Insulation monitoring
S1EN



The S1EN insulation monitoring relay provides protection against insulation faults in galvanically isolated voltage supplies (IT systems). It meets the requirements of DIN EN 61557-8.

Approvals

	S1EN
c UL us LISTED	◆
CCC	◆

Unit features

- For DC and AC supplies
- Normally energised mode
- Fault latching or automatic reset
- Normal/test mode
- External reset button can be connected

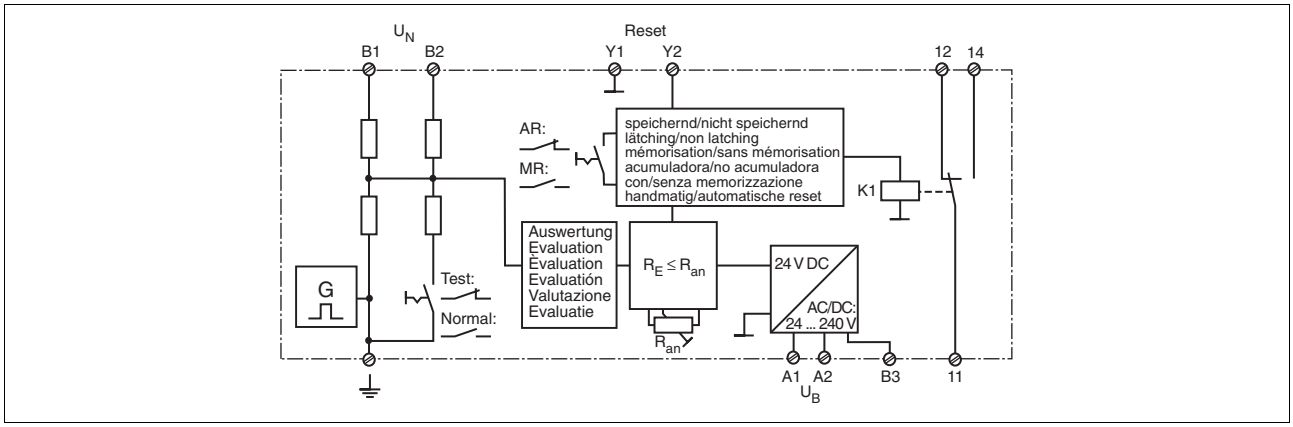
Description

The insulation monitoring relay is enclosed in an S-95, slimline housing. 2 versions are available, with measuring ranges of 50 kΩ and 200 kΩ. Its universal power supply operates with all supply voltages.
Features:

- Relay outputs: 1 auxiliary contact (C/O)
- Two insulation measuring circuits
- Detects symmetrical insulation faults
- Switch for function testing
- LED for supply voltage and fault

The unit measures the insulation resistance between the phases and the operating earth on galvanically isolated voltage supplies. If the insulation resistance in either of the two measuring circuits drops below the response value R_{on}, the auxiliary contact switches and the “Fault” LED is lit. If the release value R_{off} is then exceeded, the device is ready for operation immediately if automatic reset is selected; if manual reset is selected, it is necessary to operate an external button or the MR/AR switch.

Internal wiring diagram

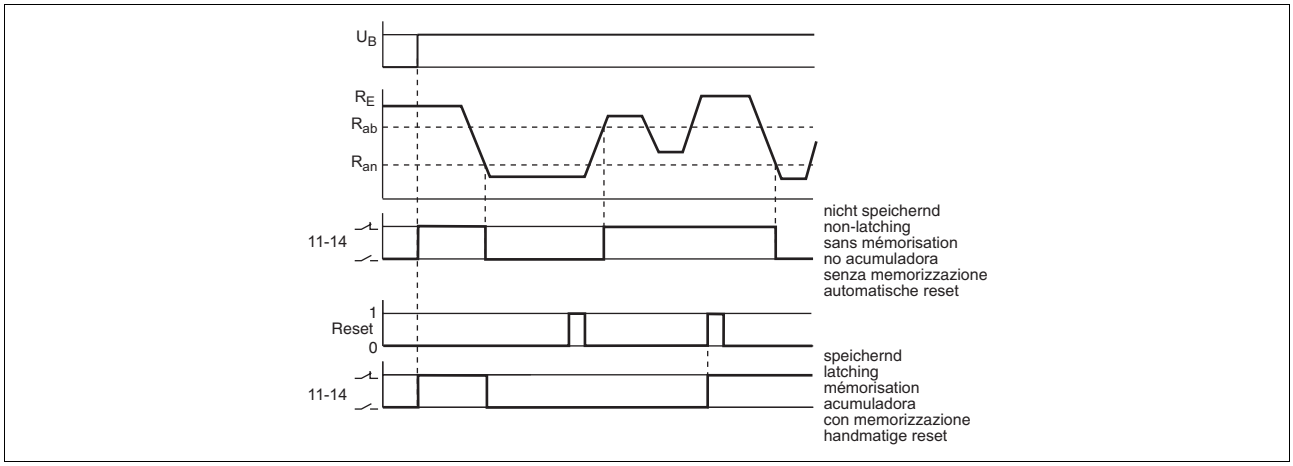


Key

- U_N: Mains voltage
- R_{on}: Response value
- U_B at B3-A2: 24 VAC/DC
- U_B at A1-A2: 42-240 VAC/DC

Insulation monitoring
S1EN

Timing diagram

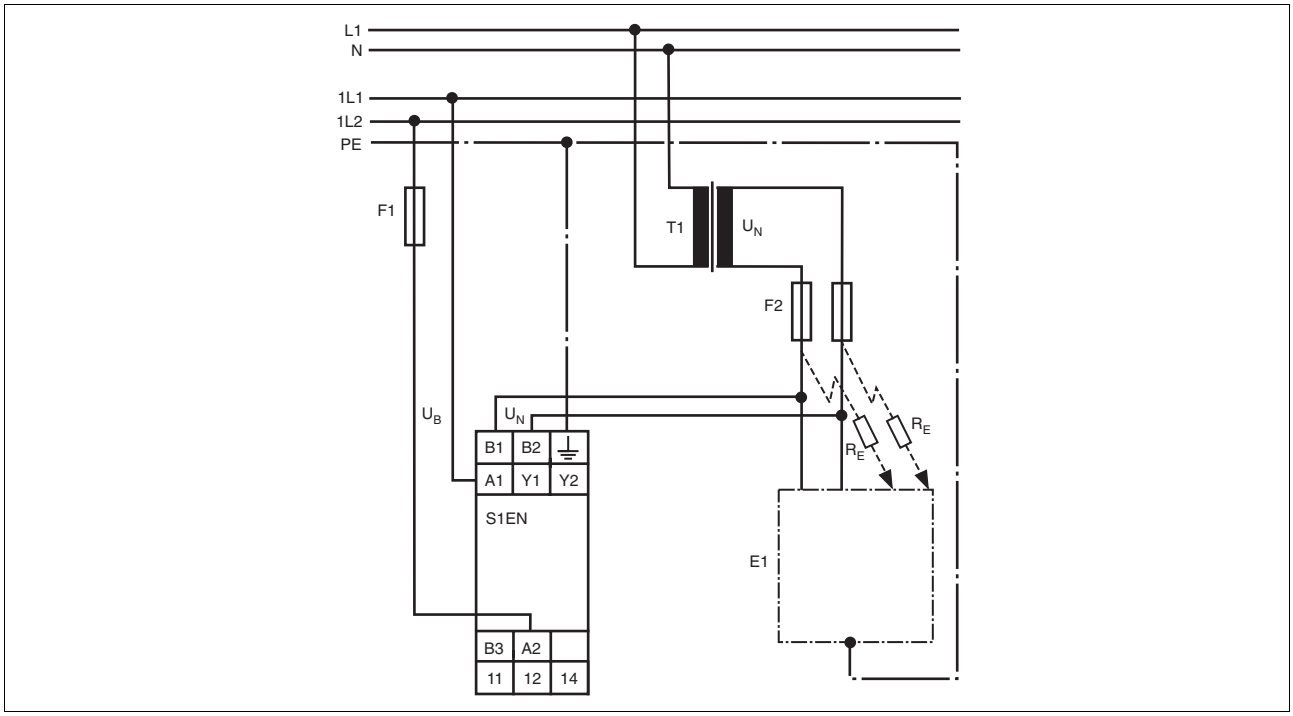


Key

- U_B: Supply voltage
- R_{on}: Response value
- R_{off}: Release value
- R_E: Insulation resistance

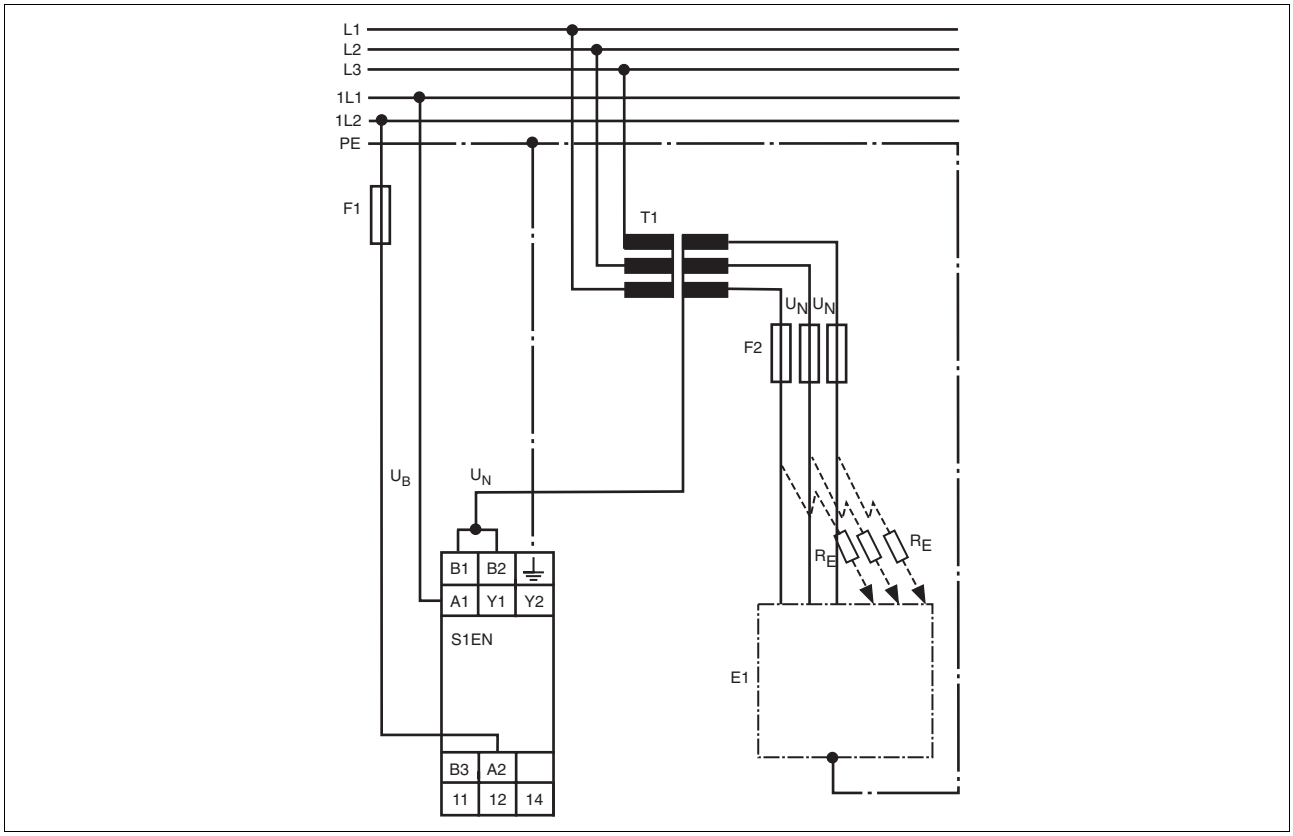
Connection examples

- Example 1
  AC application circuit



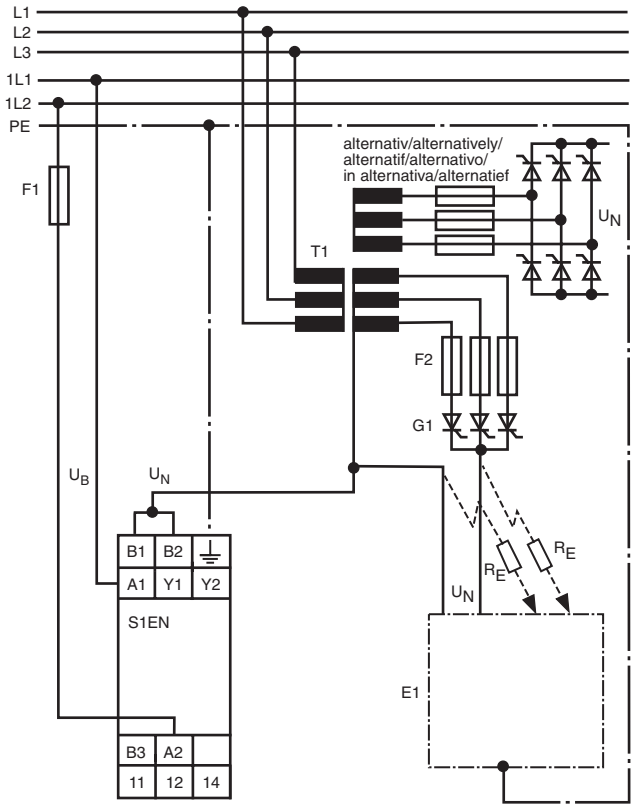
Insulation monitoring
S1EN

- Example 2
  3AC application circuit



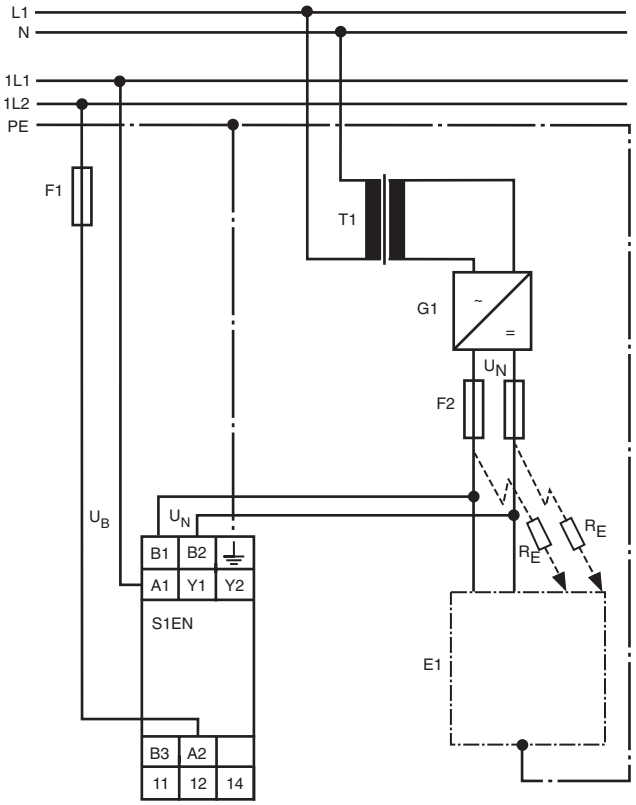
Insulation monitoring
S1EN

- Example 3
  3AC/DC application circuit



Insulation monitoring
S1EN

- Example 4
  DC application example



Insulation monitoring
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Technical details	S1EN
Electrical data	
Supply voltage	AC/DC: 24 ... 240 V
Tolerance	85 ... 110 %
Frequency range AC	50 … 60 Hz
Power consumption	240 VAC: 5 VA, 24 VDC: 1 W
Switching capability in accordance with EN 60947-4-1 EN 60947-5-1	 AC1: 240 V/0.1 ... 5 A/1200 VA DC1: 24 V/0.1 ... 5 A/120 W AC15: 230 V/2 A; DC13: 24 V/1.5 A
Output contacts	1 auxiliary contact (C/O)
Contact material	AgCdO, 3 µm gold plating for low load range 1-50 V/1-100 mA
Contact fuse protection in accordance with EN 60947-5-1	Max. 6 A quick or max. 4 A slow
Measuring circuit	
Rated mains voltage (monitored supply)	50 kΩ version: AC/DC: 0 ... 240 V 200 kΩ version: AC/DC: 0 ... 400 V
Response value	50 kΩ version: 12.5 ... 50 kΩ, selectable 200 kΩ version: 50 ... 200 kΩ, selectable
Release value	50 kΩ version: Response value + ca. 5 kΩ 200 kΩ version: Response value + ca. 20 kΩ
Max. measuring current (DC)	50 kΩ version: 2.4 mA 200 kΩ version: 1.0 mA
Max. measuring voltage (DC)	± 17 V
Max. permitted external voltage (AC/DC)	50 kΩ version: 264 V 200 kΩ version: 460 V
Min. impedance (AC/DC)	50 kΩ version: 75 KΩ 200 kΩ version: 300 KΩ
Max. permitted line capacitance	1 µF
Max. response error in accordance with DIN EN 61557-8	± 15%
Measuring time	10 s
Environmental data	
EMC	EN 61000-6-2, EN 61000-6-4
Vibration in accordance with EN 60068-2-6	Frequency: 10 ... 55 Hz Amplitude: 0.35 mm
Climatic suitability	EN 60068-2-78
Airgap creepage	EN 60947-1
Ambient temperature	-10 ... +55 °C
Storage temperature	-40 ... +85 °C
Condensation and ice formation	Not permitted
Mechanical data	
Cross section of external conductors 1 core flexible 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve without crimp connectors or with TWIN crimp connectors	 0.20 – 4.00 mm², 24 – 10 AWG 0.20 – 2.50 mm², 24 – 14 AWG 0.20 – 2.50 mm², 24 –14 AWG
Torque setting for connection terminals	0.6 Nm (screws)
Mounting position	Any
Housing material Housing Front	 PPO UL 94 V0 ABS UL 94 V0
Protection types	Mounting: IP54 Housing: IP40 Terminals: IP20
Dimensions (H x W x D)	87 x 22.5 x 121 mm
Weight	150 g

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S1EN

Order reference

Type	U_B	R_{on}	Order no.
S1EN	24 - 240 VAC/DC	50 KΩ	884 100
S1EN	24 - 240 VAC/DC	200 KΩ	884 110

U_B: Supply voltage
R_{on}: Response value