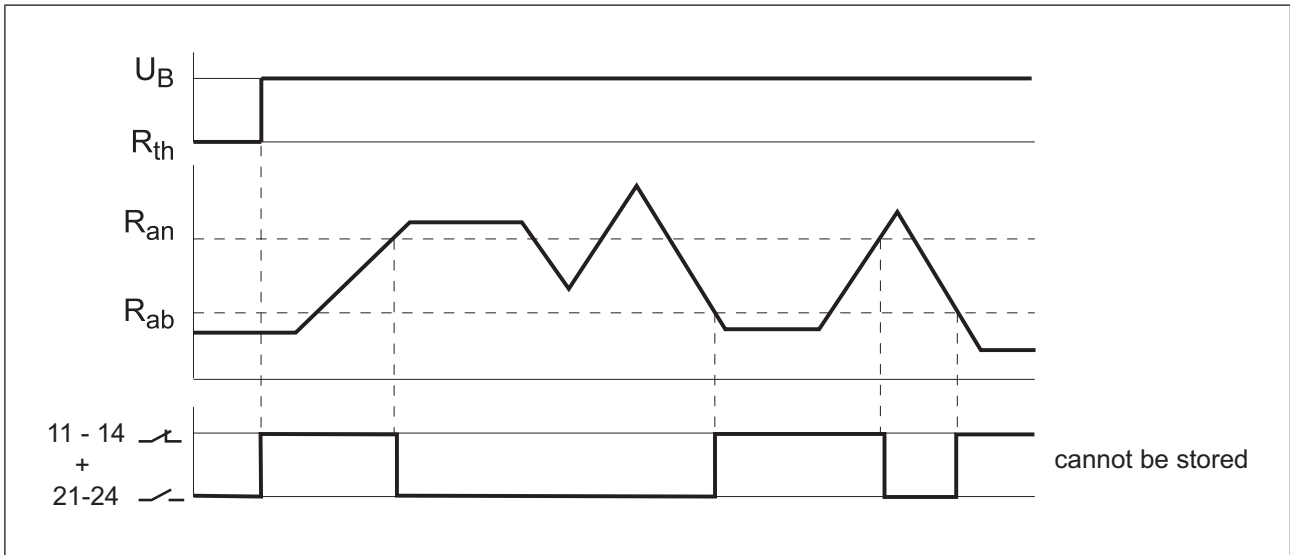


* Insulation between the non-marked area and the relay contacts: Basic insulation (over-voltage category III), safe separation (over-voltage category II)

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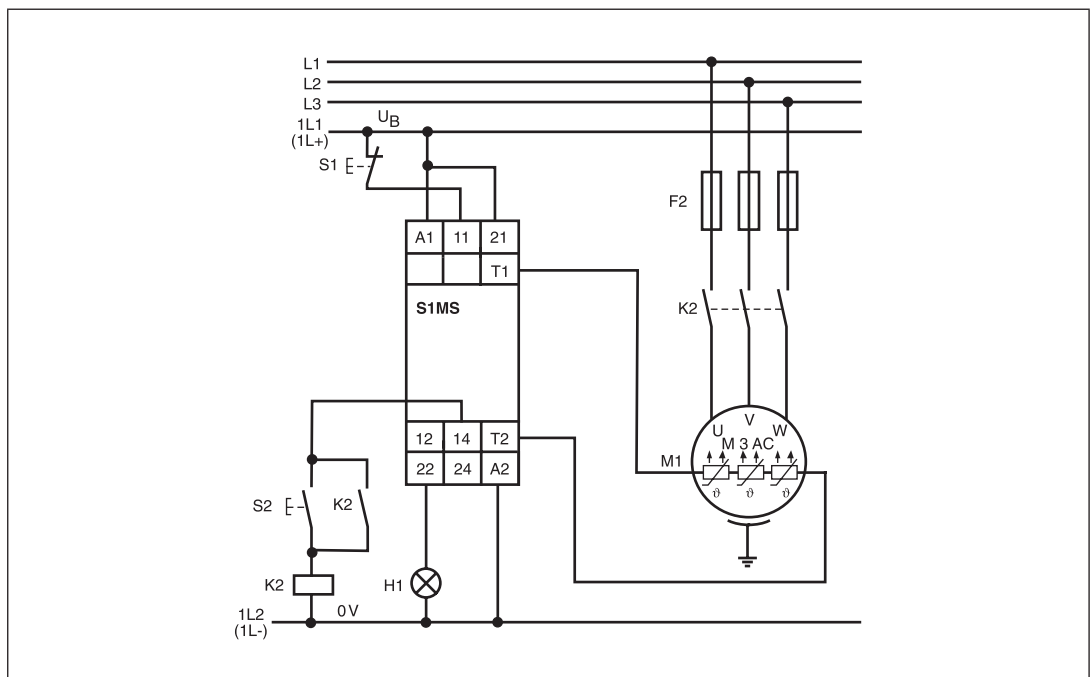
Timing diagram



Legend:

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

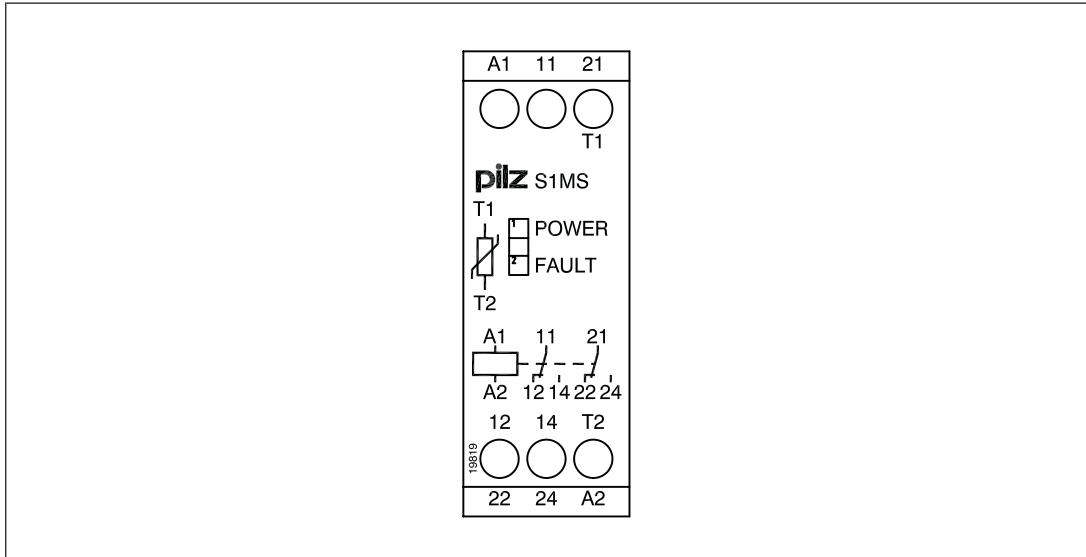
Connection example



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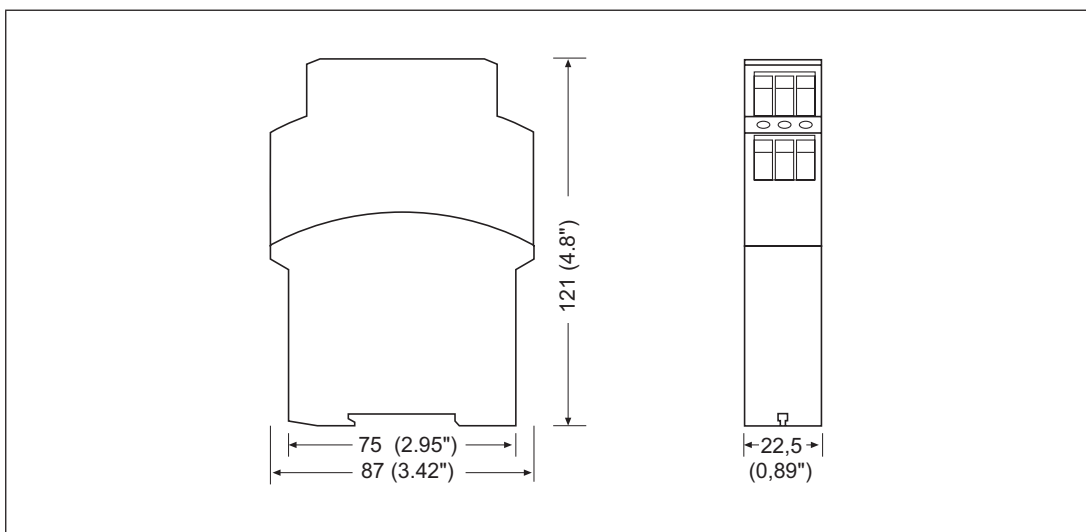
Terminal configuration



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



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Technical details

Order no. 840775, 840725, 840740

See below for more order numbers

General	840725	840740	840775
Approvals	CCC, CE, cULus Listed	CCC, CE, cULus Listed	CCC, CE, cULus Listed
Electrical data	840725	840740	840775
Supply voltage			
Voltage	48 V	110 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. conductor cross section	Max. conductor cross section	Max. conductor cross section
Measuring circuit	840725	840740	840775
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	840725	840740	840775
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	840725	840740	840775
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	840725	840740	840775
Switch-on delay			
Typ. switch-on delay	350 ms	350 ms	350 ms
Environmental data	840725	840740	840775
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	840725	840740	840775
Protection type			
Mounting (e.g. cabinet)	IP54	IP54	IP54
Housing	IP40	IP40	IP40
Terminals	IP20	IP20	IP20
Mechanical data	840725	840740	840775
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	160 g	160 g	120 g

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Order no. 840760, 840765, 839770

General	839770	840760	840765
Approvals	CCC, CE	CCC, CE, cULus Listed	CCC, CE, cULus Listed
Electrical data	839770	840760	840765
Supply voltage			
Voltage	400 V	230 V	240 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	839770	840760	840765
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	839770	840760	840765
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	839770	840760	840765
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	839770	840760	840765
Switch-on delay			
Typ. switch-on delay	350 ms	350 ms	350 ms
Environmental data	839770	840760	840765
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	839770	840760	840765
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	839770	840760	840765
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				
Type	Features		Terminals	Order no.
S1MS	24 VAC/DC		Screw terminals	840 775
S1MS	48 VAC		Screw terminals	840 725
S1MS	110 VAC		Screw terminals	840 740
S1MS	230 VAC		Screw terminals	840 760
S1MS	240 V AC		Screw terminals	840 765
S1MS	400 VAC		Screw terminals	839 770