

EVE - ETIREL

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SIQ HR

MODULAR AND CONTROL DEVICES



POWER NEEDS CONTROL

Build-in switch SV

Build-in switch SV

Rated current
16 - 125 A

Utilization category
AC-23B, AC-22B

Application

Build-in switch SV is used as a main switch in distribution boxes in houses or as a switch for individual electric circuits. With a build-in switch we can completely replace the cam switch. Build-in switch SV can be sealed either in ON or OFF position.

Advantages

Build-in switch SV has a more robust and simple construction and therefore a more reliable operation. It also shows the status of the contacts. With an additional label the circuit in which the switch is built in can be marked. Switches with $I_n \leq 63A$ have a double switching OFF.



1-pole

Type	I_n [A]	Code No.	U_n [V]	utilization category	Weight [g]	Packaging [pcs]
SV 116	16	002423121	230/400	AC-23B	87	12/108
SV 125	25	002423122	230/400	AC-23B	89	12/108
SV 140	40	002423123	230/400	AC-23B	92	12/108
SV 163	63	002423114	230/400	AC-22B	90	12/108
SV 180	80	002423115	230/400	AC-22B	90	12/108
SV 1100	100	002423116	230/400	AC-22B	90	12/108
SV 1125	125	002423117	230/400	AC-22B	90	12/108

2-pole

Type	I_n [A]	Code No.	U_n [V]	utilization category	Weight [g]	Packaging [pcs]
SV 216	16	002423221	400	AC-23B	173	6/54
SV 225	25	002423222	400	AC-23B	178	6/54
SV 240	40	002423223	400	AC-23B	184	6/54
SV 263	63	002423214	400	AC-22B	180	6/54
SV 280	80	002423215	400	AC-22B	180	6/54
SV 2100	100	002423216	400	AC-22B	180	6/54
SV 2125	125	002423217	400	AC-22B	180	6/54

3-pole

Type	I_n [A]	Code No.	U_n [V]	utilization category	Weight [g]	Packaging [pcs]
SV 316	16	002423321	400	AC-23B	265	4/36
SV 325	25	002423322	400	AC-23B	270	4/36
SV 340	40	002423323	400	AC-23B	280	4/36
SV 363	63	002423314	400	AC-22B	270	4/36
SV 380	80	002423315	400	AC-22B	270	4/36
SV 3100	100	002423316	400	AC-22B	270	4/36
SV 3125	125	002423317	400	AC-22B	270	4/36

Build-in switch SV / Build-in devices EVESYS

4-pole

Type	I _n [A]	Code No.	U _n [V]	utilization category	Weight [g]	Packaging [pcs]
SV 416	16	002423421	400	AC-23B	363	3/27
SV 425	25	002423422	400	AC-23B	365	3/27
SV 440	40	002423423	400	AC-23B	380	3/27
SV 463	63	002423414	400	AC-22B	360	3/27
SV 480	80	002423415	400	AC-22B	360	3/27
SV 4100	100	002423416	400	AC-22B	360	3/27
SV 4125	125	002423417	400	AC-22B	360	3/27



Build-in devices EVESYS

Build-in devices EVESYS

Rated current
25-40 A

Utilization category
AC-22A

Modular changeover switches SSQ I-0-II (network - generator) enable simple and trouble-free switching of power supply sources in case of emergency (e.g. mains voltage failure). They are designed for installation in switchgear equipped with TH35 rails adapted for mounting modular devices. Switches can be sealed for the selected positions: I or II.

Advantages:

- the family of SSQ changeover switches expands the EVE modular system range,
- all changeover switches are made in modular form - module width 18 mm,
- the distance between the changeover switch contacts in the open state is larger than 3 mm per one pair of contacts, (two pair of contacts in the current path of changeover switch)
- the changeover switches are equipped with terminals enabling connection of conductors of cross-section :
 - 16 mm² for a "wire" type wire
 - 10 mm² for a "stranded wire" type cable.

Three-position modular changeover switch I-0-II

Type	I _n [A]	Code No.	U _n [V]	number of poles	utilization category	Weight [g]	Packaging [pcs]
SSQ 125	25	002421414	230	1	AC-22A	88	1/12
SSQ 225	25	002421424	400	2	AC-22A	176	1/6
SSQ 325	25	002421434	400	3	AC-22A	264	1/4
SSQ 425	25	002421444	400	4	AC-22A	352	1/3
SSQ 140	40	002421415	230	1	AC-22A	88	1/12
SSQ 240	40	002421425	400	2	AC-22A	176	1/6
SSQ 340	40	002421435	400	3	AC-22A	264	1/4
SSQ 440	40	002421445	400	4	AC-22A	352	1/3



SSQ 440

Modular indicators SON H

Type	Color	Code No.	Weight [g]	Packaging [pcs]
SON H-1R	1x red	002471550	40	1/400
SON H-1G	1x green	002471551	40	1/400
SON H-3R	3x red	002471552	48	1/400
SON H-3K	1x red, 1x yellow, 1x green	002471553	48	1/400
SON H-3G	3x green	002471556	48	1/400
SON H-1Y	1x yellow	002471554	40	1/400
SON H-1B	1x blue	002471555	40	1/400



**Bell/Buzzer**

Type	Code No.	U _n [V]	Weight [g]	Packaging [pcs]
Bell ZE 220	002412001	230	70	12/108
Bell ZE 8	002412002	8	70	12/108
Buzzer BE 220	002413001	230	54	12/108
Buzzer BE 8	002413002	8	54	12/108

Bell transformer

Type	I _n [A]	Code No.	P _n [VA]	U _{1n} [V]	U _{2n} [V]	Weight [g]	Packaging [pcs]
Zt 8/8	1	002411005	8	230	4, 6, 8	620	1/36
Zt 8/12	0,63	002411006	8	230	6, 8, 12	600	1/36
Zt 8/8 - 2M	1	002411010	8	230	8	314	1/54
Zt 8/12 - 2M	0,63	002411011	8	230	12	312	1/54

DIN socket

Type	Code No.	I _n [A]	U _n [V]	pole numbers	Weight [g]	Packaging [pcs]
T-2P+Z schuko	002414020	10A DC, 16A AC	250V AC	2+PE	77	15

Control equipment ETIREL

Power relays VS116K, VS316K



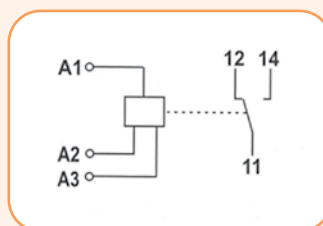
Application: Control signals in low-power circuits, combined with buttons, switches, for automation systems

Advantages:

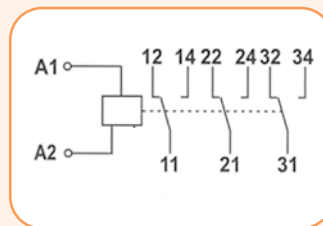
- Voltage range AC230 or AC / DC 24V,
- 1 module, DIN rail mounting
- Changeover contact 1x16A or 3x16A,
- Output status LED indication

Power relays VS116K, VS316K

Type	Code No.	Voltage U _n	Number of contacts	Weight [g]	Packaging [pcs]
VS116K	002471211	AC230V / AC/DC 24V	1P	58	1/10
VS316/230V	002471220	AC230V	3P	84	1/10
VS316/24V	002471225	AC/DC 24V	3P	84	1/10



VS116K

A1 - A2 230V AC
A1 - A3 24V AC/DC

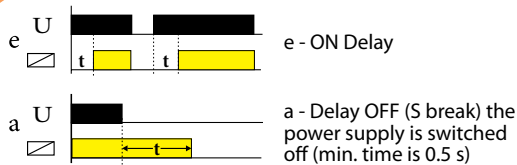
VS316K

Delay OFF without supply voltage CRM-82TO

- „True OFF“ relay - relay timing without supply voltage
- Sample of use: back-up source for Delay OFF in case of voltage failure (emergency lighting, emergency respirator, or protection of el. controlled doors - in case of fire)
- 2 time functions adjustable by rotary switch:
 - a - Delayed return after disconnecting of supply
 - e - Delayed start
- Time range (adjustable by rotary switch and fine setting by potentiometer): 0.1 s - 10 min
- Universal supply voltage AC/DC 12 - 240 V
- Output contact: 2x changeover/DPDT 8 A
- Output status indicated by LED (only in case of supply voltage connection)
- Clamp terminals
- 1-MODULE, DIN rail mounting

Delay OFF without supply voltage CRM-82TO

Type	Code No.	Weight [g]	Packaging [pcs]
CRM-82TO	002470074	93	1/10



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

Advantages

- 1-module, DIN rail mounted
- Universal supply voltage: AC/DC 12V - 240V
- 10 functions:
 - 5 time functions controlled via supply voltage
 - 4 time functions controlled via control input
 - 1 function of memory (latching) relay
- Time scale 0.1 s - 10 days divided into 10 ranges
- User-friendly setting of functions and time via rotary switch
- Output contact:
 - CRM-91H 1x16A changeover
 - CRM-93H 3x8A changeover
- Output indication: multifunction red LED, flashing at certain states

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

Type	I _n [A]	Code No.	Weight [g]	Packaging [pcs]
CRM-91H	16	002470001	68	1/10
CRM-93H	8	002470002	93	1/10



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



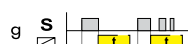
e) Delay OFF after de-energisation, instant make of output



f) Delay OFF responding to make of control contact regardless its length



g) Delay OFF after break of control contact with instant output



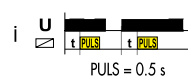
h) Delay OFF after make and break of control contact



i) Memory (latching) relay



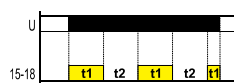
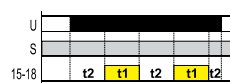
j) Pulse generator

**Time relay CRM-2H****Advantages**

- 1-module, DIN rail mounted
- Universal supply voltage: AC/DC 12V - 240V
- 2 time functions:
 - cycler beginning with pulse
 - cycler beginning with pause
- Time scale 0.1s - 100 days divided into 10 time ranges
- Rough time setting by rotary switch
- Output contact: 1x 16 A changeover
- Output indication: multifunction red LED

Time relay CRM-2H

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
CRM-2H	16	002470003	68	1/10

Cycler beginning with pulse**Cycler beginning with pause**

Delay ON star/delta relay CRM-2T

Advantages

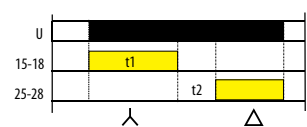
- 1-module, DIN rail mounting
- Supply voltage: AC/DC 12V - 240 V
- Generates motor starting cycle star-delta
- Time t1 (star)
 - time scale 0.1 s - 100 days is divided into 10 time ranges
 - rough time setting by rotary switch
 - fine time setting by potentiometer (from 0,1 to 1)
- Time t2 (delay) between star/delta:
 - time range 0.1 s - 1 s is set by potentiometer
- Output contact: 2x 16 A (AC1)
- Output indication: multifunction red LED



Delay ON star/delta relay CRM-2T

Type	I _n [A]	Code No.	Weight [g]	Packaging [pcs]
CRM-2T UNI	16	002470013	95	1/10

Delay ON star/delta



Staircase switch CRM-4

Advantages

- 1-module, DIN rail mounted
- Supply voltage: AC 230 V
- Protection against control push-button blocking
- Time range: 0,5 - 10 min
- Selector switch:
 - AUTO: normal function acc. to set time
 - OFF: permanent off
 - ON: permanent on
- Time setting via potentiometer
- Output contact: 1x 16 A changeover (load up to 4000 VA/AC1)



Staircase switch CRM-4

Type	I _n [A]	Code No.	Weight [g]	Packaging [pcs]
CRM-4	16	002470012	53	1/10

Programmable staircase switch CRM-46

Description

Staircase switch enables delayed switching off of lighting on stairs, corridors, entrances, common areas or for delayed running of fans in the toilet or bathroom:

- 1 TE size, DIN rail mounted.
- Supply voltage: AC 230 V
- The intelligent staircase switch offers similar application possibilities as the CRM-4, while it is possible to extend the delay for functions a, b repeatedly by briefly pressing the control button (s). Each short press multiplies the time set by the potentiometer, i.e. setting the potentiometer to 2 minutes with three presses extends the delay up to

6 minutes. The maximum value of such an extended delay will always be 30 minutes, regardless of the number of presses:

- Long press (> 2 s) can switch off the output prematurely and end the ongoing delay.
- Control input with the possibility of loading up to 100mA load (glim lamp, LED in the button, etc.).

Function (selectable by potentiometer on the front panel):

- a – STAIRCASESWITCH, programmable with signalization
- b – STAIRCASESWITCH, programmable without signalization
- c – MEMORY LATCH (press to switch on, press to switch off)
- d – MEMORY LATCH with delay

ON (permanently closed) - e.g. during cleaning, moving

OFF (permanently open) - e.g. when replacing luminaires

- Adjustable time range 0.5... 10 minutes.

- Output contact 16A AC1 (4000VA), handles surge currents up to 80A.

- 3-wire or 4-wire connection (input S can be controlled by potential A1 or A2).

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



Programmable staircase switch CRM-46

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
CRM-46	16	002470295	72	1/10

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

Advantages

- 2-modules, DIN rail mounting
- Daily, weekly program in one device (SHT-1; SHT-1/2)
- Daily, weekly, monthly, yearly program (SHT-3, SHT-3/2)
- Supply voltage AC230 V or AC/DC 12-240 V
- Switching: according to the program (AUTO)/constantly manual/manually until next program change/random (CUBE)
- Automatic conversion summer/winter time
- Sealable cover of the front panel
- 100 memory places, clear LCD display
- Min. interval 1s
- Pulse/cyclic output
- Output contact: 1x 16A changeover → SHT-1, SHT-3.
- Output contact: 2x 16A changeover → SHT-1/2, SHT-3/2.



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

Type	I _n [A]	Code No.	Weight [g]	Packaging [pcs]
SHT-1 UNI	16	002470051	130	1
SHT-1 230V	16	002470050	110	1
SHT-1/2 UNI	16	002470054	130	1
SHT-1/2 230V	16	002470053	110	1
SHT-3 UNI	16	002470056	110	1
SHT-3 230V	16	002470055	130	1
SHT-3/2 UNI	16	002470058	110	1
SHT-3/2 230V	16	002470057	130	1

Digital time switch SHT-4

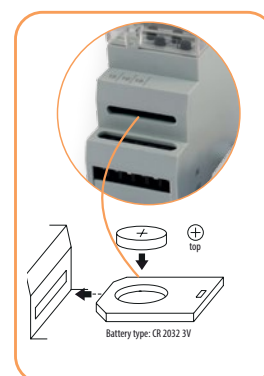
Description

Used to control different loads according to sunrise and sunset time based on geographical coordinates:

- preset coordinates for European cities incl. manual setting options
- hour meter for each channel
- two-channel design - each channel is programmed individually
- Sealable transparent front panel cover, easy to operate with 4 buttons.
- Real-time backup - up to 3 years with replaceable battery.
- Automatic winter/summer time changeover.
- Program: weekly, annually, astro
- Output: 2x CO, 16 A AC I
- Housing: 2-MODULE SIZE
- Supply voltage (frequency): AC 230 V (50/60 Hz)
- Mounting: DIN rail EN 60715

Digital time switch SHT-4

Type	I _n [A]	Code No.	Weight [g]	Packaging [pcs]
SHT-4 230	2xCO, 16A AC I	002470296	287	1



Analog electromechanical time switch APC-D1, APC-DR1

Advantages

- The APC time switch controls any electrical installation by means of daily programs.
- Without (D1) or with (DR1) battery backup.
- Manual switch with permanent ON position.
- Supply voltage : AC 230V
- Sealable cover of frontal panel
- Output contact : 1x NO 16A
- Simple dial time setting. Minimum switching time is 15 min.
- 1 module, DIN rail mounting.

Analog electromechanical time switch APC-D1, APC-DR1

Type	I _n [A]	Code No.	Weight [g]	Packaging [pcs]
APC-D1	16	002472001	87	1/10
APC-DR1	16	002472002	87	1/10



Analog electromechanical time switch ATS-1DR 230



Description

- The mechanical time switch is a simple and inexpensive alternative to digital time switches for controlling heating, ventilation, cooling, lighting systems or pumps depending on real time.
- Daily program.
- Selection of operating modes using the switch on the panel:
 - switches automatically according to the set program
- Power reserve after power off for up to 100 hours after fully charged.
- Sealable transparent front panel cover.
- Supply voltage: AC 230V (50/60 Hz)
- Power consumption (max): 1 W (1,5 VA)
- Program: daily
- Minimum operating switching time: 15 min
- Power reserve: max. 100 hrs
- Number of contacts 1 x NO (AgNi) 16A AC1
- Mounting: DIN rail EN 60715

Analog mechanical time switch ATS-1DR 230

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
ATS-1DR 230	1xNO, 16A AC1	002470297	73	1

Multifunction relay SMR-T, SMR-H, SMR-B



Advantages

- Multifunction relay designated for installation into a wiring box, under wall-switch into an existing installation (SMR-T doesn't need neutral to function)
- Fast solution for exchanging standard wall-switch for a switch controlled by time or for a memory relay controlled by a button

SMR-T

- 3-wire connection, works without neutral wire
- Output: 10-160 VA (resistive load)
- It cannot be used for fluorescent lights and energy saving lights (loads of capacitive type)

SMR-H

- 4-wire connection
- Output 0-200 VA
- It cannot be used for fluorescent lights and energy saving lights (loads of capacitive type)

SMR-B

- 4-wire connection
- 10 functions
- Output contact 1 x 16A / 4000 VA, 250V AC1
- Enables switching of fluorescent lights and also energy saving lights (see instruction manual technical data)
- Independent galvanically separated input AC/DC 5-250 V (for example for control from a security system)

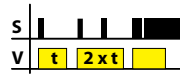
Multifunction relay SMR-T, SMR-H, SMR-B

Type	Code No.	Weight [g]	Packaging [pcs]
SMR-T	002470004	29	1/14
SMR-H	002470005	31	1/14
SMR-B	002470021	53	1/14

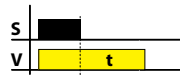
Control equipment ETIREL

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 - cyder - flasher impulser
output cycles in regular interval, cyder starts with an impulse



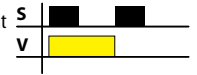
Function e - puls shift
delay on after the switch is switched on and delay on after it is switched off



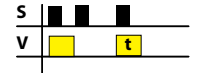
Function f - delay on
delay on after switch is switched on until it is switched off



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, cyder starts with a gap



Function j *- cyder 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

Memory and latching relays MR-41, MR-42

Advantages

- 1-module, DIN rail mounted
- Supply voltage:
 - UNI AC/DC 12V - 240V
 - 230 AC 230V
- Keeps state in memory when supply disconnected. When energized again, relay returns to the state before disconnecting.

MR-41

- Output contact: 1x changeover 16A/ AC1

MR-42

- Options - 2x parallel contacts or the other relay is latching
- Function selected via external wire link between B1-B2
- Output contact: 2x changeover 16A/ AC1





Memory & latching relays MR-41, MR-42

Type	Code No.	Weight [g]	Packaging [pcs]
MR-41 UNI	002470007	64	1/10
MR-42 UNI	002470008	89	1/10
MR-41 230	002470094	60	1/10
MR-42 230	002470095	85	1/10



In applications with long control cables and/or leading other connections in parallel MR-41/42 can be exposed to EM disturbances and unstable operation (random switching). We advice using RBS bistable switch instead.

Dimmers - compatibility with various types of light bulbs

Product	automatically detects type of load	R  Standard and halogen light bulbs	L  Low voltage light bulbs (12-24V), wounded transformer	C  Low voltage light bulbs (12-24V), electronic transformer	ESL  Dimmable Energy Saving Lamps (ESL)	LED	
						CATEGORY 1: „LOW COST“ LED LAMPS - MULTILED SYSTEMS WITH INTEGRATED LINEAR POWER SUPPLY	CATEGORY 2: 1-3 DIMMABLE POWER LED LAMPS WITH INTEGRATED SWITCHING POWER SUPPLY
DIM-2	×	✓	✓	×	×	×	×
DIM-14	✓	✓	✓	✓	×	×	×
DIM-15	×	×	×	×	✓	✓	✓
SMR-M	×	×	×	×	✓	✓	✓
SMR-S	×	✓	✓	×	×	×	×
SMR-U	✓	✓	✓	✓	×	×	×

Staircase switch with dimming DIM-2



Advantages

- 1-module, DIN rail mounted
- Supply voltage AC 230V
- Function of gradual dim-up and dim-down, controlling inputs for push button and switch
- Protection against button dead locking
- Potentiometers adjust:
 - speed (fluency) of switching on
 - maximum intensity of light
 - time of maximum intensity light
 - speed (fluency) of switching off
- Contactless output: 1 x triac
- Load AC I 2A / 500W

Staircase switch with dimming DIM-2

Type	Code No.	Weight [g]	Packaging [pcs]
DIM-2	002470009	70	1/10

Dimmer DIM-14

Advantages

- 1-module, DIN rail mounting
- Supply voltage: AC 230 V
- Designed for dimming of electrical bulbs and halogen lights with wound or electronic transformer
- For switching and dimming of lights, control inputs for a button
- Short pressing switches ON/OFF, longer pressing (more than 0.5 s) enables gradual light intensity setting when switched off, brightness level is stored in a memory and when switched on again last brightness level is restored
- Output without contacts: 2x MOSFET
- LED output indication (with any level of brightness)
- Possibility of parallel connection of control buttons
- Resistive, inductive or capacitive load, up to 300 W, for a short term up to 500 W
- Simultaneous connection of inductive and capacitive load is not allowed.
- Electronic overvoltage protection
- Protection against temperature overrun inside a device – output off and signalization of overheat by LED flashing



Dimmer DIM-14

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
DIM-14	2	002470023	58	1

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

Advantages

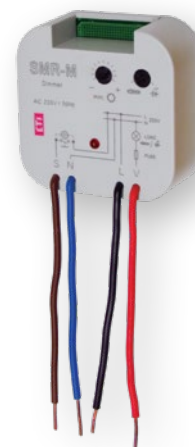
- Designated for dimming of:
 - a) LED bulbs and LED light sources
 - b) dimmable saving fluorescent lamps
- Enables gradual setting of luminance by push-button (non-detent) or parallel buttons
- Returns to last state upon re-energization
- Type of light source (LED or saving fluorescent lamp) is set by switch-over on the front panel of device
- Minimal luminance, set by potentiometer on the front panel, eliminates flashing of some types of saving fluorescent lamps

DIM-15

- Supply voltage 230V AC
- Output status is indicated by red LED:
 - shines when output is active
 - flashes while heating overload, at the same time output is disconnected
- 1-MODULE version, DIN rail mounting, saddle terminal(h)

SMR - M

- Button-controlled dimmer intended to be installed in an installation box (e.g. KU-68) into the existing electrical wiring
- Protection against excessive temperature inside the device - switches off the output



Dimmer DIM-15, SMR-M

Type	Code No.	Weight [g]	Packaging [pcs]
DIM-15	002470290	57	1/10
SMR-M	002470291	38	1/14



Dimmer SMR-S, SMR-U



Advantages

- Button-controlled dimmers designated for flush mounting into a wiring box, into an existing installation (SMR-S doesn't need neutral to function)
- Controlling lamp brightness
- Dimming, control from more places (parallel button connected), possible protection against temperature overrun inside the device – output off.
- By changing wall-switch for a switch with SMR-S/SMR-U installed below effective brightness control can be reached. SMR-S enables dimming of electrical bulbs and wound transformers 12V, halogen lights (inductive load), SMR-U also enables dimming of electronic transformers 12V, halogen lights (capacitive load). It cannot be used for dimming fluorescent lights or energy saving lights.

SMR-S

- 3-wire connection, functional without neutral
- Max. load: 300 VA (resistive loads)
- Contactless output - 1x triac
- With exchangeable fuse

SMR-U

- 4-wire connection
- Max. load: 500 VA
- Contactless output - 2x MOSFET
- Electronic overload and overtemperature protection – output off in case of short-circuit or overvoltage

Dimmer SMR-S, SMR-U

Type	Code No.	Weight [g]	Packaging [pcs]
SMR-S	002470010	32	1/14
SMR-U	002470022	32	1/14

Twilight switch in IP65 ETS-16b



Application

Used for remote control of external lighting. time delay prevents accidental activation of the short-term changes in the intensity lighting. Designed to be mounted on a flat surface (eg a wall, disc).

Advantages:

- robust and simple design,
- adjustable-sensitivity threshold,
- IP 65

Twilight switch in IP65 TS-16b

Type	Code No.	Weight [g]	Packaging [pcs]
ETS-16b	002471102	160	1/10

Twilight switch SOU-1 + sensor

Advantages

- 1-module, DIN rail mounted
- Supply voltage: AC 230 V
- Switches according to level ambient light intensity
- Adjustable time pause to eliminate short-term illumination peaks
- Adjustable level of light intensity in 2 ranges 100-50000 Lx and 1-100 Lx
- Controlling input for additional control inputs, e.g. time switch
- External sensor, protection degree IP55, suitable for mounting on the wall (supplied by switch)
- Output contact: 1x changeover 16A / AC1
- LED output indication



Twilight switch SOU-1

Type	Code No.	Weight [g]	Packaging [pcs]
SOU-1	002470011	65	1

* Sensor for twilight switch SOU-1 also available separately (code No. 002470052)

Sensor tolerance $\pm 33\%$

Twilight switch with digital time switch SOU-2 + sensor

Advantages

- 2-module, DIN rail mounting
- Supply voltage: AC 230 V
- Adjustable light intensity 1-50000 lx
- Serves for control of lights on the basis of ambient light intensity and real time (combination of SOU-1 and time switch clock SHT-1 in one device)
- The advantage of real time consists in the blocking function of the twilight switch in the case of an uneconomical use of lights (night hours, weekends etc.)
- Function of random switching enables simulation of presence when nobody is in the building
- Switching: according to the program (AUTO) / permanently manual / random (CUBE)
- External sensor IP56 is suitable for mounting on the wall/ in panel (cover and sensors are part of delivery)



Twilight switch with digital time switch SOU-2 + sensor

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
SOU-2 + sensor	16	002470020	130	1

* Sensor for twilight switch SOU-2 also available separately (code No. 002470302)

Sensor tolerance $\pm 33\%$

Time switch ASTROLOCK-2



Description

The ASTROLOCK-2 is a time switch designed to control luminous loads in function of dawn and dusk times. It includes a program that automatically adjusts the dawn lighting-up and dusk switching-off times, without sensors and any need for maintenance. The geographic position location is set up by entering geographic coordinates of location where operating or with selecting nearest city from built in list. This product successfully replaces twilight switches with dusk(light) sensor (photo cell).

Its small size of only two modules makes it ideal for installation on distribution boards with little available space. The unit includes 40 memory spaces in two independent circuits that can be programmed in an astronomic or with fixed time operation or combination.

Advantages

- 2 module – DIN rail mounting.
- Supply voltage: 230V 50/60 Hz.
- Two independent programmable output contacts 2x 16A (AC1).
- 40 daily and weekly programs with astronomical or fixed-time manoeuvres.
- Daily astronomical adjustment with offset possibility(±delay).
- Option of automatic switching between summer and winter time.
- Backup power supply: Replaceable CR2032 battery(included).
- High-contrast backlit display.
- Menu languages: ENG, SLO, HR/SRB/BiH, POL, RUS.
- Countries with biggest cities directly supported: Poland, Slovenia, Estonia, Lithuania, Latvia, Russia, Ukraine, Bosnia and Herzegovina, Croatia, Macedonia, Serbia.
- Other cities supported through entering geographic coordinates (zone latitude and longitude).

Time switch ASTROLOCK-2

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
ASTROLOCK-2	16	002472051	166	1/120

Digital time switch ETICLOCK-R1



Description

ETICLOCK-R1 is a digital time switch designed to control an electrical installation. Different types of operations: ON and OFF at a set time, shortterm operations or pulses (1 to 59 seconds) and repetitive cycles (1 to 59 seconds or 1 minute to 23 hours and 59 minutes) applied to one channel (C1). It includes a series of additional functions such as: automatic DST changes, 4 holiday periods, adjustable screen brightness. Menus can be displayed in several languages (ENG, SLO, HR/SRB/BiH, POL, RUS). One voltage free changeover output (channel) allows programming of up to 40 operations (programs).

Advantages:

- Rated voltage and frequency: As indicated on the device (230 V AC 50-60Hz)
- Voltage free programmable changeover output contact: 1x16 (10) A / 250 V AC
- Automatic DST change by country can be disabled
- On-screen operating schedule
- Display screen: Back-lit LCD, Menu languages: English, Slovenian, HR/SRB/BiH, Polish, Russian.
- Memory spaces: 40 programs (operations)
- Power reserve:
 - 10 years (with 4 years replaceable CR2032 battery and no network connection)
 - 48 h (without battery or empty and no network connection)
- Types of operations: ON/OFF, PULSE (1 to 59 sec.) and CYCLES (1 to 59 sec. or 1 min to 23h and 59 min)
- Size: 2 DIN modules (35 mm)

Digital time switch ETICLOCK-R1

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
ETICLOCK-R1	16	002472053	136	1/10

Digital time relay EDIGI-R2

The EDIGI-R2 weekly digital switches with 2 relay outputs are equipped with a backlit display and programming is easy and intuitive. The ultimate solution to managing loads based on time or brightness and/or their combinations; EDIGI-R2 is universal device that consists of an ASTRONOMICAL TIME SWITCH, a TWILIGHT SWITCH and a TIME SWITCH in a single device. Ideally used in domestic buildings, industrial buildings, schools, offices, public areas, etc.; have a special Slot to insert the KEY-EDIGI (External Memory Device) that allows one or more programs to be read/saved/copied/run on different EDIGI-R2 digital switches of the same model.

Advantages:

Device dimensions (LxDxH): 35 x 60 x 90 (2 DIN modules)

- Device with daily/weekly programming, guided by menus with the guidelines read on the white backlit display.
- Models with one or two relay control outputs.
- Smart relay piloting that "zero crossing" increases the load values and the duration of the relay as well as the connected load.
- Slot for external memory device to run, load Astro, lux, time programs and download/upload the holiday programs alone.
- Twilight sensor connection input.
- Calendar: year - month - day - hour and minutes.
- Date/time setting with automatic winter/summer time change.
- Multilingual menu: English - German - HRV/SRP/BOS
- Memory capacity: 45 ON/OFF programs that are free to be set.
- Minimum ON/OFF 1-minute time scheduling to a maximum of 1 week less 1 minute.
- Types of programs: Astronomical (ASTRO), Twilight (LUX), Timer (TIME), Holiday (suspension of programs for a preset period of time).
- Twilight operation 0.....1000 LUX.
- Possibility of entering 1 or more «Holiday programs», (suspension of Astro - Lux -Time programs - twilight override in progress) from a minimum of 1 day to a maximum of 12 months.
- Permanent memory for saving programs.
- Possibility of deleting the selected program rapidly.
- Program/s deletion menu.
- Possibility of permanent or temporary manual override (ON/OFF).
- Possibility of twilight override (Total / Partial).
- Scheduled maintenance of the connected loads.
- Hour counter function to monitor the operating hours of the load.
- Warranty menu: view the elapsed time from when the product was connected.
- White backlit display.
- Managing the backlighting of the display: timed at 6 seconds / Fixed ON / Fixed OFF.
- Ecological LITHIUM battery, which can be replaced without removing the device from its seat.
- Charge reserve guaranteed by the lithium battery (replaceable) is about 6 years.
- Key lock.
- Hinged and sealable cover.



EDIGI-R2



EDIGI-SN



EDIGI-KEY

Digital time relay EDIGI-R2

Type	Code No.	Description	Weight [g]	Packaging [pcs]
EDIGI-R2	002470400	Time relay - digital	227	1/30
EDIGI-SN	002470401	Sensor lx	35	1/50
EDIGI-KEY	002470402	Programming key	3	1/100

Current monitoring relay PRI-51



Advantages

- To monitor heating of rods in shunts, heating of cables, to indicate current flowing, to monitor consumption of one-phase electrical loads
- 1-phase, 1-module, DIN rail mounting
- Universal supply voltage AC 24 V - 240 V and DC 24 V
- Output contact: 1 x changeover 8 A/AC1
- Supply is galvanically separated from measured current
- Adjustable delay 0,5 - 10 s to eliminate short current peaks
- Fluent adjusting actuating current via potentiometer, choice of 5 ranges: 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, AC 0.1 - 10 A

Current monitoring relay PRI-51

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
PRI - 51/1	1	002471816	58	1/10
PRI - 51/2	2	002471817	58	1/10
PRI - 51/5	5	002471818	58	1/10
PRI - 51/8	8	002471819	58	1/10
PRI - 51/16	16	002470019	58	1/10
PRI-51/0.1-10	0,1 - 10	002470298	87	1/10

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



Advantages

- Serves to control/monitor supply voltage for appliances sensitive to supply tolerance, protects devices against under/over voltage
- 1-module, DIN rail mounting, 1-phase monitoring
- Supply from monitored voltage (monitors level of its own supply)
- 3-state indication - LEDs indicating normal state and 2 fault states
- Adjustable time delay for all types is 0 - 10 s (to eliminate short voltage drops or peaks) voltage U_{min} adjusted as % of U_{max}
- Time delay and voltage adjusted via potentiometer
- **HRN-33**
 - monitors voltage in range AC 48 - 276 V
 - U_{max} and U_{min} can be monitored independently
- **HRN-34**
 - like HRN-33, but voltage range is DC 6 - 30 V
 - monitoring of battery circuits (12, 24 V)
- **HRN-35**
 - like HRN-33, but independent output relays for each voltage level
 - switching of other loads possible

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

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
HRN-33	16	002470015	73	1/10
HRN-34	16	002471400	73	1/10
HRN-35	16	002471401	85	1/10

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

Advantages

- Serves to monitor voltage , phase failure and sequence in switchboards, protection of devices in 3-phase mains
- 1-module, DIN rail mounting
- It is possible to set upper and lower level of monitoring voltage
- Adjustable time delay eliminates short voltage peaks and failures in the mains
- Faulty state is indicated by red LED and by breaking output relay contact
- Output contact: 1x changeover 8 A /250 V AC1
- If the supply voltage falls below 60 % U_n (U_{off} lower level) the relay immediately breaks with no delay
- **HRN-54** - supply from all phases which means that the relay is functional also in case when one phase is faulty
- **HRN-54N** - supply L1-N, means that relay monitors also failure of neutral wire

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

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
HRN-54	8	002471416	69	1/10
HRN-54N	8	002471412	67	1/10



Frequency and voltage monitoring relay HRN-100

Description:

Multifunction voltage and frequency monitoring relay with LCD display for protection of devices connected to 3 phase network.

Advantages:

- 3-wire or 4-wire connection (with or without neutral).
- Monitoring of upper and lower voltage & frequency in 3-phase circuits, phase sequence, failure and asymmetry incl. neutral fail (only in 4-wire connection).
- The device is supplied from monitored voltage.
- Both output contacts can be set individually.
- Measures real effective value of AC voltage (True RMS).
- Optional response delay of the output contact to the measured fault state or transition from the fault state to the OK state incl. delayed response of output contacts after connecting the power supply.
- Possibility of automatic or manual transition from fault state (memory).
- Optional closing or opening of the output contact when measuring a fault state (Fail Safe / Non Fail Safe).
- Password protection against unauthorized changes to settings.
- Digital backlit display with the possibility of monitoring the current state of the network, incl. possible failures.
- The last five fault states are stored in a history that can be viewed retrospectively.
- Sealable transparent cover for display and controls.

**Frequency and voltage monitoring relay HRN-100**

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
HRN-100	2 x 5 A (AC1)	002470303	132	1

Level switch HRH-5



Advantages:

- Relay is designated for monitoring levels in wells, reservoirs, pools, tanks....
- In one device you can choose the following configurations:
 - one-level switch of conductive liquids (by connecting H and D)
 - two-level switch of conductive liquids
- One-state device monitors one level, two-state device monitors two levels (switches on one level and switches off on another level).
- Choice of function PUMP UP, PUMP DOWN
- Adjustable time delay on the output (0.5 - 10s)
- Sensitivity adjustable by a potentiometer (5-100k Ω)
- Measuring frequency 10Hz prevents polarization of liquid and raising oxidation of measuring probes
- Galvanically separated supply voltage UNI 24.. 240 VAC/DC
- Output contact 1xchangeover 8A/250V AC1
- 1-module type, mounting onto a DIN rail

Level switch HRH-5

Type	Code No.	Weight [g]	Packaging [pcs]
HRH-5	002471715	72	1/8

Level switch HRH-8

Relay is designed to control the level of conductive liquids in wells, tanks, pools, tankers, reservoirs... (replacement for HRH-1)

- Galvanically isolated supply and guard circuits
- Within one device, the following configurations can be selected:
 - 2x one-level monitoring (in separate tanks)
 - 1x two-level monitoring (in one tank)
 - Pumping from one tank to another
- DIP switch selection on the front panel (8 functions)
- Adjustable probe sensitivity (for each probe separately)
- Adjustable relay switching delay (for each probe separately)
- 10Hz watch frequency prevents polarization of the liquid and increases resistance to interference by network frequency
- 2x output relay (with changeover contact 16A / 250V AC1)
- 3-MODULE design, mounting DIN rail mounting



HRH-8

Level switch HRH-8

Type	Code No.	Weight [g]	Packaging [pcs]
HRH-8 230 V AC	002470293	276	1
HRH-8 24V AC/DC	002470294	176	1

Sensors HRH

Sensors HRH

Type	Code No.	Description	Weight [g]	Packaging [pcs]
Sensor SHR-1-M	002471205	Brass sensor without cable, max. wire profile 2,5mm ² , op. temp. (-25 to...+60°C)	9,7	1
Sensor SHR-1-N	002471709	Stainless steel sensor without cable, max. wire profile 2,5mm ² , op. temp. (-25 to...+60°C)	9,7	1
Sensor SHR-2	002471203	Stainless steel sensor without cable, max. wire profile 2,5mm ² - IP68, op. temp. (+1...+80°C)	48,6	1
Sensor SHR-3	002471230	Stainless steel sensor with 3m cable PVSC 2x0,75mm ² - IP67, op. temp. (< 95°C)	239	1
Sensor HRH-10	002471703	Sensor with 10m cable	30	1
Sensor HRH-15	002471704	Sensor with 15m cable	35	1
Sensor HRH-20	002471705	Sensor with 20m cable	40	1
Sensor HRH-30	002471706	Sensor with 30m cable	48	1
Sensor HRH-40	002471707	Sensor with 40m cable	62	1

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



Advantages

- 1-module, DIN rail mounting
- Red LED indicates status of output, green LED indicates energization of the device
- Single thermostat for temperature monitoring and regulation in range of -30.. +70 °C in six ranges
- Can be used for monitoring temperature e.g. in switchboards, heating systems, cooling systems, liquids, radiators, motors, devices, open spaces etc.
- Function of short-circuit or sensor disconnection monitoring
- Possibility to set function "heating" / "cooling" (setting is done by DIP switch)
- Adjustable hysteresis (sensitivity) , switching by potentiometer in range 0.5 -5 K
- Universal supply AC/DC 24V -240 V, not galvanically separated
- Output contact: 1x NO 16 A /250 V AC1
- It is possible to place the sensor directly on terminal block – for temperature monitoring in a switchboard or in its surroundings
- Choice of external thermo sensors with double insulation in standard lengths 3, 6 and 12 m



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

Type	temp. range or sensor length	Code No.	Weight [g]	Packaging [pcs]
TER-3A	-30...+10 °C	002471801	73	1/10
TER-3B	0...+40 °C	002471813	73	1/10
TER-3C	+30...+70 °C	002471802	73	1/10

*Note: Order sensor TZ from the table below

Multifunction digital thermostat TER-9

Advantages

- Digital thermostat with 6 functions and in-built time switch clock, with daily and weekly program (as SHT-1). Thermo functions can be managed also in real time
- Complex control of heating and water heating in buildings, solar heating etc
- 2 thermostats in one, 2 temperature inputs, 2 outputs with potential free contact
- Functions: two independent thermostats, 1x dependent, differential thermostat, 2-stage thermostat, thermostat with dead zone, heating functions
- Program setting of output function, calibration of sensors according to reference temperature (off set)
- Thermostat is inferior to a program of digital switch clock
- 2 -module, DIN rail mounting
- Supply AC 230 V or AC/DC 24 V galvanically separated
- Output contact 1x changeover 8 A / 250 V AC1 for each output
- Memory for the most often used temperatures
- Well-arranged display of set and measured data, illuminated LCD by backlight
- Zero error when value setting
- Function of monitoring short-circuits or sensor disconnection

Control equipment ETIREL

Multifunction digital thermostat TER-9

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
TER-9 24V AC/DC	8	002471803	140	1
TER-9 230V AC	8	002471824	140	1

*Note: Order sensor TZ from the table below

Thermal sensors TZ

Type	length of sensor cable [A]	Code No.	Weight [g]	Packaging [pcs]
sensor TZ-0	0,11 m.	002471809	4,5	1
sensor TZ-3	3m.	002471810	103	1
sensor TZ-6	6m.	002471811	216	1
sensor TZ-12	12 m.	002471812	418	1



Thermostat for monitoring temperature of motor winding TER-7

Advantage:

- Monitors temperature of motor winding of motors with built in PTC sensor
- Fixed levels of switching
- MEMORY function - active by DIP switch
- RESET of faulty state:
 - button on the front panel
 - by external contact (remote by two wires)
- Function of short-circuit or sensor disconnection monitoring, red LED flashing indicates faulty sensor
- Output contact: 2x changeover 8 A /250 V AC1
- Red LED shines and indicates exceeded temperature
- Multivoltage supply AC/DC 24-240 V (UNI)
- 1-module, DIN rail assembly possible

Thermostat relay TER-7

Type	Code No.	Weight [g]	Packaging [pcs]
TER-7	002471804	65	1/10



Hour meter HM-1



Applications

- Gen-sets
- Compressors
- Pumps
- Medical equipment
- Control panels
- Air conditioning

Advantages

- 2-module size
- DIN rail mounting
- Long lifetime
- IP40 protection – front
- Operating voltage 230V AC

Hour meter HM1

Type	Supply voltage [U _e AC]	Code No.	Weight [g]	Packaging [pcs]
HM-1	230	002472045	35	1

Electronic fuse monitor EFM



- Recognize fuse failure in three-phase or mono-phase system
- Can be used for all sizes and types of fuses
- Signals operation even if loads are switched off
- Automatic reset after replacing the fuse
- Working properly even if:
 - Asymmetrical mains
 - Independence of phase sequence
 - Mains with harmonic waves
 - Motors providing feedback
- Internal resistance > 2000 Ω/v
- Output relay 1 pole changeover contact
- Size 2 modules - 35mm - DIN rail mounting EN50.022
- Self-extinguished material UL94 v0
- Typical application: fuses monitoring on 3-ph motor mains
- EU directives - CE marking:
 - 2014/30/UE - EMC
 - 2014/35/UE - LVD

Electronic fuse monitor EFM

Type	In [A]	Un [V AC]	Code No.	Description	Weight [g]	Packaging [pcs]
EFM230	8	230	002472213	Fuse Monitor 3X230 volts - 1 RelayCO 250VAC 8A	175	1
EFM400	8	400	002472214	Fuse Monitor 3X400 volts - 1 RelayCO 250VAC 8A	175	1

Electromechanical Relays

Electromechanical power relays RERM3

Application

Electromechanical relays RERM are designed for switching, control and signaling of auxiliary and power circuits.

Features

- 3 changeover contacts;
- Control voltages AC 24V, AC 230V;
- Test button without blocking
- Base for relay RERB3-S (DIN rail mounting TH-35);
- Accessories: (metal bracket-holder RER-CLIP-SP);

Electromagnetic Plugin Relays with Mechanical Indication Test Button

Type	Code	Ucrated coil voltage [V]	Indication	No. Of contacts	Weight [g]	Packaging [pcs]
RERM3-230AC	002473060	230 V AC	-	3 x CO In=16A AC1, 250V AC)	80	1/100
RERM3-230ACL	002473061	230 V AC	LED		80	1/100
RERM3-024AC	002473062	24 V AC	-		80	1/100
RERM3-024ACL	002473063	24 V AC	LED		80	1/100

- Screw terminals (max torque 0.7 Nm);

Plug-in Sockets (Base)

Type	Code	For use with	Single product weight [g]	Packaging [pcs]
RERB3-S	002473064	RERM3	70	1/250

Accessories

Type	Code	For use with	Single product weight [g]	Packaging [pcs]
RER-CLIP-SP	002473065	RERB3-S	-	1/1000



RERM3-230AC



RERB3-S



RER-CLIP-SP

Industrial Plugin Electromagnetic Relays

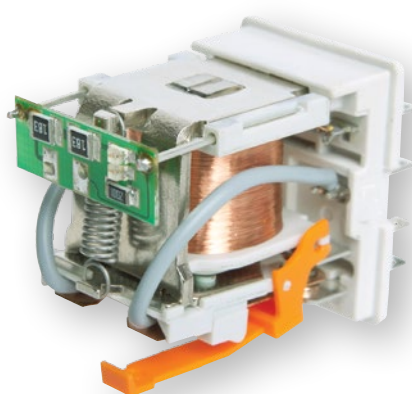
Description

Relays of general application - the new relays are distinguished by a modern design, high reliability and functionality. Modern technology ensures high quality and effectiveness

- ERM2 (2 pole CO »change over contact«) and ERM4 (4 pole CO »change over contact«)
- AC and DC coils (12, 24V), 230V AC only
- Two types of plug-in sockets (M type and T type)
- Accessories (connection terminals, retainer/retractor clips, description plates, RC modules...)
- Colour: grey

Features

- Mechanical indicator with lockable test button as a standard version
- Optional: Light indication (with built in smd LED)
- Mounting on panel or 35 mm rail in accordance with EN60715
- Improved electromagnet efficiency
- Strong insulation between contacts (applied polyamide PA66)
- Cadmium - free contacts



Robust design

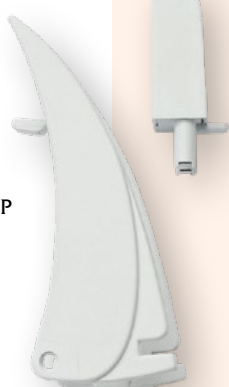
Test buttons

green - DC coils



orange - AC coils

Protecting module ERC



Retainer / retractor clip - ER-CLIP



Electromagnetic relay ERM

Screw terminals plug-in socket ERB



Description plate ER-PLATE

* All parts must be ordered separately

Electromechanical Relays

Electromagnetic Plugin Relays with Mechanical Indication and Lockable Test Button

Type	Code	Uc rated coil voltage [V]	No. Of contacts	Weight [g]	Packaging [pcs]
ERM4-012DCL	002473021	12 V DC	4 x CO (6A, AC1)	33	10/100
ERM2-024DC	002473000	24 V DC	2 x CO (12A, AC1)	33	10/100
ERM2-024DCL	002473001	24 V DC	2 x CO (12A, AC1)	33	10/100
ERM2-024AC	002473002	24 V AC	2 x CO (12A, AC1)	33	10/100
ERM2-024ACL	002473003	24 V AC	2 x CO (12A, AC1)	33	10/100
ERM2-230AC	002473004	230 V AC	2 x CO (12A, AC1)	33	10/100
ERM2-230ACL	002473005	230 V AC	2 x CO (12A, AC1)	33	10/100
ERM4-024DC	002473006	24 V DC	4x CO (6A, AC1)	33	10/100
ERM4-024DCL	002473007	24 V DC	4x CO (6A, AC1)	33	10/100
ERM4-024AC	002473008	24 V AC	4x CO (6A, AC1)	33	10/100
ERM4-024ACL	002473009	24 V AC	4x CO (6A, AC1)	33	10/100
ERM4-230AC	002473010	230 V AC	4x CO (6A, AC1)	33	10/100
ERM4-230ACL	002473011	230 V AC	4x CO (6A, AC1)	33	10/100

*L - built in LED light indicator (red)

Other coil (control) voltages available upon special request:

V DC: 5, 6, 48, 60, 80, 110, 220

V AC: 6, 12, 42, 48, 60, 80, 110, 115, 120, 127, 220, 240

Ordering designation

ERMX-YYYYYZ

X - Number of contacts:

4: 4 CO (4 changeover)

2: 2 CO (2 changeover)

YYYYY - 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.

Plug-in Sockets (Base)

Type	Code	For use with	Single product weight [g]	Packaging [pcs]
ERB2-T	002473012	ERM2	60	10/100
ERB2-M	002473013	ERM2	71	10/80
ERB4-T	002473014	ERM4	60	10/100
ERB4-M	002473015	ERM4	71	10/80

T - T type

M - M type



ERB2-T, ERB4-T



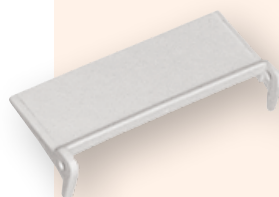
ERB2-M, ERB4-M

Accessories

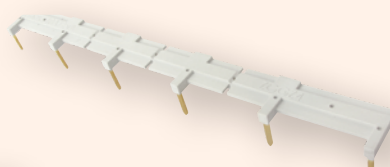
Type	Code	For use with	Single product weight [g]	Packaging [pcs]
ER-CLIP	002473016	ERB-T & ERB-M	4,5	10/300
ER-PLATE	002473017	ERB-T & ERB-M	0,5	10/400
ER-TERMINAL	002473018	ERB-T & ERB-M	1,3	2/20
ERC-024AC	002473019	ERB-T & ERB-M $U_c \leq 24V$ AC	2,6	20/100
ERC-230AC	002473020	ERB-T & ERB-M $U_c \leq 230V$ AC	2,6	20/100
ERC-024ACDCL	002473040	ERB-T & ERB-M $U_c = 6 \dots 24V$ AC/DC	2,9	20/100
ERC-060ACDCL	002473041	ERB-T & ERB-M $U_c = 24 \dots 60V$ AC/DC	2,9	20/100
ERC-230ACDCL	002473042	ERB-T & ERB-M $U_c = 110 \dots 230V$ AC/DC	2,9	20/100



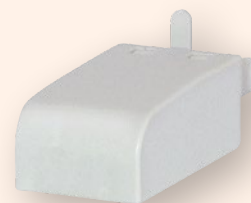
ER-CLIP
Mechanical lock of relay in socket



ER-PLATE
description



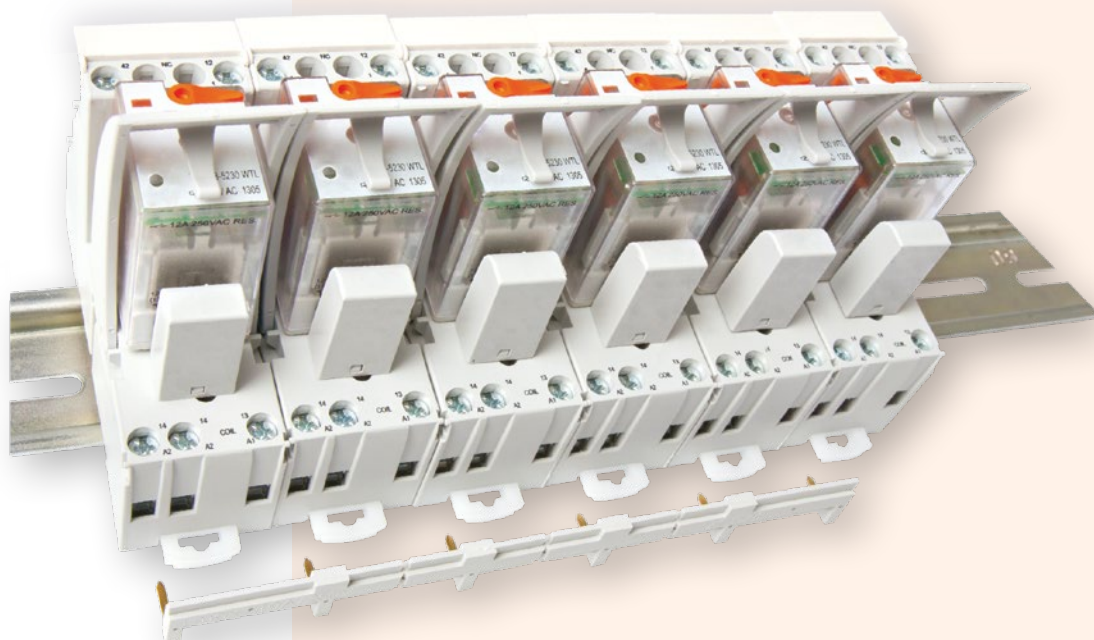
ER-TERMINAL
bridges common input signals (coil terminals
A1 or A2) up to 6 relays



ERC
protection module



ERC-(024...230)ACDCL
MOV protection module with indication AC and DC.



Miniature Electromagnetic Relays

Description

Electromechanical relay with 2x CO contacts in miniature housing. Can be used in PCB or with plug-in sockets.

- MER2 (2 pole CO »change over contact«, 2x8A AC1)
- Wide range of control voltages (AC coils: 24V and 230V, DC coils: 5V, 12V, 24V)
- Two types of plugin sockets (M type and T type)
- Accessories (retainer/retractor clips, RC modules...)
- Color: Grey

Features

- Cadmium - free contacts; height 15,7 mm
- 5000V / 10 mm reinforced insulation
- For PCB and plug-in sockets
- AC and DC coils
- Compliance with standard EN 60335-1
- RoHS



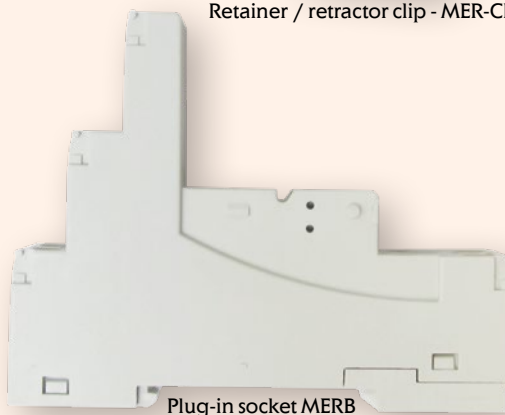
Miniature electromechanical relay MER



Retainer / retractor clip - MER-CLIP-PL



Description plate MER-PLATE

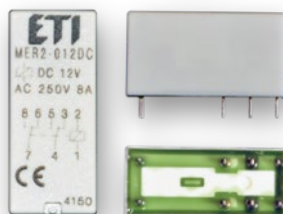


Plug-in socket MERB



Protecting module ERC

* All parts must be ordered separately

**Miniature electromagnetic relays**

Type	Code	Rated coil voltage [V]	No. Of contacts	Weight [g]	Packaging [pcs]
MER2-005DC	002473030	5 V DC	2xCO (8A, AC1)	13	20/1000
MER2-012DC	002473031	12 V DC			
MER2-024DC	002473032	24 V DC			
MER2-024AC	002473033	24 V AC			
MER2-230AC	002473034	230 V AC			

By parallel connection of relay main circuit (joining 2 CO contacts), the nominal current of output is increased to 16A.

Other coil (control) voltages available upon special request:

V DC: 3, 6, 9, 18, 36, 48, 60, 110

V AC: 12, 48, 60, 110, 115, 120, 220, 240

Ordering designation

MER2-YYYY

X – Number of contacts:
2: 2 CO (2 changeover)

YYYY – Coil code:
024AC: 24 V AC 50/60 Hz
230AC: 230 V AC 50/60 Hz
005DC: 5 V DC
012DC: 12 V DC
024DC: 24 V DC

Example:

MER2-024DC

Miniature electromagnetic relay, two changeover contacts, coil voltage 24 V DC.

Plug-in Sockets (Base)

Type	Code	For use with	Single product weight [g]	Packaging [pcs]
MERB-T	002473035	MER2	44	10/100
MERB-M	002473036			10/80

T - T type

M - M type

Electromechanical Relays

Accessories

Type	Code	For use with	Single product weight [g]	Packaging [pcs]
MER-CLIP-SP	002473037	MERB-T & MERB-M	0,3	25/400
MER-CLIP-PL	002473038			
MER-PLATE	002473039		0,34	10/700
ERC-024AC	002473019	MER2-024AC	2,6	10/200
ERC-230AC	002473020	MER2-230AC		
ERC-024ACDCL	002473040	MERB-T & MERB-M $U_c = 6 \dots 24 \text{ V AC/DC}$	2,9	20/100
ERC-060ACDCL	002473041	MERB-T & MERB-M $U_c = 24 \dots 60 \text{ V AC/DC}$	2,9	20/100
ERC-230ACDCL	002473042	MERB-T & MERB-M $U_c = 110 \dots 230 \text{ V AC/DC}$	2,9	20/100
MER-TERMINAL	002473048	MERB-T, MERB-M	6	20/200

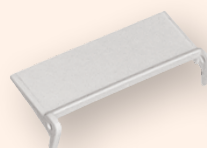


MER-CLIP-PL

Mechanical lock of relay in socket, two types
Standard plastic MS and spring wire type



MER-CLIP-SP

MER-PLATE
description

ERC-(024...230)ACDCL

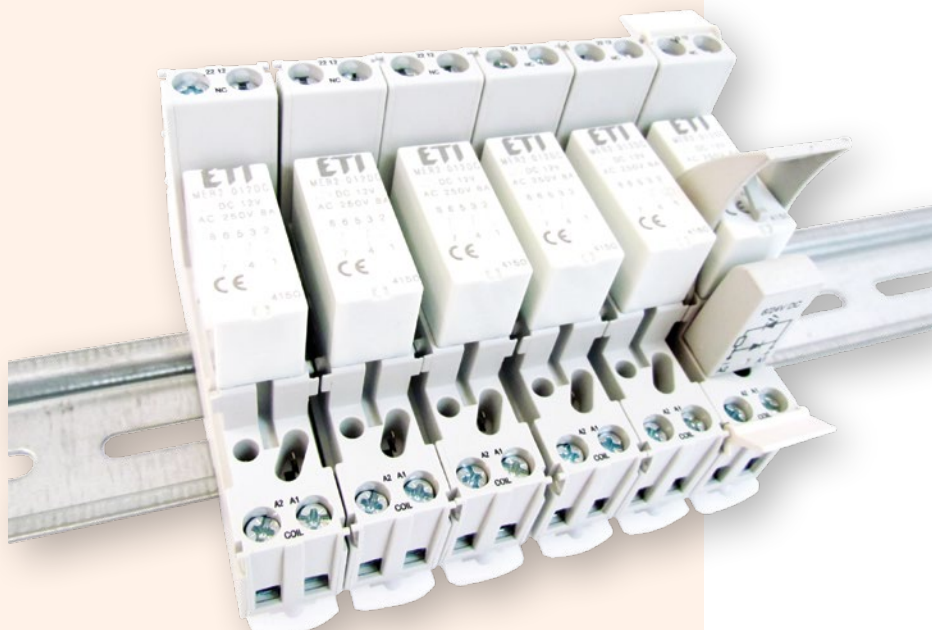
MOV protection module with indication AC and DC.
*More data about ERC module can be found on page 204.

ERC
protection module
RC filter

*More data about ERC module can be found on page 204.



MER-TERMINAL



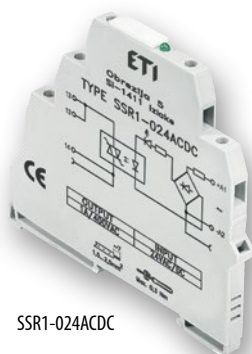
SLIM RELAYS SSR & SER, Electromagnetic and solid

Advantages:

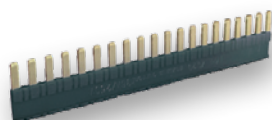
- Width 6,2 mm;
- Interface relay SER1 - with 1 CO contact output;
- 35 mm rail mount acc. to PN-EN 60715;
- May be linked with interconnection strip type
- SR-TERMINAL;
- Equipped in LED green;



SER1-024ACDC



SSR1-024ACDC



SR-TERMINAL

Mounting

Relays are designed for direct mounting on 35 mm rail mount acc. to PN-EN 60715. Connections: max. cross section of the cables: 1 x 2,5 mm² / 2 x 1,5 mm² (1 x 14 / 2 x 16 AWG), length of the cable deinsulation: 8 mm, max. tightening moment for the terminal: 0,3 Nm. Relays may be linked with interconnection strip type SR-TERMINAL bridges common input or output signals, maximum permissible current is 36 A / 250 V AC.

Electromagnetic relays

Type	Code	Uc rated coil voltage [V]	No. Of contacts	I _n [A]	Weight [g]	Packaging [pcs]
SER1-024ACDC	002473052	24 V AC/DC	1xCO	AC1: 6 A / 250 V DC1: 6A/24V; 0,15A/250 V	40	10/100
SER1-230ACDC	002473053	230 V AC/DC				

Solid state relay (triac output)

Type	Code	Uc rated coil voltage [V]	No. Of contacts	I _n [A]	Weight [g]	Packaging [pcs]
SSR1-024ACDC	002473050	24 V AC/DC	1xNO	AC1: 1,2 A/400V	40	10/100
SSR1-230ACDC	002473051	230 V AC/DC				

Accessories

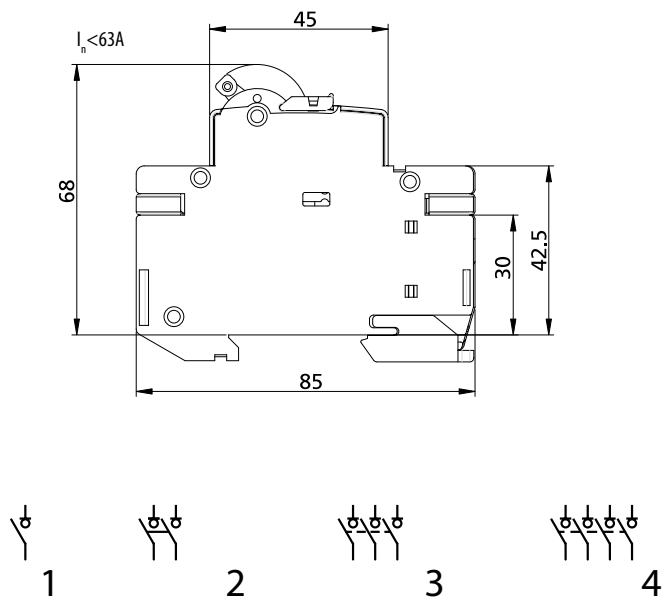
Type	Code	Colour	Description	Weight [g]	Packaging [pcs]
SR-TERMINAL	002473054	black	max 36A (250VAC) or Max permissible current	12,3	10/100



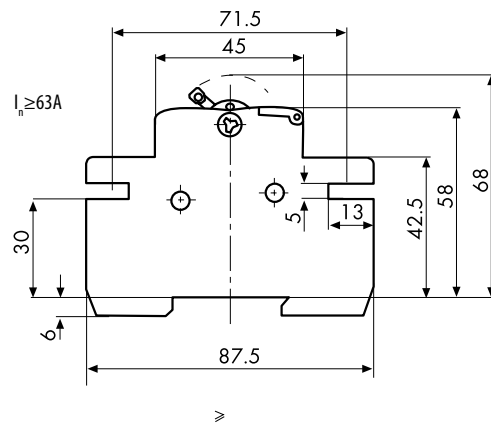
SR-TERMINAL: bridging of common input or output signals

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

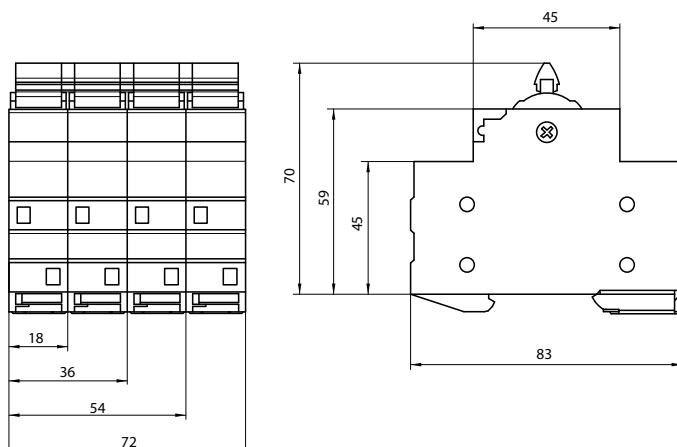
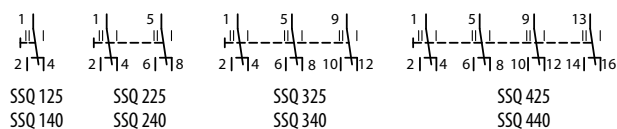


Technical data

Build-in devices "EVESYS"

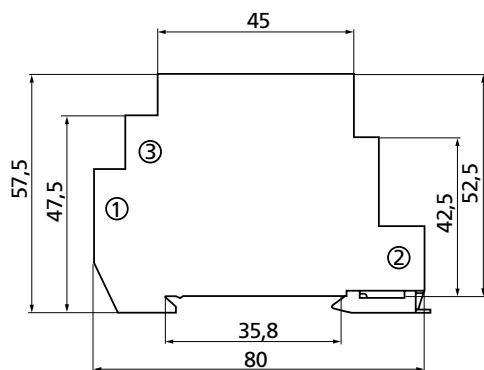
Technical data

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

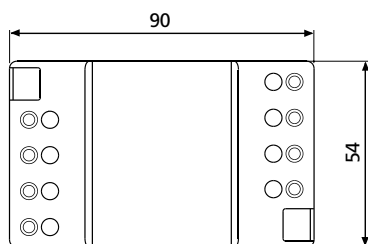
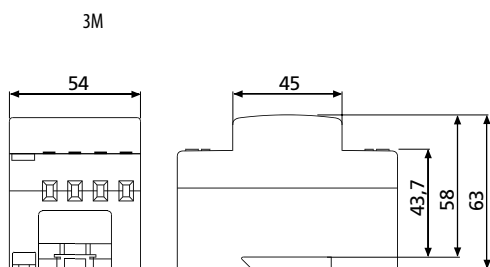


Technical data

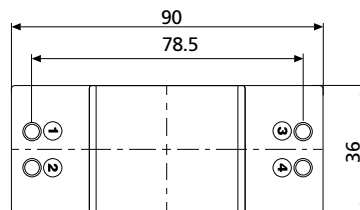
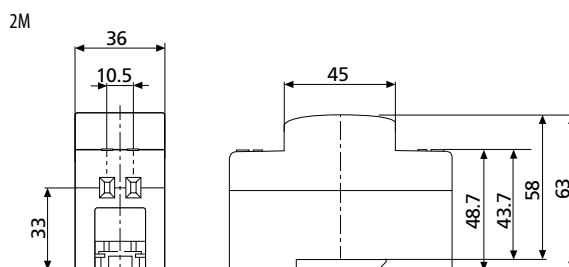
	SON H-1R	SON H-1G	SON H-1Y	SON H-1B	SON H-3R	SON H-3K	SON H-3G
Rated voltage U _n	240V AC				3x240V AC		
Voltage tolerance	-25%...+10%						
Rated frequency f _n	50/60Hz						
Power consumption	0,267W (240V AC)				1,04W (240V AC)		
Diode colour	1 red	1 green	1 yellow	1 blue	3 red	1 red, 1 yellow, 1 green	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						



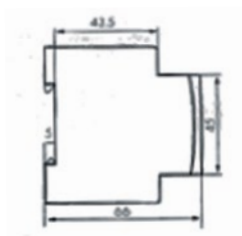
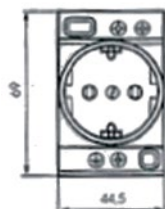
Bell/Buzzer



Bell transformer type 3M



Bell transformer type 2M



DIN socket

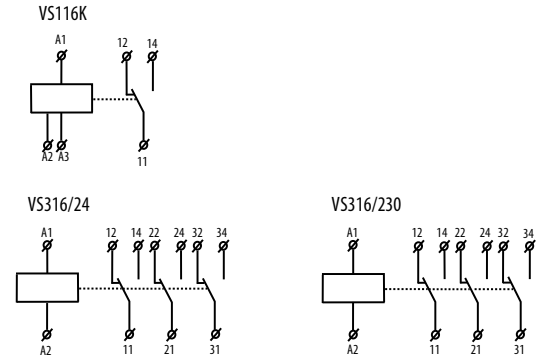
Technical data

Power relays VS116K, VS316K

Technical data

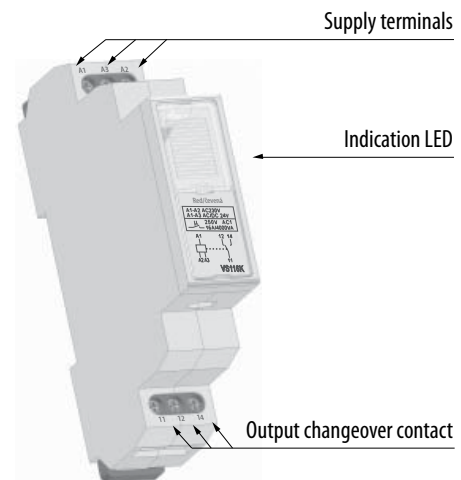
	VS116K	VS316/24	VS316/230
Supply terminals	A1 - A2		
Voltage range	230 V AC/50-60 Hz	24 V AC/DC/50-60 Hz	230 V AC/50-60 Hz
Burden	AC max. 7.5 VA/ 1W	1.6 VA/ 1.2 W	2.5 VA
Supply terminals	A1-A3	x	
Voltage range	24 V AC/DC (50-60 Hz)	x	
Burden	1 VA AC/ 1W DC	x	
Supply voltage tolerance	-15%; +10%		
Output			
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	3x10 ⁷	1x10 ⁷	
Electrical life (AC1)	0.7x10 ⁵	1x10 ⁵	
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



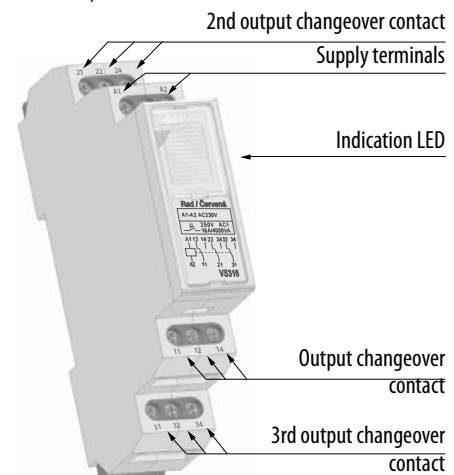
Description

VS116K



terminal A3 only for VS116K

VS316/24, VS316/230



Notes

Max. time of changeover of contact is 10ms.
VS316/24 and VS316/230 enable switching of different phases or 3 phase voltage.

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)

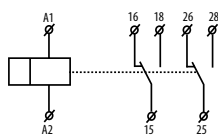
Output

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

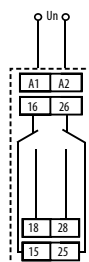
Other information

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

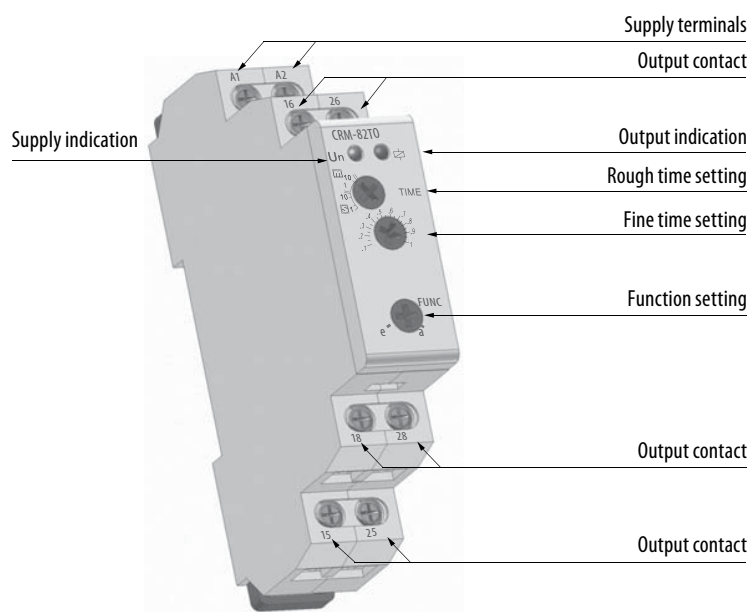
Symbol



Connection



Description



Function

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



e - ON Delay



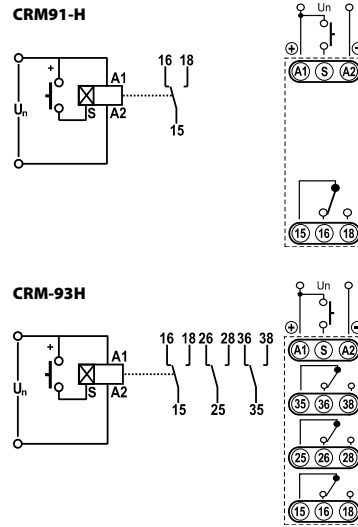
Technical data

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

Technical data

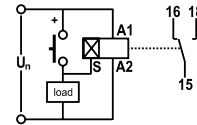
	CRM-91H	CRM-93H
Number of functions	10	
Supply	A1-A2	
Supply voltage	12-240 V AC/DC(50-60 Hz AC)	
Consumption	AC 0,7-3 VA / DC 0,5 - 1,7 W	
Supply indication	green LED	
Time ranges	0.1 s-10 days	
Time settings	rotary switch	
Time deviation	5%-mechanical setting	
Repeat accuracy	0,2%-set value stability	
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

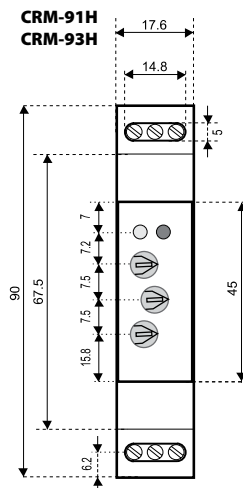


Load with control input possible.

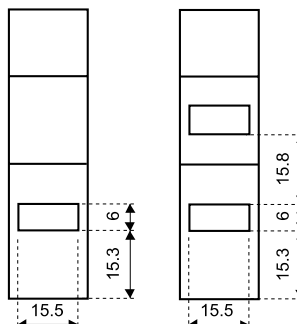
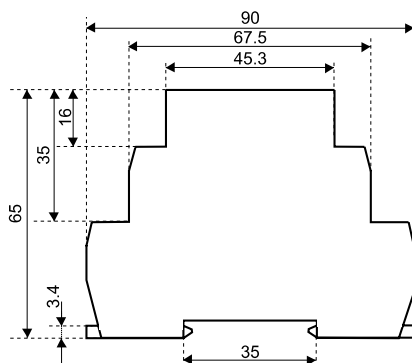
Load between S-A2 possible to connect in parallel way, without disturbing of proper operation of the relay.



Dimensions

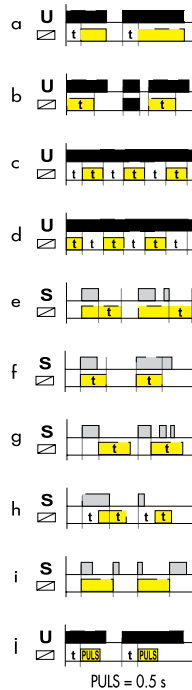


1-module design

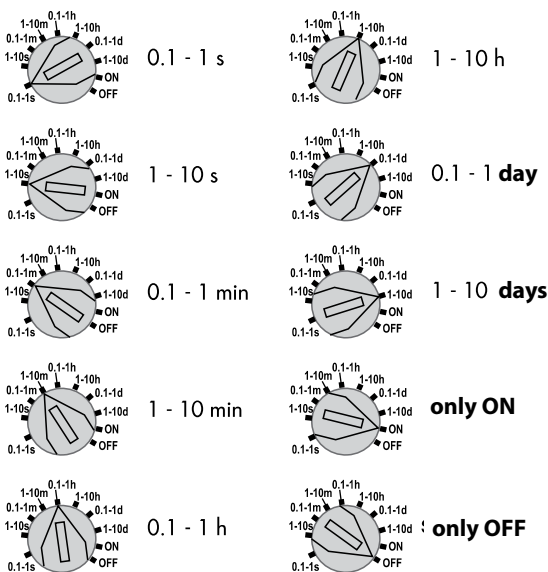


Functions

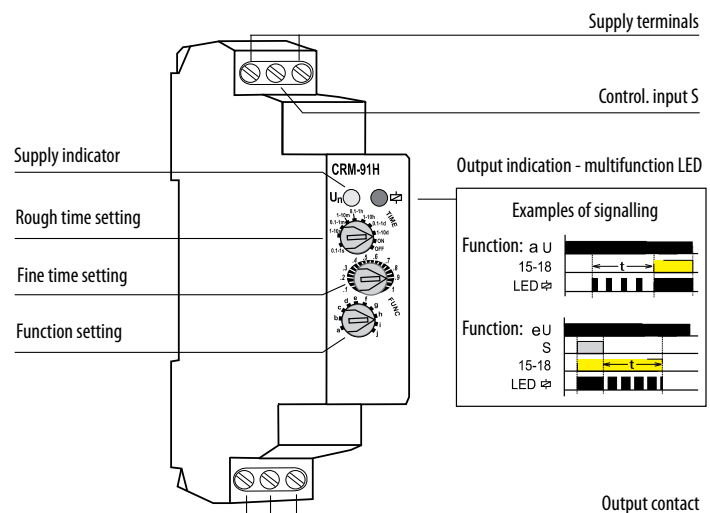
- a) Delay ON after energisation
- b) Delay OFF after energisation
- c) Cycler beginning with pause after energisation
- d) Cycler beginning with impulse after energisation
- e) Delay OFF after de-energisation, instant make of output
- f) Delay OFF responding to make of control contact regardless its 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



Time relay CRM-2H

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

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

The figure consists of two Gantt charts, labeled (a) and (b), illustrating the scheduling of tasks T_1 and T_2 on two processors, U and S . The horizontal axis represents time, and the vertical axis represents the processors.

(a) In this schedule, processor U is idle (white) at the beginning and end, and busy (black) in the middle. Processor S is busy (gray) throughout the entire duration. The tasks are scheduled as follows: T_1 (yellow) is scheduled on U in three blocks, and T_2 (light gray) is scheduled on U in two blocks. On S , T_2 is scheduled in two blocks, and T_1 is scheduled in three blocks.

(b) In this schedule, processor U is idle (white) at the beginning and end, and busy (black) in the middle. Processor S is busy (gray) throughout the entire duration. The tasks are scheduled as follows: T_2 (light gray) is scheduled on U in two blocks, and T_1 (yellow) is scheduled on U in one block. On S , T_2 is scheduled in three blocks, and T_1 is scheduled in two blocks.

The diagram illustrates the CPM-2H timer unit with the following components and connections:

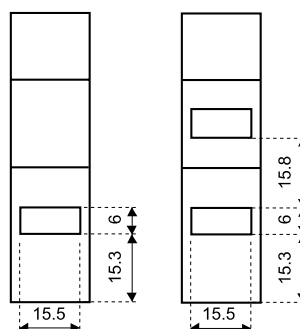
- Supply indication:** Points to the top terminal block.
- Terminal for function selection:** Points to the top terminal block.
- Rough time setting-PULSE:** Points to the 'Un' (green) button.
- Fine time setting-PULSE:** Points to the 'LED' (red) button.
- Rough time setting-PAUSE:** Points to the 'TIME 1' and 'TIME 2' rotary switches.
- Fine time setting-PAUSE:** Points to the 'LED' button.
- Output indication:** Points to the output terminal block on the right.
- Output contact:** Points to the bottom terminal block.

The timer unit features two rotary switches for 'TIME 1' and 'TIME 2', each with a scale from 1 to 99.9. The 'LED' button is used for fine time setting, and the 'Un' button is used for rough time setting. The output terminal block is labeled '0', '11', '12', and 'LED'.

Figure 1 consists of ten circular diagrams arranged in two rows of five. Each diagram represents a different time scale, with the time scale indicated below the diagram. Each diagram has a central cross and ten segments around the perimeter, labeled with letters and numbers: m, h, d, S, 1, 10, 30, 100. The segments are shaded to represent their relative importance for the given time scale. The time scales are: 0.1 - 1 s, 1 - 10 s, 0.1 - 1 min, 1 - 10 min, 0.1 - 1 h, 1 - 10 h, 0.1 - 1 day, 1 - 10 days, 3 - 30 days, and 10 - 100 days.

Technical drawing of a mechanical part with the following dimensions:

- Overall width: 90
- Inner width (top): 67.5
- Inner width (middle): 45.3
- Overall height: 65
- Top flange height: 16
- Inner height (top): 35
- Inner height (middle): 3.4
- Bottom flange width: 35



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

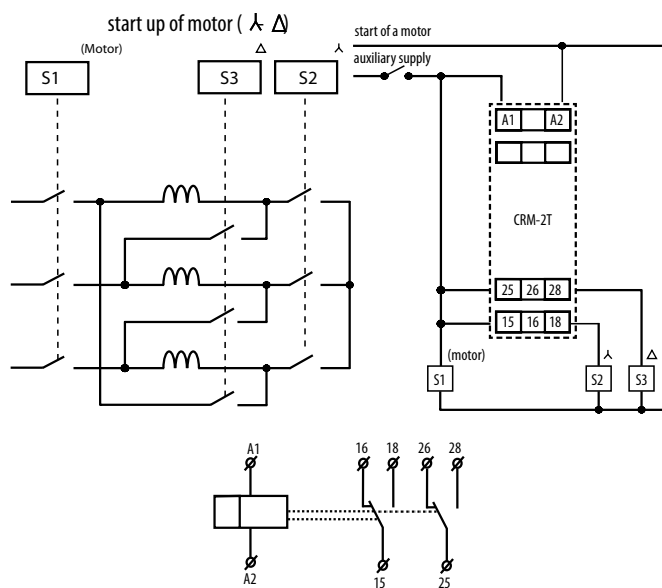
Output

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

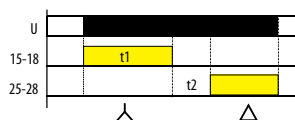
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from front panel
Overvoltage category	III
Pollution degree	2
Max. cable size	2.5 mm ²
Dimensions	90 x 17,6 x 64 mm
Standards	EN 61812-1,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

Connection

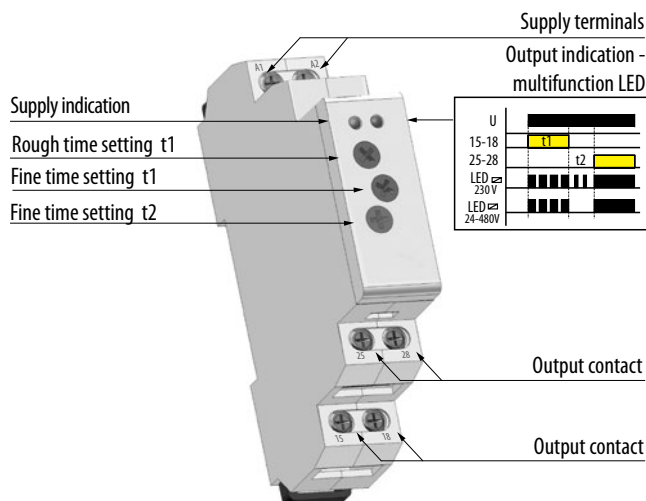


Functions

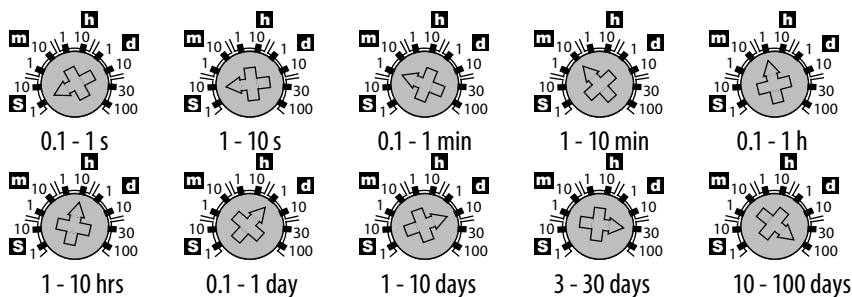
Delay ON star/delta



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

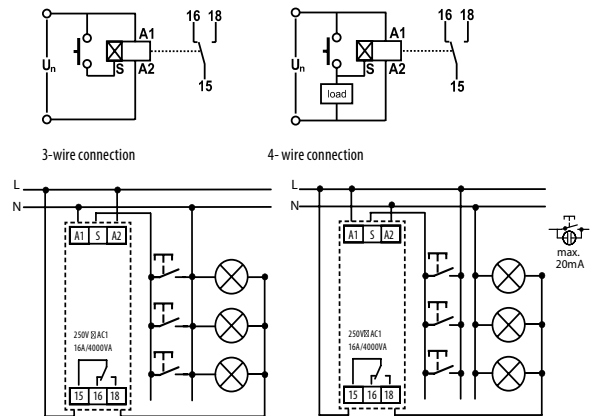
Output

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

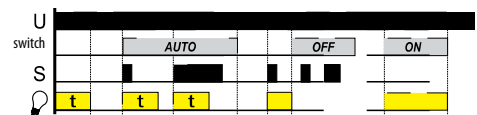
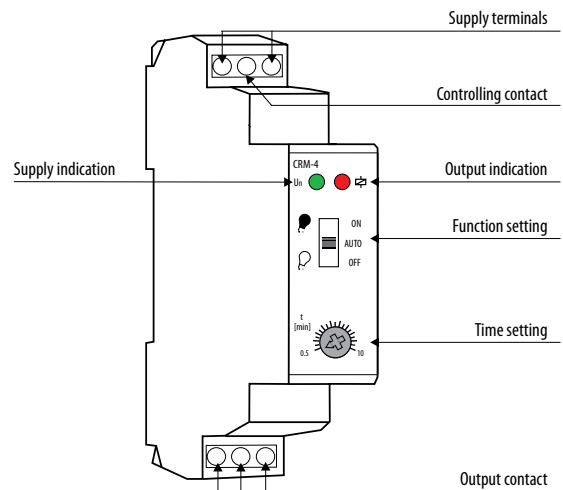
Controlling

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

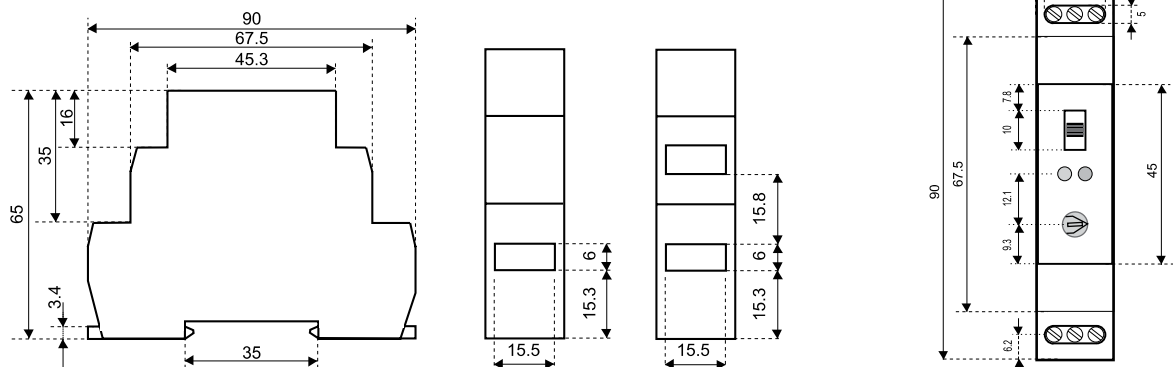


Description



Dimensions

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

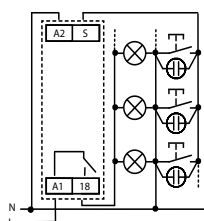
Control

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

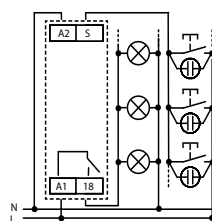
* For higher loads and frequent switching, it is recommended to strengthen the relay contact with a power contactor.

Connection

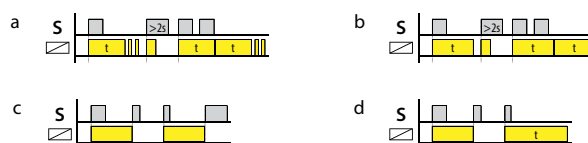
3-wire connection



4-wire connection



Functions



When switching between functions, the red LED flashes.

a - STAIRCASE SWITCH, programmable with signalization

The device times 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 time 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).

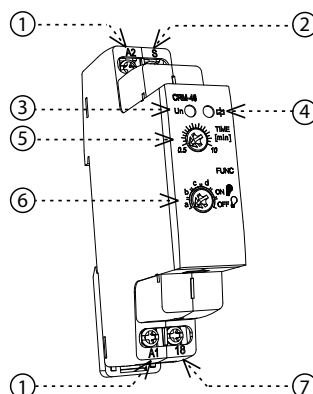
c - MEMORY LATCH (press to switch on, press to switch off)

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	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) 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 V AC/50 - 60 Hz
Consumption	max. 14 VA AC / 2 W
Supply voltage tolerance	-15%; +10%
Back-up supply	✓
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/day / 23°C
Minimum interval	1 s
Data stored for	min. 10 years

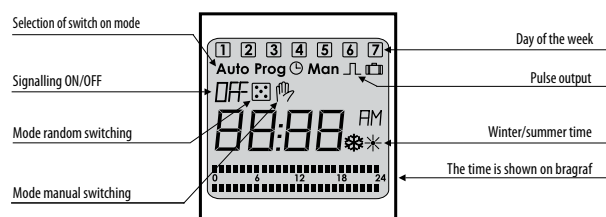
Program circuit

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

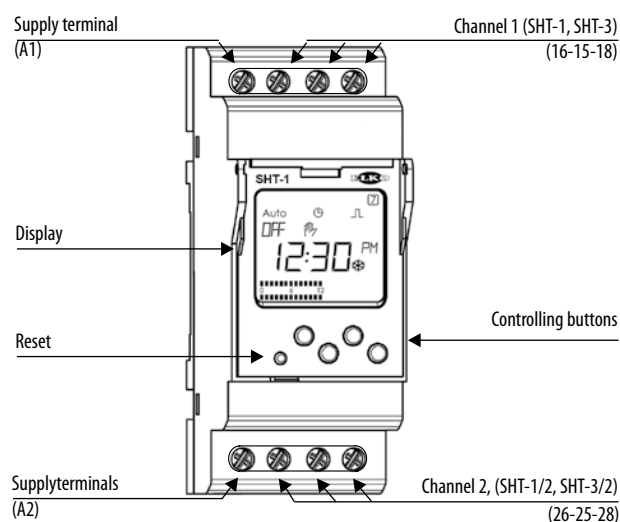
Other information

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

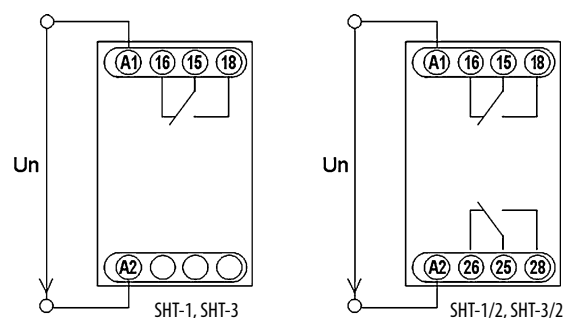
Controlling elements



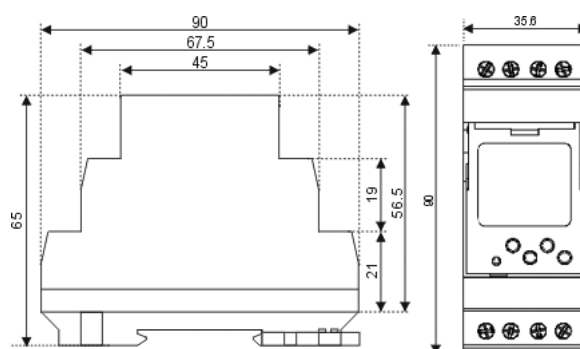
Description



Connection



Dimensions



Digital time switch SHT-4

Technical data

Supply terminals	A1-A2
Supply voltage	AC 230 V (50/60 Hz)
Input power	AC max. 14 VA / 2 W
Max. dissipated power (Un + terminals)	5 W
Supply voltage tolerance	-15%; +10%
Real time back-up	✓
Backup battery type	CR 2032 (3V)
Summer/winter time	automatic

Output

Number of contacts	2x CO SPDT (AgSnO ₂)
Rated current	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
Mechanical life	>3x10 ⁷
Electrical life (AC1)	>0,7x10 ⁵

Time circuit

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

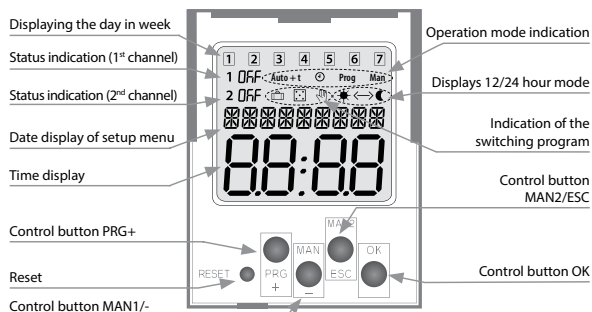
Program circuit

Number of memory locations	100
Program	daily, yearly
Data readout	LCD display, backlight

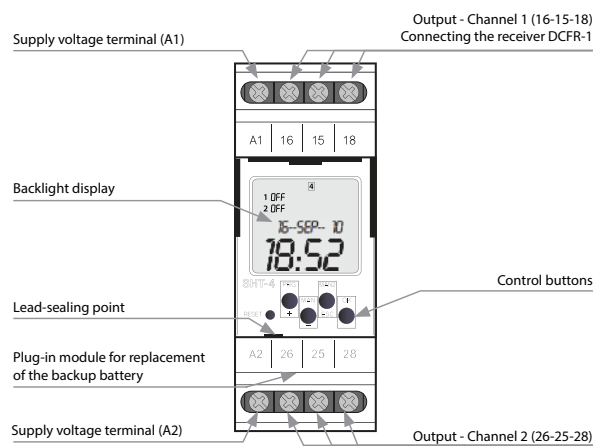
Other information

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	IP10 terminals, IP40 from front panel
Overvoltage category	III
Pollution degree	2
Max. cable size	max. 2x 2,5 mm ² , max. 1x 4 mm ² , with sleeve max. 1x 2,5 mm ² , max. 2x 1,5 mm ²
Dimensions	90 x 35 x 64 mm
Standards	EN 61812-1

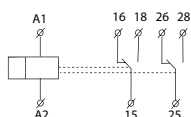
Controlling elements



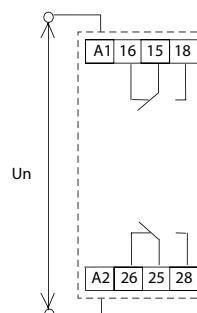
Description



Symbol



Connection



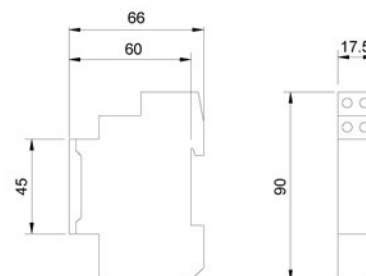
Technical data

Analog electromechanical time switch APC-D1, APC-DR1

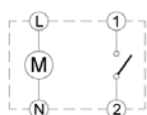
Technical data

	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

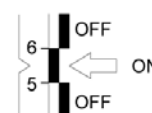
Dimensions



Connection



Programming

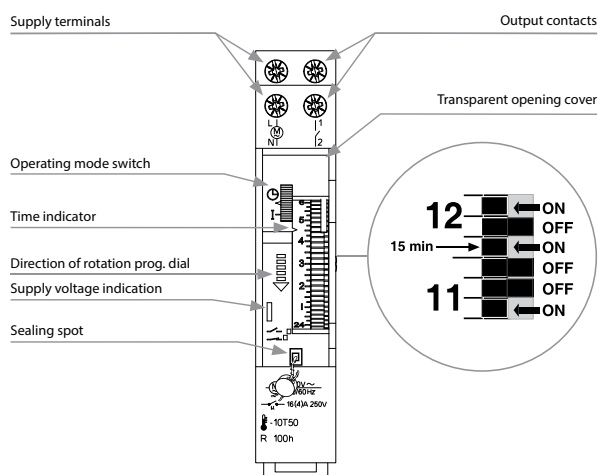


Analog electromechanical time switch ATS-1DR 230

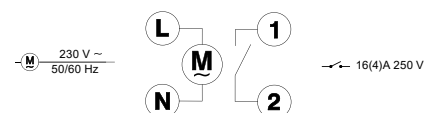
Technical data

Supply terminals	L, N
Supply voltage	AC 230 V (50/60 Hz)
Power consumption (max.)	1W (1.5 VA)
Supply voltage tolerance	-10%, +10%
Output	
Number of contacts	1x NO (AgNi)
Rated current	16 A / AC1
Breaking capacity	3500VA/AC1
Switching voltage	250V AC
Mechanical life	>1x10 ⁶
Electrical life (AC1)	>5x10 ⁴
Time circuit	
Program	daily
Number of switching segments	96
Minimum interval	15 min
Operating accuracy	+/- 1s / day
Power reserve	max. 100 hours
Other information	
Operating temperature	-10...+50°C
Storage temperature	-10...+50°C
Electrical strength	4 kV (supply-output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP20
Overvoltage category	III
Pollution degree	2
Max. cable size	max. 1x 4 mm ² , max. 2x 1,5 mm ² / with sleeve max. 1x 4 mm ² , max. 2x 1,5 mm ²
Dimensions	90 x 17,5 x 64 mm
Standards	EN 61812-1, EN 60669-1, EN 63044-1

Description



Connection



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

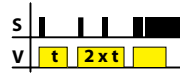
Technical data

	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		1xNO (AgSnO2)
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		

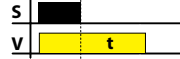
Technical data

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



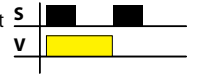
Function e - puls shift
delay on after the switch is switched on and delay on after it is switched off



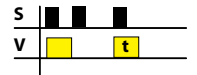
Function f - delay on
delay on after switch is switched on until it is switched off



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

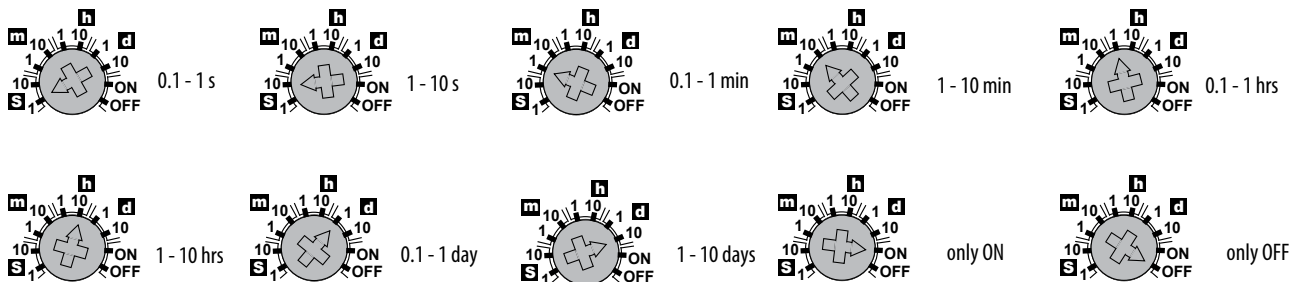


Function j *- cycler starting with gap
delay on after switching on until it is de-energized or a switch is pressed again.

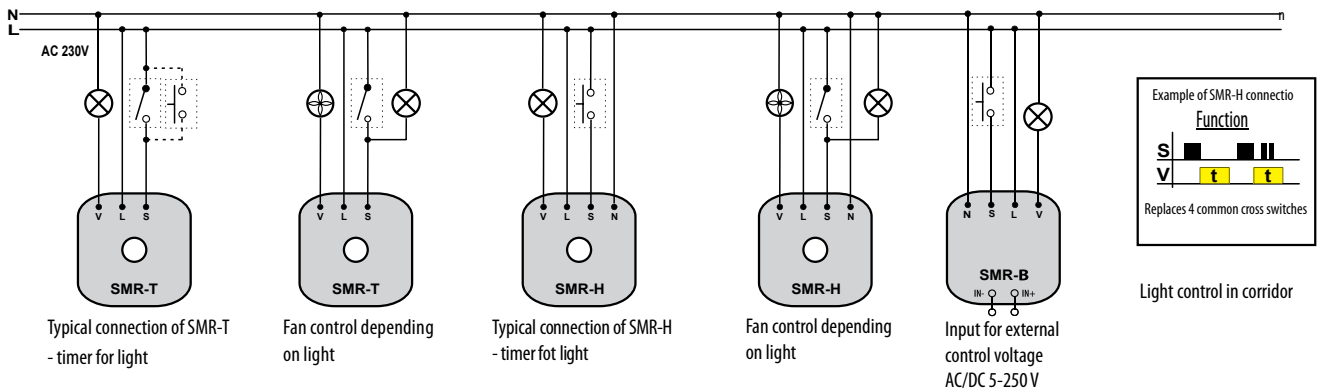


*function j is valid only for SMR-B

Time ranges

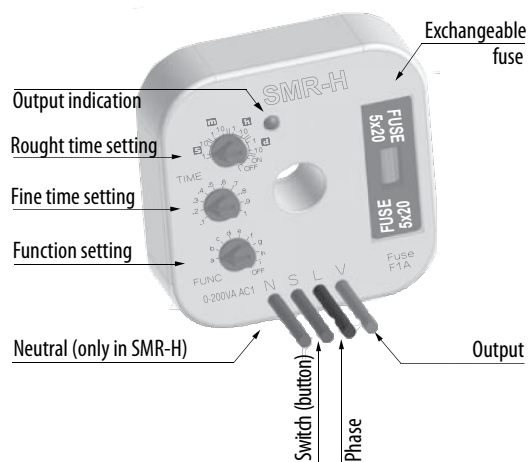


Connection SMR-B, SMR-H, SMR-T

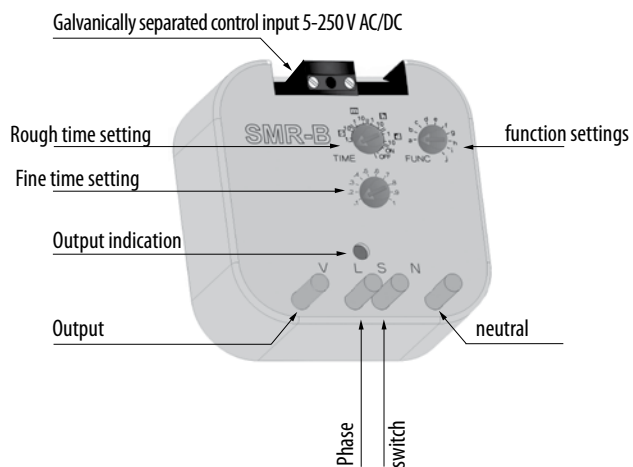


Description

SMR-T, H

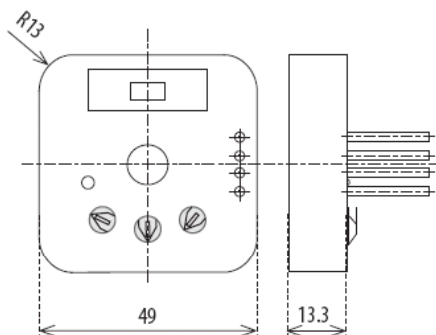


SMR-B

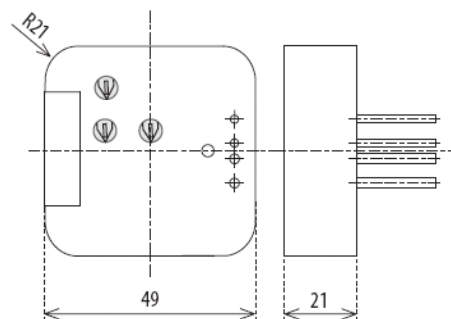


Dimension

SMR-T, SMR-H



SMR-B



Technical data

Dimmer flush mounting SMR-S, SMR-U

Technical data

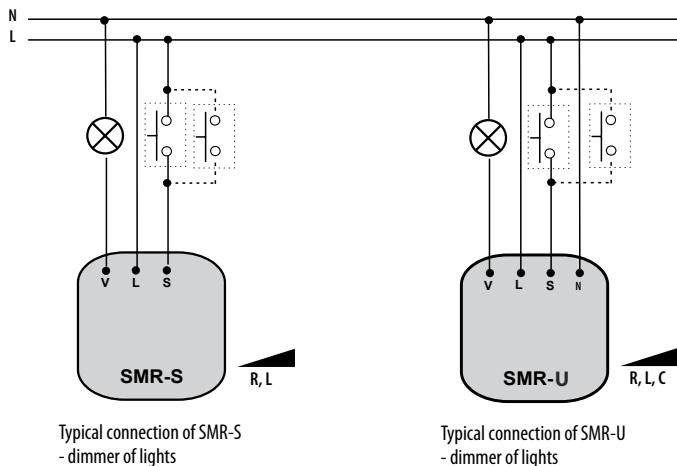
	SMR-S	SMR-U
Connection	4-wire without neutral	4-wire with neutral
Supply voltage	AC 230 V / 50-60 Hz	
Consumption (no operation/make)	max. 3VA	
Supply voltage tolerance	- 15%; + 10%	
Output		
Resistive load	10-300 VA	500 VA*
Capacitive load	x	500 VA*
Inductive load	10 -150VA	500 VA*
Controlling		
Control 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 mm ² , 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!

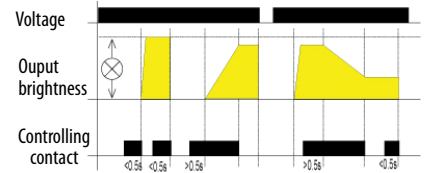
SMR-U: It is not allowed to connect together loads of inductive and capacitive type at the same time

Connection SMR-S, SMR-U



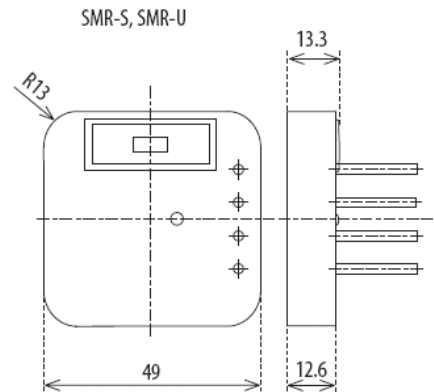
Warning: it cannot be used for fluorescent lights and energy saving lights!
SMR-U: It is not allowed to connect together loads of inductive and capacitive type at the same time

Functions

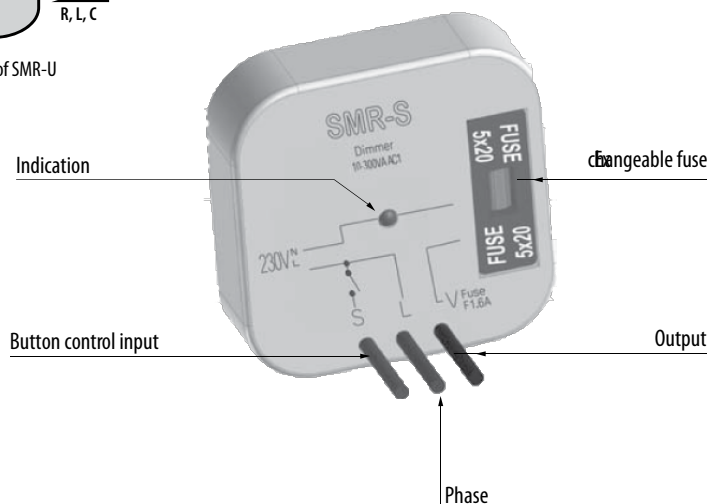


KA short press (<0.5s) turns a light on, another short press turns it off. A longer press (>0.5s) causes a gradual regulation of light intensity min-max-min round until the button is released. After releasing a set intensity is kept in memory, further short presses turn the light on/off keeping the set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

Dimensions



Description SMR-S

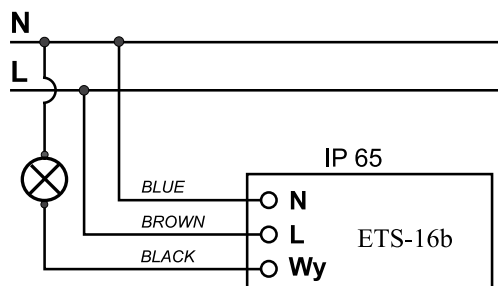


Twilight switch in IP65 ETS-16b

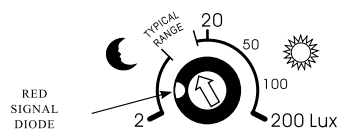
Technical data

	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

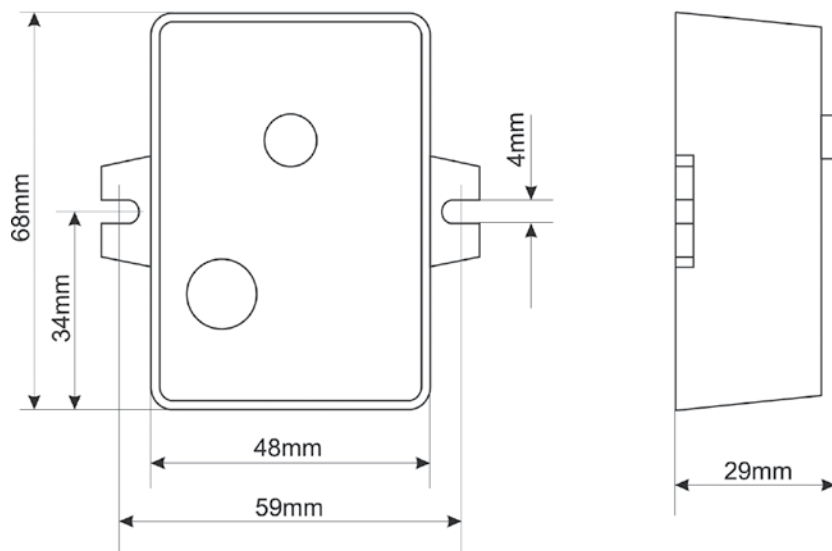
Connection



Setting



Dimensions



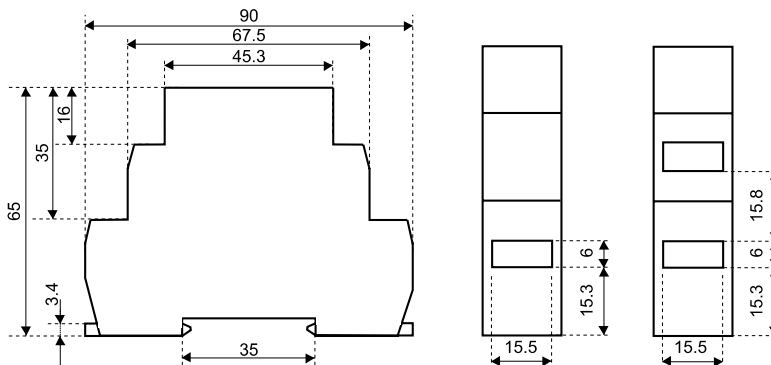
Technical data

Memory and latching relays MR-41, MR-42

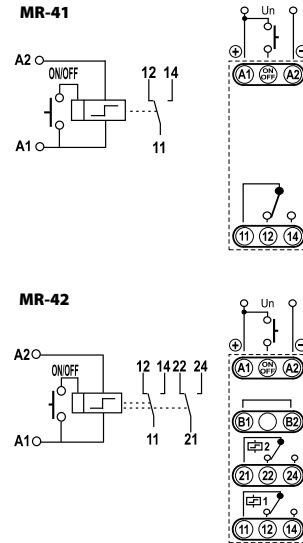
Technical data

	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	

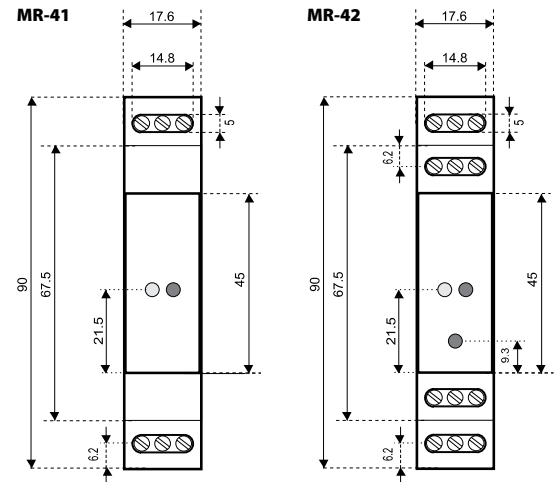
1-module design



Connection

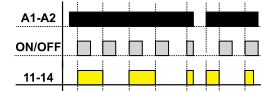


Dimensions

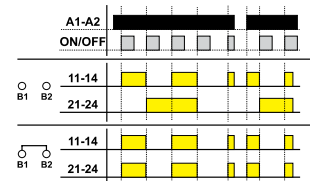


Function

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

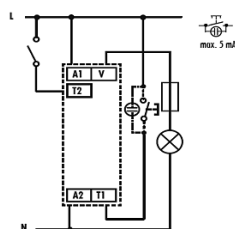
Controlling T1

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

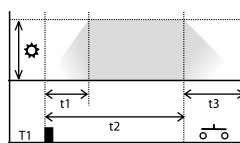
Terminals	T2-A1
Voltage	230 V AC
Power control input	max. 0,1 VA
Impulse length	min. 100 ms / max. unlimited
Glow-lamps	no
Output	contactless - triac
Rated current	2 A
Resistive load	10-500 VA
Inductive load	10-250 VA
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Operating position	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

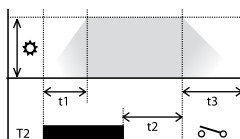


Function

Controlled via input T1 (button)



Controlled via input T2 (switch)



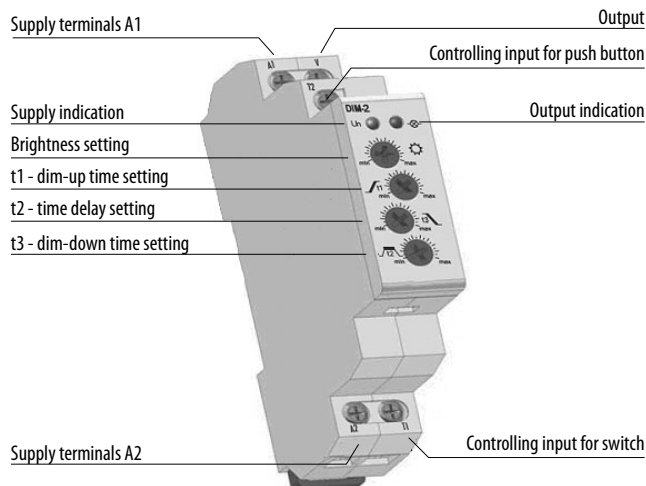
Cycle dim-up time is activated by pressing the button; By repressing the button (during the cycle) it is possible to prolong the time of the cycle.

Legend:

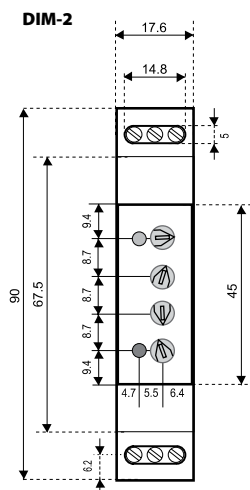
- ⚙ Output / Brightness: 10-100%
- t1 Dim-up time: 1-40 s
- t2 Time delay: 0s-20min
- t3 Dim-down time: 1-40s
- T1/T2 Controlling contact

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.

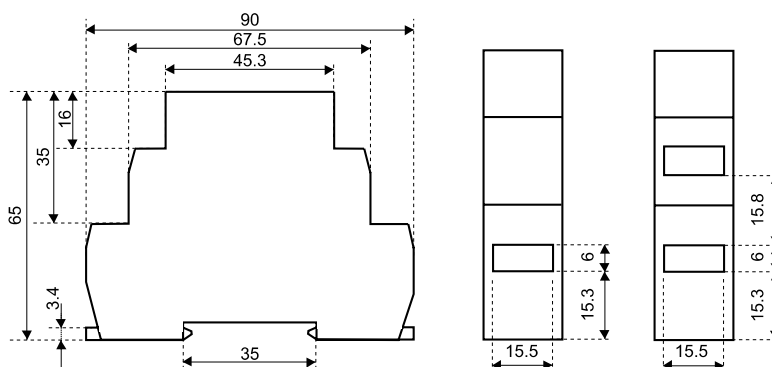
Description



Dimensions



1-module design



Technical data

Dimmer DIM-14

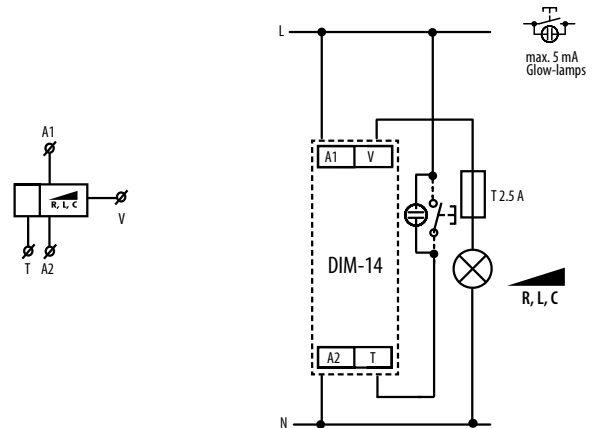
Technical data	
DIM-14	
Supply	A1-A2
Supply voltage	230 V AC (50 Hz)
Consumption	1,3 W
Supply voltage tolerance	- 15%; + 10%
Supply indication	green LED
Indication output	6 VA
Controlling	
Terminals	T1-A1
Control Voltage	230 V AC
Power control input	0,3 - 0,6 VA AC
Impulse length	min. 80 ms / max. unlimited
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

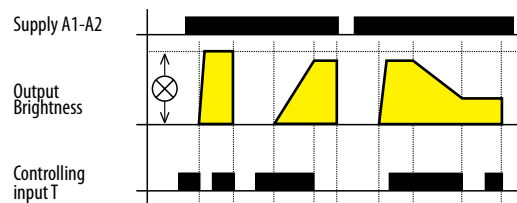
Recommendation for mounting: leave a gap of min. 0,5 module (approx. 9 mm) on side of the device to ensure better cooling of the device.

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

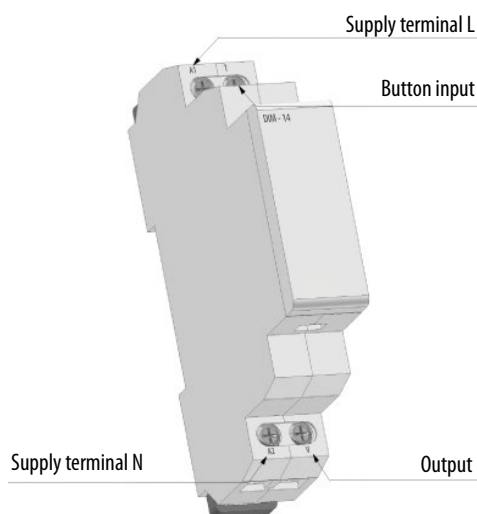
Connection



Functions



Description



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

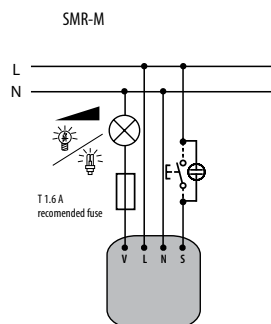
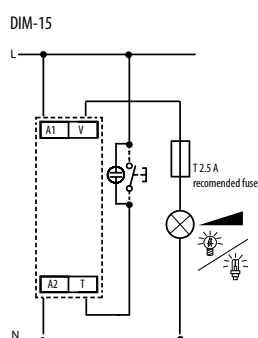
Technical data		
	DIM-15	SMR-M
Supply voltage	230V AC / 50-60 Hz	
Supply voltage tolerance	-15%; +10%	
Apparent power	max. 1.5VA	
Loss power	max. 0.7W	
Supply indication	green LED	
Controlling		
Control wire	A1 - T	L - S
Control voltage	230V AC	
Control input power	AC 0.3-0.6 VA	
Control impulse length	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

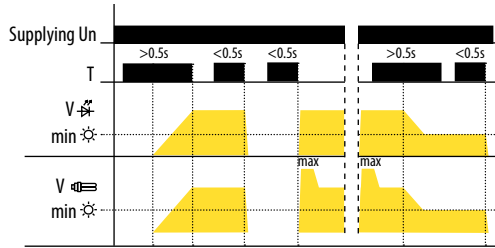


LED bulbs



Technical data

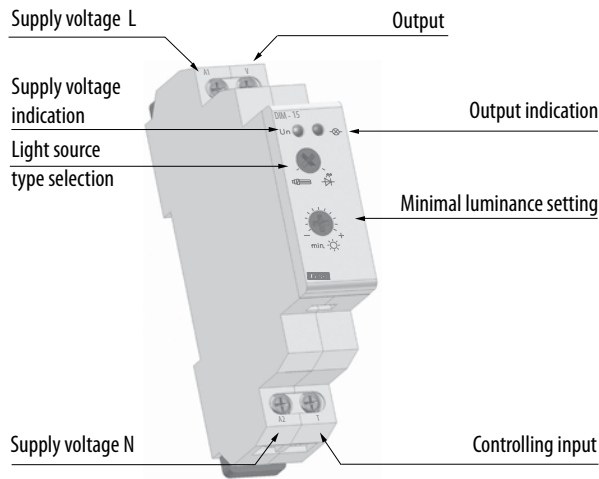
Functions and controlling



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:

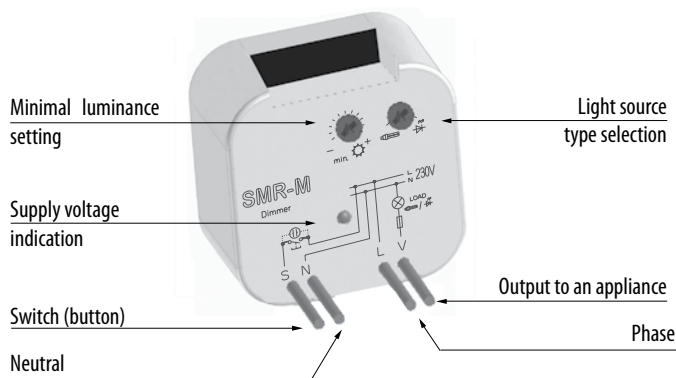
- if the light is turned off, short press (<0.5s) switches the light onto last set luminance level

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

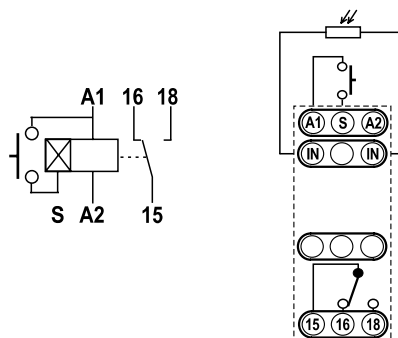
Output

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

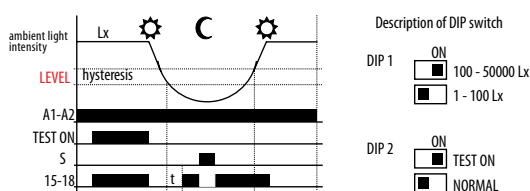
Controlling

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

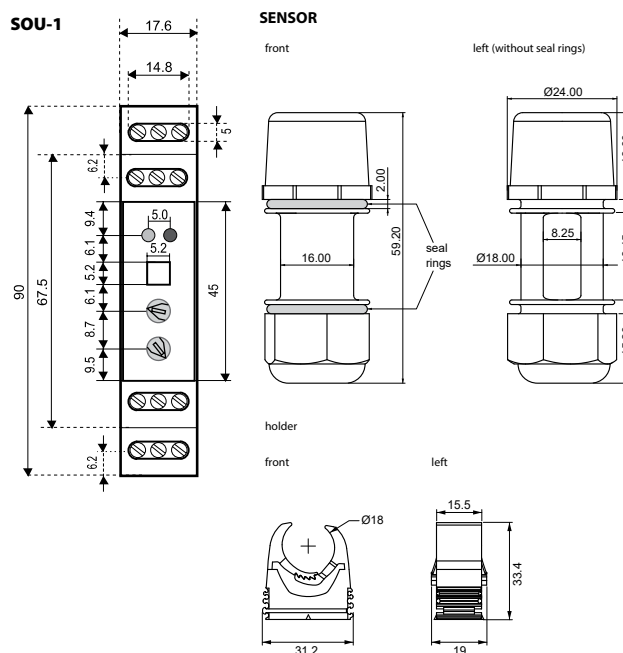
Connection



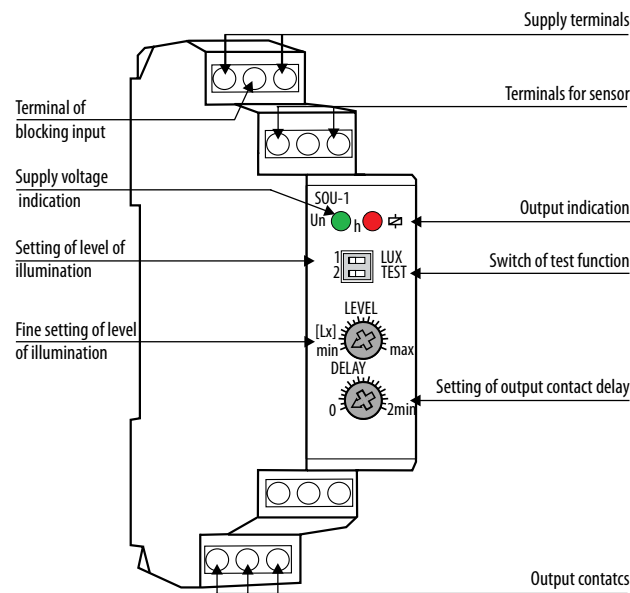
Function



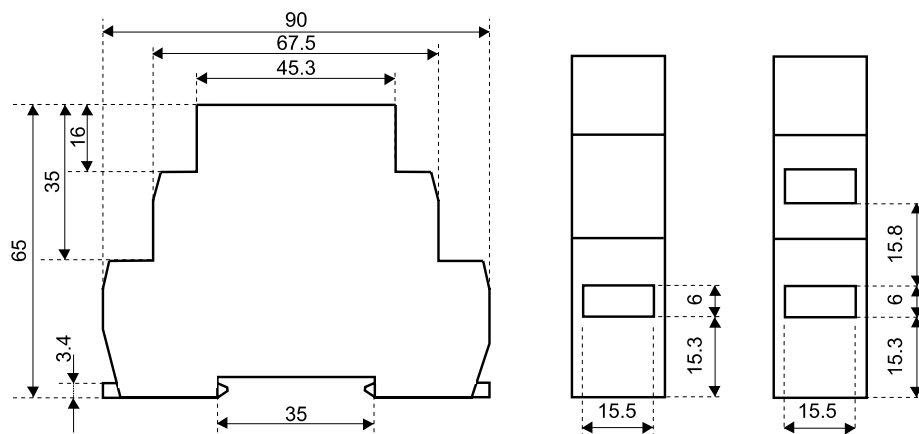
Dimensions



Description



1-module design

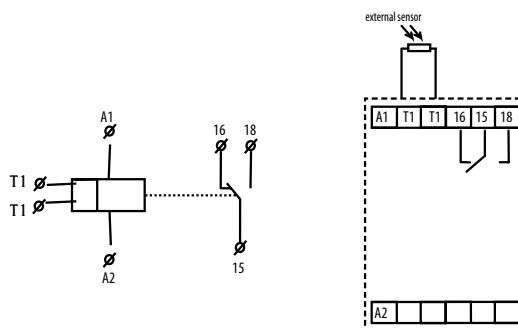


Twilight switch with digital time switch SOU-2 + sensor

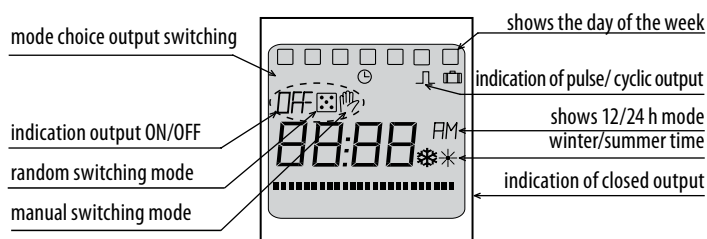
Technical data

	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

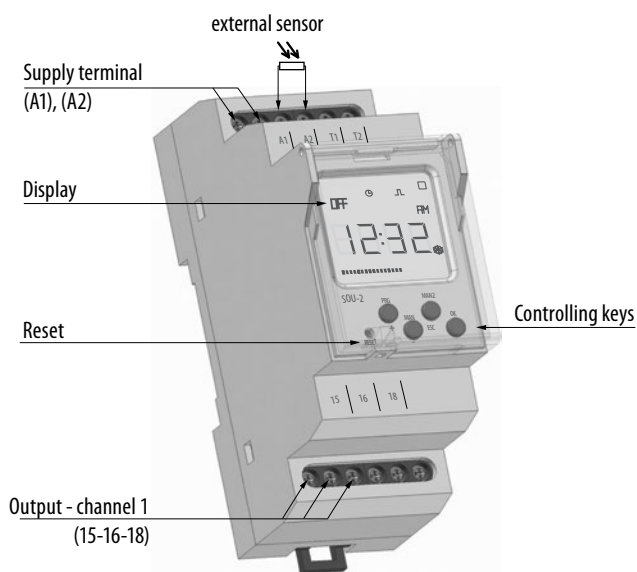
Connection



Controlling elements



Description

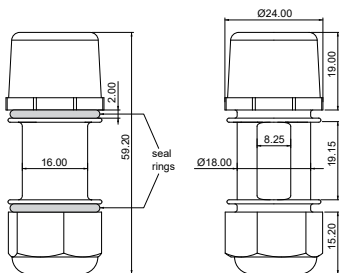


Dimensions

SOU-2 SENSOR

front

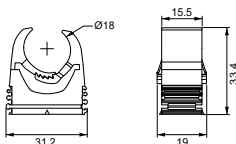
left (without seal rings)



holder

front

left



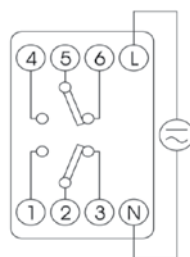
Technical data

Time switch ASTROCLOCK-2

Technical data

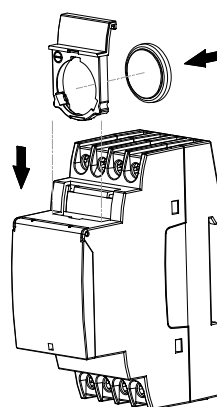
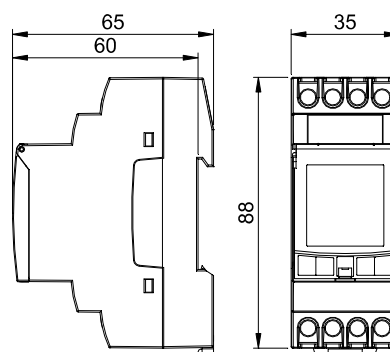
Rated voltage As indicated in the device	230V~ /50-60Hz
Tolerance	± 10%
No. of output contacts	2
Rated current/switching voltage	2x 16A / 250 V~
Maximum recommended loads (N.A)	See Electrical scheme and parameters
Consumption	16 VA (1,3 W)
Display	back-lit liquid crystal display
Accuracy	± 1 s / day 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)
Standards	EN 60730-1:2011, EN 60730-2:2010 + AC:2011

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

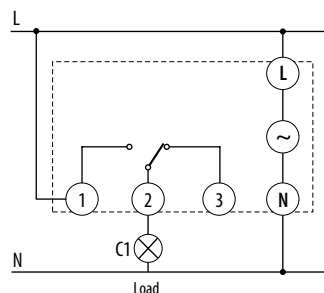


Digital time switch ETICLOCK-R1

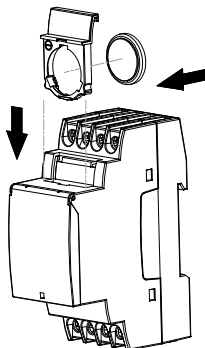
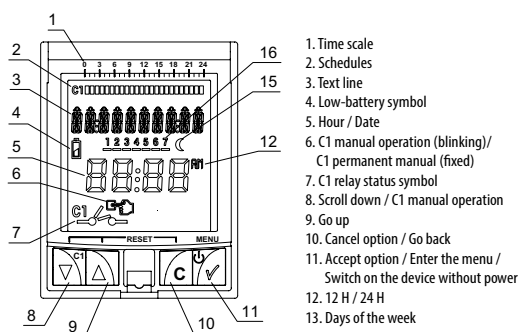
Technical data

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)
Standards	EN 60730-1:2011, EN 60730-2-7:2010 + AC:2011

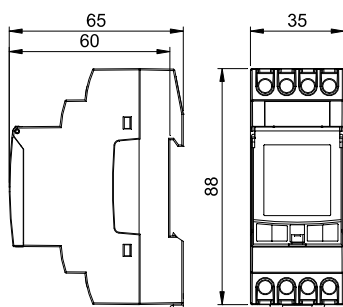
Connection



Controlling elements



Dimensions



Maximum recommended loads

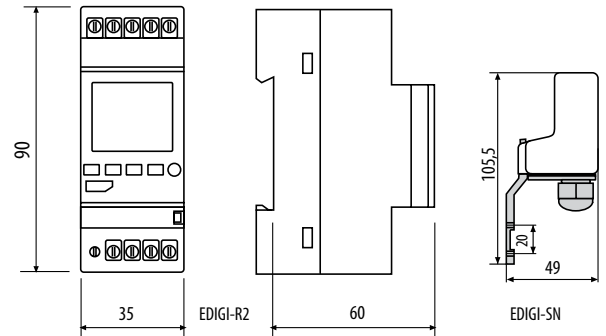
Load	Designation	Max. load
Incandescent		3000 W
Fluorescent		1200 VA
Low voltage halogen (12 V)		2000 VA
Halogen (230 V)		3000 W
Low consumption lamps		600 VA
Downlights		400 VA
LED	LED	90 VA

Technical data

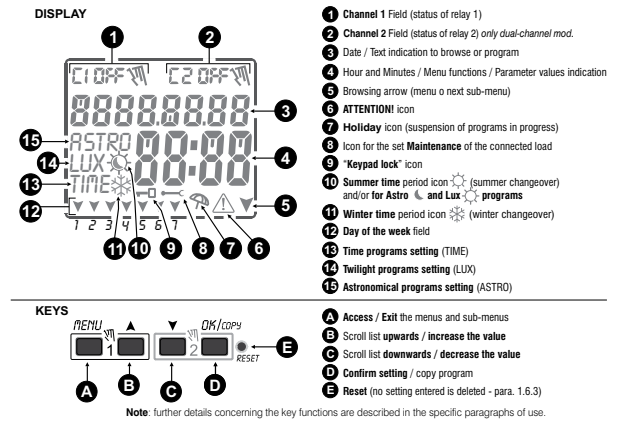
Digital time relay EDIGI-R2

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	16(10)A / 250V~
	Zero Crossing	
	N.C. contact	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

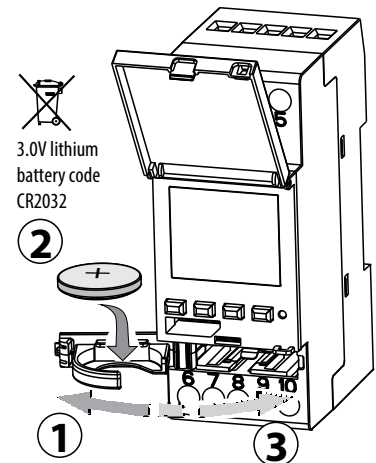
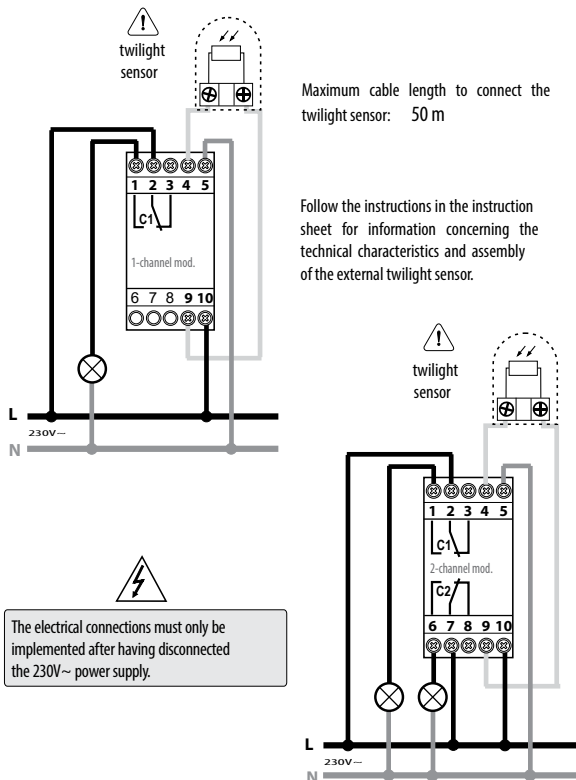
Dimensions



Controlling elements



Connection



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.)

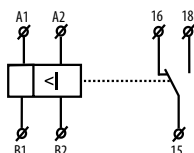
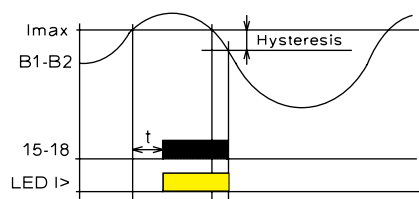
LED lighting: max inrush current 80A/20ms

Current monitoring relay PRI-51

Technical data

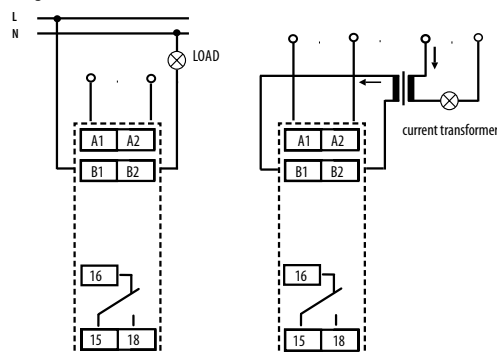
	PRI-51					
Supply circuit						
Supply	A1-A2					
Universal supply	24-240V AC / 24 V DC (50-60 Hz AC)					
Consumption	max. 1,5 VA					
Supply voltage tolerance	-15% - +10%					
Measuring circuit						
Load	between B1 - B2					
Current ranges	PRI51/1	PRI51/2	PRI51/5	PRI51/8	PRI51/16	PRI-51/0.1-10
	AC 0.1-1 A	AC 0.2-2 A	AC 0.5-5 A	AC 0.8-8 A	AC 1.6-16A	AC 0.1 - 10A
Inrush overload <1ms	100 A					
Max. permanent current	1A	2A	5A	8A	16A	10A
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



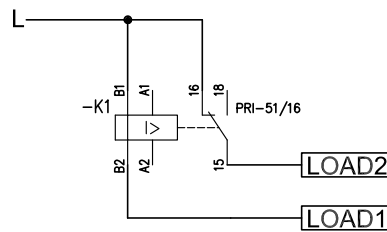
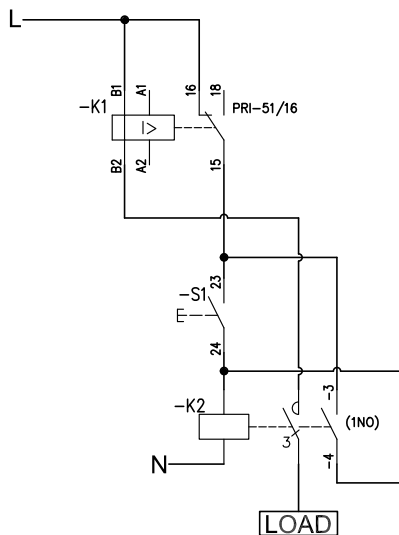
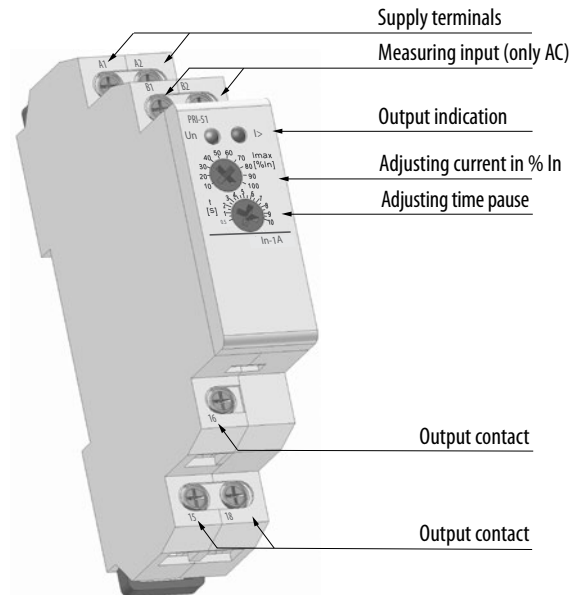
Connection

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.

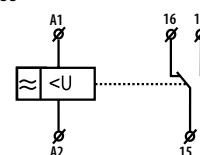
Voltage monitoring relay HRN-33, HRN-34, HRN-35

Technical data

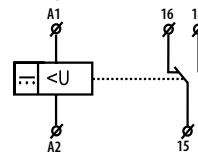
	HRN-33, HRN-34, HRN-35		
Type	HRN-33	HRN-34	HRN-35
Supply	A1-A2	A1-A2	A1-A2
Universal supply	monitoring voltage range	monitoring voltage range	monitoring voltage range
Consumption	max. 1,2 VA AC / DC	max. 1,2 VA AC / DC	max. 1,2 VA AC / DC
Upper level U _{max}	160-276 V AC	18-30 V DC	160-276 V AC
Bottom 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

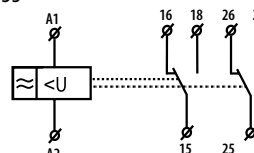
HRN-33



HRN-34



HRN-35

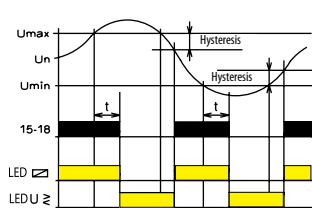


Functions

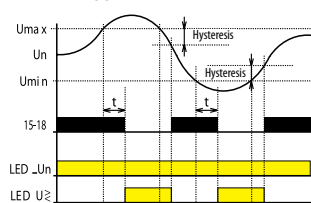
Legend:

- 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

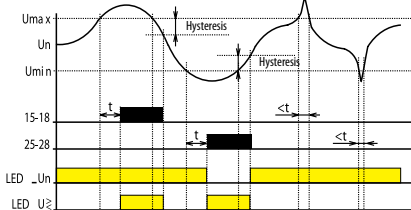
HRN-34



HRN-33

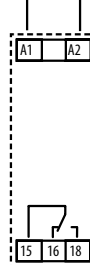


HRN-35

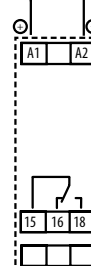


Connection

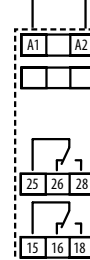
Un HRN-33



Un HRN-34



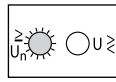
Un HRN-35



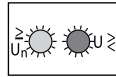
Technical data

Indication LED

HRN-33

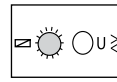


Normal state
 $U_{min} < U_n < U_{max}$
 Green LED = ON
 Red LED = OFF

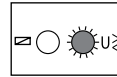


Exceeded U_{max} (overvoltage)
 Drop below U_{min} (undervoltage)
 $U_n > U_{max}$ or $U_n < U_{min}$.
 Green LED = ON
 Red LED = ON

HRN-34



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

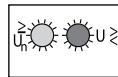


Exceeded U_{max} (overvoltage)
 Drop below U_{min} (undervoltage)
 $U_n > U_{max}$ or $U_n < U_{min}$.
 Green LED = OFF
 Red LED = ON

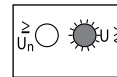
HRN-35



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



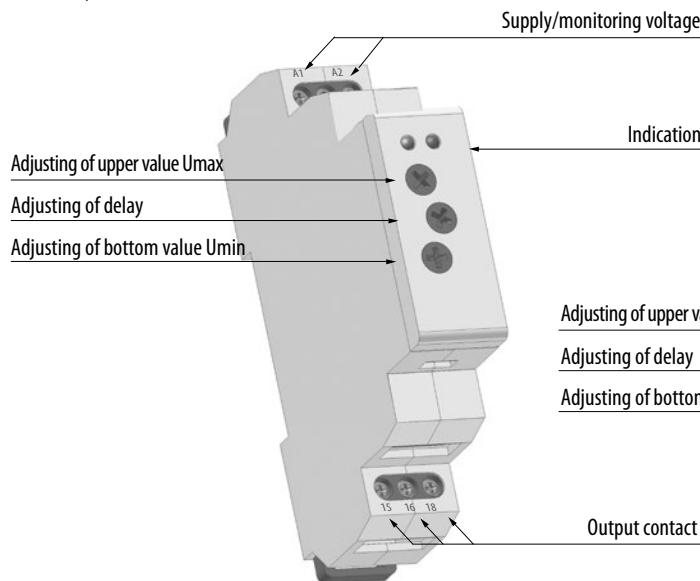
Drop below U_{min} (undervoltage)
 $U_n < U_{min}$
 Green LED = OFF
 Red LED = ON

Function description

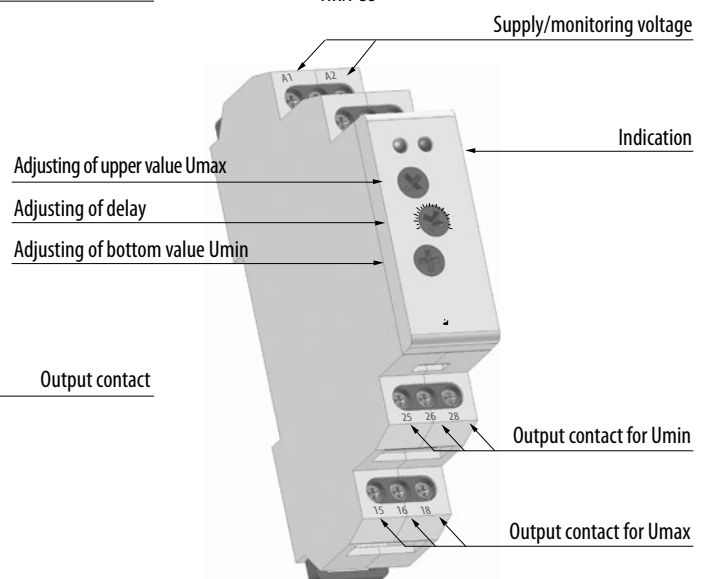
Monitoring relay series HRN-3 monitors level of voltage in single-phase circuits. Monitored voltage serves also as supply voltage. It is possible to set two independent levels of voltage, when exceeded output is activated. HRN-33 and HRN-34 - in normal state the output relay is permanently switched on. 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.	

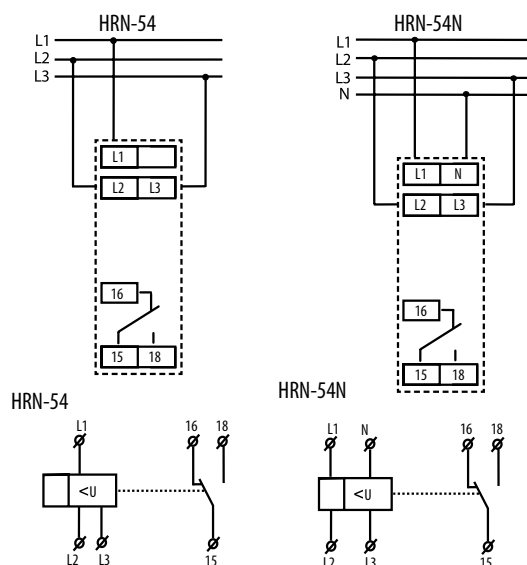
Output

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.

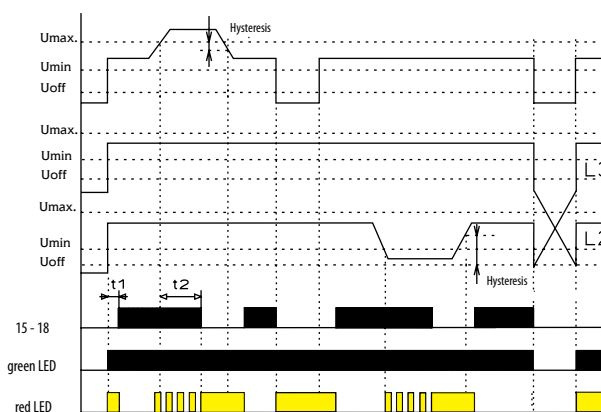
Controlling

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



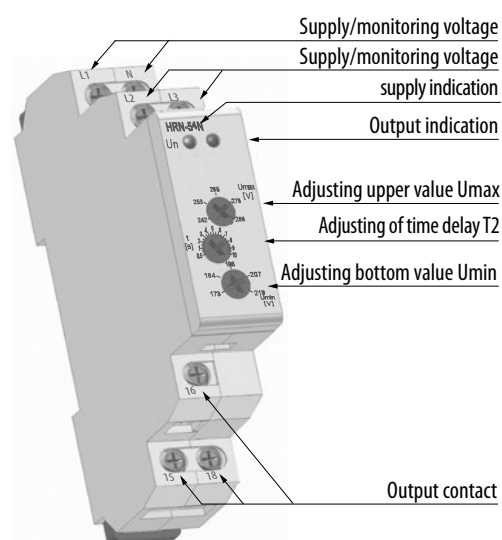
Functions



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 is off. 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

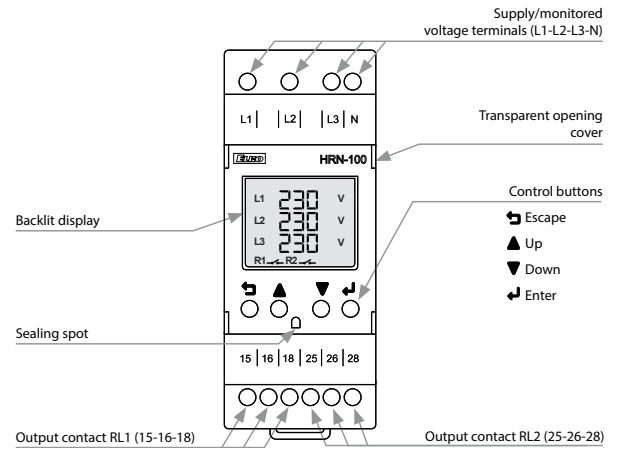


Technical data

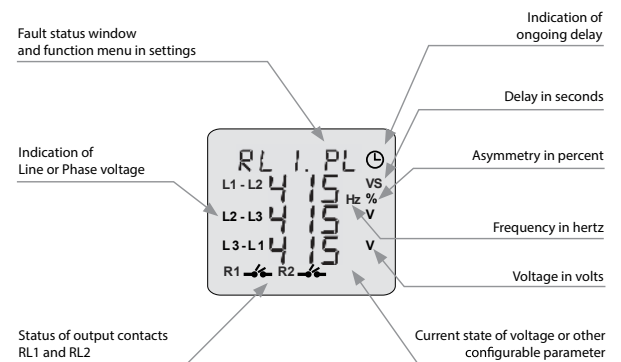
Frequency and voltage monitoring relay HRN-100

Technical data	
	HRN-100
Supply	
Supply and measuring terminals	L1, L2, L3, (N)
Supply and monitored voltage	$U_{LN} = 3 \sim 90 - 288 \text{ V}$, (AC 45-65 Hz) $U_{LL} = 3 \sim 155 - 500 \text{ V}$, (AC 45-65 Hz)
Power consumption (max.)	5 VA
Measuring circuit	
Selection of the measured circuit	Phase voltage - 3 phase, 4 wire Line voltage - 3 phase, 3 wire
Adjustable upper (OV) and lower (UV) voltage levels	Phase voltage: 90 - 288 VAC Line voltage: 155 - 500 VAC
Upper (HC) / lower (LC) limit voltage	Phase voltage: 310 VAC / 85 VAC Line voltage: 535 VAC / 150 VA
Adjustable upper (OF) and lower (UF) frequency level	45 - 65 Hz
Adjustable asymmetry	5 - 99 VAC / 2 - 50%
Adjustable voltage and frequency hysteresis level	3 - 20 VAC (OV, UV, HC, LC) 0.5 - 2 Hz (OF, UF)
Adjustable hysteresis asymmetry	3 - 99 VAC / 2 - 15%
Accuracy of measured voltage	+/- 5V
Accuracy of measured frequency	+/- 0,3 Hz
Adjustable delay after supply connection P_{on}	1.5 sec 0 - 999 s (HW initialization 250 ms)
Adjustable delay T_{on}	0,5 - 999 s
Adjustable delay T_{off}	0,1 - 999 s
Fixed delay	<100 ms (phase sequence, failure) <200 ms (HC, LC), <500 ms (neutral fail)
Output	
Number of contacts	2x C0 (AgSnO ₂)
Rated current	5A/AC1
Switching power	1200VA/AC1, 150W/DC1
Switched voltage	240V AC/30V DC
Max. output power dissipation	5W
Mechanical life (AC1)	1x10 ⁷
Electrical life	1x10 ⁵
Other data	
Operating temperature	-10.. +60 °C
Storage temperature	-20.. +70 °C
Electrical strength	4kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP20 terminals/IP40 from front panel
Overvoltage category	III
Pollution degree:	2
Cable size	max. 1x 2,5 mm ² , max. 2x 1,5 mm ² / with sleeve max. 1x 2,5 mm ²
Dimensions:	90 x 36 x 66,5 mm
Standards:	EN 61812-1, EN IEC 63044

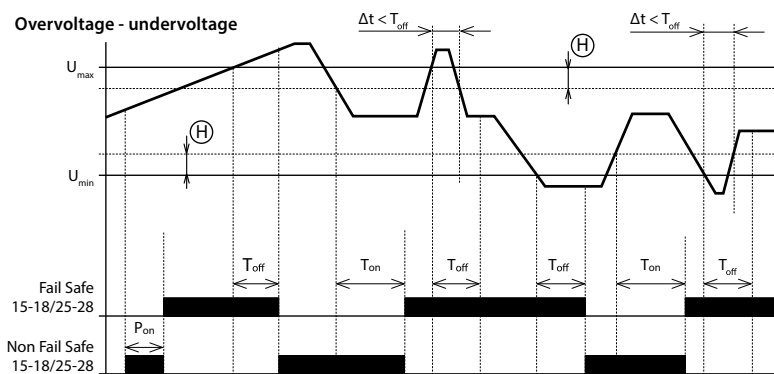
Description



Controlling elements



Overvoltage - undervoltage



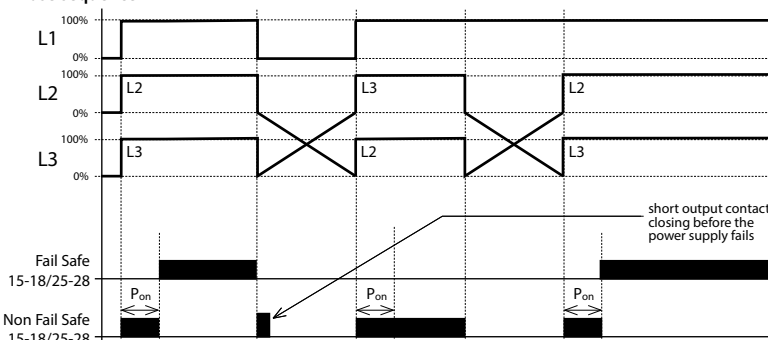
Graph legend:

P_{on} - Power ON delay (delay after power supply connection)
 $P_{on} = 0 - 999$ s (min. 250 ms hardware initialization)
 T_{on} - ON Delay (delay to OK state)
 $T_{on} = 0,5 - 999$ s
 T_{off} - OFF delay (delay to fault state)
 $T_{off} = 0,1 - 999$ s
 T_{off} - Adjustable for OV, UV, OF, UF & asymmetry faults
 T_{off} - Phase sequence, failure <100ms;
 Neutral fail <500ms

Δt - Duration of the fault state
 (H) Hysteresis

- After the supply/monitored voltage is connected, the delay P_{on} starts timing - during the timing the output contact is in a fault state - in the FAIL SAFE mode it is open. After the delay, if the monitored voltage is in the range $U_{min} \dots U_{max}$, the output contact closes.
- If the monitored voltage exceeds the set value U_{max} , the time delay to the fault state (T_{off}) starts. After the delay, the output contact opens.
- If the monitored voltage falls below the U_{max} value reduced by the set hysteresis, the time delay start to OK state (T_{on}). After the delay, the output contact closes.
- If the duration of the fault state (Δt) is shorter than the set value T_{off} , the status of the output contact does not change.
- If the monitored voltage falls below the value U_{min} , the time delay to the fault state (T_{off}) starts. After the delay, the output contact opens.
- If the monitored voltage exceeds the value U_{min} increased by the set hysteresis, the time delay start to the OK state (T_{on}). After the delay, the output contact closes.
- If the duration of the fault state (Δt) is shorter than the set value (T_{off}), the status of the output contact does not change.

Phase sequence

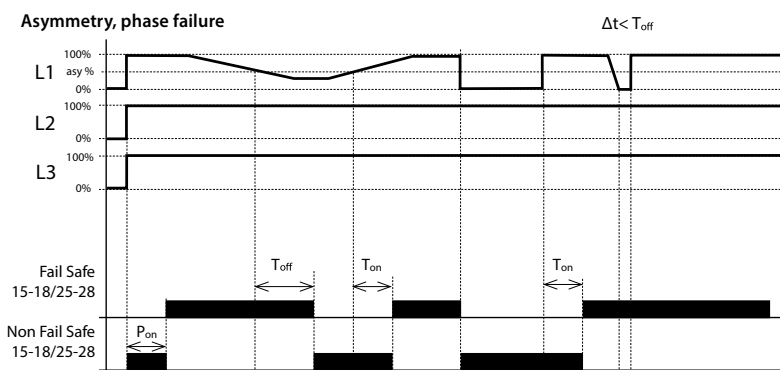


Graph legend:

P_{on} - Power ON delay (delay after power supply connection)
 $P_{on} = 0 - 999$ s (min. 250 ms hardware initialization)

- After the supply/monitored voltage is connected, the delay P_{on} starts timing - during the timing the output contact is in a fault state - in FAIL SAFE mode it is open. After the delay, if the phase sequence is correct, the output contact closes.
- If the phase sequence is incorrect after the P_{on} delay, the output contact remains open (fault state).

Asymmetry, phase failure



Graph legend:

P_{on} - Power ON delay (delay after power supply connection)
 $P_{on} = 0 - 999$ s (min. 250 ms hardware initialization)
 T_{on} - ON Delay (delay to OK state)
 $T_{on} = 0,5 - 999$ s
 T_{off} - OFF delay (delay to fault state)
 $T_{off} = 0,1 - 999$ s
 T_{off} - Adjustable for OV, UV, OF, UF & asymmetry faults
 T_{off} - Phase sequence, failure <100ms;
 Neutral fail <500ms

Δt - Duration of the fault state

- After the supply/monitored voltage is connected, the delay P_{on} starts timing - during the timing the output contact is in a fault state - in the FAIL SAFE mode it is open. After the delay, if the phase asymmetry is lower than the set value (absolute or percentage), the output contact closes.
- If the phase asymmetry exceeds the set value, the time delay to the fault state (T_{off}) begins. After the delay, the output contact opens.
- If the phase asymmetry falls below the set value, the time delay starts to OK state (T_{on}). After the delay, the output contact closes.
- If the duration of the fault state (Δt) is shorter than the set value T_{off} , the status of the output contact does not change.
- If a phase failure occurs, the time delay to the fault state (T_{off}) begins. After the delay, the output contact opens.
- If the phase failure resumes, the time delay starts to OK state (T_{on}). After the delay, the output contact closes.
- If the duration of the fault state (Δt) is shorter than the set value T_{off} , the status of the output contact does not change.

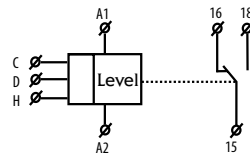
Technical data

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. 2x 2.5 / with sleeve max. 1x 2.5, 2x 1.5
Dimensions:	90 x 17.6 x 64 mm
Weight:	72 g
Applicable standards:	EN 60255-6, EN 61010-1

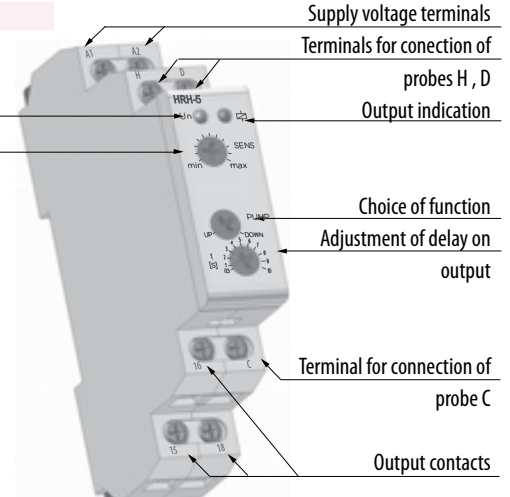
Symbol



Description

Indication of supply voltage

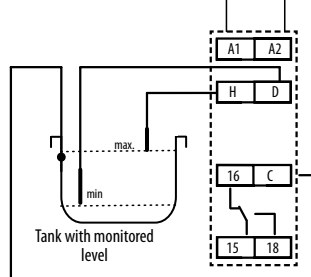
Choice of function



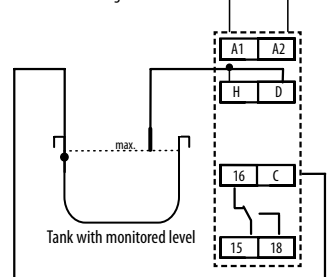
HRH-5

Connection

Monitoring of two levels

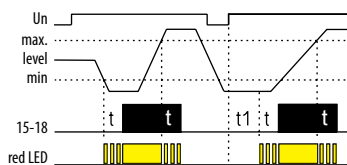


Monitoring of one level

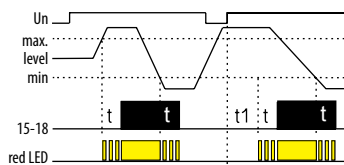


Functions

Function PUMP UP



Function PUMP DOWN

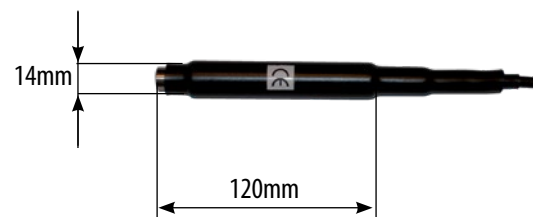


Relay is designated for monitoring of levels of conductive liquids with possibility of functions: PUMP UP or PUMP DOWN. To prevent polarization and liquid electrolysis of liquid, and undesirable oxidation of measuring probes, alternating current is used. For measuring use three measuring probes: H- upper 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

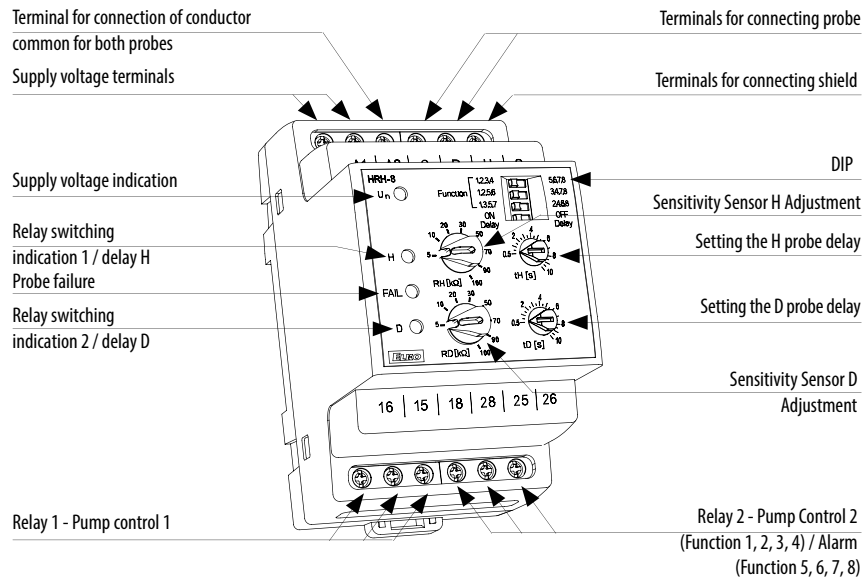


Level switch HRH-8

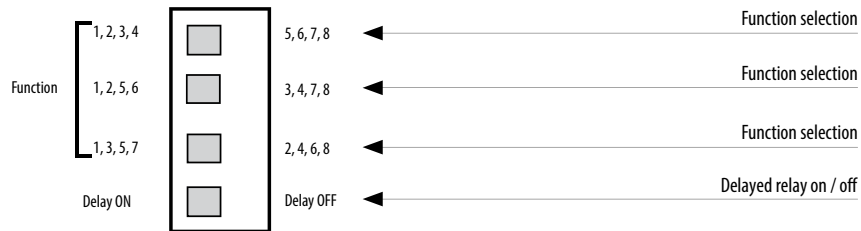
Technical data		
		HRH-8
Function		8
Supply terminals		A1-A2
Voltage range		AC 230 V, AC 110 V, AC 400 V, AC/DC 24 V (AC 50 - 60 Hz)
Max load		2,5 W / 5 VA (AC 230 V, AC 110V, AC 400 V), 1,4 W / 2 VA (AC/DC 24 V)
Supply voltage tolerance		-15 %; +10 %
Measuring circuit		
Hysteresis (input - opening)		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

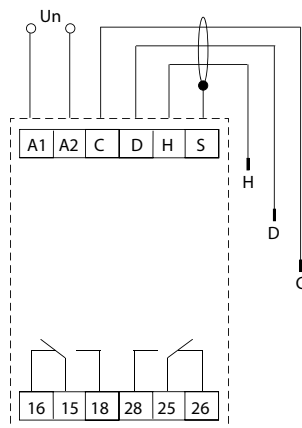
Description



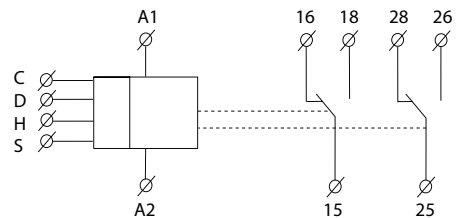
Description and importance of DIP switches



Connection



Symbol



Measuring probes

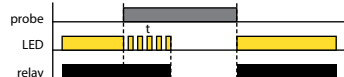
There can be any measuring probe (any conductive contact, it is recommended to use brass or stainless steel).
The probe wire does not need to be shielded, but it is recommended.
When using a shielded wire, the shielding is connected to terminal S.

Functions

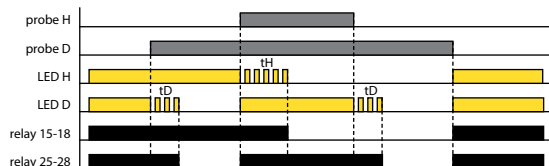
PUMP UP, ON DELAY (Function 1,3,4)



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



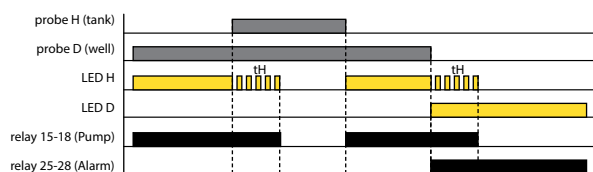
PUMP UP, OFF DELAY (Function 5)



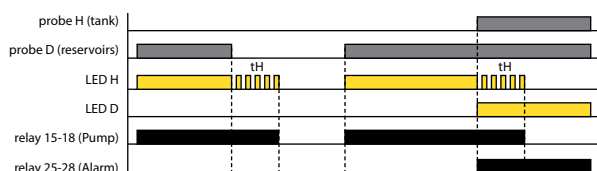
PUMP DOWN, OFF DELAY (Function 6)



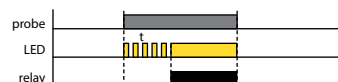
WELL - TANK, OFF DELAY (Function 7)



RESERVOIRS - TANK, OFF DELAY (Function 8)



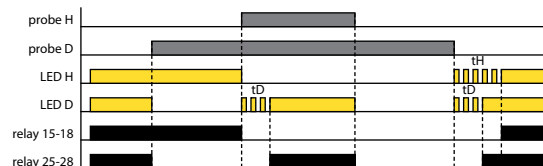
PUMP DOWN, ON DELAY (Function 2,3,4)



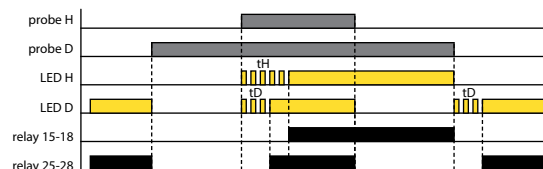
PUMP DOWN, OFF DELAY (Function 2,3,4)



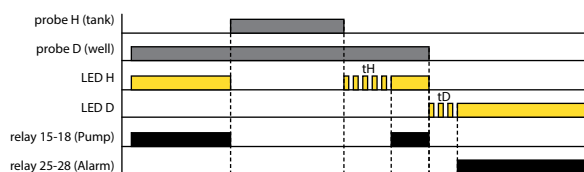
PUMP UP, ON DELAY (Function 5)



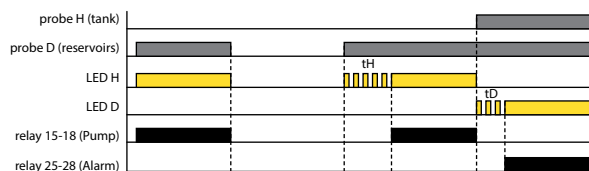
PUMP DOWN, ON DELAY (Function 6)



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, thermistor NTC
Sensor fault indication	flashing red LED
Setting accuracy - mechanical	5%
Switching difference	0,5°C
Temperature coefficient	< 0.1 % / °C

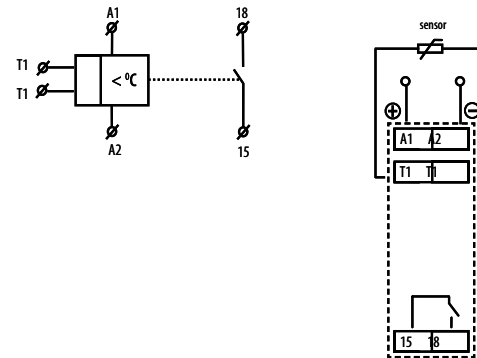
Output

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

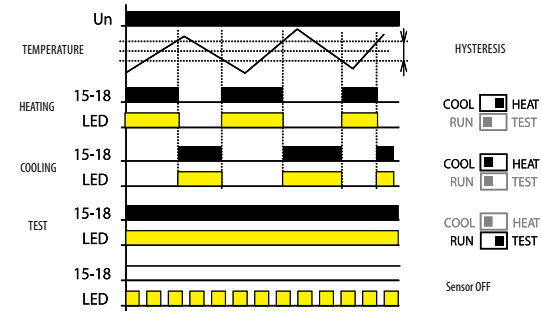
Controlling

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

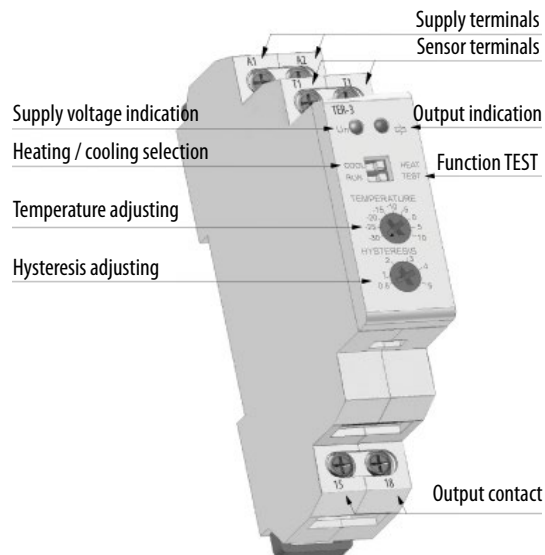


Functions



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

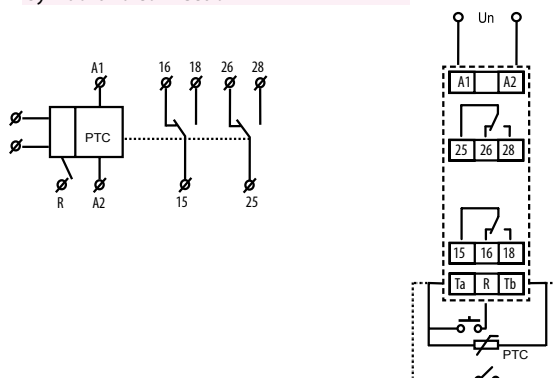
Note:

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

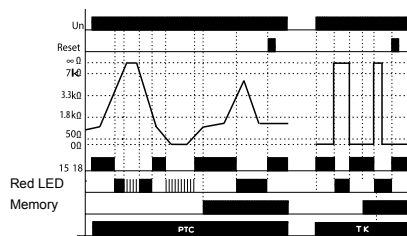
Warning:

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

Symbol and connection

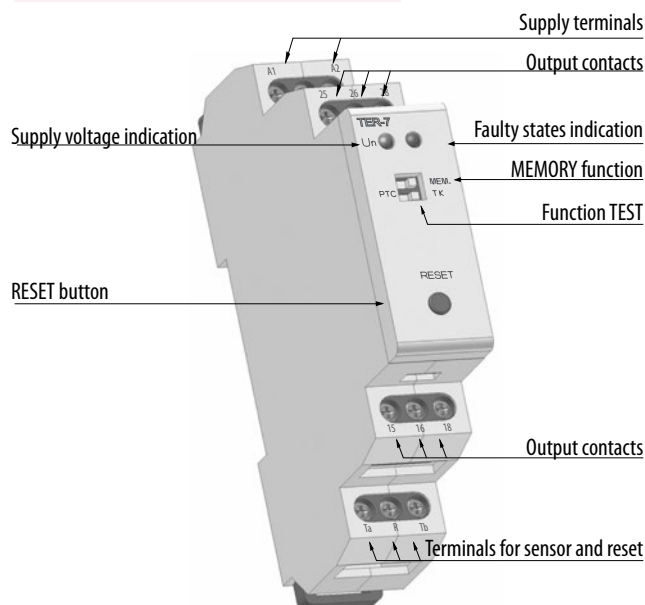


Function



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

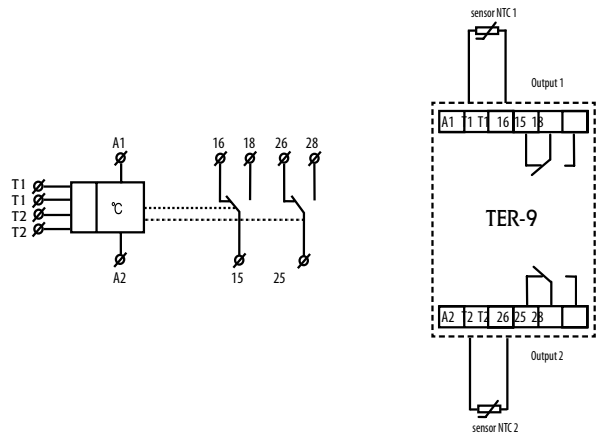


Technical data

Multifunction digital thermostat TER-9

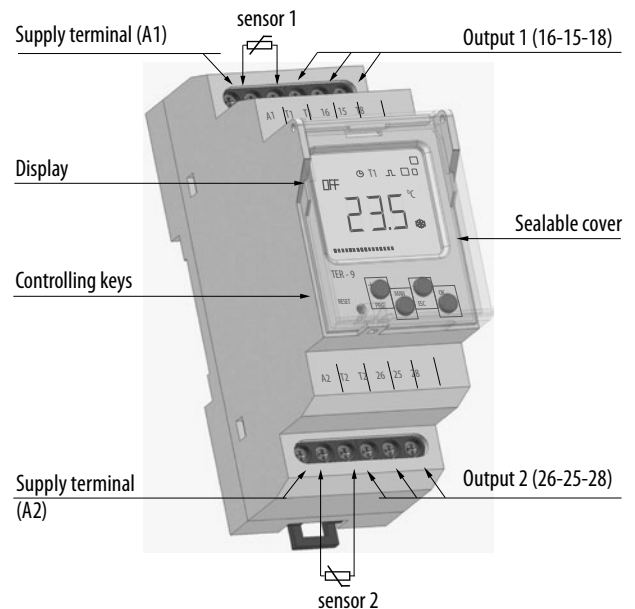
Technical data	
	TER-9
Number of functions	6
Supply	A1-A2
Supply voltage	AC 230V or AC/DC 24V, galvanically separated
Consumption	max. 3,5 VA
Supply voltage tolerance	-15% - +10%
Measuring circuit	
Measuring terminals	T1 - T1 in T2-T2
Temperature range	-40...+110 °C
Hysteresis (sensitivity):)	adjustable 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

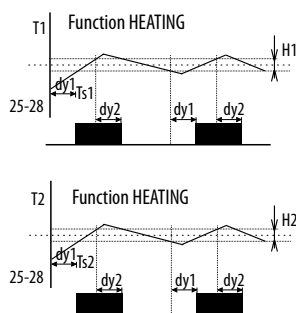


Note: It is possible to operate the device with one sensor. In such case it is necessary to connect resistor 10kΩ. This resistor is a part of delivery.

Description



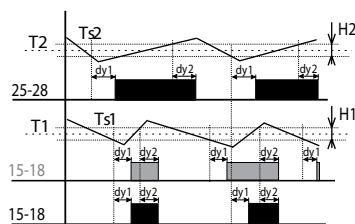
2 independent single-stage thermostat

**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.

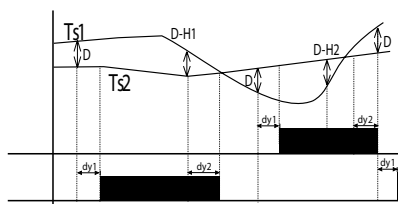
Dependent functions of 2 thermostats

**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).

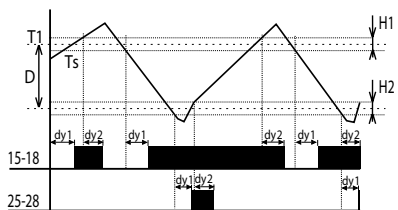
Differential thermostat

**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

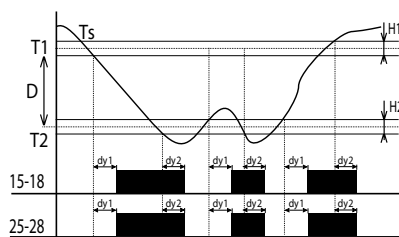
**Legend:**

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.

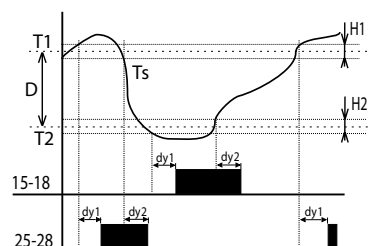
Thermostat with "WINDOW"

**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 sit 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)

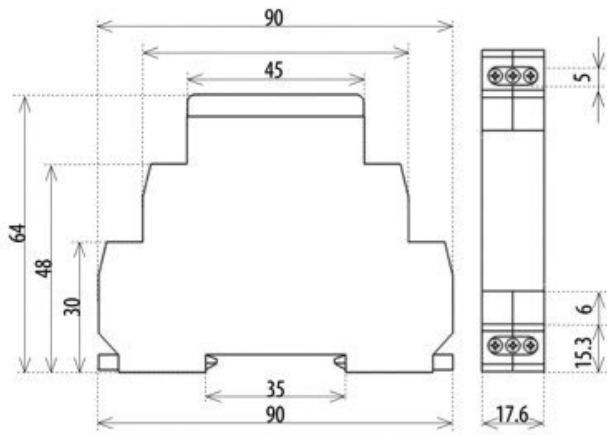
TZ-3 - Temperature sensor 3m, double isolation silicone

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

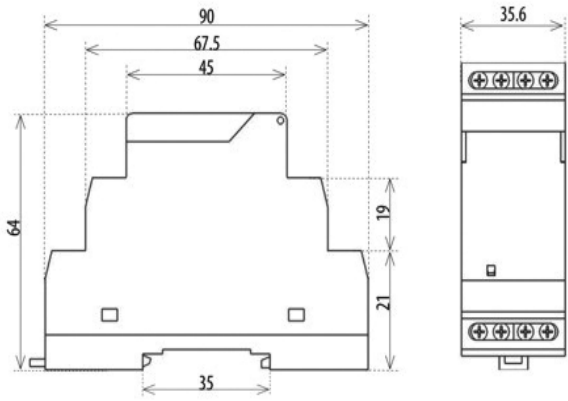
TZ-12 - Temperature sensor 12m, double isolation silicone

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

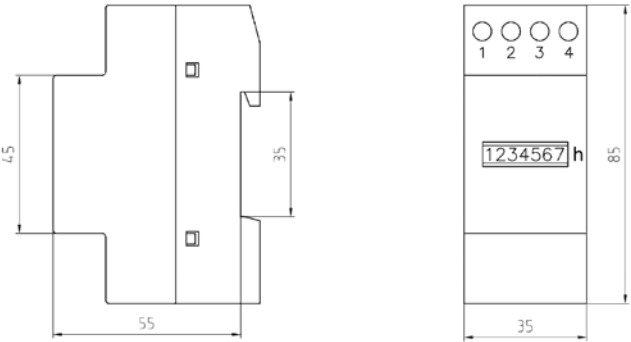
It is valid for following products: CRM-91H, CRM-2H, CRM-2T, HRN-33, HRN-34, HRN-35, TER-3

	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



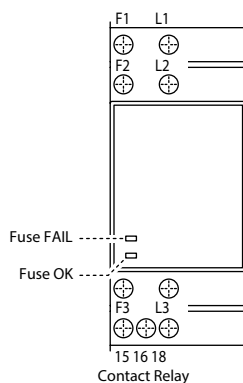
Technical data

Electronic fuse monitor EFM

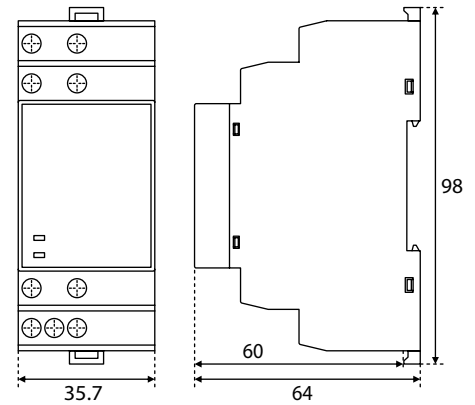
Technical data

		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		30x10³ ops / 100x10³ 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	

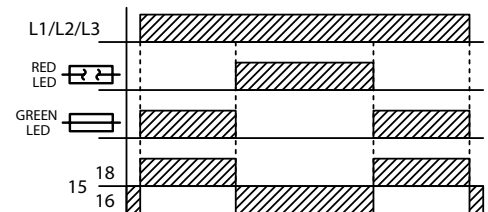
Description



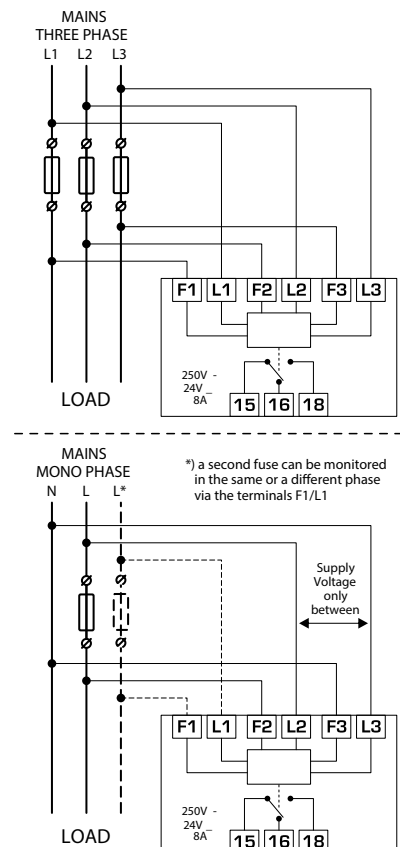
Dimensions



Function



Connection



Electromechanical power relays RERM3

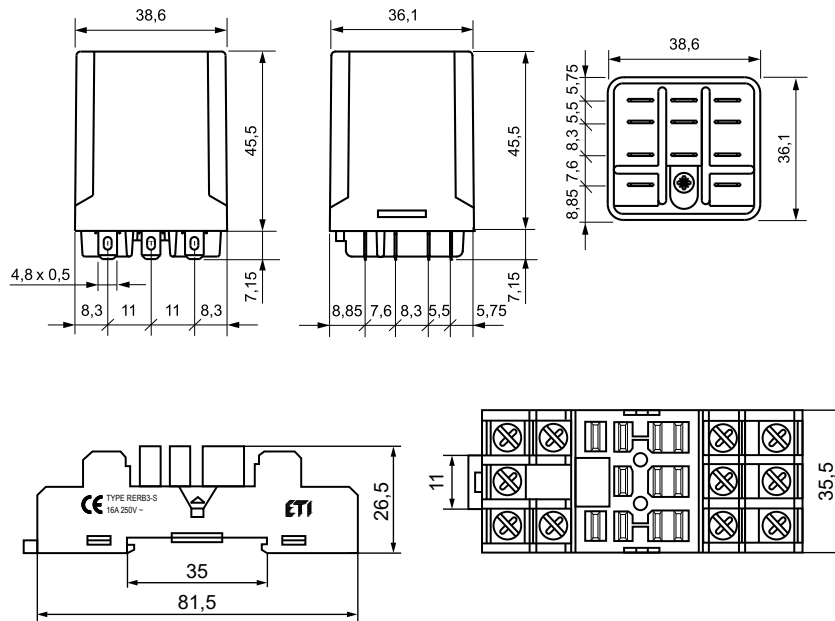
Table 1: Technical data		
		RERM3
Contact Data		
Number and type of contacts		3 CO
Contact material		AgNi
Rated / max. switching voltage AC		440 V
Min. switching voltage		5 V
Rated load (capacity)		16 A / 250 V AC 10 A / 400 V AC
Min. switching current		5 mA
Max. inrush current		40 A
Rated current		16 A
Max. breaking capacity AC1		4000 VA
Min. breaking capacity		0.3 W
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 ≥ 3 mm		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

Technical data

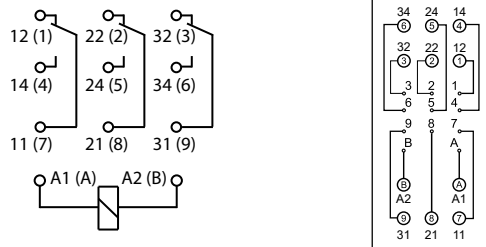
Table 2: Coil data

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	± 15%	19,2	26,4
230AC	230	7080	± 15%	184,0	253,0

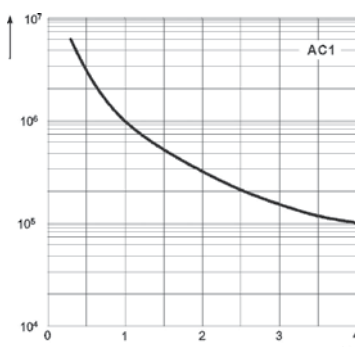
Dimensions



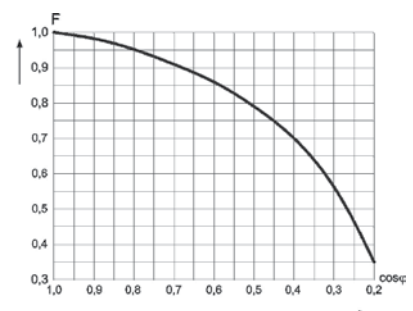
Connection diagram (pin side view)



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



Electrical life reduction factor at AC inductive load



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 50/60 Hz AC DC		See table 2	
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 0,9 W	
AC			
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
• cosØ		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	

Technical data

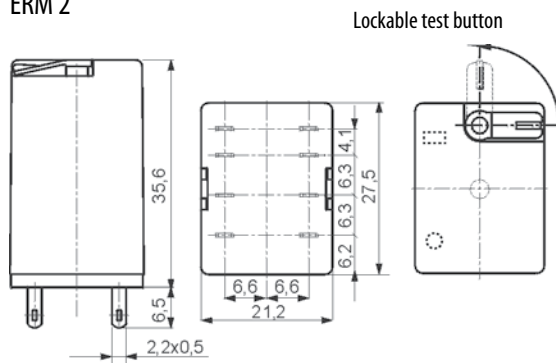
Table 2: Coil data

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)
012DC	12	160	$\pm 10\%$	9,6	21,6
024DC	24	640	$\pm 10\%$	19,2	43,2
048DC	48	2600	$\pm 10\%$	38,4	86,4
110DC	110	13600	$\pm 10\%$	88	198
220DC	220	54000	$\pm 10\%$	176	250

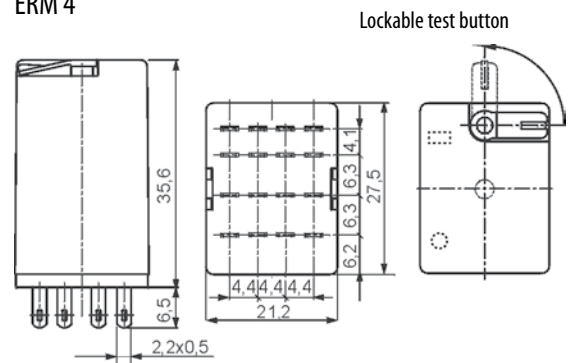
AC voltage version					
Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 20 °C)
024AC	24	158	$\pm 10\%$	19,2	25,3
230AC	230	16100	$\pm 10\%$	184,0	253

Dimensions

ERM 2

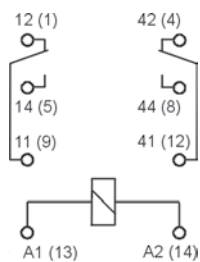


ERM 4

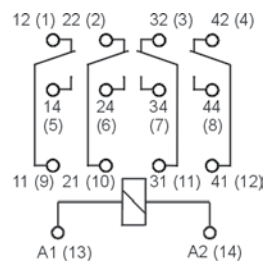


Connection diagram (pin side view)

ERM 2



ERM 4



Ordering designation

ERMX-YYYYYZ

X – Number of contacts:
4: 4 CO (4 changeover)
2: 2 CO (2 changeover)

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.

YYYYY – Coil code:
024AC: 24 V AC 50/60 Hz
230AC: 230 V AC 50/60 Hz
024DC: 24 V DC
012DC: 12 V DC

Meaning of color codes:

green - DC coils

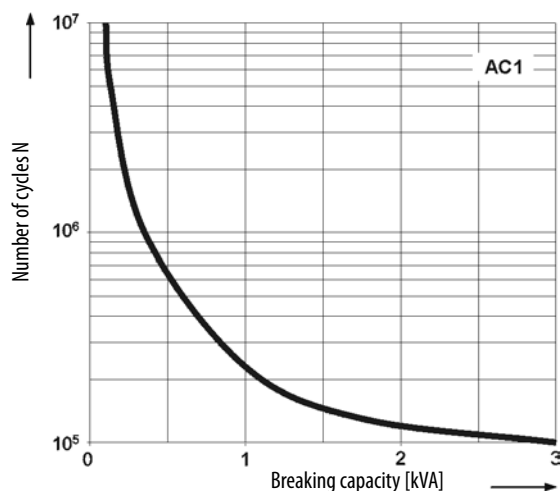


orange - AC coils

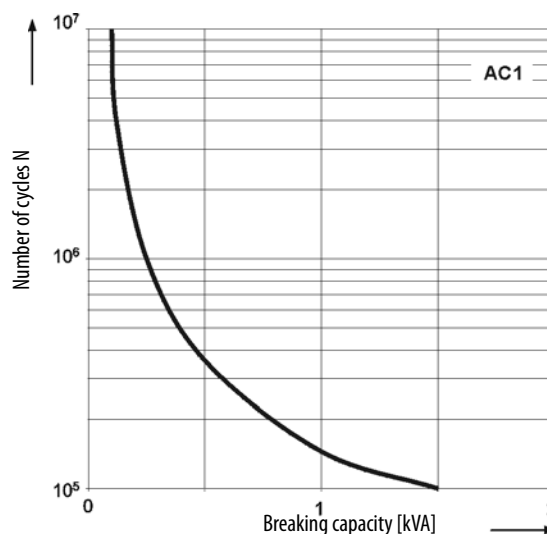
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

Fig. 1

ERM 2



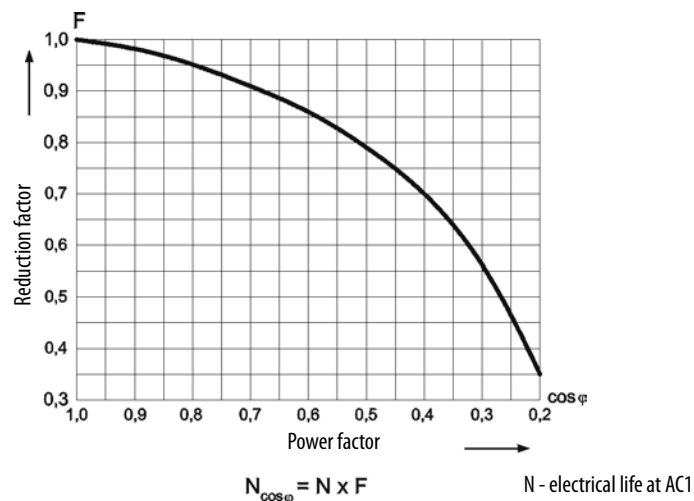
ERM 4



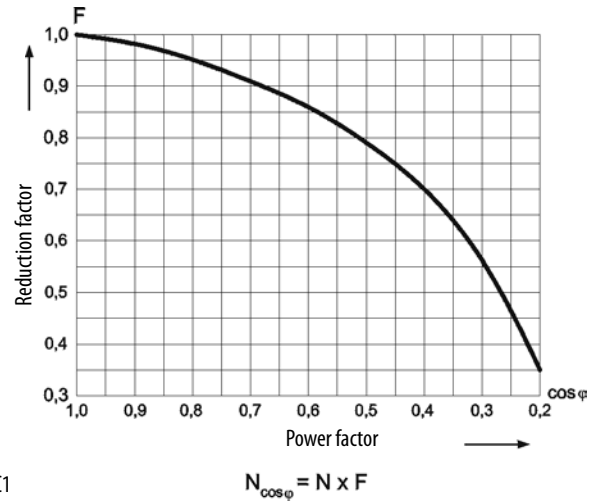
Electrical life reduction factor at AC inductive load

Fig. 2

ERM 2



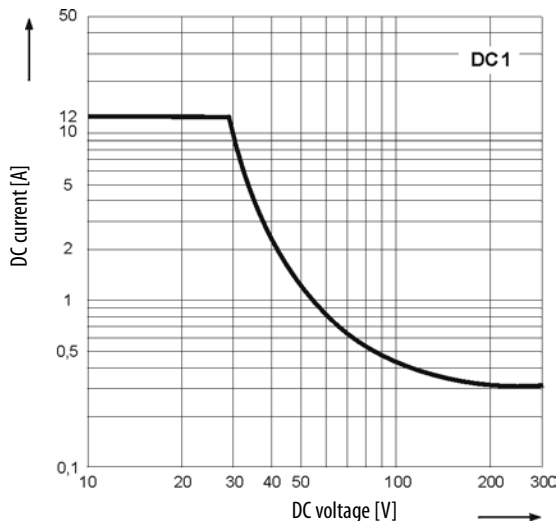
ERM 4



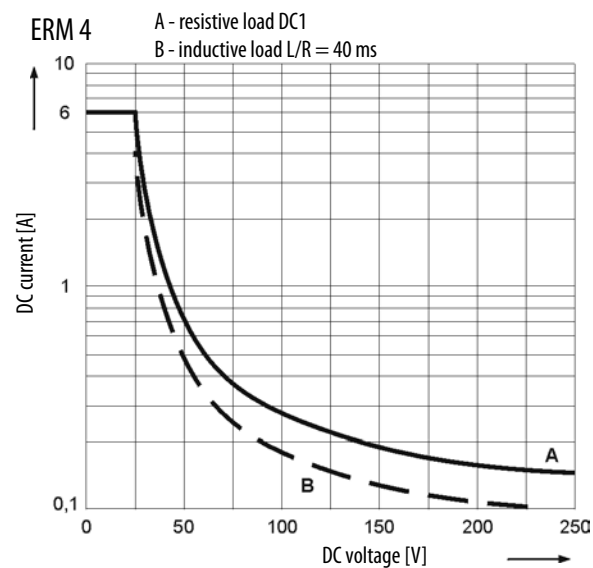
Max. DC resistive load breaking capacity

Fig. 3

ERM 2



ERM 4



Technical data

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
- 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
- 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**

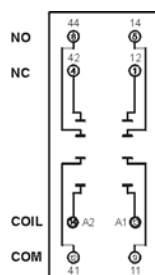
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 76,3 x 27 x 42,5(80) mm*

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

Two poles

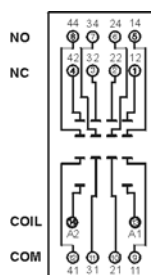
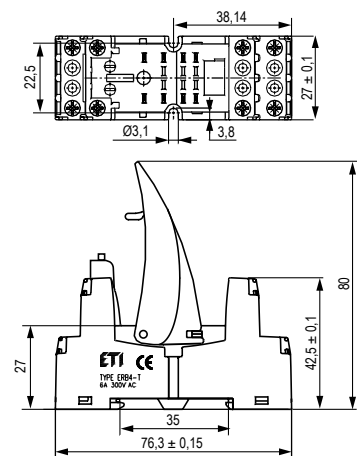
12A, 300 V AC

For ERM2

Connection diagram**Four poles**

6A, 300 V AC

For ERM4

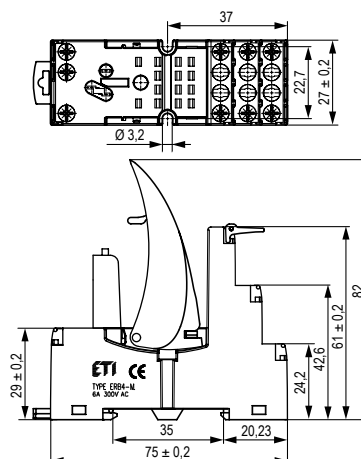
**Dimensions**

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.

Dimensions



Two poles

12A, 300 V AC

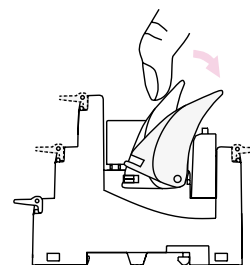
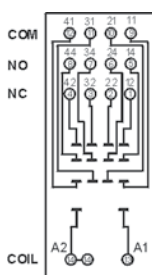
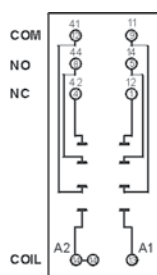
For ERM2

Four poles

6A, 300 V AC

For ERM4

Connection diagram



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	ERC-024AC
		110/240 V AC	ERC-230AC

Protection RC modules type ERC_ACDCL

It limits overvoltage on AC and DC coils. Coil energizing indication.		6...24 V ACDC	ERC-024ACDCL
		24...60 V AC DC	ERC-060ACDCL
		110...230 V ACDC	ERC-230ACDCL



Modules are parallely 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



Technical data

Miniature Electromagnetic Relays

Table 1: Technical data

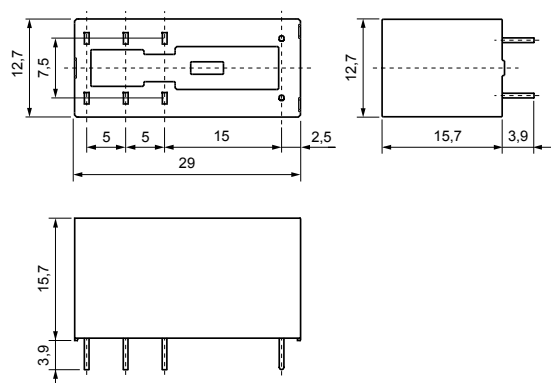
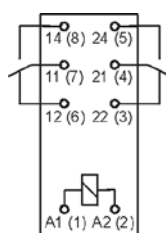
		MER2
Number and type of contacts		2 C0
Contact material		AgNi
Rated / max. switching voltage AC		250 V / 440 V
Min. switching voltage		5 V AgNi
Rated load (capacity)		
AC1		8 A / 250 V AC
AC15		3 A / 120 V 1,5 A / 240 V (B300)
AC3		550 W (single-phase motor)
DC1		8 A / 24 V DC (see Fig. 3)
DC13		0,22 A / 120 V 0,1 A / 250 V (R300)
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		12 ... 240 V
DC		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

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 $\varnothing 1,3 + 0,1$ mm		
• for sockets $\varnothing 1,5 + 0,1$ mm		

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

Fig. 1

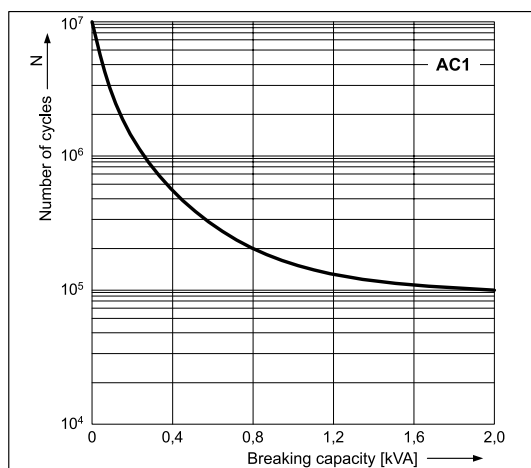
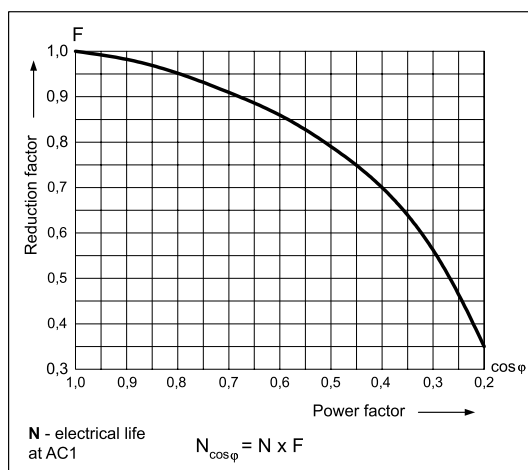
**Electrical life reduction factor at
AC inductive load**

Fig. 2



Max. DC resistive load breaking capacity

Fig. 3

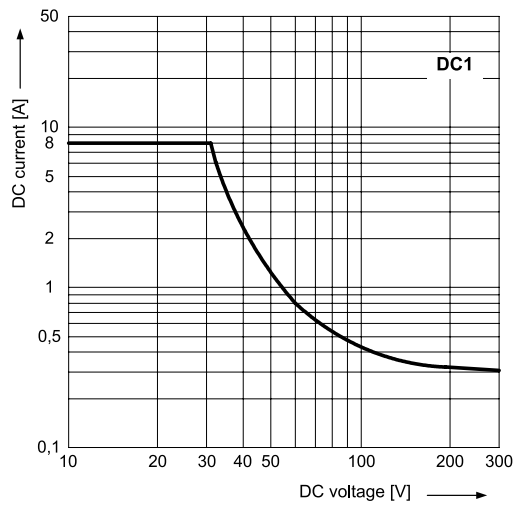
**Coil operating range = DC**

Fig. 4

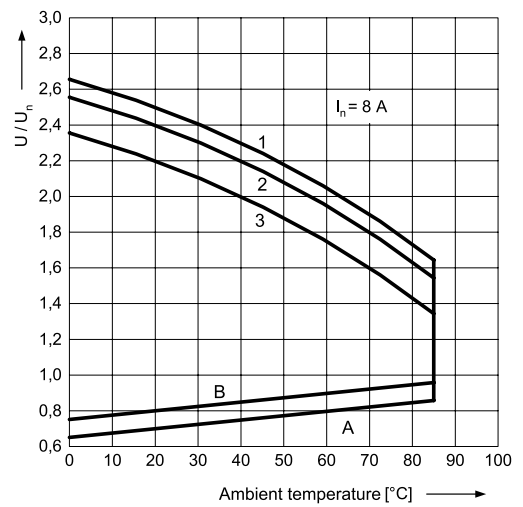
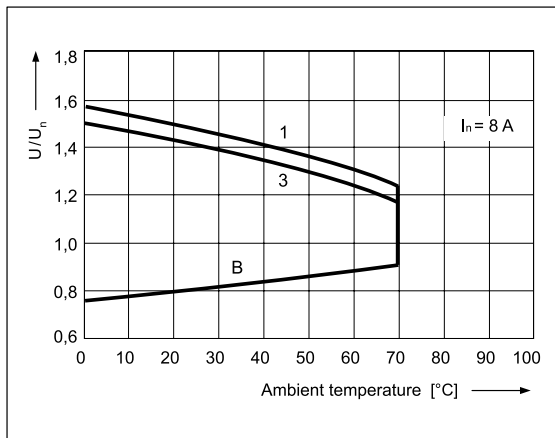
**Coil operating range = AC 50 Hz**

Fig. 5

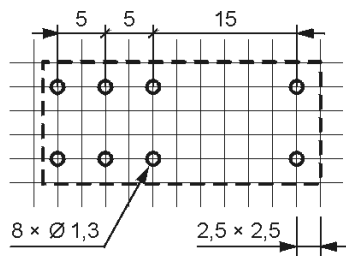
**Description of Fig. 4 and 5**

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

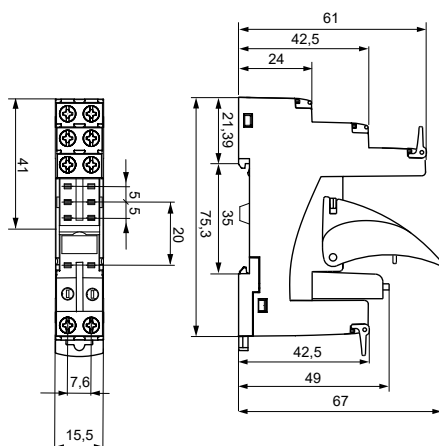
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 75,3 x 15,5 x 61 (67) mm*

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

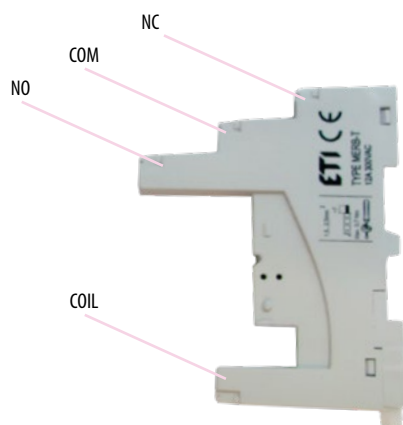
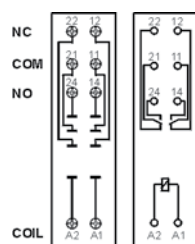
Two poles, 5mm pinout

12A, 300 V AC

Dimensions



Connection diagram



MERB-M

Plugin sockets (base) type M

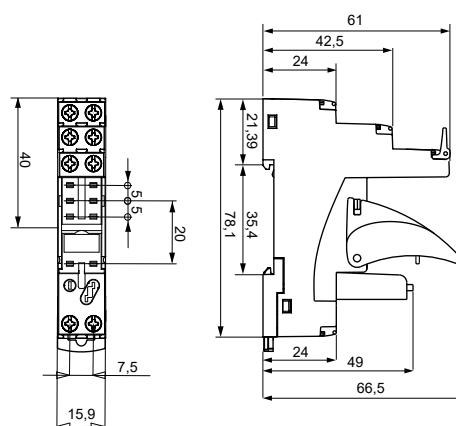
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 78,1 x 15,9 x 61 (66,5) mm*

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

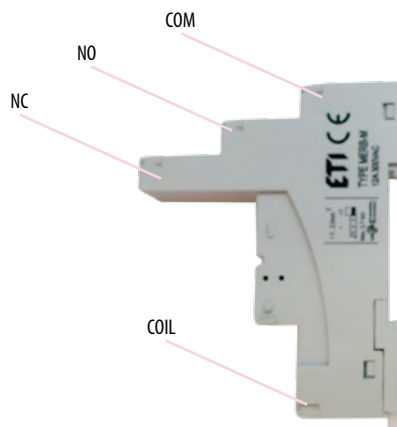
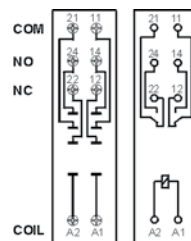
Two poles, 5mm pinout

12A, 300 V AC

Dimensions



Connection diagram



Technical data

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	AgSnO2	-
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	

Input data SER1

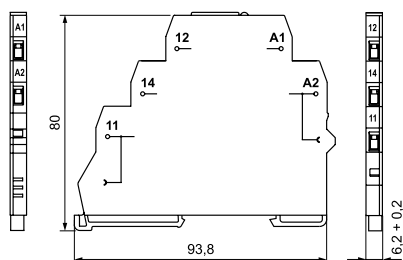
Interface relay code	Rated input voltage, Un	Power of input circuit	Input - voltage range, V	
			min. (20 °C)	max. (55 °C)
SER1-024ACDC	24 V AC/DC	0,5 VA / 0,5 W	19,2	26,4
SER1-230ACDC	230 V AC/DC	0,8 VA / 0,8 W	184,0	253,0

Input data SSR1

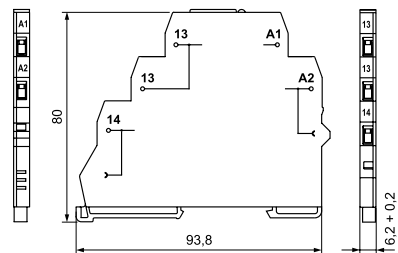
Interface relay code	Rated input voltage Un	Power of input circuit
SSR1-024ACDC	24 V AC/DC	0,3 VA / 0,3 W
SSR1-230ACDC	230 V AC/DC	1,6 VA / 1,6 W

Dimensions

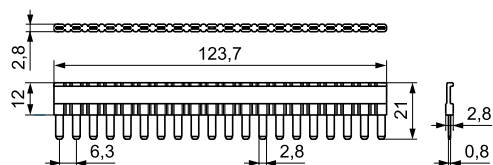
SER1-024ACDC / SER1-230ACDC



SSR1-024ACDC / SSR1-230ACDC

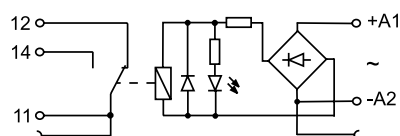


SR-TERMINAL

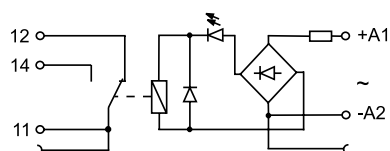


Connection diagram

SER1-024ACDC



SER1-230ACDC

SSR1-024ACDC
SSR1-230ACDC