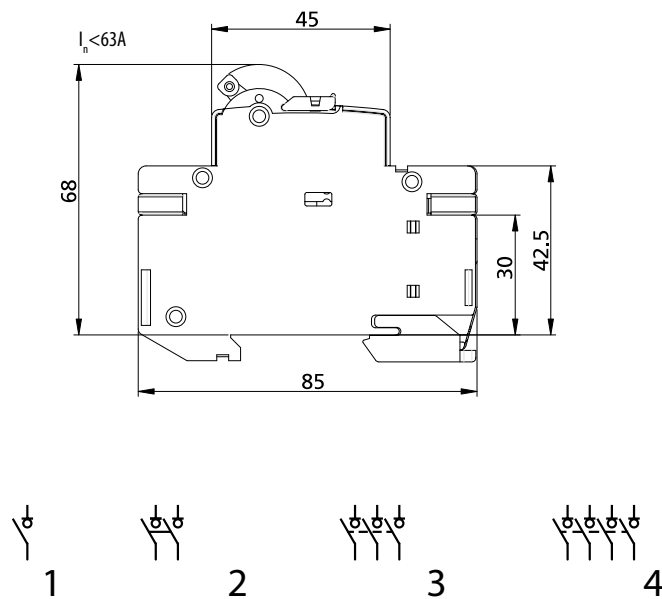


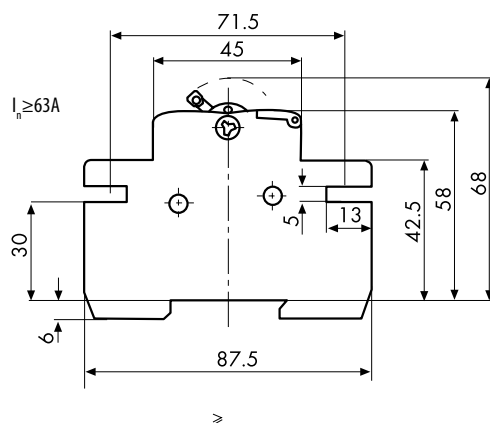
Technical data

Build-in switch SV

| Technical data | |
|--|---------------------------------------|
| Type | 16A-40A |
| Electrical | |
| Number of poles | 1p, 2p, 3p, 4p |
| Rated operational voltage U_e | 230/400V AC (1p), 400V AC (2p, 3p 4p) |
| Rated current I_n | 16, 25, 40A |
| Rated Insulation voltage U_i | 1000V |
| Rated impulse withstand voltage U_{imp} | 4 kV |
| Utilization category | AC-23B |
| Rated frequency | 50/60Hz |
| Rated short-time withstand current I_{cw} | 800A |
| Rated short-circuit making capacity I_{cm} | 500A |
| Rated conditional short-circuit current | 2000A (with 50A fuse) |
| Rated making capacity | 400A |
| Rated breaking capacity | 320A |
| Switch Type | Build-in switch |
| Standard | IEC/EN 60947-3 |
| Mechanical | |
| Device height | 68mm (DIN rail acc to EN60715) |
| Device width | 18mm/p |
| Degree of protection | IP20 |
| Terminal capacity | 1-25mm ² |
| Terminal screw | M5 (Pozidrive PZ2) |
| Terminal torque | max. 3Nm |
| Operating temperature | -25°C ... +55°C |
| Storage- and transport temperature | -40°C ... +70°C |
| Contact position indicator | mechanical red/green |
| Supply possibility | Top or bottom |



| Technical data | |
|---|---|
| Type | 63-125A |
| Electrical | |
| Number of poles | 1p, 2p, 3p, 4p |
| Rated operational voltage U_e | 1p: 230/400V AC, 24V DC 2p: 400V AC, 48V DC 3p, 4p: 400V AC |
| Rated current I_n | 63, 80, 100, 125A |
| Rated insulation voltage U_i | AC: 1000V; DC: 1500V |
| Rated impulse withstand voltage U_{imp} | 4 kV |
| Utilization category | AC-22B; DC-22B |
| Rated frequency | 50/60Hz AC, DC |
| Rated short-time withstand current I_{cw} | 1500A / 1s |
| Rated short-circuit making capacity I_{cm} (peak) | 2200A |
| Rated conditional short-circuit current | 4,0kA (with 100A fuse) / 2,5kA (with 125A fuse) |
| Rated making capacity | 400A |
| Rated breaking capacity | 320A |
| Switch Type | Build-in switch-disconnector |
| Standard | IEC/EN 60947-3 |
| Mechanical | |
| Device height | 68mm (DIN rail acc to EN60715) |
| Device width | 18mm/pole |
| Degree of protection | IP20 |
| Terminal capacity | 1-50mm ² |
| Terminal screw | M6 (Pozidrive PZ2) |
| Terminal torque | max. 3Nm |
| Operating temperature | -25°C ... +55°C |
| Storage- and transport temperature | -40°C ... +70°C |
| Contact position indicator | mechanical red/green |
| Supply possibility | Top or bottom |

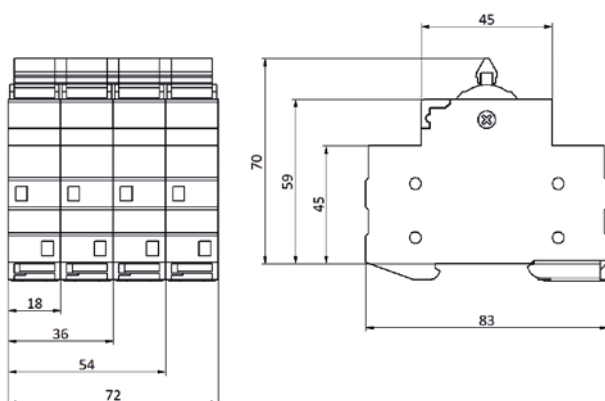
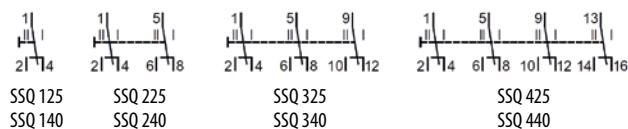


Technical data

Build-in devices "EVESYS"

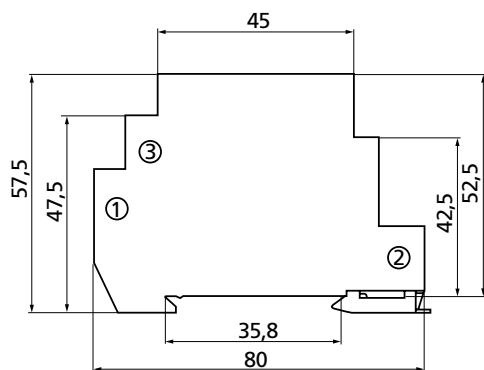
Technical data

| | |
|-------------------------------------|---------------------------------------|
| Rated voltage U_n | 230/400V AC |
| Rated current I_n | 25A, 40A |
| Rated frequency f_n | 50/60 Hz |
| Terminals | 1,5 - 16 mm ² , max 1,8 Nm |
| Electrical insulation | >3mm contact space |
| Rated short-circuit making capacity | 2,5 kA |
| Pollution degree | 3 (for Switch) |
| Degree of protection | IP20 |
| Width of the switch | 18mm |
| Standards | PN-IEC 60947-3 |
| Mounting position | any |

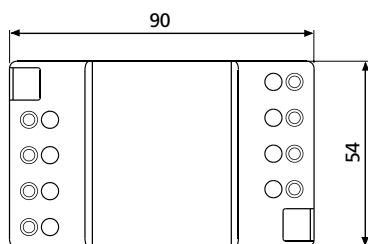
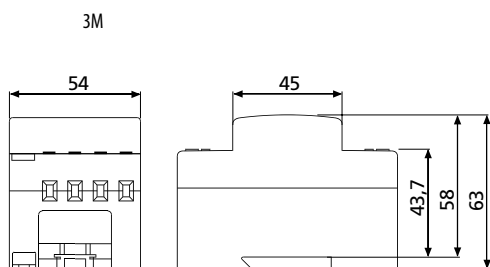


Technical data

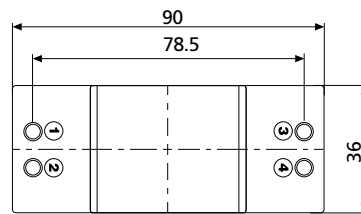
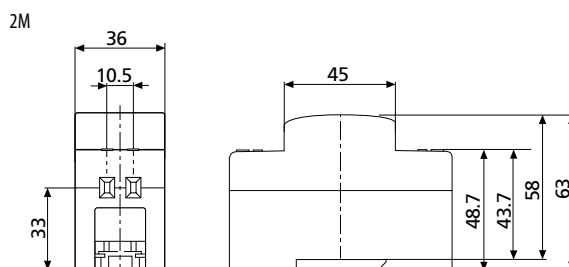
| | SON H-1R | SON H-1G | SON H-1Y | SON H-1B | SON H-3R | SON H-3K | SON H-3G |
|--------------------------------|------------------------------------|----------|----------|----------|-----------------|--------------------------|----------|
| Rated voltage U _n | 240V AC | | | | 3x240V AC | | |
| Voltage tolerance | -25%...+10% | | | | | | |
| Rated frequency f _n | 50/60Hz | | | | | | |
| Power consumption | 0,267W (240V AC) | | | | 1,04W (240V AC) | | |
| Diode colour | 1 red | 1 green | 1 yellow | 1 blue | 3 red | 1 red, 1 yellow, 1 green | 3 green |
| Protection class | Casing: IP40, terminals IP20 | | | | | | |
| Humidity | 95% (without condansation) | | | | | | |
| Material | Self-extinguished material UL94-V0 | | | | | | |
| Cross section | 1-4 mm² | | | | | | |
| Torque | 0,6 Nm | | | | | | |
| Montage | TH35 | | | | | | |
| Width | 1 Modul | | | | | | |
| Standards | IEC EN 61000-3-2; IEC EN 61000-4 | | | | | | |



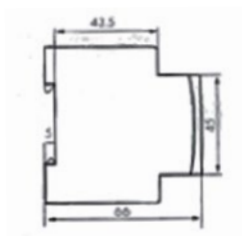
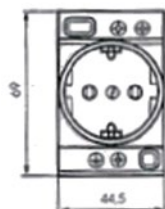
Bell/Buzzer



Bell transformer type 3M



Bell transformer type 2M



DIN socket

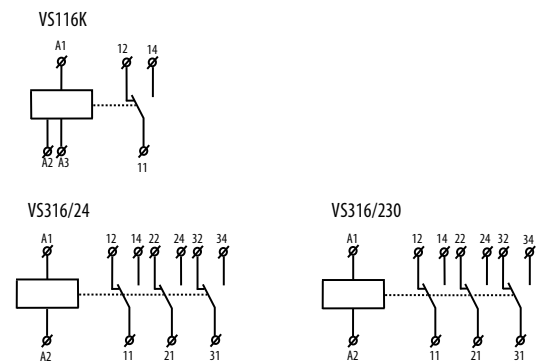
Technical data

Power relays VS116K, VS316K

Technical data

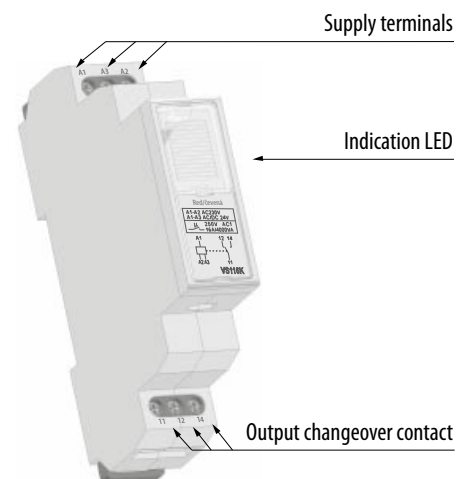
| | VS116K | VS316/24 | VS316/230 |
|---------------------------|--|--|-------------------|
| Supply terminals | A1 - A2 | | |
| Voltage range | 230 V AC/50-60 Hz | 24 V AC/DC/50-60 Hz | 230 V AC/50-60 Hz |
| Burden | AC max. 7.5 VA/ 1W | 1.6 VA/ 1.2 W | 2.5 VA |
| Supply terminals | A1-A3 | x | |
| Voltage range | 24 V AC/DC (50-60 Hz) | x | |
| Burden | 1 VA AC/ 1W DC | x | |
| Supply voltage tolerance | -15%; +10% | | |
| Output | | | |
| Number of contacts | 1 x changeover/ SPDT (AgSnO2) | 3 x changeover/ 3PDT (AgSnO ₂) | |
| Current rating | 16 A/ AC1 | 16A/ AC1 | |
| Breaking capacity | 4000VA/ AC1, 384W/ DC | 4000VA/ AC1, 384W/ DC | |
| Inrush current | 30 A/ <3s | 30 A/ <3s | |
| Switching voltage | 250 V AC1/ 24 V DC | | |
| Min. breaking capacity DC | 500 mW | | |
| Output indication | high intensity of LED | | |
| Mechanical life | 3x107 | 1x107 | |
| Electrical life (AC1) | 0.7x105 | 1x105 | |
| Time between switching | min. 2s | 20 ms | 50 ms |
| Other information | | | |
| Operating temperature | -20 °C ... +55 °C (-4 °F ... 131 °F) | | |
| Storage temperature | -30 °C ... +70 °C (-22 °F ... 158 °F) | | |
| Electrical strength | 4 kV (supply-output) | | |
| Operating position | any | | |
| Mounting/DIN rail | DIN rail EN 60715 | | |
| Protection degree | IP 40 from front panel | | |
| Overvoltage category | III. | | |
| Pollution degree | 2 | | |
| Max. cable size (mm²) | max.1x 2.5 / 2x1.5 | | |
| | max. 1x2.5 (AWG 12) | | |
| Dimensions | 90 x 17.6 x 64 mm (3.5" x 0.7" x 2.5") | | |
| Weight | 54 g (1.9 oz.) | 90 g (3.17 oz.) | 92 g (3.25 oz.) |
| Standards | EN 61810-1, EN 61010-1 | | |

Symbol



Description

VS116K



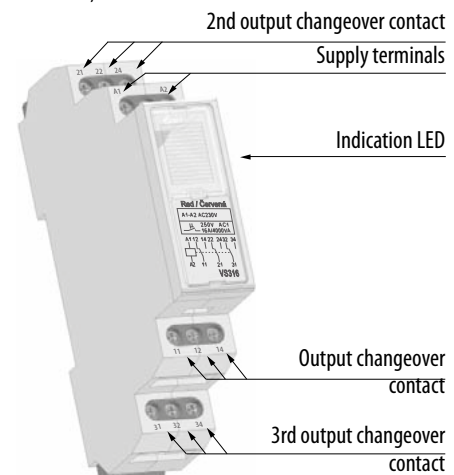
terminal A3 only for VS116K

Notes

Max. time of changeover of contact is 10ms.

VS316/24 and VS316/230 enable switching of different phases or 3 phase voltage.

VS316/24, VS316/230



Delay OFF without supply voltage CRM-82TO

Technical data

| | CRM-82TO |
|--------------------------|--|
| Number of functions | a - On Delay (Power On)/ e - Off Delay (S Break) |
| Supply terminals | A1 - A2 |
| Voltage range | 12 - 240 V AC/DC (AC 50 - 60 Hz) |
| Burden | 0.7 - 3 VA AC/ 0.5 - 1.7 W DC |
| Supply voltage tolerance | -15 %; +10 % |
| Supply indication | green LED |
| Time ranges | 0.1 s - 10 min |
| Time setting | potentiometer |
| Time deviation | 5 % - mechanical setting |
| Repeat accuracy | 0.2 % - set value stability |
| Temperature coefficient | 0.01 % / °C, at = 20 °C (0.01 % / °F, at = 68 °F) |

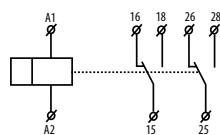
Output

| | |
|---------------------------|---|
| Number of contacts | 2x changeover/SPDT (AgNi/ Silver Alloy) |
| Current rating | 8 A / AC1 |
| Breaking capacity | 2000 VA / AC1, 192 W / DC |
| Inrush current | 10 A / <3 s |
| Switching voltage | 250 V AC1 / 24 V DC |
| Min. breaking capacity DC | 500 mW |
| Output indication | red LED |
| Mechanical life | 3x10 ⁷ |
| Electrical life (AC1) | 0.7x10 ⁵ |

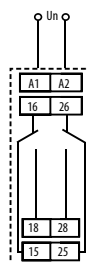
Other information

| | |
|------------------------------------|---|
| Operating temperature | -20 °C ... +55 °C (-4 °F ... 131 °F) |
| Storage temperature | -30 °C ... +70 °C (-22 °F ... 158 °F) |
| Electrical strength | 4 kV (supply-output) |
| Mounting/DIN rail | DIN rail EN 60715 |
| Protection degree | IP 40 from front panel / IP 10 terminals |
| Operating position | any |
| Overvoltage category | III. |
| Pollution degree | 2 |
| Max. cable size (mm ²) | solid wire max. 2x2.5 or 1x4 (AWG 12) with sleeve max. 2x1.5 or 1x2.5 (AWG 12) |
| Dimensions | 90 x 17.6 x 64 mm (3.5" x 0.7" x 2.5") |
| Weight | 93 g (3.3 oz.) |
| Standards | EN 61812-1, EN 61010-1 |

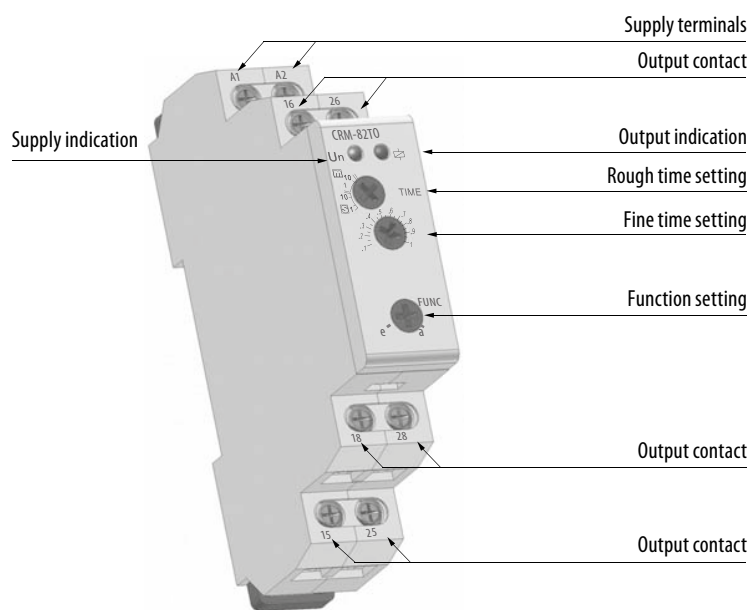
Symbol



Connection



Description



Function

a - Delay OFF (S break) the power supply is switched off (min. time is 0.5 s)



e - ON Delay



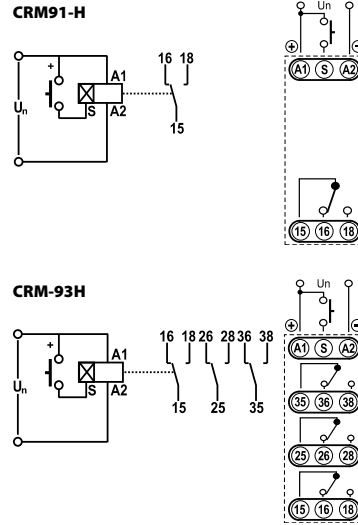
Technical data

Multifunction time relay CRM-91H, CRM-93H

Technical data

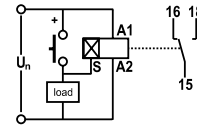
| | CRM-91H | CRM-93H |
|----------------------------------|-------------------------------|----------------|
| Number of functions | 10 | |
| Supply | A1-A2 | |
| Supply voltage | 12-240 V AC/DC(50-60 Hz AC) | |
| Consumption | AC 0,7-3 VA / DC 0,5 - 1,7 W | |
| Supply indication | green LED | |
| Time ranges | 0.1 s-10 days | |
| Time settings | rotary switch | |
| Time deviation | 5%-mechanical setting | |
| Repeat accuracy | 0,2%-set value stability | |
| Temperature coefficient | 0,01% / °C at 20 °C | |
| Output | | |
| Changeover contacts | 1 | 3 |
| Rated current | 16 A / AC1 | 8 A / AC1 |
| Breaking capacity | 4000 VA / AC1, | 2000 VA / AC1, |
| | 384 W /DC | 192 W / DC |
| Inrush current (duty factor 10%) | 30 A / <3 s | 10 A / <3 s |
| Switching voltage | 250 V AC1 / 24 V DC | |
| Min. breaking capacity DC | 500 mW | |
| Output indication | multifunction red LED | |
| Mechanical life | 3x10 ⁷ | |
| Electrical life | 0,7x10 ⁵ | |
| Controlling | | |
| Controlling voltage | 12-240 V AC/DC | |
| Consumption of output | 0,025-0,2 VA AC/ 0,1-0,7 W DC | |
| Load between S-A2 | ✓ | |
| Glow-tubes | ✗ | |
| Control. terminals | A1-S | |
| Impulse length | min. 25 ms/ max. unlimited | |
| Reset time | max. 150 ms | |
| Operating temperature | -20...+55 °C | |
| Storing temperature | -30...+70 °C | |
| Electrical strength | 4 kV | |
| Operating position | any | |
| Mounting | DIN rail EN 60715 | |
| Protection degree | IP 40 from frontal panel | |
| Overvoltage category | III. | |
| Pollution degree | 2 | |
| Max. cable size | 2.5 mm ² | |
| Dimensions | 90 x 17,6 x 64 mm | |
| Standards | EN 61812-1, EN 61010-1 | |

Connection

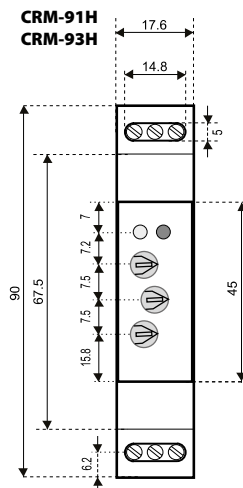


Load with control input possible.

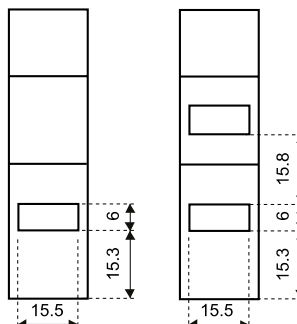
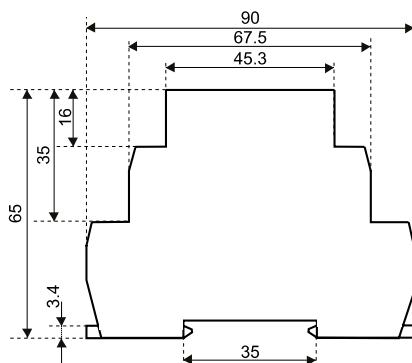
Load between S-A2 possible to connect in parallel way, without disturbing of proper operation of the relay.



Dimensions

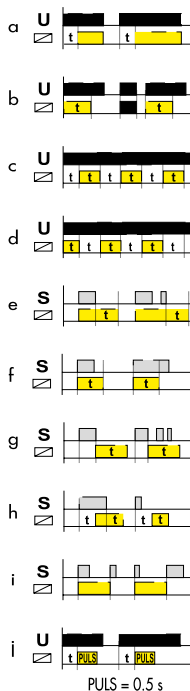


1-module design

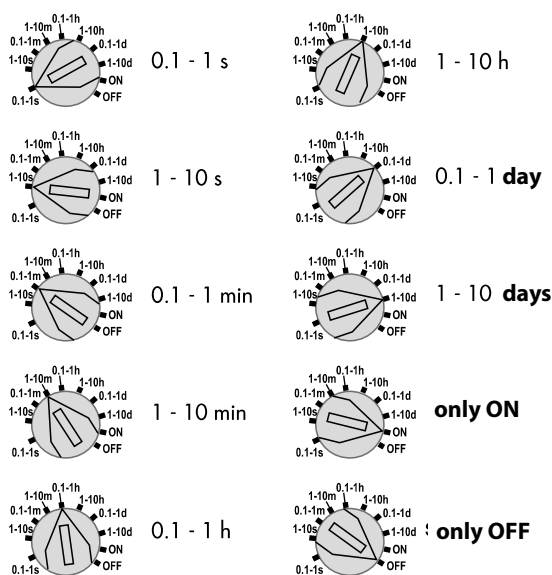


Functions

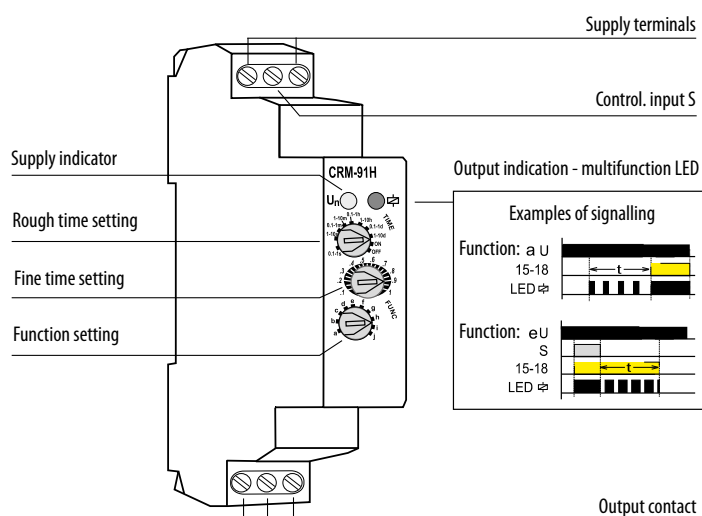
- a) Delay ON after energisation
- b) Delay OFF after energisation
- c) Cycler beginning with pause after energisation
- d) Cycler beginning with impulse after energisation
- e) Delay OFF after de-energisation, instant make of output
- f) Delay OFF responding to make of control contact regardless its length
- g) Delay OFF after break of control. contact with instant output
- h) Delay OFF after make and break of control. contact
- i) Memory (latching) relay
- j) Pulse generator



Time ranges



Description



Technical data

Time relay CRM-2H

Technical data

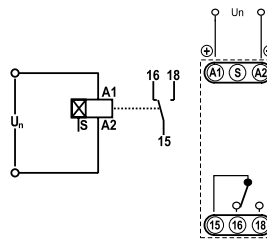
| | |
|-------------------------|---------------------------------|
| Number of functions | 2 |
| Supply | A1-A2 |
| Supply voltage | 12-240 V AC/DC (50-60 Hz AC) |
| Consumption | AC 0,7-3 VA / DC 0,5 - 1,7 W |
| Supply indication | green LED |
| Time ranges | 0.1 s-100 days |
| Time setting | rotary switch and potentiometer |
| Time deviation | 5% mechanical setting |
| Repeat accuracy | 0,2% set value stability |
| Temperature coefficient | 0,01% / °C -> 20 °C |

Output

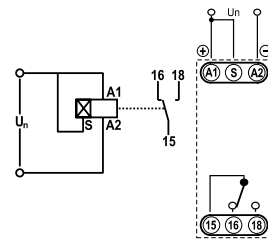
| | |
|----------------------------------|----------------------------|
| Changeover contacts | 1 |
| Rated current | 16A / AC1 |
| Breaking capacity | 4000 VA / AC1, 384 W / DC |
| Inrush current (duty factor 10%) | 30 A / <3 s |
| Switching voltage | 250 V AC1 / 24 V DC |
| Min. breaking capacity DC | 500 mW |
| Output indication | multifunction red LED |
| Mechanical life | 3x10 ⁷ |
| Electrical life | 0,7x10 ⁵ |
| Reset time | max. 150 ms |
| Operating temperature | -20...+55 °C |
| Storage temperature | -30...+70 °C |
| Electrical strength | 4 kV (supply-output) |
| Operating position | any |
| Mounting/DIN rail | EN 60715 |
| Protection degree | IP 40 from frontal panel |
| Overvoltage category | III |
| Pollution degree | 2 |
| Max. cable size | 2,5 mm ² |
| Dimensions | 90x17,6x64 mm ² |
| Standards | EN 61812-1, EN 61010-1 |

Connection

Cycler beginning with pulse

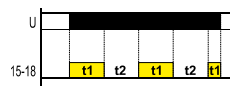


Cycler beginning with pause

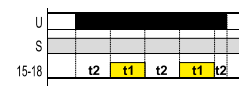


Functions

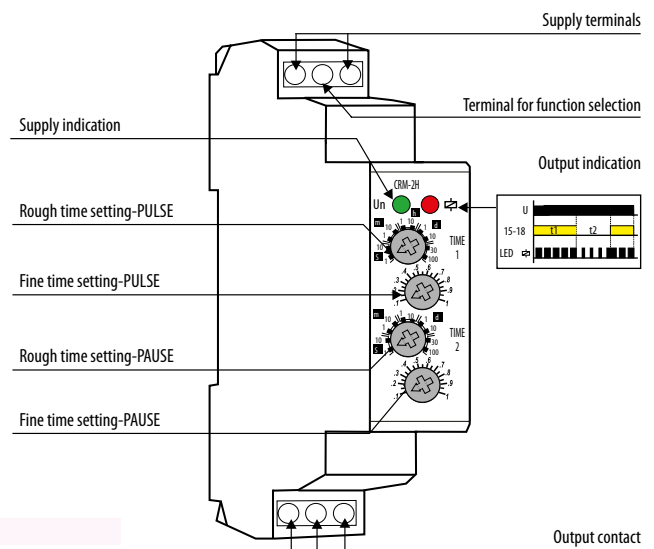
Cycler beginning with pulse



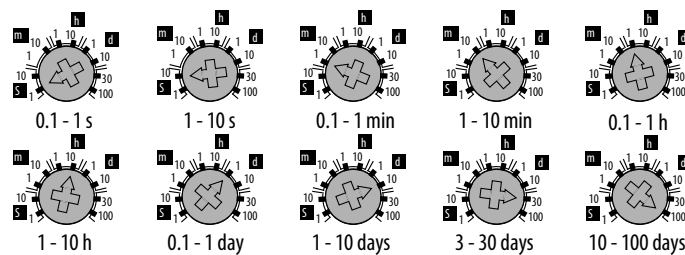
Cycler beginning with pause



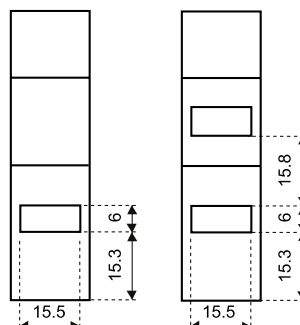
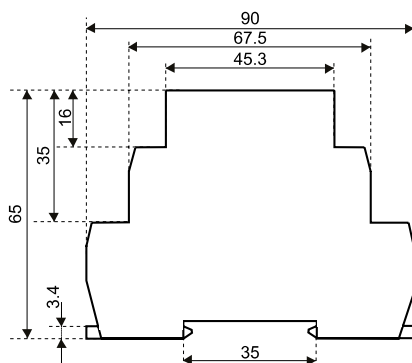
Description



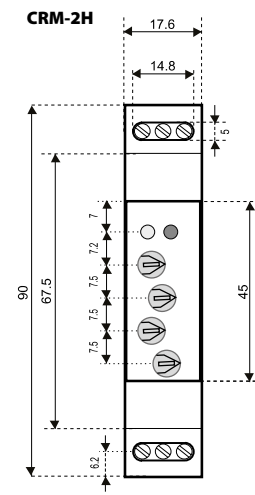
Time ranges



1-module design



Dimensions



Delay ON star/delta CRM-2T

Technical data

| | CRM-2T |
|--------------------------|---------------------------------|
| Number of functions | 1 |
| Supply | A1-A2 |
| Universal supply | AC/DC 12-240 V (AC 50-60 Hz) |
| Consumption | AC 0,7-3VA/DC 0,5-1,7 W |
| Supply voltage tolerance | -15% - +10% |
| Supply indication | green LED |
| Time ranges | t1: 0.1 s - 100 days |
| Time setting | rotary switch and potentiometer |
| Time deviation | 5%-mechanical setting |
| Repeat accuracy | 0,2%-set value stability |
| Temperature coefficient | 0,01% / °C at 20 °C |

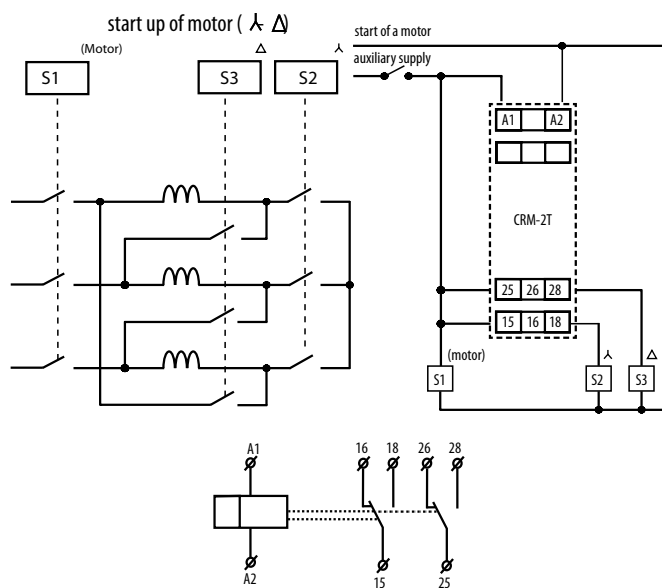
Output

| | |
|----------------------------------|---------------------------|
| Number of contacts | 2 x changeover (AgNi) |
| Rated current | 16 A / AC1 |
| Breaking capacity | 4000 VA / AC1, 384 W / DC |
| Inrush current (duty factor 10%) | 30A/<3s |
| Switching voltage | max. 250 V AC1 / 24 V DC |
| Min. breaking capacity DC | 500 mW |
| Output indication | multifunction red LED |
| Mechanical life | 3x10 ⁷ |
| Electrical life | 0.7x10 ⁵ |
| Reset time | max. 150 ms. |

Controlling

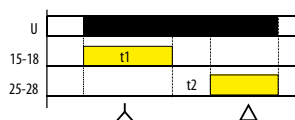
| | |
|-----------------------|------------------------|
| Operating temperature | -20...+55 °C |
| Storage temperature | -30...+70 °C |
| Electrical strength | 4 kV |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 40 from front panel |
| Overvoltage category | III |
| Pollution degree | 2 |
| Max. cable size | 2.5 mm ² |
| Dimensions | 90 x 17,6 x 64 mm |
| Standards | EN 61812-1, EN 61010-1 |

Connection

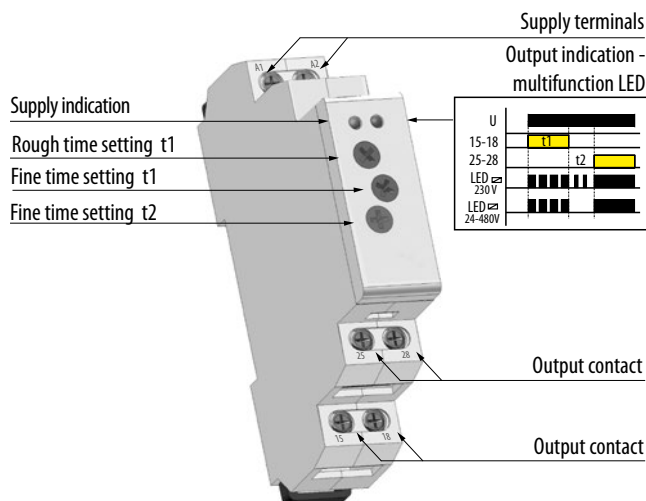


Functions

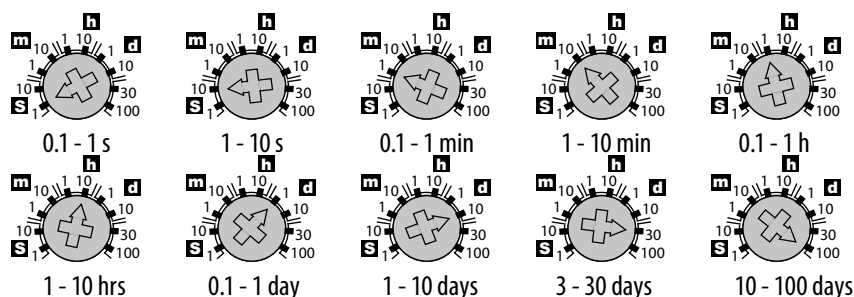
Delay ON star/delta



Description



Time ranges



Technical data

Staircase switch CRM-4

Technical data

| | |
|--------------------------|------------------------|
| Function | delay OFF |
| Supply | A1-A2 |
| Supply voltage | 230 V AC/50-60 Hz |
| Consumption | max. 12 VA AC/1.8 W |
| Supply voltage tolerance | - 15%; + 10% |
| Supply indication | green LED |
| Time ranges | 0,5 - 10 min |
| Time setting | potentiometer |
| Time deviation | 10% mechanical setting |
| Repeat accuracy | 5% set value stability |
| Temperature coefficient | 0,05% / °C -> 20 °C |

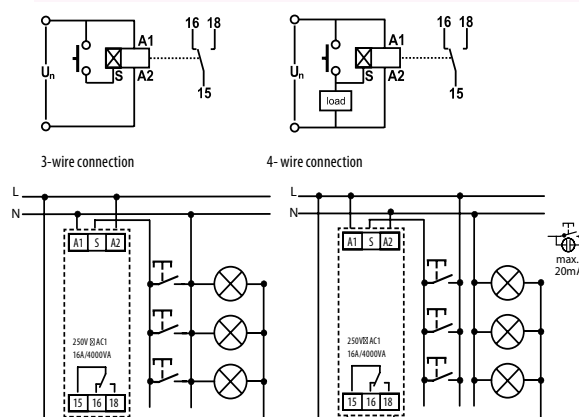
Output

| | |
|----------------------------------|---------------------------|
| Changeover contacts | 1 |
| Rated current | 16 A / AC1 |
| Breaking capacity | 4000 VA / AC1, 384 W / DC |
| Inrush current (duty factor 10%) | 30 A / <3 s |
| Switching voltage | 250 V AC1 / 24 V DC |
| Min. breaking capacity DC | 500 mW |
| Output indication | red LED |
| Mechanical life | 3x10 ⁷ |
| Electrical life | 0,7x10 ⁵ |

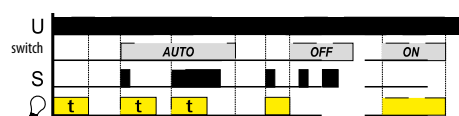
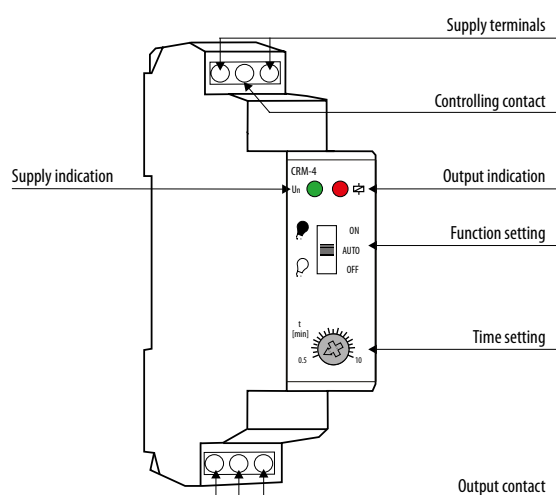
Controlling

| | |
|-----------------------|-----------------------------|
| Control. voltage | 230 V AC |
| Consumption of input | 0,53 VA AC |
| Load between S-A2 | yes |
| Glow-tubes | yes, max. 20 pcs. (at 1 mA) |
| Control. terminals | A1-S |
| Impulse length | min. 25 ms/max. unlimited |
| Reset time | max. 150ms |
| Operating temperature | -20...+55 °C |
| Storage temperature | -30...+70 °C |
| Electrical strength | 4 kV (supply - output) |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 40 from frontal panel |
| Overvoltage category | III |
| Pollution degree | 2 |
| Max. cable size | 2,5 mm ² |
| Dimensions | 90x17, 6x64 mm |
| Standards | EN 60669-2-3, EN 61010-1 |

Connection



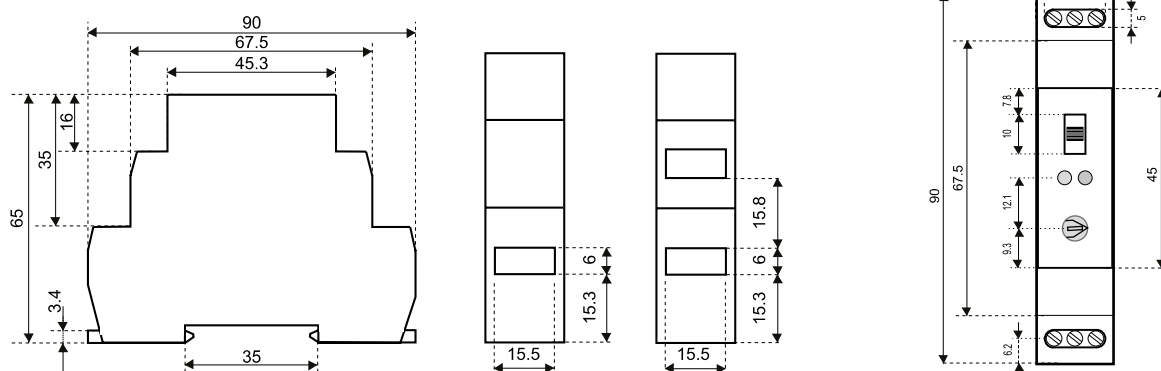
Description



Dimensions

CRM-4

1-module design



Programmable staircase switch CRM-46

Technical data

| | CRM-46 |
|--|-------------------------|
| Number of functions | 6 |
| Supply | A1-A2 |
| Supply voltage | 230 V AC / 50-60Hz |
| Consumption | max. 3VA AC / 1.6 W |
| Max. dissipated power (U _n + terminals) | 4 W |
| Supply voltage tolerance | -15% - +10% |
| Supply indication | green LED |
| Time ranges | 0.5 - 10 min |
| Time setting | potentiometer |
| Time deviation | 5%-mechanical setting |
| Repeat accuracy | 5%-set value stability |
| Temperature coefficient | 0.01 % / °C, at = 20 °C |

Output

| | |
|------------------------|---|
| Number of contacts | 1x NO - SPST(AgSnO ₂), switching potential A1 |
| Rated current | 16 A / AC1 |
| Breaking capacity | 4000 VA / AC1, 384W / DC |
| Inrush current | 30A / < 3s. |
| Switching voltage | max. 250 V AC / 24 V DC |
| Output indication | red LED |
| Mechanical life | 10 ⁷ |
| Electrical life (AC1)* | 5x10 ⁴ |

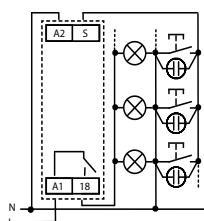
Control

| | |
|--------------------------------------|---|
| Control Voltage | 230 V AC |
| Power the control input max. | 4.5 VA / 0.3 W |
| Glow tubes | ✓ |
| Max. current of connected glow lamps | 100 mA |
| Control terminals | A1-S / A2-S |
| Impulse length | min 40ms. / max.unlimited |
| Reset time | max. 320 ms. |
| Operating temperature | -20...+55 °C |
| Storage temperature | -30...+70 °C |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 40 from front panel / IP10 terminals |
| Overvoltage category | III. |
| Pollution degree | 2 |
| Max. cable size | |
| - Solid wire max. | 2x2.5 mm ² / 1x4 mm ² |
| - with sleeve max. | 1x2.5 mm ² / 2x1.5 mm ² |
| Dimensions | 90 x 17,6 x 64 mm |
| Standards | EN 61812-1 |

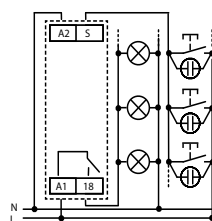
* For higher loads and frequent switching, it is recommended to strengthen the relay contact with a power contactor.

Connection

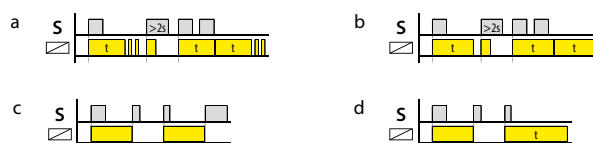
3-wire connection



4-wire connection



Functions



When switching between functions, the red LED flashes.

a - STAIRCASE SWITCH, programmable with signalization

The device timed the set time, 30 and 40s before the end of the time by double flashing of the luminaire announces the impending switch-off. You can increase the time interval by briefly pressing the button repeatedly. Suitable for resistive loads (e.g. bulbs).

b - STAIRCASE SWITCH, programmable without signalization

The device will timed the set time without flashing at the end of the interval. You can increase the time interval by briefly pressing the button repeatedly. The function is suitable for loads that can withstand frequent switching on and off (eg energy saving lamps, LED bulbs).

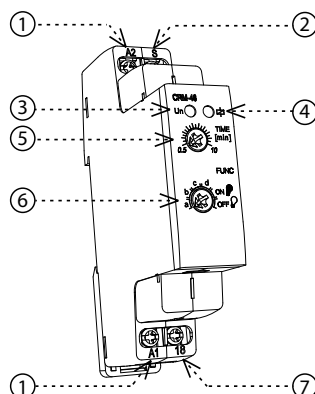
c - MEMORY LATCH (press to switch on, press to switch off)

By pressing the button the output relay closes and by pressing again the relay opens. This function is primarily intended for locations where long-term lighting (without timing) is desirable and the unit is controlled from multiple locations (e.g. in office buildings).

d - MEMORY LATCH with delay

Pressing the button switches the output on / off. If the output is not turned off during the set time "t", it turns off automatically after the timer. This function is suitable for places where lighting is often forgotten (e.g. toilets, corridors, cellars).

Description



1. Supply terminal
2. Controlling input
3. Supply indication
4. Output contact timing / closing indication
5. Time delay setting 0.5 - 10 min
6. Function setting
7. Output contact

| Type of load | cos φ ≥ 0.95 | AC1 | AC2 | AC3 | AC5a uncompensated | AC5a compensated | AC5b | AC6a | AC7b | AC12 |
|--|--------------|-----------|-----------|-------------------|--------------------|-------------------------------------|----------|----------|-----------|------|
| mat. contacts AgSnO ₂ , contact 16A | 250V / 16A | 250V / 5A | 250V / 3A | 230V / 3A (690VA) | 230V / 3A (690VA) | 230V / 3A (690VA) max. input C=14uF | 1000W | x | 250V / 3A | x |
| Type of load | AC13 | AC14 | AC15 | DC1 | DC3 | DC5 | DC12 | DC13 | DC14 | |
| mat. contacts AgSnO ₂ , contact 16A | x | 250V / 6A | 250V / 6A | 24V / 10A | 24V / 3A | 24V / 2A | 24V / 6A | 24V / 2A | x | |

Technical data

Digital time switch SHT-1, SHT-1/2, SHT-3 and SHT-3/2

Technical data

| | |
|--------------------------|--|
| Supply terminals | A1-A2 |
| Supply voltage | UNI 12 - 240 V AC/DC (50 AC - 60 Hz) |
| Consumption | 0,5 - 2 VA AC/ 0,4 - 2 W DC |
| Supply voltage | 230 |
| Consumption | 230 V AC/50 - 60 Hz max. 14 VA AC / 2 W |
| Supply voltage tolerance | -15%; +10% |
| Back-up supply | yes |
| Summer/winter time | automatic |

Output

| | |
|----------------------------------|---|
| Number of contacts | 1x CO → SHT-1, SHT-3; 2X CO → SHT-1/2, SHT-3/2 |
| Rated current | 16 A / AC1 |
| Breaking capacity | 4000 VA / AC1, 384 W / DC |
| Inrush current (duty factor 10%) | 30 A / < 3 s |
| Switching voltage | 250 V AC1 / 24 V DC |
| Min. breaking capacity DC | 500 mW |
| Mechanical life | >3x10 ⁷ |
| Electrical life (AC1) | >0,7x10 ⁵ |

Time circuit

| | |
|------------------|-----------------------|
| Power back-up | 3 years |
| Accuracy | max. +/-1s/dat / 23°C |
| Minimum interval | 1 s |
| Data stored for | min. 10 years |

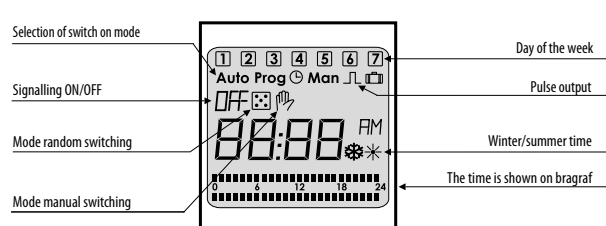
Program circuit

| | |
|------------------------|--------------------------------|
| Program SHT-1, SHT-1/2 | daily, weekly |
| Program SHT-3, SHT-3/2 | daily, weekly, monthly, yearly |
| Data readout | LCD display |

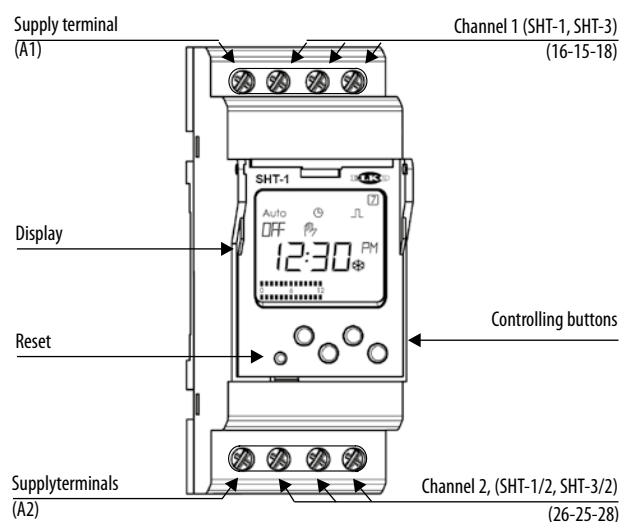
Other information

| | |
|-----------------------|--|
| Operating temperature | -20...+55°C |
| Storage temperature | -30...+70°C |
| Electrical strength | 4 kV (supply-output) |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 20 |
| Overvoltage category | III |
| Pollution degree | 2 |
| Max. cable size | max. 2x1,5 mm ² , 2x2,5 mm ² |
| Dimensions | 90x35, 6x64mm |
| Standards | EN 61812-1, EN 61010-1 |

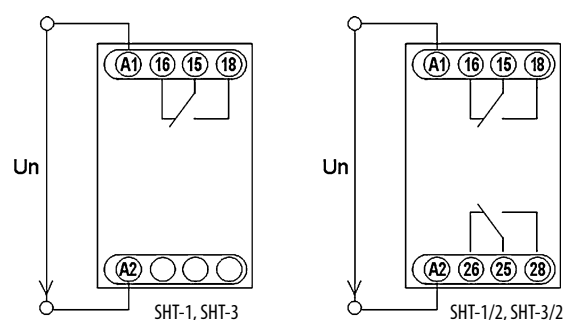
Controlling elements



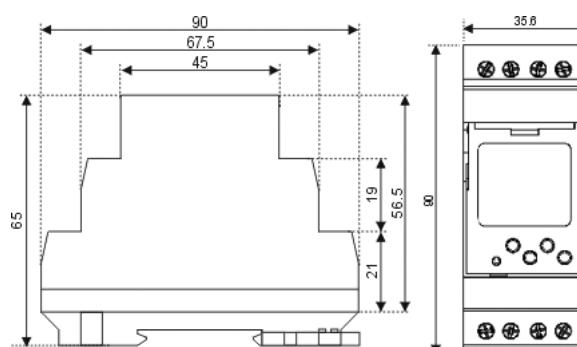
Description



Connection



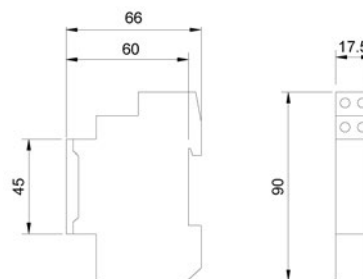
Dimensions



Analog electromechanical time switch APC-D1, APC-DR1

| Technical data | | |
|-----------------------------|--------------------|--------------------|
| | APC-DR1 | APC-D1 |
| Supply voltage | 230V AC | 230V AC |
| Power reserve | yes (100 hrs) | no |
| Dial/minimum switching time | 15 min | 15 min |
| Operating accuracy | +/- 1s/day at 22°C | +/- 1s/day at 22°C |
| Program | Daily | Daily |
| Output contact | 1 x NO | 1 x NO |
| Switching capability | 16A 125/250V AC1 | 16A 125/250V AC1 |
| Power consumption | 0,5W | 0,5W |
| Operating temperature | -25...+55°C | -10...+45°C |
| Mounting | DIN rail EN 60715 | DIN rail EN 60715 |
| Protection category | IP20 | IP20 |
| Overvoltage category | II | II |
| Dimensions | 90 x 17,5 x 66 | 90 x 17,5 x 66 |
| Standards | EN 60730-2-7 | EN 60730-2-7 |

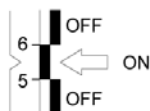
Dimensions



Connection



Programming



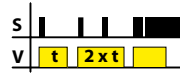
Multifunction relays SMR-T, SMR-H, SMR-B

| Technical data | | | |
|---------------------------------|---|-------------------------------------|---------------------------|
| | SMR-T | SMR-H | SMR-B |
| Number of functions | 9 | 9 | 10 |
| Connection | 3-wires, without neutral | 4-wires, with neutral | 4-wires, with neutral |
| Supply voltage | 230 V AC / 50-60 Hz | | |
| Consumption (no operation/make) | 0,8/3 VA | 0,8/3 VA | 3 VA |
| Supply voltage tolerance | - 15%; + 10% | | |
| Time ranges | 0,1 s-10 days | 0,1 s-10 days | x |
| Time setting via | via rotary switch and potentiometer | via rotary switch and potentiometer | x |
| Time deviation | 10% mechanical setting | 10% mechanical setting | x |
| Repeat accuracy | 2% set value stability | 2% set value stability | x |
| Temperature coefficient | 0,1%, °C at 20 °C | 0,1%, °C at 20 °C | x |
| Output | 1x triac | | |
| Resistive load | 10-160 VA | 0-200 VA | 16A 125/250 V AC1 |
| Inductive load | 10-100 VA | 0-100 VA | 8A 250 V AC (cos φ > 0,4) |
| Controlling | | | |
| Voltage | 230 V AC | | |
| Current | 3 mA | | |
| Impulse length | min. 50 ms/ max. unlimited | | |
| Operating temperature | 0...+50 °C | | |
| Operating position | any | | |
| Mounting | free at connecting wires | | |
| Protection degree | IP 30 from front panel | | |
| Overvoltage category | III | | |
| Pollution degree | 2 | | |
| Fuse | F1 A / 250 V | F1 A / 250 V | F1,6 A / 250 V |
| Outlets | 3 x solid wires 0,75 mm ² length 90 mm | | |
| Glow-laps in button (pcs) | max. 10 | | |
| Dimensions | 48,5 x 48,5 x 13 mm | | |
| Standards | EN 61010-1 | | |

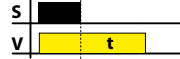
Technical data

Function

Function a - delay off on entering edge
output times when it is switched. Each following pressing (max. 5x) increases time
Long pressing switches output off



Function b - delay off on downward edge
output times after button is switched off, switches immediately



Function c - delay off on downward edge
after switching off output switches on and times.



Function d - cycler - flasher impulser
output cycles in regular interval, cycler starts with an impulse



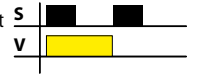
Function e - puls shift
delay on after the switch is switched on and delay on after it is switched off



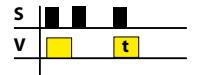
Function f - delay on
delay on after switch is switched on until it is switched off



Function g - pulse relay
switches on by a press, another pressing switches the output off. The length of pressing doesn't matter, it is possible to set reaction delay by a potentiometer and thus eliminate rebound of a button



Function h - impulse relay with delay
one press switches on, another one switches the output off in case it is done before the end of timing



Function i - delay on after switched off
output cycles in regular intervals, cycler starts with a gap

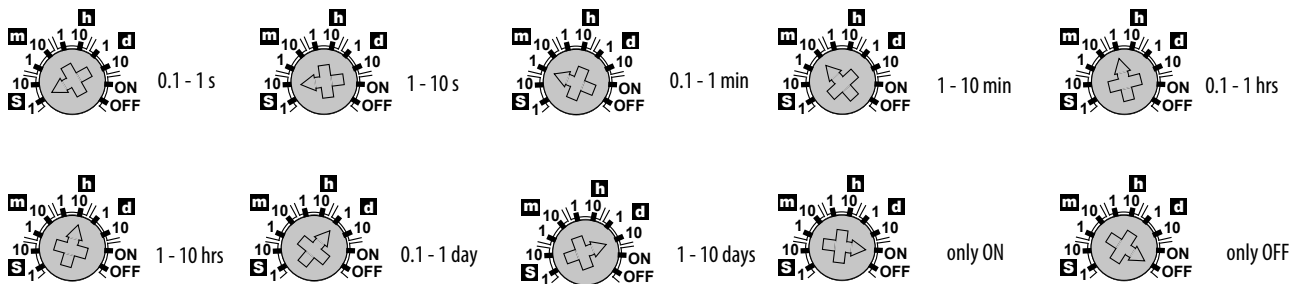


Function j *- cycler starting with gap
delay on after switching on until it is de-energized or a switch is pressed again.

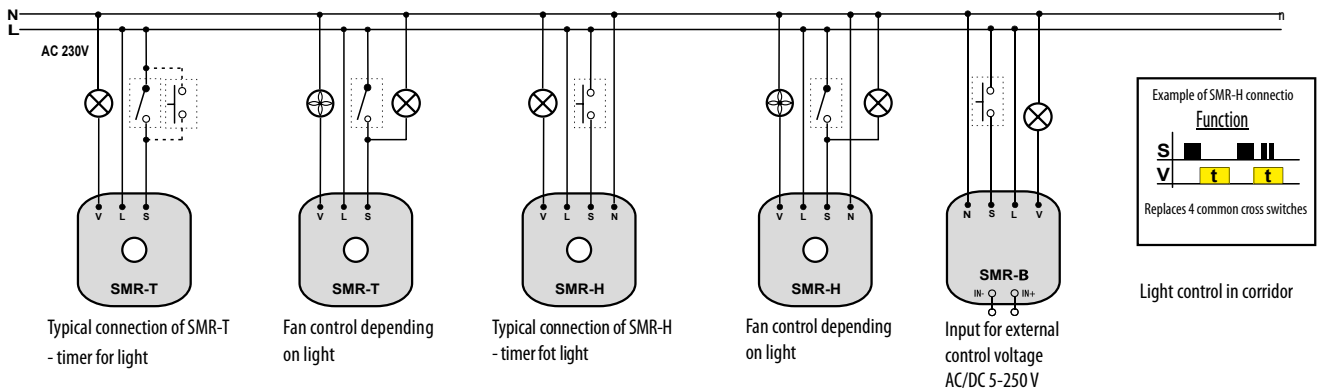


*function j is valid only for SMR-B

Time ranges

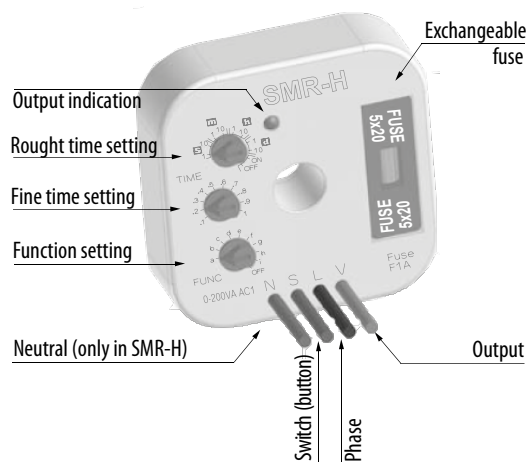


Connection SMR-B, SMR-H, SMR-T

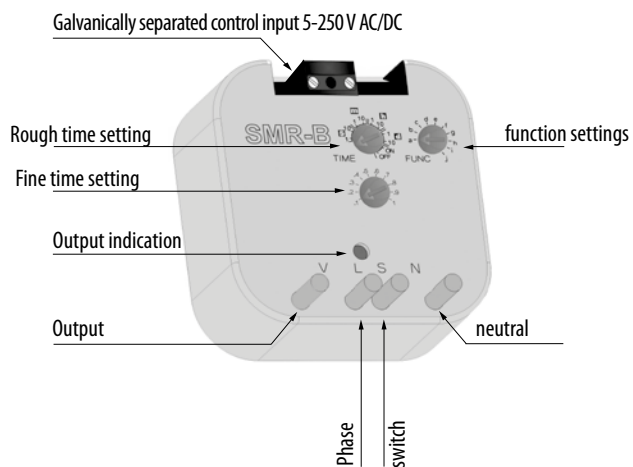


Description

SMR-T, H

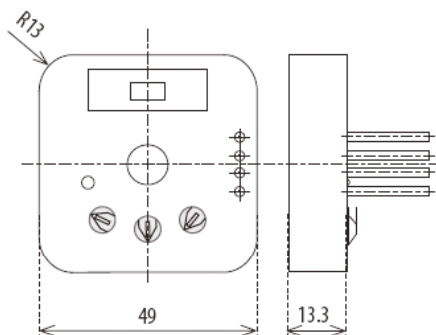


SMR-B

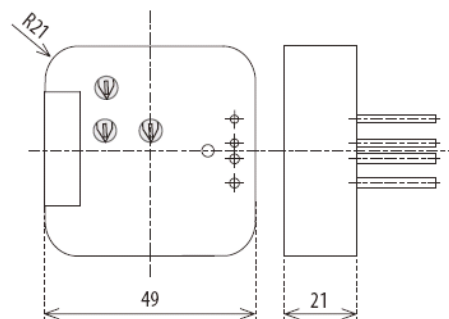


Dimension

SMR-T, SMR-H



SMR-B



Technical data

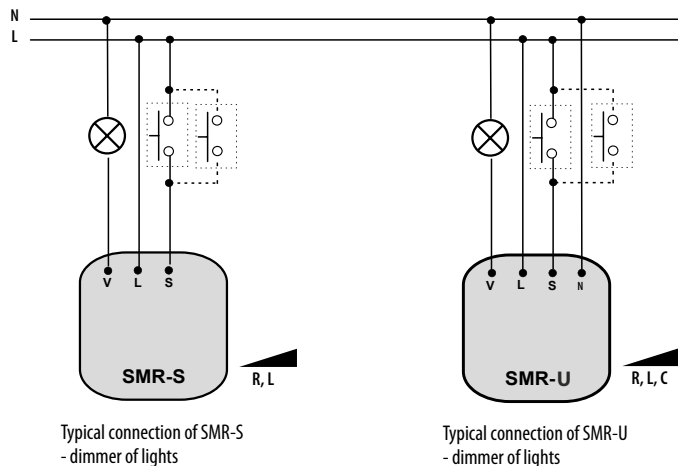
Dimmer flush mounting SMR-S, SMR-U

| Technical data | | |
|---------------------------------|------------------------------|---------------------|
| | SMR-S | SMR-U |
| Connection | 4-wire without neutral | 4-wire with neutral |
| Supply voltage | AC 230 V / 50-60 Hz | |
| Consumption (no operation/make) | max. 3VA | |
| Supply voltage tolerance | - 15%; + 10% | |
| Output | | |
| Resistive load | 10-300 VA | 500 VA* |
| Capacitive load | x | 500 VA* |
| Inductive load | 10 -150VA | 500 VA* |
| Controlling | | |
| Control Voltage | AC 230 V | |
| Current | 3 mA | |
| Impulse length | min. 50 ms/ max. unlimited | |
| Operating temperature | 0...+50 °C | |
| Operating position | any | |
| Mounting | free of connecting wires | |
| Protection degree | IP30 from front panel | |
| Overvoltage category | III | |
| Pollution degree | 2 | |
| Fuse | F 1.6A/ 250V | x |
| Output | solid 0,75 mm², length 90 mm | |
| Glow-lamps in control button | max. 10 pcs. | |
| Dimensions | 49x49x13 mm | |
| Standards | EN 60669-2-1, EN 61010-1 | |

*When load is above 300 VA it is necessary to ensure sufficient cooling; see instruction manual technical data

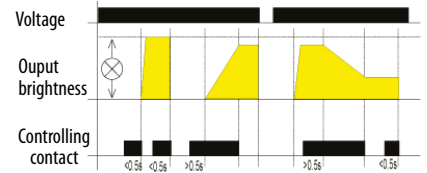
Warning: it cannot be used for fluorescent lights and energy saving lights!
SMR-U: It is not allowed to connect together loads of inductive and capacitive type at the same time

Connection SMR-S, SMR-U



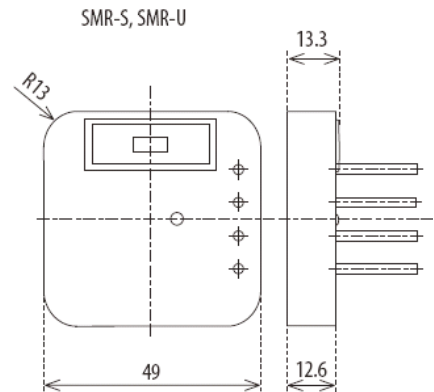
Warning: it cannot be used for fluorescent lights and energy saving lights!
SMR-U: It is not allowed to connect together loads of inductive and capacitive type at the same time

Functions

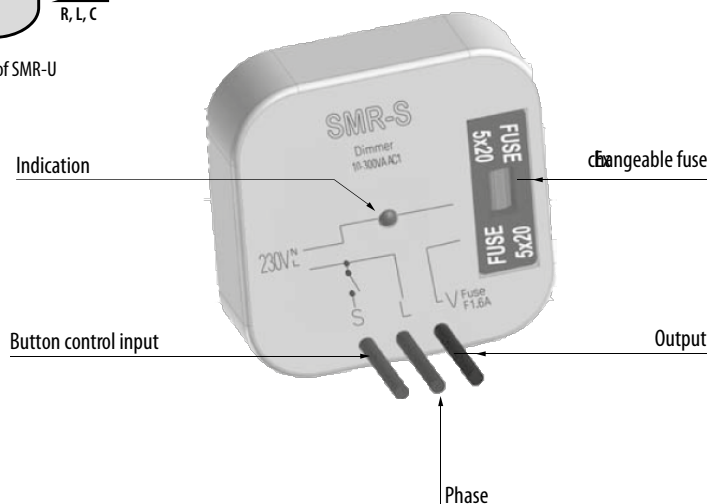


KA short press (<0.5s) turns a light on, another short press turns it off. A longer press (>0.5s) causes a gradual regulation of light intensity min-max-min round until the button is released. After releasing a set intensity is kept in memory, further short presses turn the light on/off keeping the set intensity. The intensity can be changed by further long press. After de-energising the relay remembers the set value.

Dimensions



Description SMR-S

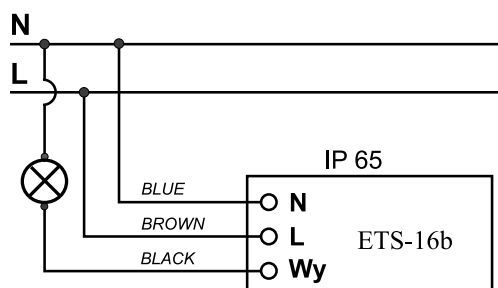


Twilight switch in IP65 ETS-16b

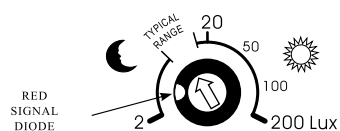
Technical data

| | ETS-16b |
|----------------------------------|--------------------------------|
| Voltage | 230 V AC |
| Time delay | cca 20 s |
| Light level | 2-50 Lx |
| The number and types of contacts | 1 NO - NO |
| Rated current contact | 16A/AC1 |
| Installation | on a flat surface |
| Standards | EN 61812-1, EN 50081, EN 61000 |
| Power supply range | 180 - 240 V AC 50Hz |
| Max load current (AC-1) | 16 A |
| Switch ON treshold | 10 lux |
| Switch off treshold | 20 lux |
| Time delay of switch ON or OFF | cca 20 s |
| Adjustment range | cca 2 - 200 lux |
| Working temperature | - 40 °C ... +50 °C |
| Protection class | IP65 |

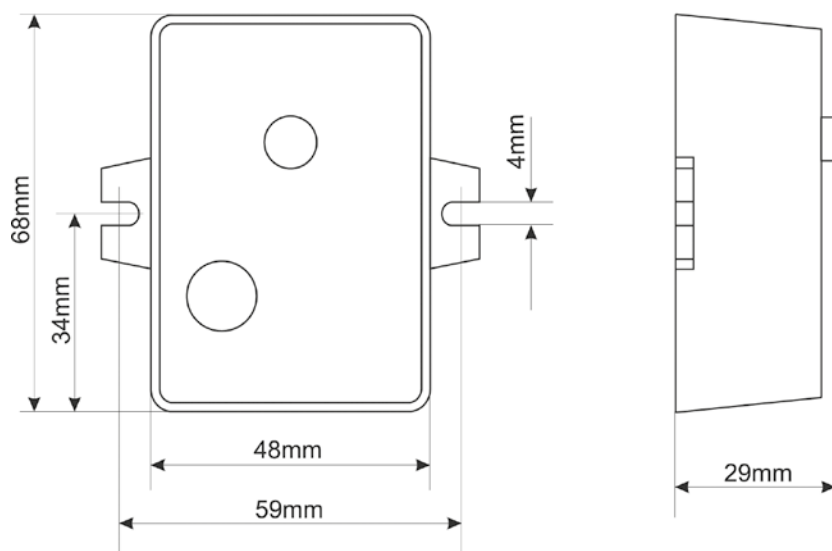
Connection



Setting



Dimensions

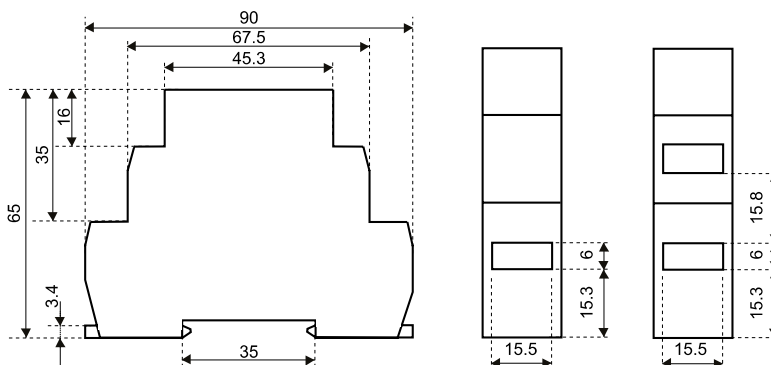


Memory and latching relays MR-41, MR-42

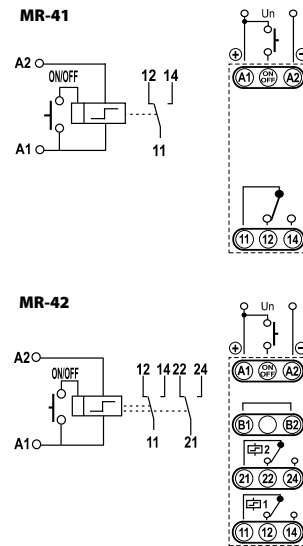
Technical data

| | MR-41 | MR-42 |
|-------------------------------|--|--|
| Number of functions | 1 | 2 |
| Supply | A1-A2 | |
| Supply voltage UNI | 12-240 V AC/DC (50-60 Hz AC) | |
| Consumption UNI | AC 0,17-3 VA / DC 0,5 - 1,2 W | AC 0,17-12 VA / DC 0,11 - 1,9 W |
| Supply voltage 230 | 230 V AC / 50-60 Hz | |
| Consumption 230 | AC max. 12 VA / DC 1,2 W | AC max. 12 VA / DC 1,9 W |
| Supply indication | green LED | |
| Output | | |
| Supply voltage tolerance | - 15%; + 10% | |
| Number of contacts | 1xCO | 2xCO |
| Rated current | 16 A / AC1 | 2x16 A / AC1 |
| Breaking capacity | 4000 VA / AC1, 384 W /DC | 4000 VA / AC1, 2x384 W / DC |
| Inrush current | 30 A / <3 s | 30 A / <3 s |
| Switching voltage | 250 V AC1 / 24 V DC | 250 V AC1 / 24 V DC |
| Min. breaking capacity DC | 500 mW | 500 mW |
| Output indication | red LED | red LED |
| Mechanical life | 3x10 ⁷ | |
| Electrical life | 0,7x10 ⁵ | |
| Controlling | | |
| Voltage | 12-240 V AC/DC | |
| Consumption of input | AC 0,025-0,2 VA / DC0,1-0,7 W (UNI) , AC 0,53 VA (AC 230V) | |
| Load between A2 ON/OFF | yes | |
| Glow-lamps | no (UNI) , yes -max. 4 pcs at 1mA (AC 230V) | |
| Control terminals | A1 ON/OFF | |
| Capacitance of cable control: | | |
| -without connected glow lamps | 12 nF (UNI), 12nF (230V) | |
| -with connected glow lamps | 9nF (UNI), glow lamps cannot connected/NO 9nF (230V), max. 4pcs (1pc-1mA) | 9nF (UNI), glow lamps cannot connected/NO 9nF (230V), max. 4pcs (1pc-1mA) |
| Impulse length | min. 25 ms/ max. unlimited | |
| Operating temperature | -20...+55°C | |
| Storage temperature | -30...+70°C | |
| Electrical strength | 4 kV (supply - output) | |
| Operating position | any | |
| Mounting | DIN rail EN 60715 | |
| Protection degree | IP 40 from frontal panel | |
| Overvoltage category | III | |
| Pollution degree | 2 | |
| Max. cable size | 2,5 mm ² | |
| Dimensions | 90x17, 6x64 mm | |
| Standards | EN 60669-2-2, EN 61010-1 | |

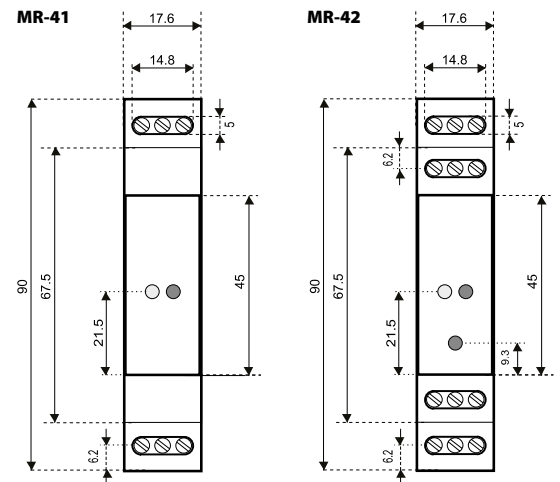
1-module design



Connection

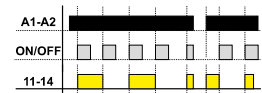


Dimensions

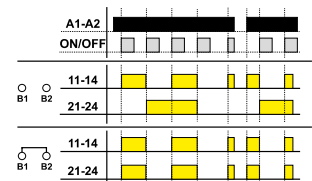


Function

MR-41



MR-42



Staircase switch with dimming DIM-2

Technical data

| | |
|--------------------------|------------------------|
| Supply | A1-A2 |
| Supply voltage | 230 V AC (50 Hz) |
| Consumption | max. 5 VA |
| Supply voltage tolerance | - 15%; + 10% |
| Supply indication | green LED |
| Time setting via | potentiometer |
| Time deviation | 10% mechanical setting |
| Repeat accuracy | 5% set value stability |
| Temperature coefficient | 0,01% / °C / 20 °C |

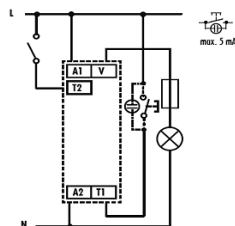
Controlling T1

| | |
|------------------------|------------------------------|
| Terminals | T1-A1 |
| Voltage | 230 V AC |
| Power on control input | max. 1,5 VA |
| Impulse length | min. 100 ms / max. unlimited |
| Glow-lamps | yes, max. 5 pcs (at 1 mA) |

Controlling T2

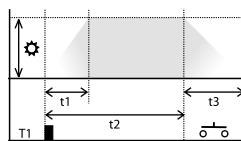
| | |
|-----------------------|------------------------------|
| Terminals | T2-A1 |
| Voltage | 230 V AC |
| Power control input | max. 0,1 VA |
| Impulse length | min. 100 ms / max. unlimited |
| Glow-lamps | no |
| Output | contactless - triac |
| Rated current | 2 A |
| Resistive load | 10-500 VA |
| Inductive load | 10-250 VA |
| Operating temperature | -20...+55 °C |
| Storage temperature | -30...+70 °C |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 40 from front panel |
| Overvoltage category | III |
| Pollution degree | 2 |
| Max. cable size | 2,5 mm ² |
| Dimensions | 90x17,6x64 mm |
| Standards | EN 60669-2-1, EN 61010-1 |

Connection

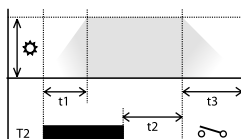


Function

Controlled via input T1 (button)



Controlled via input T2 (switch)



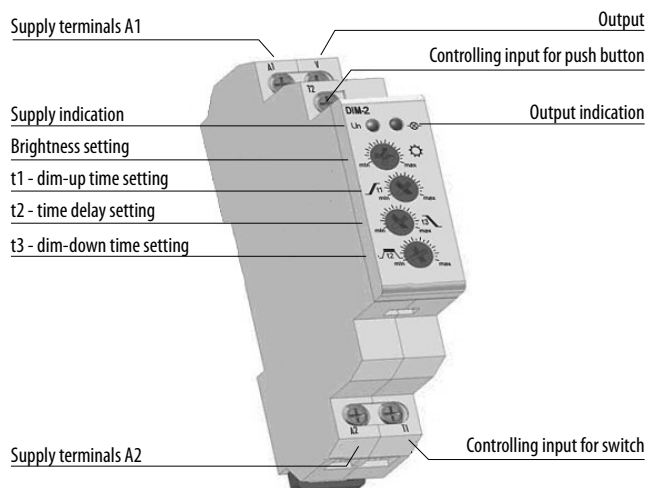
Cycle dim-up time is activated by pressing the button; By repressing the button (during the cycle) it is possible to prolong the time of the cycle.

Legend:

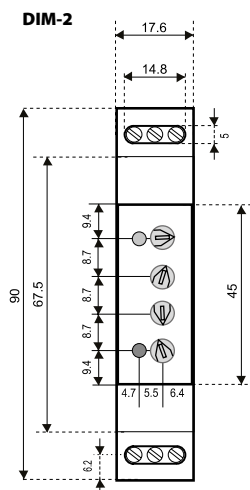
- ⚙ Output / Brightness: 10-100%
- t1 Dim-up time: 1-40 s
- t2 Time delay: 0s-20min
- t3 Dim-down time: 1-40s
- T1/T2 Controlling contact

The cycle is started by activating the switch and breaks on max. adjusted brightness level. After the switch is turned off the switch cycle is complete.

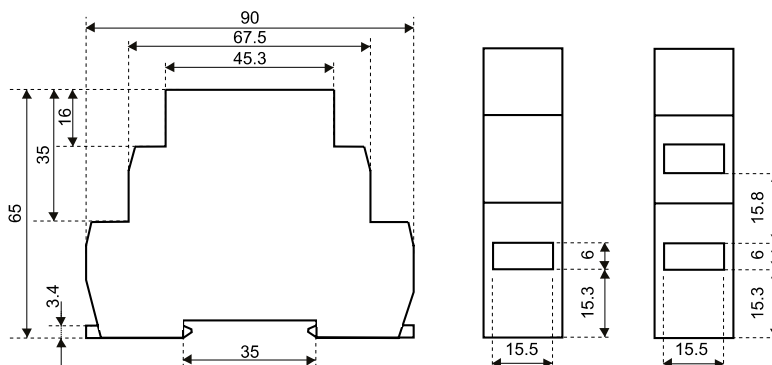
Description



Dimensions



1-module design



Technical data

Dimmer DIM-14

Technical data

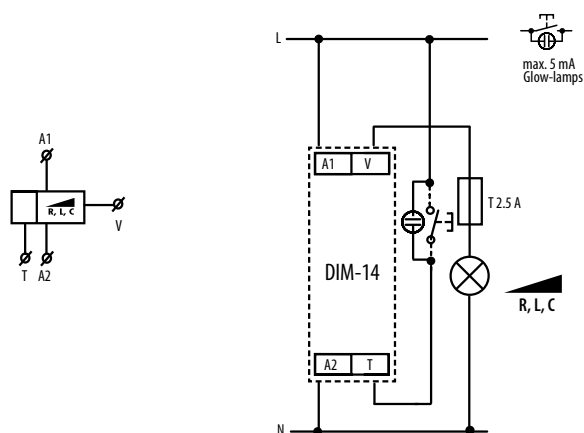
| DIM-14 | |
|------------------------------|-----------------------------|
| Supply | A1-A2 |
| Supply voltage | 230 V AC (50 Hz) |
| Consumption | 1,3 W |
| Supply voltage tolerance | - 15%; + 10% |
| Supply indication | green LED |
| Indication output | 6 VA |
| Controlling | |
| Terminals | T1-A1 |
| Control Voltage | 230 V AC |
| Power control input | 0,3 - 0,6 VA AC |
| Impulse length | min. 80 ms / max. unlimited |
| Glow-lamps in control button | yes, max. 5 pcs. (at 1 mA) |
| Output | 2 x MOSFET |
| Rated current | 2 A |
| Resistive load | 500 VA* |
| Inductive load | 500 VA* |
| Capacitive load | 500 VA* |
| Output indication | red LED |
| Operating temperature | -20...+35 °C |
| Storage temperature | -20...+60 °C |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 40 from front panel |
| Overvoltage category | III |
| Pollution degree | 2 |
| Max. cable size | 2,5 mm ² |
| Dimensions | 90x17,6x64 mm |
| Standards | EN 60669-2-1, EN 61010-1 |

* When load is above 300 VA it is necessary to ensure sufficient cooling

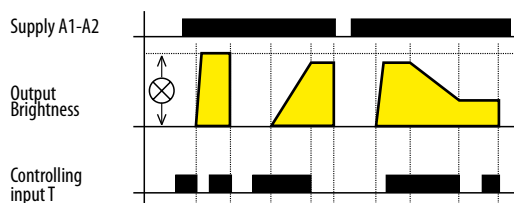
Recommendation for mounting: leave a gap of min. 0,5 module (approx. 9 mm) on side of the device to ensure better cooling of the device.

Warning for DIM-14: it is not allowed to connect together loads of inductive and capacitive type at the same time

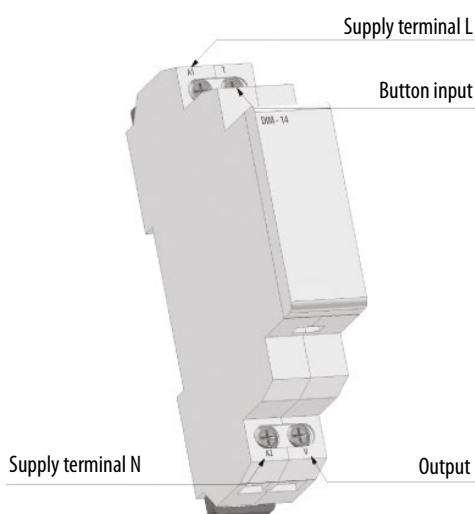
Connection



Functions



Description



Dimmers for LED bulbs and dimmable fluorescent lamps DIM-15 and SMR-M

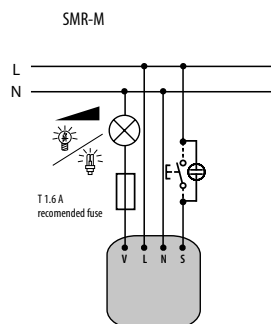
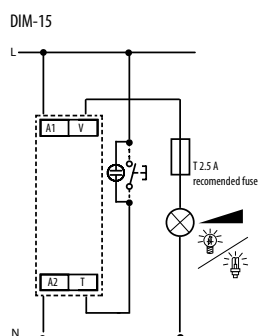
| Technical data | | |
|--|--|--|
| | DIM-15 | SMR-M |
| Supply voltage | 230V AC / 50-60 Hz | |
| Supply voltage tolerance | -15%; +10% | |
| Apparent power | max. 1.5VA | |
| Loss power | max. 0.7W | |
| Supply indication | green LED | |
| Controlling | | |
| Control wire | A1 - T | L - S |
| Control voltage | 230V AC | |
| Control input power | AC 0.3-0.6 VA | |
| Control impulse length | min. 80 ms / unlimited | |
| Glow tubes connection | ✓ | |
| Max. amount of glow lamps connected to controlling input | 230V - max. 15pcs (measured with glow lamp 0.68mA/230VAC) | 230V - max. 10pcs (measured with glow lamp 0.68mA/230VAC) |
| Output | | |
| Contactless | 2 x MOSFET | |
| Load* | 300W (at cos φ=1) | 160W (at cos φ=1) |
| Output status indication | red LED | x |
| Other data | | |
| Operating temperature | -20 ... +35°C | |
| Storing temperature | -20 ... +60°C | |
| Operating position | any | |
| Mounting | DIN rail EN 60715 | free at connection wires |
| Protection degree | IP40 from front panel / IP10 terminals | IP30 in standard conditions |
| Overvoltage category | III | |
| Pollution level | 2 | |
| Terminal wires (mm²) | max. 2x2.5; with sleeve 1x1.5 | x |
| Dimensions | 90 x 17.6 x 64 mm | 49 x 49 x 21 mm |
| Weight | 57 g | 38 g |
| Standards | EN 60669-2-1, EN 61010-1 | |

* Due to a large number of light source types, the maximum load depends on the internal construction of dimmable LEDs and ESL bulbs and their power factor $\cos \varphi$.

The power factor of dimmable LEDs and ESL bulbs ranges from $\cos \varphi = 0.95$ to 0.4.

An approximate value of maximum load may be obtained by multiplying the load capacity of the dimmer by the power factor of the connected light source.

Connection



Light source type setting

dimmable saving fluorescent lamps

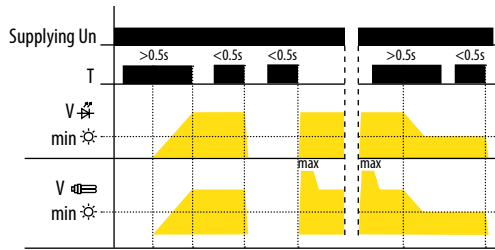


LED bulbs



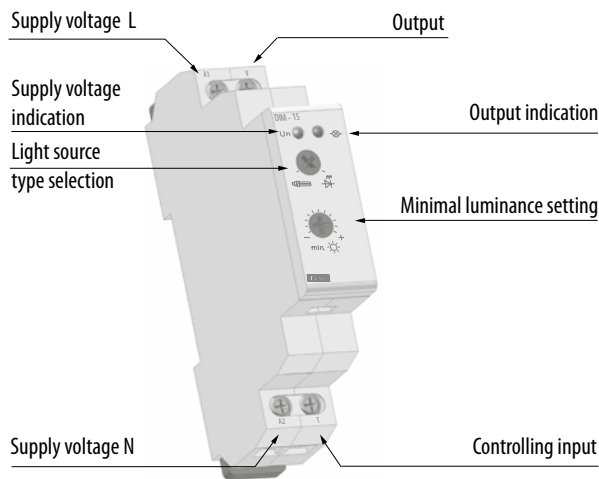
Technical data

Functions and controlling

**Controlling:**

- short button press ($<0.5s$) turns the light off or on
- long press ($>0.5s$) enables slight regulation of light intensity
- setting of minimal luminance is possible only during decreasing of luminance by long button press

Devices description

**Minimal luminance setting:****LED bulb:**

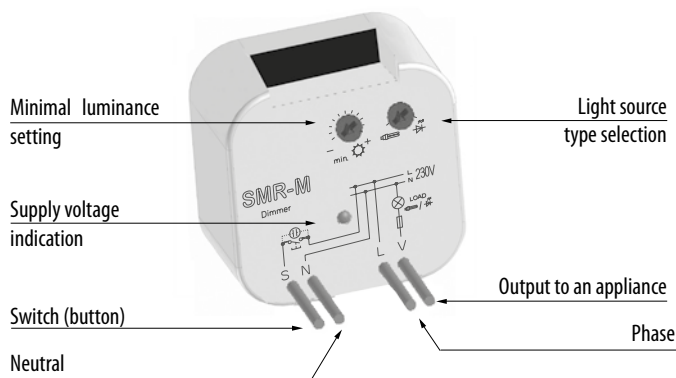
- if the light is turned off, short press ($<0.5s$) switches the light onto last set luminance level

Saving fluorescent lamp:

- if the light is turned off, short press increases the luminance onto maximal level (saving fluorescent lamps fires up) and then luminance decreases onto set level
- setting of minimal luminance by saving fluorescent lamps serves for harmonizing of lowest light intensity prior its unprompted switching off

Additional information

- it is possible to dim only LED bulbs equipped with capacitor supplying
- it is not possible to dim saving fluorescent lamps without marking: dimmable
- an incorrect setting of light source has effect only on dimming range, it means neither dimmer or load get damaged
- maximal load is counting with usage of LC filter



Technical data

| | |
|--------------------------|-----------------------|
| Supply | A1-A2 |
| Supply voltage AC 230 | 230 V AC (50-60 Hz) |
| Consumption AC 230 | max. 12 VA AC / 1,8 W |
| Supply voltage tolerance | - 15%; + 10% |
| Supply indication | green LED |
| Time dwell | 0-2 min |
| Time dwell setting | potentiometer |
| Measuring range 1) | 1-100 Lx |
| Measuring range 2) | 100-50000 Lx |

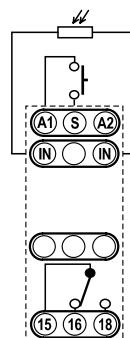
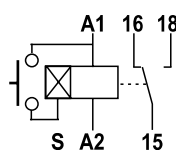
Output

| | |
|----------------------------------|-----------------------|
| Number of contacts | 1xCO |
| Rated current | 16/AC1 |
| Breaking capacity | 4000 VA/AC1, 384 W/DC |
| Inrush current (duty factor 10%) | 30 A/<3 s |
| Switching voltage | 250 V AC1/24 V DC |
| Min. breaking capacity DC | 500 mW |
| Output indication | red LED |
| Mechanical life | 3x10 ⁷ |
| Electrical life | 0,7x10 ⁵ |

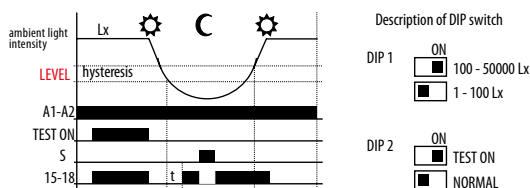
Controlling

| | |
|------------------------------------|----------------------------|
| Voltage | 230 V AC |
| Consumption of input | 0,8-530 mVA |
| Load between S-A2 | yes |
| Glow-lamps | yes, max. 4 pcs (at 1 ms) |
| Terminals | A1-S |
| Impulse length | min. 25 ms/ max. unlimited |
| Reset time | 150 ms |
| Operating temperature | -20...+55 °C |
| Storage temperature | -30...+70 °C |
| Electrical strength | 4 kV (supply - output) |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 40 from frontal panel |
| Connection cable length for sensor | max. 50 m (standard wire) |
| Overvoltage category | III |
| Pollution degree | 2 |
| Max. cable size | 2,5 mm ² |
| Dimensions | 90x17, 6x64 mm |
| Standards | EN 60255-6, EN 61010-1 |

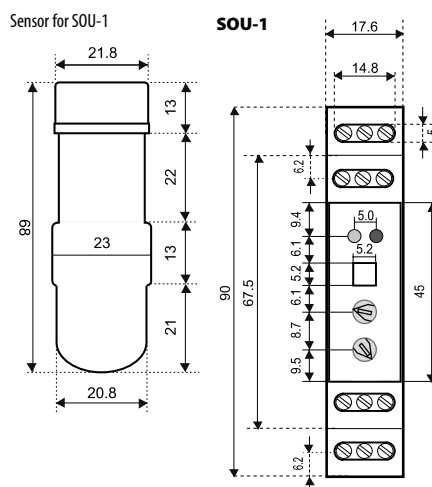
Connection



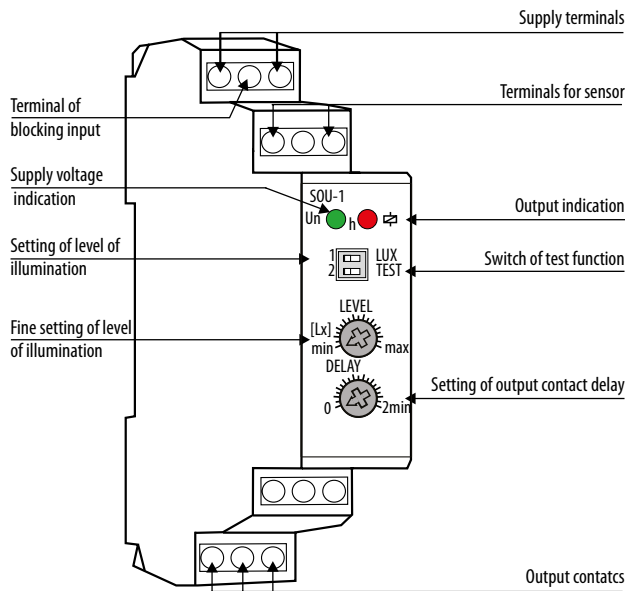
Function



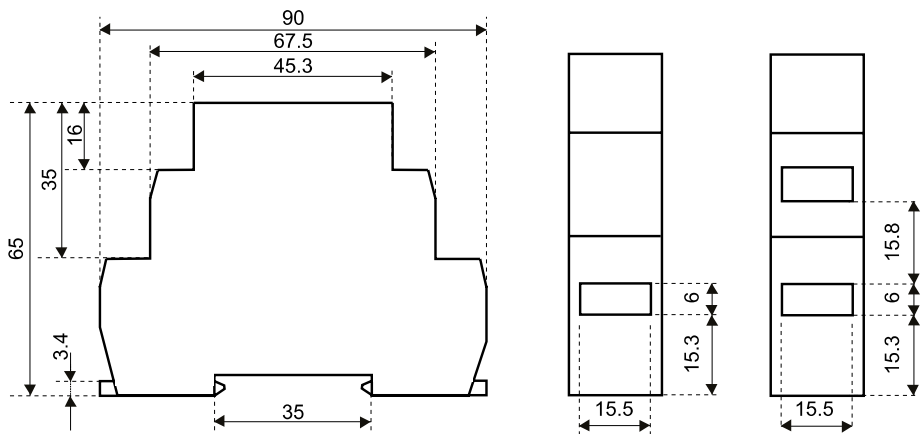
Dimensions



Description



1-module design

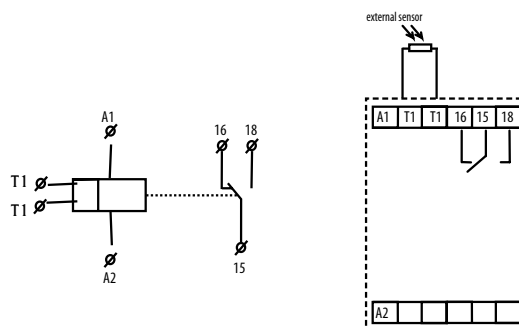


Twilight switch with digital time switch SOU-2 + sensor

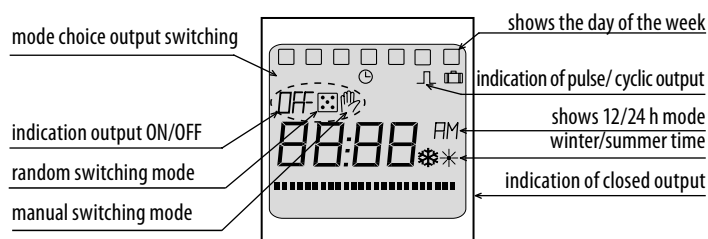
Technical data

| | SOU-2 |
|---------------------------|------------------------------------|
| Supply | A1-A2 |
| Supply voltage | 230 V AC (50-60Hz) |
| Consumption | max. 3,5 VA |
| Supply voltage tolerance | -15% ; +10% |
| Back-up supply | yes |
| Summer/winter time | automatic |
| Output | |
| Number of contacts | 1 changeover (AgNi) |
| Rated current | 8 A / AC1 |
| Breaking capacity | 2500 VA / AC1, 240W / DC |
| Switching voltage | max. 250 V AC1 / 24 V DC |
| Min. breaking capacity DC | 500 mW |
| Mechanical life | 1x10 ⁷ |
| Electrical life | 1x10 ⁵ |
| Time circuit | |
| Back-up supply | 3 years |
| Accuracy | max. +/- 1s. day (23°C) |
| Minimal interval | 1 min. |
| Data stored for | min. 10 years |
| Program circuit | |
| Illumination range | 1-50000 Lx |
| Program place number | 100 |
| Program | daily, weekly |
| Data readout | LCD display |
| Controlling | |
| Operating temperature | -20...+55 °C |
| Storage temperature | -30...+70 °C |
| Electrical strength | 4kV (supply - output) |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 20 from front panel |
| Overvoltage category | III |
| Pollution degree | 2 |
| Max. cable size | 2.5 mm ² |
| Dimensions | 90 x 35,6 x 64 mm |
| Standards | EN 61812-1, EN 61010-1, EN 60255-6 |

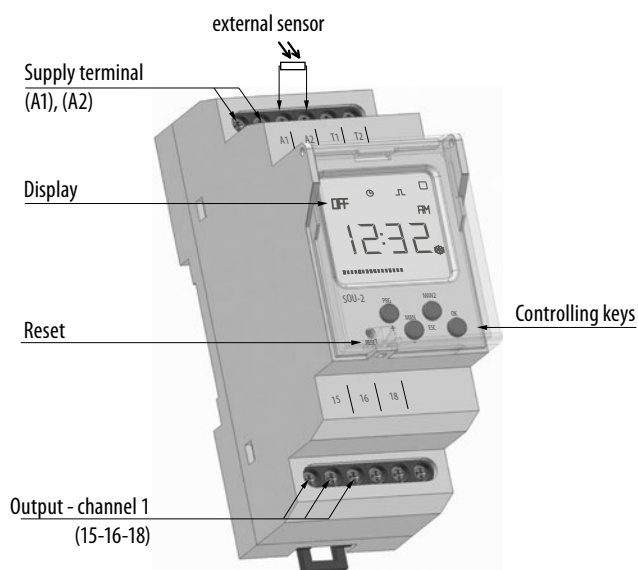
Connection



Controlling elements



Description



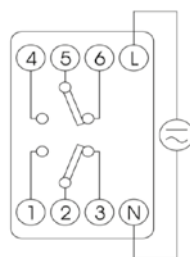
Technical data

Time switch ASTROCLOCK-2

Technical data

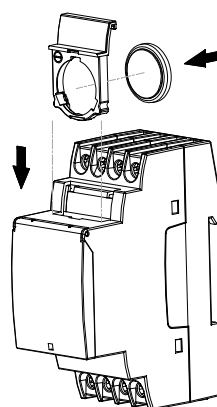
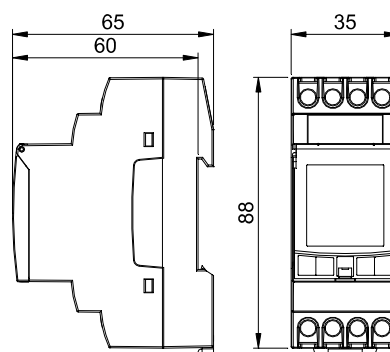
| | |
|--|---|
| Rated voltage As indicated in the device | 230V~ /50-60Hz |
| Tolerance | ± 10% |
| No. of output contacts | 2 |
| Rated current/switching voltage | 2x 16A / 250 V~ |
| Maximum recommended loads (N.A) | See Electrical scheme and parameters |
| Consumption | 16 VA (1,3 W) |
| Display | back-lit liquid crystal display |
| Accuracy | ± 1 s / day at 23 °C |
| Temperature effect on accuracy | ± 0.15 s / °C / 24 h |
| Power reserve | 4 years (without connection to mains), 48 h (without battery and without connection to mains) |
| Software class and structure | Class A |
| Memory spaces | 40 |
| Types of manoeuvres | SUNRISE, SUNSET, FIXED TIME: ON/OFF, REDUC. |
| Astronomical adjustment | Daily |
| Operating temperature | -10 °C ... +45 °C |
| Transport and storage temperature | -20 °C ... +60 °C |
| Pollution degree | 2 |
| Protection level | IP 20 (EN60529) |
| Overvoltage category | Class II under correct mounting conditions |
| Transient impulse voltage | 2.5 kV |
| Keyboard access cover | Sealable |
| Connection | With screw terminal for section conductors of 4mm ² maximum section |
| Battery | CR2032 - 3 V - 220 mAh |
| Size | 2 DIN modules (35 mm) |

Electrical scheme and parameters



| Incandescent | Fluorescent | Low voltage halogen (12 V AC) | Halogen (230 V AC) |
|-----------------------|-------------|-------------------------------|--------------------|
| | | | |
| 3000 W | 1200 VA | 2000 VA | 3000 W |
| Low consumption lamps | Downlights | LED | |
| | | | |
| 600 VA | 400 VA | 90 VA | |

Dimensions

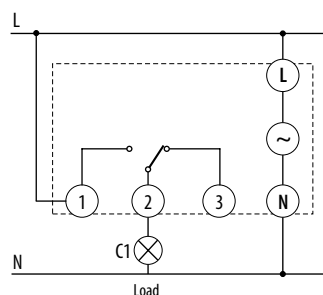


Digital time switch ETICLOCK-R1

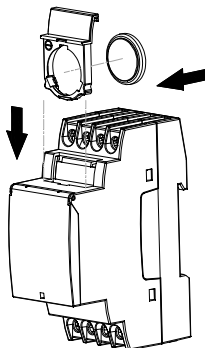
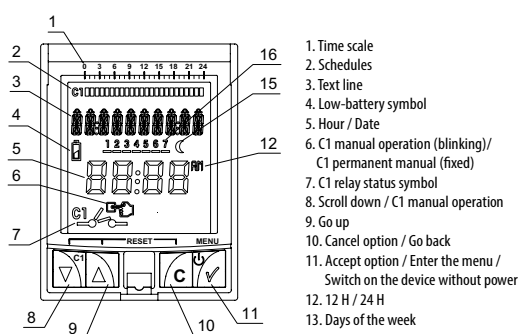
Technical data

| | ETICLOCK-R1 |
|---|---|
| Rated voltage and frequency As indicated on the device | (230 V ~ 50-60Hz) |
| Breaking capacity | μ 1x16 (10) A / 250 V AC |
| Own consumption | 16 VA (1.3 W) max. |
| Contact | AgSnO2 switched |
| Display screen | LCD |
| Running accuracy | ± 1 s / day at 23 °C |
| Accuracy variation with temperature | ± 0.15 s / °C / 24 h |
| Power reserve | 4 years (with battery and no network connection) 48 h (no battery and no network connection) |
| Memory spaces | 40 |
| No. of channels | 1 |
| Types of operations | ON/OFF, PULSE (1 ... 59 sec.) & CYCLES (1 ... 59 sec. / 1 min ... 23h, 59 min) |
| Operating temperature | -10 °C ... +45 °C |
| Transport and storage temperature | -20 °C ... +60 °C |
| Pollution degree | 2 |
| Protection level | IP 20 (EN60529) |
| Protection class | II under correct mounting conditions |
| Transient impulse voltage | 2.5 kV |
| Temperature for the ball test | + 80 °C (21.2.5) |
| Keyboard access cover | Sealable |
| Connection | With screw terminal for wire cross section of up to 4mm ² |
| Battery | CR2032 - 3 V - 220 mAh |
| Size | 2x DIN mod. (35 mm) |

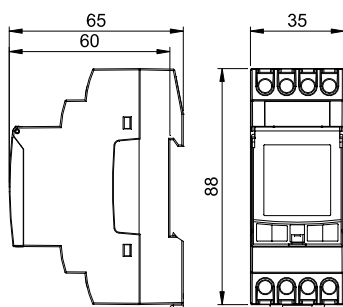
Connection



Controlling elements



Dimensions



Maximum recommended loads

| Load | Designation | Max. load |
|----------------------------|-------------|-----------|
| Incandescent | | 3000 W |
| Fluorescent | | 1200 VA |
| Low voltage halogen (12 V) | | 2000 VA |
| Halogen (230 V) | | 3000 W |
| Low consumption lamps | | 600 VA |
| Downlights | | 400 VA |
| LED | LED | 90 VA |

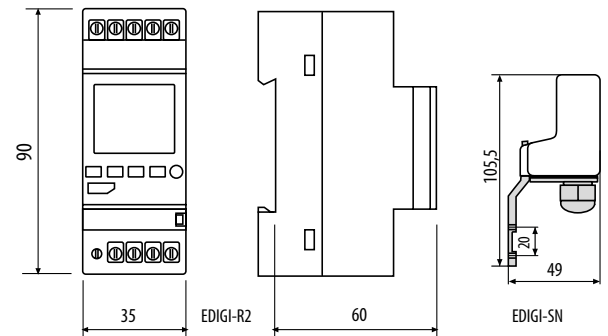
Technical data

Digital time relay EDIGI-R2

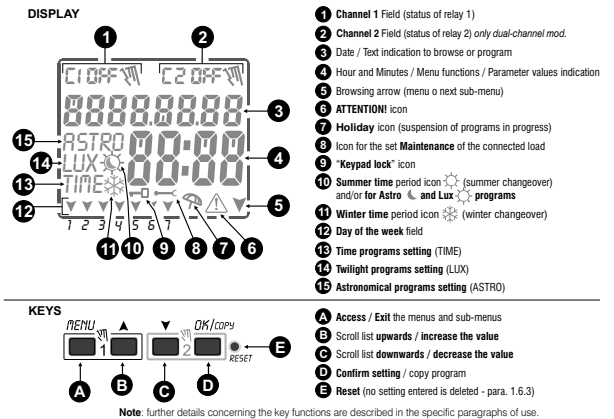
Technical data

| | EDIGI-R2 |
|---|--|
| Supply voltage | 230 V c.a. +/- 10% |
| Frequency | 50 Hz |
| Protection rating | IP20 |
| Output type | |
| Potential-free changeover contact relay | N.O. contact Zero Crossing N.C. contact |
| | 16(10)A / 250V~ 16(2)A / 250V~ |
| Type of action, disconnection and unit | 1 B S U / electronic |
| Section of the cables to the terminals | 1...6mm ² |
| Replaceable backup battery | 3V lithium code CR2032 |
| Power reserve in case of power failure | about 6 years from the first start-up, guaranteed by the lithium battery (replaceable) |
| Rated impulse voltage | 4kV |
| Software class | A |
| Operating accuracy | +/- 1 sec/day at 25 °C |
| Consumption/Stand-by consumption | 8 VA mono-channel / 6 VA dual-channel |
| Type of insulation | II |
| Rate of pollution | normal |
| Installation | DIN rail |
| Operating temperature | -20 °C ... +55 °C |
| Storage temperature | -30 °C ... +60 °C |
| CE marking regulation | LVD/EMC EN60730-2-7 |
| Languages available in the device | ENG, DE, HRV/SRP/BOS |

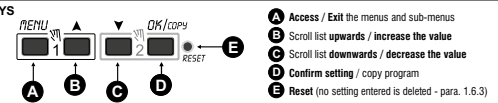
Dimensions



Controlling elements

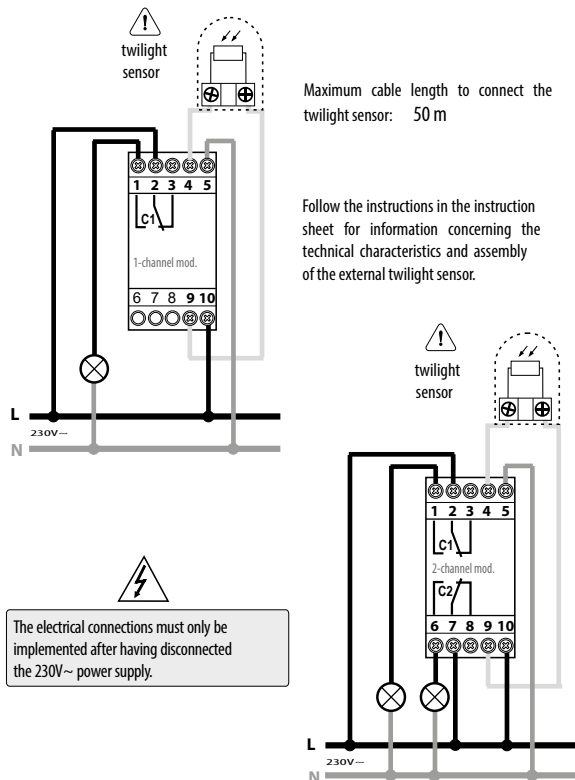


KEYS



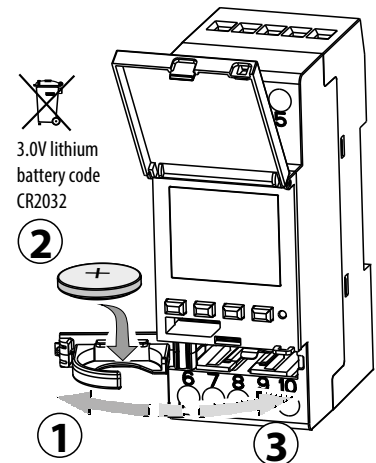
Note: further details concerning the key functions are described in the specific paragraphs of use.

Connection



Maximum cable length to connect the twilight sensor: 50 m

Follow the instructions in the instruction sheet for information concerning the technical characteristics and assembly of the external twilight sensor.



Maximum recommended loads

| Load | Designation | Max. load |
|-----------------------|-------------|--------------------------|
| Incandescent | | 3000 W |
| Fluorescent | | 1100 W |
| Halogen (230 V) | | 3000 W |
| Low consumption lamps | | 7W ÷ 23W (max. 23 lamp.) |

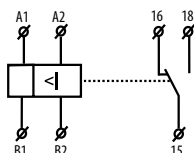
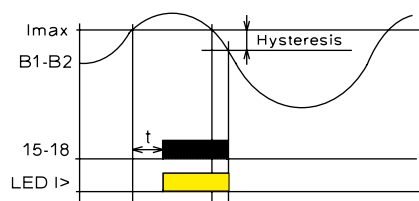
LED lighting: max inrush current 80A/20ms

Current monitoring relay PRI-51

Technical data

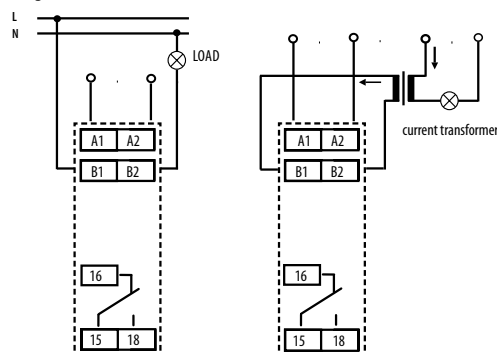
| | PRI-51 | | | | |
|-------------------------------|------------------------------------|------------|------------|------------|-------------|
| Supply circuit | | | | | |
| Supply | A1-A2 | | | | |
| Universal supply | 24-240V AC / 24 V DC (50-60 Hz AC) | | | | |
| Consumption | max. 1,5 VA | | | | |
| Supply voltage tolerance | -15% - +10% | | | | |
| Measuring circuit | | | | | |
| Load | between B1 - B2 | | | | |
| Current ranges | PRI51/1 | PRI51/2 | PRI51/5 | PRI51/8 | PRI51/16 |
| | AC 0.1-1 A | AC 0.2-2 A | AC 0.5-5 A | AC 0.8-8 A | AC 1.6-16 A |
| Inrush overload <1ms | 100 A | | | | |
| Max. permanent current | 1A | 2A | 5A | 8A | 16A |
| Time setting | potentiometer | | | | |
| Time ranges | 0.5 s-10 s | | | | |
| Setting accuracy - mechanical | 5% | | | | |
| Time deviation | < 1 % | | | | |
| Limit values tolerance | 5% | | | | |
| Temperature coefficient | < 0.1 % / °C | | | | |
| Hysteresis | 5% | | | | |
| Output | | | | | |
| Number of contacts | 1 x changeover (AgNi) | | | | |
| Rated current | 8 A / AC1 | | | | |
| Breaking capacity | 2500 VA / AC1, 240W / DC | | | | |
| Output indication | green / red LED | | | | |
| Controlling | | | | | |
| Operating temperature | -20...+55 °C | | | | |
| Storage temperature | -30...+70 °C | | | | |
| Electrical strength | 4 kV (supply-output) | | | | |
| Operating position | any | | | | |
| Mounting | DIN rail EN 60715 | | | | |
| Protection degree | IP 40 from front panel | | | | |
| Overvoltage category | III. | | | | |
| Pollution degree | 2 | | | | |
| Max. cable size | 2,5 mm² | | | | |
| Dimensions | 90 x 17,6 x 64 mm | | | | |
| Standards | EN 60255-6, EN 61010-1 | | | | |

Functions



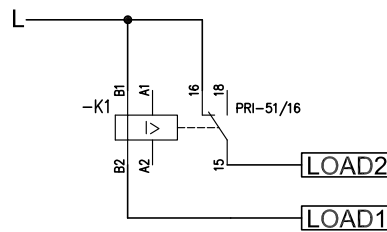
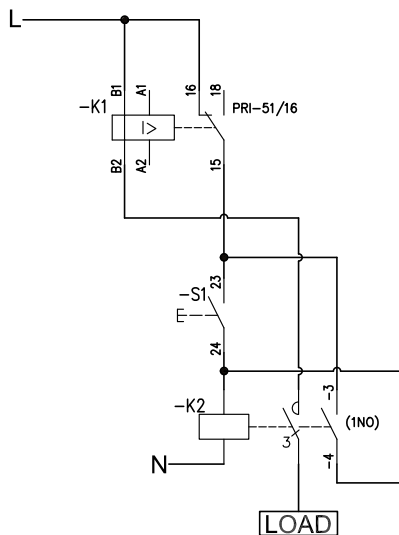
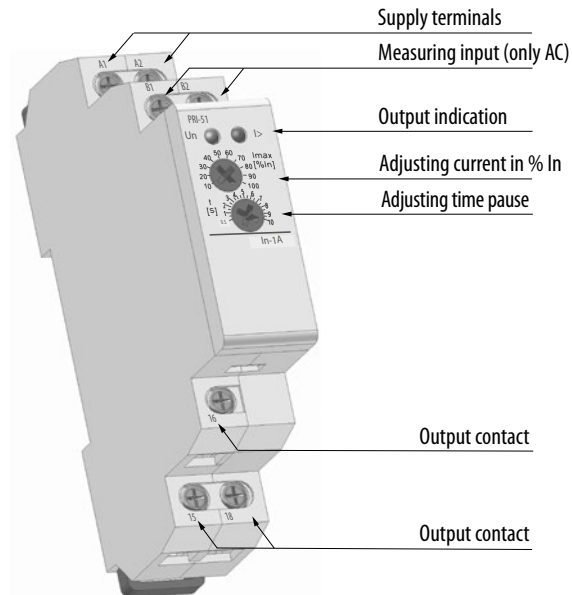
Connection

Example connection: PRI-51 with current transformer for current range increase



Technical data

Description



LOAD1 -> Critical load - always available ($I_{set} < I_{LOAD1}$)
 LOAD2 -> Optional load - only when LOAD1 not operating

In case of overload, all the loads will shutdown.

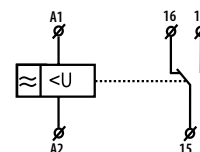
Voltage monitoring relay HRN-33, HRN-34, HRN-35

Technical data

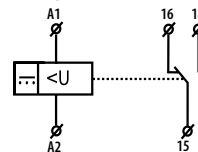
| | HRN-33, HRN-34, HRN-35 | | |
|-------------------------------|--------------------------|--------------------------|--|
| Type | HRN-33 | HRN-34 | HRN-35 |
| Supply | A1-A2 | A1-A2 | A1-A2 |
| Universal supply | monitoring voltage range | monitoring voltage range | monitoring voltage range |
| Consumption | max. 1,2 VA AC / DC | max. 1,2 VA AC / DC | max. 1,2 VA AC / DC |
| Upper level U _{max} | 160-276 V AC | 18-30 V DC | 160-276 V AC |
| Bottom level U _{min} | 30-99% U _{max} | 30-99% U _{max} | 30-99% U _{max} |
| Time delay | 0-10 s | 0-10 s | 0-10 s |
| Setting accuracy (mechanical) | 5 % | 5 % | 5 % |
| Repeat accuracy | < 1 % | < 1 % | < 1 % |
| Temperature coefficient | < 0,1% / °C | < 0,1% / °C | < 0,1% / °C |
| Hysteresis | 2-6 % of adjusted value | 2-6 % of adjusted value | 2-6 % of adjusted value |
| Output | | | |
| Number of contacts | 1 x changeover (AgNi) | 1 x changeover (AgNi) | 1 x changeover (AgNi) for each voltage level |
| Rated current | 16 A / AC1 | 16 A / AC1 | 16 A / AC1 |
| Breaking capacity | 4000VA / AC1, 384W / DC | 4000VA / AC1, 384W / DC | 4000VA / AC1, 384W / DC |
| Inrush current | 30 / < 3s | 30 / < 3s | 30 / < 3s |
| Switching voltage | max. 250 V AC1 / 24V DC | max. 250 V AC1 / 24V DC | max. 250 V AC1 / 24V DC |
| Min. breaking capacity DC | 500mW | 500mW | 500mW |
| Output indication | green / red LED | green / red LED | green / red LED |
| Mechanical life | 3x10 ⁷ | 3x10 ⁷ | 3x10 ⁷ |
| Electrical life | 0.7x10 ⁵ | 0.7x10 ⁵ | 0.7x10 ⁵ |
| Controlling | | | |
| Operating temperature | -20...+55 °C | | |
| Storage temperature | -30...+70 °C | | |
| Electrical strength | 4 kV | | |
| Operating position | any | | |
| Mounting | DIN rail EN 60715 | | |
| Protection degree | IP 40 from front panel | | |
| Overvoltage category | III. | | |
| Pollution degree | 2 | | |
| Max. cable size | 2.5 mm ² | | |
| Dimensions | 90 x 17,6 x 64 mm | | |
| Standards | EN 60255-6, EN 61010-1 | | |

Symbols

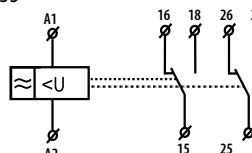
HRN-33



HRN-34



HRN-35

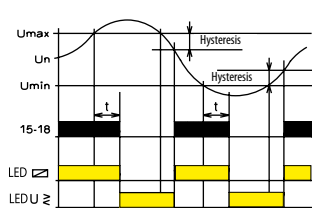


Functions

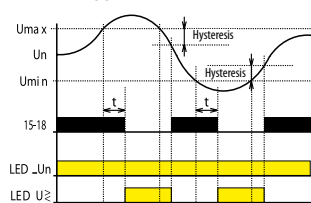
Legend:

- U_{max} - upper adjustable level of voltage
- U_n - measured voltage
- U_{min} - bottom adjustable level of voltage
- 15-18 - switching contact of output relay No.1
- 25-28 - switching contact of output relay No. 2
- LED \geq U_n - indication green
- LED \leq U_n - indication red

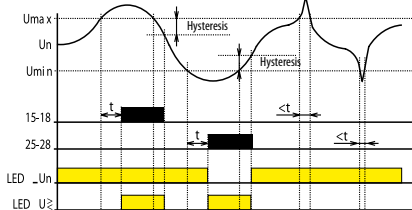
HRN-34



HRN-33

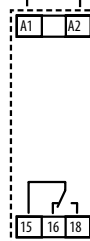


HRN-35

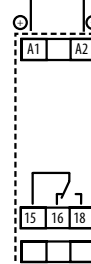


Connection

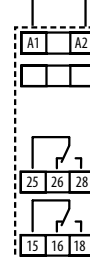
Un HRN-33



Un HRN-34



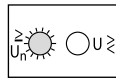
Un HRN-35



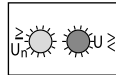
Technical data

Indication LED

HRN-33

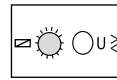


Normal state
 $U_{min} < U_n < U_{max}$
 Green LED = ON
 Red LED = OFF

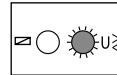


Exceeded U_{max} (overvoltage)
 Drop below U_{min} (undervoltage)
 $U_n > U_{max}$ or $U_n < U_{min}$.
 Green LED = ON
 Red LED = ON

HRN-34

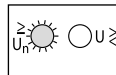


Normal state
 $U_{min} < U_n < U_{max}$
 Green LED = ON
 Red LED = OFF

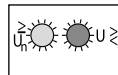


Exceeded U_{max} (overvoltage)
 Drop below U_{min} (undervoltage)
 $U_n > U_{max}$ or $U_n < U_{min}$.
 Green LED = OFF
 Red LED = ON

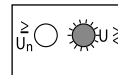
HRN-35



Normal state
 $U_{min} < U_n < U_{max}$
 Green LED = ON
 Red LED = OFF



Exceeded U_{max} (overvoltage)
 $U_n > U_{max}$
 Green LED = ON
 Red LED = ON



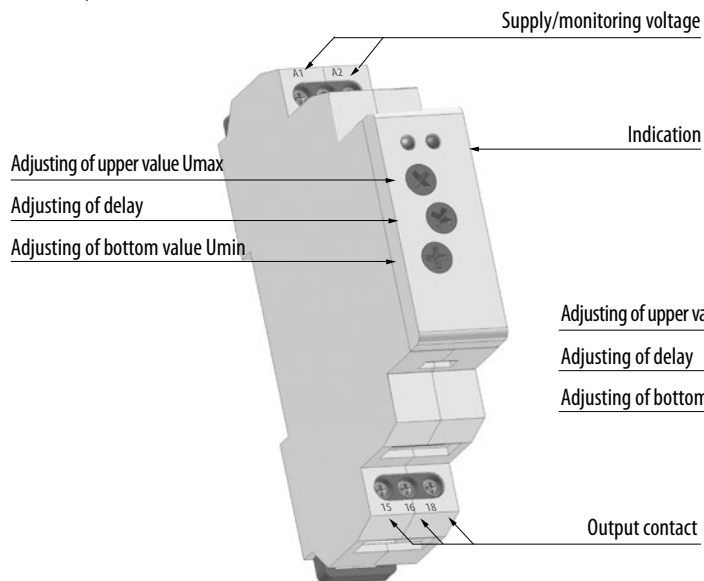
Drop below U_{min} (undervoltage)
 $U_n < U_{min}$
 Green LED = OFF
 Red LED = ON

Function description

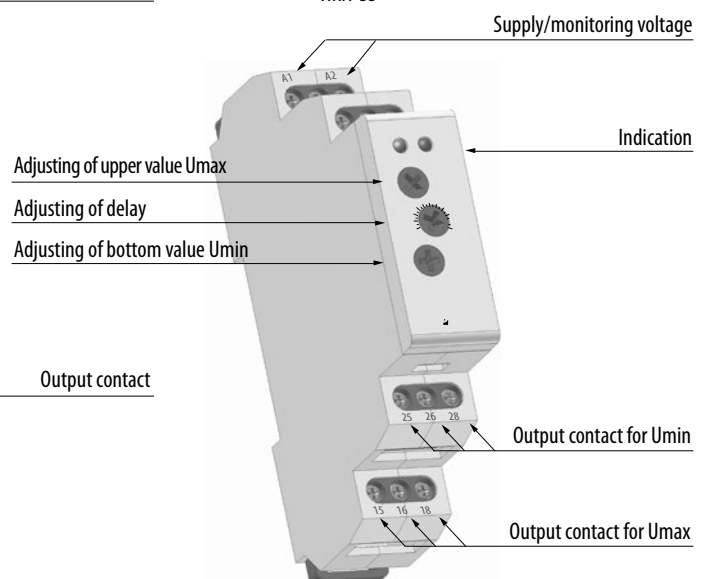
Monitoring relay series HRN-3 monitors level of voltage in single-phase circuits. Monitored voltage serves also as supply voltage. It is possible to set two independent levels of voltage, when exceeded output is activated. HRN-33 and HRN-34 - in normal state the output relay is permanently switched on. It switches off when voltage is below or above deflection. This combination of linkage of the output relay is advantageous when the full failure of supply (monitored) voltage is considered to be a faulty state in the same way as a decrease of voltage within the set level. Output relay is in both situations always switched off. Differently HRN-35 version uses independent relay for each level, in normal state it is switched off. If the upper level is exceeded (for example overvoltage) 1st relay switches on, when the bottom level (e.g. undervoltage) is exceeded 2nd relay switches. It is thus possible to see the particular faulty state. To eliminate short peaks in the main, the time delay, which is possible to be set in range 0 - 10 s, is used. It functions when changing from normal to faulty state and prevents unavailing pulsation of the output relay caused by parasitive peaks. Time delay doesn't apply when changing from faulty to normal state, but hysteresis (1-6% depends on the voltage setting) apply. Thanks to changeover contacts it is possible to get other configurations and functions according to actual requirements of the application.

Description

HRN-33, HRN-34



HRN-35



Over/undervoltage monitoring relay HRN-54, HRN-54N

Technical data

| | HRN-54 | HRN-54N |
|-------------------------|------------------|------------------|
| Supply and measuring | L1,L2,L3 | L1,L2,L3,N |
| Supply | L1,L2,L3 | L1,N |
| Supply/measured voltage | 3 x 400 V | 3 x 400 V/ 230 V |
| Level U_{min} | 75 - 95% U_n | |
| Level U_{max} | 105 - 125% U_n | |
| Consumption | max. 2 VA | |
| Hysteresis | 5 % | |
| Max. permanent overload | 3 x 460V AC | 3 x 265V AC |
| Peak overvoltage <1ms. | 3 x 500V AC | 3 x 288V AC |
| Time delay T1 | max. 500 ms. | |
| Time delay T2 | 0.1 - 10 s. | |

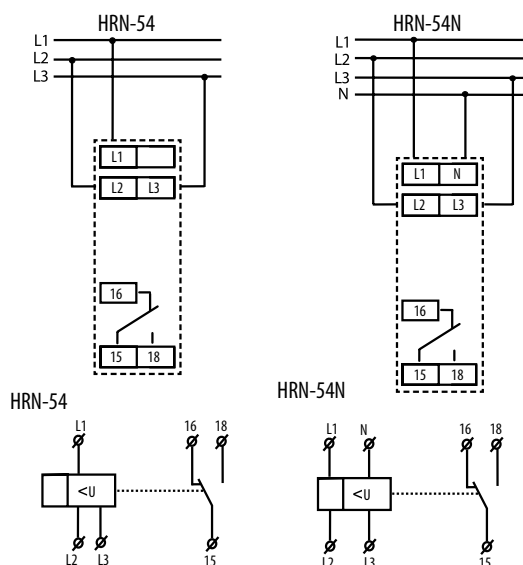
Output

| | |
|---------------------------|--------------------------|
| Number of contacts | 1 x changeover (AgNi) |
| Rated current | 8 A / AC1 |
| Breaking capacity | 2500 VA / AC1, 240W / DC |
| Inrush current | 10 A |
| Switching voltage | max. 250 V AC1 / 24 V DC |
| Min. breaking capacity DC | 500mW |
| Output indication | red LED |
| Mechanical life | 1×10^7 |
| Electrical life | 1×10^5 |
| Reset time | max. 150 ms. |

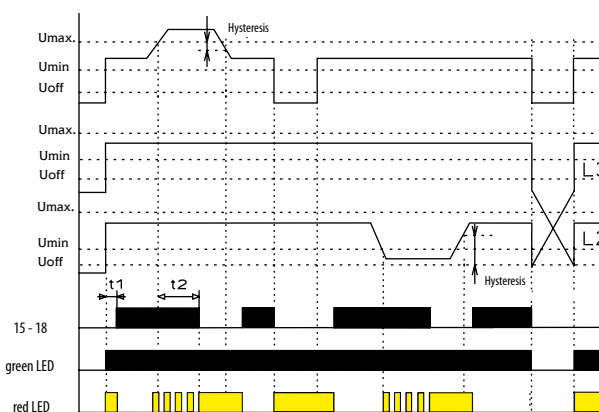
Controlling

| | |
|-----------------------|------------------------|
| Operating temperature | -20...+55 °C |
| Storage temperature | -30...+70 °C |
| Electrical strength | 4 kV |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 40 from front panel |
| Overvoltage category | III |
| Pollution degree | 2 |
| Max. cable size | 2.5 mm ² |
| Dimensions | 90 x 17,6 x 64 mm |
| Standards | EN 60255-6, EN 61010-1 |

Connection



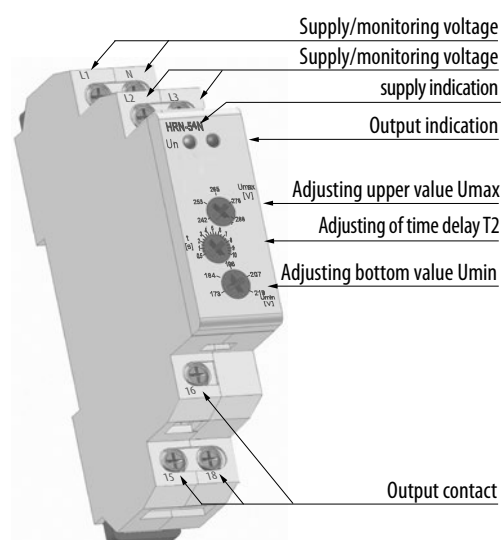
Functions



Function description

Relay in 3-phase main monitors size of phase voltage. It is possible to set two independent voltage levels and thus it is possible to set two independent voltage levels and monitor e.g. undervoltage and overvoltage independent. In normal state when voltage is within set levels, output relay is closed and red LED shines. In case voltage exceeds or falls below the set levels, output relay breaks and red LED shines (LED indicates faulty state – flashes when timing). In case of In case supply voltage falls below 60 % U_n (U_{off} lower level) relay immediately breaks without delay and faulty state is indicated by red LED. In case timing is in progress and faulty state is indicated, timing is immediately stopped.

Description



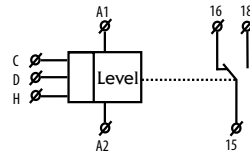
Technical data

Level switch HRH-5

Technical data

| | HRH-5 |
|--|---|
| Functions: | 2 |
| Supply terminals: | A1 - A2 |
| Supply voltage: | 24... 240 V AC/ DC |
| Input: | max. 2 VA |
| Tolerance of supply voltage: | -15 %; +10 % |
| Measuring circuit | |
| Sensitivity (input resistance): | adjustable in range 5 kΩ -100 kΩ |
| Voltage in electrodes: | max. 3.5 V AC |
| Current in probes: | <0.1 mA AC |
| Time response: | max. 400 ms |
| Max. capacity of probe cable: | max. 400 ms |
| Time delay (t): | 800 nF (sensitivity 5kΩ), 100 nF (sensitivity 100 kΩ) |
| Time delay after switching on (t1): | adjustable, 0.5 -10 sec |
| Accuracy | 1.5 sec |
| Accuracy in setting (mechanical): | ± 5 % |
| Output | |
| Number of contacts: | 1x changeover (AgNi) |
| Rated current: | 8 A / AC1 |
| Switched output: | 2500 VA , 240 W |
| Switched voltage: | 250 V AC1 / 24 V DC |
| Min. switched output DC: | 500 mW |
| Mechanical life (AC1): | 1x10 ⁷ |
| Electrical life: | 1x10 ⁵ |
| Other data | |
| Operational temperature: | -20.. +55 °C |
| Storing temperature: | -30.. +70 °C |
| Electrical strength: | 3.75 kV (supply - sensors) |
| Operational position: | any |
| Mounting: | DIN rail EN 60715 |
| Protection degree: | IP 40 from front panel |
| Overvoltage category: | III |
| Pollution degree: | 2 |
| Profile of connecting wires (mm ²) | max. 1x 4, max. 2x2.5/ with sleeve max. 1x2.5, 2x1.5 |
| Dimensions: | 90 x 17.6 x 64 mm |
| Weight: | 72 g |
| Applicable standards: | EN 60255-6, EN 61010-1 |

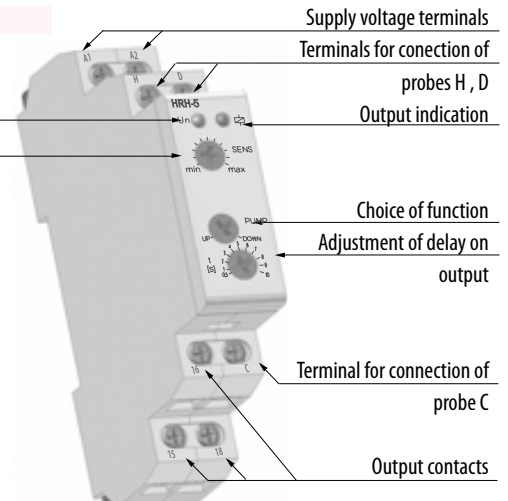
Symbol



Description

Indication of supply voltage

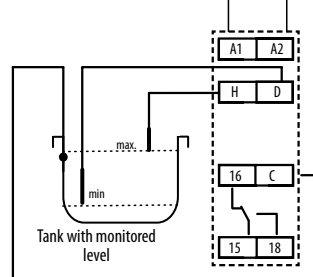
Choice of function



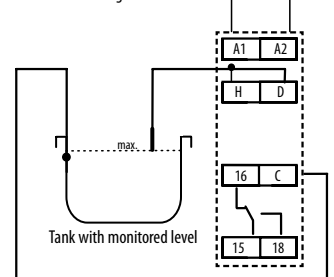
HRH-5

Connection

Monitoring of two levels

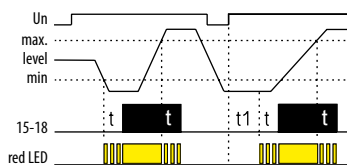


Monitoring of one level

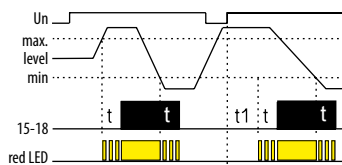


Functions

Function PUMP UP



Function PUMP DOWN

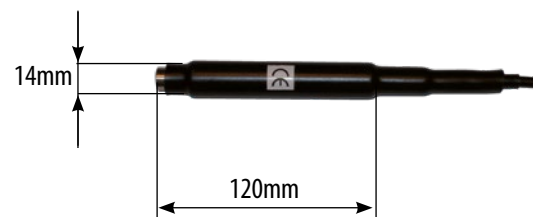


Relay is designated for monitoring of levels of conductive liquids with possibility of functions: PUMP UP or PUMP DOWN. To prevent polarization and liquid electrolysis of liquid, and undesirable oxidation of measuring probes, alternating current is used. For measuring use three measuring probes: H- upper level, D- lower level, C - common probe. In case you use a tank made of a conductive material, you can use it as probe C. In case you require monitoring of one level only, it is necessary to connect inputs H and D and connect them to one probe - in this case sensitivity is lowered by half (2.5... 50kΩ). Probe C can be connected with a protective wire of supply system (PE). To prevent undesirable switching out output contacts by various influences (sediment on probes, humidity...) it is possible to set sensitivity of the device according to conductivity of monitored liquid (corresponding to "resistance" of liquid) range 5 up to 100...kΩ. To reduce influences of undesirable switching of output contacts by liquid gorgle in tanks, it is possible to set delay of output reaction 0,5 - 10s.

Technical data - Measuring probes HRH

| | HRH-5-measuring probes |
|-----------------------|-----------------------------|
| Cables | 10m, 15m, 20m, 30m, 40m |
| Max. cable size | 1,5 mm ² |
| Insulation voltage Ui | 750 V |
| Fluids | Conductible, unaggressive * |

* Special probes for aggressive fluids

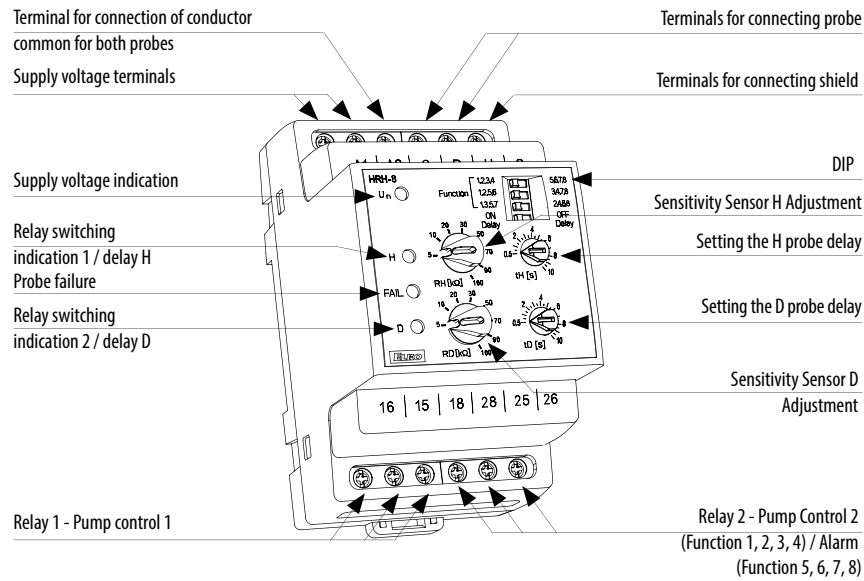


Level switch HRH-8

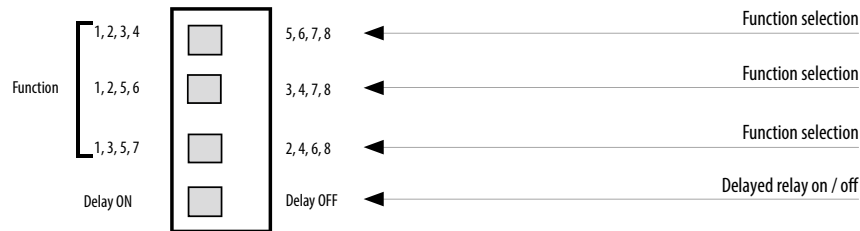
| Technical data | | |
|------------------------------|-------------|--|
| | | HRH-8 |
| Function | | 8 |
| Supply terminals | | A1-A2 |
| Voltage range | | AC 230 V, AC 110 V, AC 400 V, AC/DC 24 V (AC 50 - 60 Hz) |
| Max load | | 2,5 W / 5 VA (AC 230 V, AC 110V, AC 400 V), 1,4 W / 2 VA (AC/DC 24 V) |
| Supply voltage tolerance | | -15 %; +10 % |
| Measuring circuit | | |
| Hysteresis (input - opening) | | 5 kΩ - 100 kΩ |
| Voltage on electrode | | max. AC 3,5 V |
| Current in probes | | AC < 1 mA |
| Time reaction | | max. 400 ms |
| Max. cable capacity | | 800 nF (sensitivity 5kΩ), 100 nF (sensitivity 100 kΩ) |
| Time delay t | | 0,5 -10 s |
| Accuracy | | |
| Setting accuracy (mech.): | | ± 5 % |
| Output | | |
| Number of contacts | | 2x changeover / SPDT (AgNi / Silver Alloy) |
| Current rating | | 16 A / AC1 |
| Breaking capacity | | 4000 VA / AC1, 384 W / DC |
| Inrush current | | 30 A / < 3 s |
| Switching voltage | | 250 V AC1 / 24 V DC |
| Output indication | | red LED |
| Mechanical life | | 3x10 ⁷ |
| Electrical life (AC1) | | 0,7x10 ⁵ |
| Other information | | |
| Operating temperature | | -20 ... +55 °C |
| Storage temperature | | -30 ... +70 °C |
| Electrical strength | | 4 kV (supply - output) |
| Operating position | | any |
| Mounting | | DIN rail EN 60715 |
| Protection degree | | IP40 from front panel / IP20 terminals |
| Overvoltage category | | III |
| Pollution degree | | 2 |
| Max. cable size (mm²) | solid wire | max. 1x 2,5 / 2x1,5 |
| | with cavern | 1x 1,5 (AWG 12) |
| Dimensions | | 90 x 52 x 65 mm |
| Standards | | EN 60255-6, EN 61010-1 |

Technical data

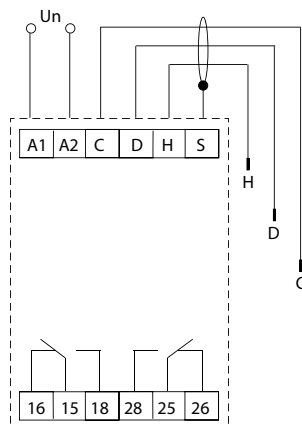
Description



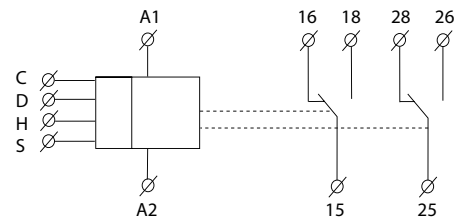
Description and importance of DIP switches



Connection



Symbol



Measuring probes

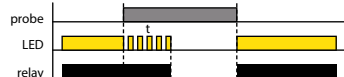
There can be any measuring probe (any conductive contact, it is recommended to use brass or stainless steel).
The probe wire does not need to be shielded, but it is recommended.
When using a shielded wire, the shielding is connected to terminal S.

Functions

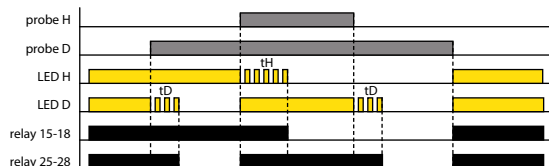
PUMP UP, ON DELAY (Function 1,3,4)



PUMP UP, OFF DELAY (Function 1,3,4)



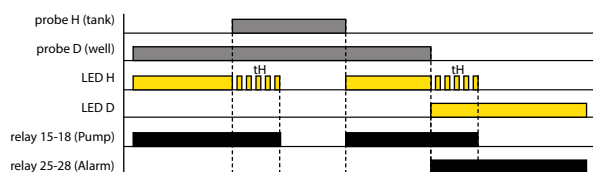
PUMP UP, OFF DELAY (Function 5)



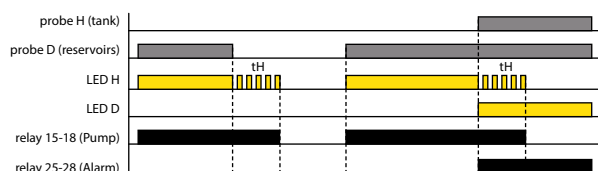
PUMP DOWN, OFF DELAY (Function 6)



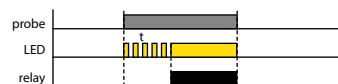
WELL - TANK, OFF DELAY (Function 7)



RESERVOIRS - TANK, OFF DELAY (Function 8)



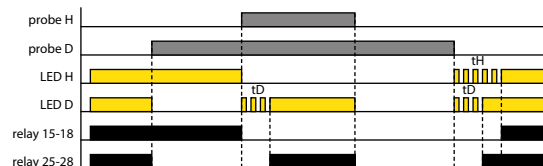
PUMP DOWN, ON DELAY (Function 2,3,4)



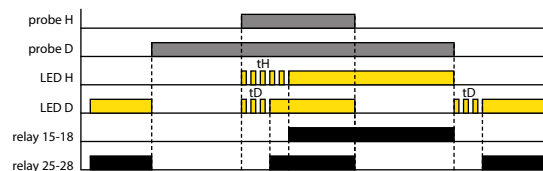
PUMP DOWN, OFF DELAY (Function 2,3,4)



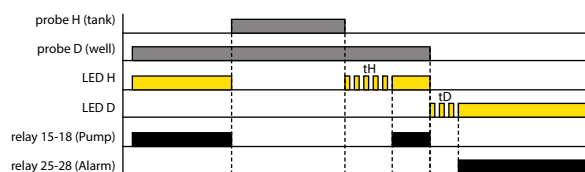
PUMP UP, ON DELAY (Function 5)



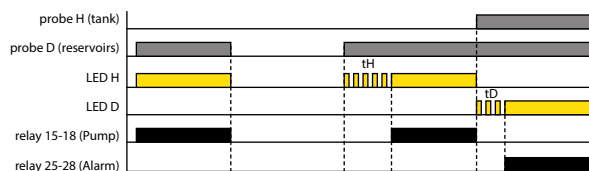
PUMP DOWN, ON DELAY (Function 6)



WELL - TANK, ON DELAY (Function 7)



RESERVOIRS - TANK, ON DELAY (Function 8)



Function description

The relay is designed to monitor the level of conductive liquids with a choice of 8 functions:

- 1) - 2 separate tanks (each with 1 probe) - both PUMP UP (filling)
- 2) - 2 separate tanks (each with 1 probe) - both PUMP DOWN (emptying)
- 3) - 2 separate tanks (each with 1 probe) - H PUMP DOWN probe, D PUMP UP probe
- 4) - 2 separate tanks (each with 1 probe) - H PUMP UP probe, probe D PUMP DOWN
- 5) - both probes in one tank - PUMP UP - maintain level between probes H and D (as HRH-5), relay 1 switches on the pump, relay 2 alarm (level is not between probes H and D)
- 6) - Both probes in one tank - PUMP DOWN - maintaining the level between probes H and D (as HRH-5), relay 1 switches on the pump, relay 2 alarm (the level is not between probes H and D)
- 7) - Pumping from the well to the tank - probe D in the well, probe H in the tank. The pump only runs if the probe D is flooded (enough water in the well) and the tank is not full (probe H). The alarm reports a lack of water in the well (probe D is not flooded).
- 8) - Pumping from the reservoir to the tank - probe D in the reservoir, probe H in the tank. The pump only runs if the probe D is flooded (full reservoir) and

the tank is not full (probe H). The alarm reports the status of full tank and reservoir (both probes are flooded).

LED indication:

The red LED lights up - the corresponding relay is switched on

Red LED flashes - delay timing

The yellow LED indicates probe failure - Functions 5, 6 probe H is flooded and probe D is not. At the same time both red LEDs flash.

To prevent polarization and electrolysis of the liquid and undesirable oxidation of the monitoring probes, an AC current of 10 Hz is used for monitoring.

The low frequency has a positive effect on suppression of interference by 50 (60) Hz. Three probes are used to monitor the level: H - upper level, D - lower level and C - common probe. In the case of the use of a conductive material tank, it is possible to use the tank itself as a C probe. Probe C can also be connected to the protective conductor of the power supply system (PE). To prevent undesired switching by various influences (soiling of dips, moisture ...), the sensitivity of the device can be set according to the conductivity of the liquid being monitored (corresponding to the "resistance" of the liquid) in the range of 5 to 100 kΩ. To limit the effect of undesired switching of output contacts by raising the liquid level in the tank, it is possible to set the output response delay 0,5 - 10 s.

Technical data

Thermostat relay TER-3 (A, B, C)

Technical data

| | TER-3 (A, B, C) |
|--------------------------|---------------------------------------|
| Function | single level |
| Supply | A1-A2 |
| Universal supply | AC/DC 24-240 galvanically unseparated |
| Consumption | 2 VA |
| Supply voltage tolerance | -15% - +10% |

Measuring circuit

| | |
|-------------------------------|--|
| Measuring terminals | T1 - T1 |
| Temperature range | TER-3A TER-3B TER-3C |
| | -30...+10 °C 0...+40 °C -30...+70 °C |
| Hysteresis | adjustable in range 0.5...5K |
| Sensor | external, termistor NTC |
| Sensor fault indication | flashing red LED |
| Setting accuracy - mechanical | 5% |
| Switching difference | 0,5°C |
| Temperature coefficient | < 0.1 % / °C |

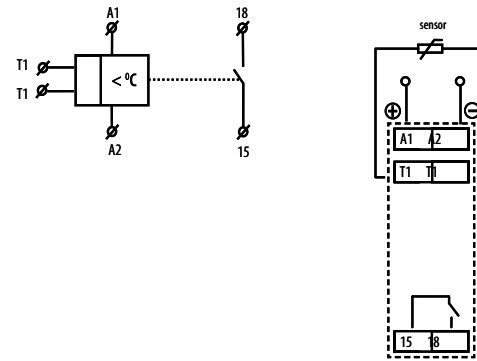
Output

| | |
|---------------------------|--------------------------|
| Number of contacts | 1 x changeover (AgNi) |
| Rated current | 16 A / AC1, 10A/24 V DC |
| Breaking capacity | 4000 VA / AC1, 300W / DC |
| Switching voltage | 250V AC1/ 24V DC |
| Min. breaking capacity DC | 500 mW |
| Output indication | red LED |
| Mechanical life | 3x10 ⁷ |
| Electrical life | 0,7x10 ⁵ |

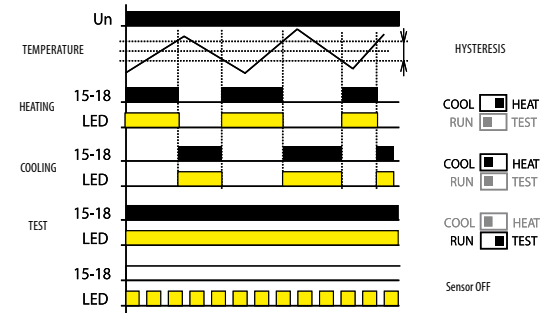
Controlling

| | |
|-----------------------|--------------------------|
| Operating temperature | -20...+55 °C |
| Storage temperature | -30...+70 °C |
| Electrical strength | 4 kV |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 40 from front panel |
| Overvoltage category | III. |
| Pollution degree | 2 |
| Max. cable size | 2.5 mm ² |
| Dimensions | 90 x 17,6 x 64 mm |
| Standards | EN 60730-2-9, EN 61010-1 |

Connection

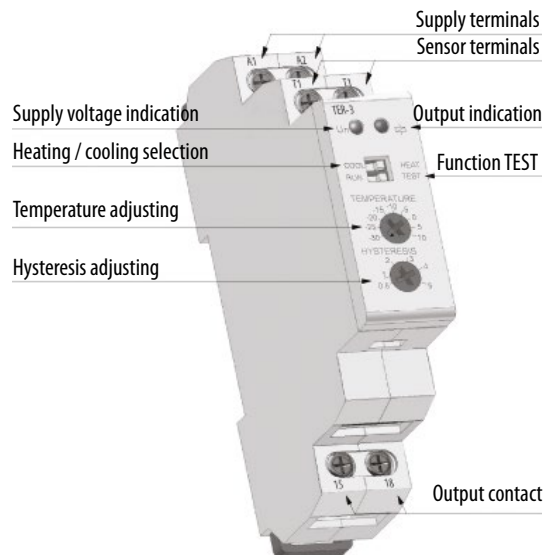


Functions



TER-3 It is a single but practical thermostat with a separated sensor for monitoring temperature. The device is placed in a switchboard and an external sensor senses temperature of required space, object or liquid. Supply is not galvanically separated from the sensor. The sensor is double insulated. Maximal length of a delivered sensor is 12m. device has in-built indication of sensor damage, which means that in case of short-circuit or disconnection red LED flashes. Thanks to adjustable hysteresis, it is advantageous to regulate width of the range and thus define sensitivity of load switching. Sensed temperature is decreased by set hysteresis. When installing it is necessary to keep in mind that hysteresis is increased by temperature gradient between sensor's jacket and thermistor.

Description



Thermostat for monitoring temperature of motor winding TER-7

Technical data

| | TER-7 |
|------------------------------------|---|
| Function | monitoring temperature of motor winding |
| Supply terminals | A1-A2 |
| Supply voltage | 24 - 240 V AC/DC |
| Consumption | max. 2 VA |
| Supply voltage tolerance | -15 %; +10 % |
| Measuring circuit | |
| Measuring terminals | Ta-Tb |
| Cold sensor resistance | 50 Ω - 1.5 kΩ |
| Upper level | 3.3 kΩ |
| Bottom level | 1.8 kΩ |
| Sensor | PTC temperature of motor winding |
| Sensor failure indication | blinking red LED |
| Accuracy | < 5 % |
| Accuracy in repetition | ± 5 % |
| Temperature dependence | < 0.1 % / °C |
| Output | |
| Number of contacts | 2x changeover (AgNi) |
| Rated current | 8 A / AC1 |
| Breaking capacity | 2000 VA / AC1, 192 W / DC |
| Inrush current | 10 A / < 3 s |
| Switching voltage | 250 V AC1 / 24 V DC |
| Min. breaking capacity DC | 500mW |
| Mechanical life | 3x10 ⁷ |
| Electrical life | 0.7x10 ⁵ |
| Other information | |
| Operating temperature | -20 ... +55 °C |
| Storage temperature | -30 ... +70 °C |
| Electrical strength | 4 kV (supply - output) |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 40 |
| Overvoltage category | III. |
| Pollution degree | 2 |
| Max. cable size (mm ²) | solid wire max. 1x 2.5 or 2x1.5 with sleeve max. 1x2.5 |
| Dimensions | 90 x 17.6 x 64 mm, |
| Weight | 83 g |
| Standard | EN 60730-2-9, EN 61010-1 |

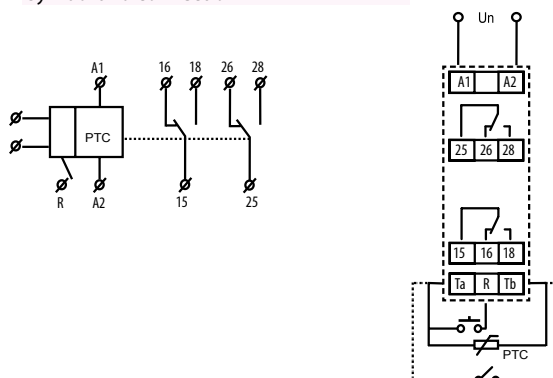
Note:

Sensors could be in series in abide with conditions in technical specification - switching limit.

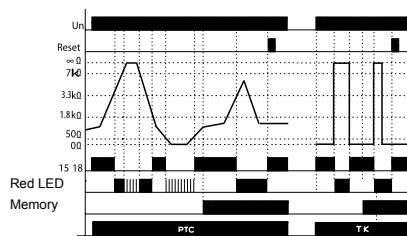
Warning:

In case of supply from the main, neutral wire must be connected to terminal A2.

Symbol and connection

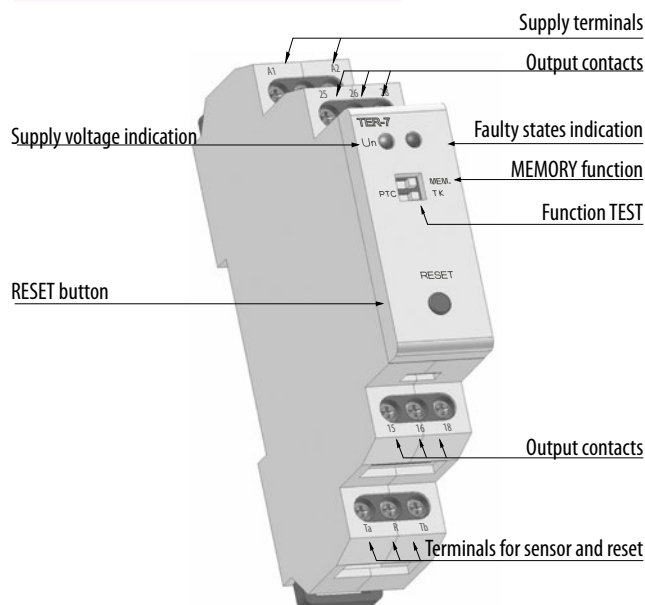


Function



The device controls temperature of motor winding with PTC thermistor which is mostly placed in motor winding or very close to it. Resistance of PTC thermistor run to max 1.5 kΩ in cold stage. By temperature increase the resistance goes strongly up and by overrun the limit of 3.3 kΩ the contact of output relay switch off - mostly contactor controlling a motor. By temperature decrease and thereby decrease of thermistor resistance under 1.8 kΩ the output contact of relay again switches on. The relay has function "Control of sensor fault". This controls interruption or disconnection of sensor. When switch is in position "TK" monitoring of faulty sensor is not functional - it is possible to connect bimetal sensor with only 2 states: ON or OFF. The device can work with bi-metal sensor in this position. Other safety unit is function "Memory". By temperature overrun (and output switches off) the output is hold in faulty stage until service hit. This bring the relay to normal stage (with RESET button) on front panel or by external contact (remote).

Description



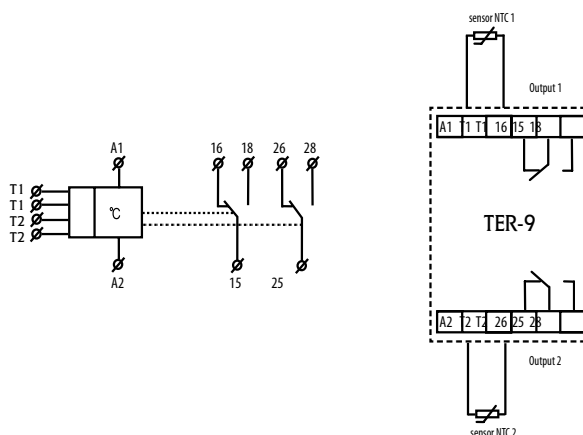
Technical data

Multifunction digital thermostat TER-9

Technical data

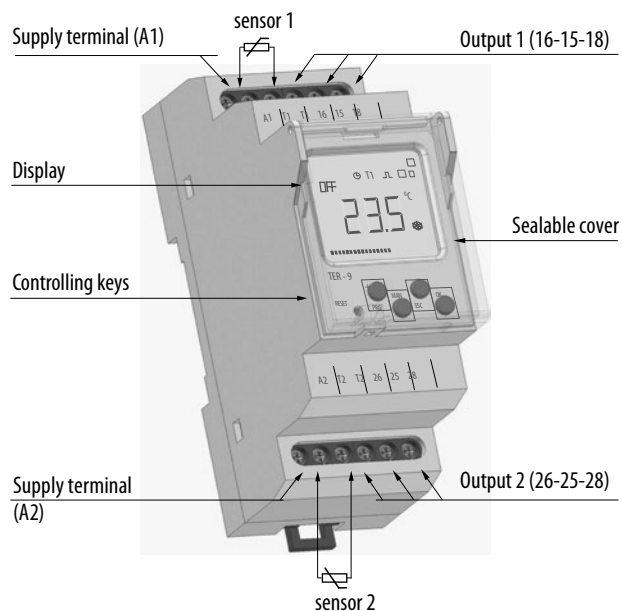
| Technical data | TER-9 |
|----------------------------|--|
| Number of functions | 6 |
| Supply | A1-A2 |
| Supply voltage | AC 230V or AC/DC 24V, galvanically separated |
| Consumption | max. 3,5 VA |
| Supply voltage tolerance | -15% - +10% |
| Measuring circuit | |
| Measuring terminals | T1 - T1 in T2-T2 |
| Temperature range | -40...+110 °C |
| Hysteresis (sensitivity):) | adjustable in range 0.5...5K |
| Difference temperature | adjustable 1.. 20 °C |
| Sensor | termistor NTC 12Ω at 25°C |
| Sensor fault indication | sign "Err" |
| Measuring accuracy | 5 % |
| Repeat accuracy | <0,5 % |
| Temperature coefficient | < 0.1 % / °C |
| Output | |
| Number of contacts | 1 x changeover for each output (AgNi) |
| Rated current | 8 A / AC1 |
| Breaking capacity | 2500 VA / AC1, 240W / DC |
| Switching voltage | 250V AC1/ 24V DC |
| Min. breaking capacity DC | 500 mW |
| Output indication | ON / OFF |
| Mechanical life | 1x10 ⁷ |
| Electrical life | 1x10 ⁵ |
| Controlling | |
| Operating temperature | -20...+55 °C |
| Storage temperature | -30...+70 °C |
| Electrical strength | 4 kV (supply - contact) |
| Operating position | any |
| Mounting | DIN rail EN 60715 |
| Protection degree | IP 40 from front panel |
| Overvoltage category | III. |
| Pollution degree | 2 |
| Max. cable size | 2.5 mm ² |
| Dimensions | 90 x 35,6 x 64 mm |
| Standards | EN 60730-2-9, EN 61010-1, EN 61812-1 |

Connection

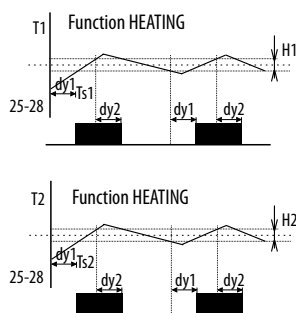


Note: It is possible to operate the device with one sensor. In such case it is necessary to connect resistor 10kΩ. This resistor is a part of delivery.

Description



2 independent single-stage thermostat

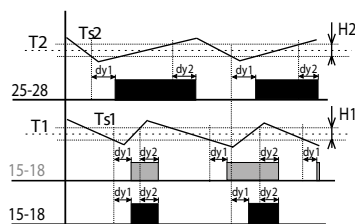


Legend:

Ts1 - real (measured) temperature 1
Ts2 - real (measured) temperature 2
T1 - adjusted temperature T1
T2 - adjusted temperature T2
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1 - set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact (for T1)
25-28 output contact (for T2)

Output contact switched until adjusted temperature is reached. Hysteresis eliminates frequent switching. Heating/cooling function adjusted in the menu.

Dependent functions of 2 thermostats

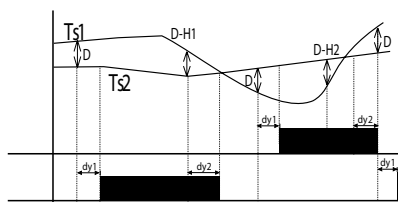


Legend:

Ts1 - real (measured) temperature 1
Ts2 - real (measured) temperature 2
T1 - adjusted temperature T1
T2 - adjusted temperature T2
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1 - set switching delay of the output
dy2 - set delay on output breaking
25-28 output contact (for T2)
15-18 output contact (intersection T1 and T2)

Output 15-18 is closed, if temperature of both thermostats is below an adjusted level. When any thermostat reaches adjusted level, the contact 15-18 open. Serial inner connection of thermostats (logic function AND).

Differential thermostat

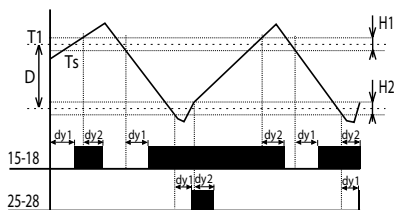


Legend:

Ts1 - real (measured) temperature T1
Ts2 - real (measured) temperature T2
D - adjusted difference
dy1 - set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact (for T1)
25-28 output contact (for T2)

Switching of output corresponds with input, which has lower temperature when difference is exceeded differential thermostat is used for keeping two identical temperature e.g. in heating systems (boiler and reservoir), solar systems (collector - reservoir, exchanger), water heating (water heater, water distribution) etc.

2-stage thermostat



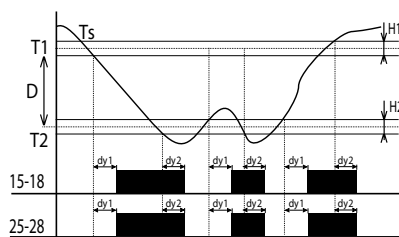
Legend:

Ts - real (measured) temperature
T1 - adjusted temperature
D - adjusted difference
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1 - set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact
25-28 output contact

Typical example of use for two-stage thermostat is e.g. in boiler-room, where there are two boilers from which one is main and the other one is auxiliary. The main boiler is managed according to set temperature and auxiliary boiler is switched in case temperature falls under set difference.

Thus it helps to the main boiler in case outside temperature dramatically falls. In the range of difference (D) output 15-18 functions as normal thermostat to input 1 (type 1). In case temperature falls under set difference, output 2 switches.

Thermostat with "WINDOW"

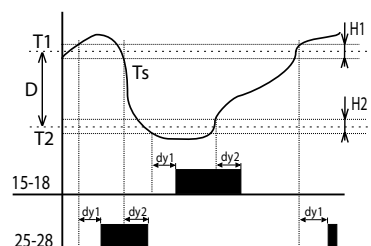


Legend:

Ts - real (measured) temperature
T1 - adjusted temperature MAX
T2 - adjusted temperature MIN (T2=T1-D)
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1 - set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact
25-28 output contact

Output is closed (heating) only if temperature is within adjusted range. If temperature is out of range, the contact opens. T2 is set as T1-D. The function is used for protection of gutters against freezing.

Thermostat with dead zone



Legend:

Ts - real (measured) temperature
T1 - adjusted temperature T1
T2 - adjusted temperature T2 (T2=T1-D)
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1 - set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact (heating)
25-28 output contact (cooling)

In case of thermostat with a "dead zone", it is possible to set temperature T1 and a difference (respectively a width of dead zone D). In case the temperature with set hysteresis H1 is lower than T1, the output contact switches heating ON and when T1 is reached it opens. In case the temperature falls under T2, contact switches cooling down and opens when T2 is reached. This function can be used for example for automatic air warming and cooling in ventilation so the site is always within the range T1 and T2.

Technical data

Thermal sensor TZ

Temperature sensors are made of thermistor NTC embedded in a metal sleeve by thermo-conductive sealer (TZ)

Sensor TZ :
 - cable V03SS-F 2Dx0,5mm with silicon insulation
 - suitable mainly for use in extreme temperatures

Technical parameters TZ

| | |
|--------------------|------------------------|
| Range: | -40...+125°C |
| Scanning element: | NTC 12K 2% |
| In air/in water: | (t65) 62s/8s |
| In air/in water: | (t95) 216s/23s |
| Cable material: | silicone |
| Terminal material: | nickel-couted copper |
| Protection degree: | IP 67 |
| Protection class: | II (double insulation) |

Resistive values of sensors in dependance on temperature

| Temperature (°C) | Sensor NTC (kΩ) |
|------------------|-----------------|
| 20 | 14,7 |
| 30 | 9,8 |
| 40 | 6,6 |
| 50 | 4,6 |
| 60 | 3,2 |
| 70 | 2,3 |

TZ: Thermal sensors for range -40...+125°

TZ-0 - Thermo sensor can be connected directly to terminal block (length of the sensor 110mm)

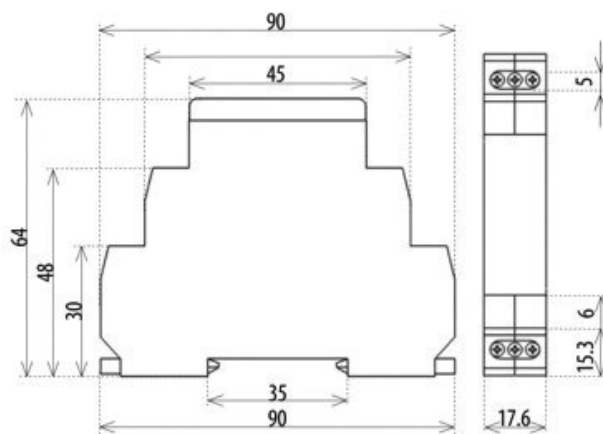
TZ-3 - Temperature sensor 3m, double isolation silicone

TZ-6 - Temperature sensor 6m, double isolation silicone

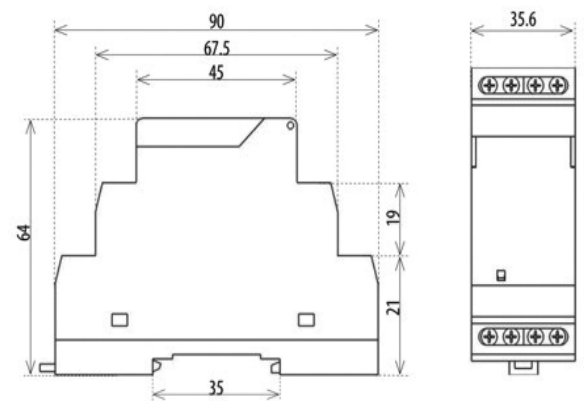
TZ-12 - Temperature sensor 12m, double isolation silicone

Dimensions

1-module devices








2-module devices








Product loadability






It is valid for following products: CRM-4, SHT-1, MR-41, MR-42, SOU-1, SHT-1/2, SHT-3, SHT-3/2, CRM-42, SMR-B

| | Load | | | | | | | | |
|--------------------|---|---|---|---|---|---------|--------|--------|-----------------------|
| relay contact 16 A |  |  |  |  |  | AC1 | AC3 | AC15 | DC1 (24/110/220 V) |
| AgSNO ₂ | 2000 W | 1000 W | 1000 W | 750 W | 500 W | 4000 VA | 0,9 kW | 750 VA | 16A/0,5A/0,35A |

It is valid for following products: CRM-93H, SOU-2, HRN-54, HRN-54N, PRI-51, TER-9

| | Load | | | | | | | | |
|-------------------|---|---|---|---|---|---------|-----|--------|-----------------------|
| relay contact 8 A |  |  |  |  |  | AC1 | AC3 | AC15 | DC1 (24/110/220 V) |
| AgNi | 500 W | x | x | x | x | 2000 VA | | 375 VA | 8A/0,4A/0,25A |

It is valid for following products: CRM-91H, CRM-2H, CRM-2T, HRN-33, HRN-34, HRN-35, TER-3

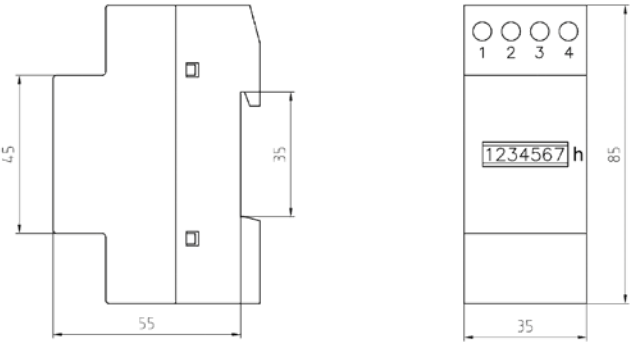
| | Load | | | | | | | | |
|--------------------|---|---|---|---|---|---------|--------|--------|-----------------------|
| relay contact 16 A |  |  |  |  |  | AC1 | AC3 | AC15 | DC1 (24/110/220 V) |
| AgNi | 1000 W | x | x | x | x | 4000 VA | 0,9 kW | 750 VA | 16A/0,5A/0,35A |

Hour meter HM-1

Technical data

| Mechanical data | description |
|---------------------------|------------------------|
| Display | 5 integers, 2 decimals |
| Digit height | 4mm |
| Counting range | 99999,99 |
| Reading accuracy | 1/100 h (36sec) |
| Weight | 32g |
| Electrical data | |
| Operating voltage | 230V+/- 10%, 50Hz |
| Current consumption | max. 8mA |
| Accuracy | +/- 0,02% |
| IP protection | IP40 |
| Ambient conditions | |
| Operating temperature | -25°C .. + 70°C |
| Storage temperature | -40°C .. + 70°C |
| Relative humidity | max. 80% / +25°C |
| Approvals | |
| CE Mark RoHS compliant | |

Dimensions



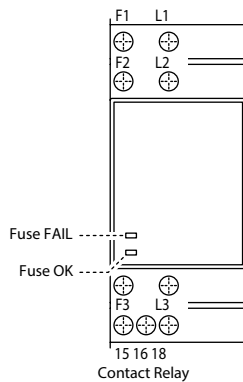
Technical data

Electronic fuse monitor EFM

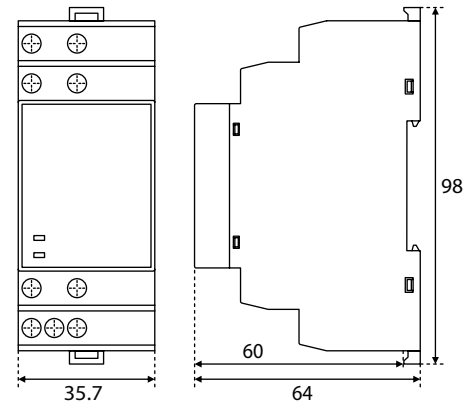
Technical data

| | | EFM230 | EFM400 |
|-----------------------------|-----|--|--------|
| Input | | | |
| Supply voltage AC ±10% | V~ | 230 | 400 |
| Nominal Frequency | Hz | 50-60 (range:47-63) | |
| Power consumption (max. AC) | VA | 3,6 | 1,5 |
| Output relay | | | |
| Rating | - | 8A-250V AC /24V DC | |
| Max switching power | VA | 2000 | |
| Max switching voltage | V~ | 400 | |
| Min switching load | - | 10mA 12V dc | |
| Contact life | | 30x10 ³ ops / 100x10 ³ ops | |
| Changeover contacts | - | AgNi0.15 | |
| Status indication | | | |
| Fuse OK | - | Green LED - Relay ON | |
| Fuse FAIL | - | Red LED - Relay OFF | |
| General | | | |
| Internal resistance paths | Ω/V | >2000 | |
| Permissible feedback (Ue) | - | max. 90 | |
| Response/Release Time: | | | |
| - After Breaking Fuse | ms | <30 | |
| - After Restoring Fuse | ms | <500 | |
| Working temperature | °C | -20...+50 | |
| Storage temperature | °C | -30...+70 | |
| Electrical Insulation | kV | 4 | |
| Overvoltage Category | - | III | |
| Protection degree | IP | 20 | |
| Pollution degree | - | 2 | |
| Climatic category | - | IEC 60068-1 (20/050/60), DIN 40040 (class D) | |
| Altitude up to | m | 2000 | |
| Dimensions | mm | 98x35,7x64 | |

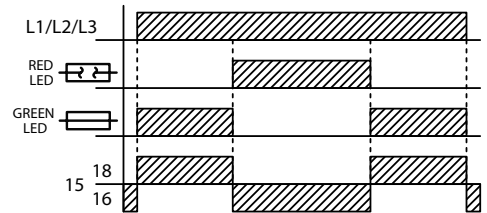
Description



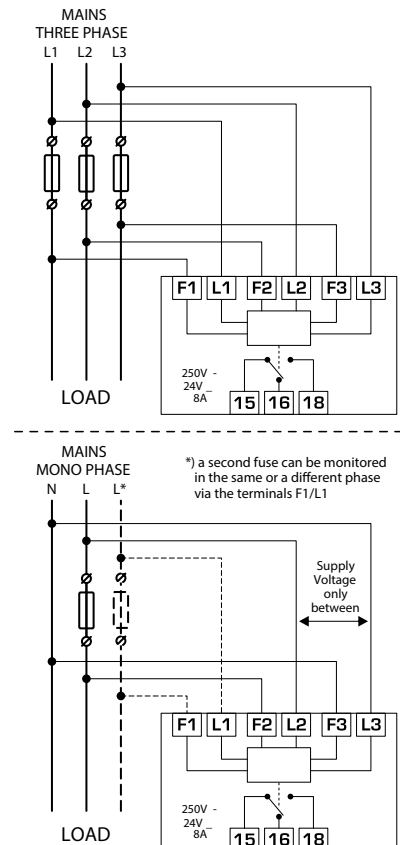
Dimensions



Function



Connection



Power supplies PS-30

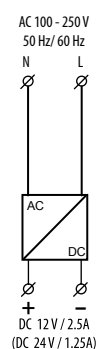
Technical data

| | PS-30-24 |
|--------------------------------------|---|
| Input | |
| Voltage range | AC 100-250V / 50 - 60Hz |
| Burden without load (max) | 10VA/1.5W |
| Burden with full load (max) | 70VA / 37W |
| Protection | fuse T2A |
| Output | |
| Output voltage DC / max. current | 24.2V/1.25A |
| Tolerance of output voltage: | $\pm 2\%$ |
| Output indication | green LED |
| Wave of off-load output voltage | 30mV |
| Wave of output voltage with max load | 80mV |
| Time delay after connection | max. 5s |
| Time delay after over-load | max. 1s |
| Efficiency | >82% |
| Electronic fuse | electronic protections short-circuit, over load, over voltage (from 120% of rated output) |
| Other information | |
| Working humidity | 20 .. 90% RH |
| Operating temperature | -20 °C ... +40 °C |
| Storage temperature | -25 °C ... +70 °C |
| Electrical strength input- output | 4kV |
| Protection degree | IP40 device/ IP20 in-built in distribution board |
| Overvoltage category: | II. |
| Pollution degree | 2 |
| Max. cable size (mm ²) | solid wire max. 1x2.5 or 2x1.5/ with sleeve max. 1x1.5 |
| Dimensions | 90 x 52 x 65 mm |
| Weight | 158 g |
| Standards | EN 61204-1, EN 61204-3, EN 61204-7 |

PS-30: switching stabilized power supplies, version 3-module

- PS-30-24 - stabilized power supply with fixed output voltage 24 V/30 W

Connection



Description

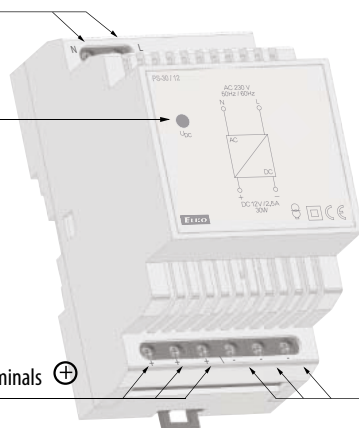
PS-30-24

Supply terminals

Output voltage indication

Output voltage terminals ⊕

Output voltage terminals ⊖



Technical data

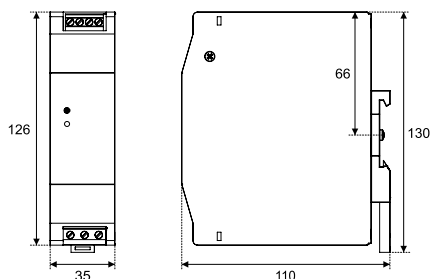
Switching Power Supply

Technical data

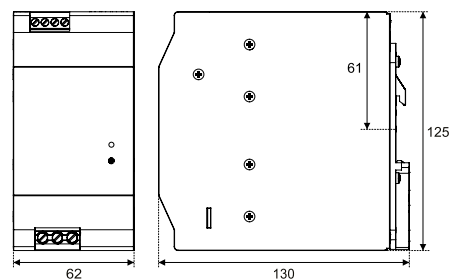
| | | PS-48-24 | PS-72-24 | PS-120-24 | PS-240-24 | PS-480-24 | |
|--|------|-----------------------------------|------------|------------|------------|------------|---|
| Input | | | | | | | |
| Supply voltage AC | V AC | 100 - 240 | | | | | |
| Nominal frequency | Hz | 50 - 60 (range: 47 - 63) | | | | | |
| Supply voltage DC | V DC | 140 - 340 | | | | | |
| Input current at 230VAC | A | 0,4 | 0,97 | 0,6 | 1,4 | 2,4 | |
| In-rush current at 230VAC | A | 15 | 20 | 25 | 30 | 50 | |
| Input overload protection T-type fuse (internal) | A | 2 | 3,15 | 5 | 5 | 6,3 | |
| Power Factor at 230VAC | - | 0,5 | 0,5 | 0,96 | 0,92 | 0,97 | |
| Output | | | | | | | |
| Output adjustable voltage DC | V DC | 24 - 28 (±2%) | | | | | |
| Max. continuous output current | A | 2 | 3 | 5 | 10 | 20 | |
| Max. continuous output power | W | 45 | 75 | 120 | 240 | 480 | |
| Ripple BW 20MHz at max. load | mV | 120 | 120 | 80 | 100 | 150 | |
| Hold-up time at rated V AC and max. load | ms | 20 | | | | | |
| Rise time at rated V AC | ms | 200 | | 60 | | | |
| Parallel connection | - | ✗ | | | | | ✓ |
| Output overvoltage protection min. % of Vout | % | 120 - 135 | 120 - 135 | 110 - 140 | 120 - 150 | 110 - 140 | |
| Output overload protection % of max. load | % | 110 - 150 | | | | | |
| Power good relay | % | ✗ | ✗ | ✗ | ✗ | ✓ | |
| General | | | | | | | |
| Efficiency at rated V AC | % | 88,5 | 89,5 | 92 | 93 | 93 | |
| Working temperature - free convection | °C | -25 ... +70 | | | | | |
| De-rating 2,5% In/°C | °C | > 55 | | | | | |
| Storage temperature | °C | -40 ... +85 | | | | | |
| Electrical Insulation | kV | 3 (IN/OUT) 1,5 (IN/⊕) 0,5 (OUT/⊕) | | | | | |
| Over-temperature protection | - | ✓ | | | | | |
| Protection degree | IP | 20 | | | | | |
| Relative Humidity w/o cond. | RH% | 90 | | | | | |
| Altitude up to | m | 2000 | | | | | |
| Dimensions | mm | 130x35x110 | 130x35x110 | 130x40x120 | 130x62x125 | 138x86x125 | |

Dimensions

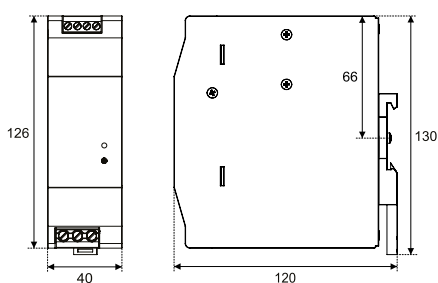
PS-48-24 & PS-72-24



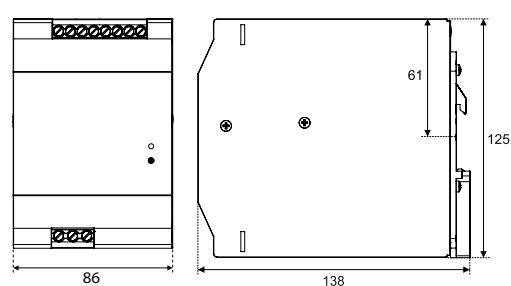
PS-240-24



PS-120-24

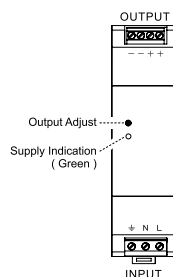


PS-480-24

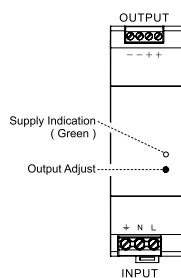


Description

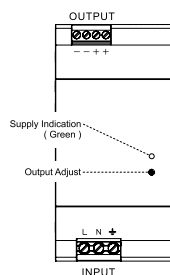
PS-48-24 & PS-72-24



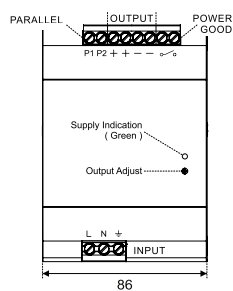
PS-120-24



PS-240-24

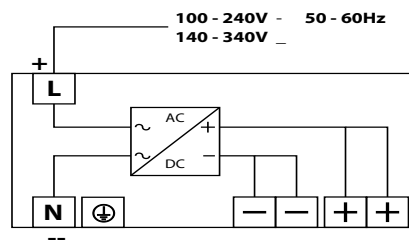


PS-480-24

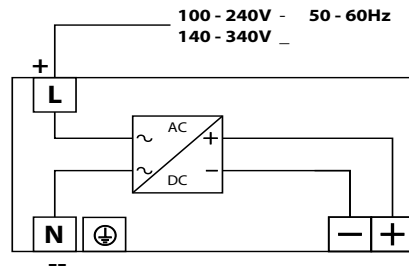


Connection

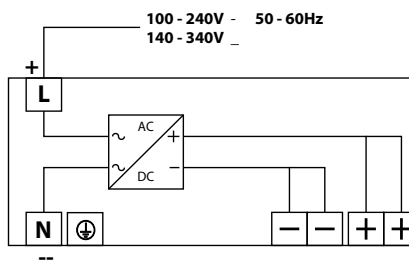
PS-48-24 & PS-72-24



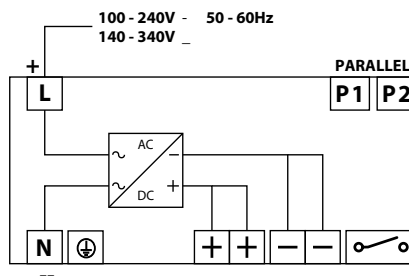
PS-120-24



PS-240-24



PS-480-24



Install rail: TS35/7.5 or TS35/15

POWER GOOD:

Relay closed: power supply (Output) is stable and within the tolerance limits.

Relay opened: power supply (Output) out of tolerance limits. Power cut off – to prevent damages on sensitive loads.

PARALLEL P1 P2:

Parallel connection of up to 10 power supplies. Connect P1s with P1s, P2s with P2s of each power supply wired in parallel (+ and – outputs in parallel). Each power supply unit must have connection to supply (Input)

Electromechanical power relays RERM3

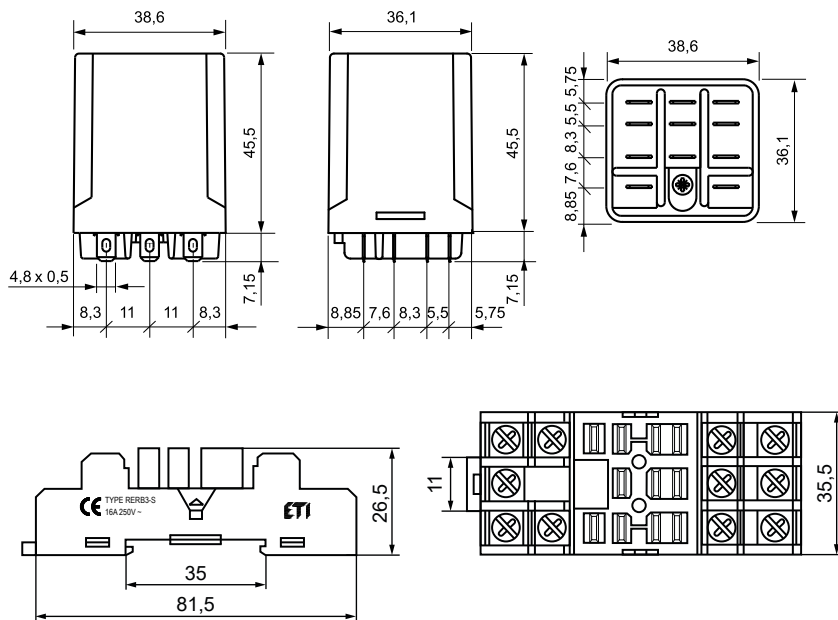
Table 1: Technical data

| RERM3 | | |
|--|--|--|
| Contact Data | | |
| Number and type of contacts | | 3 CO |
| Contact material | | AgNi |
| Rated / max. switching voltage AC | | 440 V |
| Min. switching voltage | | 5V |
| Rated load (capacity) | | 16 A / 250 V AC 10 A / 400 V AC |
| Min. switching current | | 5 mA |
| Max. inrush current | | 40A |
| Rated current | | 16A |
| Max. breaking capacity AC1 | | 4000 VA |
| Min. breaking capacity | | 0.3W |
| Contact resistance | | ≤ 100 mΩ |
| Max. operating frequency (cycles/hour) | | |
| • at rated load AC1 | | 1 200 |
| • no load | | 12 000 |
| Coil data | | |
| Rated voltage | | AC: 24V, 240V |
| Must release voltage | | AC: ≥ 0,15 Un |
| Operating range of supply voltage | | see next page |
| Rated power consumption | | 2,8 VA (50Hz) / 2,5 VA (60Hz) |
| Insulation according to EN 60664-1 | | |
| Insulation rated voltage | | 400 V AC |
| Rated surge voltage | | 4 000 V 1,2 / 50 μs |
| Overvoltage category | | III |
| Insulation pollution degree | | 2 |
| Dielectric strength between coil and contacts (basic insulation) | | 2500 V AC |
| Dielectric strength - contact clearance | | |
| - micro disconnection | | 1500 V AC |
| - full disconnection with contact gap ≥3mm | | 2500 V AC |
| Dielectric strength pole-pole (basic insulation) | | 2500 V AC |
| Contact - coil distance | | |
| - Clearance | | ≥ 5 mm 2CO, 2NO ≥ 4 mm 3CO, 3NO |
| - Creepage | | ≥ 8 mm 2CO, 2NO ≥ 5 mm 3CO, 3NO |
| General data | | |
| Operating / release time (typical values) | | 20 ms / 15 ms |
| Electrical life | | |
| - Resistive AC1 | | >10 ⁵ 16 A, 250 V AC / 10 A, 400 V AC |
| - cos φ | | See next page |
| Mechanical life (cycles) | | >10 ⁷ |
| Dimensions | | 36,1 x 38,6 x 45,5 mm |
| Ambient temperature | | |
| - storage | | - 40...+85°C |
| - operating | | - 40...+55°C |
| Cover protection category | | IP 00 |
| Environmental protection | | RTI |
| Shock resistance (NO/NC) | | 10 g |
| Vibration resistance | | 5g 10...150 Hz |
| Solder bath temperature | | max. 270°C |
| Soldering time | | max. 5s |

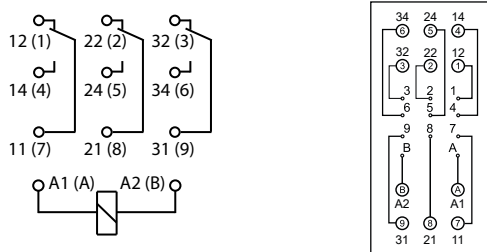
Table 2: Coil data

| Coil code | Rated voltage V AC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V AC | |
|-----------|-----------------------|--------------------------------------|--------------------------|---------------------------|-----------------|
| | | | | min. (at 20 °C) | max. (at 55 °C) |
| 024AC | 24 | 75 | $\pm 15\%$ | 19,2 | 26,4 |
| 230AC | 230 | 7080 | $\pm 15\%$ | 184,0 | 253,0 |

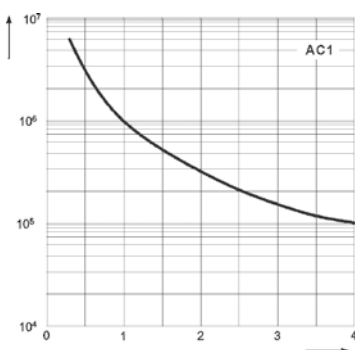
Dimensions



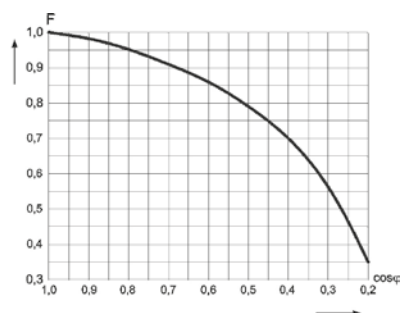
Connection diagram (pin side view)



Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour



Electrical life reduction factor at AC inductive load



Technical data

Industrial plugin electromagnetic relays

Relays for general application

For plug-in sockets: 35 mm rail mount acc. to EN 60715; panel mounting

Miniature dimensions

Cadmium - free contacts

AC and DC coils

Recognitions, certifications, directives: RoHS, CE

Standards: EN61810-1:2008 (electromechanical relays); EN61984:2002, EN60998-2-1:2001, EN60664-1:2003 (sockets)

Table 1: Technical data

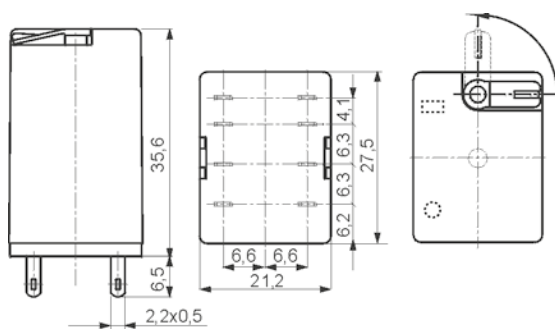
| Table 1: Technical data | | ERM2 | ERM4 |
|---|-----|----------------------------------|--|
| Number and type of contacts | | 2 C0 | 4 C0 |
| Contact material | | AgNi | |
| Rated / max. switching voltage | AC | 250 V / 440 V | 250 V / 250 V |
| Min. switching voltage | | 10 V | 10 V AgNi, 10 V AgNi/Au 0,2 µm, 5 V AgNi/Au 5 µm |
| Rated load (capacity) | | | |
| AC1 | | 12 A / 250 V AC | 6 A / 250 V AC |
| AC15 | | 3 A / 120 V 1,5 A / 240 V | 1,5 A / 120 V 0,75 A / 240 V (C300) |
| AC3 | | 370 W (single-phase motor) | 125 W (single-phase motor) |
| DC1 | | 12 A / 24 V DC (see Fig. 3) | 6 A / 24 V DC (see Fig. 3) |
| DC13 | | 0,22 A / 120 V 0,1 A / 250 V | 0,22 A / 120 V 0,1 A / 250 V (R300) |
| Min. switching current | | 5 mA | |
| Max. inrush current | | 24 A | 12 A |
| Rated current | | 12 A | 6 A |
| Max. breaking capacity | AC1 | 3 000 VA | 1 500 VA |
| Min. breaking capacity | | 0,3 W | 0,3 W AgNi, 0,3 W AgNi/Au 0,2 µm, 0,1 W AgNi/Au 5 µm |
| Contact resistance | | ≤ 100 mΩ | |
| Max. operating frequency (cycles/hour) | | | |
| • at rated load AC1 | | 1 200 | |
| • no load | | 18 000 | |
| Coil data | | | |
| Rated voltage | | See table 2 | |
| 50/60 Hz AC DC | | | |
| Must release voltage | | AC: ≥ 0,2 Un DC: ≥ 0,1 Un | |
| Operating range of supply voltage | | see Table 2 | |
| Rated power consumption | | 1,6 VA | |
| AC | | 0,9 W | |
| DC | | | |
| Insulation according to EN 60664-1 | | | |
| Insulation rated voltage | | 250 V AC | |
| Rated surge voltage | | 4 000 V 1,2 / 50 µs | 2 500 V 1,2 / 50 µs |
| Overvoltage category | | III | II |
| Insulation pollution degree | | 3 | 2 |
| Dielectric strength | | | |
| • between coil and contacts | | 2 500 V AC | type of insulation: basic |
| • contact clearance | | 1 500 V AC | type of clearance: micro-disconnection |
| • pole - pole | | 2 500 V AC | type of insulation: basic |
| Contact - coil distance | | | |
| • clearance | | ≥ 2,5 mm | ≥ 1,6 mm |
| • creepage | | ≥ 4 mm | ≥ 3,2 mm |
| General data | | | |
| Operating / release time (typical values) | | AC: 10 ms / 8 ms | DC: 13 ms / 3 ms |
| Electrical life | | | |
| • resistive AC1 | | > 10 ⁵ 12 A, 250 V AC | > 10 ⁵ 6 A, 250 V AC |
| • cosΦ | | see Fig. 2 | see Fig. 2 |
| Mechanical life (cycles) | | > 2 x 10 ⁷ | |
| Dimensions (L x W x H) | | 27,5 x 21,2 x 35,6 mm | |
| Weight | | 35 g | |
| Ambient temperature | | | |
| • storage | | -40...+85 °C | |
| • operating | | AC: -40...+55 °C | DC: -40...+70 °C |
| Cover protection category | | IP 40 | EN 60529 |
| Environmental protection | | RTI | EN 116000-3 |
| Shock resistance (NO/NC) | | 10 g / 5 g | |
| Vibration resistance | | 5 g 10...150 Hz | |

Table 2: Coil data

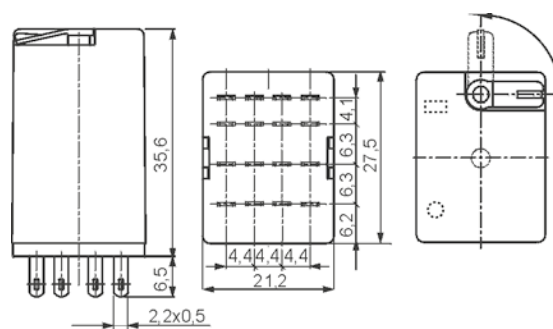
| DC voltage version | | | | | |
|--------------------|-----------------------|-------------------------------|--------------------------|---------------------------|-----------------|
| Coil code | Rated voltage V DC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V DC | |
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| 012DC | 12 | 160 | ± 10% | 9,6 | 21,6 |
| 024DC | 24 | 640 | ± 10% | 19,2 | 43,2 |
| 048DC | 48 | 2600 | ± 10% | 38,4 | 86,4 |
| 110DC | 110 | 13600 | ± 10% | 88 | 198 |
| 220DC | 220 | 54000 | ± 10% | 176 | 250 |
| AC voltage version | | | | | |
| Coil code | Rated voltage V AC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V AC | |
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| 024AC | 24 | 158 | ± 10% | 19,2 | 25,3 |
| 230AC | 230 | 16100 | ± 10% | 184,0 | 253 |

Dimensions

ERM 2

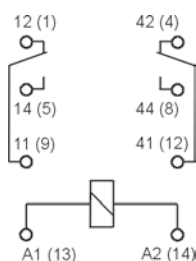


ERM 4

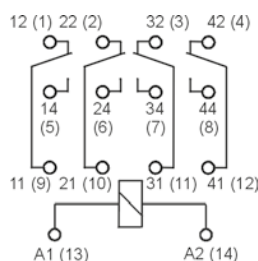


Connection diagram (pin side view)

ERM 2



ERM 4



Ordering designation

ERMX-YYYYZ

X – Number of contacts:

4: 4 CO (4 changeover)

2: 2 CO (2 changeover)

YYYY – Coil code:

024AC: 24 V AC 50/60 Hz

230AC: 230 V AC 50/60 Hz

024DC: 24 V DC

012DC: 12 V DC

Z – Additional features:

L – Light indicator (smd LED - red)

Example:

ERM4-024DCL Electromagnetic relay for plugin sockets with mechanical indication and lockable test button, four changeover contacts, coil voltage 24 V DC with light indicator.

Meaning of color codes:

green - DC coils

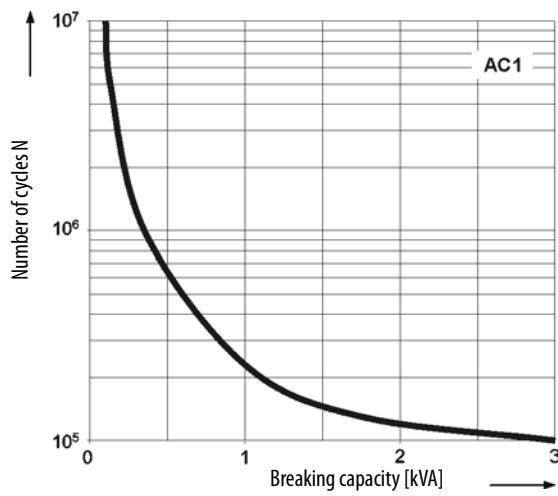


orange - AC coils

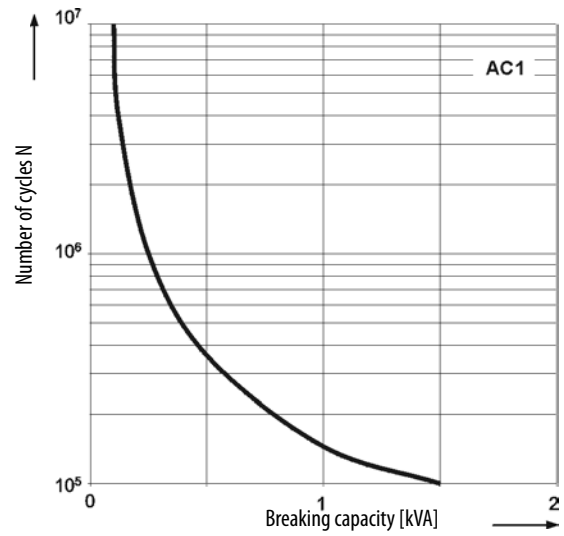
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

Fig. 1

ERM 2



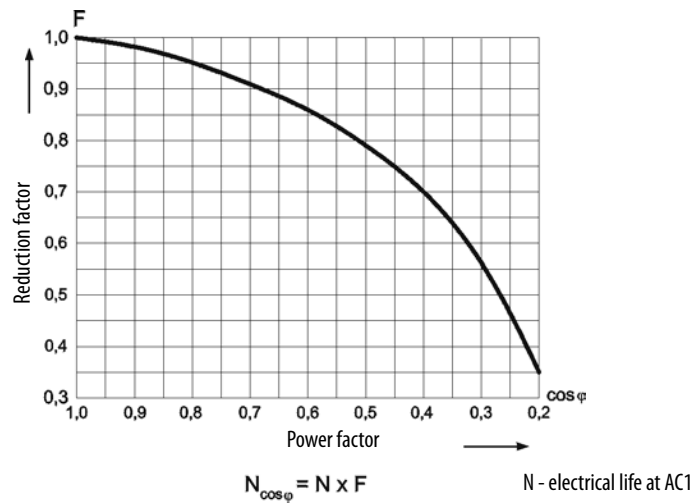
ERM 4



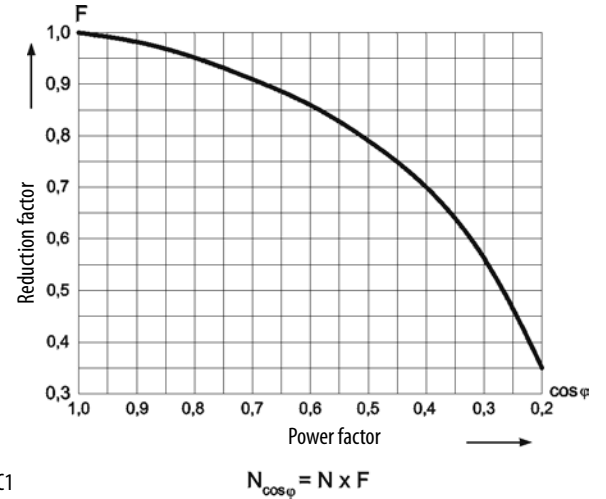
Electrical life reduction factor at AC inductive load

Fig. 2

ERM 2



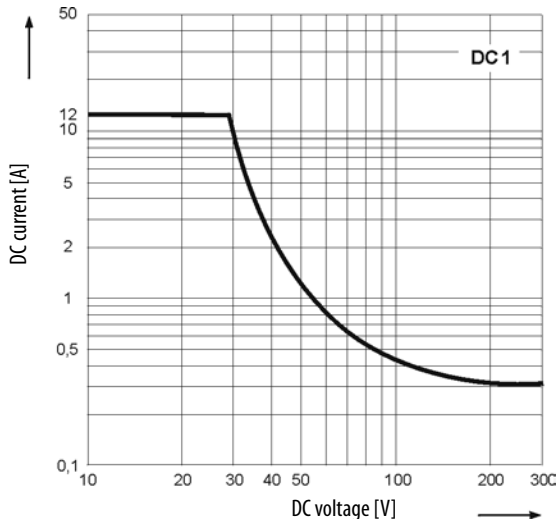
ERM 4



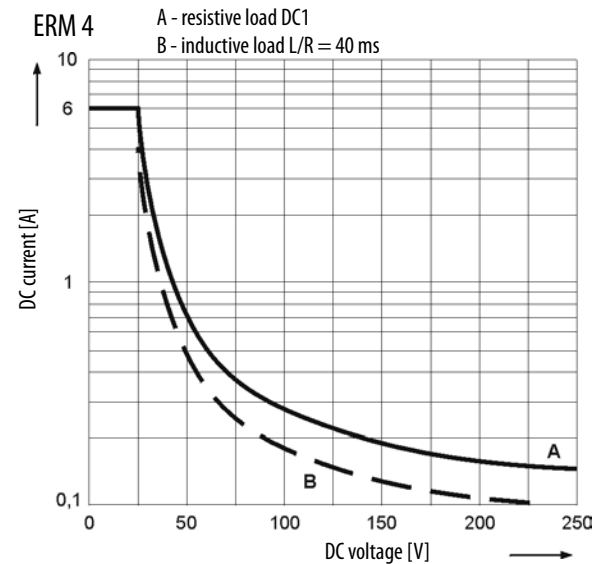
Max. DC resistive load breaking capacity

Fig. 3

ERM 2



ERM 4



Contact material selection for different load types ERM2 and ERM4

AgNi - for resistive or inductive loads,

Mounting**ERM 2**

Relays ERM2 are designed for mounting in plug-in sockets, standard version includes mechanical indicator with lockable front test button.

Relays ERM2 are designed for:

- screw terminals plug-in
- sockets ERB2-T*
- sockets ERB2-M* with clip ER-CLIP
- 35 mm rail mount acc. to EN 60715 or
- panel mounting

protecting modules type ERC are available as accessories /sockets (see below)

*Plug-in sockets ERB2-T and ERB2-M may be linked with interconnection strip type ER-TERMINAL

ERM 4

Relays ERM4 are designed for mounting in plug-in sockets, standard version includes mechanical indicator with lockable front test button.

Relays ERM4 are designed for:

- screw terminals plug-in
- sockets ERB4-T*
- sockets ERB4-M* with clip ER-CLIP
- 35 mm rail mount acc. to EN 60715 or
- panel mounting

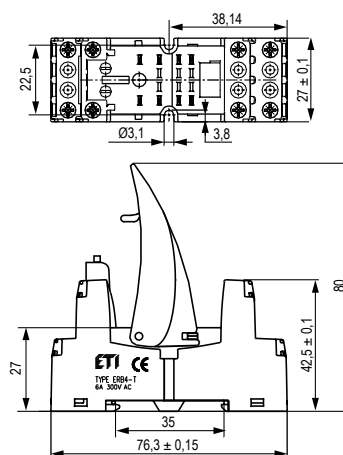
protecting modules type ERC are available as accessories /sockets (see below)

*Plug-in sockets ERB4-T and ERB4-M may be linked with interconnection strip type ER-TERMINAL

Plugin Sockets And Accessories**ERB2-T and ERB4-T****Plugin sockets (base) type T**

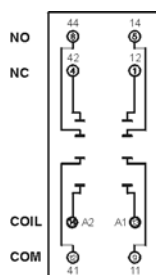
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 76,3 x 27 x 42,5(80) mm*

*In the bracket the height of socket with retainer / retractor clip is shown.

Dimensions**Two poles**

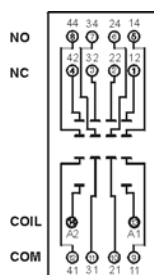
12A, 300 V AC

For ERM2

Connection diagram**Four poles**

6A, 300 V AC

For ERM4



Technical data

ERB2-M and ERB4-M Plugin sockets (base) type M

- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 75 x 27 x 61(82) mm*

*In the bracket the height of socket with retainer / retractor clip is shown.

Two poles

12A, 300 V AC

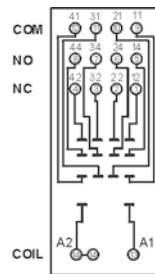
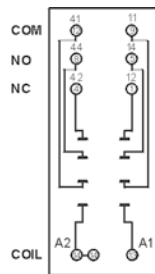
For ERM2

Four poles

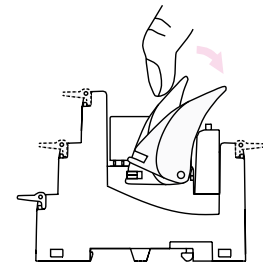
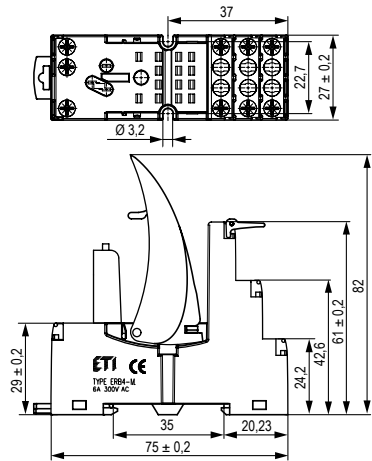
6A, 300 V AC

For ERM4

Connection diagram



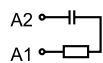
Dimensions



Removing the relay from the socket
with a retractor / retractor clip

Protection RC modules type ERC_AC

It protects against EMC disturbance and limits overvoltage.

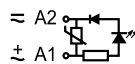


6/24 V AC
110/240 V AC

ERC-024AC
ERC-230AC

Protection RC modules type ERC_ACDCL

It limits overvoltage on AC and DC coils. Coil energizing indication.



6...24 V ACDC
24...60 V AC DC
110...230 V ACDC

ERC-024ACDCL
ERC-060ACDCL
ERC-230ACDCL



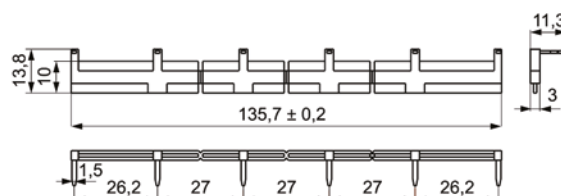
Modules are parallelly connected with relay coil

Interconnection strip ER-CLIP

designed for the co-operation with plug-in sockets ERB of miniature industrial relays, which are equipped with screw terminals; sockets and relays are mounted on 35 mm rail mount acc. to EN 60715.

- bridges common input signals (coil terminals A1 or A2)
- maximum permissible current is 10 A / 250 V AC,
- possibility of connection of 6 sockets or relays

Dimensions



Miniature Electromagnetic Relays

Table 1: Technical data

| | | MER2 |
|---|-------------------|--|
| Number and type of contacts | | 2 CO |
| Contact material | | AgNi |
| Rated / max. switching voltage AC | | 250 V / 440 V |
| Min. switching voltage | | 5 V AgNi |
| Rated load (capacity) | | 8 A / 250 V AC |
| AC1 | | 3 A / 120 V 1,5 A / 240 V (B300) |
| AC15 | | 550 W (single-phase motor) |
| AC3 | | 8 A / 24 V DC (see Fig. 3) |
| DC1 | | 0,22 A / 120 V 0,1 A / 250 V (R300) |
| DC13 | | |
| Min. switching current | | 5 mA AgNi |
| Rated current | | 8 A |
| Max. breaking capacity AC1 | | 2000 VA |
| Min. breaking capacity | | 0,3 W AgNi |
| Contact resistance | | ≤ 100 mΩ |
| Max. operating frequency (cycles/hour) | | |
| • at rated load AC1 | | 600 |
| • no load | | 72 000 |
| Coil data | | |
| Rated voltage | 50/60 Hz AC DC | 12 ... 240 V 3 ... 110 V |
| Must release voltage | | AC: ≥ 0,15 U _n DC: ≥ 0,1 U _n |
| Operating range of supply voltage | | See Tables 1, 2 and Fig. 4, 5 |
| Rated power consumption AC | | 0,75 VA |
| DC | | 0,4 ... 0,48 W |
| Insulation according to EN 60664-1 | | |
| Insulation rated voltage | | 400 V AC |
| Rated surge voltage | | 4000 V 1,2 / 50 μs |
| Overvoltage category | | III |
| Insulation pollution degree | | 3 |
| Dielectric strength | | |
| • between coil and contacts | | 5000 V AC type of insulation: reinforced |
| • pole - pole | | 2500 V AC type of insulation: basic |
| Contact - coil distance | | |
| • clearance | | ≥ 10 mm |
| • creepage | | ≥ 10 mm |
| General data | | |
| Operating / release time (typical values) | | 7 ms / 3 ms |
| Electrical life | | |
| • resistive AC1 | | > 10 ⁵ 8 A, 250 V AC |
| • cosΦ | | see Fig. 2 |
| • DC L/R = 40 ms | | > 10 ⁵ 0,15 A, 220 V DC |
| Mechanical life (cycles) | | > 3x10 ⁷ |
| Dimensions (L x W x H) | | 29 x 12,7 x 15,7 mm |
| Weight | | 14 g |
| Ambient temperature | | |
| • storage | | -40 ... +85 °C |
| • operating | | AC: -40 ... +70 °C DC: -40 ... +85 °C |
| Cover protection category | | IP40 / IP67 |
| Environmental protection | | RTII / RTIII |
| Shock resistance (NC) | | 20 g |
| Vibration resistance | | 5 g 10 ... 150 Hz |
| Solder bath temperature/ soldering time | | max. 270 °C / max. 5 s |

Technical data

Table 2: Coil data

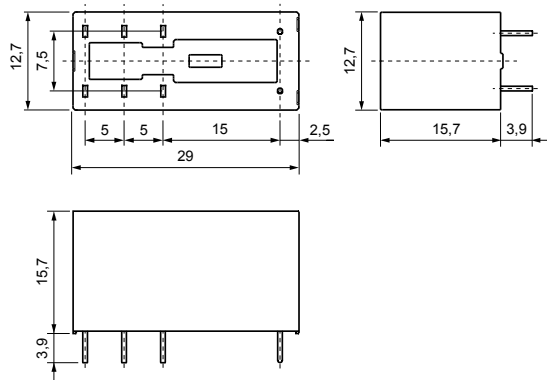
DC voltage version

| Coil code | Rated voltage V DC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V DC | |
|-----------|-----------------------|--------------------------------------|--------------------------|---------------------------|-----------------|
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| 005DC | 5 | 60 | $\pm 10\%$ | 3,5 | 12,7 |
| 012DC | 12 | 360 | $\pm 10\%$ | 8,4 | 30,6 |
| 024DC | 24 | 1440 | $\pm 10\%$ | 16,8 | 61,2 |

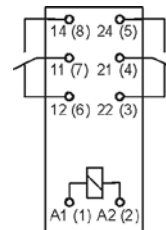
AC 50/60 Hz voltage version

| | | | | | |
|-------|-----|--------|------------|-------|-------|
| 024AC | 24 | 400 | $\pm 10\%$ | 19,2 | 28,8 |
| 230AC | 230 | 38 500 | $\pm 10\%$ | 184,0 | 276,0 |

Dimensions



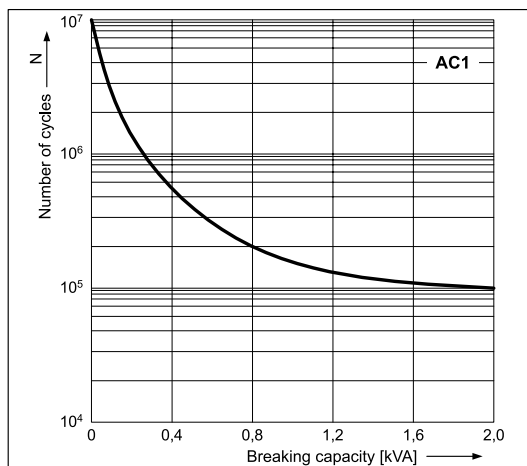
Connection diagram (pin side view)



| Terminal (pin) | A1(1); A2(2) | 22(3); 21(4); 24(5); 12(6); 11(7); 14(8) |
|--|-------------------|---|
| [mm] | $\varnothing 0,6$ | $0,5 \times 0,9$ |
| Drilling hole: | | |
| • for relays $\varnothing 1,3 \pm 0,1$ mm | | |
| • for sockets $\varnothing 1,5 \pm 0,1$ mm | | |

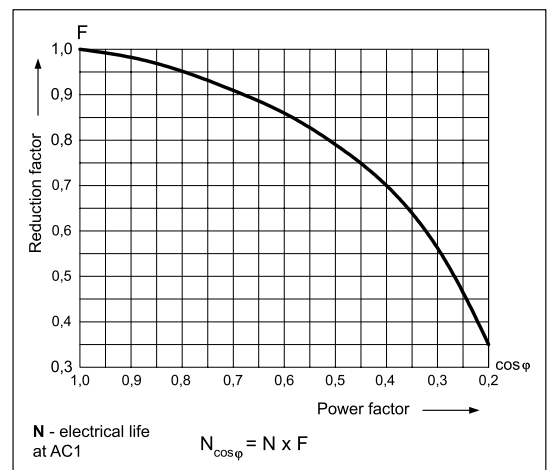
Electrical life at AC resistive load.
Switching frequency: 600 cycles/hour

Fig. 1



Electrical life reduction factor at AC inductive load

Fig. 2



Max. DC resistive load breaking capacity

Fig. 3

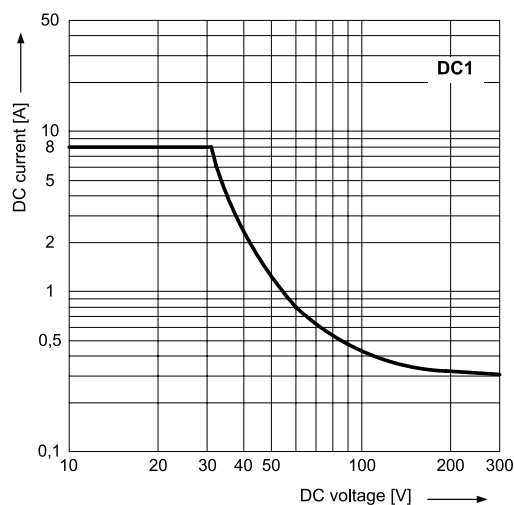
**Coil operating range = DC**

Fig. 4

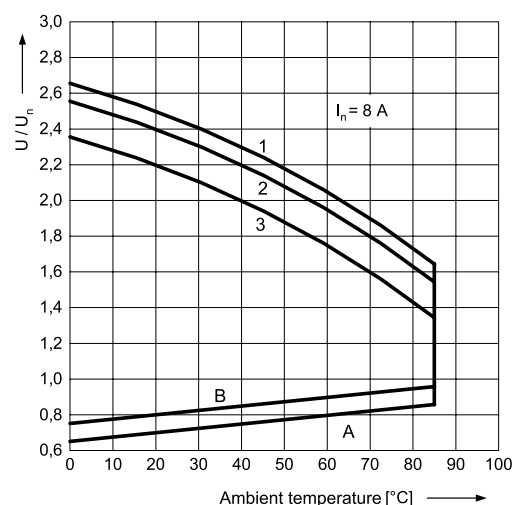
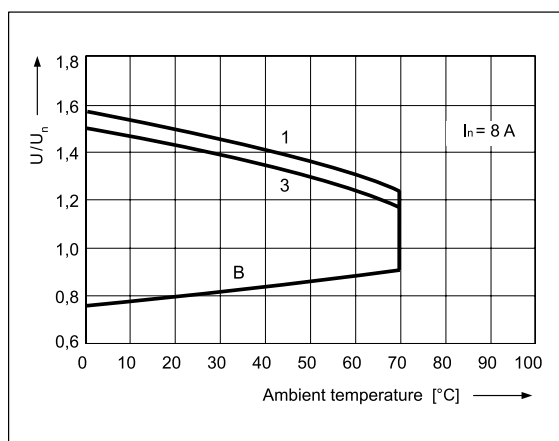
**Coil operating range = AC 50 Hz**

Fig. 5

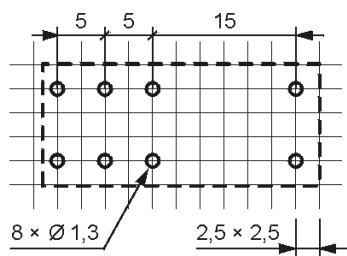
**Description of Fig. 4 and 5**

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).

B - relations between make voltage and ambient temperature after initial coil heating up with $1,1 U_n$ at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).

1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:

- 1 - no load
- 2 - 50% of rated load
- 3 - rated load

Pinout (soldier side view)**Mounting**

Relays MER2 are designed for:

- direct PCB mounting
- screw terminals plug-in sockets MERB-T and MERB-M

Plugin Sockets And Accessories

MERB-T Plugin sockets (base) type T

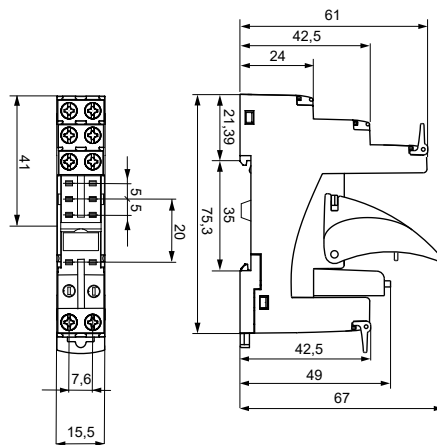
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 75,3 x 15,5 x 61(67) mm*

*In the bracket the height of socket with retainer / retractor clip is shown.

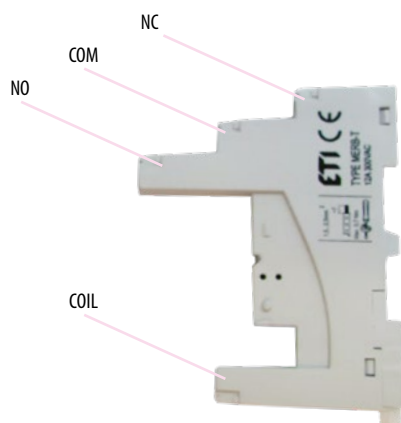
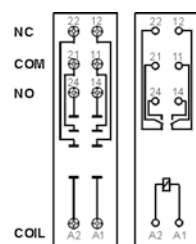
Two poles, 5mm pinout

12A, 300 V AC

Dimensions



Connection diagram



MERB-M Plugin sockets (base) type M

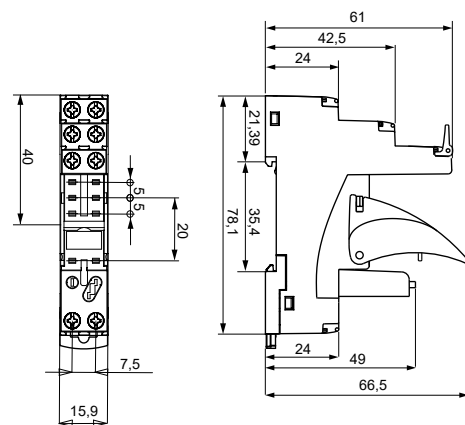
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 78,1 x 15,9 x 61(66,5) mm*

*In the bracket the height of socket with retainer / retractor clip is shown.

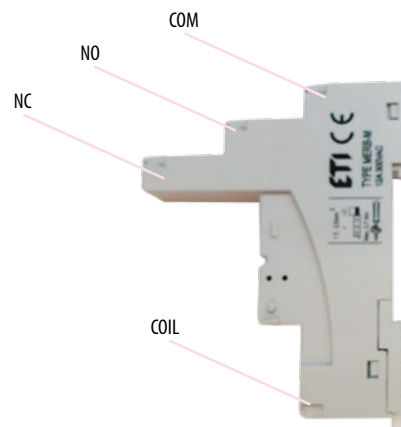
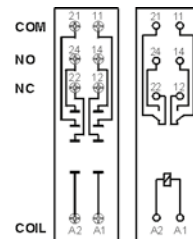
Two poles, 5mm pinout

12A, 300 V AC

Dimensions



Connection diagram



SLIM RELAYS SSR & SER, Electromagnetic and solid

Table 1: Technical data

| | SER1; Contact data | SSR1; Output circuit - Triac |
|---|--|--|
| Number and type of contacts | 1 CO | 1 NO |
| Contact material | AgSnO ₂ | - |
| Rated / max. switching voltage AC | 400 V AC / 250 V DC | 400 V AC / 440 V AC |
| Min. switching voltage | 10 V AC / DC | 20 V AC |
| Rated load (capacity) | | |
| AC1 | 6 A / 250 V AC | 1,2 A / 400 V AC |
| DC1 | 6 A / 24 V DC; 0,15 A / 250 V DC | - |
| Min. switching current | 100 mA | 10 mA |
| Max. inrush current / Max. non-repeat surge current | 10 A (t=20 ms) | 30 A (t=20 ms) |
| Rated current | 6 A | 1,2 A |
| Max. breaking capacity AC1 | 1 500 VA | - |
| Min. breaking capacity | 1 W | - |
| Contact resistance | ≤100 mΩ 100 mA, 24 V | - |
| Max. operating frequency (cycles/hour) | | - |
| • at rated load AC1 | 360 | |
| • no load | 72 000 | |
| I ² t for fusing | - | 5,1 A ² s (t=1-10 ms) |
| dI/dt | - | 50 A/μs |
| dV/dt | - | 40 V/μs |
| Input circuit | | |
| Rated voltage AC: 50/60 Hz AC/DC | 24 V; 230 V | |
| Must release voltage / Turn-off voltage | AC: ≥ 0,2 Un DC: ≥ 0,1 Un | |
| Must operate voltage | AC & DC: ≤ 0,8 Un | - |
| Rated power consumption AC/DC | 0,3 ... 1,6 VA / 0,3 ... 1,6 W | 0,3 VA / 0,3 W 24 V AC/DC |
| AC/DC | - | 1,6 VA / 1,6 W 230 V AC/DC |
| Insulation according to PN-EN 60664-1 | | |
| Insulation rated voltage | 400 V AC | 600 V AC |
| Rated surge voltage | 4 000 V 1,2 / 50 μs | - |
| Overvoltage category | III | - |
| Insulation pollution degree | 3 | 2 |
| Dielectric strength | | |
| • input - output | 4 000 V AC 50/60 Hz, 1 min. (type of insulation: reinforced) | 4 000 V AC 50/60 Hz, 1 min. (type of insulation: reinforced) |
| • input - output | 6 000 V 1,2 / 50 μs | - |
| • mass - input, output | 2 500 V AC 50/60 Hz, 1 min. | - |
| • contact clearance | 1 000 V AC 50/60 Hz, 1 min. (type of clearance: micro-disconnection) | - |
| Input - output distance | | - |
| • clearance | ≥ 6 mm | |
| • creepage | ≥ 8 mm | |
| General data | | |
| Operating / release time (typical values) | AC: 7 ms DC: 6 ms / AC: 15 ms DC: 10 ms | 10 ms max. (zero turn-on) / 10 ms max. |
| Electrical life | | - |
| • resistive AC1 (cos φ = 0,4) | > 0,6 x 10 ⁵ 6 A, 250 V AC; > 2 x 10 ⁵ 2 A, 250 V AC | |
| • resistive DC1 | 10 ⁵ 6 A, 30 V DC | |
| Mechanical life (cycles) | > 2 x 10 ⁷ | - |
| Dimensions (L x W x H) | 93,8 x 6,2 x 80 mm | |
| Weight | 40 g | |
| Ambient temperature | | |
| • storage | -40...+70 °C | -40...+70 °C |
| • operating | -40...+55 °C (-40...+60 °C 24 V DC) | -40...+55 °C |
| Protection category | IP 20 PN-EN 60529 | |
| Environmental protection | RTI PN-EN 116000-3 | |
| Shock resistance | 10 g | |
| Vibration resistance | 5 g 10...500 Hz | |

Technical data

Input data SER1

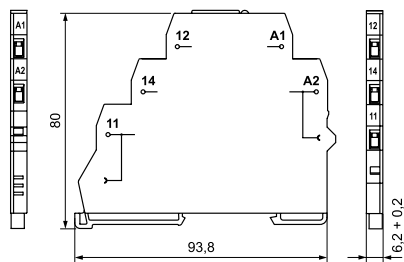
| Interface relay code | Rated input voltage, Un | Power of input circuit | Input - voltage range, V | |
|----------------------|-------------------------|------------------------|--------------------------|--------------|
| | | | min. (20 °C) | max. (55 °C) |
| SER1-024ACDC | 24 V AC/DC | 0,5 VA / 0,5 W | 19,2 | 26,4 |
| SER1-230ACDC | 230 V AC/DC | 0,8 VA / 0,8 W | 184,0 | 253,0 |

Input data SSR1

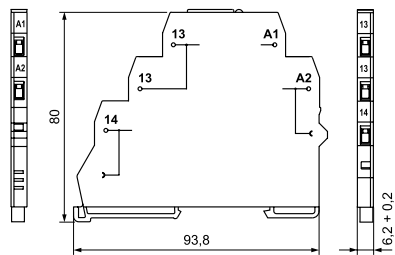
| Interface relay code | Rated input voltage Un | Power of input circuit |
|----------------------|------------------------|------------------------|
| | | |
| SSR1-024ACDC | 24 V AC/DC | 0,3 VA / 0,3 W |
| SSR1-230ACDC | 230 V AC/DC | 1,6 VA / 1,6 W |

Dimensions

SER1-024ACDC / SER1-230ACDC

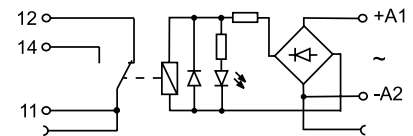


SSR1-024ACDC / SSR1-230ACDC

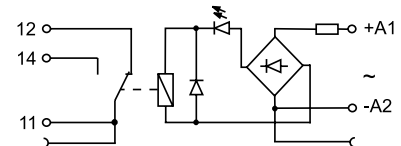


Connection diagram

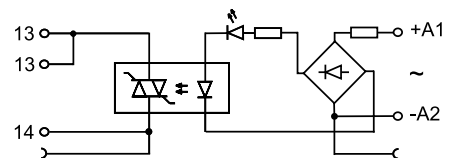
SER1-024ACDC



SER1-230ACDC



SSR1-024ACDC
SSR1-230ACDC



SR-TERMINAL

