pilz
more than automation
safe automation

# Single-phase voltage monitoring
## S1UM

The S1UM voltage monitoring relay is used for monitoring minimum or maximum voltage values.

### Features

- 12 measuring ranges, 0.1 V ... 500 V, selectable
- Reaction time can be set up to 10 seconds
- Detects AC-/DC voltage values automatically
- Operates to normally energised or normally de-energised mode
- AC versions and UP version: Galvanic isolation between measuring and supply voltage.
- UP version: Measuring inputs are not polarity-sensitive

### Approvals

| | S1UM | |
|---|---|---|
| c UL us LISTED | ● | |
| CCC | ● | |

| Technical Details | S1UM |
|---|---|
| **Electrical data** | |
| Supply voltage | AC: 24, 42...48, 110...127, 230...240 V<br>DC: 24 V |
| Tolerance | 85 ... 110 % |
| Power consumption | AC: 2 VA, DC: 1 W |
| Switching capability in accordance with<br>EN 60947-4-1, 10/91<br><br>EN 60947-5-1, 10/91 | <br>AC1: 240 V/0.1 ... 5 A/1200 VA<br>DC1: 24 V/0.1 ... 5 A/120 W<br>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, 10/91 | Max. 6 A quick or max. 4 A slow |
| **Measuring circuit** | |
| Frequency range | 0.40 ... 400 Hz |
| Adjustable limit values for measuring range | 1 V: 1; 0.5 ; 0.2; 0.1 V<br>20 V: 20, 10, 4, 2 V<br>500 V: 500, 250, 100, 50 V |
| Hysteresis | 0.6 to 0.95 x response value |
| Impedance of the measurement inputs | 1 V: 15 kΩ<br>20 V: 390 kΩ<br>500 V: 10 MΩ |
| Overload on the measuring inputs | 1 V: max. 40 V<br>20 V: max. 200 V<br>500 V: max. 700 V |
| Polarity of measuring inputs | Polarised<br>UP version: any (not polarity-sensitive) |
| Reaction time | 0.1 ... 10 s |
| Temperature variation | ± 0.05% per +1°C |
| **Environmental data** | |
| Ambient temperature | -15 ... +55 °C |
| **Mechanical data** | |
| Max. cable cross section of ext. conductor | 1 x 4 mm² or 2 x 1.5 mm²<br>single-core or multi-core with crimp connector |
| Dimensions (H x W x D) | 87 x 22.5 x 122 mm |
| Weight | 165 g |

### Description

The voltage monitoring relay is enclosed in an S-95 slimline housing. There are eight AC versions and one DC version available.
Features:

- Relay output: 1 auxiliary contact (C/O)
- 3 measuring circuits for 1 V, 20 V and 500 V each with 4 different ranges
- Response value can be set from 20% to 100% of the measuring range limit value
- Hysteresis can be set from 0.6 to 0.95 x $U_{on}$
- Fault status can be latched or non-latched
- LEDs for switching status for the relay and supply voltage.

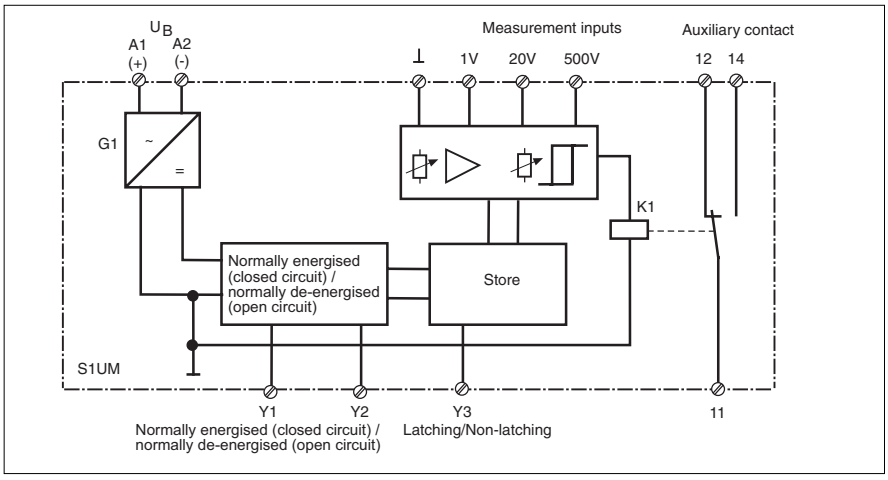
(Description continued overleaf)

Pilz GmbH & Co. KG, Sichere Automation, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany
Telephone +49 711 3409-0, Telefax +49 711 3409-133, E-Mail: pilz.gmbh@pilz.de

# Single-phase voltage monitoring
## S1UM

The S1UM monitors for voltage values exceeding a threshold limit. On the UP version the measuring inputs are not polarity-sensitive. If the measured voltage reaches the response value $U_{on}$, the auxiliary contact 11-14 changes over and the LED is illuminated. If the measured voltage falls below the hysteresis value $U_{off}$ and automatic reset is selected, the auxiliary contact changes over again and the LED goes out. The unit is ready for operation again. If faults are latched, the unit is not ready for operation again until an external reset button is activated or the supply voltage has been switched off and on again.

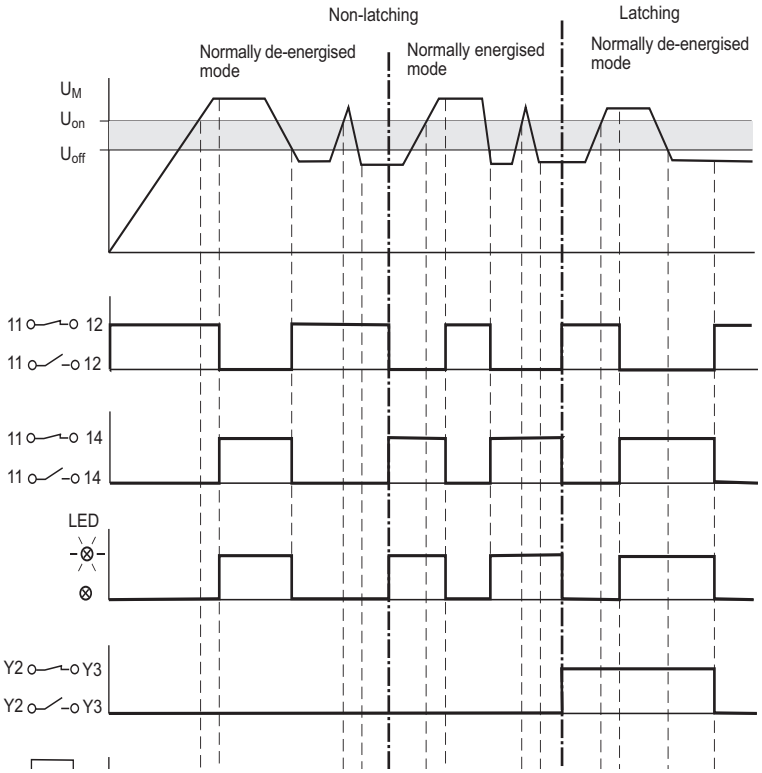
**Internal wiring diagram**




Pilz GmbH & Co. KG, Sichere Automation, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany
Telephone +49 711 3409-0, Telefax +49 711 3409-133, E-Mail: pilz.gmbh@pilz.de

# Single-phase voltage monitoring
## S1UM

**Timing diagram**




Hysteresis ($U_{off}$): 0.6 to 0.95 x $U_{on}$
Adjustable hysteresis
$t_R$: Reaction time

Ia: $U_M > U_{on}$: Once $t_R$ has elapsed, the relay energises and the LED "OUT" is illuminated.
$U_M < U_{off}$: Relay de-energises and LED goes out

IIa: $U_M > U_{on}$ before $t_R$ has elapsed: Relay remains de-energised.

Ib: $U_M > U_{on}$: As above, but relay de-energises and LED "Out" goes out.
$U_M < U_{off}$: Relay energises and LED is illuminated.

IIb: As above but relay remains energised.

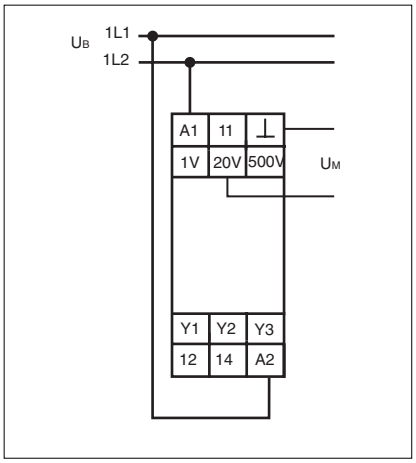
III: $U_M > U_{on}$: see above
$U_M < U_{off}$: Relay de-energises once Y2 - Y3 is open.

Pilz GmbH & Co. KG, Sichere Automation, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany
Telephone +49 711 3409-0, Telefax +49 711 3409-133, E-Mail: pilz.gmbh@pilz.de

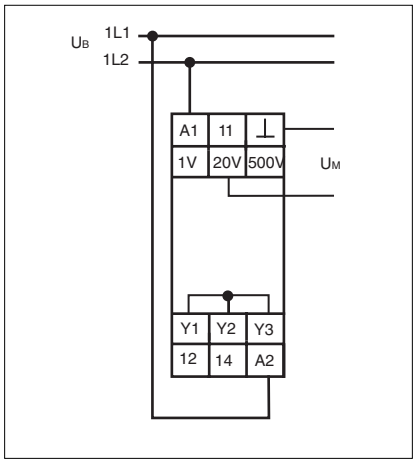
# Single-phase voltage monitoring
S1UM

**Connection examples**

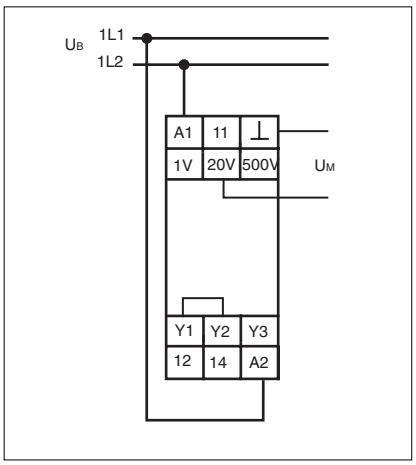
● Example 1
Normally energised,
non-latching



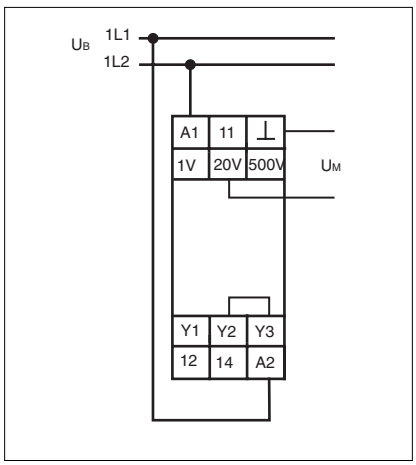

● Example 3
Normally de-energised mode,
latching




● Example 2
Normally de-energised mode,
non-latching




● Example 4
Normally energised,
latching




Pilz GmbH & Co. KG, Sichere Automation, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany
Telephone +49 711 3409-0, Telefax +49 711 3409-133, E-Mail: pilz.gmbh@pilz.de

pilz
more than automation
safe automation

# Single-phase voltage monitoring
## S1UM

| General Details |
|---|

| Unless stated otherwise in the technical details for the specific unit. |
|---|

| Electrical data | |
|---|---|
| AC frequency range | 50 ... 60 Hz |
| DC residual ripple | 160 % |
| Contact material | AgCdO |
| Continuous duty | 100 % |
| **Environmental data** | |
| EMC | EN 50081-1, 01/92; EN 50082-2, 03/95 |
| Vibration in accordance with EN 60068-2-6, 04/95 | Frequency: 10 ... 55 Hz, Amplitude: 0.35 mm |
| Climatic suitability | IEC 60068-2-3, 1969 |
| Airgap creepage | DIN VDE 0110-1, 04/97 |
| Ambient temperature | -10 ... +55 °C |
| Storage temperature | -40 ... +85 °C |
| **Mechanical data** | |
| Torque setting for connection terminals | 0.6 Nm (screws) |
| Mounting position | Any |
| Housing material | Thermoplastic Noryl SE 100 |
| Protection types | Mounting: IP 54<br>Housing: IP 40<br>Terminals: IP 20 |

**Order references key**
$U_B$ Supply voltage
$U_M$ Measuring voltage

**Order references**

| Type | $U_B$ | $U_M$ | Order no. |
|---|---|---|---|
| S1UM | 24V AC | 500 V AC/DC | 827 230 |
| S1UM | 42-48 V AC | 500 V AC/DC | 827 240 |
| S1UM | 110-130 V AC | 500 V AC/DC | 827 250 |
| S1UM | 230-240 V AC | 500 V AC/DC | 827 260 |
| S1UM UP | 24 V DC | 500 V AC/DC | 827 225 |
| S1UM UP | 24 V AC | 500 V AC/DC | 827 235 |
| S1UM UP | 42-48 V AC | 500 V AC/DC | 827 245 |
| S1UM UP | 110-130 V AC | 500 V AC/DC | 827 255 |
| S1UM UP | 230-240 V AC | 500 V AC/DC | 827 265 |

Additional versions available on request

Pilz GmbH & Co. KG, Sichere Automation, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany
Telephone +49 711 3409-0, Telefax +49 711 3409-133, E-Mail: pilz.gmbh@pilz.de