RELAYS

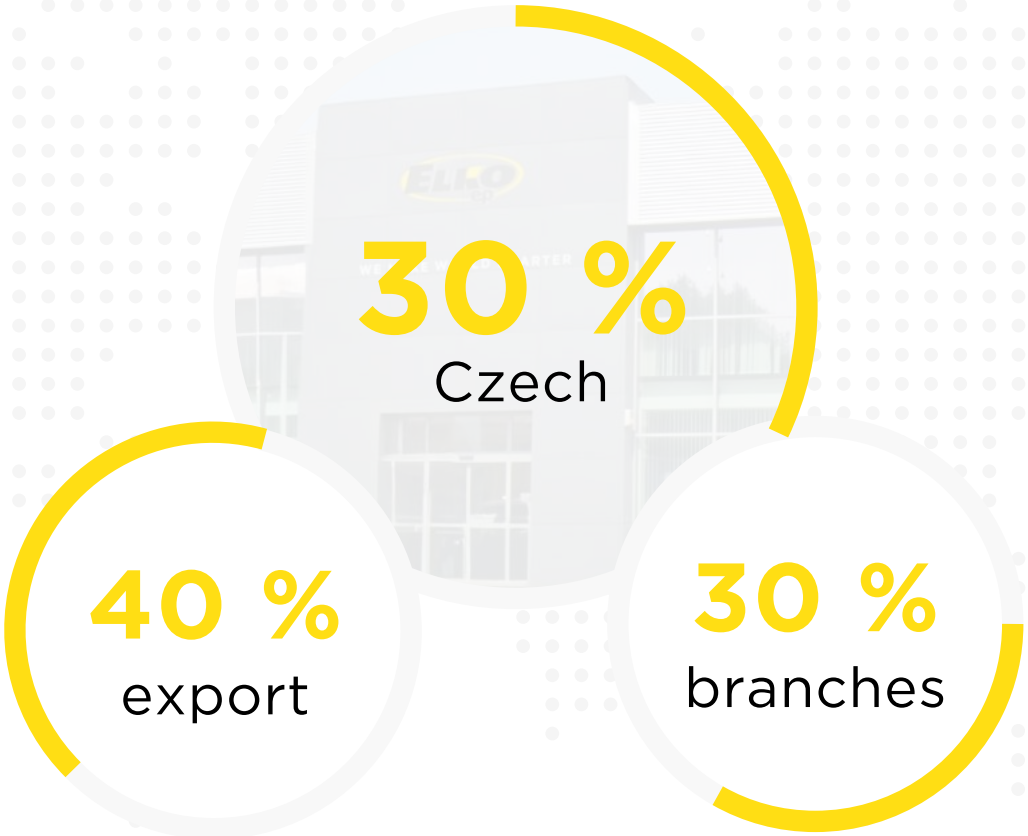
Modular electronic devices

www.elkoep.com

32 years of innovations

About us

ELKO EP have been your partner in the field for 32 years, developing and manufacturing the highest quality electronic devices for electroinstallation as well as smart system for residential and building automation.



ELKO EP employs more than 350 people across 17 foreign branches and exports its products to more than seventy countries. Company of the Year, Visionary of the Year, Superbrands and Global Exporter of the Year are just some of the awards we have received throughout the years as we consistently strive to move forward in the field of innovation and development. Millions of relays, thousands of smart homes, hundreds of buildings and many satisfied customers - This is ELKO EP; a traditional company based in the center of Europe, where own development, production, logistics, and service are at the forefront of our focus.

Facts and stats

WORLDWIDE
11 branches
6 franchises
70 export countries

350
employees
in holding

30 000 +
iNELS
installations

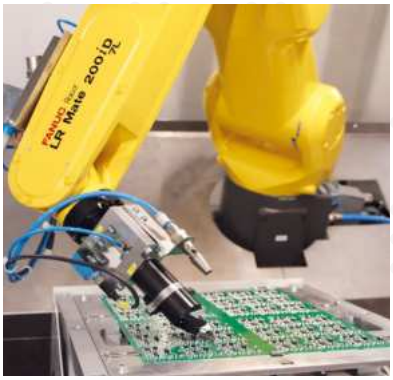
World leader
in DIN rail
relays
production

MANUFACTURER
fully automated
complete process

30 000 000 +
manufactured
products

R&D
continuosly
innovative

SUPPORT
24 / 7 / 365



WE MAKE WORLD SMARTER

www.elkoep.com

Product lines ELKO EP

Timers/Relays **www.elkoep.com/relays**

Time relays, auxiliary relays, installation contactors, memory and bistable relays, staircase switches, time switches, twilight and light switches, dimmers and light intensity controllers, power supplies and bell transformers, controlling and signalling devices.

Monitoring/Protection relays **www.elkoep.com/monitoring**

Voltage relays 1-phase and 3-phase (undervoltage, overvoltage, phase failure, phase asymmetry and phase sequence), current relays, liquid level relays, thermostats, voltage indicator, power factor and frequency monitoring relays.

iNELS Wireless

Wireless electro-installation iNELS **www.elkoep.com/wireless**

Components of smart wireless system can be easily and quickly used in existing buildings where it is not desirable to cut holes for cables (e.g. add/change a light switch when changing room layouts). However, it is also possible to assemble a complete system for apartment or house control, intelligent control of heating, blinds or scene settings. When using the eLAN-RF gateway, the entire installation can also be controlled by an application from a mobile phone, tablet or television.

Hotel Wireless Retrofit (HRESK) **www.elkoep.com/retrofit**

Hotel Room Energy Saving Kit - is a complete solution designed primarily for existing hotel rooms and is based on the iNELS Wireless system. It focuses on the following areas: "Energy savings": switching off all appliances when leaving the room or not overheating/not overcooling, "Comfort" - all out of bed and "Safety": bell, guest in the room, maid, visitor.

Smart kits **elkoep.com/smart-kits**

Smart Kits are pre-packaged sets of our most popular wireless control devices from the iNELS Wireless product range. The devices in the set are paired and ready for immediate assembly. Kits are divided according to their main functions, so customers can easily choose from the following categories: Wireless switch, Wireless dimming, Wireless shutter control and others.

iNELS BUS

Wired electro-installation iNELS **www.elkoep.com/wired**

The sensors and actuators, together with the central unit, which is the heart of the system, communicate via a 2-wires and enable the built up a larger installation for family houses, villas, hotels and buildings. Individual functions of elements are parameterized in iDM SW, so simple and more complex actions can be set.

Hospitality Hotel (GRMS) **www.elkoep.com/hospitality**

Guest Room Management System – is a comprehensive solution designed primarily for new hotels, guesthouses or wellness and is based on the iNELS BUS system. In the room, it resolves the control of lighting, access, temperature control and audio/video distribution. It features glass panels with touch buttons that can be combined in various ways (numbers, shape, and colours) and customized (description, logo).

DIM-7

Looking for a reliable and universal lighting control solution? The **DIM-7** dimmer is here for you! This powerful dimmer combines cutting-edge technology with simple operation and offers incredible flexibility. Whether it's for offices, commercial space or demanding industrial applications, the DIM-7 can handle it all – from classic bulbs to modern LED fixtures.

The **DIM-7** is more than just a dimmer – this smart, versatile, and future-proof solution redefines modern lighting control. Combining advanced technology, intuitive design, and robust performance, it transforms how you manage light. Whether upgrading an existing system or designing something new, this innovative device delivers the perfect blend of reliability, loadability, and ease of use. Discover the next level of lighting control – your light, your way.

- DALI bus
- 1-10 V interface
- 9 functions
- 2 000 VA
- Universal dimming

SMR-B-SL

The **SMR-B-SL** is a multifunction time relay for mounting inside the installation box (e.g. KU68), with screwless terminals - which makes installation easier, quicker and saves space in the box. It turns on the connected load for a set time based on the selected function and then turns it off . It is also suitable for switching inductive and capacitive loads (e.g. LED lights).

- Staircase switch
- Ventilation control
- Time range 100 ms - 10 days
- Galvanically separated input AC/DC 12 - 230 V
- Rated output 10 A, $AgSnO_2$

SOU-13 & TER-13

The **SOU-13/1** is used to automatically control connect load (e.g. lighting) according to the set switching logic and ambient intensity level, which is measured by an external sensor. Thanks to the integration of the time switch, it is possible to limit the function of the twilight switch or change the set brightness level to which the output should respond in real time.

The **TER-13/2** thermostat uses its external NTC sensors to measure temperature and based on selected function control connected load. Thanks to the integration of the time switch, it is possible to limit the function of the thermostat or change the set temperature to which the output should respond in real time.

- Built-in web server for setup and control via Wi-Fi
- Doesn't require a router or internet connection for setup
- Control device via internet over the world using WRC
- Time synchronization through NTP server
- Create backups and transfer them to new devices

Multifunction

CRM-161

- Functions: 6
- Range: 0.1s-10h
- Output: 1x chang. 8A
- Supply: AC 24-240V and DC 24V

Economy version of CRM-91H.
pg. 12

CRM-91H **CRM-92H** **CRM-93H**

- Functions: 10
- Range: 0.1s-10d
- Output: 1x chang. 16A (CRM-91H), 2x chang. 16A (CRM-92H), 1x chang. 16A + 2x chang. 8A (CRM-93H)
- Supply: AC/DC 12-240V; AC 230V

pg. 13

CRM-91H-SL

Like CRM-91H, but with screwless terminals.
pg. 14

CRM-93H-SL

Like CRM-93H, but with screwless terminals.
pg. 14

CRM-9S

Like CRM-91H, but with solid state output contact.
- Output: 1.5A (triac)

pg. 15

CRM-91HE

Like CRM-91H, but fine adjustment of the set range with an external potentiometer (frequent adjustment).
pg. 16

CRM-101

Relay for the automatic switching ON and OFF of electricity in rooms, using connected sensors (motion detector and magnetic door contact).
pg. 18

CRM-111H **CRM-112H** **CRM-113H**

- Functions: 11(CRM-111H), 10 (CRM-112H; CRM-113H)
- Range: 50ms-30d
- Output: 1x chang. 16A (CRM-111H), 2x chang. 16A (CRM-112H), 1x chang. 16A + 2x chang. 8A (CRM-113H)
- Supply: AC/DC 12-240V

CRM-112H; CRM-113H: mode selection of 2.; 3. contact.
pg. 20

CRM-121H

Like CRM-111H, but with galvanically separated control input and stirrup terminals.
pg. 22

CRM-131H

- Functions: 11
- Range: 50ms-30d
- Output: 1x chang. 16A
- Supply: AC/DC 12-240V
- 3x control input.

pg. 24

CRM-71TO

- Functions: 8
- Range: 0.1s-10m
- Output: 1x chang. 16A
- Supply: AC/DC 12-240V

Delayed opening after power disconnection.
pg. 26

CRM-72TO

Like CRM-71TO, but
- Output: 2x chang. 8A

pg. 26

Singlefunction, special

CRM-48

- Functions: 1
- Range: 10m-180m
- Output: 1x chang. 16A
- Supply: AC 230V

Semi-automatic testing of emergency lighting.
pg. 28

CRM-2T

- Functions: 1
- Range: ⅄ 0.1s-100d, Δ 0.1s-1s
- Output: 2x chang. 16A
- Supply: AC/DC 12-240V; AC 230V

Delayed start of star-delta motors.
pg. 29

CRM-2H

- Functions: 2
- Range: 0.1s-100d
- Output: 1x chang. 16A
- Supply: AC/DC 12-240V; AC 230V

Independent setting of pulse/gap time.
pg. 30

CRM-2HE

Like CRM-2H, but fine adj. of the set range with an external potentiometers (frequent adjustment).
pg. 31

CRM-181J **CRM-182J** **CRM-183J**

- Functions: 1
- Range: 0.1s-100h
- Output: 1x chang. 16A (CRM-181J), 2x chang. 16A (CRM-182J), 1x chang. 16A + 2x chang. 8A (CRM-183J)
- Supply: AC/DC 12-240V

Choice of 4 functions.
pg. 32

SJR-2

- Functions: 1
- Range: 0.1s-10d
- Output: 2x chang. 16A
- Supply: AC/DC 12-240V; AC 230V

For gradual switching of large loads.
pg. 34

To the installation box

SMR-B-SL

- Connection: 4-wire
- Functions: 10
- Range: 0.1s-10d
- Output: 1x chang. 10A
- Supply: AC 230V

It switches both inductive and capacitive loads (LEDs, energy-saving lamps). Galvanically separated control input operating in the range of AC 12-230V.
pg. 35

SMR-K

- Connection: 3-wire
- Functions: 9
- Range: 0.1s-10d
- Output: 1x triac 160VA
- Supply: AC 230V

Input current 3μA (parallel connection of LEDs and energy-saving lamps without glow lamps).
pg. 36

SMR-T

- Connection: 3-wire
- Functions: 9
- Range: 0.1s-10d
- Output: 1x triac 160VA
- Supply: AC 230V

Input current 3mA (can be used with glow lamps, but parallel connection of loads is only possible with higher power consumption).
pg. 36

SMR-H

Like SMR-T, but
- Connection: 4-wire
- Output: 1x triac 200VA

pg. 36

SMR-B

Like SMR-B-SL, but
- Output: 1x chang. 16A

Galvanically separated control input operating in the range of AC 5-230V.
pg. 36

Digital

CRM-100

- Functions: 18
- Range: 0.1s-999h
- Output: 1x chang. 8A
- Supply: AC/DC 24-240V

pg. 38

PDR-2A

- Functions: 16
- Range: 0.01s-100h
- Output: 2x chang. 16A
- Supply: AC/DC 12-240V

Independent setting of pulse/gap time. START and STOP control input.

pg. 40

PDR-2B

- Functions: 10
- Range: 0.01s-100h
- Output: 2x chang. 16A
- Supply: AC/DC 12-240V

Function setting for each channel separately. START control input for each channel separately.

pg. 40

PLUG-IN

PTRM-216TP

- Functions: 10
- Range: 50ms-30d
- Output: 2x chang. 16A
- Supply: AC/DC 12-240V
- Voltage-dependent control input.

Mode selection of 2. contact and fine adjustment of set range using a small dial.

pg. 42

PTRM-216KP

Like PTRM-216TP, but fine adjustment of set range using a big knob.

pg. 42

PTRM-216T

- Functions: 10
- Range: 50ms-30d
- Output: 2x chang. 16A
- Supply: AC/DC 12-240V
- Potential-free control input.

Mode selection of 2. contact and fine adjustment of set range using a small dial.

pg. 43

PTRM-216K

Like PTRM-216T, but fine adjustment of set range using a big knob.

pg. 43

PTRA-216T

- Functions: 10
- Range: 50ms-30d
- Output: 2x chang. 16A
- Supply: AC/DC 12-240V
- 3x control input

Mode selection of 2. contact and fine adjustment of set range using a small dial.

pg. 44

PTRA-216K

Like PTRA-216T, but fine adjustment of set range using a big knob.

pg. 44

Staircase switches

CRM-4

- Connection: 3/4-wire
- Functions: 1
- Range: 30s-10m
- Output: 1x chang. 16A
- Supply: AC 230V

pg. 45

CRM-47

- Connection: 3/4-wire
- Functions: 4
- Range: 30s-10m
- Output: 1x clos. 16A
- Supply: AC 230V

Optional signaling before contact opening and possibility of extending the delay by the number of times the cont. input is pressed.

pg. 46

DIM-2

- Functions: 1
- Range: 40s/1h+20m
- Load: R-L-LED[1]
- Output: 1x triac 500VA
- Supply: AC 230V

Adjustable dim-up, lighting, dim-down time and brightness thanks to the dimming option.

pg. 84

Accessories

1-MODULE

Potentiometer for CRM-91HE

External control element - 5 kΩ, (linear), mounting into the panel, max. connection length 10 m (32.8 ft.).
EAN code: 8595232367967

Potentiometer for CRM-2HE

External control element - 10 kΩ, (linear), mounting into the panel, max. connection length 10 m (32.8 ft.).
EAN code: 8595232367981

Potentiometer for CRM-91HE + CRM-2HE

External control element - 47 kΩ, (linear), mounting into the panel, max. connection length 10 m (32.8 ft.).
EAN code: 8595232125215

Comb busbar CB-17-8

Serves for mass connection of up to eight power supply contacts A1 or A2, suitable for all relays with a width of 17.5 mm (0.69˝) (1-MODULE), pack of 10 pcs.
EAN code: 8598188181892

	CRM-161	CRM-91H, CRM-91H-SL	CRM-92H	CRM-93H, CRM-93H-SL	CRM-9S	CRM-91HE	CRM-111H	CRM-112H	CRM-113H	CRM-121H	CRM-131H	CRM-71TO	CRM-72TO	CRM-2T	CRM-181J ZR; ZN; BL; OD	CRM-182J ZR; ZN; BL; OD	CRM-183J ZR; ZN; BL; OD	CRM-2H	CRM-2HE	SJR-2	PTRM-216TP	PTRM-216KP	PTRM-216T	PTRM-216K	PTRA-216T	PTRA-216K	CRM-100	PDR-2/A	PDR-2/B	CRM-4	CRM-47	CRM-48	SMR-K	SMR-T	SMR-H	SMR-B	SMR-B-SL
Design																																				
1-MODULE	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							●			●	●	●					
3-MODULE																												●	●								
PLUG-IN																					●	●	●	●	●	●											
Under the switch																																	●	●	●	●	●
Control elements																																					
Rotary switches/potentiometers	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●					●	●	●	●	●	●	●	●
Large rotary knob																						●		●		●											
Buttons																											●	●	●								
External potentiometer						●																●															
Time range																																					
50 ms – 0.5 s							●	●	●	●	●										●	●	●	●	●	●											
0.1 – 1 s	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●
1 – 10 s	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●
3 – 30 s															●	●	●																				
0.1 – 1 min	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●
1 – 10 min	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●
3 – 30 min														●	●	●																					
0.1 – 1 h	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●
1 – 10 h	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●							●	●	●	●	●
3 – 30 h															●	●	●																				
0.1 – 1 d		●	●	●	●	●	●	●	●	●	●			●				●	●	●	●	●	●	●	●	●							●	●	●	●	●
1 – 10 d															●	●	●																				
10 – 100 h		●	●	●	●	●	●	●	●	●	●			●				●	●	●	●	●	●	●	●	●							●	●	●	●	●
3 – 30 d							●	●	●	●	●			●				●	●		●	●	●	●	●	●											
10 – 100 d														●				●	●																		
0.5 – 10 min																														●	■						
0.01s – 100 h																												●	●								
0.1s – 999 h																											●										
Supply voltage																																					
AC 230 V		□		□										●				●		●								●	●	●	●	●	●	●	●	●	
AC/DC 12–240 V		●		●	●	●	●		●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●		●	●								
AC 24–240 V, DC 24 V	●																																				
AC/DC 24–240 V																											●										
Output contact																																					
1× changeover 8 A	●																										●										
1× changeover 16 A		●				●	●			●	●	●			●			●	●											●		●					
2× changeover 8 A													●																								
2× changeover 16 A			●					●						●		●				●	●	●	●	●	●	●		●	●								
1× switching 10 A																																					●
1× switching 16 A																															●					●	
1× changeover 16 A, 2× changeover 8 A				●					●								●																				
Solid state (triac)					●																												●	●	●		

□ only for CRM-91H, CRM-93H

■ with the option of extending it to 30 min

Functions	CRM-161	CRM-9xH, CRM-9xH-SL	CRM-9S, CRM-91HE	CRM-101	CRM-111H, CRM-121H	CRM-112H, CRM-113H	CRM-131H	CRM-7xTO	CRM-2T	CRM-18xJ ZR	CRM-18xJ ZN	CRM-18xJ BL	CRM-18xJ OD	CRM-2H, CRM-2HE	SJR-2	PTRM-216x, PTRM-216xP	PTRA-216x	CRM-100	PDR-2/A	PDR-2/B	CRM-4	CRM-47	CRM-48	SMR-T, SMR-K, SMR-H	SMR-B, SMR-B-SL
ON DELAY	●	●	●		●	●				●						●		●	●	●					
ON DELAY with Inhibit					●	●				●						●		●							
ON DELAY with Inhibit, inverted																		●							
ON DELAY with Control Signal	●																								●
ON DELAY with Control Signal 2																		●						●	●
ON DELAY with Control Signal 2, inverted																		●							
ON DELAY with Control Signal 3, inverted																		●							
ON DELAY / 3× Control Signal							●										●								
2× ON DELAY															●										
INTERVAL ON	●	●	●		●	●					●					●		●	●	●					
INTERVAL ON with Inhibit					●	●					●					●		●							
INTERVAL ON / 3× Control Signal							●										●								
TRUE INTERVAL ON								●																	
TRUE INTERVAL ON 2								●																	
FLASHER - ON first	●	●	●		●	●						●				●			●	●					
FLASHER - ON first with Inhibit												●													
FLASHER - ON first with Control Signal																								●	●
FLASHER - ON first / 3× Control Signal							●										●								
ASYMMETRIC FLASHER - ON first														●				●	●						
FLASHER - OFF first		●	●		●	●										●			●	●					
FLASHER - OFF first with Control Signal																								●	●
FLASHER - OFF first / 3× Control Signal							●										●								
ASYMMETRIC FLASHER - OFF first														●				●	●						
OFF DELAY	●	●	●		●	●							●			●		●							
OFF DELAY / 3× Control Signal							●										●								
OFF DELAY 2																			●	●					
OFF DELAY 3																			●	●					
OFF DELAY 4																								●	●
TRUE OFF DELAY								●																	
TRUE OFF DELAY 2								●																	
SINGLE SHOT rising edge		●	●		●	●										●		●	●	●					
SINGLE SHOT rising edge, programmable																								●	●
SINGLE SHOT rising edge, inverted																			●	●					
SINGLE SHOT rising edge / 3× Control Signal							●										●								
SINGLE SHOT rising edge 2																		●							
WATCHDOG					●	●										●									
WATCHDOG / 3× Control Signal							●										●								
SINGLE SHOT falling edge		●	●															●	●	●				●	●
SINGLE SHOT falling edge, inverted																			●	●					
SINGLE SHOT falling edge 2																		●							
TRUE SINGLE SHOT falling edge								●																	
TRUE SINGLE SHOT falling edge 2								●																	
MEMORY LATCH		●	●		●	●										●									
MEMORY LATCH with Delay	●				●																			●	●
MEMORY LATCH with Delay / 3× Control Signal							●																		
PULSE GENERATOR (0.5s)		●	●		●	●										●									
PULSE GENERATOR with Inhibit (0.5s)					●	●										●									
PULSE GENERATOR (0.5s) / 3× Control Signal							●										●								
ASYMMETRIC PULSE GENERATOR																			●						
ASYMMETRIC PULSE GENERATOR 2																		●							
ON/OFF DELAY		●	●		●	●										●									
ON/OFF DELAY 2																		●							
ON/OFF DELAY 3																								●	●
ON/OFF DELAY 4																								●	●
ON/OFF DELAY / 3× Control Signal							●										●								
ASYMMETRIC ON/OFF DELAY																			●						
INTERVAL ON/OFF					●	●										●									
INTERVAL ON/OFF 2																		●							
INTERVAL ON/OFF / 3× Control Signal							●										●								
ASYMMETRIC INTERVAL ON/OFF																			●						
TRUE INTERVAL ON/OFF								●																	
TRUE INTERVAL ON/OFF 2								●																	
STAIRCASE SWITCH																					●				
STAIRCASE SWITCH, programmable without signalization																						●			
STAIRCASE SWITCH, programmable with signalization																						●			
STAR/DELTA									●										●						
EMERGENCY LIGHT TESTER																							●		
ENERGY SAVING				●																					

CRM-161 | Multifunction time relay - economy version

c UL us LISTED E308660

EAN code
CRM-161: 8595188181617

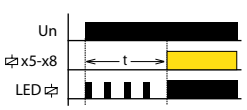
- Multifunction economy version of time relay for universal use in automation, control and regulation or in house installations.
- Universal supply voltage: AC 24 – 240 V (AC 50/60 Hz) and DC 24 V.
- Comfortable and well-arranged function and time-range setting by rotary switches.
- Time scale 0.1 s - 10 hrs divided into 6 ranges: (0.1 s - 1 s/1 s - 10 s/0.1 min - 1 min/1 min - 10 min/0.1 hrs - 1 h/1 h - 10 hrs).
- Output contact: 1x changeover/SPDT 8 A.
- Multifunction red LED flashes or shines depending on the operating status.

Technical parameters	CRM-161
Power supply	
Supply terminals:	A1-A2
Supply voltage:	AC 24 - 240 V | DC 24 V (AC 50-60 Hz)
Consumption (max.):	2 VA/1.5 W
Supply voltage tolerance:	–15 %; +10 %
Time circuit	
Number of functions:	6
Time ranges:	0.1 s - 10 h
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 (0.01 %/°F, at = 68 °F)
Output	
Contact type:	1x changeover/SPDT (AgNi)
Current rating:	8 A/AC1; PD. B300
Breaking capacity:	2000 VA/AC1, 192 W/DC
Switching voltage:	AC 250 V/DC 24 V
Power dissipation (max.):	0.6 W
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Control	
Control terminals:	A1-S
Load between S-A2:	Yes
Impulse length:	min. 25 ms/max. unlimited
Reset time:	max. 150 ms
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:	AC 4kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel/IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm^2):	solid wire max. 1x 2.5 or 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)
Dimensions:	90 × 17.6 × 64 mm (3.5˝ × 0.7˝ × 2.5˝)
Weight:	62 g (2.2 oz)
Standards:	EN 61812-1

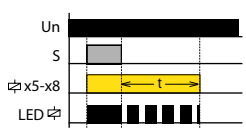
Indication of operating states

Signaling example:

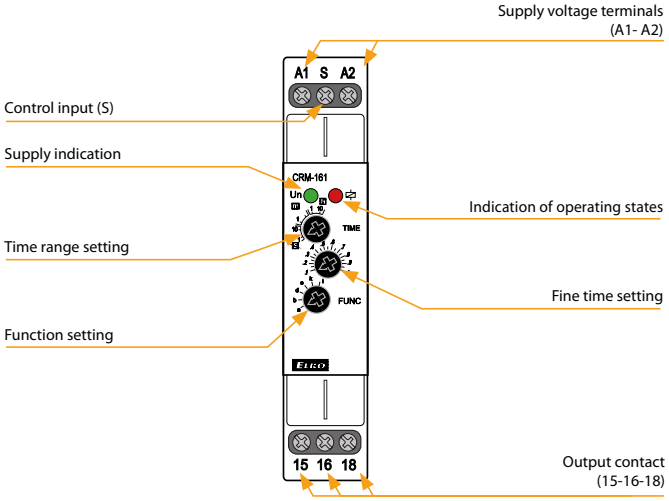
Function a



Function e



Description

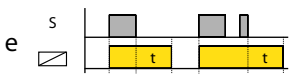


Functions

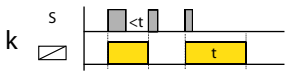
ON DELAY

INTERVAL ON

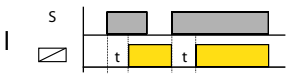
FLASHER - ON first



OFF DELAY

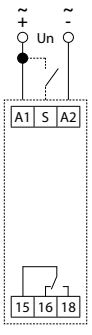


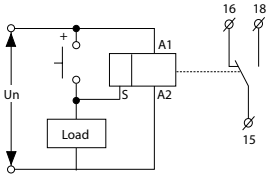
MEMORY LATCH with Delay



ON DELAY with Control Signal

Connection





Possibility to connect load onto controlling input

It is possible to connect the load (e.g.: contactor) between terminals S-A2, without any interruption of correct relay function.

UNI only

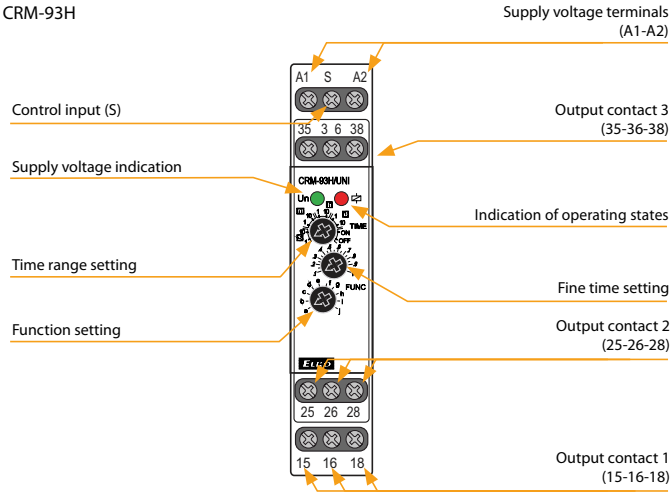
EAN code
CRM-91H/230V: 8595188112444
CRM-91H/UNI: 8595188112420
CRM-92H/UNI: 8595188176897
CRM-93H/230V: 8595188112789
CRM-93H/UNI: 8595188112468

- Multifunction time relay for universal use in automation, control and regulation or in house installations.
- Comfortable and well-arranged function and time-range setting by rotary switches.
- Multifunction red LED flashes or shines depending on the operating status.

Technical parameters		CRM-91H	CRM-92H	CRM-93H
Power supply				
Supply terminals:		A1-A2		
Supply voltage:	UNI	AC/DC 12 – 240 V (AC 50-60 Hz)		
Consumption (max.):	UNI	2 VA/1.5 W	2.5 VA/1.5 W	2.5 VA/1.5 W
Supply voltage:	230	AC 230 V (50-60 Hz)		
Consumption (max.):	230	3 VA/1.4 W	x	4 VA/2 W
Supply voltage tolerance:		–15 %; +10 %		
Time circuit				
Number of functions:		10		
Time ranges:		0.1 s – 10 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 (0.01 %/°F, at = 68 °F)		
Output				
Contact type 1:		1× changeover/SPDT (AgNi)		
Current rating:		16 A/AC1; PD. B300		
Breaking capacity:		4000 VA/AC1, 384 W/DC1		
Electrical life (AC1):		100.000 ops.		
Contact type 2 (3):		x	1× chang./SPDT (AgNi)	2× chang./DPDT (AgNi)
Current rating:		x	16 A/AC1; PD. B300	8 A/AC1; PD. B300
Breaking capacity:		x	4000 VA/AC1, 384 W/DC1	2000 VA/AC1, 192 W/DC1
Electrical life (AC1):		x	100.000 ops.	50.000 ops.
Switching voltage:		250 V AC/24 V DC		
Power dissipation (max.):		1.2 W	2.4 W	2.4 W
Mechanical life:		10.000.000 ops.		
Control				
Control terminals:		A1-S		
Load between S-A2:		Yes		
Impulse length:		min. 25 ms/max. unlimited		
Reset time:		max. 150 ms		
Other information				
Operating temperature:		–20 .. +55 °C (–4 .. 131 °F)		
Storage temperature:		–30 .. +70 °C (–22 .. 158 °F)		
Dielectric strength:				
supply – output 1		AC 4 kV		
supply – output 2 (3)		x	AC 4 kV	AC 1 kV
output 1 – output 2		x	AC 4 kV	AC 1 kV
output 2 – output 3		x	x	AC 1 kV
Operating position:		any		
Mounting:		DIN rail EN 60715		
Protection degree:		IP40 front panel/IP20 terminals		
Overvoltage category:		III.		
Pollution degree:		2		
Cross-wire section – solid/ stranded with ferrule (mm^2):		max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 12)		
Dimensions:		90 × 17.6 × 64 mm (3.5˝ × 0.7˝ × 2.5˝)		
Weight:		UNI - 62 g (2.2 oz)	UNI - 85 g (3 oz)	UNI - 85 g (3 oz)
		230 - 57 g (2 oz)	x	230 - 80 g (2.8 oz)
Standards:		EN 61812-1		

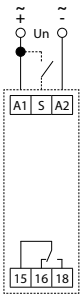
Description

CRM-93H

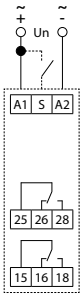


Connection

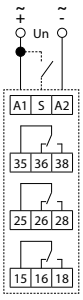
CRM-91H



CRM-92H



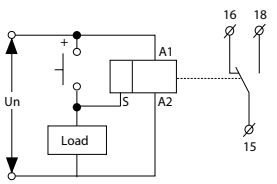
CRM-93H



CRM-93H:
The potential difference between the supply terminals (A1-A2), output contact 2 (25-26-28) and output contact 3 (35-36-38) must be a maximum of AC rms/DC 250V.

Possibility to connect load onto controlling input

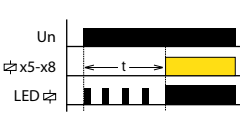
It is possible to connect the load (e.g.: contactor) between terminals S-A2, without any interruption of correct relay function.



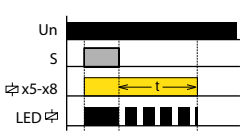
Indication of operating states

Signaling example:

Function a



Function e



Function

Function (page 17).

CRM-91H-SL, CRM-93H-SL | Multifunction time relays - screwless terminals

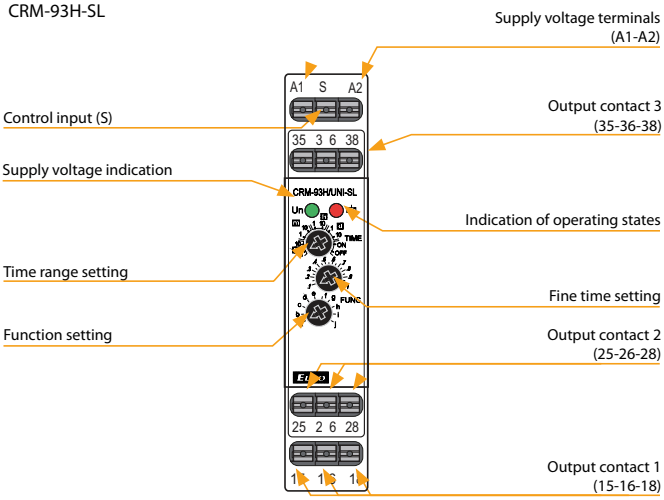
EAN code
CRM-91H/UNI-SL: 8595188184816
CRM-93H/UNI-SL: 8595188184823

- Multi-function time relay for universal use in automation, control and regulation or in house installations
- Universal supply voltage AC/DC 12 – 240V
- Easy connection with screw-less terminals
- Comfortable and well-arranged function and time-range setting by rotary switches.
- Time scale 0.1 s - 10 days divided into 10 ranges:
  (0.1 s - 1 s / 1 s - 10 s / 0.1 min - 1 min / 1 min - 10 min / 0.1 hrs - 1 h / 1 h - 10 hrs / 0.1 day - 1 day / 1 day - 10 days / only ON / only OFF)
- Output contact:
  CRM-91H-SL: 1x changeover / SPDT 16A
  CRM-93H-SL: 1x changeover / SPDT 16A, 2x changeover / DPDT 8A
- Multifunction red LED flashes or shines depending on the operating states

Technical parameters	CRM-91H-SL	CRM-93H-SL
Power supply		
Supply terminals:	A1-A2	
Supply voltage:	AC/DC 12 – 240 V (AC 50-60 Hz)	
Consumption (max.):	2 VA/1.5 W	2.5 VA/1.5 W
Supply voltage tolerance:	–15 %; +10 %	
Time circuit		
Number of functions:	10	
Time ranges:	0.1 s – 10 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 (0.01 %/°F, at = 68 °F)	
Output		
Output contact 1:	1× changeover/SPDT (AgNi)	
Current rating:	16 A/AC1; PD. B300	
Breaking capacity:	4000 VA/AC1, 384 W/DC1	
Electrical life (AC1):	100.000 ops.	
Output contact 2 (3):	x	2× chang./DPDT (AgNi)
Current rating:	x	8 A/AC1; PD. B300
Breaking capacity:	x	2000 VA/AC1, 192 W/DC
Electrical life (AC1):	x	50.000 ops.
Switching voltage:	250 V AC/24 V DC	
Power dissipation (max.):	1.2 W	2.4 W
Mechanical life:	10.000.000 ops.	
Control		
Control terminals:	A1-S	
Load between S-A2:	Yes	
Impulse length:	min. 25 ms / max. unlimited	
Reset time:	max. 150 ms	
Other information		
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)	
Dielectric strength:		
supply – output 1	4 kV AC	
supply – output 2 (3)	x	1 kV AC
output 1 – output 2	x	1 kV AC
output 2 – output 3	x	1 kV AC
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP40 front panel / IP20 terminals	
Overvoltage category:	III.	
Pollution degree:	2	
Connected wire cross-section (mm^2):	solid wire max. 1× 2.5, 2× 1.5/ with sleeve max. 1× 2.5 (AWG 12)	
Dimensions:	90 × 17.6 × 64 mm (3.5″ × 0.7″ × 2.5″)	
Weight:	58 g (1.86 oz)	
Standards:	EN 61812-1	

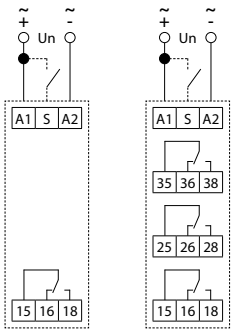
Description

CRM-93H-SL



Connection

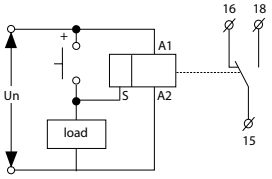
CRM-91H-SL CRM-93H-SL



CRM-93H-SL:
The potential difference between the supply terminals (A1-A2), output contact 2 (25-26-28) and output contact 3 (35-36-38) must be a maximum of 250V AC rms/DC.

Possibility to connect load onto controlling input

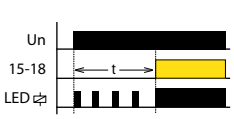
It is possible to connect the load (e.g.: contactor) between terminals S-A2, without any interruption of correct relay function.



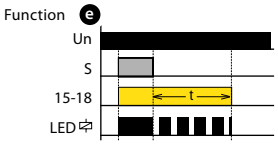
Indication of operating states

Signaling examples:

Function a



Function e



Function

Function (page 17).

CRM-9S | Multifunction time relay - solid state output

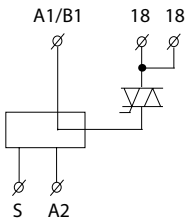
EAN code
CRM-9S: 8595188116008

- Multifunction time relay for universal use in automation, control and regulation or in house installations
- Universal supply voltage AC/DC 12 – 240 V
- Noiseless switching output
- Comfortable and well-arranged function and time-range setting by rotary switches.
- Time scale 0.1 s - 10 days divided into 10 ranges:
  (0.1 s - 1 s / 1 s - 10 s / 0.1 min - 1 min / 1 min - 10 min / 0.1 hrs - 1 h / 1 h - 10 hrs / 0.1 day - 1 day / 1 day - 10 days / only ON / only OFF)
- Output contact: 1× static contactless output (triac) 1.5 A, switches potential A1
- Multifunction red LED flashes or shines depending on the operating states

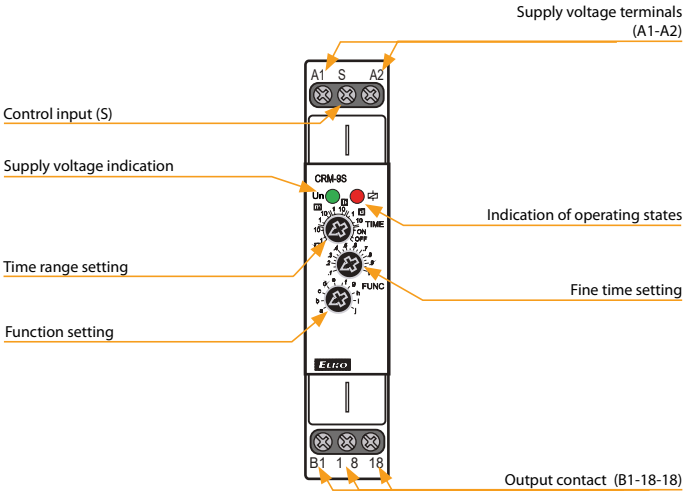
Technical parameters	CRM-9S
Power supply	
Supply terminals:	A1-A2
Supply voltage:	AC/DC 12 – 240 V (AC 50-60 Hz)*
Consumption (max.):	3 VA/0.7 W
Supply voltage tolerance:	–15 %; +10 %
Time circuit	
Number of functions:	10
Time ranges:	0.1 s – 10 days
Time setting:	rotary switch and potentiometer
Time deviation:	5 % – mechanical setting
Repeat accuracy:	0.2 % – set value stability
Temperature coefficient:	0.01 %/°C, at = 20 °C (0.01 %/°F, at = 68 °F)
Output	
Contact type:	1× static contactless output (triac)
Current rating:	1.5 A/AC1
Breaking capacity:	375 VA/AC1
Inrush current:	60 A/< 10 ms
Switching voltage:	250 V AC
Power dissipation (max.):	1.4 W
Voltage drop across switch:	max. 0.9 V/Imax.
Load to terminal B1:	Yes/Imax. 1.5 A
Electrical lifetime (AC1):	100.000.000 ops.
Control	
Control terminals:	A1-S
Load between S-A2:	Yes
Impulse length:	min. 25 ms/max. unlimited
Reset time:	max. 150 ms
Other information	
Operating temperature:	–20 .. +55 °C
Storage temperature:	–30 .. +70 °C
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel/IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/ stranded with ferrule (mm^2):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 12)
Dimensions:	90 × 17.6 × 64 mm (3.5˝ × 0.7˝ × 2.5˝)
Weight:	55 g (1.95 oz)
Standards:	EN 61812-1

** Load can only be connected to AC voltage, see connection diagram 2.*

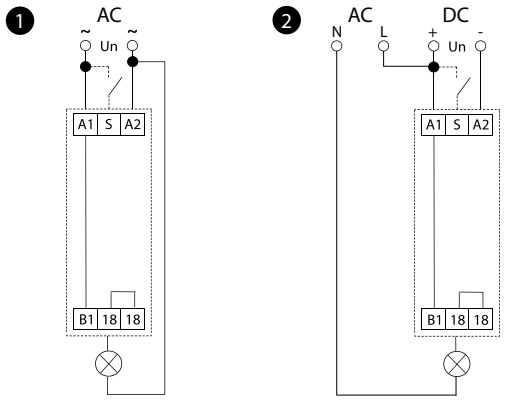
Symbol



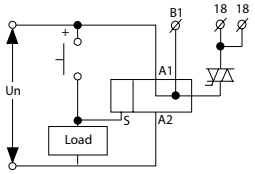
Description



Connection

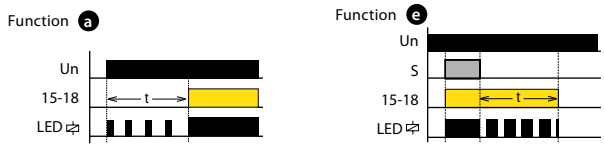


Possibility to connect load onto controlling input:
It is possible to connect the load (e.g.: contactor) between terminals S-A2, without any interruption of correct relay function.



Indication of operating states

Signaling examples:



Function

Function (page 17).

CRM-91HE | Multifunction time relay with external potentiometer

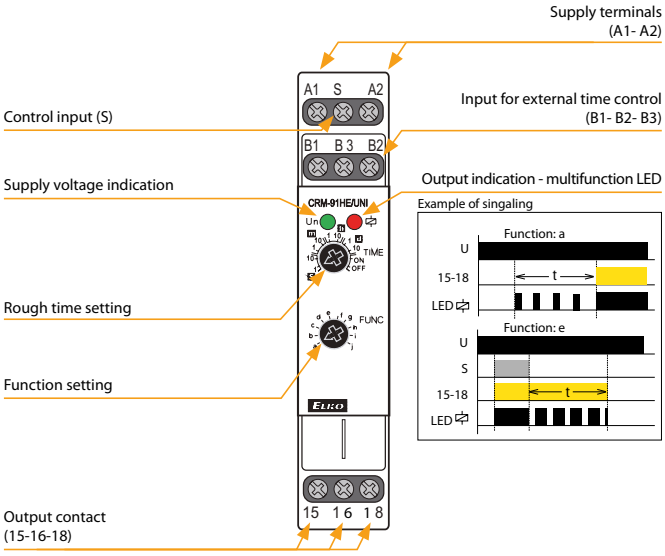
EAN code
CRM-91HE/UNI: 8595188118958
CRM-91HE/UNI + potentiometer: 8595188142052
Potentiometer: 8595232367967

- Control by external control unit - potentiometer (can be placed/mounted for example on switch board doors or in panel).
- 10 functions:
  5 time functions controlled by supply voltage
  4 time functions controlled by control input
  1 function of latching relay.
- Possible to connect external potentiometer - max. distance 10 m (32.8 ft.) from relay.

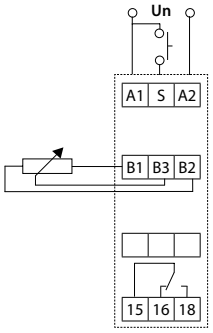
Technical parameters	CRM-91HE
Number of functions:	10
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 12 - 240 V (AC 50-60 Hz)
Consuption (max.):	3 VA/1.7 W
Max. dissipated power:	4 W (Un + terminals)
Supply voltage tolerance:	–15 %; +10 %
Supply indication:	green LED
Time ranges:	0.1 s – 10 days
Time setting:	rotary switch, external 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	
Contact type:	1× changeover/SPDT (AgNi/Silver Alloy)
Current rating:	16 A/AC1; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC1
Inrush current:	30 A/<3 s
Switching voltage:	250V AC/24V DC
Output indication:	multifunction red LED
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Controlling	
Control voltage:	AC/DC 12 - 240 V (AC 50-60 Hz)
Consumption of input:	AC 0.025-0.2 VA/DC 0.1-0.7 W
Load between S-A2:	Yes
Glow-tubes:	No
Control. terminals:	A1-S
Impulse length:	min. 25 ms/max. unlimited
Reset time:	max. 150 ms
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectrical strength:	AC 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
Cross-wire section – solid/	max. 1× 2.5, 2× 1.5/
stranded with ferrule (mm²):	max. 1× 2.5 (AWG 12)
Dimensions:	90 × 17.6 × 64 mm (3.5˝ × 0.7˝ × 2.5˝)
Weight:	75 g (2.6 oz)
Standards:	EN 61812-1

Technical parameters	Potentiometer
Potentiometer:	5 - 150kΩ, linear
Protection degree:	IP 65 front side / IP20 f back side
Max. cable size (mm²):	1.5 with sleeve/without sleeve max. 2.5 (AWG 12)
Weight:	16 g (0.6 oz.)
Dimensions:	see page Accessories

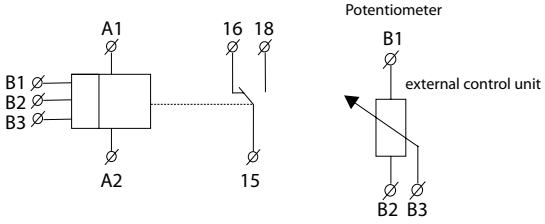
Description



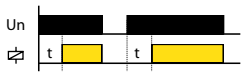
Connection



Symbol



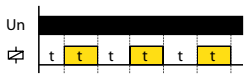
Function

a 

ON DELAY
When the input voltage U is applied, timing delay t begins. Relay contacts R change state after time delay is complete. Contacts R return to their shelf state when input voltage U is removed. Trigger switch is not used in this function.

b 

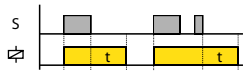
INTERVAL ON
When input voltage U is applied, relay contacts R change state immediately and timing cycle begins. When time delay is complete, contacts return to shelf state. When input voltage U is removed, contacts will also return to their shelfstate. Trigger switch is not used in this function.

c 

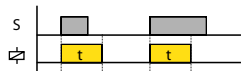
FLASHER - OFF first
When input voltage U is applied, time delay t begins. When time delay t is complete, relay contacts R change state for time delay t. This cycle will repeat until input voltage U is removed. Trigger switch is not used in this function.

d 

FLASHER - ON first
When input voltage U is applied, relay contacts R change state immediately and time delay t begins. When time delay t is complete, contacts return to their shelf state for time delay t. This cycle will repeat until input voltage U is removed. Trigger switch is not used in this function.

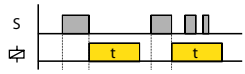
e 

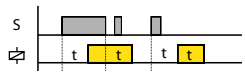
OFF DELAY
Input voltage U must be applied continuously. When trigger switch S is closed, relay contacts R change state. When trigger switch S is opened, delay t begins. When delay t is complete, contacts R return to their shelf state. If trigger switch S is closed before time delay t is complete, then time is reset. When trigger switch S is opened, the delay begins again, and relay contacts R remain in their energized state. If input voltage U is removed, relay contacts R return to their shelf state.

f 

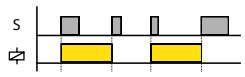
SINGLE SHOT rising edge
Upon application of input voltage U, the relay is ready to accept trigger signal S. Upon application of the trigger signal S, the relay contacts R transfer and the preset time t begins. During time-out, the trigger signal S is ignored. The relay resets by applying the trigger switch S when the relay is not energized.

SINGLE SHOT falling edge
Upon application of input voltage U, the relay is ready to accept trigger signal S. Upon application of the trigger signal S, the relay contacts R transfer and the preset time t begins. At the end of the preset time t, the relay contacts R return to their normal condition unless the trigger switch S is opened and closed prior to time out t (before preset time elapses). Continuous cycling of the trigger switch S at a rate faster than the preset time will cause the relay contacts R to remain closed. If input voltage U is removed, relay contacts R return to their shelf state.

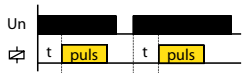
g 

h 

ON/OFF DELAY
Input voltage U must be applied continuously. When trigger switch S is closed, time delay t begins. When time delay t is complete, relay contacts R change state and remain transferred until trigger switch S is opened. If input voltage U is removed, relay contacts R return to their shelf state.

i 

MEMORY LATCH
Input voltage U must be applied continuously. Output changes state with every trigger switch S closure. If input voltage U is removed, relay contacts R return to their shelf state.

j 

puls = 0.5 s

PULSE GENERATOR (0.5s)
Upon application of input voltage U, a single output pulse of 0.5 seconds is delivered to relay after time delay t. Power must be removed and reapplied to repeat pulse. Trigger switch is not used in this function.

CRM-101 | Energy-saving time relay

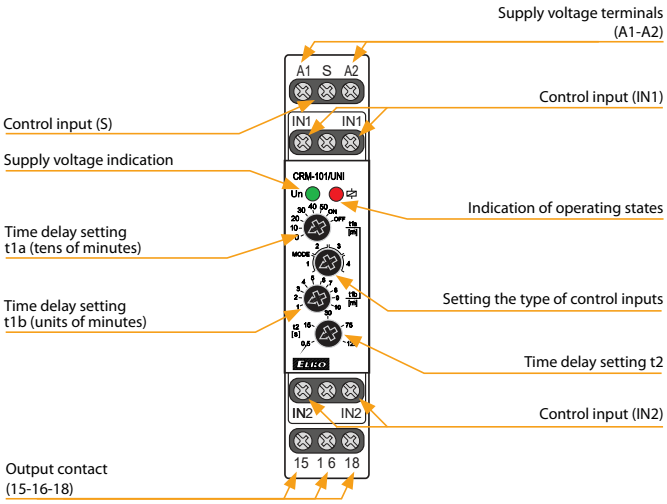
EAN code
CRM-101/UNI: 8595188184113

- Time relay for automatic switching on and off of electricity, with the help of connected sensors (can be combined with a regular card switch)
- 2 control inputs – **potential-free contacts:**
  IN1 (MD) – motion detector
  IN2 (MC) – magnetic door contact
- 1 control input – **voltage dependent contact:**
  S (MD) – motion detector
- Adjustable configuration of control inputs:
  (closing – NO / opening – NC, according to the type of connected sensors)
- Time delay t1 (delayed switch-off of electricity)
  Adjustable in the range of 1 – 60 min in minute steps
- Time delay t2 (blocking input for motion detector)
  Adjustable continuously in the range of 0.5 – 120 s

Technical parameters	CRM-101
Power supply	
Supply terminals:	A1-A2
Supply voltage:	AC/DC 12 – 240 V (AC 50-60 Hz)
Consumption (max.):	2 VA/1.5 W
Supply voltage tolerance:	–15 %; +10 %
Time circuit	
Time delay (t0):	90 s
Time delay (t1a + t1b):	1 – 60 min (t1=t1a + t1b)
Time delay (t2):	0.5 – 120 s*
Time setting:	rotary switches and potentiometers
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	
Contact type:	1× changeover/ SPDT (AgNi)
Current rating:	16 A/AC1; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC1
Switching voltage:	250 V AC/24V DC
Power dissipation (max.):	1.2 W
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Control	
Control terminals:	A1-S (voltage dependent contact)
Load between S-A2:	Yes
Control terminals:	IN1-IN1, IN2-IN2 (potential-free contacts)
Impulse length:	min. 25 ms / max. unlimited
Reset time:	max. 150 ms
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:	AC 4kV (supply – output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel / IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/ stranded with ferrule (mm²):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)
Dimensions:	90 × 17.6 × 64 mm (3.5″ × 0.7″ × 2.5″)
Weight:	70 g (2.5 oz)
Standards:	EN 61812-1

* Time t2 can be limited by time t1
(t1 = 1 m, t2 = max. 30 s)
(t1 = 2 m, t2 = max. 1 m)

Description

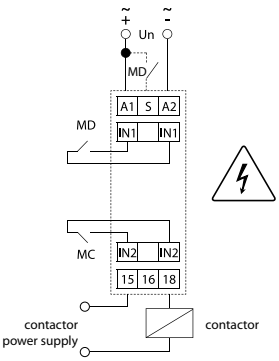


Setting the type of control inputs

MODE	IN1/S	IN2
1	NO	NO
2	NO	NC
3	NC	NO
4	NC	NC

Setting example:
- Door contact is NC (closed when the door is closed)
- Motion detector has NC contact (closed at rest, opens when motion is detected)
- MODE must be set to position 4

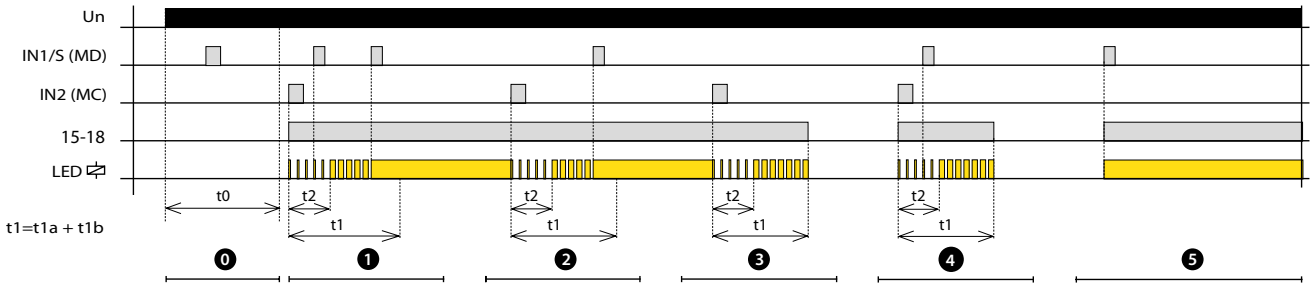
Connection



Do not apply voltage to terminals IN1 and IN2 - the control contacts must be potential-free!

Function

Graph and description of the function corresponds to the setting of MODE 1 control inputs.



0 Motion detector blocking
After switching on the power supply, inputs IN1/S (MD - motion detector) are blocked for a period of t0.

1 Arrival of persons in the room
When people enter the room, IN2 is activated (MC - magnetic door contact)
- Closes the relay (turns on the electricity) and at the same time the delay t1 and t2 starts
- The red LED flashes depending on the delay in progress.

Contact IN1/S, responds to the movement of people in the room
- During the delay t2, the MD operation is blocked
- If IN1/S is activated after the delay t2 has elapsed, the delay t1 ends and the red LED lights up permanently. The relay remains permanently closed.

2 Person leaving the room
When the person leaves the room, contact IN2 is activated
- Delays t1 and t2 start at the same time
- If there is a movement in the room after the delay t2 has elapsed, IN1/S is activated, the delay t1 is terminated and the relay remains closed.

3 Last person leaving the room
When the person leaves the room, contact IN2 is activated
- Delays t1 and t2 start at the same time
- If IN1/S is not activated after the delay t2 has elapsed (no movement in the room), then after the delay t1 the red LED goes out and the relay opens (switches off the electricity).

4 No movement after delay t2
When people enter the room, IN2 is activated (MC - magnetic door contact)
- Closes the relay (turns on the electricity) and at the same time the delay t1 and t2 starts
- If IN1/S is not activated after the delay t2 has elapsed (e.g. a brief insight into the room), then after the delay t1 the red LED goes out and the relay opens (switches off the electricity).

5 Movement at rest
If, after the person leaves the room, the IN1/S is not activated after the t2 delay, it opens the relay (turns off the electicity). However, another person remains in the room motionless (e.g. sleeping)
- If IN1/S is activated (e.g. by waking up a sleeping person), the relay closes without delay (turns on the electricity).

CRM-111H, CRM-112H, CRM-113H | Multifunction time relay with inhibit delay

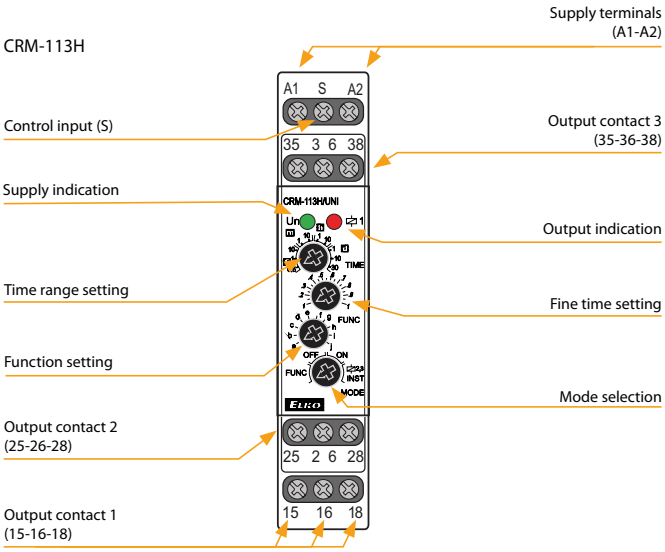
EAN code
CRM-111H/UNI: 8595188175548
CRM-112H/UNI: 8595188175531
CRM-113H/UNI: 8595188180634

- Multifunction time relay for universal use in automation, control and regulation or in house installations.
- All functions initiated by the supply voltage, except for the flasher function, can use the control input to inhibit the delay (pause).
- Mode selection - according to the set function, permanently closed, permanently open, function of MEMORY LATCH with delay (CRM-111H)/ switching of the second output contact according to supply voltage (CRM-113H).
- Multifunction red LED flashes or shines depending on the operating status.

Technical parameters	CRM-111H	CRM-112H	CRM-113H
Power supply			
Supply terminals:	A1-A2		
Supply voltage:	AC/DC 12 - 240 V (AC 50/60 Hz)		
Consumption (max.):	2 VA/1.5 W	2.5 VA/1.5 W	2.5 VA/1.5 W
Supply voltage tolerance:	–15 %; +10 %		
Supply indication:	green LED		
Time circuit			
Number of functions:	11	10	10
Time ranges:	50 ms – 30 days		
Time setting:	rotary switches and potentiometers		
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			
Contact type 1:	1× changeover/SPDT (AgNi)		
Current rating:	16 A/AC1; PD. B300		
Breaking capacity:	4000 VA/AC1, 384 W/DC1		
Electrical life (AC1):	100.000 ops.		
Contact type 2 (3):	×	1× chang./SPDT (AgNi)	2× chang./DPDT (AgNi)
Current rating:	×	16 A/AC1; PD. B300	8 A/AC1; PD. B300
Breaking capacity:	×	4000 VA/AC1, 384 W/DC1	2000 VA/AC1, 192 W/DC1
Electrical life (AC1):	×	100.000 ops	50.000 ops.
Switching voltage:	250V AC/24 V DC		
Power dissipation (max.):	1.2 W	2.4 W	2.4 W
Output indication:	multifunction red LED		
Mechanical life:	10.000.000 ops.		
Control			
Control terminals:	A1-S		
Load between S-A2:	Yes		
Impulse length:	min. 25 ms/max. unlimited		
Reset time:	max. 150 ms		
Other information			
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)		
Storage temperature:	–30 .. +70 °C (–22 ..158 °F)		
Dielectric strength:			
supply – output 1	AC 4 kV		
supply – output 2 (3)	×	AC 4 kV	AC 1 kV
output 1 – output 2	×	AC 4 kV	AC 1 kV
output 2 – output 3	×	×	AC 1 kV
Operating position:	any		
Mounting:	DIN rail EN 60715		
Protection degree:	IP40 front panel/IP20 terminals		
Overvoltage category:	III.		
Pollution degree:	2		
Cross-wire section – solid/ stranded with ferrule (mm²):	max. 1× 2.5 or 2× 1.5/ max. 1× 2.5 (AWG 12)		
Dimensions:	90 × 17.6 × 64 mm (3.5″ × 0.7″ × 2.5″)		
Weight:	62 g (2.2 oz.)	85 g (3 oz.)	85 g (3 oz.)
Standards:	EN 61812-1		

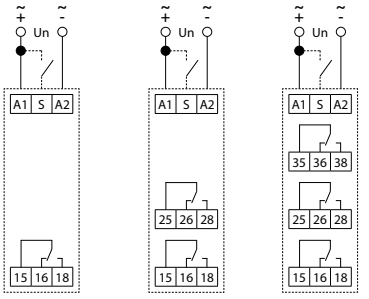
* for adjustable delay <100 ms, a time deviation of ± 10 ms applies

Description



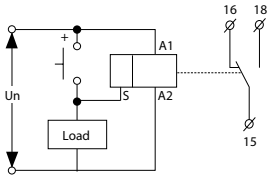
Connection

CRM-111H CRM-112H CRM-113H

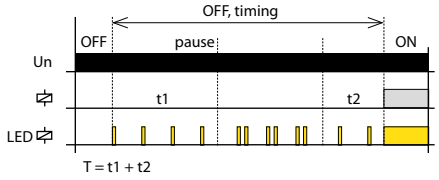


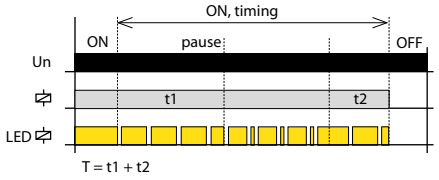
CRM-113H:
The potential difference between the supply terminals (A1-A2), output contact 2 (25-26-28) and output contact 3 (35-36-38) must be a maximum of AC rms/DC 250V.

Possibility to connect load onto controlling input
It is possible to connect the load (e.g.: contactor) between terminals S-A2, without any interruption of correct relay function.



Indication of operating states





Mode selection

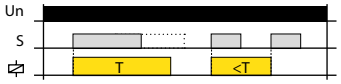
FUNC. Settings function mode

The desired function a-j is set with the FUNC rotary switch.

OFF. Output contact open mode

ON. Output contact closed mode

j Function: MEMORY LATCH with Delay (Only for CRM-111H)



When the supply voltage is applied, the relay is open. If the control contact is closed, the relay closes and the time delay T starts. It does not matter the length of the control pulse. When the timing is complete, the relay opens. If the control contact is closed during timing, the relay opens immediately. Each time the control contact closes during relay timing, it changes status.

2,3 INST. Second or third output contact instantaneous (Only for CRM-112H, CRM-113H)

The second or third output contact switches according to the supply voltage. The first output contact switches according to the function (a-j) set by the trimmer FUNC.

Function

Function (page 23).

CRM-121H | Multifunction time relay with galvanically separated control input

c UL us LISTED E308660

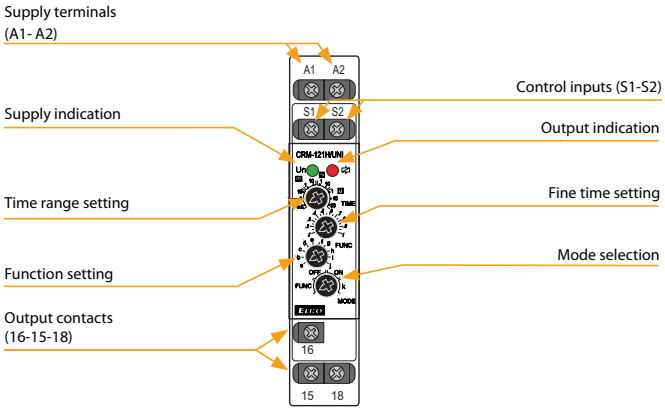
- Multifunction time relay for universal use in automation, control and regulation or in house installations.
- Galvanically separated control input (Power Trigger).
- All functions initiated by the supply voltage, except for the flasher function, can use the control input to inhibit the delay (pause).
- Mode selection - according to the set function, permanently closed, permanently open, function of MEMORY LATCH with delay.
- Time scale 50 ms - 30 days divided into 10 ranges.
- Multifunction red LED flashes or shines depending on the operating status.

EAN code
CRM-121H/UNI: 8595188175555

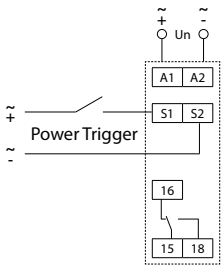
Technical parameters	CRM-121H
Power supply	
Supply terminals:	A1 - A2
Voltage range:	AC/DC 12 - 240 V (AC 50-60 Hz)
Power input (max.):	2 VA/1.5W
Supply voltage tolerance:	–15 %; +10 %
Supply indication:	green LED
Time circuit	
Number of functions:	11
Time ranges:	50 ms - 30 days
Time setting:	rotary switch and potentiometer
Time deviation:*	5 % - mechanical setting
Repeat accuracy:	0.2 % - set value stability
Temperature coefficient:	0.01 %/°C, at = 20 °C (0.01 %/°F, at = 68 °F)
Output	
Number of contacts	1x changeover/SPDT (AgNi)
Current rating:	16 A/AC1; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC
Switching voltage:	250 V AC/24 V DC
Max. power dissipation:	1.2 W
Output indication:	multifunction red LED
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Control	
Control terminals:	S1-S2
Impulse length:	min. 25 ms/max. unlimited
Reset time:	max. 150 ms
Other information	
Operating temperature:	–20 .. +55 °C (–4 ..131 °F)
Storage temperature:	–30 .. +70 °C (–22 ..158 °F)
Dielectric strength:	4 kV AC (supply - output) 4 kV AC (supply - control input)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel/IP10 terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm²):	solid wire max. 2x 2.5 or 1x 4/ with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	72 g (2.5 oz.)
Standards:	EN 61812-1

* for adjustable delay <100 ms, a time deviation of ± 10 ms applies

Description

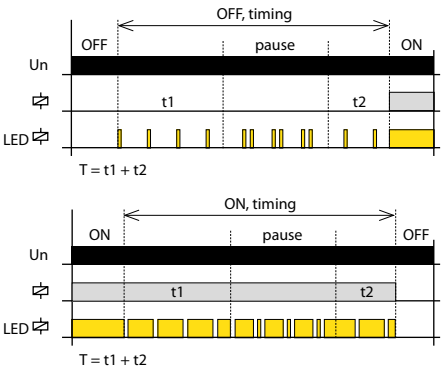


Connection



(Range of control voltage same as supply voltage)

Indication of operating states



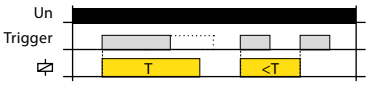
Mode selection

FUNC. Settings function mode
The desired function a-j is set with the FUNC rotary switch.

OFF. Output contact open mode

ON. Output contact closed mode

k. Function: MEMORY LATCH with Delay



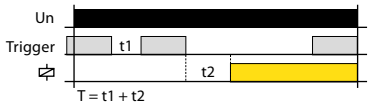
When the supply voltage is applied, the relay is open. If the control contact is closed, the relay closes and the time delay T starts. It does not matter the length of the control pulse. When the timing is complete, the relay opens. If the control contact is closed during timing, the relay opens immediately. Each time the control contact closes during relay timing, it changes status.

Function

a. ON DELAY

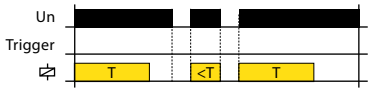
When the supply voltage is applied, the time delay T begins. When the timing is complete, the relay closes and this condition continues until the supply voltage is disconnected.

ON DELAY with Inhibit



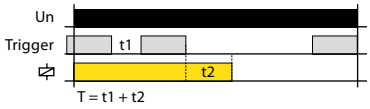
If the control contact is closed and the supply voltage is connected, the relay is opened and timing does not start until the control contact opens.
When the timing is complete, the relay closes. If the control contact is closed during timing, the timing is interrupted and continues only after the control contact opens.

b. INTERVAL ON



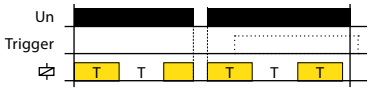
After supply voltage relay closes and starts the delay time T. After the end of the timing relay opens and this state lasts until the supply voltage is disconnected.

INTERVAL ON with Inhibit



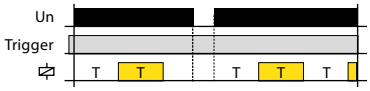
If the control contact is closed and the supply voltage is connected, the relay will close and the timing will start only after the control contact has been opened.
When the timing is complete, the relay opens. If the control contact is closed during timing, the timing is interrupted and continues only after the control contact opens.

c. FLASHER - ON first



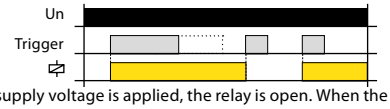
After supply voltage relay closes and starts the delay time T. After the end of the timing relay opens and again runs delay time T. When the timing is complete, the relay closes again and the sequence is repeated until the supply voltage is disconnected. If the control contact is closed during timing, this does not affect the operation of the cycler.

FLASHER - OFF first



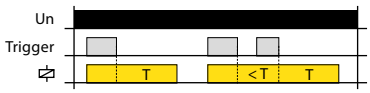
If the control contact is closed during timing; this does not aff ect the operation of the cycler. If the control contact is closed and the supply voltage is connected, the cycler starts with a pause (relay open).

d. MEMORY LATCH



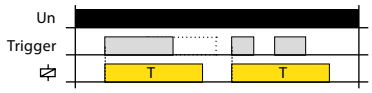
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes. The status does not change when the control contact is opened. When the control contact is closed again, the relay opens. Each time the control contact is closed, the relay changes status.

e. OFF DELAY



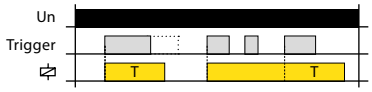
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes. When the control contact opens, the time delay T begins. If the control contact is closed during timing, the time is reset and the relay remains closed. When the control contact opens, the time delay T starts again and opens when the relay closes.

f. SINGLE SHOT rising edge



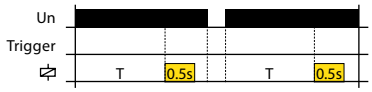
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes and the time delay T begins. Closing the control contact during timing is ignored.

g. WATCHDOG



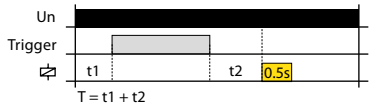
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes and the time delay T begins. Closing the control contact during timing triggers a new time delay T - the relay closing time is thus increased.

h. PULSE GENERATOR (0.5s)



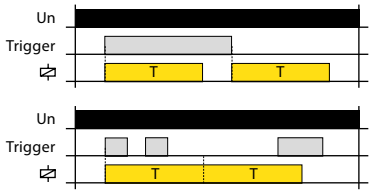
After the supply voltage has been applied, the time delay T begins. When the timing is complete, the relay closes for a fixed time (0.5 s).

PULSE GENERATOR with Inhibit (0.5s)



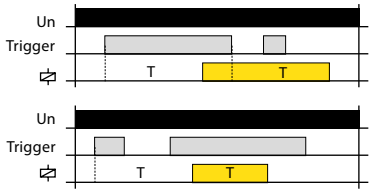
After supply voltage starts the time delay T. By closing timing of the control contact during timing is suspended. When the control contact opens, the time interval is completed and the relay closes for a fixed time (0.5 s).

i. INTERVAL ON/OFF



When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes and the time delay T begins. When the control contact is opened, the relay closes and the time delay T begins. If the control contact is open during timing, the relay remains closed for 2T. When the timing is complete, the relay opens. Any other change of control contact status during timing is ignored.

j. ON/OFF DELAY



When the supply voltage is applied, the relay is open. If control contact is closed, time delay T starts. When the control contact is opened, a new time delay T begins. If the control contact is open during timing, the relay closes at the end of the timing and opens the relay after the new time delay. Any other change of control contact status during timing is ignored.

CRM-131H | Multifunction time relay with three control inputs

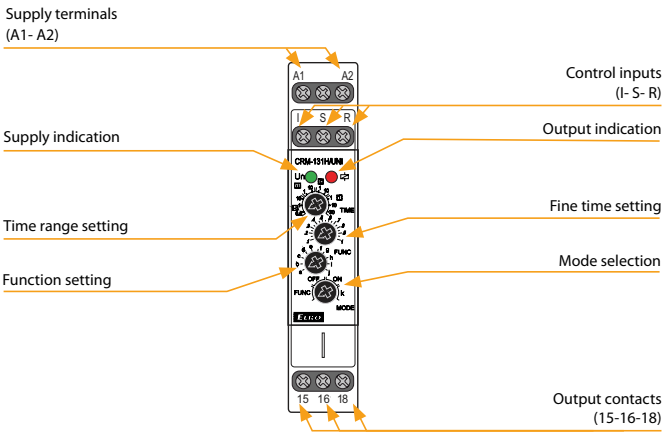
EAN code
CRM-131H/UNI: 8595188175562

Technical parameters	CRM-131H
Power supply	
Supply terminals:	A1 - A2
Voltage range:	AC/DC 12 - 240 V (AC 50-60 Hz)
Power input (max.):	2 VA/1.5W
Supply voltage tolerance:	-15 %; +10 %
Supply indication:	green LED
Time circuit	
Number of functions:	11
Time ranges:	50 ms - 30 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 (0.01 %/°F, at = 68 °F)
Output	
Number of contacts	1x changeover/SPDT (AgNi)
Current rating:	16 A/AC1; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC
Switching voltage:	250 V AC/24 V DC
Max. power dissipation:	1.2 W
Output indication:	multifunction red LED
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Control	
Load between I, S, R - A2:	Yes
Control terminals:	I, S, R - A1
Impulse length:	min. 25 ms/max. unlimited
Reset time:	max. 150 ms
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 ..158 °F)
Dielectric strength:	4 kV AC (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 (mm^2):	solid wire max. 1x 2.5 or 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	61 g (2.2 oz.)
Standards:	EN 61812-1

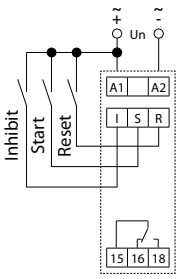
* for adjustable delay <100 ms, a time deviation of ± 10 ms applies

- Multifunction time relay for universal use in automation, control and regulation or in house installations.
- Three control inputs - START, INHIBIT, RESET.
- Mode selection - according to the set function, permanently closed, permanently open, function of MEMORY LATCH with delay.
- Multifunction red LED flashes or shines depending on the operating status.

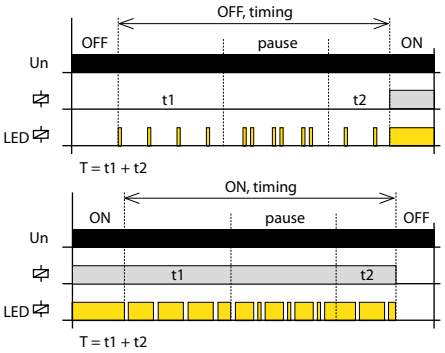
Description



Connection



Indication of operating states



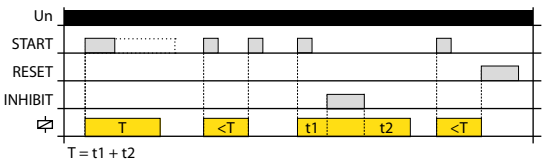
Mode selection

FUNC. Settings function mode
The desired function a-j is set with the FUNC rotary switch.

OFF. Output contact open mode

ON.Output contact closed mode

k. MEMORY LATCH with Delay / 3x Control Signal



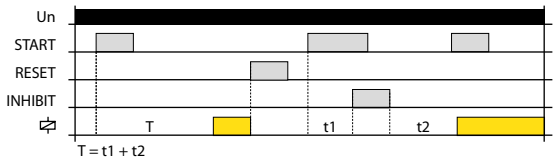
When the supply voltage is applied, the relay is open. If the START control contact is closed, the relay closes and the time delay T starts. It does not matter the length of the control pulse. When the timing is complete, the relay opens. If the START control contact is closed during timing, the relay opens immediately. Each time the control contact closes during relay timing, it changes status. Closing the INHIBIT control contact pauses the timing, after opening the INHIBIT control contact the timing continues from the moment of interruption. Closing the RESET control contact immediately ends the timing and the relay opens, just like as when the supply voltage is disconnected.

Function

Control input function description:
- Contact START starts the time function
- INHIBIT contact pauses timing (pause)
- The RESET contact simulates switching the supply voltage on and off

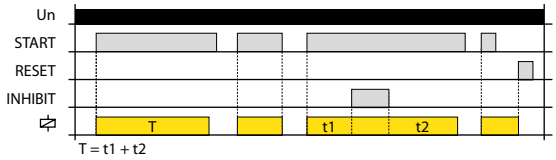
Same for all features:
- If the control contact START is closed and the supply voltage is connected, the time function is activated when the supply voltage is connected.
- Closing the control contact INHIBIT pauses the timing, after opening the control contact INHIBIT timing continues from the moment of interruption.
- If the INHIBIT control contact is closed, the START control contact is activated and the timing is paused.
- Closing the control contact RESET immediately terminates the timing and the relay opens, just as when the supply voltage is disconnected.
- If the control contact RESET is closed and then the control contact START is closed, the time function is activated when the control contact RESET is opened as well as when the supply voltage is connected.

a. ON DELAY / 3x Control Signal



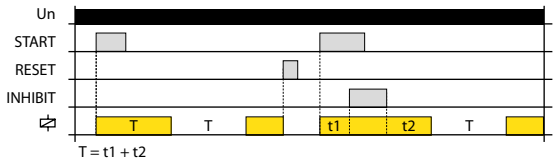
When the supply voltage is applied, the relay is open. If the control contact START is closed, the time delay T starts.
The closing of the START control contact during timing is ignored.

b. INTERVAL ON / 3x Control Signal



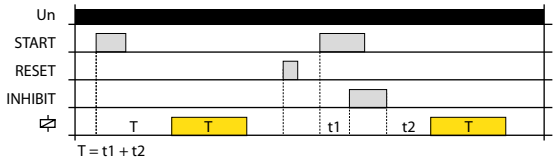
When the supply voltage is applied, the relay is open. When the control contact START is closed, the relay closes and the time delay T begins.
If the START control contact is open during timing, the time interval is immediately terminated and the relay opens.

c. FLASHER - ON first / 3x Control Signal



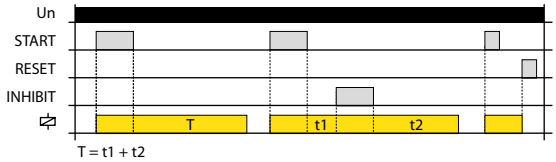
When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time T. After the end of the timing relay opens and again runs delay time T. Upon completion timing again switches, and the sequence is repeated until the supply voltage is disconnected.

d. FLASHER – OFF first / 3x Control Signal



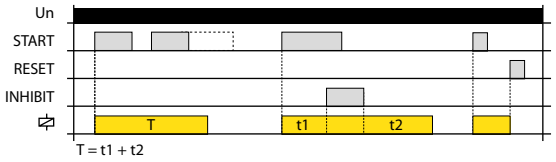
When the supply voltage is applied, the relay is open. When the START control contact is closed, starts the time delay T. After the end of the timing relay closes and again runs delay time T. After the end of the timing relay opens and the sequence is repeated until the supply voltage is disconnected.

e. OFF DELAY / 3x Control Signal



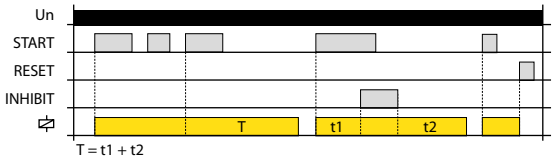
When the supply voltage is applied, the relay is open. If the control contact START is closed, the relay closes. After tripping Contact Start starts the delay time T. After the end of the timing relay is switched off.

f. SINGLE SHOT rising edge / 3x Control Signal



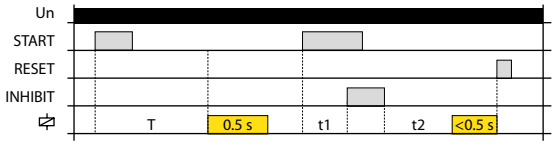
When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time T. After the end of the timing relay is switched off. The closing of the START control contact during timing is ignored.

g. WATCHDOG / 3x Control Signal



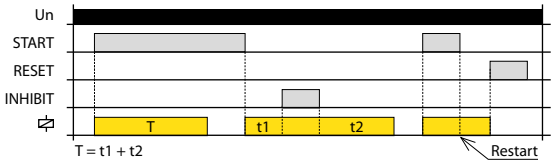
When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time T. After the end of the timing relay is switched off. Closing control contact START during timing triggers a new time delay T - the relay closing time is thus increased.

h. PULSE GENERATOR (0.5s) / 3x Control Signal

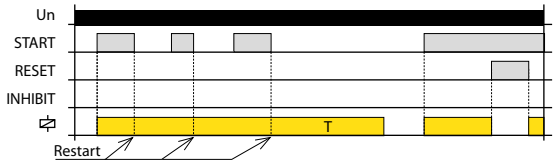


When the supply voltage is applied, the relay is open. When the START control contact is closed, starts the time delay T. After the end of the timing relay switches for the fixed time (0.5 sec).

i. INTERVAL ON/OFF / 3x Control Signal

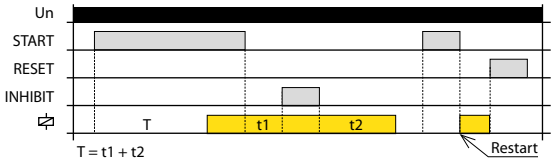


When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time T. After the end of the timing relay is switched off. By opening the control contact start relay again closes and starts the delay time T. After the end of the timing relay is switched off.

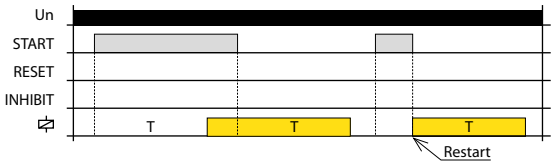


If the START control contact is open during timing, a restart occurs - the relay remains closed and a new time delay T begins. When the timing is complete, the relay opens.

j. ON/OFF DELAY / 3x Control Signal



When the supply voltage is applied, the relay is open. When the START control contact is closed, starts the time delay T. After the end of the timing relay switches. Opening the control contact START starts a new time delay T. When the timing is complete, the relay opens.



If the START control contact is open during timing, a restart occurs - the relay closes and a new time delay T begins. When the timing is complete, the relay opens.

CRM-71TO, CRM-72TO | Multifunction time relays with supply voltage disconnection

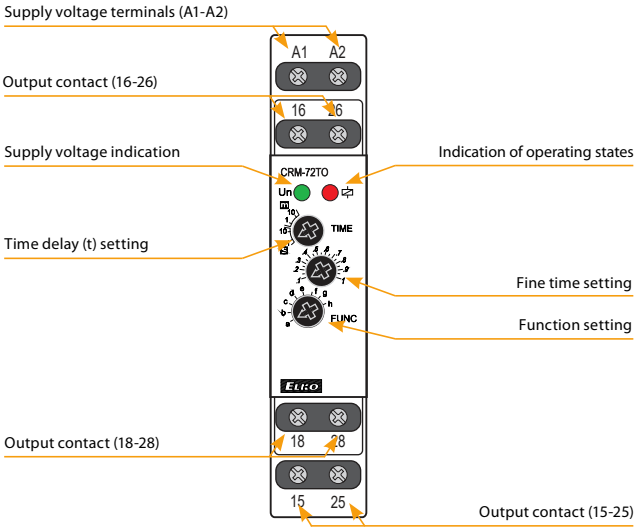
EAN code
CRM-71TO/UNI: 8595188192811
CRM-72TO/UNI: 8595188192828

- The relay keeps timing according to the set function even after the power supply is disconnected.
- It can be used for delayed switching off of a backup power supply and systems in case of power failure (e.g. emergency lighting, emergency ventilation, electrically and automatically operated doors – lifts, escalators).
- Comfortable and well-arranged time delay (t) setting by rotary switch.
- Adjustable time delay from 0.1 s to 10 m is split into four ranges: (0.1 s – 1 s / 1 s – 10 s / 0.1 m – 1 m / 1 m – 10 m)
- Power supply outages must be in the order of tens to hundreds of milliseconds.
- Multifunction red LED flashes or shines depending on the operating states.

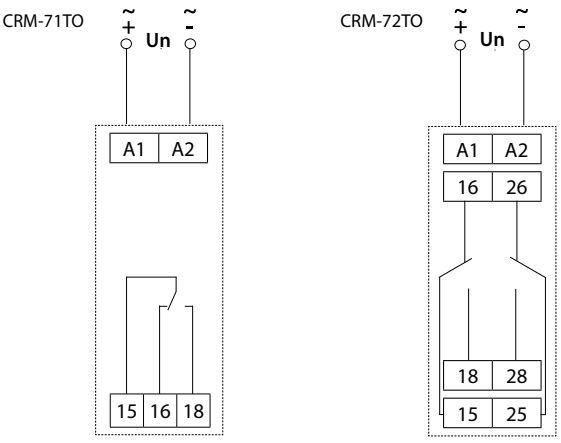
Technical parameters	CRM-71TO	CRM-72TO
Power supply		
Supply terminals:	A1-A2	
Supply voltage:	AC/DC 12 – 240 V (AC 50-60 Hz)	
Consumption (max.):	1.9 VA/0.9 W	
Supply voltage tolerance:	–15 %; +10 %	
Time circuit		
Number of features:	8	
Time delay (t):	0.1 s – 10 m	
Time setting:	rotary switch and potentiometer	
Time deviation:	5 % – mechanical setting	
Repeat accuracy:	0.2 % – set value stability	
Temperature coefficient:	0.01 %/°C, at = 20 °C (0.01%/°F, at = 68 °F)	
Output		
Contact type:	1× changeover ($AgSnO_2$)	2× changeover (AgNi)
Current rating:	16 A/AC; PD. B300	8 A/AC1; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC1	2000 VA/AC1, 192 W/DC1
Inrush current:	20 A/<3 s	10 A/<3 s
Switching voltage:	250V AC/24V DC	
Power dissipation (max.):	1.2 W	
Mechanical life:	2.000.000 ops.	
Electrical life (AC1):	50.000 ops.	200.000 ops.
Other specifications		
Operating temperature:	–20 .. +55 °C	
Storage temperature:	–30 .. +70 °C	
Dielectric strength:		
supply – output 1	AC 4 kV	AC 3.5 kV
supply – output 2	-	AC 3.5 kV
output 1 – output 2	-	AC 3.5 kV
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP40 front panel / IP20 terminals	
Overvoltage category:	III.	
Pollution degree:	2	
Cross-wire section – solid/ stranded with ferrule (mm^2):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)	
Dimensions:	90 × 17.6 × 64 mm (3.54" × 0.69" × 2.52")	
Weight:	63 g (2.22 oz)	69 g (2.43 oz)
Standards:	EN 61812-1	

Description

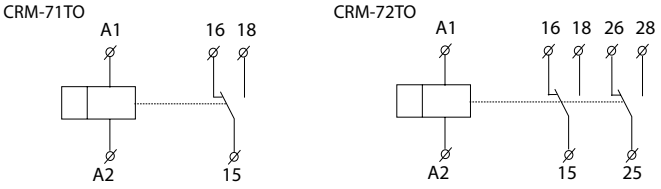
CRM-72TO



Connection

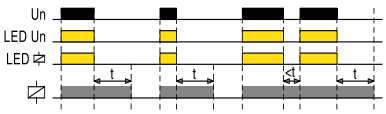


Symbol

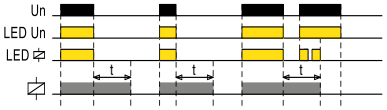


Function

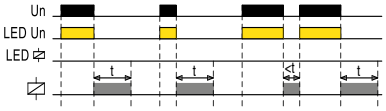
a TRUE OFF DELAY 1



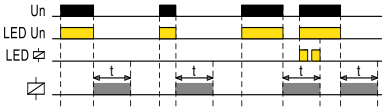
e TRUE OFF DELAY 2



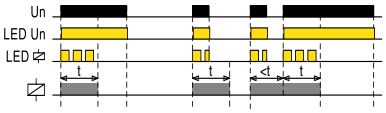
b TRUE SINGLE SHOT falling edge 1



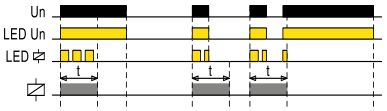
f TRUE SINGLE SHOT falling edge 2



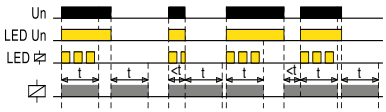
c TRUE INTERVAL ON 1



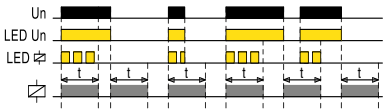
g TRUE INTERVAL ON 2



d TRUE INTERVAL ON/OFF 1



h TRUE INTERVAL ON/OFF 2



Functions a, b, c, d (1) differ from functions e, f, g, h (2) in behavior after a power failure, shorter than the set time delay (t).

- Functions a, b, c, d (1) after a short outage reset the delay and run from the beginning as when the power was turned on
- The function e, f, g, h (2) does not respond to a short outage and it completes the set delay until the end

If the function or time range rotary switches are in any unused positions, the red LED will flash rapidly after power-up and a short delay.

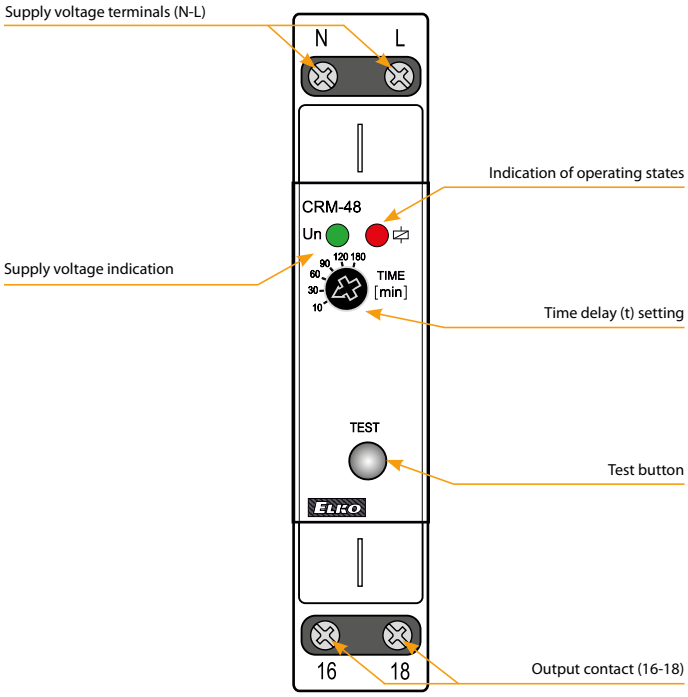
CRM-48 | Emergency light tester

EAN code
CRM-48: 8595188191227

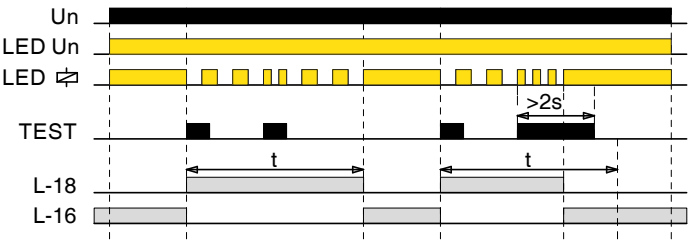
- Time relay for automatic testing of emergency lighting.
- Panel button for starting the test.
- Comfortable and well-arranged time delay (t) setting by rotary switch.
- Adjustable time delay 10 m – 30 m – 60 m – 90 m – 120 m – 180 m is divided into six ranges.
- ZERO CROSS feature: closes and opens the output contact when the voltage crosses zero.
- Multifunction red LED flashes or shines depending on the operating states.

Technical parameters	CRM-48
Power supply	
Supply terminals:	L-N
Supply voltage:	AC 230 V (50-60 Hz)
Consumption (max.):	3.9 VA/1.9 W
Supply voltage tolerance:	–15 %; +10 %
Time circuit	
Number of functions:	1
Time delay (t):	10 m – 30 m – 60 m – 90 m – 120 m – 180 m
Time setting:	rotary switch
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	
Contact type:	1× changeover ($AgSnO_2$); changes the potential "L"
Current rating:	16 A/AC1; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC1
Inrush current:	80 A/20 ms (NO contact)
Switching voltage:	250 V AC/24 V DC
Power dissipation (max.):	1.2 W
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	20.000 ops.
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel / IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/	max. 1× 2.5, 2× 1.5/
stranded with ferrule (mm^2):	max. 1× 2.5 (AWG 14)
Dimensions:	90 × 17.6 × 64 mm
Weight:	53 g
Standards:	EN 61812-1

Description



Function

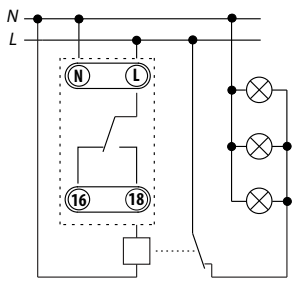


If the supply voltage is connected, the green LED Un lights up and at the same time the red LED indicates that the idle output contact "16" is closed. Pressing the TEST button on the device panel closes the output contact "18" and disconnects the phase wire "L" from the tested emergency lights.

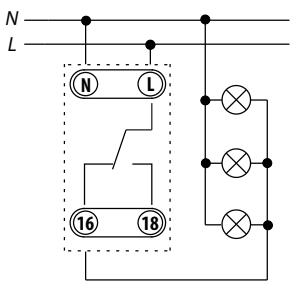
After the set time delay (t) has elapsed, output contact "18" opens and emergency lighting is connected through contact "16". During the delay, the red LED flashes slowly.

Repeated short pressing of the TEST button does not affect the length of the delay. A long press of the TEST button (>2 s) ends the delay. While pressing the button, the red LED flashes quickly.

Connection



Emergency lighting connection through contactor (for I>16A)



Direct emergency lighting connection (for I<16A)

CRM-2T | STAR (⅄)/DELTA (△) time relay

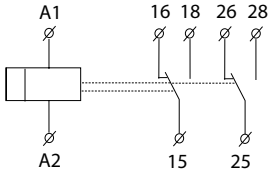
UNI only

- It serves for delay ON of motors star/delta.
- Time t1 (star):
  - time range setting by rotary switch
  - fine time setting by potentiometer.
- Time t2 (delay) between ⅄/△
  - fine time setting by potentiometer.
- Multifunction red LED flashes or shines depending on the operating status.

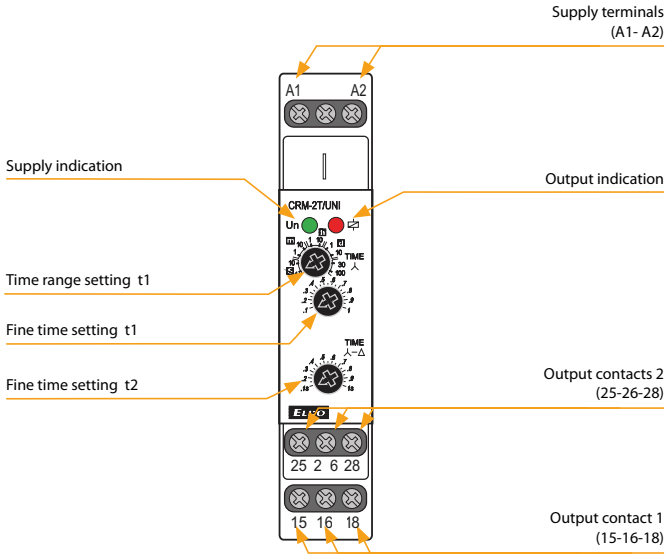
EAN code
CRM-2T/230V: 8595188112291
CRM-2T/UNI: 8595188112437

Technical parameters		CRM-2T
Power supply		
Supply terminals:		A1 - A2
Voltage range:	UNI	AC/DC 12 - 240 V (AC 50-60 Hz)
Power input (max.):	UNI	2 VA/1.5 W
Voltage range:	230	AC 230 V (50-60 Hz)
Power input (max.):	230	AC 3 VA/1.4 W
Supply voltage tolerance:		–15 %; +10 %
Supply indication:		green LED
Function		
Time scale:		t1: 0.1 s - 100 days, t2: 0.1 s - 1 s
Time setting:		rotaty switch and 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)
Current rating:		16 A/AC1; PD. B300
Breaking capacity:		4000 VA/AC1, 384 W/DC
Inrush current:		30 A/< 3 s
Switching voltage:		250 V AC/24 V DC
Max. power dissipation:		1.2 W
Output indication:		multifunction red LED
Mechanical life:		10.000.000 ops.
Electrical life (AC1):		100.000 ops.
Reset time:		max. 150 ms
Other information		
Operating temperature:		–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:		–30 .. 70 °C (–22 .. 158 °F)
Dielectric strength:		
supply - output 1		4 kV AC
supply - output 2		4 kV AC
output 1 - output 2		4 kV AC
Operating position:		any
Mounting:		DIN rail EN 60715
Protection degree:		IP40 from front panel/IP20 terminals
Overvoltage category:		III.
Pollution degree:		2
Terminal wire capacity (mm²):		max.1x 2.5, 2x1.5, with sleeve max. 1x 2.5 (AWG 12)
Dimensions:		90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:		UNI - 78 g (2.8 oz.), 230 - 73 g (2.6 oz.)
Standards:		EN 61812-1

Symbol

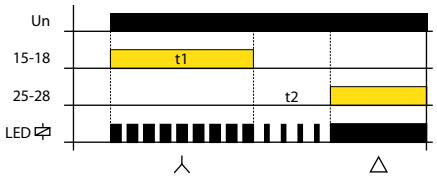


Description



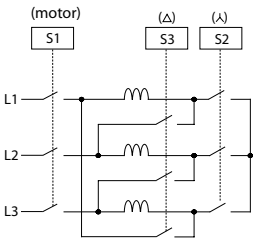
Function

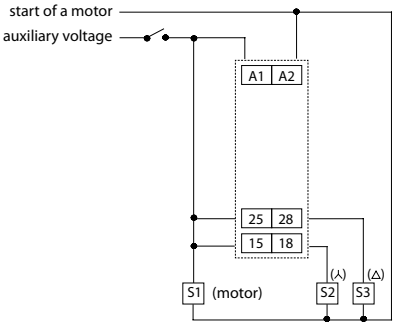
STAR/DELTA



Connection

Start up of motor (⅄ - △)





CRM-2H | Asymmetric flasher

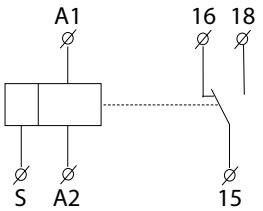
UNI only
cULus LISTED
E308660

EAN code
CRM-2H/230V: 8595188124201
CRM-2H/UNI: 8595188113007

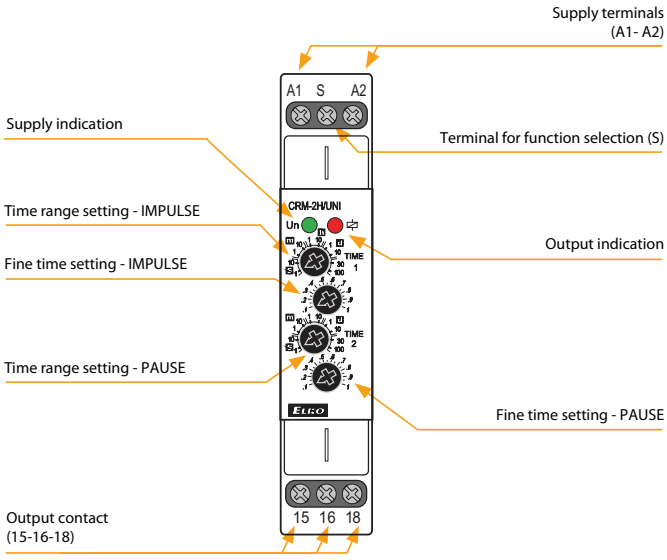
- Flasher with independent adjustable switch ON and switch OFF.
- Used for regular room ventilation, cyclic dehumidification, light control, circulating pumps, illuminated advertising, etc.
- 2 time functions:
  1) Asymmetric FLASHER - ON first
  2) Asymmetric FLASHER - OFF first
- Function choice is done by an external jumper of terminals S-A1.
- Time scale 0.1 s - 100 days divided into 10 time ranges.
- Time range setting via rotary switch.
- Fine time setting by potentiometer.
- Multifunction red LED flashes or shines depending on the operating status.

Technical parameters		CRM-2H
Power supply		
Supply terminals:		A1 - A2
Voltage range:	UNI	AC/DC 12 - 240 V (AC 50-60 Hz)
Power input (max.):	UNI	2 VA/1.5 W
Voltage range:	230	AC 230 V (50/60 Hz)
Power input (max.):	230	AC 3 VA/1.4 W
Supply voltage tolerance:		–15 %; +10 %
Supply indication:		green LED
Function		
Time scale:		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 (0.01 %/°F, at = 68°F)
Output		
Number of contacts:		1x changeover/SPDT (AgNi)
Current rating:		16 A/AC1; PD. B300
Breaking capacity:		4000 VA/AC1, 384 W/DC
Inrush current:		30 A/< 3 s
Switching voltage:		250 V AC/24 V DC
Max. power dissipation:		1.2 W
Output indication:		multifunction red LED
Mechanical life:		10.000.000 ops.
Electrical life (AC1):		100.000 ops.
Reset time:		max. 150 ms
Other information		
Operating temperature:		–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:		–30 .. 70 °C (–22 .. 158 °F)
Dielectric strength:		4 kV AC (supply - output)
Operating position:		any
Mounting:		DIN rail EN 60715
Protection degree:		IP40 from front panel/IP20 terminals
Overvoltage category:		III.
Pollution degree:		2
Terminal wire capacity (mm²):		solid wire max. 1x 2.5 or 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)
Dimensions:		90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight		UNI - 61 g (2.2 oz.), 230 - 58 g (2 oz.)
Standards:		EN 61812-1

Symbol



Description



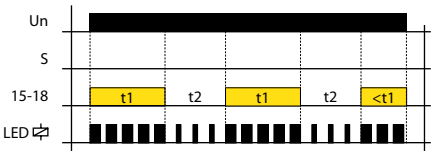
Connection

Asymmetric FLASHER - ON first

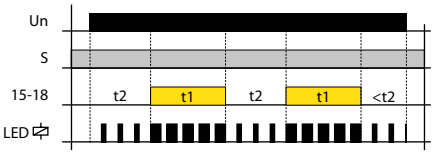
Asymmetric FLASHER - OFF first
(jumper S-A1)

Function

ASYMMETRIC FLASHER - ON first



ASYMMETRIC FLASHER - OFF first



CRM-2HE | Asymmetric flasher with external potentiometers

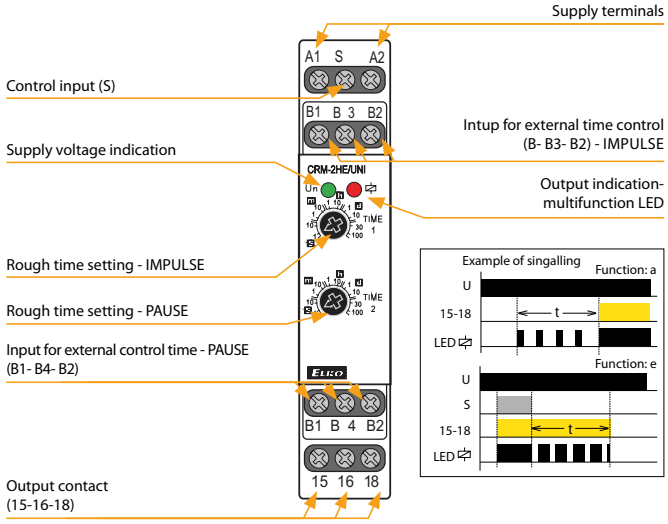
EAN code
CRM-2HE/UNI: 8595188124553
CRM-2HE/UNI + 2X potentiometer: 8595188142069
Potentiometer: 859232367981

- Control by external control unit - potentiometer (can be placed/ mounted for example on switch board doors or in panel).
- Asymmetric cycler - 2 time functions:
  - flasher beginning with pulse
  - flasher beginning with gap.
- Function selected via external wired link on control input S-A1.
- Possible to connect external potentiometer - max. distance 10 m (32.8 ft.) from relay.

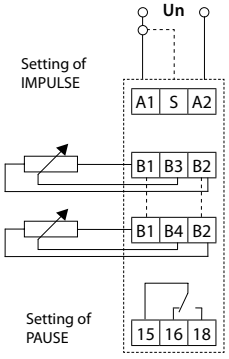
Technical parameters	CRM-2HE
Number of functions:	2
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 12 - 240 V (AC 50-60 Hz)
Consuption (max.):	3 VA / 1.7 W
Max. dissipated power:	4 W (Un + terminals)
Supply voltage tolerance:	–15 %; +10 %
Supply indication:	green LED
Time ranges:	0.1 s – 100 days
Time setting:	rotary switch, external 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	
Contact type:	1× changeover/SPDT (AgNi/Silver Alloy)
Current rating:	16 A/AC1; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC1
Inrush current:	30 A/<3 s
Switching voltage:	250 V AC/24 V DC
Output indication:	multifunction red LED
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Controlling	
Control voltage:	AC/DC 12 - 240 V (AC 50-60 Hz)
Consumption of input:	AC 0.025-0.2 VA/DC 0.1-0.7 W
Load between S-A2:	Yes
Glow-tubes:	No
Control. terminals:	A1-S
Reset time:	max. 150 ms
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:	AC 4 kV (supply – output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel / IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/	max. 1× 2.5, 2× 1.5/
stranded with ferrule (mm²):	max. 1× 2.5 (AWG 12)
Dimensions:	90 × 17.6 × 64 mm (3.5˝ × 0.7˝ × 2.5˝)
Weight:	78 g (2.8 oz.)
Standards:	EN 61812-1

	Potentiometer
Potentiometer:	10 - 150 kΩ, linear
Protection degree:	IP65 from front side/IP20 from back side
Max. cable size (mm²):	1.5 with sleeve/without sleeve max. 2.5 (AWG 12)
Weight:	16 g (0.6 oz.)
Dimensions:	see page Accessories

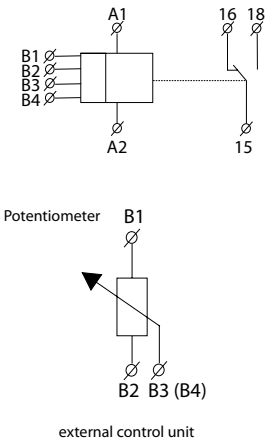
Description



Connection

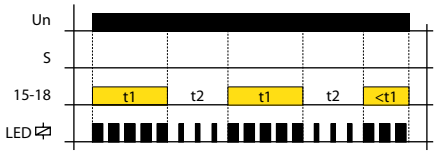


Symbol

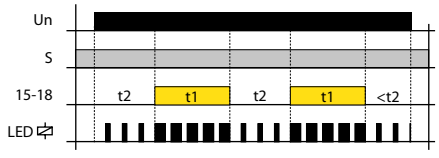


Function

ASYMMETRIC FLASHER - ON first



ASYMMETRIC FLASHER - OFF first



CRM-181J, CRM-182J, CRM-183J | Singlefunction time relays

EAN code

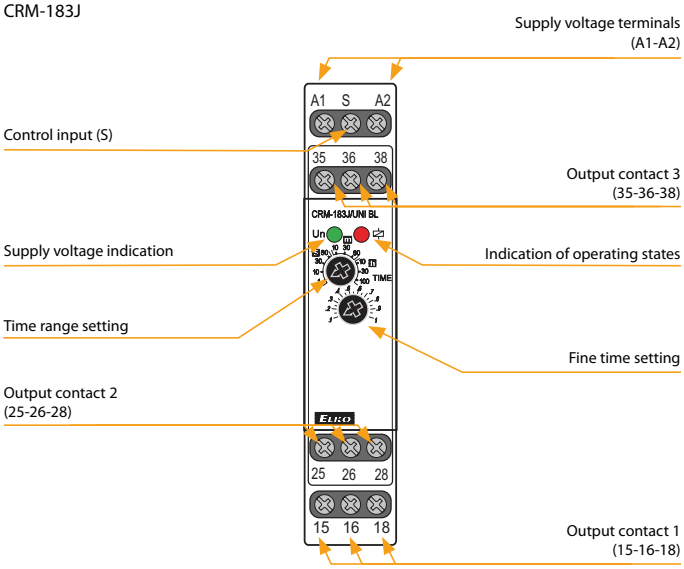
CRM-181J/UNI ZR: 8595188180382	CRM-182J/UNI ZR: 8595188176903	CRM-183J/UNI ZR: 8595188180610
CRM-181J/UNI ZN: 8595188180399	CRM-182J/UNI ZN: 8595188176910	CRM-183J/UNI ZN: 8595188180603
CRM-181J/UNI BL: 8595188180405	CRM-182J/UNI BL: 8595188176927	CRM-183J/UNI BL: 8595188180580
CRM-181J/UNI OD: 8595188180412	CRM-182J/UNI OD: 8595188176934	CRM-183J/UNI OD: 8595188180597

- Single-function time relays are suitable for universal use in automation, control and regulation or in house installations where there is a clear function requirement in advance.
- Choice of four types function: ZR, ZN, BL, OD
- All functions initiated by the supply voltage can use the control input to inhibit the ongoing delay (pause).
- Universal supply voltage AC/DC 12 – 240 V.
- Time scale 0.1 s - 100 h divided into 10 ranges: (0.1 - 1 s / 1 - 10 s / 3 - 30 s / 6 - 60 s / 1 - 10 min / 3 - 30 min / 6 - 60 min / 1 - 10 h / 3 - 30 h / 10 - 100 h).
- Output contact:
  CRM-181J: 1× changeover / SPDT 16 A
  CRM-182J: 2× changeover / SPDT 16 A
  CRM-183J: 1× changeover / SPDT 16 A, 2× changeover / DPDT 8 A
- Multifunction red LED flashes or shines depending on the operating state.

Technical parameters	CRM-181J	CRM-182J	CRM-183J
Power supply			
Supply terminals:	A1-A2		
Supply voltage:	AC/DC 12 – 240 V (AC 50-60 Hz)		
Consumption (max.):	2 VA/1.5 W	2.5 VA/1.5 W	2.5 VA/1.5 W
Supply voltage tolerance:	–15 %; +10 %		
Supply voltage indication:	green LED		
Time circuit			
Time ranges:	0.1 s - 100 h		
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 (0.01 %/°F, at = 68 °F)		
Output			
Contact type 1:	1× changeover/SPDT (AgNi)		
Current rating:	16 A/AC1; PD. B300		
Breaking capacity:	4000 VA/AC1, 384 W/DC1		
Electrical life (AC1):	100.000 ops.		
Contact type 2 (3):	×	1× chang./SPDT (AgNi)	2× chang./DPDT (AgNi)
Current rating:	×	16 A/AC1; PD. B300	8 A/AC1;PD. B300
Breaking capacity:	×	4000 VA/AC1, 384 W/DC1	2000 VA/AC1, 192 W/DC1
Electrical life (AC1):	×	100.000 ops.	50.000 ops.
Switching voltage:	250 V AC/24 V DC		
Power dissipation (max.):	1.2 W	2.4 W	2.4 W
Mechanical life:	10.000.000 ops.		
Control			
Control terminals:	A1-S		
Load between S-A2:	Yes		
Impulse length:	min. 25 ms/max. unlimited		
Reset time:	max. 150 ms		
Other information			
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)		
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)		
Dielectric strength:			
supply – output 1	AC 4 kV		
supply – output 2 (3)	×	AC 4 kV	AC 1 kV
output 1 – output 2	×	AC 4 kV	AC 1 kV
output 2 – output 3	×	×	AC 1 kV
Operating position:	any		
Mounting:	DIN rail EN 60715		
Protection degree:	IP40 front panel/IP20 terminals		
Overvoltage category:	III.		
Pollution degree:	2		
Cross-wire section – solid/ stranded with ferrule (mm²):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 12)		
Dimensions:	90 × 17.6 × 64 mm (3.5″ × 0.7″ × 2.5″)		
Weight:	61 g (2.2 oz)	84 g (3 oz)	84 g (3 oz)
Standards:	EN 61812-1		

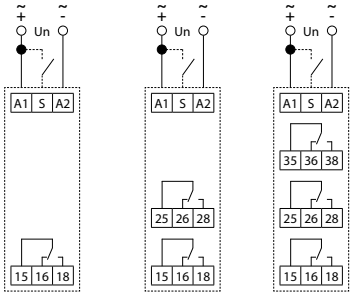
Description

CRM-183J



Connection

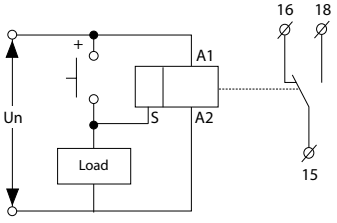
CRM-181J CRM-182J CRM-183J



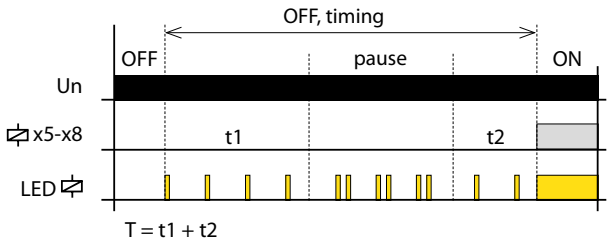
CRM-183J:
The potential difference between the supply terminals (A1-A2), output contact 2 (25-26-28) and output contact 3 (35-36-38) must be a maximum of AC rms/DC 250 V.

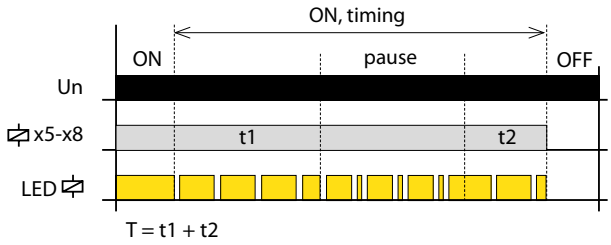
Possibility to connect load onto controlling input

It is possible to connect the load (e.g.: contactor) between terminals S-A2, without any interruption of correct relay function.



Indication of operating states



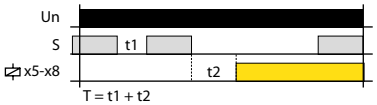


Function

ZR ON DELAY

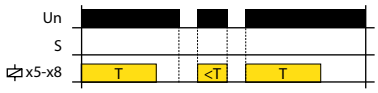
When the supply voltage "Un" is applied, the time delay "T" starts. The output contact(s) "⇄" will close after the delay has elapsed. If the supply voltage "Un" is disconnected, the output contact(s) "⇄" are opened and the function is reset. Control input "S" is not used in this function.

ON DELAY with Inhibit



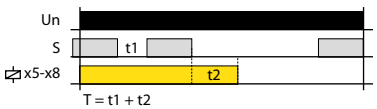
When the supply voltage "Un" is applied while the control input "S" is closed, the time delay "T" doesn't start. The delay only starts when the control input "S" is open. The output contact(s) "⇄" will close after the delay has elapsed. If the supply voltage "Un" is disconnected, the output contact(s) "⇄" are opened and the function is reset.

ZN INTERVAL ON



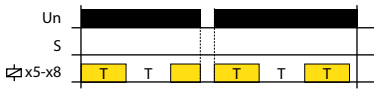
When the supply voltage "Un" is applied, output contact(s) "⇄" closes immediately and time delay "T" starts. Output contact(s) "⇄" opens after the delay has elapsed. If the supply voltage "Un" is disconnected, the output contact(s) "⇄" are opened and the function is reset. Control input "S" is not used in this function.

INTERVAL ON with Inhibit



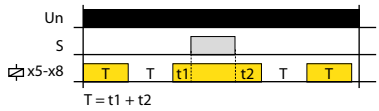
When the supply voltage "Un" is applied while the control input "S" is closed, the output contact(s) "⇄" are immediately closed and the time delay "T" doesn't start. The delay only starts when the control input "S" is open. The output contact(s) "⇄" will open after the delay has elapsed. If the supply voltage "Un" is disconnected, the output contact(s) "⇄" are opened and the function is reset.

BL FLASHER - ON first



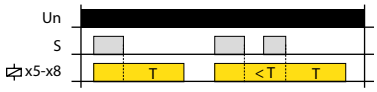
When the supply voltage "Un" is applied, output contact(s) "⇄ " closes immediately and time delay "T" starts. Output contact(s) " ⇄" opens after the delay has elapsed and the delay starts from the beginning. After the delay has elapsed, output contact(s) "⇄" closes again. This repeats as a cycle until the supply voltage "Un" is disconnected. If the supply voltage "Un" is disconnected, the output contact(s) "⇄" are opened and the function is reset. Control input "S" is not used in this function.

FLASHER - ON first with Inhibit



When the supply voltage "Un" is applied while the control input "S" is closed, the output contact(s) "⇄" closes immediately and time delay "T" doesn't start. The delay only starts when the control input "S" is open. Output contact(s) "⇄ " opens after the delay has elapsed and the delay starts from the beginning. After the delay has elapsed, output contact(s) "⇄" closes again. This repeats as a cycle until the supply voltage "Un" is disconnected. If the supply voltage "Un" is disconnected, the output contact(s) "⇄" are opened and the function is reset.

OD OFF DELAY



When the supply voltage "Un" is applied, the output contact(s) "⇄" are opened. If the control input "S" is closed, the output contact(s) "⇄" will closes as well. If the control input "S" is opened, the time delay "T" starts. The output contact(s) "⇄" will open after the delay has elapsed. If the control input "S" is re-closed during the delay, the time delay "T" is reset and will start from beginning when the control input "S" is re-opened. If the supply voltage "Un" is disconnected, the output contact(s) "⇄" open and the function is reset.

Note: ZR, ZN and BL functions are initiated by connecting the supply voltage to the device, i.e. in the event of a failure and recovery of the supply voltage, the relay automatically performs 1 cycle.

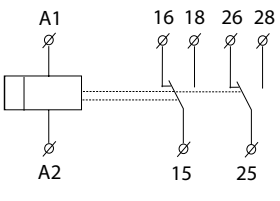
SJR-2 | ON DELAY time relay, 2-channels

EAN code
SJR-2/230V: 8595188116015
SJR-2/UNI: 8595188117401

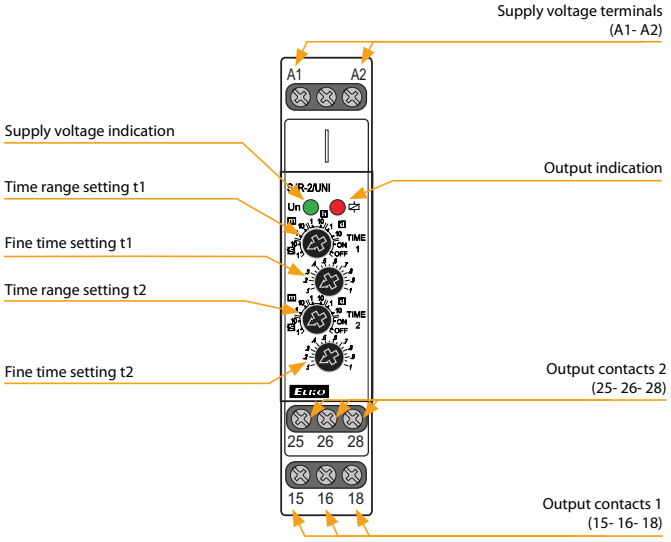
- For gradual switching of high power, prevents current strokes in the main.
- Double stage ON DELAY.
- Time scale 0.1 s - 10 days divided into 10 ranges: 0.1 s - 1 s/1 s - 10 s/0.1 min - 1 min/1 min - 10 min/0.1 hrs - 1 h/1 h - 10 hrs/0.1 day - 1 day/1 day - 10 days/only ON/only OFF.
- Times t1 and t2 are independantly adjustable.
- Time range setting via rotary switch.
- Voltage range: AC 230 V or AC/DC 12 - 240 V.
- Output contact: 2 x changeover/DPDT 16 A.
- Multifunction red LED flashes or shines depending on the operating status.

Technical parameters		SJR-2
Power supply		
Supply terminals:		A1 - A2
Voltage range:		AC/DC 12 - 240 V (AC 50-60 Hz)
Power input (max.):	UNI	2.5 VA/1.5 W
Voltage range:		AC 230 V (50-60 Hz)
Power input (max.):	230	4 VA/2 W
Supply voltage tolerance:		–15 %; +10 %
Supply indication:		green LED
Time circuit		
Time ranges:		0.1 s - 10 days
Time setting:		rotaty switch and 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/DPDT (AgNi)
Current rating:		16 A/AC1; PD. B300
Breaking capacity:		4000 VA/AC1, 384 W/DC
Inrush current:		30 A/< 3 s
Switching voltage:		250 V AC/24 V DC
Max. power dissipation:		2.4 W
Output indication:		multifunction red LED
Mechanical life:		10.000.000 ops.
Electrical life (AC1):		100.000 ops.
Reset time:		max. 150 ms
Other information		
Operating temperature:		–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:		–30 .. 70 °C (–22 .. 158 °F)
Dielectric strength:		
supply - output 1		4 kV AC
supply - output 2		4 kV AC
output 1 - output 2		4 kV AC
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 or 2x1.5/ with sleeve max. 1x 2.5 (AWG 12)
Dimensions:		90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:		UNI - 78 g (2.8 oz.), 230 - 75 g (2.6 oz.)
Standards:		EN 61812-1

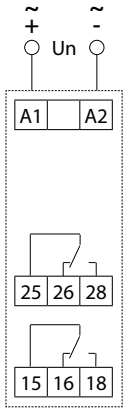
Symbol



Description

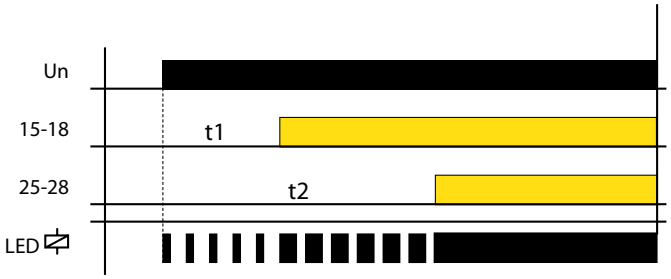


Connection



Function

2x ON DELAY



SMR-B-SL | Multifunction time relay - screwless terminals

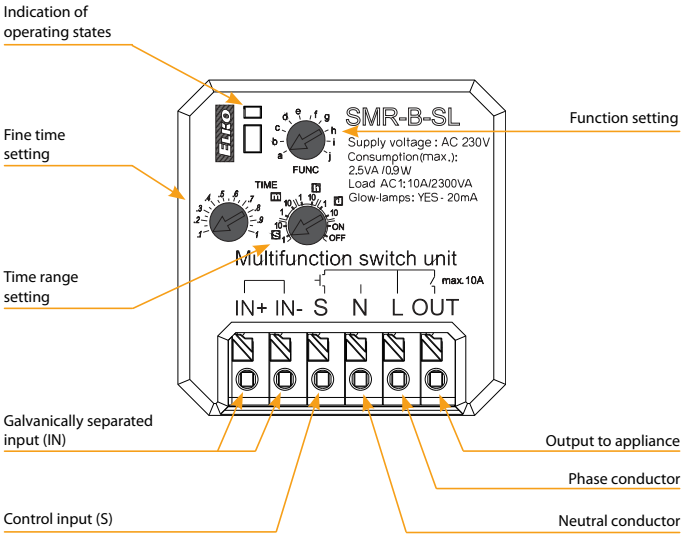
NEW

- Multifunction time relay designed for installation in an installation box, under a push button or switch in an existing electrical installation.
- Screwless terminals speed up installation and save space in the installation box.
- 4-wire connection (with neutral wire).
- Two terminals for galvanically separated input IN.
- The output contact switches the potential L (connected phase).
- Allows switching of all types of load.

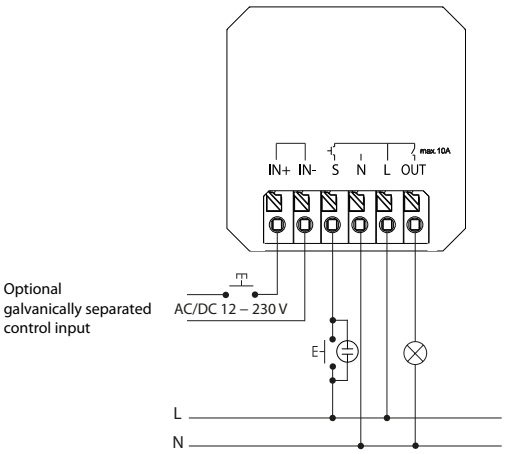
EAN code
SMR-B-SL/230V: 8595188189286

Technical parameters	SMR-B-SL
Power supply	
Connection:	4-wire
Supply voltage:	AC 230 V (50 Hz)
Consumption (max.):	2.5 VA/0.9 W
Supply voltage tolerance:	–15 %; +10 %
Time circuit	
Number of functions:	10
Time range:	0.1 s – 10 d
Time setting:	rotary switch and potentiometer
Time deviation:	10 % – mechanical setting
Repeat accuracy:	2 % – set value stability
Temperature coefficient:	0.1 %/°C, at = 20 °C (0.1 %/°F, at = 68 °F)
Reset time (max.):	450 ms
Output	
Contact type:	1× closing ($AgSnO_2$)
Current rating:	10 A
Breaking capacity:	2500 VA
Electrical life (AC1):	100.000 ops.
Switching voltage:	AC 250 V
Power dissipation (max.):	0.6 W
Mechanical life:	10.000.000 ops.
Control input S	
Control voltage:	AC 230 V (–15%; +10%)
Load between S-N:	YES
Impulse length:	min. 20 ms/max. unlimited
Glow lamp connection (max.):	YES (20 mA)
Control input IN	
Control voltage:	AC/DC 12 – 230 V (–15%; +10%)
Load between S-N:	YES
Impulse length:	min. 20 ms/max. unlimited
Galvanic isolation:	YES
Input current (max.):	2 mA
Glow lamp connection:	NO
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:	AC 4 kV (supply - input IN)
Operating position:	any
Mounting:	loose on the supply wires
Protection degree:	IP40
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section; solid/ stranded with ferrule (max.):	1× 1.5 mm² (16 AWG), 2× 0.75 mm² (18 AWG)/ 1× 1.5 mm² (16 AWG), 2× 0.75 mm² (18 AWG)
Dimensions:	43 × 44 × 22 mm (1.69˝ × 1.73˝ × 0.87˝)
Weight:	35 g (1.23 oz)
Standards:	EN 61812-1

Description



Connection



Funkce

Functions (page 37).

SMR-K, SMR-T, SMR-H, SMR-B | Super-multifunction time relays

EAN code
SMR-K/230V: 8595188145176
SMR-T/230V: 8595188129107
SMR-H/230V: 8595188129114
SMR-B/230V: 8595188135566

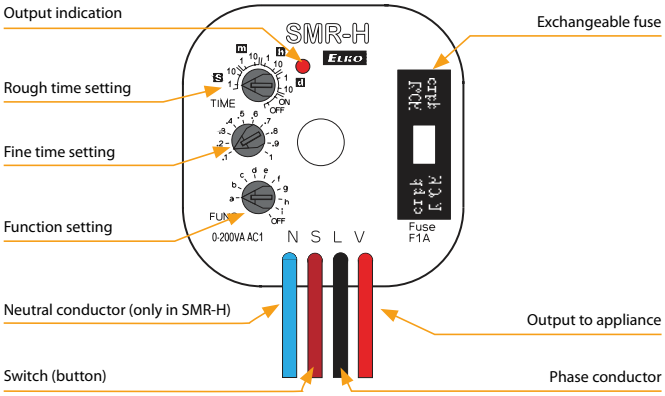
Technical parameters	SMR-K	SMR-T	SMR-H	SMR-B
Number of functions:		9		10
Connection:	3-wire, without neutral		4-wire, with neutral	
Voltage range:	AC 230 V (50-60 Hz)			
Power input (no operation/make):	max. 0.8/3 VA			max. 1/1 VA
Supply voltage tolerance:	–15 %; +10 %			
Time ranges:	0.1 s - 10 days			
Time setting:	via rotaty switch			
Time deviation:	10 % - mechanical setting			
Repeat accuracy:	2 % - set value stability			
Temperature coefficient:	0.1 %/°C, at = 20 °C (0.1 %/°F, at = 68 °F)			
Output				
Number of contacts:	1 x triac			1x NO-SPST ($AgSnO_2$)
Resistive load:	10 - 160 VA		0 - 200 VA	16 A 125/ 250 V AC1*
Inductive load:	4 W		4 W	8 A 250 V AC (cos φ > 0.4)
Mechanical life:	30.000.000 ops.			
Electrical life (AC1):	100.000 ops.			
Control				
Control voltage:	AC 230 V			AC 230 V, UNI 5-250 V AC/DC
Control current:	25µA	3 mA		
Impulse length:	min. 50 ms/max. unlimited			
Glow tubes connetions:	x	Yes		
Max. amount of glow lamps connected to controlling input:	x	230 V - max. amount 50 pcs (measured with glow lamp 0.68 mA/230 V AC)		
Other information				
Operating temperature:	0 .. +50 °C (+32 .. +122 °F)			
Operating position:	any			
Mounting:	free at connecting wires			
Protection degree:	IP 30 in standard conditions**			
Overvoltage category:	III.			
Pollution degree:	2			
Fuse:	F 1 A/250 V			x
Connection wires (cross-section/lenght):	3x CY, 0.75 mm² (AWG 18) 90 mm (3.5˝)		4x sol. wir., 0.75 mm² (AWG 18) 90 mm (3.5˝)	2x CY, 0.75mm² (AWG 18), 2x CY, 2.5 mm² (AWG 10), 90 mm
Glow-lamps in control button:	x	max. 10		max. 20
Dimensions:	49 x 49 x 13 mm (1.9˝ x 1.9˝ x 0.5˝)			49 x 49 x 21 mm (1.9˝ x 1.9˝ x 0.8˝)
Weight:	27 g(0.95 oz.)	27 g(0.95 oz.)	28 g(0.98 oz.)	53 g (1.9 oz.)
Standards:	EN 61812-1			

* PD. B300
** for more information see page 75

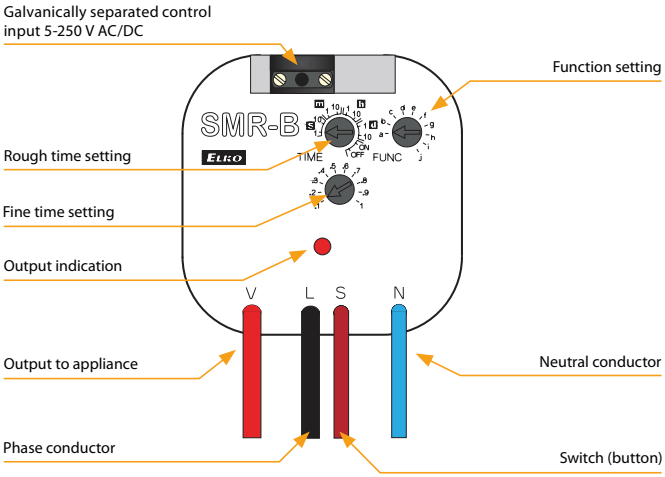
- Multifunction relay designed for installation into a wiring box or under wall-switch in an existing electrical installation.
- Advantageous and fast solution for exchanging standard wall-switch for a switch controlled by time or for an impulse relay controlled by a button.
- **SMR-K**
  - 3-wire connection, works without the connection of a neutral conductor
  - power output: 10-160 VA
  - for flawless function of the product is necessary the presence of a load R, L or C between input S and neutral wire.
- **SMR-T**
  - 3-wire connection, works without the connection of a neutral conductor
  - power output: 10 - 160 VA
  - between input S and neutral wire is possible connect any load R, L, or C - that is not necessary (unlike SMR-K).
- **SMR-H**
  - 4-wire connection
  - power output: 0 - 200 VA.
- **SMR-B**
  - 4-wire connection
  - output contact 1x 16 A/4000 VA, 250 V AC1
  - enables switching of fluorescent lights and also energy saving lights
  - independent galvanically separated input AC/DC 5 - 250 V, for example for control from a security system.

Description

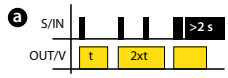
SMR-H



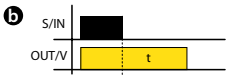
SMR-B



Function

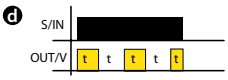


SINGLE SHOT rising edge, programmable
When input S/IN is closed, the output closes and starts timing. Each subsequent pressing (max. 5×) prolongs the set time and thus the delay length. When the delay runs out, the output opens. Long press >2s during the delay opens the output immediately.



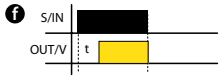
OFF DELAY 4
When input S/IN is closed, the output closes. When input S/IN is open, timing starts. When the delay runs out, the output opens. If input S/IN is closed again during the delay (t), the output will open for few ms when the delay runs out and closes again.

SINGLE SHOT falling edge
When input S/IN is closed, nothing happens. When input S/IN is open, the output closes and timing starts. When the delay runs out, the output opens. Repeated closing/opening of input S/IN during the delay (t) doesn't affect its length.

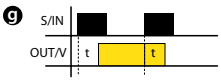


FLASHER - ON first with Control Signal
When input S/IN is closed, the output closes and timing starts. The output opens when the delay runs out, and the timing starts from the beginning. The output closes when the delay runs out, and the timing starts from the beginning once again. This repeats until input S/IN is opened which stops the cycling function and opens output (if it was closed).

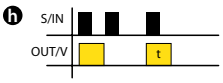
ON/OFF DELAY 3
When input S/IN is closed, the timing starts. The output closes when the delay runs out. When input S/IN is open, the timing starts again. The output opens when the delay runs out. If the input S/IN is closed and opened before first delay runs out, notning happens. If the input S/IN is closed during second delay it will immediately stops the function and opens the output.



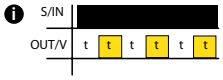
ON DELAY with Control Signal 2
When input S/IN is closed, the timing starts. The output closes when the delay runs out. When input S/IN is open, the output opens as well.



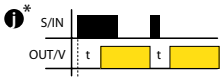
ON/OFF DELAY 4
When input S/IN is closed, the timing starts. The output closes when the delay runs out. When input S/IN is open, nothing happens. When input S/IN is closed again, the timing starts. The output opens when the delay runs out. When input S/IN is open again, nothing happnes.



MEMORY LATCH with Delay
When input S/IN is closed, the output closes and timing starts. When the delay runs out, the output opens. The output opens immediately if the input S/IN is open and closed before the delay runs out.

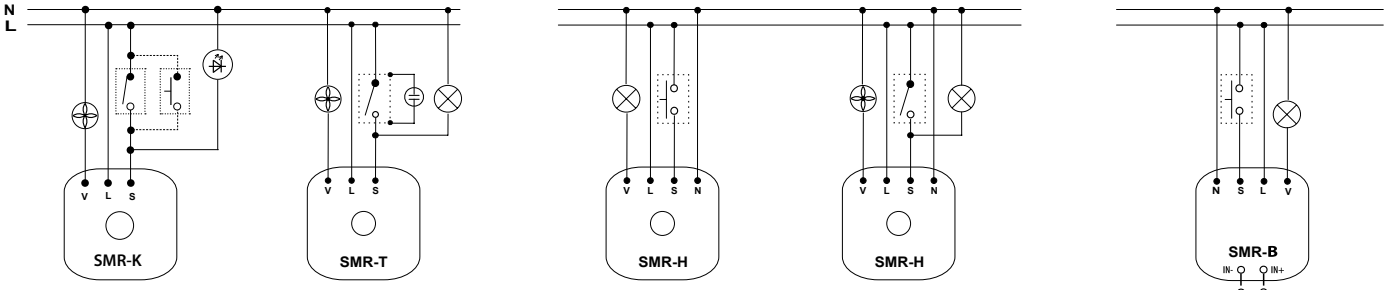


FLASHER - OFF first with Control Signal
When input S/IN is closed, the timing starts. The output closes when the delay runs out, and timing starts from the beginning. The output opens when the delay runs out, and the timing starts from the beginning once again. This repeats until input S/IN is opened which stops the cycling function and opens output (if it was closed).



ON DELAY with Control Signal*
When input S/IN is closed, the timing starts. The output closes when the delay runs out. When input S/IN is open, nothing happens. When input S/IN is closed again, the output opens and timing starts again. The output closes when the delay runs out.
Note.: * this function is valid only for SMR-B or SMR-B-SL

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



Typical wiring of SMR-K - timer for fan

SMR-T: Fan controlling depending on the lighting

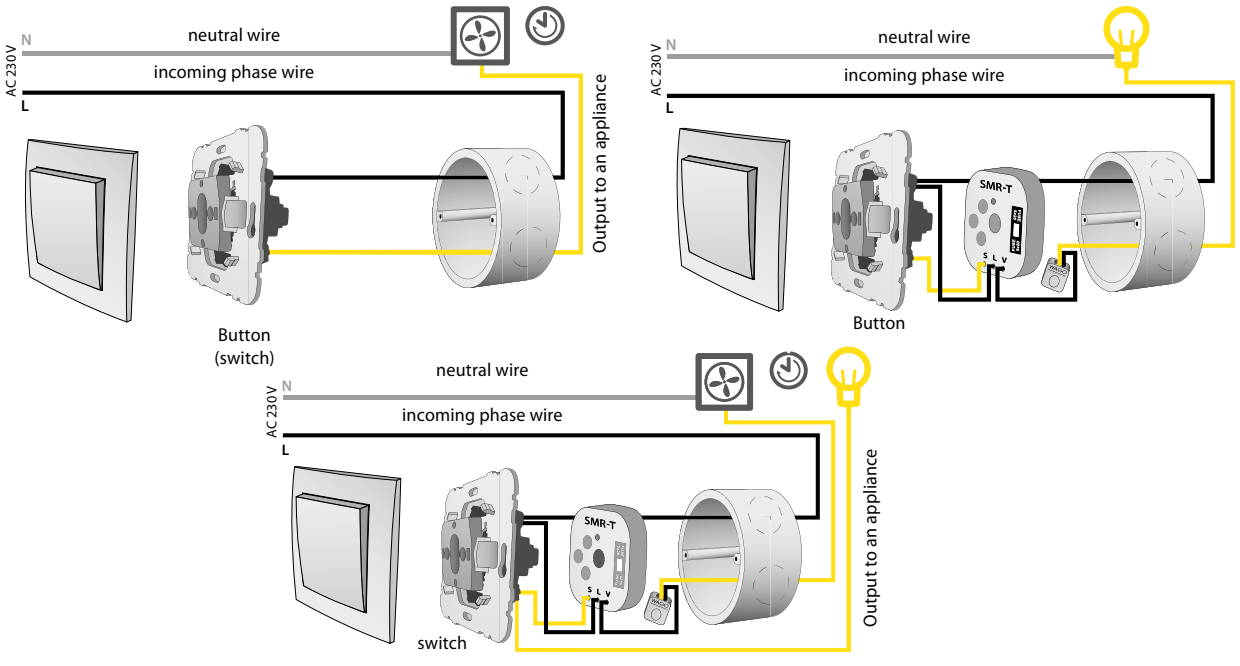
Typical wiring of SMR-H - timer for lamp

Fan control depending on the lighting

Input for external control voltage AC/DC 5-250 V

Note: SMR-K, SMR-T, SMR-H are not intended for switching capacity load (energy saving bulbs and LED lights with capacity power etc.), these products are only intended for switching resistive and inductive loads (incandescent bulbs, fans, etc.). SMR-B with relay output is intended to other types of load. Using this output it is possible to switch the load of R, L or C-values listed in the load table. Between inputs S and neutral wire is possible to connect any load of R, L or C, however this is not (unlike the SMR-K) condition.

Example of connection SMR-T



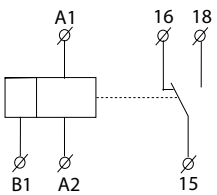
CRM-100 | Multifunction time relay with LCD display

EAN code
CRM-100: 8595188174534

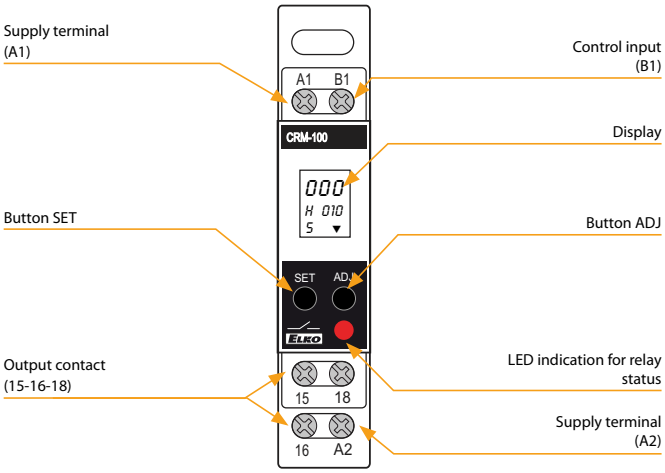
- Digital multifunction relay can be used for controlling lights, heating, motors, pumps, machines and appliances where you need set time functions.
- 17 most used functions.
- Thanks to digital display and settings you exact set required time (without any mechanical tolerance).
- Time range 0.1 s - 999 hours.
- Universal power supply 24 - 240 V AC/DC brings you variability of powering.
- Visible time function for non-autoratized.

Technical parameters	CRM-100
Number of functions:	17
Supply terminals:	A1 - A2
Voltage range:	AC/DC 24-240 V (50-60 Hz)
Consumption (max):	4 VA / 3 W
Max. dissipated power (Un + terminals):	4 W
Supply voltage tolerance:	–15 %; +10 %
Time ranges:	0.1 s - 999 hrs.
Time setting:	Buttons SET/ADJ
Repeat accuracy:	± 0.5 % - of selected range
Variation in timing due to voltage change:	± 2%
Variation in timing due to temperature change:	± 5%
Output	
Number of contacts:	1x changeover / SPDT (AgNi)
Current rating:	8 A/AC1
Breaking capacity:	2000 VA/AC1, 192 W/DC
Inrush current:	10 A/<3 s
Switching voltage:	250 V AC/24 V DC
Output indication:	multifunction red LED
Mechanical life:	20.000.000 ops.
Electrical life (AC1):	100.000 ops.
Controlling	
Control terminals:	A1-B1
Other information	
Operating temperature:	–10 .. +55 °C (14 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Isolation (Between Input and Output):	2.5 kV
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP30 from front panel/IP20 terminals
Overvoltage cathegory:	III.
Pollution degree:	2
Max. cable size (mm²):	solid wire max. 1x 2.5 or 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)
Dimensions:	85 x 18.2 x 76 mm (3.3˝ x 0.7˝ x 2.99˝)
Weight:	78 g (2.8 oz.)
Standards:	EN 61812-1

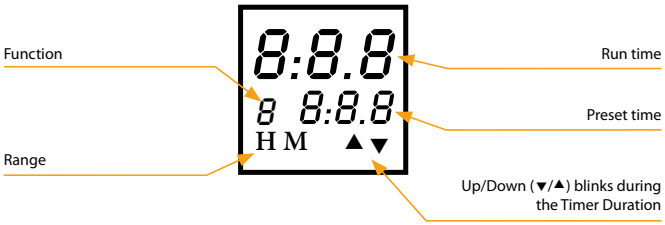
Symbol



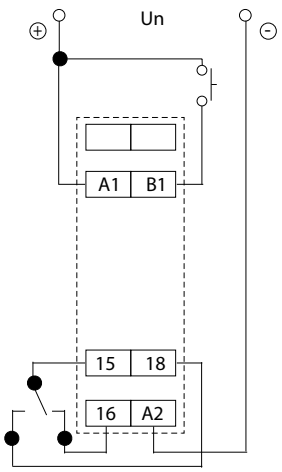
Description



Description of displayed elements on the screen



Connection

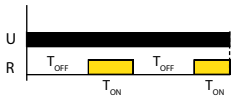


Function

0

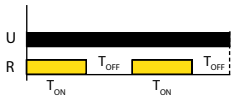
ON delay [*0*]
Timing commences when supply is present. R energizes at the end of the timing period.

1



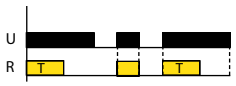
ASYMMETRIC FLASHER - OFF first [*1*]
T-ON and T-OFF can be same or different. The relay (R) keeps on changing its status till power is removed.

2



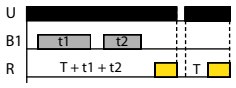
ASYMMETRIC FLASHER - ON first [*2*]
This function is quite similar to the function '1' but initially the relay(R) is ON for period T-ON after the power is applied.

3



INTERVAL ON [*3*]
After power ON, R energizes and timing starts. R de-energizes after timing is over.

4

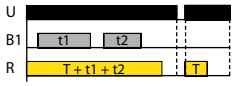


ON DELAY with Inhibit [*4*]
Time commences as supply is present and switch B1 is open. Closing switch B1 pauses timing. Timing resumes when switch B1 is opened again. R energizes at the end of timing.

5

ON DELAY with Inhibit, inverted [*5*]
Time commences as supply is present and switch B1 is closed. Opening switch B1 pauses timing. Timing resumes when switch B1 is closed again. R energizes at end of timing.

6

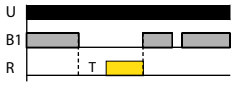


INTERVAL ON with Inhibit [*6*]
When supply is ON, R energizes. When switch B1 is closed timing is suspended and remains suspended till switch B1 is opened again. Interrupting supply resets timer.

7

ON DELAY with Control Signal 2 [*7*]
Permanent supply required. Timing starts when switch B1 is closed. R energizes at end of timing period and de-energizes when B1 is opened.

8

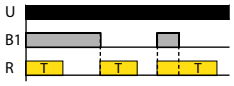


ON DELAY with Control Signal 2, inverted [*8*]
Timing will commence when supply is present and switch B1 is open. R energizes after timing. If B1 is closed during timing period, timing resets to the beginning of cycle.

9

OFF DELAY [*9*]
Permanent supply is required. R energizes when switch B1 is closed. Timing commences after S is opened and then the relay de-energizes.

A

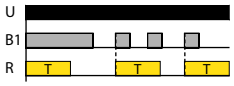


INTERVAL ON/OFF 2 [*A*]
Permanent supply is required. R energizes for the timing period when B1 is opened or closed. When timing commences, changing state of B1 does not affect R but resets timer.

B

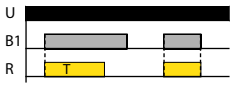
ON/OFF DELAY 2 [*B*]
When switch B1 is closed or opened for preset time ,T, the relay changes its state after time duration T.

C



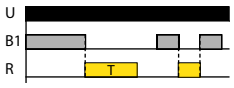
SINGLE SHOT rising edge [*C*]
A permanent supply is needed. When B1 is closed, output relay energizes until timing irrespective of any further action of B1.

D



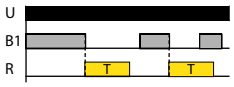
SINGLE SHOT rising edge 2 [*D*]
Permanent supply is required. when switch B1 is closed, and remains closed output relay energizes until timing is over. If B1 is opened during timing, R resets.

E



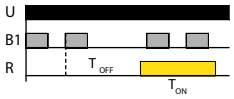
SINGLE SHOT falling edge 2 [*E*]
Permanent supply required. when B1 is opened, R energizes and de-energizes when timing is over. If B1 is closed during timing R resets.

F



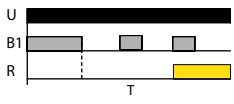
SINGLE SHOT falling edge [*F*]
Permanent supply is required. When switch B1 is opened, R energizes and will de-energize when timing is over. If B1 is pulsed during timing period it will have no effect on R.

G



ASYMMETRIC PULSE GENERATOR 2 [*G*]
When switch B1 is closed, T_{OFF} starts. Relay energizes at the end of T_{OFF} period. Then, T_{OFF} starts irrespective of signal level and relay de-energizes at the end of T_{ON} period.

H



ON DELAY with Control Signal 3, inverted [*H*]
Permanent supply voltage is required. If the control contact B1 is open, a delay starts and then the relay energizes.

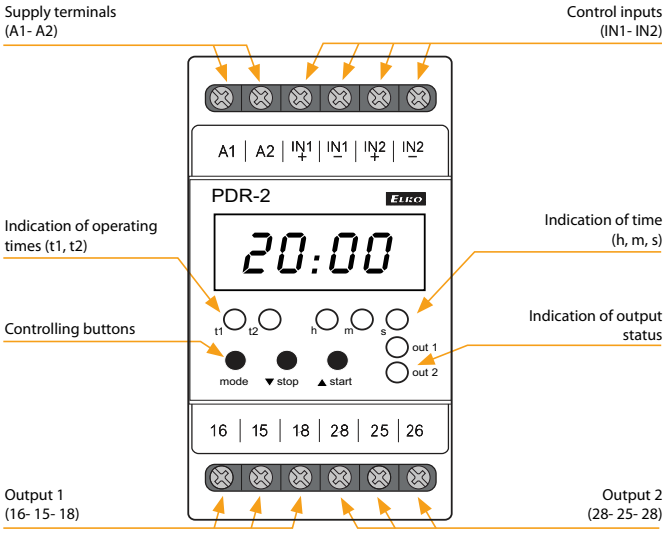
PDR-2/A, PDR-2/B | Programmable digital relays

EAN code
PDR-2A/230V: 8594030333037
PDR-2A/UNI: 8594030333044
PDR-2B/230V: 8594030333051
PDR-2B/UNI: 8594030333068

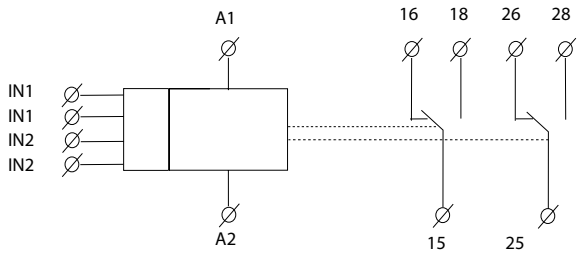
- Multifunction programmable digital relay with 4 digit red LED display.
- Control and setting are done by 3 buttons, user-friendly menu, absolute accuracy in timer setting, time countdown on a display, galvanically separated START and STOP control inputs with UNI supply.
- Thanks to its complexity, it is possible to program also more demanding time functions by using 2 independent times.
- 2 independent times, with combination of 2 inputs and 2 outputs.
- **PDR-2/A:** 16 functions, choice of functions of the other relay, 30 memory places for most frequently used times.
- **PDR-2/B:** 10 functions, 1 output of 10 functions can be assigned to each relay = 2 relays in one device.

Technical parameters		PDR-2/A	PDR-2/B
Function:		16	10
Supply terminals:		A1 - A2	
Voltage range:	UNI	AC/DC 12 - 240 V (AC 50-60 Hz)	
Burden (max.):	UNI	AC 0.5 - 2.5 VA/DC 0.4 - 2.5 W	
Voltage range:	230	AC 230 V (50-60 Hz)	
Consumption (apparent/loss):	230	AC max. 16 VA/2.5 W	
Max. dissipated power (Un + terminals):		5.5 W	
Supply voltage tolerance:		–15 %; +10 %	
Time ranges:		0.01 s - 100 h	
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:		16 A/AC1; PD. B300	
Breaking capacity:		4000 VA/AC1, 384 W/DC	
Inrush current:		30 A/< 3 s	
Switching voltage:		250 V AC/24 V DC	
Output indication:		red LED	
Mechanical life:		30.000.000 ops.	
Electrical strength (AC1):		60.000 ops.	
Control			
Control input Burden:		AC 0.01 - 0.25 VA (UNI), AC 0.25 VA (AC 230 V)	
Glow lamps:		No	
Control. impulse length:		min. 1 ms/max. unlimited	
Reset time:		max. 200 ms	
Display - colour:		red	
Number and height of digits:		4 positions with separating colon, height 10 mm (0.39″)	
Luminace:		2200 - 3800 ucd	
Light wavelength:		635 nm	
Brightness setting:		range 20 - 100 % in 10 steps adjustable	
Memory - memory locations:		30 (PDR-2/A)/20 (PDR-2/B) for times ranges + service function	
Data stored for:		min. 10 years	
Other information			
Operating temperature:		–20 .. +55 °C (–4 .. 131 °F)	
Storage temperature:		–30 .. +70 °C (–22 .. 158 °F)	
Dielectric 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 or 2x 1.5/ with sleeve max. 1x 1.5 (AWG 12)	
Dimensions:		90 x 52 x 65 mm (3.5″ x 2″ x 2.6″)	
Weight:		142 g (5 oz.) (230), 140 g (4.9 oz.) (UNI)	
Standards:		EN 61812-1	

Description



Symbol

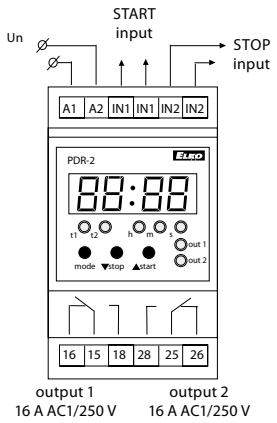


Time data

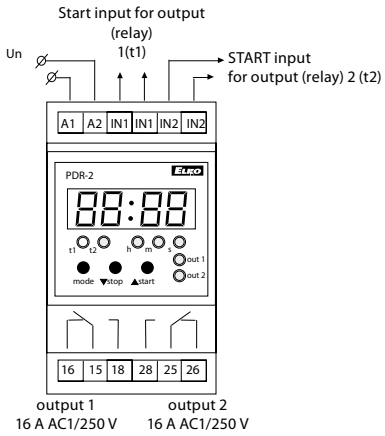
Time range:	0.01 s - 99 h 59 min 59 sec 99 ss
Minimal time step:	0.01 s
Time deviation:	0.01 % of set value
Setting error:	0 %
Setting, reset accuracy:	100 %
Digital places:	selected via program

Connection

PDR-2/A



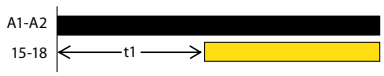
PDR-2/B



Function

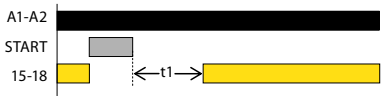
Functions for PDR-2/A and PDR-2/B

1. ON DELAY



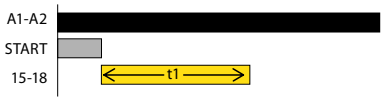
2. INTERVAL ON

3. SINGLE SHOT falling edge, inverted



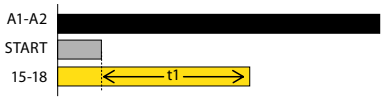
4. SINGLE SHOT rising edge, inverted

5. SINGLE SHOT falling edge

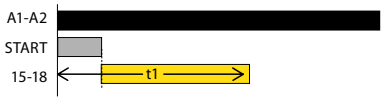


6. SINGLE SHOT rising edge

7. OFF DELAY 2



8. OFF DELAY 3



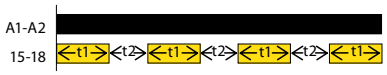
9. FLASHER - ON first

10. FLASHER - OFF first

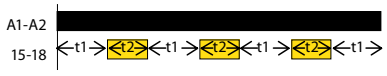
Recommendation:
PDR-2/B is replacing 2 simple time relays = 2 in 1.

Functions for PDR-2/A

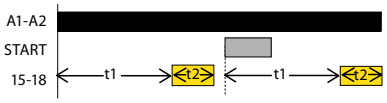
11. ASYMMETRIC FLASHER - ON first



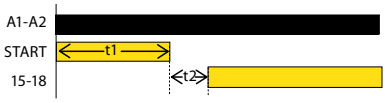
12. ASYMMETRIC FLASHER - OFF first



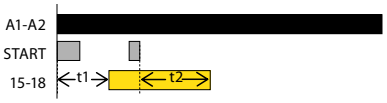
13. ASYMMETRIC PULSE GENERATOR



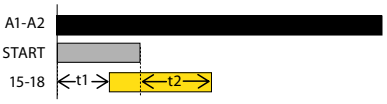
14. STAR/DELTA



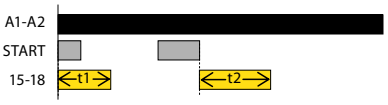
15A. ASYMMETRIC ON/OFF DELAY



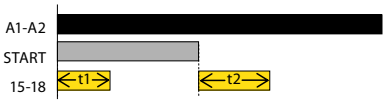
15B. ASYMMETRIC ON/OFF DELAY



16A. ASYMMETRIC INTERVAL ON/OFF



16B. ASYMMETRIC INTERVAL ON/OFF



PTRM-216TP, PTRM-216KP | Multifunction time relay with inhibit delay

EAN code
PTRM-216TP/UNI: 8595188179386
PTRM-216KP/UNI: 8595188178617

- Multifunction time relay for universal use in automation, control and regulation or in house installations.
- Possibility to select the control element for fine time setting:
  PTRM-216KP - knob, for easy handling without the need for tools
  PTRM-216TP - rotary switch, for the possibility of using a sealable cover.
- All functions initiated by the supply voltage, except for the flasher function, can use the control input to inhibit the delay (pause).
- Mode selection - according to the set function, permanently closed, permanently open, and switching of the second output contact according to the supply voltage.
- Multifunction red LED flashes or shines depending on the operating status.

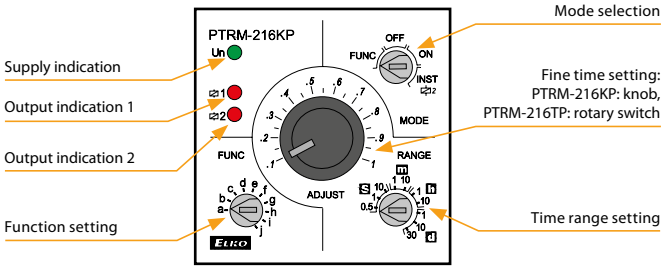
Technical parameters	PTRM-216TP	PTRM-216KP
Power supply		
Power pins:	2, 10	
Voltage range:	AC/DC 12 – 240 V (AC 50-60 Hz)	
Power input (max.):	2.5 VA/1.5 W	
Supply voltage tolerance:	±10 %	
Supply indication:	green LED	
Time circuit		
Number of functions:	10	
Time ranges:	50 ms - 30 days	
Time setting:	rotary switch and potentiometer	
Time deviation:*	5 % - mechanical setting	
Repeat accuracy:	0.2 % - set value stability	
Temperature coefficient:	0.01 %/°C, at = 20 °C (0.01 %/°F, at = 68 °F)	
Output		
Number of contacts:	2x changeover/SPDT (AgNi)	
Current rating:	16 A/AC1; PD. B300	
Breaking capacity:	4000 VA/AC1, 384 W/DC	
Switching voltage:	250 V AC/24 V DC	
Max. power dissipation:	2.4 W	
Output indication:	multifunction red LED	
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Control		
Control pins:	5 (2) -6	
Impulse length:	min. 25 ms/max. unlimited	
Reset time:	max. 150 ms	
Other information		
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)	
Dielectric strength:		
supply - output 1 (1, 3, 4)	2.5 kV AC	
supply - output 2 (8, 9, 11)	2.5 kV AC	
output 1 - output 2	2.5 kV AC	
Operating position:	any	
Mounting:	11 pin octal socket	
Protection degree:	IP40 from front panel	
Overvoltage category:		
for supply voltage 12-150 V AC/DC	III.	
for supply voltage 150-240 V AC/DC	II.	
Pollution degree:	2	
Dimensions:	48x48x79mm (1.7˝x1.7˝x3.1˝)	48x48x89mm (1.7˝x1.7˝x3.5˝)
Weight:	111 g (3.9 oz.)	108 g (3.81 oz.)
Standards:	EN 61812-1	

* for adjustable delay <100 ms, a time deviation of ± 10 ms applies

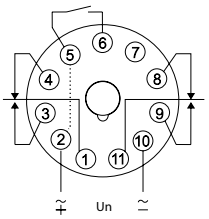
Function

Functions (page 23).

Description

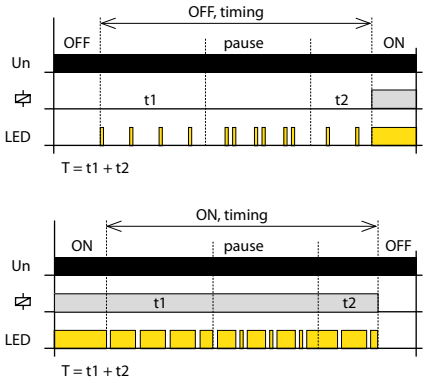


Connection



Pins 2 and 5 are internally connected.

Indication of operating states



Mode selection

FUNC. Settings function mode
The desired function a-j is set with the FUNC rotary switch.

OFF. Output contact open mode

ON. Output contact closed mode

2 INST. Second output contact instantaneous

The second output contact switches according to the supply voltage.
The first output contact switches according to the function (a-j) set by the trimmer FUNC.

PTRM-216T, PTRM-216K | Multifunction time relay with potential-free control input

EAN code
PTRM-216T/UNI: 8595188175586
PTRM-216K/UNI: 8595188175579

- Multifunction time relay for universal use in automation, control and regulation or in house installations.
- Potential-free control input (Control Switch Trigger).
- Possibility to select the control element for fine time setting:
- **PTRM-216K** - knob, for easy handling without the need for tools.
- **PTRM-216T** - rotary switch, for the possibility of using a sealable cover.
- All functions initiated by the supply voltage, except for the flasher function, can use the control input to inhibit the delay (pause).
- Mode selection - according to the set function, permanently closed, permanently open, and switching of the second output contact according to the supply voltage.
- Multifunction red LED flashes or shines depending on the operating status.

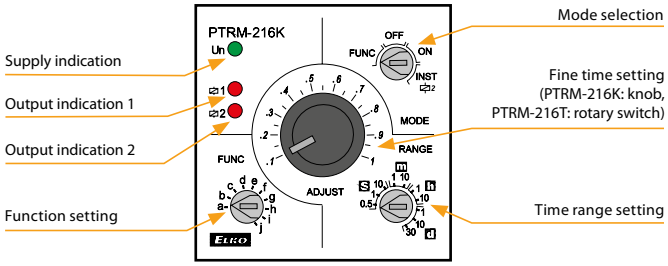
Technical parameters	PTRM-216T	PTRM-216K
Power supply		
Power pins:	2, 10	
Voltage range:	AC/DC 12 – 240 V (AC 50-60 Hz)	
Power input (max.):	2.5 VA/1.5 W	
Supply voltage tolerance:	±10 %	
Supply indication:	green LED	
Time circuit		
Number of functions:	10	
Time ranges:	50 ms - 30 days	
Time setting:	rotary switch and potentiometer	
Time deviation*:	5 % - mechanical setting	
Repeat accuracy:	0.2 % - set value stability	
Temperature coefficient:	0.01 %/°C, at = 20 °C (0.01 %/°F, at = 68 °F)	
Output		
Number of contacts:	2x changeover/SPDT (AgNi)	
Current rating:	16 A/AC1; PD. B300	
Breaking capacity:	4000 VA/AC1, 384 W/DC	
Switching voltage:	250 V AC/24 V DC	
Max. power dissipation:	2.4 W	
Output indication:	multifunction red LED	
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Control		
Control pins:	5 - 6	
Impulse length:	min. 25 ms/max. unlimited	
Reset time:	max. 150 ms	
Other information		
Operating temperature:	–20 .. +55 °C (–4 ..131 °F)	
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)	
Dielectric strength:		
supply - output 1 (1, 3, 4)	2.5 kV AC	
supply - output 2 (8, 9, 11)	2.5 kV AC	
output 1 - output 2	2.5 kV AC	
Operating position:	any	
Mounting:	11 pin octal socket	
Protection degree:	IP40 from front panel	
Overvoltage category:		
for supply voltage 12-150V AC/DC	III.	
for supply voltage 150-240V AC/DC	II.	
Pollution degree:	2	
Dimensions:	48x48x79mm (1.7˝x1.7˝x3.1˝)	48x48x89mm (1.7˝x1.7˝x3.5˝)
Weight:	111 g (3.9 oz.)	108 g (3.81 oz.)
Standards:	EN 61812-1	

* for adjustable delay <100 ms, a time deviation of ± 10 ms applies

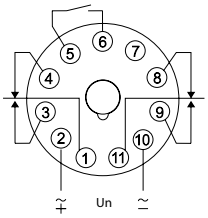
Function

Functions (page 23).

Description

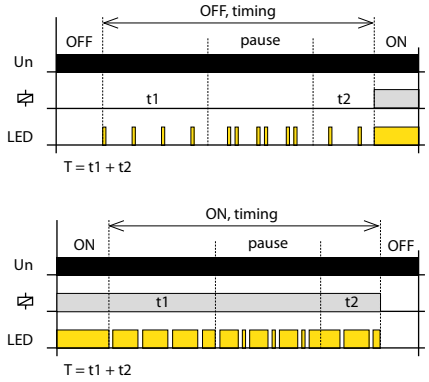


Connection



Do not apply voltage to terminals 5, 6, 7!

Indication of operating states



Mode selection

FUNC. Settings function mode
The desired function a-j is set with the FUNC rotary switch.

OFF. Output contact open mode

ON. Output contact closed mode

2 INST. Second output contact instantaneous

The second output contact switches according to the supply voltage.
The first output contact switches according to the function (a-j) set by the trimmer FUNC.

PTRA-216T, PTRA-216K | Multifunction time relay with three control inputs

- Multifunction time relay for universal use in automation, control and regulation or in house installations.
- Three control inputs - START, INHIBIT, RESET.
- Possibility to select the control element for fine time setting:
  PTRA-216K - knob, for easy handling without the need for tools
  PTRA-216T - rotary switch, for the possibility of using a sealable cover.
- Mode selection - according to the set function, permanently closed, permanently open, and switching of the second output contact according to the supply voltage.
- Multifunction red LED flashes or shines depending on the operating status.

EAN code
PTRA-216T/UNI: 8595188175609
PTRA-216K/UNI: 8595188175593

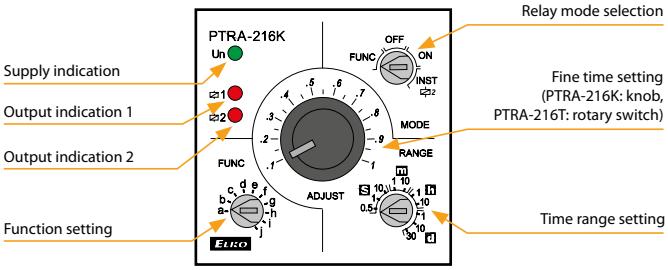
Technical parameters	PTRA-216T	PTRA-216K
Power supply		
Power pins:	2, 10	
Voltage range:	AC/DC 12 – 240 V (AC 50-60 Hz)	
Power input (max.):	2.5 VA/1.5 W	
Supply voltage tolerance:	±10 %	
Supply indication:	green LED	
Time circuit		
Number of functions:	10	
Time ranges:	50 ms - 30 days	
Time setting:	rotary switch and potentiometer	
Time deviation*:	5 % - mechanical setting	
Repeat accuracy:	0.2 % - set value stability	
Temperature coefficient:	0.01 %/°C, at = 20 °C (0.01 %/°F, at = 68 °F)	
Output		
Number of contacts:	2x changeover/SPDT (AgNi)	
Current rating:	16 A/AC1; PD. B300	
Breaking capacity:	4000 VA/AC1, 384 W/DC	
Switching voltage:	250 V AC/24 V DC	
Max. power dissipation:	2.4 W	
Output indication:	multifunction red LED	
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Control		
Control pins:	5 - 2, 6 - 2, 7 - 2	
Impulse length:	min. 25 ms/max. unlimited	
Reset time:	max. 150 ms	
Other information		
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)	
Dielectric strength:		
supply - output 1 (1, 3, 4)	2.5 kV AC	
supply - output 2 (8, 9, 11)	2.5 kV AC	
output 1 - output 2	2.5 kV AC	
Operating position:	any	
Mounting:	11 pin octal socket	
Protection degree:	IP40 from front panel	
Overvoltage category:		
for supply voltage 12-150V AC/DC	III.	
for supply voltage 150-240V AC/DC	II.	
Pollution degree:	2	
Dimensions:	48x48x79mm (1.7˝x1.7˝x3.1˝)	48x48x89mm (1.7˝x1.7˝x3.5˝)
Weight:	111 g (3.9 oz.)	108 g (3.81 oz.)
Standards:	EN 61812-1	

* for adjustable delay <100 ms, a time deviation of ± 10 ms applies

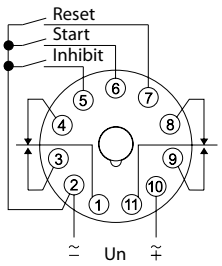
Function

Functions (page 25).

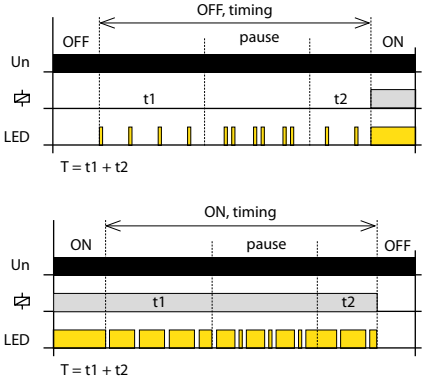
Description



Connection



Indication of operating states



Mode selection

FUNC. Settings function mode
The desired function a-j is set with the FUNC rotary switch.

OFF. Output contact **open mode**

ON. Output contact **closed mode**

2 INST. Second output contact **instantaneous**

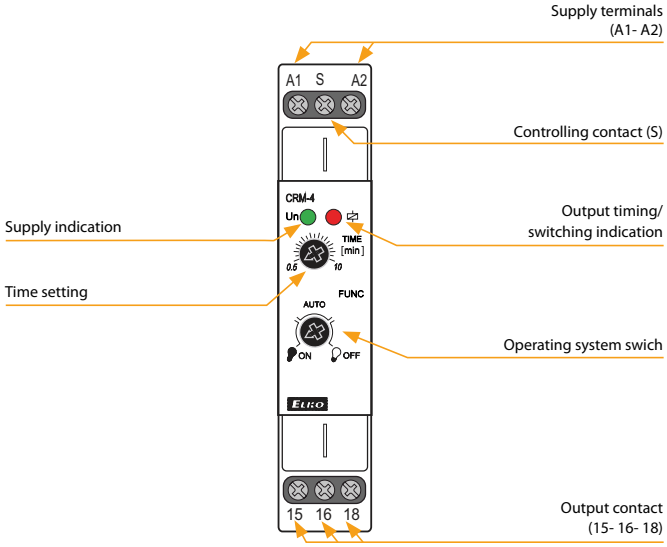
The second output contact switches according to the supply voltage.
The first output contact switches according to the function (a-j) set by the trimmer FUNC.

EAN code
CRM-4: 8595188170772

Technical parameters	CRM-4
Number of functions:	3
Supply terminals:	A1 - A2
Supply voltage:	AC 230 V (50-60 Hz)
Consumption max.:	3 VA/1.6 W
Max. dissipated power (Un + 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 (0.01 %/°F, at = 68 °F)
Output	
Changeover contacts:	1x changeover ($AgSnO_2$)
Rated current:	16 A/AC1; PD. B300
Switching capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	30 A/<3 s
Switching voltage:	250 V AC/24 V DC
Output indication:	red LED
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Control	
Control voltage:	AC 230 V
Power on input max.:	4.5 VA/0.3 W
Control. terminals:	A1-S or A2-S
Glow-tubes:	yes
Max. Current of connected glow lamps:	100 mA
Impulse length:	min. 40 ms/max. unlimited
Reset time:	max. 320 ms
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:	4 kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel/IP20 terminals
Overvoltage cathegory:	III.
Pollution degree:	2
Max. cable size (mm^2):	solid wire max. 1x 2.5 or 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	56 g (2 oz.)
Standards:	EN 61812-1

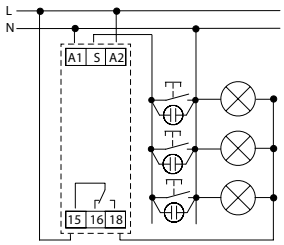
- Simple staircase switch used to control lighting in corridors, halls, staircases, common areas.
- Can also be used for delayed fan run-out e.g. in bathrooms, toilets,...
- 3 functions:
  - ON (permanently closed) - e.g. when cleaning, moving
  - AUTO - STAIRCASE SWITCH without signalization
  - OFF (permanently open) - e.g. when replacing lights.
- Adjustable time range 0.5 to 10 minutes.
- Timing can be terminated by long pressing the control button (>2s).
- Possibility to connect control buttons with glow lamps (max. 100mA).
- Handles surge currents up to 80 A.
- 3-wire or 4-wire connection (input S can be controlled by potential A1 or A2).

Description

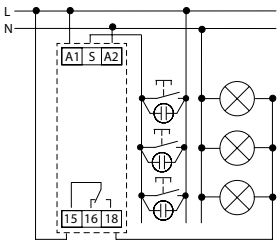


Circuit connection

3-wire connection

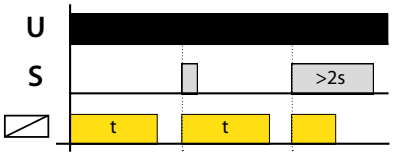


4- wire connection



Function

When switching between functions, the red LED flashes.



AUTO - STAIRCASE SWITCH without signalization

By briefly pressing the control button, the device timed the set time. You cannot extend the time interval by briefly pressing the button repeatedly.

Function suitable for resistive loads (e.g. bulbs) and loads that do not tolerate frequent switching on and off (e.g. energy saving lamps).

Notice:

- After the supply voltage has been connected, the device always performs 1 time cycle.
- The control input reacts to the potential of terminals A1 and A2.

CRM-47 | Programmable staircase switch

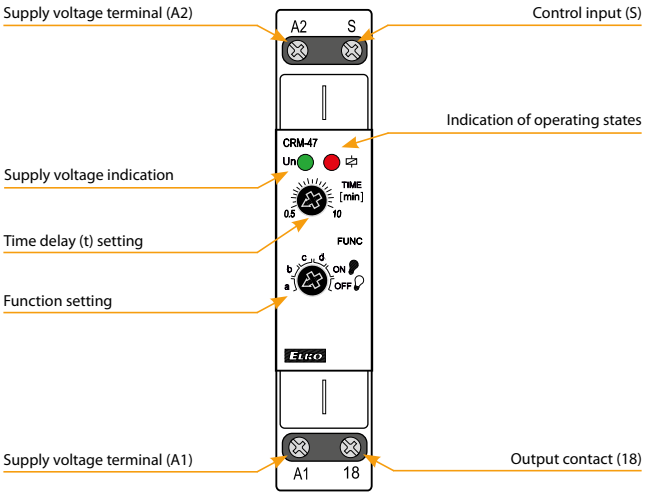
EAN code
CRM-47: 8595188191210

Technical parameters	CRM-47
Power supply	
Supply terminals:	A1-A2
Supply voltage:	AC 230 V (50-60 Hz)
Consumption (max.):	3 VA/1.6 W
Supply voltage tolerance:	–15 %; +10 %
Time circuit	
Number of functions:	6
Time delay (t):	0.5 – 10 m (prog. 30 m)
Time setting:	rotary potentiometer
Time deviation:	5 % – mechanical adjustment
Repeat accuracy:	0.2 % – set value stability
Temperature coefficient:	0.01 %/°C, reference value = 20 °C (=68 °F)
Output	
Contact type:	1× closing (AgSnO2); closes potential "A1"
Current rating:	16 A/AC1
Breaking capacity:	4000 VA/AC1, 384 W/DC1
Inrush current:	30 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Power dissipation (max.):	1.2 W
Mechanical life:	10.000.000 op.
Electrical life (AC1):*	100.000 op.
Controls	
Control voltage:	AC 230 V (50-60 Hz)
Consumption (max.):	4.5 VA/0.3 W
Glow lamp connection:	Yes
Max. current of connected glow lamps:	100 mA
Control terminals:	A1-S or A2-S
Impulse length:	min. 40 ms / max. unlimited
Reset time:	max. 320 ms
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel / IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/ stranded with ferrule (mm^2):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)
Dimensions:	90 × 17.6 × 64 mm
Weight:	55 g
Standards:	EN 61812-1

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

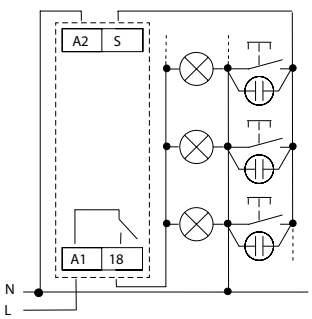
- Staircase switch enables delayed switching off of lighting on stairs, corridors, entrances, common areas or for delayed running of fans in the toilet or bathroom.
- The programmable staircase switch offers similar application possibilities as the CRM-4, while it is possible to extend the delay for functions a, b repeatedly by briefly pressing the control button (buttons). 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 100 mA load (glow lamp, LED in the button, etc.).
- Function (selectable by potentiometer on the front panel)
  a – STAIRCASE SWITCH, programmable with signalization
  b – STAIRCASE SWITCH, 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.
- ZERO CROSS feature: closes the output contact when the voltage crosses zero.
- Adjustable time delay (t) 0.5 – 10 m.
- Handles surge currents up to 80 A.
- 3-wire or 4-wire connection (input S can be controlled by potential A1 or A2) .

Description

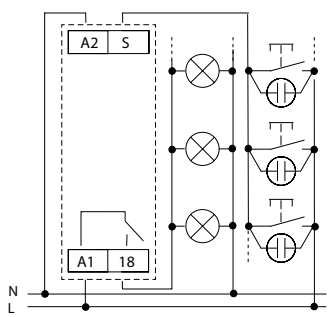


Connection

3-wire connection



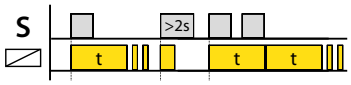
4- wire connection



Functions

When switching between functions, the red LED flashes.

ⓐ

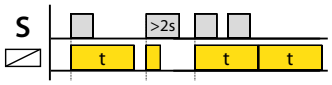


STAIRCASE SWITCH, programmable with signalization

The device timed the set time, 30 and 40s before the end of the time by double flashing of the luminaire announces the impending switch-off. You can increase the time interval by briefly pressing the button repeatedly.

Suitable for resistive loads (e.g. bulbs).

ⓑ

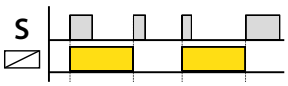


STAIRCASE SWITCH, programmable without signalization

The device will timed the set time without flashing at the end of the interval. You can increase the time interval by briefly pressing the button repeatedly.

The function is suitable for loads that can withstand frequent switching on and off (eg energy saving lamps, LED bulbs).

ⓒ

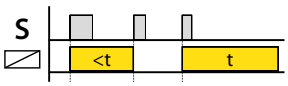


MEMORY LATCH

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).

ⓓ



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).

Digital + Astro + Wi-Fi

SHT-13/1
- Prog.: daily, weekly, yearly, astro
- Output: 1x chang. 16A
Backup using replaceable battery. Internet network connection not required. Remote control using WRC.
pg. 49

SHT-13/2
Like SHT-13/1, but
- Output: 2x chang. 16A
pg. 49

Astro + Wi-Fi

SHT-14/1
- Prog.: daily, weekly, yearly, astro
- Output: 1x chang. 16A
Backup using integrated capacitor. Internet network connection not required. Remote control using WRC.
pg. 50

Digital

SHT-1
- Prog.: daily, weekly, yearly
- Output: 1x chang. 16A
Backup using integrated battery.
pg. 51

SHT-1/2
Like SHT-1, but
- Output: 2x chang. 16A
pg. 51

Analog

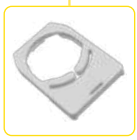
ATS-1DR
- Prog.: daily
- Output: 1x clos. 16A
Min. switching interval 15m. Power reserve up to 100h.
pg. 52

ATS-2D
- Prog.: daily
- Output: 1x chang. 16A
Min. switching interval 30m. Without power reserve.
pg. 53

ATS-2DR
- Prog.: daily
- Output: 1x chang. 16A
Min. switching interval 30m. Power reserve up to 150h.
pg. 53

ATS-2WR
- Prog.: weekly
- Output: 1x chang. 16A
Min. switching interval 210m. Power reserve up to 150h.
pg. 53

Accessories for SHT-13



PLUG-IN backup battery module
Suitable for type CR2032 (3V)
EAN code: 8595188169813

Type	Design	Supply voltage	Output contact				Program				Options						Description	Page
			1 channel, 1x 16 A changeover $AgSnO_2$	2 channel, 2x 16 A changeover $AgSnO_2$	1 channel, 1x 16 A closing AgCdO15	1 channel, 1x 16 A changeover AgCdO15/ AgNi	daily	weekly	yearly	astro	auto. winter/summer time transition	pulse/cycle output	backup (battery)	backup (conductor)	power reserve	connection via Wi-Fi		
SHT-13/1	2-M DIN	AC/DC 24 - 240 V	●	x	x	x	●	●	●	●	■	●	● (E)	x	x	●	Built-in web server for setup and control via Wi-Fi. All programs in one device. Optional Web Remote Control.	49
SHT-13/2	2-M DIN	AC/DC 24 - 240 V	x	●	x	x	●	●	●	●	■	●	● (E)	x	x	●		
SHT-14/1	1-M DIN	AC 110 - 230 V	●	x	x	x	●	●	●	●	■	●	x	●	x	●	Same as SHT-13/1, but without display. Backup with a supercapacitor instead of the battery.	50
SHT-1	2-M DIN	AC/DC 12 - 240 V; AC 230 V	●	x	x	x	●	●	●	x	●*	●	●	●	x	x	Time switch for the needs of controlling the connected load according to the user-set program and time, in addition with pulse/cycle output mode.	51
SHT-1/2	2-M DIN	AC/DC 12 - 240 V; AC 230 V	x	●	x	x	●	●	●	x	●*	●	●	●	x	x		
ATS-1DR	1-M DIN	AC 230V	x	x	●	x	●	x	x	x	x	x	x	x	●	x	Daily program, minimum switching interval 15 minutes, power backup (up to 100 hours).	52
ATS-2D	2-M DIN	AC 230V	x	x	x	●	●	x	x	x	x	x	x	x	●	x	Daily program, minimum switching interval 30 minutes, without power backup.	53
ATS-2DR	2-M DIN	AC 230V	x	x	x	●	●	x	x	x	x	x	x	x	●	x	Daily program, minimum switching interval 30 minutes, power backup (up to 150 hours).	
ATS-2WR	2-M DIN	AC 230V	x	x	x	●	x	●	x	x	x	x	x	x	●	x	Weekly program, minimum switching interval 210 minutes, power backup (up to 150 hours).	

* default settings (can be changed)
■ configurable with first setup
(E) exchangeable

SHT-13 | Multifunction digital time switch with Wi-Fi connection

ALL IN ONE daily weekly yearly astro PROGRAM

c UL us LISTED E308660

WEB SERVER

Wi-Fi 2.4 GHz

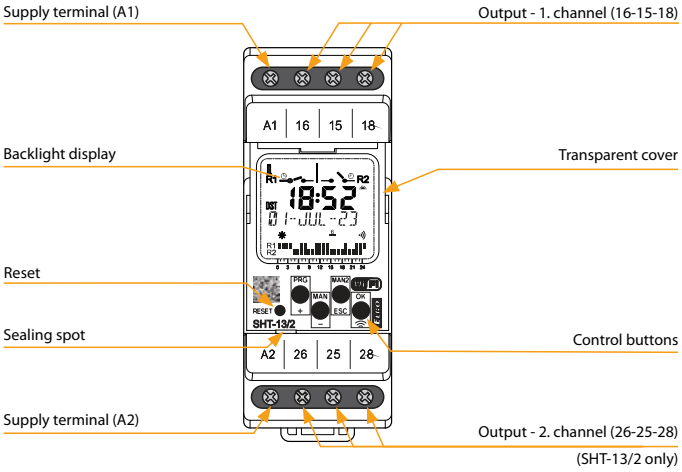
EAN code
SHT-13/1: 8595188189071
SHT-13/2: 8595188184854

- All programs in one device (daily, weekly, yearly and astronomical).
- UNIversal supply voltage in range of AC/DC 24 – 240 V (AC 50-60 Hz).
- Simple setting after the first start-up.
- User replaceable battery to back up the set time during power outages.
- Built-in web server for setup and control via Wi-Fi connection.
- Time synchronization through NTP server (require internet connection of time switches).
- Possibility of permanent connection to the local network.
- WRC: web remote control and setup from anywhere (require internet connection of time switches).
- New well-arranged display with white backlight.
- ASTROnomic program: manual entry of coordinates or selecting from one of more then 500 preset cities.
  - selection of days of the week
  - astro interrupt function (night break): controls the sunrise/sunset times and compares them with the set OFF/ON times
  - high position accuracy thanks to two decimal places in latitude/logitude
- One/two channel design (each with an operating hours counter).
- Pulse/cycle output mode.
- Transition of summer/winter time – AUTO or OFF.
- Sealable transparent front panel cover.
- PIN code protection against unauthorized changes.
- Wireless firmware update

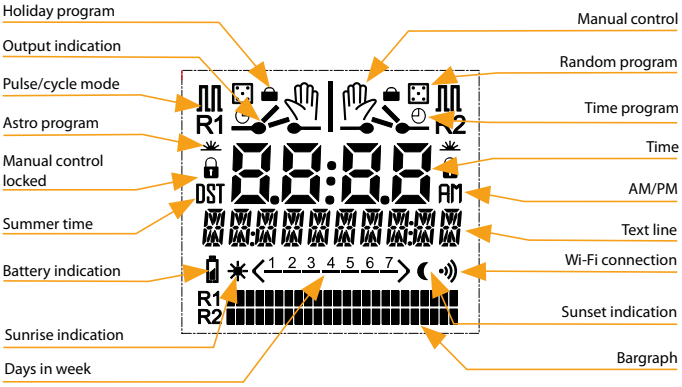
Technical parameters	SHT-13/1	SHT-13/2
Supply terminals:	A1-A2	
Supply voltage:	AC/DC 24 – 240 V (AC 50-60 Hz)	
Consumption (max.):	Wi-Fi "OFF" 0.5 W/2 VA | "ON" 1 W/3 VA	
Supply voltage tolerance:	–15 %; +10 %	
Output		
Contact type:	1× changeover ($AgSnO_2$)	2× changeover ($AgSnO_2$)
Current rating:	16 A/AC1; PD. B300	
Breaking capacity:	4000 VA/AC1, 384 W/DC1	
Inrush current:	30 A/< 3 s	
Switching voltage:	250 V AC/24 V DC	
Power dissipation (max.):	1.2 W	2.4 W
Mechanical life:	30.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Time circuit		
Accuracy:	max. ±0.5 s/day at 23°C (73.4 °F)	
Min. switching interval:	1 s	
Data retention time:	min. 10 years	
Set time backup:	up to half a year with 60 outages (CR 2032 - 3V)	
Program circuit		
Number of memory locations:	200 - time programs, 30 - holidays	
Program type:	daily, weekly, yearly, astro	
Displayed data:	LCD display with white backlight	
Settings via website:	by Wi-Fi (2.4 GHz)	
Other information		
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)	
Dielectric strength:		
supply – output	AC 4 kV	
output 1 – output 2	AC 4 kV	
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP40 front panel / IP20 terminals	
Overvoltage category:	III.	
Pollution degree:	2	
Cross-wire section – solid/	max. 1× 2.5, 2× 1.5/	
stranded with ferrule (mm^2):	max. 1× 2.5 (AWG 14)	
Dimensions:	90 × 35 × 64 mm (3.5″ × 1.4″ × 2.5″)	
Weight:	122 g (4.3 oz)	135 g (4.8 oz)
Standards:	EN 61812-1, EN 18031-1	

Description

SHT-13/2

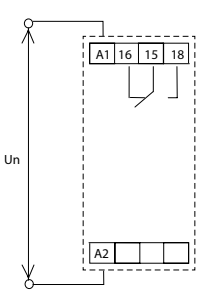


Description of displayed elements

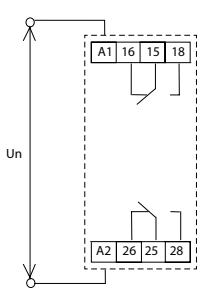


Connection

SHT-13/1

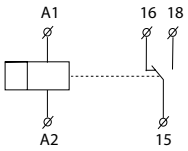


SHT-13/2

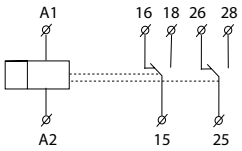


Symbol

SHT-13/1



SHT-13/2



SHT-14 | Multifunction time switch with Wi-Fi connection

ALL IN ONE
daily
weekly
yearly
astro
PROGRAM

WEB SERVER

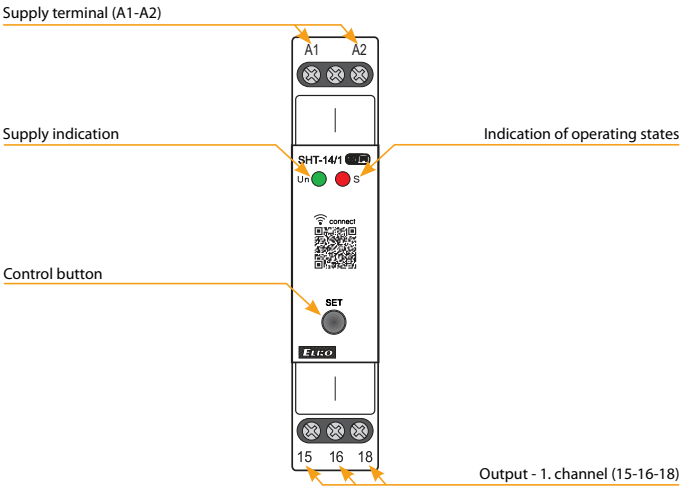
Wi-Fi 2.4 GHz

EAN code
SHT-14/1: 8595188192279

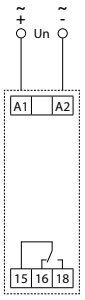
- All programs in one device (daily, weekly, yearly and astronomical).
- UNIversal supply voltage in range of AC 110 – 230 V (50-60 Hz).
- Simple setting after the first start-up.
- Integrated super capacitor to back up the set time during power outages.
- Built-in web server for setup and control via Wi-Fi connection.
- Time synchronization through NTP server (require internet connection of time switches).
- Possibility of permanent connection to the local network.
- WRC: web remote control and setup from anywhere (require internet connection of time switches).
- Withou display in 1-module housing.
- ASTROnomic program: manual entry of coordinates or selecting from one of more then 500 preset cities.
  - selection of days of the week
  - astro interrupt function (night break): controls the sunrise/sunset times and compares them with the set OFF/ON times
  - high position accuracy thanks to two decimal places in latitude/logitude
- 1-channel design (with an operating hours counter).
- Pulse/cycle output mode.
- Transition of summer/winter time – AUTO or OFF.
- PIN code protection against unauthorized changes.
- Wireless firmware update

Technical parameters	SHT-14/1
Supply terminals:	A1-A2
Supply voltage:	AC 110 – 230 V (50-60 Hz)
Consumption (max.):	Wi-Fi "OFF" 0.35 W/0.8 VA | "ON" 0.80 W/1.5 VA
Supply voltage tolerance:	–25 %; +10 %
Output	
Contact type:	1× changeover ($AgSnO_2$)
Current rating:	16 A/AC1
Breaking capacity:	4000 VA/AC1, 384 W/DC1
Inrush current:	30 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Power dissipation (max.):	1.2 W
Mechanical life:	30.000.000 ops.
Electrical life (AC1):	100.000 ops.
Time circuit	
Accuracy:	max. ±0.5 s/day at 23°C (73.4 °F)
Min. switching interval:	1 s
Data retention time:	min. 10 years
Set time backup:	25 h
Program circuit	
Number of memory locations:	200 - time programs, 30 - holidays
Program type:	daily, weekly, yearly, astro
Settings via website:	by Wi-Fi (2.4 GHz)
Other information	
Operating temperature:	–15 .. +50 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:	
supply – output	AC 4 kV
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel/IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/	max. 1× 2.5, 2× 1.5/
stranded with ferrule (mm^2):	max. 1× 2.5 (AWG 12)
Dimensions:	90 × 17.6 × 64 mm (3.5˝ × 0.7˝ × 2.5˝)
Weight:	71 g (2.5 oz)
Standards:	EN 61812-1

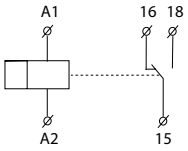
Description



Connection



Symbol



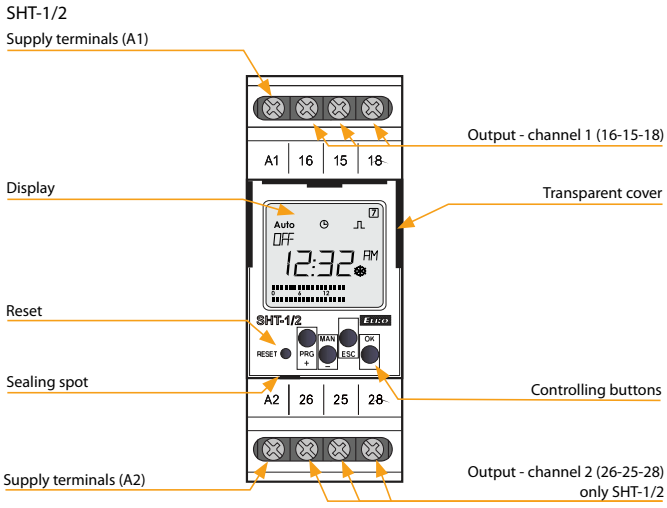
SHT-1, SHT-1/2 | Digital time switches with weekly/yearly program

EAN code
SHT-1/230V: 8595188130424
SHT-1/UNI: 8595188130431
SHT-1/2/230V: 8595188130400
SHT-1/2/UNI: 8595188130417

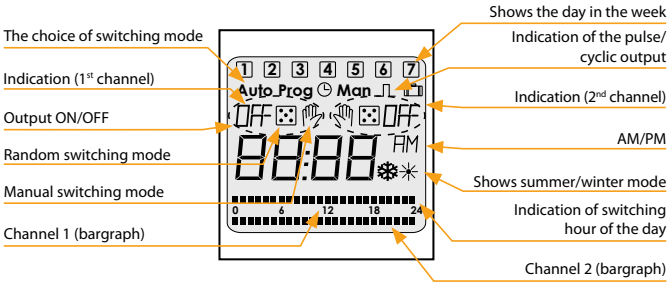
- It serves to control various types of appliances depending on real time with the possibility of daily, weekly, monthly and yearly programs.
- Switching: according to program (AUTO)/permanently manually (MAN)/ random (⚄).
- Choice of 1-channel or 2-channel design, each channel is adjustable individually.
- Sealable transparent front panel cover, easy control with 4 buttons.
- Cyclic/pulse output option.
- Real time backup - up to 3 years using built-in battery.
- Automatic summer/winter time transition (can be switched off in settings).
- Supply voltage is divided into two types: AC 230 V or AC/DC 12 – 240 V.

Technical parameters		SHT-1	SHT-1/2
Supply terminals:		A1 - A2	
Voltage range:	UNI	AC/DC 12 – 240 V (AC 50-60 Hz)	
Burden (max.):	UNI	AC 0.5 – 2 VA/DC 0.4 – 2 W	
Voltage range:	230	AC 230 V (50-60 Hz)	
Burden:	230	AC max. 14 VA/2 W	
Max. dissipated power (Un + terminals):		3.5 W	5 W
Supply voltage tolerance:		–15 %; +10 %	
Back-up supply:		yes	
Summer/winter time:		automatic	
Output			
Contact type:		1× changeover/SPDT (AgSnO$_2$)	2× changeover/SPDT (AgSnO$_2$)
Current rating:		16 A/AC1; PD. B300	
Breaking capacity:		4000 VA/AC1, 384 W/DC	
Inrush current:		30 A/< 3 s	
Switching voltage:		250 V AC/24 V DC	
Mechanical life:		30.000.000 ops.	
Electrical life (AC1):		100.000 ops.	
Time circuit			
Power back-up:		up to 3 years	
Accuracy:		max. ±1s/day at 23 °C (73.4 °F)	
Minimum interval:		1 min	
Data stored for:		min. 10 years	
Cyclic output:		1 – 99 s	
Pulse output:		1 – 99 s	
Program circuit			
Number of memory places:		100	
Program:		daily, weekly, monthly, yearly	
Data readout:		LCD display, with back light	
Other information			
Operating temperature:		–20 .. +55 °C (–4 .. 131 °F)	
Storage temperature:		–30 .. +70 °C (–22 .. 158 °F)	
Dielectric strength:		AC 4 kV (supply - output)	
Operating position:		any	
Mounting:		DIN rail EN 60715	
Protection degree:		IP10 clips, IP40 from front panel	
Overvoltage category:		III.	
Polution degree:		2	
Cross-wire section – solid/ stranded with ferrule (mm^2):		max. 2× 2.5 or 1× 4/ max. 1× 2.5 or 2× 1.5 (AWG 12)	
Dimensions:		90 × 35 × 64 mm (3.5˝ × 1.4˝ × 2.5˝)	
Weight:		(UNI) – 117 g (4.13 oz), (230) – 115 g (4.06 oz)	(UNI) – 132 g (4.7 oz), (230) – 128 g (4.5 oz)
Standards:		EN 61812-1	

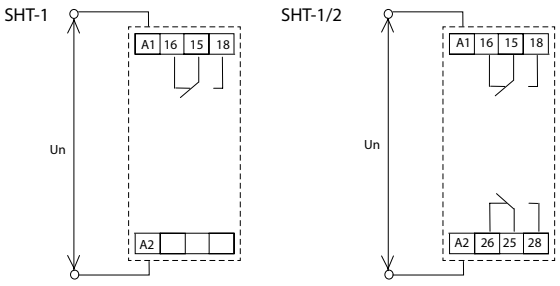
Description



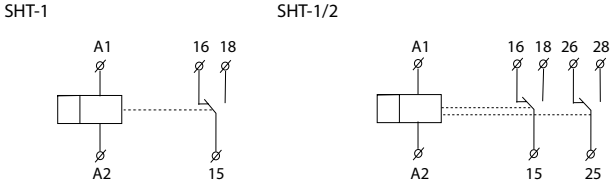
Description of displayed elements on the screen



Connection



Symbol



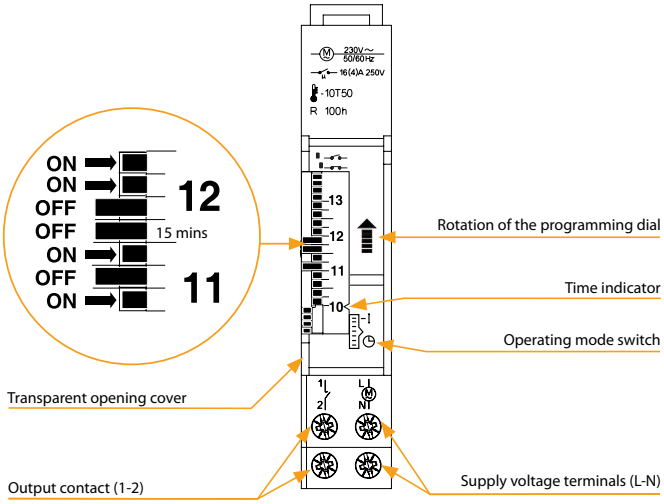
ATS-1DR | Analog time switches with daily program

EAN code
ATS-1DR: 8595188182171

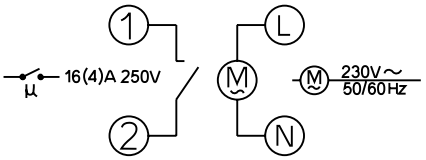
- The mechanical time switch is a simple and inexpensive alternative to digital time switches for controlling real-time heating, ventilation, cooling, lighting or pump systems.
- Daily program.
- Selection of operating modes using a switch on the panel:
  - switches automatically according to the set program
  - I closes permanently
- Power reserve after power failure up to 100 hours, after fully charged.

Technical parameters	ATS-1DR
Supply	
Supply terminals:	L-N
Supply voltage:	AC 230 V (50/60 Hz)
Consumption (max.):	1.5 VA/1 W
Supply voltage tolerance:	–10 %; +10 %
Time circuit	
Program:	daily
Number of switching segments:	96
Min. switching interval:	15 mins
Operating accuracy:	±2s/day at 25 °C
Power reserve:	max. 100 hrs.
Output	
Number of contacts:	1× NO (AgCdO15)
Rated current:	16 A/AC1
Breaking capacity:	4000 VA/AC1
Switching voltage:	250 V AC
Mechanical life:	100.000 ops.
Electrical life (AC1):	30.000 ops.
Other information	
Operating temperature:	–10 .. +50 °C (14 .. 122 °F)
Storage temperature:	–10 .. +50 °C (14 .. 122 °F)
Dielectric strength:	4 kV (supply – output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP20
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/	max. 1× 4, 2× 2.5/
stranded with ferrule (mm²):	max. 1× 4 (12 AWG)
Dimensions:	90 × 18 × 66 mm (3,55˝ × 0,71˝ × 2,6˝)
Weight:	70 g (2.5 oz)
Standards:	EN 61812-1, EN 60730

Description



Circuit connection



EAN code
ATS-2D: 8595188195782
ATS-2DR: 8595188182188
ATS-2WR: 8595188182140

- 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.
- Power reserve after power off for up to 150 hours after fully charged (ATS-2DR, ATS-2WR).
- Sealable transparent front panel cover.
- The ATS-2D and ATS-2DR package includes a plastic DIN rail.
- Selection of operating modes using the switch on the panel:

ATS-2D, ATS-2DR

I permanently closes
II switches automatically according to the set program

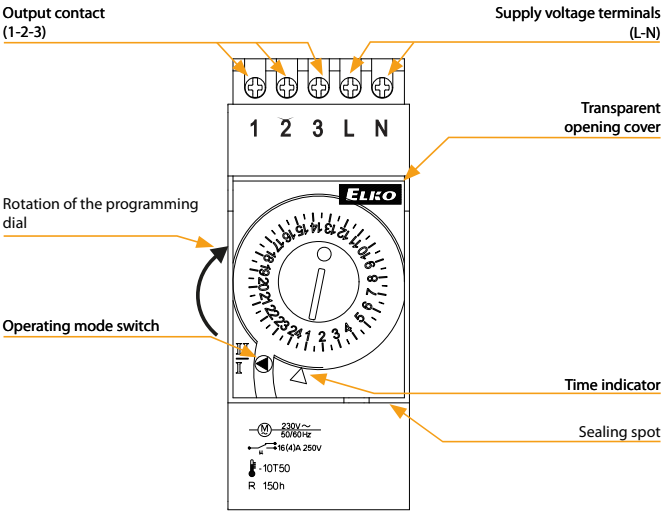
ATS-2WR

switches automatically according to the set program
I permanently closes
O permanently opens

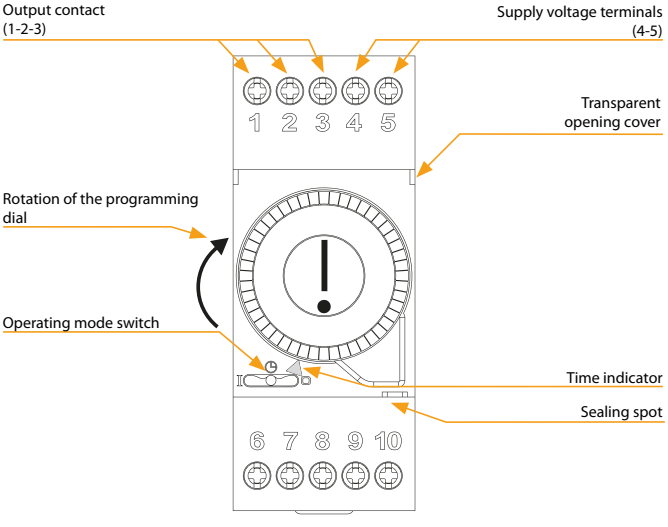
Technical parameters	ATS-2D	ATS-2DR	ATS-2WR
Supply			
Supply terminals:	L-N	L-N	4-5
Supply voltage:	AC 230 V (50/60 Hz)		
Consumption (max.):	1.6 VA/1 W		
Supply voltage tolerance:	–10%; +10%		
Time circuit			
Program:	daily	daily	weekly
Number of switching segments:	48		
Minimum switching interval:	30 mins	30 mins	3.5 hrs
Operating accuracy:	±2 s/day		
Power reserve:	×	max. 150 hrs	
Output			
Contact type:	1× changeover (AgCdO15)	1× changeover (AgCdO15)	1× changeover (AgNi)
Rated current:	16 A/AC1		
Breaking capacity:	3500 VA/AC1		
Switching voltage:	250 V AC		
Mechanical life:	100.000 ops.	100.000 ops.	2.000.000 ops.
Electrical life (AC1):	30.000 ops.	30.000 ops.	100.000 ops.
Other information			
Operating temperature:	–10 .. +50 °C (14 .. 122 °F)		
Storage temperature:	–10 .. +50 °C (14 .. 122 °F)		
Dielectric strength:	AC 4 kV (supply – output)		
Operating position:	any		
Mounting:	DIN rail EN 60715		
Protection degree:	IP20		
Overvoltage category:	III.		
Pollution degree:	2		
Cross-wire section – solid/ stranded with ferrule (mm^2):	max. 1× 4, 2× 1.5/ max. 1× 4, 2× 1.5 (AWG 12)		
Dimensions:	91 × 36 × 61 mm (3.6″ × 1.4″ × 2.4″)		
Weight:	120 g (4.25 oz)		
Standards:	EN 61812-1		

Description

ATS-2D, ATS-2DR

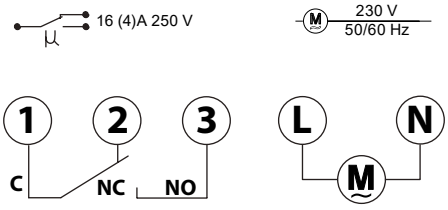


ATS-2WR

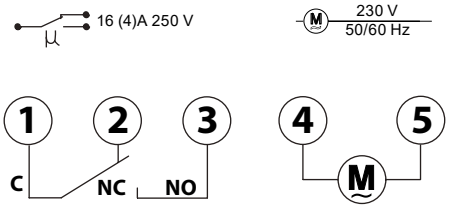


Connection

ATS-2D, ATS-2DR



ATS-2WR



VS

VS116B/230

- Output: 1x chang. 16A ($AgSnO_2$)
- Supply: AC 230V

pg. 55

VS116K

- Output: 1x chang. 16A ($AgSnO_2$)
- Supply: AC/DC 24V, AC 230V

pg. 55

VS308K

- Output: 3x chang. 8A (AgNi)
- Supply: AC/DC 24V, AC 230V

pg. 55

VS316/24

- Output: 3x chang. 16A ($AgSnO_2$)
- Supply: AC/DC 24V

Possibility of connection to a 3-phase distribution.

pg. 55

VS316/230

- Output: 3x chang. 16A ($AgSnO_2$)
- Supply: AC 230V

Possibility of connection to a 3-phase distribution.

pg. 55

VS116U

- Output: 1x chang. 16A ($AgSnO_2$)
- Supply: AC/DC 12-240V

pg. 55

VS308U

- Output: 3x chang. 8A (AgNi)
- Supply: AC/DC 12-240V

pg. 55

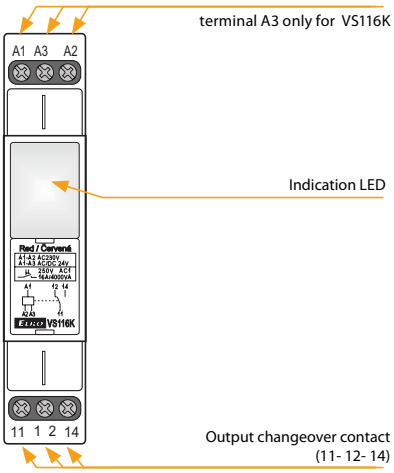
Type	Design	Supply voltage	Output contact	Other features			Descripiton	Page
				LED signal light	RC unit	Paralel diode		
VS116B/230	BOX	AC 230 V	1×16A changeover	●	x	x	VS116B/230 MINI, with installation into junction box or ceiling that allows control of lights, shades or awnings drives	55
VS116K	1-M DIN	AC/DC 24, AC 230V	1×16A changeover	●	●	●	as a separation relay (4kV), direct switching of appliances up to 4000VA (e.g. heaters), well visible signalization	
VS116U	1-M DIN	AC/DC 12-240V	1×16A changeover	●	●	●	as VS116K, but universal supply voltage	
VS308K	1-M DIN	AC/DC 24, AC 230V	3× 8A changeover	●	●	●	multiplication of contacts, 3x changeover contact 3PDT in 1-MODULE, well visible signalization	
VS308U	1-M DIN	AC/DC 12-240V	3× 8A changeover	●	●	●	as VS308K, but universal supply voltage	
VS316/24	1-M DIN	AC/DC 24V	3×16 A changeover	●	●	●	3x changeover contact in 1-MODULE, possibility of "multiplication" of contacts and in the same time possibility of switching high output, possibility of 3 phase switching	
VS316/230	1-M DIN	AC 230V	3×16 A changeover	●	●	●	as VS316/24, but AC 230V	

- Power relay used for switching larger load output, strengthen or „multiplying" contacts of the existing device.
- Relays VS316/24, VS316/230 enable connection to a 3-phase circuit.
- In the design 1-MODULE , DIN rail mounting, output status indicated by high intensity LED with choice of LED color (red, green, blue or white LED*).
- **VS116B/230** MINI, mounting in installation box or ceilings, enabling switching of lights, motors for blinds or awnings.
- For **VS116B/230** status of output indicated by LED on front panel of device.

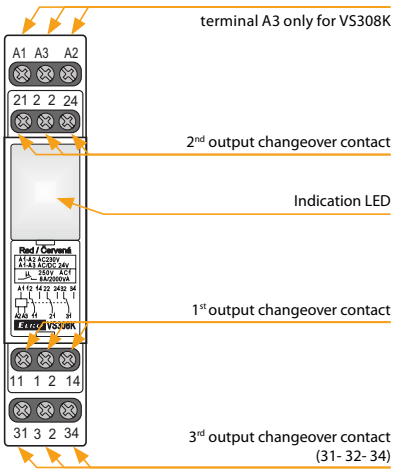
Technical parameters	VS116B/230	VS116K	VS116U	VS308K	VS308U	VS316/24	VS316/230
Supply terminals:	L - N	A1 - A2					
Voltage range:	AC 230 V (50-60 Hz)	AC 230 V (50-60 Hz)	AC/DC 12-240 V (50-60 Hz)	AC 230 V (50-60 Hz)	AC/DC 12-240 V (50-60 Hz)	AC/DC 24 V (50-60 Hz)	AC 230 V (50-60 Hz)
Burden (max.):	AC 7.5 VA 1 W	AC 7.5 VA 1 W	AC 0.7 - 3 VA/DC 0.5 - 1.7 W	AC 10.3 VA 1.1 W	AC 0.7 - 3 VA/DC 0.5 - 1.7 W	1.6 VA 1.2 W	2.5 VA
Supply terminals:	x	A1 - A3	x	A1 - A3		x	
Voltage range:	x	AC/DC 24 V (AC 50-60 Hz)	x	AC/DC 24 V (AC 50-60 Hz)		x	
Burden:	x	AC 1 VA/DC 1W	x	AC 1 VA/DC 1W		x	
Supply voltage tolerance:	–15%; +10%						
Max. dissipated power (Un + terminals):	4 W			3 W		8 W	6 W
Output							
Number of contacts:	1 x changeover/SPDT ($AgSnO_2$)			3 x changeover/TPDT (AgNi/Silver Alloy)		3 x changeover/TPDT ($AgSnO_2$)	
Current rating:	16 A/AC1; PD. B300			8 A/AC1; PD. B300		16A/AC1; PD. B300	
Breaking capacity:	4000VA/AC1, 384W/ DC			2000VA/AC1, 192W/ DC		4000VA/AC1, 384W/DC	
Inrush current:	30 A/<3 s			10 A/<3 s		30 A/<3 s	
Switching voltage:	250V AC/24V DC						
Output indication:	red LED	high intensity LED					
Mechanical life:	30.000.000 ops.						
Electrical life (AC1):	100.000 ops.			60.000 ops.		100.000 ops.	
Time between switching:	min. 2s					20 ms	50 ms
Other information							
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)						
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)						
Dielectric strength:	4 kV (supply-output)						
Operating position:	any						
Mounting:	free at connecting wire	DIN rail EN 60715					
Protection degree:	IP30	IP40 from front panel/IP20 terminals					
Overvoltage category:	III.						
Pollution degree:	2						
Max. cable size (mm^2):	2x 0.75 mm^2 (AWG 18), 3x 2.5 mm^2 (AWG 10)	max. 1x 2.5 or 2x 1.5 max. 1x 2.5 (AWG 12)					
Dimensions:	49 x 49 x 21 mm (2˝ x 2˝ x 0.8˝)	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)					
Weight:	48 g (1.7 oz.)	56 g (2 oz.)	59 g (2.1 oz.)	78 g (2.75 oz.)	80 g (2.8 oz.)	90 g (3.17 oz.)	93 g (3.3 oz.)
Standards:	EN 60669-1, EN 60669-2-1						

Description

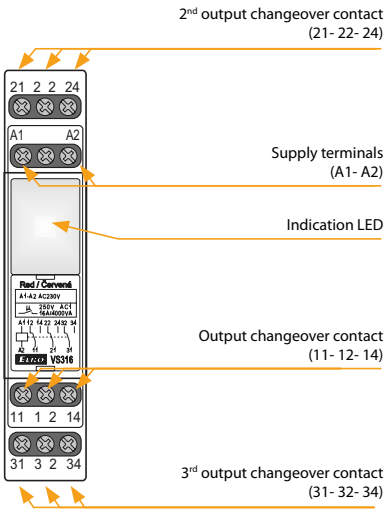
VS116K, VS116U



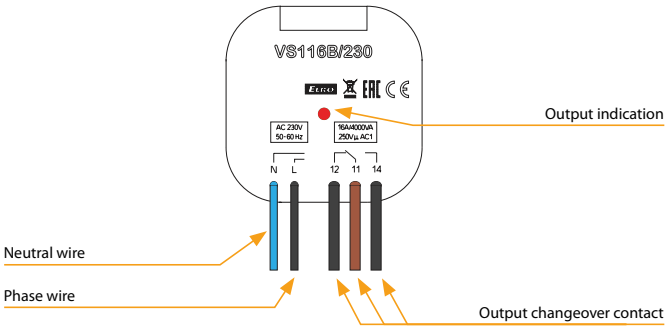
VS308K, VS308U



VS316/24, VS316/230

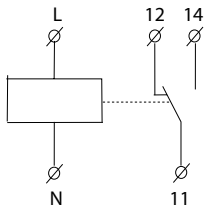


VS116B/230

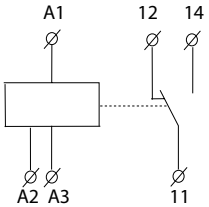


Symbol

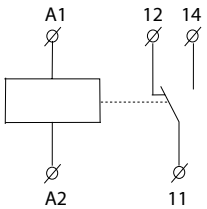
VS116B/230



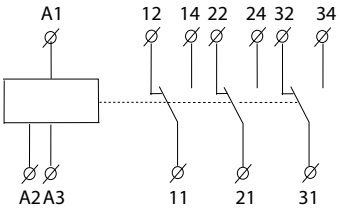
VS116K



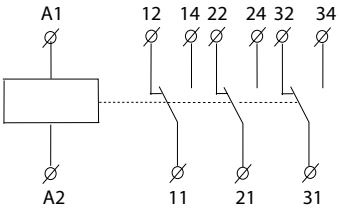
VS116U



VS308K



VS308U, VS316/24, VS316/230



EAN codes

VS116B/230	8595188147545				
VS116K/red	8595188122597	VS308K/red	8595188122696	VS316/24 red	8595188135771
VS116K/green	8595188122610	VS308K/green	8595188122719	VS316/24 green	8595188136105
VS116K/white	8595188122573	VS308K/white	8595188122672	VS316/24 white	8595188136099
VS116K/blue	8595188122603	VS308K/blue	8595188122702	VS316/24 blue	8595188136112
VS116U/red	8595188124607	VS308U/red	8595188130103	VS316/230 red	8595188135559
VS116U/green	8595188136433	VS308U/green	8595188136440	VS316/230 green	8595188136075
VS116U/white	8595188138482	VS308U/white	8595188138512	VS316/230 white	8595188136051
VS116U/blue	8595188138475	VS308U/blue	8595188138505	VS316/230 blue	8595188136068

Order code

	**VS116K/red:** 2295	**VS116U/red:** 2460	**VS308K/red:** 2269	**VS308U/red:** 3010	**VS316/24V red:** 3577	**VS316/230V red:** 4471
	**VS116K/green:** 2261	**VS116U/green:** 3643	**VS308K/green:** 2271	**VS308U/green:** 3644	**VS316/24V green:** 3610	**VS316/230V green:** 4472
	**VS116K/white:** 2257	**VS116U/white:** 3848	**VS308K/white:** 2267	**VS308U/white:** 3851	**VS316/24V white:** 3609	**VS316/230V white:** 4470
	**VS116K/blue:** 2260	**VS116U/blue:** 3847	**VS308K/blue:** 2270	**VS308U/blue:** 3850	**VS316/24V blue:** 3611	**VS316/230V blue:** 4474

Notes

Max. time of changeover of contact is 10 ms.

VS316/24 or VS316/230 enables switching of different phases or 3-phase voltage.

* possibility to choose blue and white color of LED for power relays line VS in case of minimal order quantity 100 pcs.

INSTALLATION CONTACTORS

Installation contactors VS

VS120

- Output: 1x 20A
- Contact configuration (NO/NC): 10, 01

pg. 59

VS220

- Output: 2x 20A
- Contact configuration (NO/NC): 20, 11, 02

pg. 59

VS420

- Output: 4x 20A
- Contact configuration (NO/NC): 40, 31

pg. 59

VS425

- Output: 4x 25A
- Contact configuration (NO/NC): 40, 31, 22, 04

pg. 59

VS440

- Output: 4x 40A
- Contact configuration (NO/NC): 40, 31, 22, 04

pg. 59

VS463

- Output: 4x 63A
- Contact configuration (NO/NC): 40, 31, 22

pg. 59

Installation contactors with manual control VSM

VSM220

- Output: 2x 20A
- Contact configuration (NO/NC): 20, 11, 02

pg. 60

VSM425

- Output: 4x 25A
- Contact configuration (NO/NC): 40, 31, 22, 04

pg. 60

Accessories

VSK-11

- Output: 2x 6A
- Contact configuration (NO/NC): 11

pg. 61

VSK-20

- Output: 2x 6A
- Contact configuration (NO/NC): 20

pg. 61

VS120, VS220, VS420, VS425, VS440, VS463 | Installation contactors

- For switching electric circuits, especially for resistave loads and 3-phase induction motors
- Number of contacts: **VS120** - 1, **VS220** - 2, **VS325**, **VS340**, **VS363** - 3, **VS420**, **VS425**, **VS440**, **VS463** - 4
- It is produced in configuration of switching and breaking contacts:
  VS120: 10, 01 **VS220**: 20, 11, 02
  VS420: 40, 31
  VS325: 30 **VS425**: 40, 31, 22, 13 04
  VS340: 30 **VS440**: 40, 31, 22, 04
  VS363: 30 **VS463**: 40, 31, 22
- Protection IP20 - on request we deliver covers that ensure protection IP40 except contactor VS420
- It is possible to connect auxiliary contacts VSK to contactors VS425, VS440, VS463

EAN code
see page 59

Technical parameters	VS120	VS220	VS420	VS325/VS425	VS340/VS440	VS363/VS463
Rated insulation voltage (Ui):	440 V	440 V	415 V	440 V	440 V	440 V
Rated thermo-current I_{th} (in AC):	20 A	20 A	20 A	25 A	40 A	63 A
Voltage range:	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Switched operation						
AC-1 for 400 V, 3 phase:	x	x	13 kW	16 kW	26 kW	40 kW
AC-1 for 230 V:	4 kW, 1 phase	4 kW, 1 phase	7.5 kW, 3 phase	9 kW, 3 phase	16 kW, 3 phase	24 kW, 3 phase
AC-3 for 400 V, 3 phase:	x	x	2.2 kW	4 kW	11 kW	15 kW
AC-3 for 230 V:	1.3 kW only NO, 1 phase	1.3 kW only NO, 1 phase	1.1 kW, 3 phase	2.2 kW, 3 phase	5.5 kW, 3 phase	8.5 kW, 3 phase
AC-7a for 400 V, 3 phase:	x	x	13 kW	16 kW	26 kW	40 kW
AC-7a for 230 V:	4 kW, 1 phase	4 kW, 1 phase	7.5 kW, 3 phase	9 kW, 3 phase	16 kW, 3 phase	24 kW, 3 phase
AC-7b for 400 V, 3 phase:	x	x	2.2 kW	4 kW	11 kW	15 kW
AC-7b for 230 V:	1.3 kW only NO, 1 phase	1.3 kW only NO, 1 phase	1.1 kW, 3 phase	2.2 kW, 3 phase	5.5 kW, 3 phase	8.5 kW, 3 phase
AC-15 for 400 V, 1 phase:	4 A	4 A	4 A	4 A	4 A	4 A
AC-15 for 230 V, 1 phase:	6 A	6 A	6 A	6 A	6 A	6 A
DC1 U_e = 24/110/220 V:	20/6/0.6 A	20/6/0.6 A	20/2/0.5 A	25/6/0.6 A	40/4/1.2 A	63/4/1.2 A
Loadability of modular contactors see page 58						
The max. number of switching for max. load:	600 switch/hr.	600switch/hr.	600 switch/hr.	600 switch/hr.	600 switch/hr.	600 switch/hr.
Electrical life in 230/400 V						
AC-1- resistive load :	200.000	200.000	200.000	200.000	100.000	100.000
AC-3-power load:	300.000	300.000	300.000	500.000	500.000	150.000
AC-5a - high-intensity discharge lamp:	100.000 by 30 µF	100.000 by 30 µF	300.000 by 36 µF	100.000 by 36 µF	100.000 by 220 µF	100.000 by 330 µF
AC-5b - incandescent lamps:	100.000 by 2 kW	100.000 by 2 kW	100.000 by 2 kW	100.000 by 2 kW	100.000 by 4 kW	100.000 by 5 kW
AC-7a - resistive household devices:	200.000	200.000	200.000	200.000	100.000	100.000
AC-7b - inductive household devices:	300.000	300.000	300.000	300.000	150.000	150.000
Minimal load:	≥ 17 V, ≥ 50 mA	≥ 17 V, ≥ 50 mA	≥ 17 V, ≥ 50 mA	≥ 17 V, ≥ 50 mA	≥ 17 V, ≥ 50 mA	≥ 24 V, ≥ 100 mA
Short circuit protection with the fuse char. aM:	20 A	20 A	20 A	25 A	63 A	80 A
Coordination Type according EN 60 947-4-1:	2	2	2	2	2	2
Dielectric strenght:	4 kV	4 kV	4 kV	4 kV	4 kV	4 kV
Contacts - max. cable size						
Solid conductor:	AWG 7 (10 mm²)	AWG 7 (10 mm²)	AWG 14 (2.5 mm²)	AWG 10 (10 mm²)	AWG 10 (25 mm²)	AWG 10 (25 mm²)
Stranded conductor:	AWG 8 (6 mm²)	AWG 8 (6 mm²)	AWG 14 (2.5 mm²)	AWG 8 (6 mm²)	AWG 4 (16 mm²)	AWG 4 (16 mm²)
Maximal torque:	1.2 Nm (10.62 lbf.in)	1.2 Nm (10.62 lbf.in)	1.2 Nm (10.62 lbf.in)	1.2 Nm (10.62 lbf.in)	3.5 Nm (30.95 lbf.in)	3.5 Nm (30.95 lbf.in)
Coil - max. cable size						
Solid conductor:	AWG 14 (2.5 mm²)	AWG 14 (2.5 mm²)	AWG 14 (2.5 mm²)	AWG 14 (2.5 mm²)	AWG 14 (2.5 mm²)	AWG 14 (2.5 mm²)
Stranded conductor:	AWG 14 (2.5 mm²)	AWG 14 (2.5 mm²)	AWG 14 (2.5 mm²)	AWG 14 (2.5 mm²)	AWG 14 (2.5 mm²)	AWG 14 (2.5 mm²)
Max. torque:	0.6 Nm (5.31 lbf.in)	0.6 Nm (5.31 lbf.in)	0.6 Nm (5.31 lbf.in)	0.6 Nm (5.31 lbf.in)	0.6 Nm (5.31 lbf.in)	0.6 Nm (5.31 lbf.in)
Operating						
Coil control voltage:	AC/DC 24 V, 120 V, 230 V	AC/DC 24 V, 48 V, 120 V, 230 V	AC 12 V, 24 V, 48 V, 120 V, 230 V	AC/DC 24 V, 48 V, 120 V, 230 V	AC/DC 24 V, 120 V, 230 V	AC/DC 24 V, 48 V, 120 V, 230 V
Coil permanent supply +/- 10 %:	2.1 VA/2.1 W	2.1 VA/2.1 W	5 VA/1.5 W	2.6 VA/2.6 W *	5 VA/5 W	5 VA/5 W
Coil gear supply +/- 10 %:	2.1 VA/2.1 W	2.1 VA/2.1 W	30 VA/25 W	2.6 VA/2.6 W *	5 VA/5 W	5 VA/5 W
Mounting side-by-side:	max. 2 contactors**	max. 2 contactors**	max. 2 contactors**	max. 2 contactors**	max. 2 contactors**	max. 2 contactors**
Operational temperature:	–5 .. +55 °C (23 .. 131 °F)					
Storing temperature:	–30 .. +80 °C (–22 .. 176 °F)					
Weight:	120 g (4.2 oz.)	130 g (4.6 oz.)	170 g (6 oz.)	213 g (7.5 oz.)	400 g (14 oz.)	400 g (14 oz.)
Dimensions:	17.5 x 85 x 60 mm (0.7″ x 3.35″ x 2.4″)	17.5 x 85 x 60 mm (0.7″ x 3.35″ x 2.4″)	35 x 62.5 x 57 mm (1.4″ x 2.7″ x 2.24″)	35 x 85 x 60 mm (1.4″ x 3.35″ x 2.4″)	53.3 x 84 x 60 mm (2.1″ x 3.31″ x 2.4″)	53.3 x 84 x 60 mm (2.1″ x 3.31″ x 2.4″)
Standards:	IEC 60947-4-1, IEC 60947-5-1, IEC 61095, EN 60947-4-1, EN 60947-5-1, EN 61095, EN 60947-1					

* 3.8 VA/3.8 W for -04 version of contacts

** Note: If several contactors are mounted close together a gap of 9 mm must be maintained between every other contactor.

VSM220, VSM425 | Installation contactors with manual control

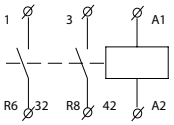
EAN code
see page 59

- Special version of installation contactors with not only basic functions but also with manual control
- For switching electric circuits, especially for resistave loads and 3-phase induction motors
- Number of contacts **VSM220** - 2, **VSM425** - 4
- Description of individual positions of manual control:
  - AUTO: common function as with installation contactors without manual control
  - 1: shifting from AUTO to 1: operational contacts are closed and back contacts are open until there is another impulse to a contactor coil
  - 0: contacts are open (operational contact) or closed (stand-by contact) regardless voltage
- Optical indicator of state ON - OFF
- It is produced in configuration of making and breaking contacts:
  VSM220: 20, 11, 02
  VSM425: 40, 31, 22, 04
- Protection IP20 - on request we deliver covers that ensure protection IP40.
- It is possible to connect auxiliary contacts VSK to contactors VSM220, VSM425

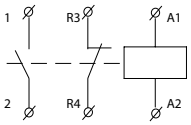
Technical parameters	VSM220	VSM425
Rated insulation voltage (Ui):	440 V	440 V
Rated thermo-current I_{th} (in AC):	20 A	25 A
Voltage range:	50/60 Hz	50/60 Hz
Switched operation		
AC-1 for 400 V:	x	16 kW, 3 phase
AC-1 for 230 V:	4 kW, 1 phase	9 kW, 3 phase
AC-3 for 400 V:	x	4 kW, 3 phase
AC-3 for 230 V:	1.3 kW only NO, 1 phase	2.2 kW, 3 phase
AC-7a for 400 V:	x	16 kW, 3 phase
AC-7a for 230 V:	4 kW, 1 phase	9 kW, 3 phase
AC-7b for 400 V:	x	4 kW, 3 phase
AC-7b for 230 V:	1.3 kW only NO, 1 phase	2.2 kW, 3 phase
AC-15 for 400 V:	4 A	4 A
AC-15 for 230 V:	6 A	6 A
DC1 U_e = 24 V:	20 A	25 A
DC1 U_e = 110 V:	6 A	6 A
DC1 U_e = 220 V:	0.6 A	0.6 A
Loadability of modular contactors see page 58		
The max. number of switching for max. load:	600 switch/hr.	600 switch/hr.
Electrical life in 230/400 V		
AC-1- resistive load :	200.000	200.000
AC-3 - power load:	300.000	500.000
AC-5a - high-intensity discharge lamp:	100.000 by 30 µF	100.000 by 36 µF
AC-5b - incandescent lamps:	100.000 by 1.5 kW	100.000 by1.5 kW
AC-7a - resistive household devices:	200.000	200.000
AC-7b - inductive household devices:	300.000	500.000
Minimal load:	≥ 17 V, ≥ 50 mA	≥ 17 V, ≥ 50 mA
Short circuit protection with the fuse char. aM:	20 A	25 A
Coordination Type according EN 60 947-4-1:	2	2
Electrical strenght:	4 kV	4 kV
Contacts - max. cable size		
Solid conductor:	AWG 7 (10 mm²)	AWG 7 (10 mm²)
Stranded conductor:	6 mm²	6 mm²
Maximal torque:	1.2 Nm	1.2 Nm
Coil - max. cable size		
Solid conductor:	AWG 10 (2.5 mm²)	AWG 10 (2.5 mm²)
Stranded conductor:	2.5 mm²	2.5 mm²
Max. torque:	0.6 Nm	0.6 Nm
Operating		
Coil control voltage:	AC 12 V, 24 V, 120 V, 230 V	AC 12 V, 24 V, 42 V, 230 V
Coil permanent supply +/- 10 %:	2.8 VA/1.2 W	5.5 VA/1.6 W
Coil gear supply +/- 10 %:	12 VA /10 W	33 VA/25 W
Mounting side-by-side:	max. 2 contactors*	max. 2 contactors*
Operational temperature:	–5 .. +55 °C (23 .. 131 °F)	
Storing temperature:	–30 .. +80 °C (–22 .. 176 °F)	
Weight:	140 g (4.9 oz.)	260 g (9.17 oz.)
Dimensions:	17.5 x 85 x 60 mm (0.7˝x 3.35˝x 2.4˝)	35 x 85 x 60 mm (1.4˝x 3.35˝x 2.4˝)
Standards:	IEC 60947-4-1, IEC 60947-5-1, IEC 61095, EN 60947-4-1, EN 61095, EN 60947-1	

Connection VSM220 VSM220 - only AC supply voltage

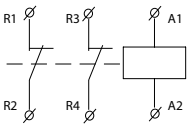
VSM220-20



VSM220-11

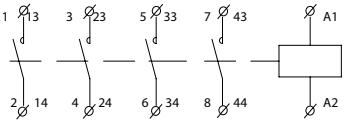


VSM220-02

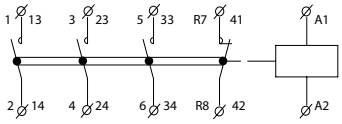


Connection VSM425 VSM425 - only AC supply voltage

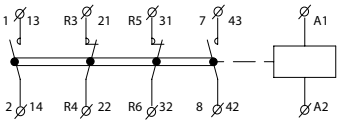
VSM425-40



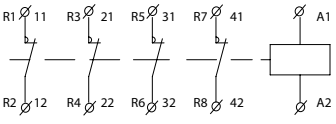
VS425-31



VSM425-22



VSM425-04



Auxiliary contacts VSK-11 and VSK-20

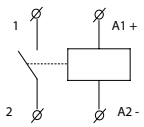
Datas of auxiliary contacts for VSK-11 and VSK-20 see page 61.

* Note: If several contactors are mounted close together a gap of 9 mm must be maintained between every other contactor.

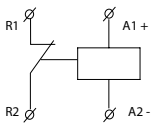
Connection

VS120

VS120-10

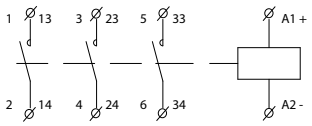


VS120-01



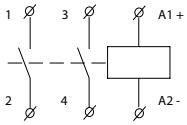
VS325

VS325-30

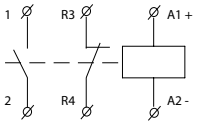


VS220

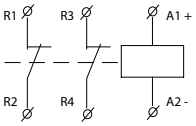
VS220-20



VS220-11

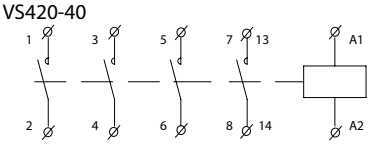


VS220-02

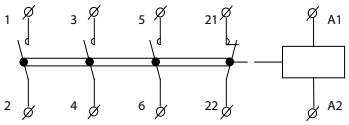


VS420

VS420-40

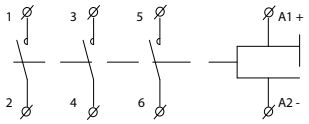


VS420-31



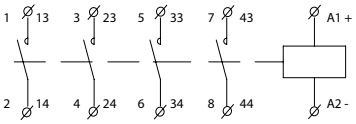
VS340

VS340-30

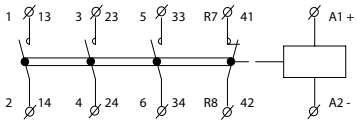


VS425

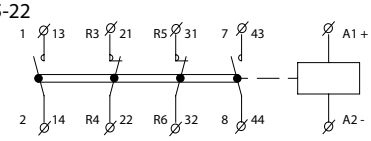
VS425-40



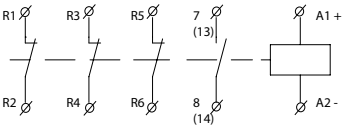
VS425-31



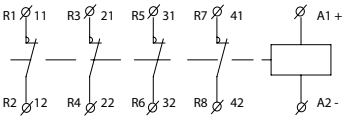
VS425-22



VS425-13

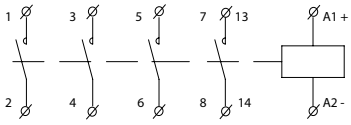


VS425-04

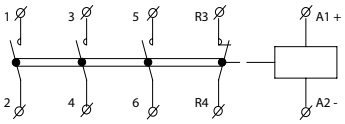


VS440

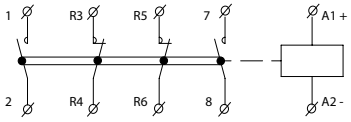
VS440-40



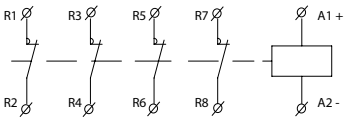
VS440-31



VS440-22

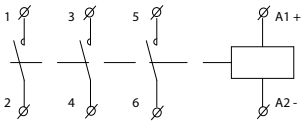


VS440-04



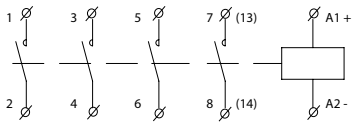
VS363

VS363-30

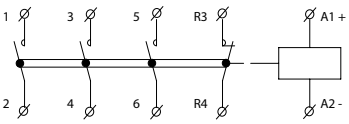


VS463

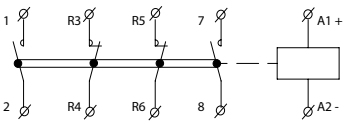
VS463-40



VS463-31



VS463-22



Auxiliary contacts for VS425, VS440, VS463 and VSM220, VSM425

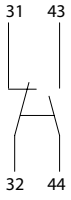
Datas of auxiliary contacts for VSK-11 and VSK-20

Ambient temperature:	–5 .. +55 °C (23 .. 131 °F)
Rated insulation voltage (Ui):	500 V
Dielectric strength:	4 kV
Rated current 230 V (AC 15):	6 A
Rated current 400 V (AC 15):	4 A
Max. switching frequence:	6 A
The max. number of switching for max. load:	600 sep./hod.
Minimal load:	≥ 12 V, ≥ 10 mA
Short circuit protection with the fuse char. aM:	6 A
Solid/Stranded conductor (max):	2.5 mm²/2.5 mm² (AWG 10)
Maximal torque:	0.8 Nm
Weight:	10 g (0.35 oz.)
Dimensions:	10 x 85 x 60 mm (0.4˝x 3.35˝x 2.4˝)

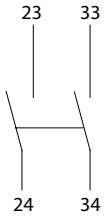
Connection of auxiliary contact VSK-11 and VSK-20

EAN code
see page 59

VSK-11



VSK-20



Loadability of installation contactors

TYPE OF LIGHT	OUTPUT (W)	I (A)	Number of lights on one contactor's contact							
			VS120	**VS220**	**VS420**	**VS425**	**VS440**	**VS463**	**VSM220**	**VSM425**
Incandescent lamps	60	0.26	33	33	33	33	65	85	33	33
	100	0.43	20	20	20	20	40	50	20	20
	200	0.87	10	10	10	10	20	25	10	10
	500	2.17	3	3	3	3	8	10	3	3
	1000	4.35	1	1	1	1	4	5	1	1
Flourescent lamps	18	0.37	22	22	22	24	90	140	22	24
	24	0.35	22	22	22	24	90	140	22	24
	36	0.43	17	17	17	20	65	95	17	20
	58	0.67	14	14	14	17	45	70	14	17
Flourescent lamps lead-lag circuit	18	0.11	2 x 30	2 x 30	2 x 30	2 x 40	2 x 100	2 x 150	2 x 30	2 x 40
	24	0.14	2 x 24	2 x 24	2 x 24	2 x 31	2 x 78	2 x 118	2 x 24	2 x 31
	36	0.22	2 x 17	2 x 17	2 x 17	2 x 24	2 x 65	2 x 95	2 x 17	2 x 24
	58	0.35	2 x 10	2 x 10	2 x 10	2 x 14	2 x 40	2 x 60	2 x 10	2 x 14
Flourescent lamps parallel correction	18	0.12	7	7	7	8	48	73	7	8
	24	0.15	7	7	7	8	48	73	7	8
	36	0.2	7	7	7	8	48	73	7	8
	58	0.32	4	4	4	5	31	47	4	5
Flourescent lamps with electronic ballast units (EVG)	1 x 18	0.09	25	25	25	35	100	140	25	35
	1 x 36	0.16	15	15	15	20	52	75	15	20
	1 x 58	0.25	14	14	14	19	50	72	14	19
	2 x 18	0.17	12	12	12	17	50	70	12	17
	2 x 36	0.32	7	7	7	10	26	38	7	10
	2 x 58	0.49	7	7	7	9	25	36	7	9
High-pressure mercury-vapour lamps uncorrected	50	0.61	14	14	14	18	38	55	14	18
	80	0.8	10	10	10	13	29	42	10	13
	125	1.15	7	7	7	9	20	29	7	9
	250	2.15	4	4	4	5	10	15	4	5
	400	3.25	2	2	2	3	7	10	2	3
	700	5.4	1	1	1	2	4	6	1	2
	1000	7.5	1	1	1	1	3	4	1	1
High-pressure mercury-vapour lamps parallel correction	50	0.28	4	4	4	5	31	47	4	5
	80	0.41	4	4	4	5	27	41	4	5
	125	0.65	3	3	3	4	22	33	3	4
	250	1.22	1	1	1	2	12	18	1	2
	400	1.95	1	1	1	1	9	13	1	1
	700	3.45	-	-	-	-	5	7	-	-
	1000	4.8	-	-	-	-	4	5	-	-
Halogen metal vapour lamps uncorrected	35	0.53	18	18	18	22	43	60	18	22
	70	1	10	10	10	12	23	32	10	12
	150	1.8	5	5	5	7	12	18	5	7
	250	3	3	3	3	4	7	10	3	4
	400	3.5	3	3	3	3	6	9	3	3
	1000	9.5	1	1	1	1	2	3	1	1
	2000	16.5	-	-	-	-	1	1	-	-
Halogen metal-vapour lamps parallel correction	35	0.25	5	5	5	6	36	50	5	6
	70	0.45	2	2	2	3	18	25	2	3
	150	0.75	1	1	1	1	11	15	1	1
	250	1.5	-	-	-	1	6	9	-	1
	400	2.5	-	-	-	1	6	8	-	1
	1000	5.8	-	-	-	-	2	3	-	-
	2000	11.5	-	-	-	-	1	2	-	-
High-pressure sodium-vapour lamps uncorrected	150	1.8	5	5	5	6	17	22	5	6
	250	3	3	3	3	4	10	13	3	4
	400	4.7	2	2	2	2	6	8	2	2
	1000	10.3	-	-	-	1	3	3	-	1
High-pressure sodium-vapour lamps parallel correction	150	0.83	1	1	1	1	11	16	1	1
	250	1.5	-	-	-	1	6	10	-	1
	400	2.4	-	-	-	-	4	6	-	-
	1000	6.3	-	-	-	-	2	3	-	-
Low-pressure sodium-vapour lamps uncorrected	18	0.35	22	22	22	27	71	90	22	27
	35	1.5	7	7	7	9	23	30	7	9
	55	1.5	7	7	7	9	23	30	7	9
	90	2.4	4	4	4	5	14	19	4	5
	135	3.5	3	3	3	4	10	13	3	4
	180	3.3	3	3	3	4	10	13	3	4
Low-pressure sodium-vapour lamps parallel correction	18	0.35	6	6	6	7	44	66	6	7
	35	0.31	1	1	1	1	11	16	1	1
	55	0.42	1	1	1	1	11	16	1	1
	90	0.63	1	1	1	1	8	12	1	1
	135	0.94	-	-	-	-	4	7	-	-
	180	1.16	-	-	-	-	5	8	-	-

EAN codes

EAN codes for VS

VS120

VS120-01 24V AC/DC: 8595188129848
VS120-01 230V AC/DC: 8595188123105

VS120-10 24V AC/DC: 8595188129367
VS120-10 230V AC/DC: 8595188123112

VS220

VS220-02 24V AC/DC: 8595188129381
VS220-02 120V AC/DC: 8595188138628
VS220-02 230V AC/DC: 8595188121422

VS220-11 24V AC/DC: 8595188129374
VS220-11 48V AC/DC: 8595188129398
VS220-11 120V AC/DC: 8595188130790
VS220-11 230V AC/DC: 8595188121408

VS220-20 24V AC/DC: 8595188125253
VS220-20 48V AC/DC: 8595188129411
VS220-20 120V AC/DC: 8595188129428
VS220-20 230V AC/DC: 8595188121392

VS420

VS420-31 24V AC: 8595188129442
VS420-31 120V AC: 8595188129466
VS420-31 230V AC: 8595188121446

VS420-40 12V AC: 8595188129459
VS420-40 24V AC: 8595188129435
VS420-40 48V AC: 8595188138581
VS420-40 230V AC: 8595188121439

VS463

VS463-22 24V AC/DC: 8595188129794
VS463-22 230V AC/DC: 8595188121514

VS463-31 24V AC/DC: 8595188129596
VS463-31 120V AC/DC: 8595188137904
VS463-31 230V AC/DC: 8595188121507

VS463-40 24V AC/DC: 8595188129589
VS463-40-48V AC/DC: 8595188160612
VS463-40 120V AC/DC: 8595188140652
VS463-40 230V AC/DC: 8595188121491

VS425

VS425-04 24V AC/DC: 8595188129527
VS425-04 48V AC/DC: 8595188129558
VS425-04 120V AC/DC: 8595188160032
VS425-04 230V AC/DC: 8595188121682

VS425-13 230V AC/DC: 8595188129473

VS425-22 24V AC/DC: 8595188129541
VS425-22 230V AC/DC: 8595188121675

VS425-31 24V AC/DC: 8595188129497
VS425-31 48V AC/DC: 8595188137898
VS425-31 120V AC/DC: 8595188129534
VS425-31 230V AC/DC: 8595188121668

VS425-40 24V AC/DC: 8595188129480
VS425-40 48V AC/DC: 8595188136174
VS425-40 230V AC/DC: 8595188121651

VS440

VS440-04 24V AC/DC: 8595188129299
VS440-04 120V AC/DC: 8595188129305
VS440-04 230V AC/DC: 8595188121484

VS440-22 24V AC/DC: 8595188129787
VS440-22 230V AC/DC: 8595188121477

VS440-31 24V AC/DC: 8595188129572
VS440-31 230V AC/DC: 8595188121460

VS440-40 24V AC/DC: 8595188129565
VS440-40 120V AC/DC: 8595188138567
VS440-40 230V AC/DC: 8595188121453

EAN codes for VS

VS120

VS120-10UL 230V AC/DC: 8595188189880
VS120-10UL 120V AC/DC: 8595188189897
VS120-10UL 24V AC/DC: 8595188189903

VS120-01UL 230V AC/DC: 8595188189910
VS120-01UL 120V AC/DC: 8595188189927
VS120-01UL 24V AC/DC: 8595188189934

VS220

VS220-20UL 230V AC/DC: 8595188189828
VS220-20UL 120V AC/DC: 8595188189835
VS220-20UL 24V AC/DC: 8595188189842

VS220-11UL 230V AC/DC: 8595188189859
VS220-11UL 120V AC/DC: 8595188189866
VS220-11UL 24V AC/DC: 8595188189873

VS220-02UL 230V AC/DC: 8595188189941
VS220-02UL 120V AC/DC: 8595188189958
VS220-02UL 24V AC/DC: 8595188189965

VS325

VS325-30UL 230V AC/DC: 8595188190039
VS325-30UL 120V AC/DC: 8595188190046
VS325-30UL 24V AC/DC: 8595188190053

VS425

VS425-40UL 230V AC/DC: 8595188189972
VS425-40UL 120V AC/DC: 8595188189989
VS425-40UL 24V AC/DC: 8595188189996

VS425-31UL 230V AC/DC: 8595188190008
VS425-31UL 120V AC/DC: 8595188190015
VS425-31UL 24V AC/DC: 8595188190022

VS425-22UL 230V AC/DC: 8595188190060
VS425-22UL 120V AC/DC: 8595188190077
VS425-22UL 24V AC/DC: 8595188190084

VS425-04UL 230V AC/DC: 8595188190091
VS425-04UL 120V AC/DC: 8595188190107
VS425-04UL 24V AC/DC: 8595188190114

VS340

VS340-30UL 230V AC/DC: 8595188190183
VS340-30UL 120V AC/DC: 8595188190190
VS340-30UL 24V AC/DC: 8595188190206

VS440

VS440-40UL 230V AC/DC: 8595188190121
VS440-40UL 120V AC/DC: 8595188190138
VS440-40UL 24V AC/DC: 8595188190145

VS440-31UL 230V AC/DC: 8595188190152
VS440-31UL 120V AC/DC: 8595188190169
VS440-31UL 24V AC/DC: 8595188190176

VS440-22UL 230V AC/DC: 8595188190213
VS440-22UL 120V AC/DC: 8595188190220
VS440-22UL 24V AC/DC: 8595188190237

VS440-04UL 230V AC/DC: 8595188190244
VS440-04UL 120V AC/DC: 8595188190251
VS440-04UL 24V AC/DC: 8595188190268

VS363

VS363-30UL 230V AC/DC: 8595188190336
VS363-30UL 120V AC/DC: 8595188190343
VS363-30UL 24V AC/DC: 8595188190350

VS463

VS463-40UL 230V AC/DC: 8595188190275
VS463-40UL 120V AC/DC: 8595188190282
VS463-40UL 24V AC/DC: 8595188190299

VS463-31UL 230V AC/DC: 8595188190305
VS463-31UL 120V AC/DC: 8595188190312
VS463-31UL 24V AC/DC: 8595188190329

VS463-22UL 230V AC/DC: 8595188190367
VS463-22UL 120V AC/DC: 8595188190374
VS463-22UL 24V AC/DC: 8595188190381

EAN codes for VSM

VSM220

VSM220-02 24V AC: 8595188129817
VSM220-02 230V AC: 8595188128100

VSM220-11 24V AC: 8595188129800
VSM220-11 230V AC: 8595188128094

VSM220-20 12V AC: 8595188138369
VSM220-20 24V AC: 8595188128117
VSM220-20 120V AC: 8595188160223
VSM220-20 230V AC: 8595188128087

VSM425

VSM425-04 24V AC: 8595188129831
VSM425-04 230V AC: 8595188128155

VSM425-22 24V AC: 8595188129336
VSM425-22 230V AC: 8595188128148

VSM425-31 24V AC: 8595188129824
VSM425-31 230V AC: 8595188128131

VSM425-40 12V AC: 8595188160049
VSM425-40 24V AC: 8595188128162
VSM425-40 230V AC: 8595188128124

EAN codes for VSK and covers

VSK-11: 8595188121613
VSK-20: 8595188121606

MEMORY RELAYS

MR-41

- Functions: 1
- Output: 1x chang. 16A
- Power supply: AC/DC 12-240V; AC 230V

pg. 65

MR-42

- Functions: 2
- Output: 2x chang. 16A
- Power supply: AC/DC 12-240V; AC 230V

Step function relay.

pg. 65

BISTABLE (IMPULSE) RELAYS

BR-216-10

- Output: 1x 16A
- Contact configuration (NO/NC): 10

pg. 66

BR-216-11

- Output: 2x 16A
- Contact configuration (NO/NC): 11

pg. 66

BR-216-20

- Output: 2x 16A
- Contact configuration (NO/NC): 20

pg. 66

BR-220-20

- Output: 2x 20A
- Contact configuration (NO/NC): 20

pg. 66

BR-232-20

- Output: 2x 32A
- Contact configuration (NO/NC): 20

pg. 66

TWILIGHT AND LIGHT SWITCHES

SOU-1

Twilight switch.
- Functions: 1
- Output: 1x chang. 16A
- Power supply: AC/DC 12-240V; AC 230V

pg. 68

SOU-13/1

Twilight/light switch with time switch + Wi-Fi.
- Functions: 2
- Prog.: daily, weekly, yearly, astro
- Output: 1x chang. 8A

Backup using replaceable battery. Internet network connection not required. Remote control using WRC.

pg. 69

SOU-3

Twilight/light switch.
- Functions: 2
- Output: 1x clos. 12A

Designed for outdoor use.

pg. 70

Accessories for SOU-1

SKS-100

Photosensor for mounting on the wall/into the panel, IP65 protection.
EAN code: 8595188180733

Accessories for SOU-13/1

PLUG-IN backup battery module

Suitable for type CR2032 (3V)
EAN code: 8595188169813

SKS-200

Photosensor for mounting on the wall/into the panel, IP65 protection.
EAN code: 8595188182331

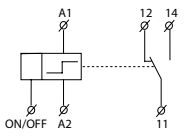
EAN code
MR-41/230 V: 8595188115889
MR-41/UNI: 8595188115896
MR-42/230 V: 8595188182492
MR-42/UNI: 8595188182256

- Memory (impulse) relays, controlled by buttons from several locations can replace three way switches or cross bar switches.
- Thanks to control by buttons (unlimited number, connected in parallel by 2 wires), installation gets more transparent and faster for mounting.
- Relays MR-41, MR-42 memorize its last state even after supply failure. During the failure relay will turn off and after re-energizing will automatically turns on.
- **MR-41** - output contact: 1x changeover 16 A.
- **MR-42** - options: 2x parallel contacts or the other relay is latching
  - function selected via potentiometer on front panel
  - output contact: 2x changeover 16 A
- Supply voltage: AC 230 V or AC/DC 12 - 240 V.

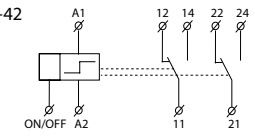
Technical parameters		MR-41	MR-42
Number of functions:		1	2
Supply terminals:		A1 - A2	
Voltage range:	UNI	AC/DC 12 - 240 V (AC 50 - 60 Hz)	
Consumption (max.):	UNI	2 VA/1.5 W	2.5 VA/1.5 W
Voltage range:	230 V	AC 230 V (50 - 60 Hz)	
Consumption (max.):	230 V	3 VA/1.4 W	4 VA/2 W
Supply voltage tolerance:		–15 %; +10 %	
Supply indication:		green LED	
Output			
Number of contacts:		1x changeover/SPDT ($AgSnO_2$)	2x changeover/DPDT ($AgSnO_2$)
Current rating:		16 A/AC1; PD. B300	
Breaking capacity:		4000 VA/AC1, 384 W/DC	
Inrush current:		30 A/< 3 s	
Switching voltage:		250V AC/24V DC	
Power dissipation (max.):		1.2 W	2.4 W
Output indication:		red LED	
Mechanical life:		10.000.000 ops.	
Electrical life (AC1):		100.000 ops.	
Controlling			
Load between A2-ON/OFF:		Yes	
Control terminals:		A1 - ON/OFF	
Glow-lamp connection:		(UNI) - NO, (230) - max. 4 pcs	
Impulse length:		min. 25 ms/max. unlimited	
Other data			
Operating temperature:		–20 .. +55 °C (–4 .. 131 °F)	
Storage temperature:		–30 .. +70 °C (–22 .. 158 °F)	
Dielectric strength:			
supply - output 1		4 kV	
supply - output 2		-	3 kV
output 1 - output 2		-	4 kV
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 (mm^2):		solid wire max. 1x 2.5 or 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)	
Dimensions:		90 x 17.6 x 64 mm (3.5″ x 0.7″ x 2.5″)	
Weight:		(UNI)-59 g (2.3 oz.), (230)-53 g (2.2 oz.)	(UNI)-80 g (2.8 oz), (230)-70 g (2.5 oz.)
Standards:		EN 60669-1, EN 60669-2-1	

Symbol

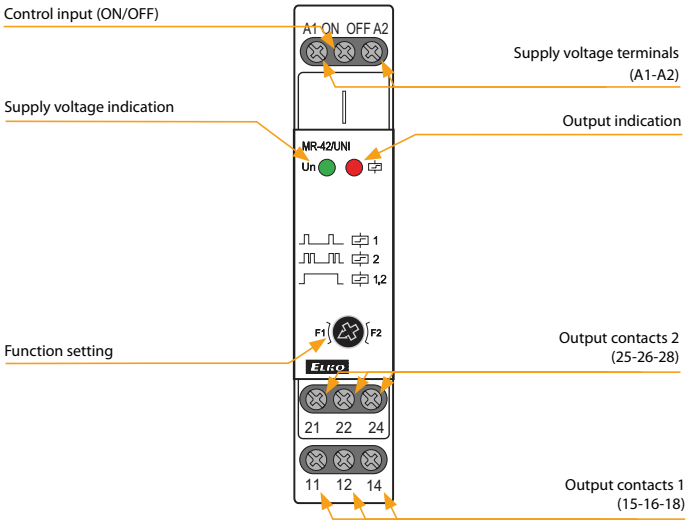
MR-41



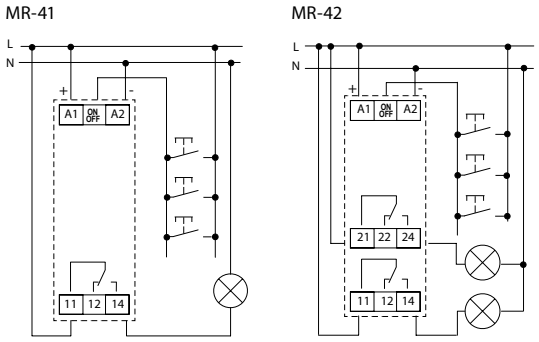
MR-42



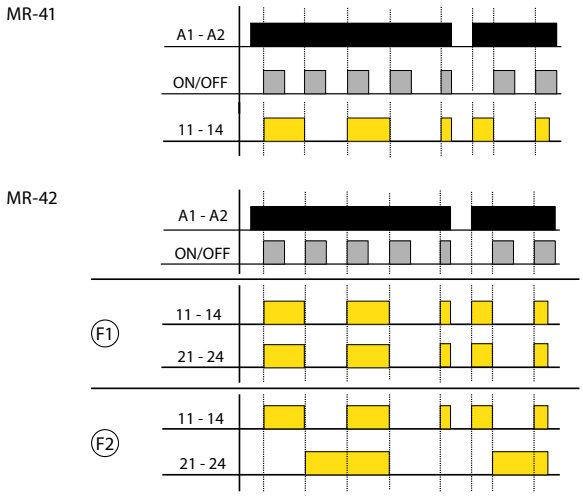
Description



Connection



Function



BR-216, BR-220, BR-232 | Bistable (impulse) relays

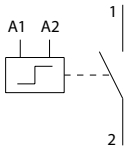
EAN code
BR-216-10/230V: 8595188168854
BR-216-11/230V: 8595188168878
BR-216-20/230V: 8595188168861
BR-220-20/230V: 8595188168885
BR-232-20/230V: 8595188168892

- Bistable relays are used to switch electrical circuits by impulse command, especially for lighting control in ordinary houses, warehouses, production halls and other buildings.
- Faster and easier installation thanks to an unlimited number of buttons, connected in parallel by two wires, which is a practical replacement for AC and cross switches.
- Last but not least, they offer savings in the number of wires used and, in the case of the control circuit, the possibility of using wires with a smaller cross-section, where the power input is minimal compared to the power circuit.
- The state of the Bistable relay changes with a short control pulse. As a result of which the relay in the steady state has zero consumption.
- All relays can be controlled manually using a switch on the relay panel (I-O), which also serves as to signal the status of the contacts.
- For types BR-220 and BR-232, it is possible to disconnect the electrical switch control and as a result the state of the relay can then only be changed manually (service, maintenance).

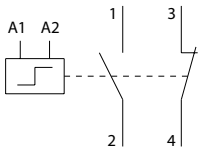
Technical parameters	BR-216-10/11/20	BR-220-20	BR-232-20
Main circuit (contact)			
Rated insulation voltage (U_i):		440 V	
Thermal current (I_{th}):	16 A	20 A	32 A
Number of poles:	1, 2, 2	2	2
Contact configuration:	10, 11, 20	20	20
Operational Power (P_e)			
AC-1, AC-7a for 230 V, 1 phase:	3.5 kW	4.4 kW	7 kW
AC-2 for 230 V, 1 phase:	1.2 kW	1.5 kW	2.4 kW
AC-3, AC-7b for 230V, 1 phase:	0.37 kW	0.55 kW	1.1 kW
DC-1 (L/R ≤ 1 ms)			
Ue = 24V (1 contact/2 contacts in series):	16 A/16 A	20 A/20 A	32 A/32 A
Ue = 48V (1 contact/2 contacts in series):	12 A/5 A	15 A/18 A	25 A/28 A
Ue = 60V (1 contact/2 contacts in series):	8 A/14 A	10 A/15 A	20 A/22 A
Ue = 110V (1 contact/2 contacts in series):	4 A/7 A	5 A/8 A	7 A/12 A
Ue = 220V (1 contact/2 contacts in series):	0.4 A/3 A	0.5 A/4 A	0.7 A/6 A
Load capacity of light sources AC-5a, AC-5b			
Max. operating frequency (op./hr)			
without load:	900	900	450
AC-1, AC-7a:	600	600	450
AC-2:	120	120	120
AC-3, AC-7b:	600	600	450
AC-5a, AC-5b:	600	600	450
DC-1:		300	
Electrical endurance: DC-1, DC-3, DC-5, AC-1, AC-7a, AC-2, AC-3, AC-7b, AC-5a / AC-5b (I_e = 10 A):		100 000 op. c.	
Mechanical lifetime:		1 000 000 op. C	
Power dissipation per pole:	1 W	1.5 W	3 W
Contact reliability:		>10 V, >100 mA	
Max. back-up fuse against short circuit gL/gG (I_v) - coordination type 1:	16 A	20 A	32 A
Rated impulse withstand voltage (U_{imp}):		4 kV	
Overload current withstand capability: 10s:	48 A	56 A	80 A
Terminal capacity (solid and stranded):		1 to 10 mm²	
Maximum tightening torque:		1.2 Nm	
Screw head:		PZ2	
Control circuit (coil)			
Rated control voltage:	AC 230 V		AC 120 V
Rated frequency:	50 Hz		60 Hz
Impulse duration:		min. 50 ms/max. 1 h	
Duration between two impulses (of control voltage):		min. 150 ms	
Maximum load of illuminated buttons (glow lamps, LEDs,…):		2,5 mA	
Terminal capacity (solid and stranded):		1 to 4 mm²	
Maximum tightening torque:		0.6 Nm	
Screw head:		PZ1	
General			
Mounting:		DIN Rail, TH35 (IEC/EN 60715)	
Number of contactors or switches side-by-side:		no limitation under 55 °C (55 .. 70 °C max. 3)/ 131 °F (131 °F .. 158 °F)	
Degree of protection:		IP20	
Operational temperature:		–25 .. +55 °C (> 55 .. +70 °C at max. pulse length - 1min)	
		(13 .. 131 °F (> 131 .. 158 °C at max. pulse length - 1min)	
Storing temperature:		–30 .. +80 °C (-22 °F to 176 °F)	
Disconnection of remote control (coil) by switch:	no	yes	yes
Standards:		IEC/EN 60669-2-2	

Connection

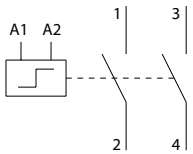
BR-216-10



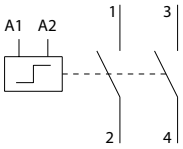
BR-216-11



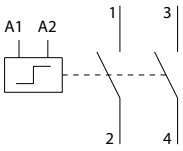
BR-216-20



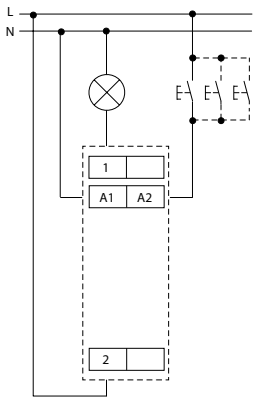
BR-220-20



BR-232-20



Example of connection BR-216-10



BR-216, BR-220, BR-232 | Loadability of bistable relays

	Power	Current	Capacity	Maximum number of lamps per pole		
Lamps Type	P (W)	I (A)	C (µF)	BR-216-10/11/20	BR-220-20	BR-232-20
LED lamps Power supplies for LEDs	-	-	-	max. 2 A per pole	max. 6 A per pole	max. 12 A per pole
Incandescent lamps and halogen lamps	15	0,07	-	133	133	233
	25	0,11	-	80	80	140
	40	0,17	-	50	50	88
	60	0,26	-	33	33	58
	75	0,33	-	27	27	47
	100	0,44	-	20	20	35
	150	0,65	-	13	13	23
	200	0,87	-	10	10	18
	300	1,3	-	7	7	12
	500	2,17	-	4	4	7
	1000	4,35	-	2	2	4
Fluorescent lamps with external electromagnetic ballasts - uncorrected	18	0,37	-	43	43	43
	36	0,43	-	37	37	37
	58	0,67	-	24	24	24
Fluorescent lamps with external electromagnetic ballasts - parallel corrected	18	0,19	4,5	18	22	33
	36	0,29	4,5	18	22	33
	58	0,46	7	11	14	21
Lead-lag circuit for fluorescent lamps with external electromagnetic ballasts - series corrected	2x18	0,26	2,7	62	62	62
	2x36	0,48	4,5	33	33	33
	2x58	0,78	7	21	21	21
Fluorescent lamps with external electronic ballasts	18	0,09	-	33	67	133
	2x18	0,17	-	18	35	71
	36	0,16	-	19	38	75
	2x36	0,31	-	10	19	39
	58	0,25	-	12	24	48
	2x58	0,48	-	6	13	25
	80	0,4	-	8	15	30
	2x80	0,76	-	4	8	16
High pressure mercury vapour lamps with external electromagnetic ballasts - uncorrected	50	0,6	-	17	27	27
	80	0,8	-	13	20	20
	125	1,2	-	8	13	13
	250	2,2	-	5	7	7
	400	3,3	-	3	5	5
	700	5,4	-	2	3	3
	1000	7,5	-	1	2	2
High pressure mercury vapour lamps with external electromagnetic ballasts - parallel corrected	50	0,3	7	11	14	21
	80	0,4	8	10	13	19
	125	0,6	10	8	10	15
	250	1,2	18	4	6	8
	400	1,8	25	3	4	6
	700	3,4	40	2	3	4
	1000	4,8	60	1	2	3
Metal halide lamps with external electromagnetic ballasts - uncorrected	35	0,5	-	16	32	32
	70	1	-	8	16	16
	150	1,8	-	4	9	9
	250	3	-	3	5	5
	400	4,6	-	2	3	3
	1000	9,7	-	1	2	2
	2000	12,2	-	0	1	1
Metal halide lamps with external electromagnetic ballasts - parallel corrected	35	0,23	6	13	17	25
	70	0,42	12	7	8	13
	150	0,77	20	4	5	8
	250	1,26	32	3	3	5
	400	2	45	2	2	3
	1000	5	85	0	1	2
	2000	10,5	125	0	0	1
High pressure sodium vapour lamps with external electromagnetic ballasts - uncorrected	150	1,8	-	7	9	9
	250	3	-	4	5	5
	400	4,4	-	3	4	4
	1000	10,3	-	1	1	1
High pressure sodium vapour lamps with external electromagnetic ballasts - parallel corrected	150	0,77	20	4	5	8
	250	1,26	32	3	3	5
	400	2	45	2	2	3
	1000	5,1	100	0	0	1
High pressure sodium vapour lamps with external electronic ballasts	150	0,72	-	4	8	17
	250	1,3	-	2	5	9
	400	2	-	2	3	6
	1000	5	-	0	1	2
Low pressure sodium vapour lamps with external electromagnetic ballasts - uncorrected	18	0,4	-	25	40	40
	35	0,6	-	15	27	27
	55	0,6	-	15	27	27
	90	0,9	-	10	18	18
	135	0,9	-	10	18	18
	180	0,9	-	10	18	18
Low pressure sodium vapour lamps with external electromagnetic ballasts - parallel corrected	18	0,35	5	16	20	30
	35	0,28	20	4	5	8
	55	0,35	20	4	5	8
	90	0,55	26	3	4	6
	135	0,8	40	2	3	4
	180	1	40	2	3	4

SOU-1 | Analog twilight switch

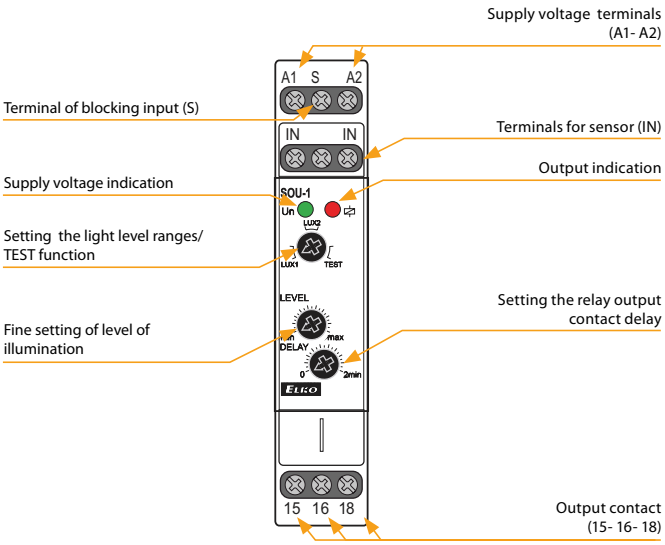
SKS-100

EAN code
SOU-1/230V + SKS-100: 8595188121002
SOU-1/UNI + SKS-100: 8595188180467
Photosensor SKS-100: 8594030337288

- Is used to control lights on the basis of ambient light intensity.
- Used for switching street illumination and garden lights, illumination of advertisements, shop windows, etc.
- Level of ambient intensity is monitored by an external sensor SKS-100 and output is switched according to set level on the device.
- Control input for additional control, e.g. time switch, preswitch etc.
- Level of illumination adjustable in two ranges:
  1 - 100 lx and 100 - 50000 lx.
- Adjustable time delay to eliminate short term fluctuation in illumination.
- External sensor IP65 suitable for mounting on the wall (cover and holder of a sensor are a part of the package).

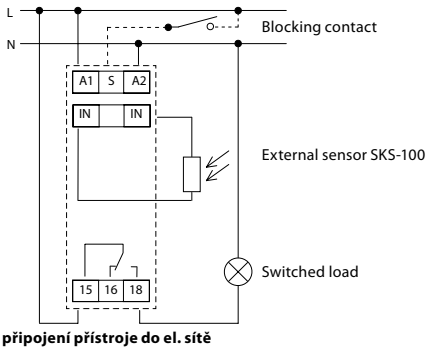
Technical parameters		SOU-1
Supply terminals:		A1 - A2
Voltage range:	UNI	AC/DC 12 - 240 V (AC 50-60 Hz)
Power input max.:	UNI	AC 1.5 VA/0.9 W
Voltage range:	230	AC 230 V (50-60 Hz)
Power input max.:	230	3 VA/2 W
Max. dissipated power (Un + terminals):		4 W
Supply voltage tolerance:		–15 %; +10 %
Supply indication:		green LED
Time delay:		0 - 2 min
Time delay setting:		potentiometer
Illumination range LUX1:		1 - 100 Lx
Illumination range LUX2:		100 - 50 000 Lx
Output		
Number of contacts:		1x changeover ($AgSnO_2$)
Current rating:		16 A/AC1; PD. B300
Breaking capacity:		4000 VA/AC1, 384 W/DC
Inrush current:		30 A/< 3 s
Switching voltage:		250 V AC/24 V DC
Output indication:		red LED
Mechanical life:		10.000.000 ops.
Electrical life (AC1):		100.000 ops.
Control		
Power the control input:		0.3 W
Load between S-A2:		yes
Control. terminals:		A1 - S
Impulse length:		min. 25 ms/max. unlimited
Reset time:		150 ms
Other information		
Operating temperature:		–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:		–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:		4 kV (supply - output)
Operating position:		any
Mounting:		DIN rail EN 60715
Protection degree:		IP40 from front panel/IP20 terminals
Sensor cable length:		max. 50 m (standard wire)
Overvoltage category:		III.
Pollution degree:		2
Max. cable size (mm^2):		solid wire max. 1x 2.5 or 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)
Dimensions:		90 x 17.6 x 64 mm (3.5 x 0.7 x 2.5 inch)
Weight:		(UNI): 66 g (2.3 oz.)/(230 V): 63 g (2.2 oz.)
Dimensions of sensor SKS -100:		58 x Ø 24 mm (2.3˝ x Ø 0.9˝)
Weight of sensor SKS-100:		20 g (0.5 oz.)
Standards:		EN 60669-1, EN 60669-2-1

Description



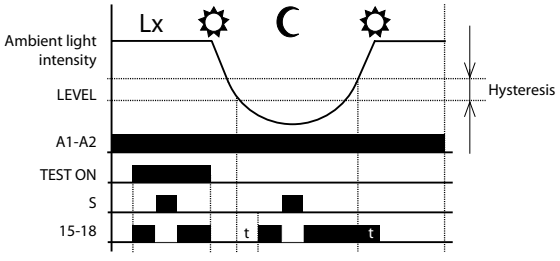
LUX1: Range 1 - 100 Lx.
LUX2: Range 100 - 50 000 Lx.
TEST: By switching to position TEST all function are switched off and switching contacts of output relay are switched on. The function TEST is used for testing of right connection of load and for verification of failure (breaking of the bulb).

Connection

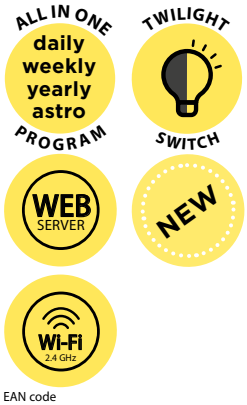


nutno dodržet správnost připojení přístroje do el. sítě
tzn. A1 = fáze (L) a A2 pracovní nulový vodič

Function



SOU-13 | Digital twilight/light switch with time switches + Wi-Fi connection



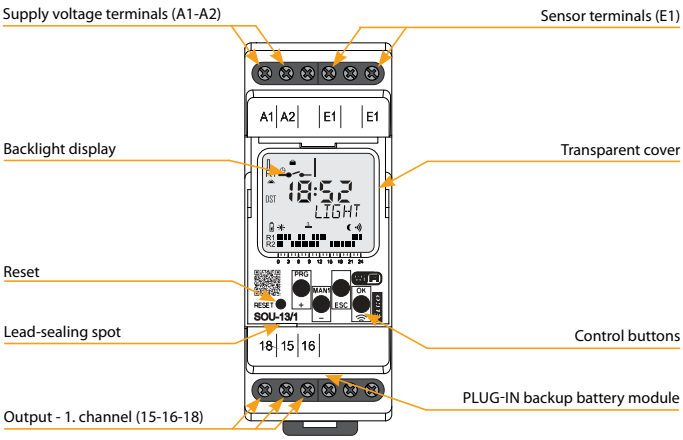
EAN code
SOU-13/1 + SKS-200: 8595188194648
SOU-13/1: 8595188192248
SKS-200: 8595188182331

Technical parameters	SOU-13/1
Supply terminals:	A1-A2
Supply voltage:	AC 100 – 240 V (50-60 Hz), DC 145 – 335 V
Consumption (max.):	Wi-Fi "OFF" 0.8 W/1.4 VA | "ZAP" 1.3 W/2.5 VA
Supply voltage tolerance:	–15 %; +10 %
Measuring circuit	
Measuring terminals:	E1-E1
Light intensity range:	1 .. 50.000 lx
Hysteresis (sensitivity):	adjustable, 1 .. 20 %
Offset (deviation):	adjustable, –50 .. +50 lx
Sensor failure indication:	displayed on LCD*
Output	
Contact type:	1× changeover ($AgSnO_2$)
Current rating:	AC 10 A/DC 5 A; PD. B300
Breaking capacity:	2500 VA/AC1, 150 W/DC1
Switching voltage:	AC 250 V/DC 30 V
Power dissipation (max.):	0.6 W
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Time circuit	
Accuracy:	max. ±0.5 s/day at 23°C (73.4 °F)
Min. switching interval:	1 s
Data retention time:	min. 10 years
Set time backup:	up to half a year with 60 outages (CR 2032 - 3V)
Program circuit	
Number of memory locations:	200 - time programs, 30 - holidays
Program type:	daily, weekly, yearly, astro + light
Displayed data:	LCD display with white backlight
Settings via website:	by Wi-Fi (2.4 GHz)
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:	
supply – output	AC 4 kV
supply – sensor	AC 3.5 kV
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel/IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section; solid/ stranded with ferrule (max.):	1× 2.5 mm² (14 AWG), 2× 1.5 mm² (16 AWG)/ 1× 2.5 mm² (14 AWG), 2× 1.0 mm² (17 AWG)
Dimensions:	90 × 35 × 64 mm (3.5˝ × 1.4˝ × 2.5˝)
Sensor dimensions SKS-200:	58 × Ø 24 mm (2.3˝ × Ø 0.9˝)
Weight:	113 g (4 oz) | SOU-13/1; 16 g (0.5 oz) | sensor SKS-200
Standards:	EN 61812-1, EN 18031-1

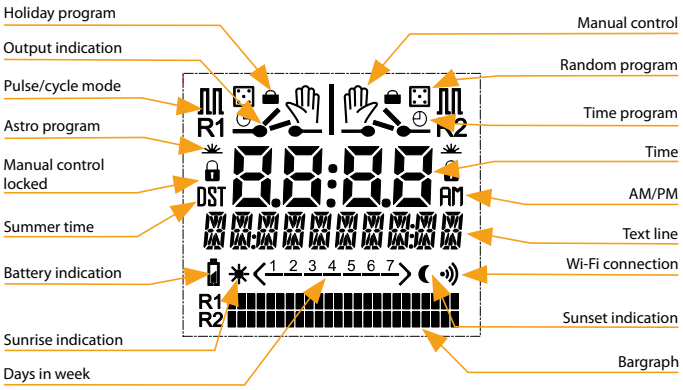
** SHORT - short circuit, NO SENS - sensor interruption*

- Switching control based on measured ambient light intensity with built-in time switch, allowing daily, weekly, yearly and astronomic program. This way, the twilight switch function can be limited in real time as required.
- The twilight switch is subordinate to the time switch programs.
- Simple setting after the first start-up.
- External sensor is suitable for mounting on the wall/in panel (holder and sensor are part of the delivery).
- User replaceable battery to back up the set time during power outages.
- Built-in web server for setup and control via Wi-Fi connection.
- Time synchronization through NTP server (require internet connection for twilight/light switch).
- Possibility of permanent connection to the local network.
- WRC: web remote control and setup from anywhere (require internet connection for twilight/light switch).
- New well-arranged display with white backlight.
- ASTROnomic program: manual entry of coordinates or selecting from one of more then 500 preset cities. Selection of days of the week, astro interrupt function (night break) and high position accuracy.
- 1-channel design (with an operating hours counter).
- Pulse/cycle output mode.
- Transition of summer/winter time – AUTO or OFF.
- PIN code protection against unauthorized changes.
- Wireless firmware update.

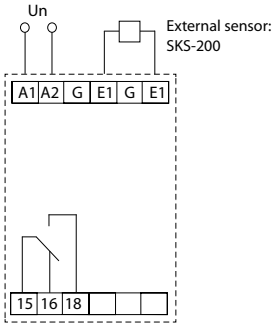
Description



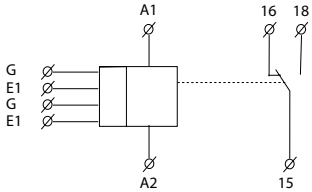
Description of displayed elements



Connection



Symbol



SOU-3 | Twilight and light switch with integrated sensor in increased protection

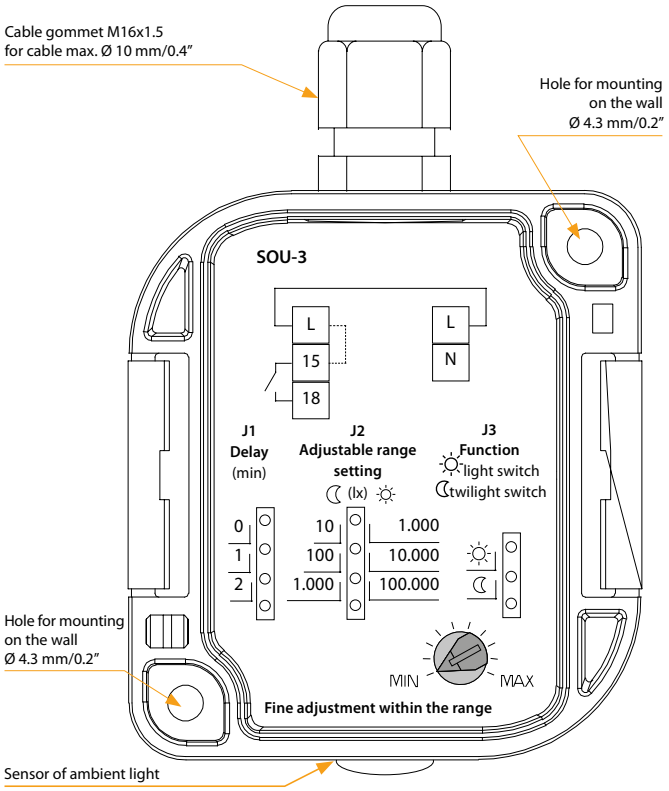
EAN code
SOU-3/230V: 8595188140560

- Is used as control of the device on the basis of ambient light intensity.
- External version in IP65, box for mounting on the wall, front cover removable without screws.
- Built in high resolution light sensor.
- Two devices in one, function is set by jumper:
  - twilight switch - contact closes by decreasing of ambient light intensity, and opens by its increasing.
  - light switch - contact closes by increasing ambient light intensity, and opens by decreasing light intensity. Used for switching of devices by reaching of pre-set ambient light level, usually sun shine (pulling down the shutters or blinds, activation of solar panels).
- 3 adjustable levels of time delay (for elimination of short-term fluctuations of light intensity - for short increases in light intensity).

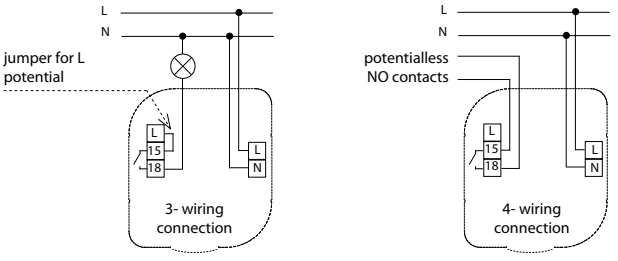
Technical parameters	SOU-3
Supply	
Supply terminals:	L - N
Voltage range:	AC 230 V (50-60 Hz)
Input (apparent/loss):	max. 6 VA/0.7 W
Max. dissipated power (Un + terminals):	2.5 W
Tolerance of voltage range:	- 15 % to +10 %
Setting the scale level of lighting	by jumper J2
Function ☾ (twilight switch)	
range 1:	1 to 10 lx
range 2:	10 to 100 lx
range 3:	100 to 1.000 lx
Function ☼ (light switch)	
range 1:	100 to 1 000 lx
range 2:	1 000 to 10 000 lx
range 3:	10 000 to 100 000 lx
Setting function	by jumper J3
Level of light-slight:	0.1 to 1 x range
Slight setting of light level:	potenciometer
Time delay t:	0/1 min./2 min.
Delay setting t:	by jumper J1
Output	
Output contact:	1x NO- SPST ($AgSnO_2$)
Current rating:	12 A/AC1
Switching output:	3000 VA/AC1, 384 W/DC
Peak current:	30 A/< 3 s
Switched voltage:	250 V AC/24 V DC
Mechanical life:	30.000.000 ops.
Electrical life:	100.000 ops.
Other information	
Operation temperature:	–30 .. +60 °C (–22 .. 140 °F)
Storing temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strengh:	4 kV (supply-output)
Operation position:	sensor-side down or on the sides
Protection degree:	IP 65
Overvoltage category:	III.
Pollution level:	2
Max. cable size (mm^2):	max. 1x 2.5, max. 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)
Suggested power-supply cable:	CYKY 3x 2.5 (CYKY 4x 1.5)
Dimensions:	98 x 62 x 34 mm (3.9˝ x 2.4˝ x 1.3˝)
Weight:	117 g (4.1 oz.)
Standards:	EN 60669-1, EN 60669-2-1

Device is standardly supplied with jumper L-15 (3-wire connection).
For the correct function of device is neccesary sensor-side down device mounting.

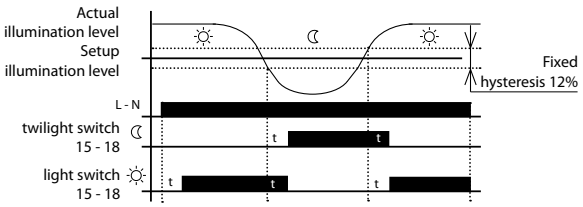
Description



Connection



Function



Notes

Switching power supplies DC, unregulated

Voltage 12 V

PS1M-15/12V
- Input: AC 100-240V
- Output: DC 12V stab.
- Load: 1.25A/15W.
- short circuit protection
- overload protection
- overvoltage protection

pg. 74

PS2M-24/12V
- Input: AC 100-240V
- Output: DC 12V stab.
- Load: 2A/24W.
- short circuit protection
- overload protection
- overvoltage protection

pg. 74

PS3M-54/12V
- Input: AC 100-240V
- Output: DC 12V stab.
- Load: 4.5A/54W.
- short circuit protection
- overload protection
- overvoltage protection

pg. 74

PS4M-85/12V
- Input: AC 100-240V
- Output: DC 12V stab.
- Load: 7.1A/85W.
- short circuit protection
- overload protection
- overvoltage protection

pg. 74

PSB-10-12
- Input: AC 110-250V
- Output: DC 12V stab.
- Load: 0.84A/10W
- galvanically separated
- short circuit protection
- overload protection
- temperature protection

pg. 76

Voltage 24 V

PS1M-15/24V
- Input: AC 100-240V
- Input: DC 24V stab.
- Load: 0.625A/15W.
- short circuit protection
- overload protection
- overvoltage protection

pg. 74

PS2M-30/24V
- Input: AC 100-240V
- Input: DC 24V stab.
- Load: 1.25 A/30W.
- short circuit protection
- overload protection
- overvoltage protection

pg. 74

PS3M-60/24V
- Input: AC 100-240V
- Input: DC 24V stab.
- Load: 2.5A/60W.
- short circuit protection
- overload protection
- overvoltage protection

pg. 74

PS4M-92/24V
- Input: AC 100-240V
- Input: DC 24V stab.
- Load: 3.83A/92W
- short circuit protection
- overload protection
- overvoltage protection

pg. 74

PSB-10-24
- Input: AC 110-250V
- Output: DC 24V stab.
- Load: 0.42A/10W
- galvanically separated
- short circuit protection
- overload protection
- thermo protection

pg. 76

Switching power supply DC, regulated

PS-30-R
- Input: AC 100-250V
- Output: DC 12-24V stab.
- Load: 2.5-1.25A/30W
- galvanically separated
- short circuit protection
- overload protection
- temperature protection

pg. 76

Analog power supply AC+DC, unregulated

ZNP-10-24
- Input: AC 230V
- Output: AC/DC 24V unstab.
- Load: 0.4A/10VA
- galvanically separated
- short circuit protection.

pg. 77

Analog power supply AC+DC, regulated

ZSR-30
- Input: AC 230V
- Output: DC 5-24V stab.
- Load: 1.6-0.3A/10VA
- galvanically separated
- short circuit protection
- overload protection

pg. 77

Bell transformers AC

ZTR-8-8
- Output: 8V
- Load: 8VA

pg. 78

ZTR-8-12
- Output: 12V
- Load: 8VA

pg. 78

ZTR-15-12
- Output: 4, 8, 12V
- Load: 5VA(4V), 10VA(8V), 15VA(12V)

pg. 78

POWER SUPPLIES AND BELL TRANSFORMERS

Type	Design	Supply voltage	Galvanically isolated	Output					Output protection against			Description	Page
				Analog	Switching	Stabilized DC	Output voltage	Loadability	Overcurrent	Short circuit	Temperature		
ZNP-10-24	3-M DIN	AC 230 V	●	●	x	x	DC 24 V 2x AC 24 V	0.3 A	●	x	●	Fixed output voltage AC 24 V, 2x DC 24 V. Power: 8 VA (AC), 8 W (DC).	77
ZSR-30	3-M DIN	AC 230 V	●	● (REG)	x	● (REG)	DC 5-24 V DC 24 V AC 24 V	0.3 A	●	●	●	Regulated output voltage DC 5- 24 V. Fixed output voltage DC 24 V, AC - 24 V. Power: 8 VA (AC), 8 W (DC).	
PSB-10-12	MINI BOX	AC 110-250 V	x	x	●	●	DC 12 V	0.84 A	●	●	●	Fixed output voltage DC 12 V. Power: 10 W.	76
PSB-10-24	MINI BOX	AC 110-250 V	x	x	●	●	DC 24 V	0.42 A	●	●	●	Fixed output voltage DC 24 V. Power: 10 W.	
PS-30-R	3-M DIN	AC 100-250 V	●	x	●	●	DC 12-24 V	2.5 A - 1.25 A	●	●	●	Regulated output voltage DC 12 - 24 V. Power: 30 W.	
PS1M-15/12V	1-M DIN	AC 100 - 240 V	x	x	●	●	DC 12 V	1.25 A	●	●	x	Fixed output voltage DC 12 V. Power: 15 W.	74
PS1M-15/24V	1-M DIN	AC 100 - 240 V	x	x	●	●	DC 24 V	0.625 A	●	●	x	Fixed output voltage DC 24 V. Power: 15 W.	
PS2M-24/12V	2-M DIN	AC 100 - 240 V	x	x	●	●	DC 12 V	2 A	●	●	x	Fixed output voltage DC 12 V. Power: 24 W.	
PS2M-30/24V	2-M DIN	AC 100 - 240 V	x	x	●	●	DC 24 V	1.25 A	●	●	x	Fixed output voltage DC 24 V. Power: 30 W.	
PS3M-54/12V	3-M DIN	AC 100 - 240 V	x	x	●	●	DC 12 V	4.5 A	●	●	x	Fixed output voltage DC 12 V. Power: 54 W.	
PS3M-60/24V	3-M DIN	AC 100 - 240 V	x	x	●	●	DC 24 V	2.5 A	●	●	x	Fixed output voltage DC 24 V. Power: 60 W.	
PS4M-85/12V	4-M DIN	AC 100 - 240 V	x	x	●	●	DC 12 V	7.1 A	●	●	x	Fixed output voltage DC 12V. Power: 85 W-	
PS4M-92/24V	4-M DIN	AC 100 - 240 V	x	x	●	●	DC 24 V	3.83 A	●	●	x	Fixed output voltage DC 24 V. Power: 92 W.	
ZTR-8-8	2-M DIN	AC 230 V	x	-	-	-	AC 8 V	1 A	x	■	x	Bell transformer (short-circuit-proof) for supplying of bells, door openers, home call-boxes.	78
ZTR-8-12	2-M DIN	AC 230 V	x	-	-	-	AC 12 V	0.66 A	x	■	x		
ZTR-15-12	3-M DIN	AC 230 V	x	-	-	-	AC 4-8-12 V	2-1.5-1A	x	■	x		

■ protection against short circuit in primary winding

PS1M, PS2M, PS3M, PS4M | Switching power supplies DC - unregulated

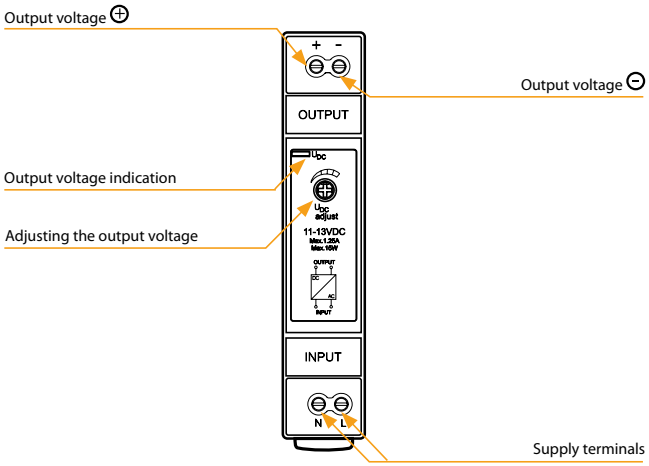
- Rated output voltage 12 or 24V DC with the possibility of regulation.
- High efficiency of up to 90%.
- Low ripple & noise.
- Protection: Over load , Over voltage and Short circuit.
- Continuously adjustable output voltage to adapt to the specific application, e.g. the need to compensate for the voltage drop caused by the length of the line.

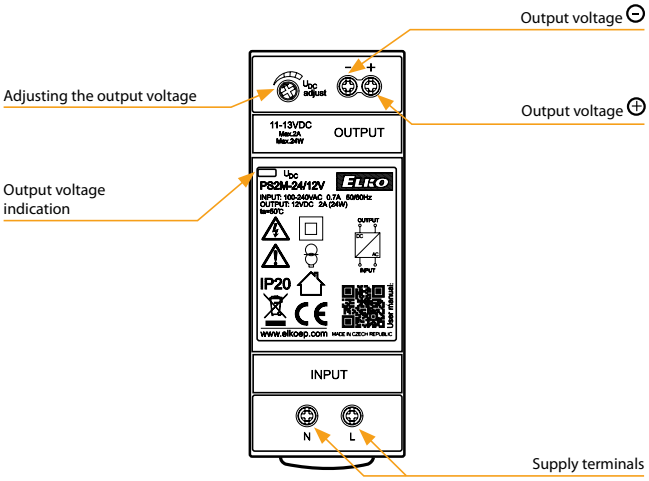
EAN code
PS1M-15/12V: 8595188180474
PS1M-15/24V: 8595188180481
PS2M-24/12V: 8595188180498
PS2M-30/24V: 8595188180504
PS3M-54/12V: 8595188180511
PS3M-60/24V: 8595188180528
PS4M-85/12V: 8595188180535
PS4M-92/24V: 8595188180542

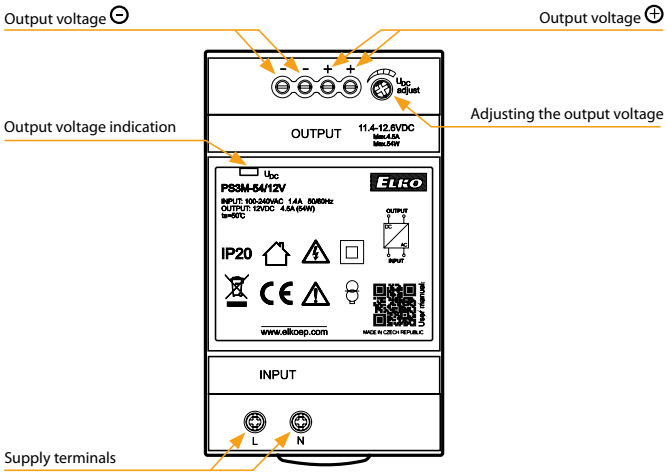
Technical parameters	PS1M-15/12V	PS1M-15/24V	PS2M-24/12V	PS2M-30/24V	PS3M-54/12V	PS3M-60/24V	PS4M-85/12V	PS4M-92/24V
Input								
Voltage range:	AC 100 - 240 V (50/60 Hz)							
Tolerance:	± 10%							
Efficiency:	85%	86%	88%	89%	88%	90%	88%	90%
Burden without load (max.):	0.3W/4VA	0.5W/4VA	0.3W/8VA	0.4W/8VA	0.3W/7VA	0.5W/6.5VA	0.4W/11VA	0.1W/12VA
Burden with full load (max.):	16W/30VA	17.5W/32VA	30W/50VA	33W/60VA	60W/95VA	70W/111VA	95W/150VA	105W/160VA
Inrush current:*	max. 25A at 115V AC/60Hz max. 45A at 240V AC/50Hz				max. 30A at 115V AC/60Hz max. 60A at 240V AC/50Hz		max. 35A at 115V AC/60Hz max. 70A at 240V AC/50Hz	
Output								
Rated voltage:	12V DC	24V DC	12V DC	24V DC	12V DC	24V DC	12V DC	24V DC
Vol. setting range:	11 - 13V	23 - 25V	11 - 13V	23 - 25V	11.4 - 12.6V	22.8 - 25.2V	11 - 13V	23 - 25V
Rated current:	1.25A	0.625A	2A	1.25A	4.5A	2.5A	7.1A	3.83A
Rated power:	15W	15W	24W	30W	54W	60W	85.2W	92W
Ripple & Noise:	120mV	150mV	120mV	150mV	120mV	150mV	120mV	150mV
Output indication:	blue LED		blue LED		green LED		blue LED	
Tolerance of output voltage:	5 %							
Overload protection:	from 130 % - 200% rated output power							
Overvoltage protection:	from 110 % - 145% rated output power							
Overcurrent protection:	from 110 % - 180% rated output power							
Short circuit protection:	temporarily disconnecting the output							
Other information								
Operating temperature:	–20 .. +50°C (–4 .. 122 °F)							
Operating humidity:	20% ~ 90% RH non-condensing							
Storage temperature:	–40 .. +80°C (–40 .. 176 °F)							
Dielectric strength:	3kV AC							
Isolation resistance:	100M Ω/500V DC/25°C (77°F)/70% RH							
Overvoltage category:	III.							
Pollution degree:	2							
Max. cable size:	max. 1x 2.5 mm², max. 2x 1.5 mm² solid wire/with sleeve max. 1x 2,5 mm²							
Terminal torque:								
input terminals	0.5 Nm		0.3 Nm		0.3 Nm		0.3 Nm	
output terminals	0.5 Nm							
Protection degree:	IP20							
MTBF:	200 000 hours minimum, full load at 25°C ambient temperature							
Mounting:	DIN rail EN 60715							
Dimensions:	90 x 18 x 58 mm (3.5˝ x 0.71˝ x 2.3˝)		90 x 35 x 58 mm (3.5˝ x 1.4˝ x 2.3˝)		90 x 52.5 x 58 mm (3.5˝ x 2.1˝ x 2.3˝)		90 x 70 x 58 mm (3.5˝ x 2.8˝ x 2.3˝)	
Weight:	78 g (2.8 oz.)		120 g (4.2 oz.)		190 g (6.7 oz.)		270 g (9.5 oz.)	
Standards:	EN 61204, UL 62368-1							

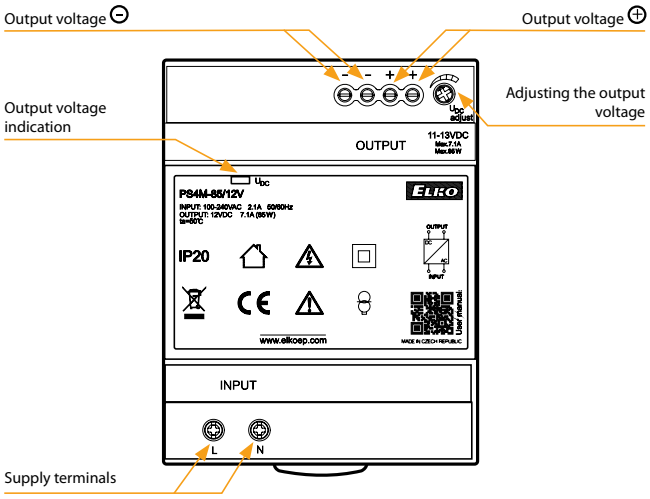
* the stated values are valid for the full load from the source

Description





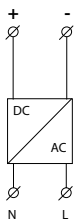




Connection

PS1M-15/12V
(PS1M-15/24V)

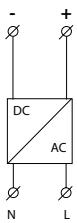
DC 12 V/1.25 A
(DC 24 V/0.625 A)



AC 100 - 240 V
50 Hz/60 Hz

PS2M-24/12V
(PS2M-30/24V)

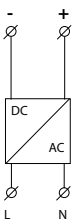
DC 12 V/2 A
(DC 24 V/1.25 A)



AC 100 - 240 V
50 Hz/60 Hz

PS3M-54/12V
(PS3M-60/24V)

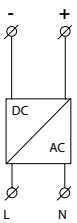
DC 12 V/4.5 A
(DC 24 V/2.5 A)



AC 100 - 240 V
50 Hz/60 Hz

PS4M-85/12V
(PS4M-92/24V)

DC 12 V/7.1 A
(DC 24 V/3.83 A)



AC 100 - 240 V
50 Hz/60 Hz

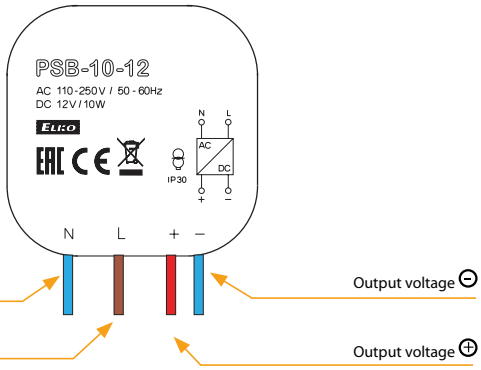
- **PSB-10:** switched stabilized power supplies with fixed output voltage, designed for mounting in the installation box.
  - **PSB-10-12:** stabilized power supply 12 V/10 W.
  - **PSB-10-24:** stabilized power supply 24 V/10 W.
- **PS-30-R:** switching stabilized adjustable power supply 12-24 V/30 W.
- The output current is limited by an electronic fuse, when the maximum current is exceeded, the source switches off and switches on again after a short time delay.
- Thermal protection - in case of thermal overload the source switches off, after cooling it switches on again

EAN code
PSB-10-12: 8595188145022
PSB-10-24: 8595188143783
PS-30-R: 8595188136655

Technical parameters	PSB-10-12	PSB-10-24	PS-30-R
Input			
Voltage range:	AC 110 - 250 V (50-60 Hz)		AC 100 - 250 V (50-60 Hz)
Burden without load (max.):	3 VA/0.5 W		10 VA/1.7 W
Burden with full load (max.):	26 VA/13 W		70 VA/37 W
Protection:	x		fuse T2A
Output			
Output voltage DC/max. current:	12 V/ 0.84 A	24 V/ 0.42 A	12.2 V/2.5 A 24.2 V/1.25 A
Tolerance of output voltage:	± 2%		± 3%
Output indication:	x		green LED
Wave of off-load output voltage:	40 mV		40 mV
Wave of output voltage with max load:	380 mV		500 mV
Time delay after connection:	max. 1s		max. 1s
Time delay after over-load:	max. 1s		max. 1s
Efficiency:	> 75%		> 81%
Electronic fuse:	against short circuit, current and temperature overload (from 120% of rated power)		
Other information			
Working humidity:	+20 .. +90 % RH		
Operating temperature:	–20 .. +40 °C (–4 .. 104 °F)		
Storage temperature:	–40 .. +85 °C (–40 .. 185°F)		–25 .. +70 °C (–13 .. 158 °F)
Dielectric strength input- output:	4kV		
Protection degree:	IP30		IP40 front panel I/IP20 terminals
Overvoltage category:	II.		
Degree of pollution:	2		
Cross section of connecting wires (mm²):	x		max. 1x 2.5, max. 2x 1.5/s dut.max. 1x 1.5
Outlets (cross section/length):	wire CY, 4x 0.75mm², 90mm (3.5″)		x
Dimensions:	49 x 49 x 21 mm (1.9″ x 1.9″ x 0.83″)		90 x 52 x 65 mm (3.5″ x 2″ x 2.6″)
Weight:	78 g (2.8 oz.)	78 g (2.8 oz.)	163 g (5.7 oz.)
Standard:	EN 61204-1, EN 61204-3, EN 61204-7		

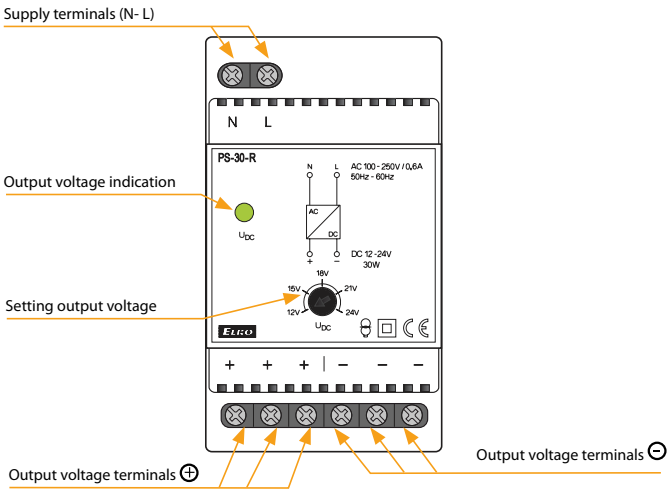
Device description

PSB-10-12



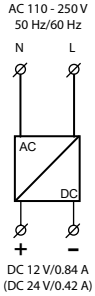
PSB-10-12/PSB-10-24
designated for installation into an installation box. Suitable for controlling of lighting sources, thermo valves, shutter engines, etc.

PS-30-R

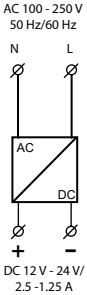


Connection

PSB-10-12 (PSB-10-24)



PS-30-R



EAN code
ZNP-10-24V: 8594030334089
ZSR-30: 8594030331750

Supply of various devices and appliances by safe voltage with full galvanic isolation from the main.

Analog power supply (regulated) **ZSR-30**
- Output voltage:
  DC 5-24 V, stabilized
  DC 24 V, unstabilized
  AC 24 V
- In case of a complete short circuit, the output current is limited by an electronic fuse.

Analog power supply (unregulated) **ZNP-10-24V**
- Output voltage:
  DC 24 V, unstabilized
  AC 24 V

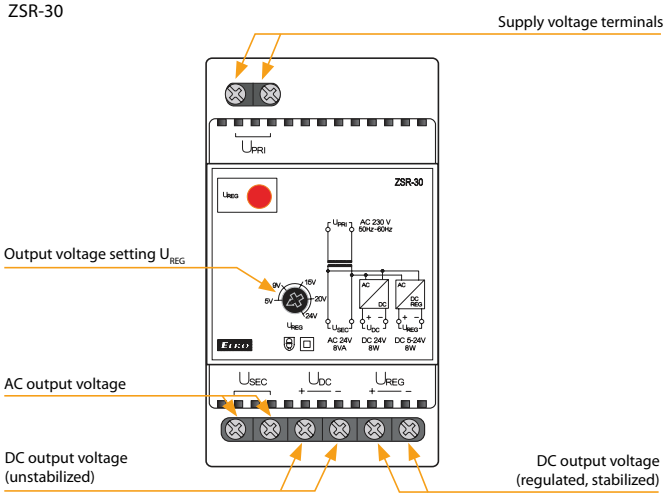
Protection against short circuit and overload by a dissolving fuse.

Technical parameters	ZSR-30	ZNP-10-24V
Supply (U_{PRI})		
Supply voltage:	AC 230 V (50-60 Hz)	
Consumption – unloaded (max.):	8 VA/2.6 W	9 VA/2 W
Consumption – loaded (max.):	16 VA/13 W	
Protection:	dissolving fuse, T100 mA	
Supply voltage tolerance:	–15 %; +10 %	
Output (U_{SEC} | U_{DC} | U_{REG})		
Output voltage:	DC 5-24 V stab. DC 24 V unstab. AC 24 V	DC 24 V unstab. AC 24 V
Voltage – unloaded AC (max.):	32 V	
Voltage – unloaded DC (max.):	43 V	
Output voltage ripple (max.):	300 mV	3 V
Efficiency:	75 %	x
Output voltage tolerance:	±5 %	x
Electronic fuse:	against short circuit & current overload	x
Other information		
Operating temperature:	–20 .. +40 °C (–4 .. 104 °F)	
Storage temperature:	–20 .. +60 °C (–4 .. 140 °F)	
Dielectric strength:	4 kV AC (supply – output)	
Protection degree:	IP40 front panel / IP20 terminals	
Cross-wire section – solid/ stranded with ferrule (mm^2):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)	
Dimensions:	90 × 52 × 65 mm (3.5″ × 2″ × 2.6″)	
Weight:	402 g (14.2 oz)	368 g (13 oz)
Standards:	EN 61204-1, EN 61204-3, EN 61204-7	

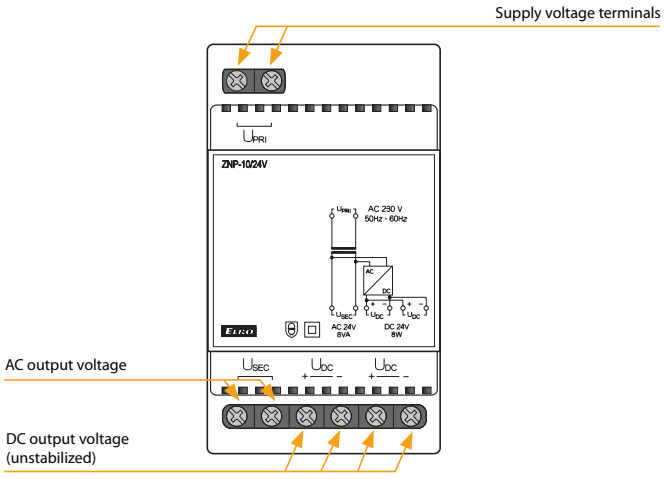
! WARNING !
Loadability of the ZSR-30 power supply differs for different values of the supply voltage, see graph of loadability U_{REG} .

Description

ZSR-30

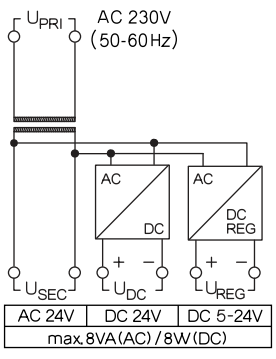


ZNP-10-24V

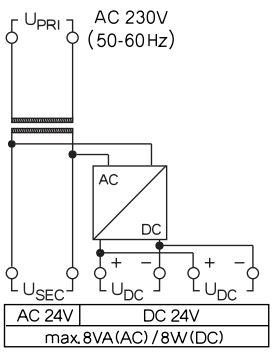


Connection

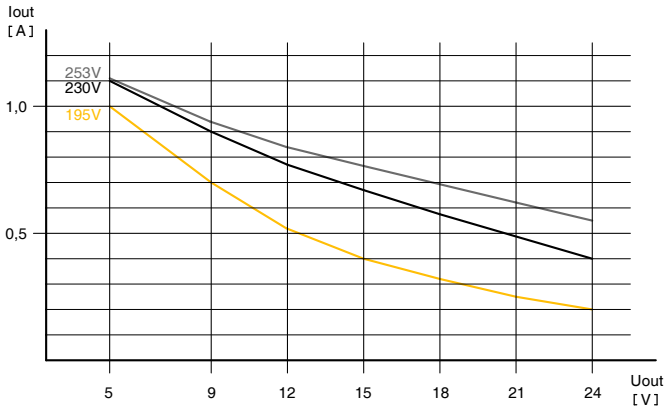
ZSR-30



ZNP-10



Loadability U_{REG}



- Designated for general use – e.g. for home bells supply, door locks supply.
- Universal power supply with AC input voltage.
- Short-circuit-proof, doubled output terminals.

- 2-MODULE, DIN rail mounting.
  ZTR-8-8: output voltage 8 V.
  ZTR-8-12: output voltage 12 V.

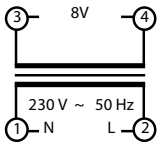
- 3-MODULE, DIN rail mounting.
  ZTR-15-12: output voltage 4, 8,12V.

EAN code
ZTR-8-8V: 8595188136808
ZTR-8-12V: 8595188136815
ZTR-15-12V: 8595188139281

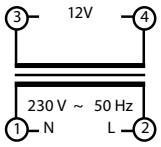
Technical parameters	ZTR-8-8	ZTR-8-12	ZTR-15-12
Entry (U prim)			
Voltage range:	AC 230 V (50 Hz)		
Max. dissipated power (Un + terminals):	1.5 W	1.5 W	2 W
Supply voltage tolerance:	± 10 %		
Efficiency:	70 %		
Output (Usec)			
Output voltage:	AC 8 V	AC 12 V	AC 4 V AC 8 V AC 12 V
Output voltage-no load AC:	12 V	16 V	16 V
Max.loability:	8 VA	8 VA	4 V 5 VA, 8 V 10 VA, 12 V 15 VA
Fuse (in primary winding):	short circuit protection		
Other information			
Operating temperature:	–20 .. +40°C (–4 .. 104 °F)		
Storing temperature:	–20 .. +60°C (–4 .. 140 °F)		
Dielectric strenght (prim/sec):	4 kV		
Protection degree:	IP40 from front panel/IP20 terminals		
Max. cable size (mm^2):	solid wire max. 1x 2.5 or 2x 1.5/ with sleeve max. 1x 1.5 (AWG 12)		
Dimensions:	90 x 35.6 x 64 mm (3.5˝ x 1,4˝ x 2.6˝)		90 x 52 x 65 mm (3.5˝ x 2˝ x 2.6˝)
Weight:	337 g (11.9 oz.)	345 g (12.2 oz.)	624 g (22 oz.)
Standards:	EN 61558-1, EN 61558-2-8		

Connection

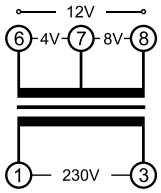
ZTR-8-8



ZTR-8-12



ZTR-15-12



Notes

DIMMERS AND LIGHT INTENSITY CONTROLLERS

Dimmers

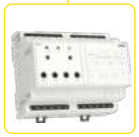
R, L, C, ESL, LED²

DIM-15

Designated for dimming of: dimmable energy saving fluorescent lamps, LED lamps.
R, L, C, LED²- resistive, inductive and capacitive loads.
pg. 82

SMR-M

For mounting under a wall-switch into an installation box KU68 (or similar). Dimmable energy saving fluorescent lamps, LED lamps.
R, L, C, LED² - resistive, inductive and capacitive loads.
pg. 82



DIM-7

Universal power dimmer with load capacity up to 2000VA. Selectable control modes (local, master, slave, dali). Up to 9 configurable functions (brightness, dimming curve, dimming speed, ...). 2 control inputs (S, IN), IN input is galvanically separated and operates in the range of AC/DC 12-240V.
pg. 86

RFDEL-76M

Universal six-channel dimmer with a load capacity of up to 150 VA/channel (230 V version) The dimmer channels can be connected in parallel and thus increase the possible load up to a maximum of 900 VA. Each channel has a separate, galvanically isolated control input.
pg. 89

R, L, LED¹

DIM-2

Staircase switch with gradual dimming up/down, level and time of illumination, all values are adjustable.
R = 10 -500 VA
L = 10 -250 VA.
pg. 84

SMR-S

Designed for dimming incandescent lamps, halogen lamps with wound transformer and dimmable LED¹.
pg. 85

Light intensity controller

R, L, C, ESL, LED²

LIC-1

Light intensity controller for maintaining the constant illumination level. Dimmable energy saving fluorescent lamps, LED lamps.
R, L, C, LED² - resistive, inductive and capacitive loads.
pg. 88

Accessories for LIC-1

SKS-100

Photosensor for mounting on the wall/into the panel, IP65 protection.
EAN code: 8595188180733

DIMMERS AND LIGHT INTENSITY CONTROLLERS

Type	Design	Supply voltage	Type of dimmed load						Output				Method of phase regulation				Description	Page
			resistive (el. bulbs, halogen lights) R	inductive (wound transformers) L	capacitive (electronic transformers) C	ESL	LED[1]	LED[2]	Output element	Rated load R	Rated load L	Rated load C	Rising edge	Falling edge	Control method 1-10V	DALI control		
DIM-15	1-M DIN	AC 230 V	●	●	●	●	x	●	2x MOSFET	300 VA	300 VA	300 VA	●	●	x	x	Universal dimmer R, C, L, ESL, LED[2], button control.	82
SMR-M	BOX	AC 230 V	●	●	●	●	x	●	2x MOSFET	160 VA	160 VA	160 VA	●	●	x	x	Like DIM-15, but for mounting under the push-button into the installation box (e.g. KU68).	
DIM-2	1-M DIN	AC 230 V	●	●	x	x	●	x	triac	10-500 VA[x]	10-250 VA	x	●	x	x	x	Stairway automaton with progressive illumination on/off, adjustable rise time, delay, maximum brightness. Dimmer R, L, LED[1].	84
DIM-7	6-M DIN	AC 230 V	●	●	●	●	x	●	4x MOSFET	2 000 VA	2 000 VA	2 000 VA	●	●	●	●	Universal dimmer 2kW R, L, C, ESL, LED[2], power modulating, control by buttons/1-10 V interface/DALI bus/potentiometer.	86
SMR-S	MINI BOX	AC 230 V	●	●	x	x	●	x	triac	10-300 VA[x]	10-150 VA	x	●	x	x	x	Designed for dimming bulbs, halogen lamps with wound transformer, dimmable LED[1] into the installation box (e.g. KU68).	85
LIC-1	1-M DIN	AC 230 V	●	●	●	●	x	●	2x MOSFET	300 VA[x]	300 VA[x]	300 VA[x]	●	●	x	x	Universal dimmer R, C, L, ESL, LED[2], button control, constant light level control.	88
RFDEL-76M	6-M DIN	AC 230; 120 V	●	●	●	●	x	●	12x MOSFET	6x 150 VA (230 V)	6x 150 VA (230 V)	6x 150 VA (230 V)	●	●	x	x	Load capacity 150 VA/channel (230 V version) or possibility to connect up to max. 900 VA in parallel at the expense of the number of channels. Each channel has a separate, galvanically separated input.	89

[x] with load over 300 VA is necessary to ensure sufficient cooling

Explanation of symbols

TYPE OF LOAD (symbols)	bulbs, halogen lamps	low-voltage el.bulbs 12/24V wound transformers	low-voltage el.bulbs 12/24V electronic transformers	ESL dimmable compact fluorescent lamps	Dimmable LED bulbs (triac dimmer)	Dimmable LED bulbs (dimmer with MOSFET)
						
	R	L	C	ESL	LED[1]	LED[2]

Demonstrated symbols are informative

Explanation:

R, L, C, ESL, LED

Dimmer with designated load:
R - resistive
L - inductive
C - capacitive
ESL - energy saving bulbs
LED[1] - dimmable LED bulbs, designed for dimmers with phase-controlled rising edge (triac dimmers)
LED[2] - dimmable LED bulbs designed for dimmers with phase or phase-to-phase phase control (dimmers with MOSFET).

IPxx protection - under normal conditions: normal conditions are understood as such conditions of operating an electrical device, installation and power supply network for which the entire device is designed, produced and installed. Upon these normal conditions of use and upon normal maintenance, all protective devices must be effective throughout the entire expected service life of the product.

Recommendation for mounting modular dimmers: leave a gap of min. 0.5 module (approx. 9 mm / 0.4") on side of the device to ensure better cooling of the device.

DIM-15, SMR-M | Universal dimmer

EAN code
DIM-15/230 V: 8595188140690
SMR-M: 8595188143776

- Designed for dimming of incandescent bulbs and halogen lights with wound or electronic transformer, dimmable light bulbs and dimmable LED².
- Enables gradual setting of luminance by push-button (non-detent) or parallel buttons.
- Returns to last state upon re-energization.
- Type of light source is set by switch-over on the front panel of device.
- Min. luminance, set by potentiometer on the front panel, eliminates flashing of light sources.

LED²: more informations on page 81

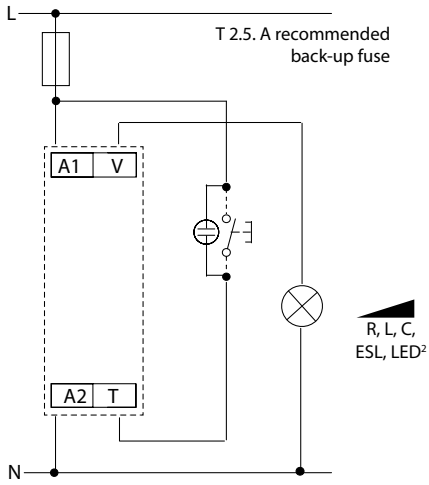
Technical parameters	DIM-15	SMR-M
Supply terminals:	A1 - A2	x
Voltage range:	x	4-wire, with neutral
Operating range:	AC 230 V (50 Hz)	
Burden (unloaded):	max. 2 VA/0.55 W	max. 0.66 VA/0.55 W
Max. dissipated power:	2 W	3 W
Supply voltage tolerance:	–15 %; +10 %	
Supply indication:	green LED	
Control		
Control terminals:	A1 - T	x
Control wire:	x	L - S
Control voltage:	AC 230 V	
Control input power:	AC 0.3 - 0.6 VA	
Control impulse lenght:	min. 80 ms/max. unlimited	
Glow tubes connection:	Yes	
Max. amount of glow lamps connected to controlling input:	max. 15 pcs (measured with glow lamp 0.68 mA/ 230 V AC)	max. 10 pcs (measured with glow lamp 0.68 mA/ 230 V AC)
Output		
Contactless:	2 x MOSFET	
Load:	300 W (at cos φ =1)*	160 W (at cos φ =1)*
Output status indication:	red LED	x
Other information		
Operating temperature:	–20 .. +35 °C (–4 .. 95 °F)	
Storing temperature:	–20 .. +60 °C (–4 .. 140 °F)	
Operating position:	any	
Mounting:	DIN rail EN 60715	free at connecting wires
Protection degree:	IP40 from front panel/ IP10 clips	IP30 in standard conditions**
Overvoltage category:	III.	
Pollution level:	2	
Terminal wire capacity (mm²):	max. 2x2.5, max. 1x 4 with sleeve max. 1x2.5, max. 2x1.5 (AWG 12)	x
Connection wires (cross-section/lenght):	x	CY, 0.75 mm² (AWG 18)/ 90 mm (3.5″)
Dimensions:	90 x 17.6 x 64 mm (3.5″ x 0.69″ x 2.5″)	49 x 49 x 21 mm (1.9″ x 1.9″ x 0.83″)
Weight:	58 g (2 oz.)	33 g (1.2 oz.)
Standards:	EN 60669-1, EN 60669-2-1	

* Due to a large number of light source types, the maximum load depends on the internal construction of dimmable light sources and their power factor cos φ. The power factor of dimmable LEDs and ESL bulbs ranges from cos φ = 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.
** For more information see page 81.

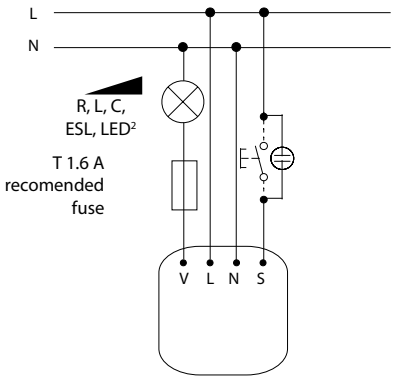
Warning: it is not allowed to connect inductive and capacitive loads at the same time.

Connection

DIM-15

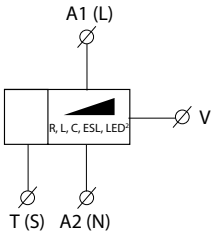


SMR-M

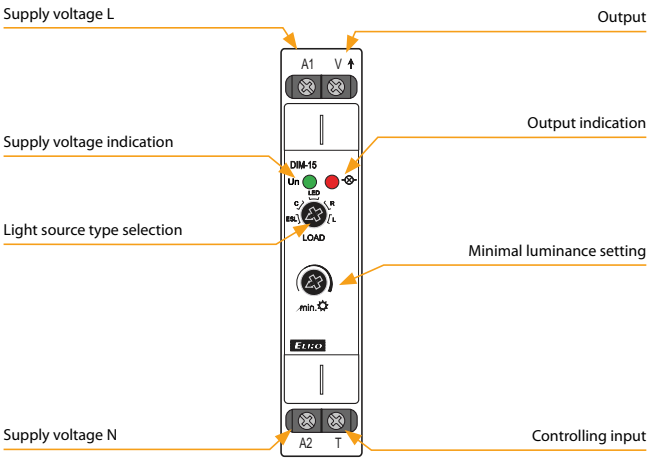


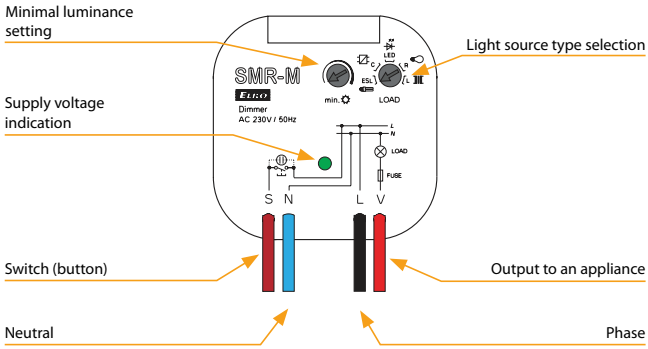
Symbol

DIM-15
(SMR-M)

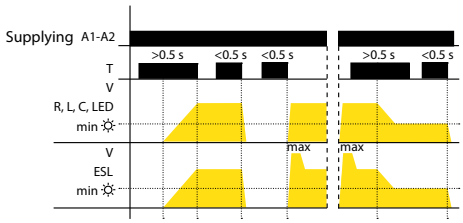


Device description





Functions and controlling



- short button press (<0.5 s) turns the light off or on
- long press (>0.5 s) enables slight regulation of light intensity
- setting of minimal luminance is possible only during decreasing of luminance by long button press
- setting of minimal luminance by saving fluorescent lamps serves for harmonizing of lowest light intensity prior its unprompted switching off

Luminance setting:

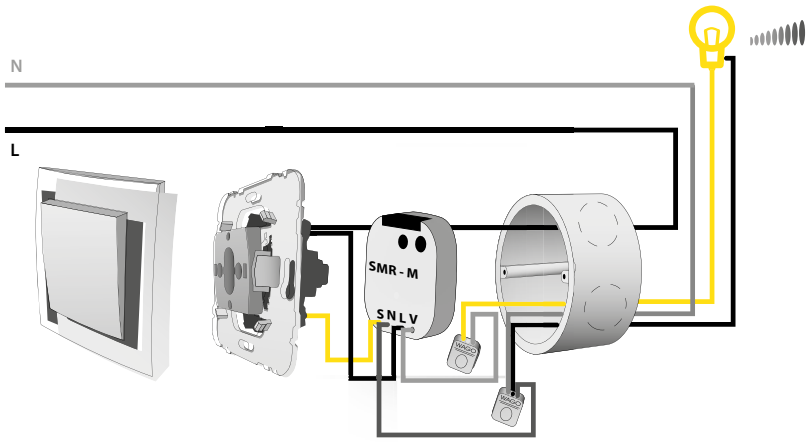
LED, R, L, C:

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

ESL:

- when light is off, short impulse turns lamp on and then luminance is decreased to set level

Connection example



Additional information

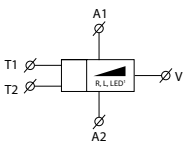
- it is not possible to dim energy-saving lamps without marking: dimmable
- an incorrect setting of light source has effect only on dimming range, it means neither dimmer or load get damaged
- max. number of dimmable light sources depends on their internal structure
- it is not recommended to connect light sources with diff erent types and brands, to one dimmer

DIM-2 | Dimmer with staircase switch function

EAN code
DIM-2 /230 V: 8595188112475
DIM-2-1h /230V: 8595188135740

Technical parameters	DIM-2
Supply terminals:	A1 - A2
Voltage range:	AC 230 V/50 Hz
Burden (unloaded):	max. 8 VA/0.6 W
Max. dissipated power:	1.5 W
Supply voltage tolerance:	–15 %; +10 %
Supply indication:	green LED
Time setting by:	potentiometers
Time deviation:	10 % - mechanical setting
Repeat accuracy:	5 % - set value stability
Temperature coefficient:	0.01 %/°C, at = 20 °C (0.01 %/°F, at = 68 °F)
Recovery time:	max. 80 ms
Controlling T1 (button)	
Terminals:	T1 - A1
Voltage:	AC 230 V
Power on control input:	max. 1.5 VA
Impulse length:	min.100 ms/max. unlimited
Glow-lamps:	Yes
Max. amount of glow lamps connected to controlling input:	230 V - max. amount 50 pcs (measured with glow lamp 0.68 mA/230 V AC)
Controlling T2 (switch)	
Terminals:	T2 - A1
Voltage:	AC 230 V
Power on control input:	0.1 VA
Impulse length:	min.100 ms/max. unlimited
Output	
Contactless:	1x triac
Current rating:	2 A
Resistance load:	10 - 500 VA
Inductive load:	10 - 250 VA
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel/IP10 terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm²):	solid wire max. 2x 2.5 or 1x 4/ with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	64 g (2.3 oz.)
Standards:	EN 60669-1, EN 60669-2-1

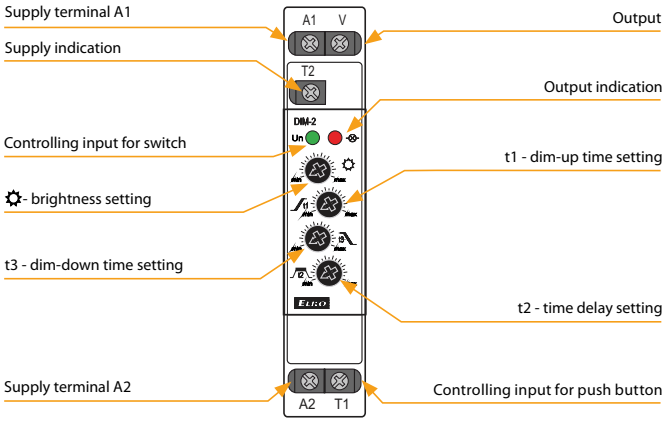
Symbol



- Designated for dimming el. bulbs, halogen lights and halogen lights with winding transformers and Dimmable LED[1].
- Intelligent control of halogen lights, function of gradual switching on and dimming.
- Controlling inputs for push button and switch.
- Values are set on front panel of the product, adjustable:
  - maximum dim-up
  - speed (fluency) of dim-up
  - speed (fluency) of dim-down
  - time for which a light is on with maximum dim-up.
- Output without contact: 1x triac.
- Parallel connection of controlling pushbuttons is possible.
- Protection against over-temperature inside the product - switches output off + signalizes overheating by LED flashing.
- Note: possibility of start and finish adjustment up on 1 second to 1 hour, device has description DIM-2 1h.

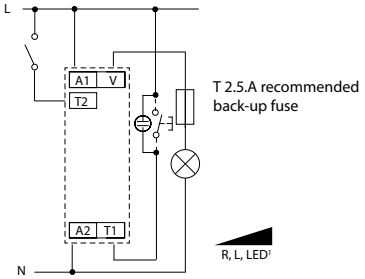
LED[1] : more informations on page 81

Description



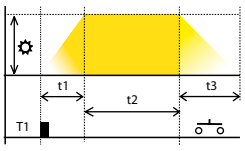
Recommendation for mounting: leave a gap of min. 0.5 module (approx. 9 mm,(0.3˝) on side of the device to ensure better cooling of the device.

Connection



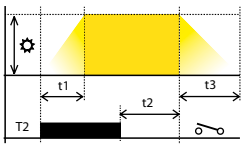
Function

Controlled via input T1(button)



Dim-up delay-down is started by a button. Cycle extension - by re-pressing button (during the cycle).

Controlled via input T2 (switch)



The switch starts the cycle and it stops on max.set brightness. After the switch is off, the cycle will continue until completed.

Legend:
☼ Brightness: 10 - 100 %
t1 Dim-up time: 1 - 40 s
t2 Time delay: 0 s - 20 min
t3 Dim-down time: 1 - 40 s

EAN code
SMR-S/230V: 8595188123518

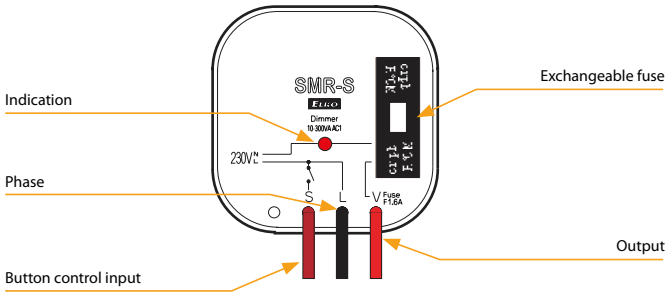
Technical parameters	SMR-S
Connection:	3-wire con., without neutral
Voltage range:	230 V AC (50 Hz)
Burden (unloaded):	max. 0.66 VA/0.55 W
Max. dissipated power:	3 W
Supply voltage tolerance:	–15 %; +10 %
Output	
Contactless:	1x triac
Resistive load:	10 - 300 VA
Inductive load:	10 - 150 VA
Capacitive load:	x
Control	
Control voltage:	AC 230 V
Current:	max. 3 mA
Impulse lenght:	min. 50 ms/max. unlimited
Glow tubes connection:	Yes
Max. amount of glow lamps connected to controlling input:	230 V - max. amount 10 pcs (measured with glow lamp 0.68 mA/230 V AC)
Other information	
Operating temperature:	0 .. +50 °C (32 .. 122 °F)
Operating position:	any
Mounting:	free at connecting wires
Protection degree:	IP30 in standard conditions*
Overvoltage category:	III.
Pollution degree:	2
Fuse:	F 1.6 A/250 V
Connection wires:	solid wires 0.75 mm² (AWG 18)/90 mm (3.5 inch)
Glow lamps in a button:	max. number 10
Dimensions:	49 x 49 x 13 mm (1.9˝ x 1.9˝ x 0.5˝)
Weight:	30 g (1.06 oz.)
Standards:	EN 60669-1, EN 60669-2-1

* for more information see page 81

- Button-controlled dimmers designated for flush mounting into a wiring box.
- Possible to control from more places (parallel connections).
- Protection against temperature overrun inside the device.
- Designated for dimming el. bulbs, halogen lights and halogen lights with winding transformers and Dimmable LED[1].
- 3-wire connection, functional without neutral.
- Max. load: 300 VA (el. bulbs or halogen lights with wound transformer).
- Contactless output -1x triac.
- With exchangeable fuse.

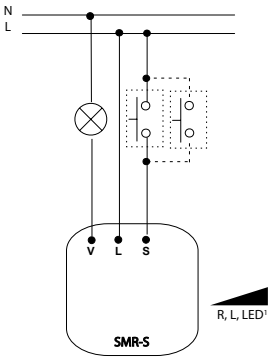
LED[1]: more informations on page 81

Description of SMR-S



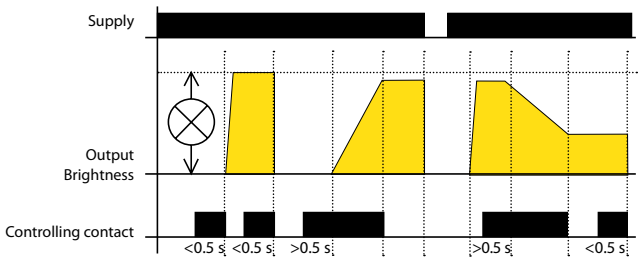
Connection

Typical connection of SMR-S - dimmer of lights



Warning: it cannot be used for fluorescent lights and energy saving lights!

Function



Short press (<0.5 s) turns a light on, another short press turns it off. A longer press (>0.5 s) 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.

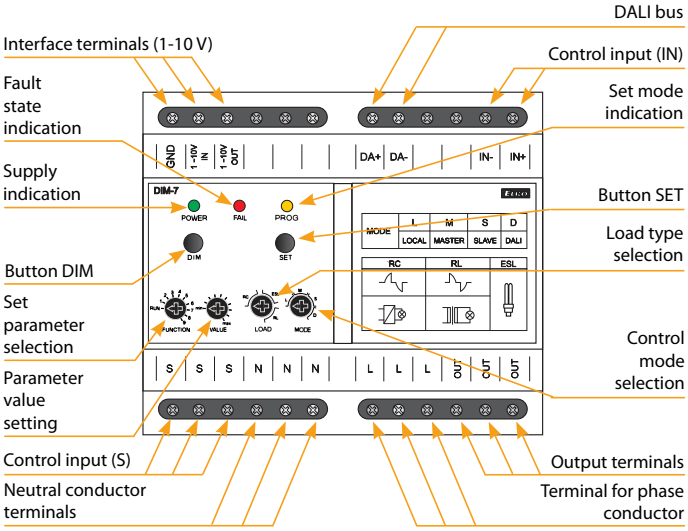
EAN code
DIM-7: 8595188192309

Technical parameters	DIM-7
Power supply	
Supply terminals:	L-N
Supply voltage:	AC 230 V (50-60 Hz)
Consumption (max.):	26 VA/1.8 W
Supply voltage tolerance:	–15%; +10%
Output	
Loadability (max.):	1500 VA*
Output current (max.):	10 A
Power dissipation (max.):	15 W
Control mode	
LOCAL (output 1-10 V OUT not active):	Control inputs S, IN
MASTER (output 1-10 V OUT active):	Control inputs S, IN
SLAVE (input S, IN not active):	Control input 1-10 V IN
DALI (input S, IN, 1-10 V not active):	Control input DA+, DA–
Control input S	
Control voltage:	AC 230 V (–15%; +10%)
Glow lamp connetion (max.):	YES (20 mA)
Control input IN	
Control voltage:	AC/DC 12 – 240 V (–15%; +10%)
Galvanically separated:	YES**
Input current (max.):	2 mA
Control 1-10 V	
Galvanically separated:	YES**
Input current (max.):	0.1 mA
Output current +10 V (max.):	10 mA
DALI control	
Power supply:	DC 16 V
Galvanically separated:	YES**
DALI current (resting state):	2.4 mA
Other information	
Operating temperature:	–20 .. +50 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Operating position:	any
Mounting:	DIN rail EN60715
Protection degree:	IP40 front panel/IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Dielectric strenght:	AC 4 kV/DC 6.1 kV**
Cross-wire section; solid/ stranded with ferrule (max.):	1× 2.5 mm² (14 AWG), 2× 1.5 mm² (16 AWG)/ 1× 2.5 mm² (14 AWG), 2× 1.0 mm² (17 AWG)
Dimensions:	90 × 105 × 65 mm (3.5˝ × 4.1˝ × 2.6˝)
Weight:	306 g (10.8 oz)
Standards:	EN 63044-1

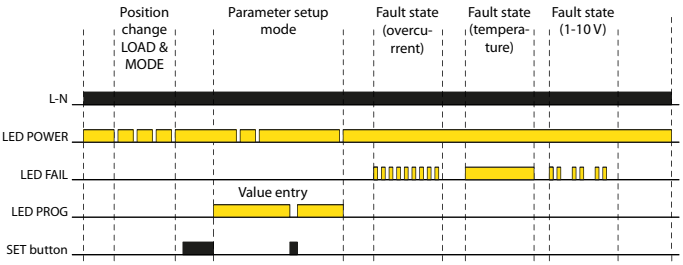
** maximum loadability of the device can be increased to 2000 VA provided that the operating temperature is limited to max. +35°C. **Warning**: it is not allowed to connect inductive and capacitive loads at the same time.*
*** dielectric strength of galvanically separated parts from each other*

- Designed for dimming incandescent lamps, halogen lamps, low-voltage halogen lamps with wound or electronic transformer, dimmable energy-saving lamps and dimmable LED lamps.
- Control via control button (with orientation glow lamp) or galvanically separated input (LOCAL/MASTER mode).
- Control via 1-10 V interface (MASTER/SLAVE mode), possibility of control via external potentiometer in SLAVE mode.
- Control via DALI bus (DALI mode).
- Electronic protection against current overload and short circuit.
- Electronic protection against thermal overload.
- Dimming parameters adjustable by potentiometers on the device panel (min./max. brightness, preheating, dimming curve, dimming speed, dim-up/dim-down time for each input S and IN separately).
- Indication of operating states – power supply, fault states (overload), programming mode.
- Loads can be divided between different phases (when controlling several DIM-7 dimmers together).
- Possibility of joint control of several DIM-7 dimmers with a 1-10 V interface or DALI bus.
- RF and BUS elements can be used to control these dimmers via the 1-10 V interface (RFDAC-71B-SL, DAC3-04M, DAC3-04B, ...).

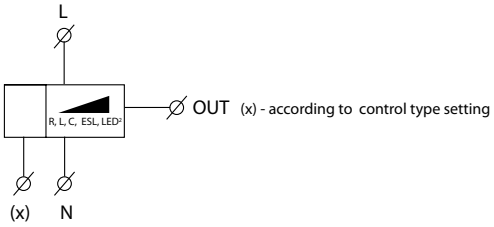
Description



LED indication

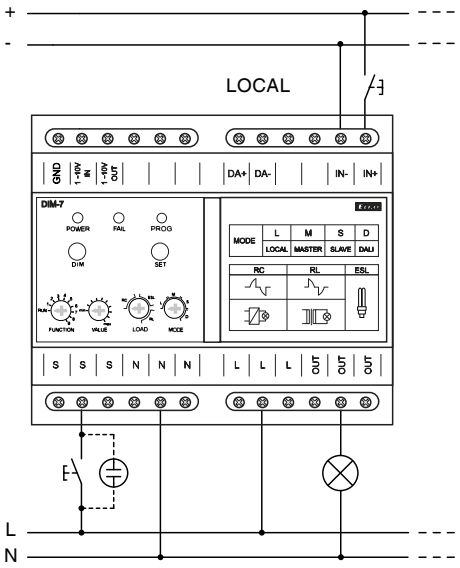


Symbol



Connection and control modes

LOCAL



LOCAL
- Button control (with orientation glow lamp) - input S
- Button control from an external (separate) source - input IN+; IN–
- DIM button control on the device panel

In this mode, control by 1-10 V interface or DALI bus is not active.

MASTER
- Button control (with orientation glow lamp) - input S
- Button control from external (separate) source - input IN+; IN–
- DIM button control on the device panel

This mode allows to control other connected dimmers with 1-10 V interface.
These other dimmers must be in SLAVE mode.
The control dimmer must have 1-10 V IN and 1-10 V OUT terminals connected.
In this mode, control by DALI bus is not active.

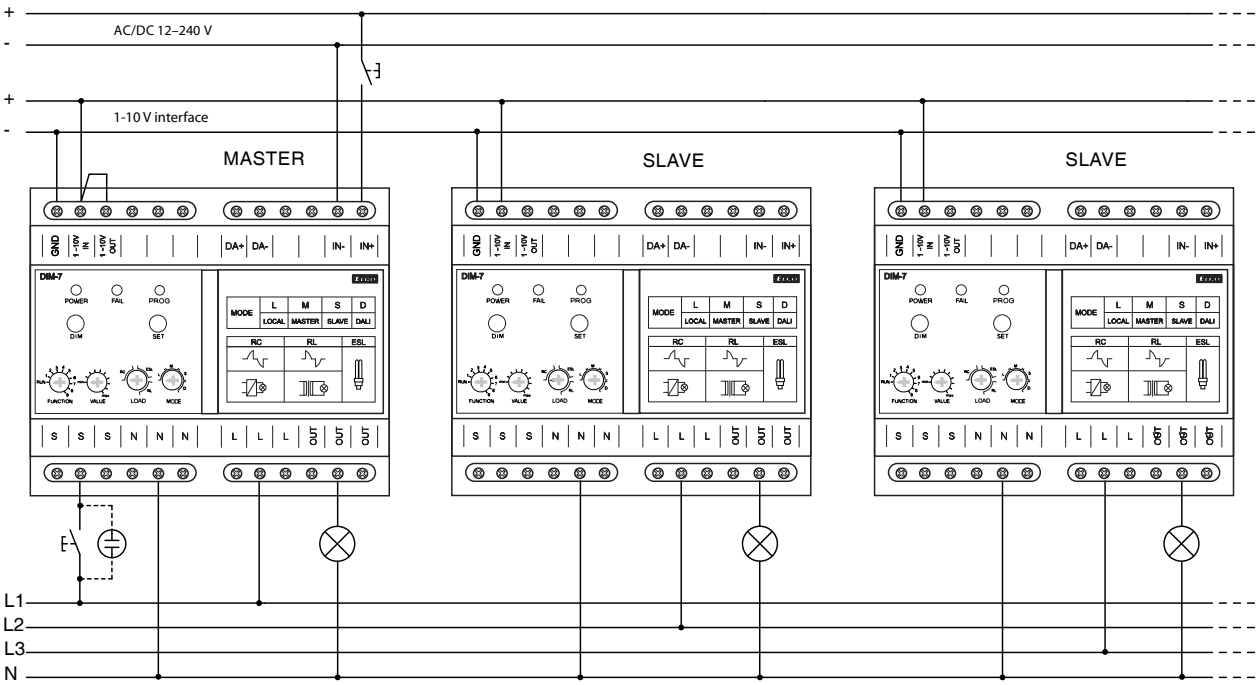
SLAVE
- Control by interface 1-10 V - either by external control device or external potentiometer (cannot be connected simultaneously)
- The potentiometer is powered from the 1-10 V OUT terminal, which in this mode has a voltage of +10 V against the GND terminal

In this mode, control by DALI bus is not active and inputs for control buttons or DIM button on the panel are not active.

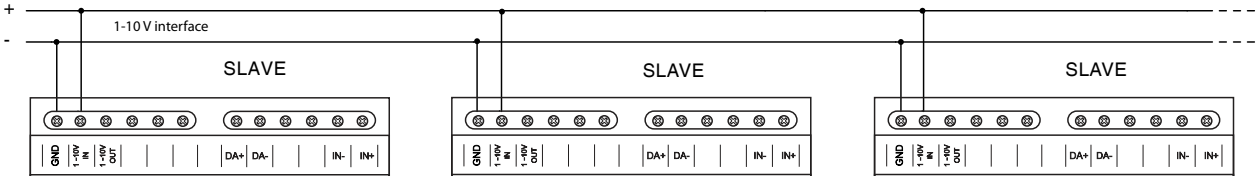
DALI
- Control by DALI bus, connected to terminals DA+; DA–

In this mode, the inputs for control buttons and the DIM button on the panel are not active.
Control by 1-10 V interface is also not active.
If the DALI bus is interrupted or disconnected, the dimmer is set to an unregulated state (maximum brightness level).

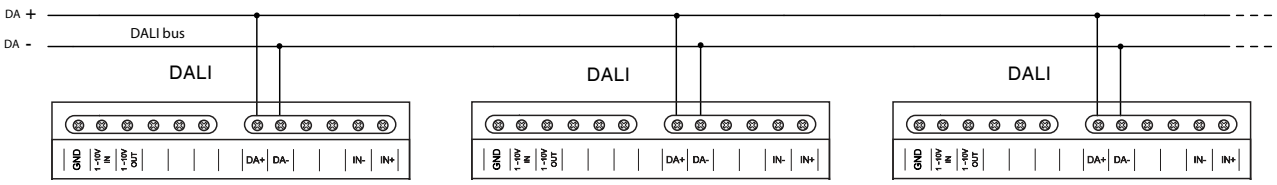
MASTER



SLAVE



DALI



LIC-1 | Light intensity controller with direct output (R-L-C-ESL-LED)

SKS-100

EAN code
LIC-1 + SKS-100: 8595188144933
Photosensor SKS-100: 8594030337288

Technical parameters	LIC-1
Supply terminals:	A1 - A2
Supply voltage:	AC 230 V (50-60 Hz)
Burden (unloaded):	max. 1.6 VA/0.8 W
Max. dissipated power:	1 W
Supply voltage tolerance:	±15 %
Power supply indication:	green LED
Control	
Button - control. terminals:	A1 - T
Control voltage:	AC 230 V
Control input power:	max. 0.6 VA
Control impulse lenght:	min. 80 ms/max. unlimited
Glow tubes connection (terminals: A1- T):	Yes
Maximum number of connected glow lamps the control input:	230 V - max. amount 50 pcs (measured with glow lamp 0.68 mA/230 V AC)
Blocking input - terminals:	A1 - B
Control. voltage:	AC 230 V
Supply:	max. 0.1 VA
Connect glow-lamps (terminals A1 - B):	No
Impulse length:	min. 80 ms/max. unlimited
Output	
Contact type:	2x MOSFET
Load capacity:*	300 VA (at cos φ =1)
Other information	
Operating temperature:	–20 .. +35 °C (–4 .. 95 °F)
Storage temperature:	–20 .. +60 °C (–4 .. 140 °F)
Operating position:	any
Mounting:	DIN rail EN 60715
Ingress protection:	IP40 from front panel/IP10 terminals
Overvoltage category:	III.
Contamination degree:	2
Connecting conductor cross-section (mm²):	solid wire max. 2x 2.5 or 1x 4 with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	66 g (2.33 oz.)
Standards:	EN 60669-1, EN 60669-2-1

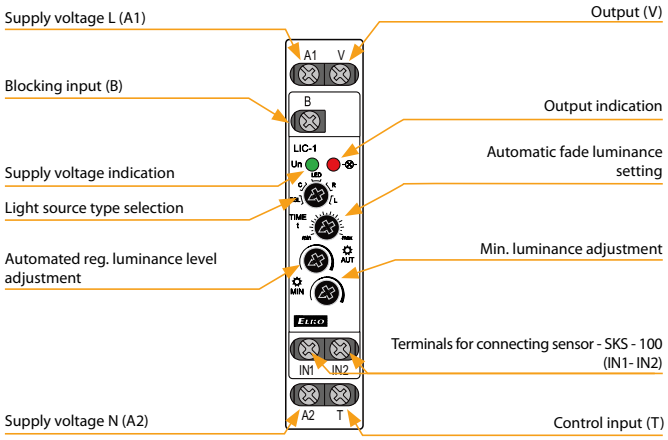
* Due to a large number of light source types, the maximum load depends on the internal construction of dimmable LEDs and ESL bulbs and their power factor cos φ. The power factor of dimmable LEDs and ESL bulbs ranges from cos φ = 0.95 to 0.4. An approximate value of maximum load may be obtained by multiplying the load capacity of the dimmer by the power factor of the connected light source.

Warning: it is not allowed to connect inductive and capacitive loads at the same time.

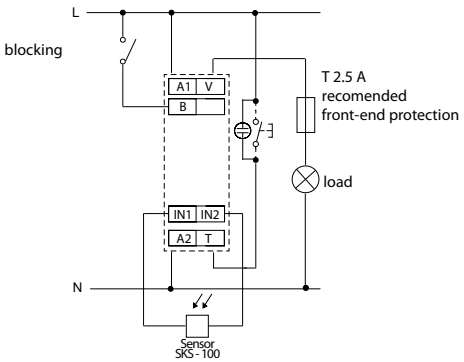
- Designed for dimming of incandescent bulbs and halogen lights with wound or electronic transformer, dimmable light bulbs and dimmable LED².
- Automatically regulates the intensity of light in a room.
- External sensor scans the intensity and based on the preset value it decreases or increases the brightness of light.
- Operating status:
  1 - Off
  2 - Automatic regulation
  3 - Cleaning (maximum level of illumination)
  4 - Setting the minimum lighting brightness
  5 - Setting the desired level of illumination.
- Optional connection of buttons with 50 neon lamps.

LED²: more information, see page 81

Description



Connection

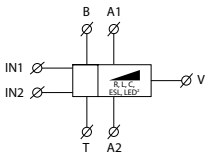


Function

T-button control:
- pressing button shortly (< 0.5 s) always turns of lamp
- pressing button longer (0.5 to 3 s) turns on lamp in automatic regulation mode
- pressing button long (> 3 s) turns on lamp to full illumination - „cleaner" mode
- after turning on the power supply, the dimmer is always turned off.

Thyristor B:
serves to block automatic regulation (lamp turns off).
WARNING! The lamp may be turned on in "cleaner" mode even while blocked.
After ending block mode, the lamp remains off.

Symbol



RFDEL-76M | Universal dimmer, 6-channels

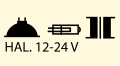
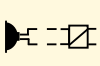
EAN code
RFDEL-76M /230: 8595188182058
RFDEL-76M /120: 8595188182096

- RFDEL-76M is a universal 6-channel actuator, which is used to control the brightness intensity of dimmable sources R - L - C - LED - ESL.
- The maximum possible load is 150 VA for 230 V and 75 VA for 120 V for each channel.
- The individual channels of the dimmer can be connected in parallel and thus increase the maximum output load at the expense of the number of outputs.
- Each of the output channels is individually controllable and addressable.
- By setting the min. brightness eliminates flickering of different types of light sources, setting min. brightness and type of load is done using the PROG buttons.
- Electronic overcurrent, thermal and short-circuit protection, which switches off the output.
- 6 galvanically isolated inputs for wired buttons, which can be used to control the outputs independently of the RF.
- Communication with bidirectional RFIO2 protocol. The package includes an internal AN-I antenna, in case of placement of a sheet metal distribution element, you can use an external AN-E antenna to improve the signal.

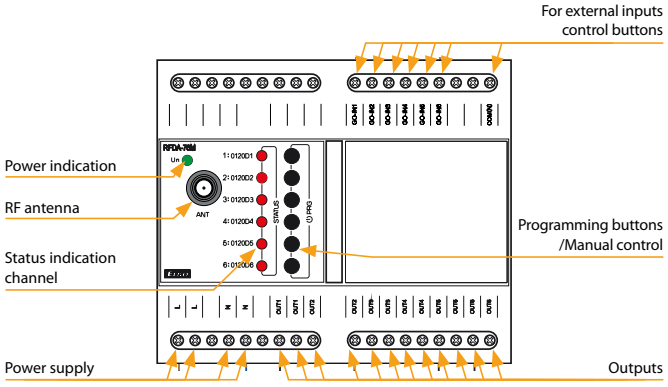
Technical parameters	RFDEL-76M/230V	RFDEL-76M/120V
Supply voltage:	230 V AC	120 V AC
Supply voltage frequency:	50 Hz	60 Hz
Power supply indication:	green LED Un	
Supply voltage tolerance:	+10/ –15 %	
Output		
Output:	12x MOSFET transistor	
Load type:*	R - resistive, L - inductive, C - capacitive, ESL - economical, LED	
Minimum output power:	10 VA	
Max. output power / channel:	150 VA	75 VA
Possible to connect outputs:	yes	
Maximum power when connecting all outputs:	max. 900 VA	max. 450 VA
Output protection:	thermal/short-term overload/longterm overload/short circuit	
Output indication:	red LED STATUS	
Control		
Wired buttons:	potential "L" or external voltage AC 20-230 V (50-60Hz)/DC 20-230 V	
Wireless:	up to 32 channels (with iNELS RF buttons)	
Communication protocol:	RFIO2	
Function repeater:	yes	
Range:	in the open up to 160 m (524.11 ft)	
RF antenna:	AN-I included (SMA connector)	
Other information		
Operating temperature:	–20 .. + 50 °C (–4 .. 122 °F)	
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)	
Ingress protection:	IP20 under normal conditions	
Overvoltage category:	II.	
Contamination degree:	2	
Connecting conductor:	max. 2.5mm²/1.5 mm²with sleeve	
Operating position:	vertical	
Installation:	in the switchboard on DIN rail EN 60715	
Dimensions:	90 x 105 x 65 mm (3.5˝ x 4.1˝ x 2.6˝)	
Weight	320 g (11 oz.)	
Standards:	ČSN EN 63044-1 ETSI, ČSN EN 300 220-2, ETSI ČSN EN 301489-3	

*__Warning__: it is not allowed to simultaneously connect loads of inductive and capacitive type in the same channel.

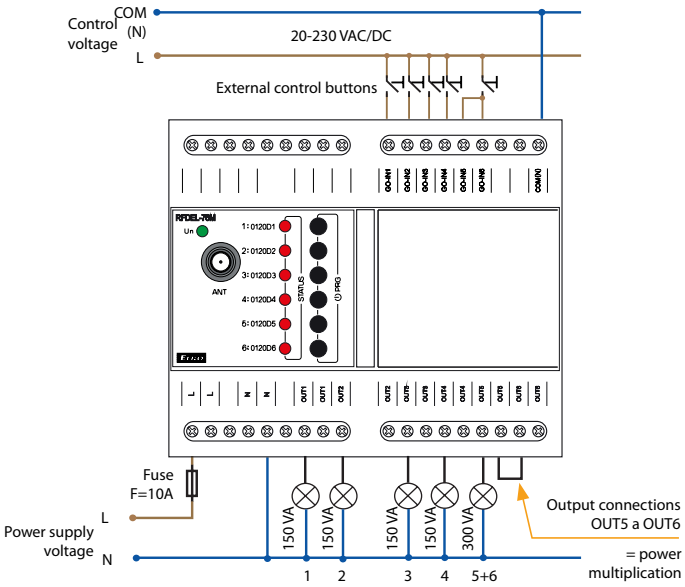
Types of connectable loads

				
R resistive	L inductive	C capacitive	ESL saving	LED light

Description



Connection



The stated outputs apply to the supply voltage AC 230V

CONTROLLING AND SIGNALING MODULES

USS
Designed for switching, control and signalling of auxiliary and power circuits.

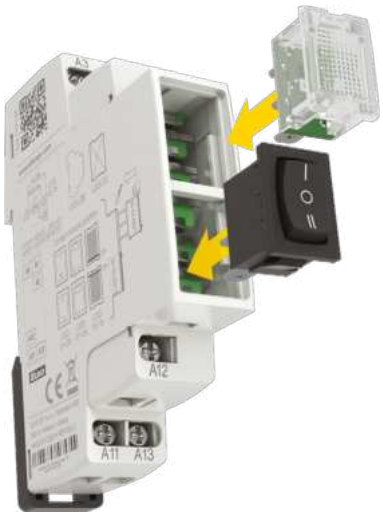
Blind

Switch, Switches, Buttons

Switch with indicator

Signals

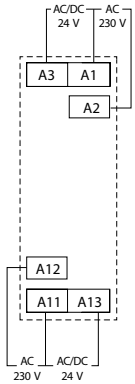
USS | Controlling and signaling modules



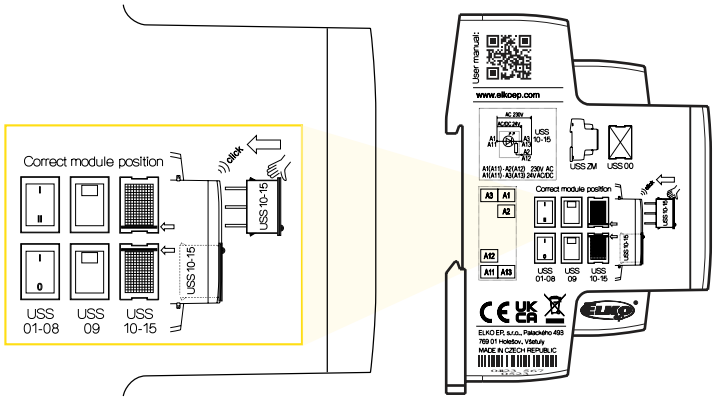
- Independent switch units designed for flexible controlling and switching of power circuits.
- USS - "Do It Yourself" = it is possible to "click into" different types of switches and signalling units into the basic module.
- Units are delivered as components and configured by the user.
- 16 types of units: switches, push buttons, signal lights of different colours including flashing lights units are replaceable also for future (for example when an application is changed, extended, etc...).
- Units are also replaceable in the future (for example when an application is changed, extended, etc…).
- It is possible to place up to two units into one MODULE (for example 2x switch, 2x signalling lights or combinations) = saves space in switchboard panels.
- 1-MODULE (90 x 17.6 x 64 mm/3.5˝ x 0.7˝ x 2.5˝), DIN rail mounting.
- Operating temperature -20 °C .. +55 °C (-4 °F .. 131 °F).
- M3 screw with clamp terminals.

Connection

Connection of signaling light



Installing the USS into the module



Examples of mounting

USS-01 + USS-03

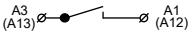
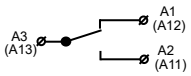
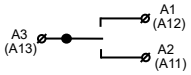
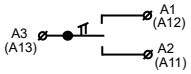
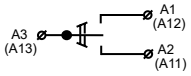
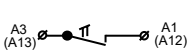
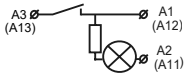
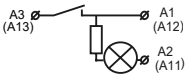
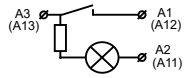
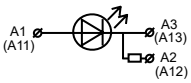
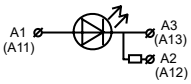
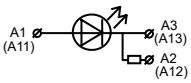
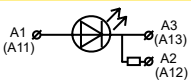
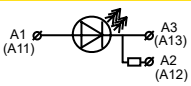
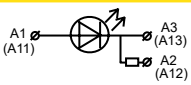
USS-07 + USS-11

USS-11 + USS-01

USS-10 + USS-00

USS-10 + USS-11

USS-07 + USS-00

TYPE DESIGNATION		EAN CODE	CONNECTION	RATED CURRENT/VOLTAGE (FOR SWITCHES) SUPPLY VOLTAGE (FOR SIGNALING LIGHTS)	DIMENSIONS	DESCRIPTION
USS-ZM		8595188124577	MODULE	-	19 x 17.6. x 64 mm (0.75˝ x 0.69˝ x 2.5˝)	Basic MODULE (housing with terminals and contacts)
USS-00		8595188124614	BLIND FLANGE	-	21 x 15 x 7 mm (0.83˝ x 0.59˝ x 0.28˝)	Used to fill in an empty position in the front panel
Switches, push buttons						
USS-01		8595188124621		6A/250 V AC	21 x 15 x 20 mm (0.83˝ x 0.59˝ x 0.79˝)	Switch
USS-02		8595188124638		10 A/250 V AC	21 x 15 x 20 mm (0.83˝ x 0.59˝ x 0.79˝)	Alternation switch
USS-03		8595188124645		10 A/250 V AC	21 x 15 x 20 mm (0.83˝ x 0.59˝ x 0.79˝)	Switch with central position
USS-04		8595188124652		6 A/250 V AC	21 x 15 x 20 mm (0.83˝ x 0.59˝ x 0.79˝)	Switch + push with central position
USS-05		8595188124669		6 A/250 V AC	21 x 15 x 20 mm (0.83˝ x 0.59˝ x 0.79˝)	Push button with central position
USS-06/S		8595188124676		10 A/250 V AC	21 x 15 x 20 mm (0.83˝ x 0.59˝ x 0.79˝)	Push button NO
USS-06/R		8595188136372		10 A/250 V AC	21 x 15 x 20 mm (0.83˝ x 0.59˝ x 0.79˝)	Push button NC
Switches with glow lamp						
USS-07		8595188124713		6 A/250 V AC	21 x 15 x 20 mm (0.83˝ x 0.59˝ x 0.79˝)	Switch with glow lamp (red, lights up when the switch is turned on - signal glowing lamp)
USS-08		8595188124720		6 A/250 V AC	21 x 15 x 20 mm (0.83˝ x 0.59˝ x 0.79˝)	Switch with glow lamp (green, lights up when the switch is turned on - signal glowing lamp)
USS-09		8595188124706		6 A/250 V AC	21 x 15 x 20 mm (0.83˝ x 0.59˝ x 0.79˝)	Switch with glow lamp (yellow, lights up before and after the switch is turned on - indicative glow lamp)
Signaling light						
USS-10		8595188124331		A1-A2, AC 230 V A1-A3, AC/DC 24 V	21 x 15 x 14 mm (0.83˝ x 0.59˝ x 0.55˝)	Signaling LED (red)
USS-11		8595188124348		A1-A2, AC 230 V A1-A3, AC/DC 24 V	21 x 15 x 14 mm (0.83˝ x 0.59˝ x 0.55˝)	Signaling LED (green)
USS-12		8595188124355		A1-A2, AC 230 V A1-A3, AC/DC 24 V	21 x 15 x 14 mm (0.83˝ x 0.59˝ x 0.55˝)	Signaling LED (yellow)
USS-13		8595188124362		A1-A2, AC 230 V A1-A3, AC/DC 24 V	21 x 15 x 14 mm (0.83˝ x 0.59˝ x 0.55˝)	Signaling LED (white)
USS-14		8595188124898		A1-A2, AC 230 V A1-A3, AC/DC 24 V	21 x 15 x 14 mm (0.83˝ x 0.59˝ x 0.55˝)	Signaling LED **FLASHING** (red)
USS-15		8595188124379		A1-A2, AC 230 V A1-A3, AC/DC 24 V	21 x 15 x 14 mm (0.83˝ x 0.59˝ x 0.55˝)	Signaling LED (blue)

MONITORING RELAY - VOLTAGE, SPECIAL

LEGEND: UV - undervoltage, OV - overvoltage, UF - underfrequency, OF - overfrequency

1-phase

AC/DC

HRN-31; HRN-31/2
- Functions: 9
- Range: AC/DC 48-276V
- Output: 1x/2x chang. 16A
Supply from monitored voltage.
pg. 94

HRN-32/2
Like HRN-31/2 but individual output for each level (Umax/Umin).
pg. 94

HRN-39; HRN-39/2
- Functions: 9
- Range: AC/DC 24-150V
- Output: 1x/2x chang. 16A
Supply from monitored voltage.
pg. 94

PMR1-31; PMR1-31/2
Like HRN-31 and HRN-31/2, but in PLUG-IN design.
pg. 96

PMR1-39; PMR1-39/2
Like HRN-39 and HRN-39/2, but in PLUG-IN design.
pg. 96

DC

HRN-36; HRN-36/2
- Functions: 9
- Range: DC 6-30V
- Output: 1x; 2x chang. 16A
Supply from monitored voltage.
pg. 94

PMR1-36; PMR1-36/2
Same as HRN-36 and HRN-36/2, but in PLUG-IN design.
pg. 96

AC/DC

HRN-41
- Function: adj. UV and OV
- Range: AC/DC 10-500V
- Output: 2x chang. 16A
- Supply: UNI; 400V
- UV: % of set OV
2x adj. delay.
pg. 98

HRN-42
Like HRN-41, but fault state memory, hysteresis, galv. separated supply (also for HRN-41).
- UV: % nominal input value
2x adj. delay.
pg. 98

3-phase

HRN-55
- Function: phase fail/sequence, fixed UV and OV
- Range: 3x 300-500V
- Supply: L1, L2, L3
Adjustable delay.
pg. 100

HRN-55N
Like HRN-55, but also monitors neutral wire interruption.
- Range: 3x 172-287V
- Supply: L1, L2, L3-N
pg. 100

HRN-54
- Function: phase fail/sequence, adj. UV and OV
- Range: 3x 300-500V
- Supply: L1, L2, L3
Adjustable delay.
pg. 101

HRN-54N
Like HRN-54, but also monitors neutral wire interruption.
- Range: 3x 172-287V
- Supply: L1, L2, L3-N
pg. 101

HRN-57
- Function: phase fail, adj. UV and OV
- Range: 3x 300-500V
- Supply: L1, L2, L3
Adjustable delay.
pg. 102

HRN-57N
Like HRN-57, but also monitors neutral wire interruption.
- Range: 3x 172-287V
- Supply: L1, L2, L3-N
pg. 102

HRN-56/208
- Function: phase fail/sequence, adj. UV
- Range: 3x 125-276V
- Supply: L1, L2, L3
Time delay setting.
pg. 103

HRN-56/240
Like HRN-56/280, but
- Range: 3x 144-276V
pg. 103

HRN-56/400
Like HRN-56/280, but
- Range: 3x 240-460V
pg. 103

HRN-56/480
Like HRN-56/280, but
- Range: 3x 228-500V
pg. 103

HRN-56/575
Like HRN-56/280, but
- Range: 3x 345-660V
pg. 103

HRN3-81
Like HRN3-80, but
- Function: phase fail/sequence/asymmetry
- Range: 3x 208-480V (fixed)
pg. 108

HRN-43
- Function: phase fail/sequence, adj. UV and OV
- Range: 3x 84-480V
- Output: 2x chang. 16A
- Supply: UNI; 400V (galv. separated)
pg. 104

HRN-43N
Like HRN-43, but also monitors neutral wire interruption.
- Range: 3x 48-276V
Adj. delay, hysteresis, memory and phase asymmetry (also for HRN-43).
pg. 104

HRN-100/2
- Function: optional phase fail/sequence/asymmetry, adj. UV and OV + UF and OF
- Range: 3x 90-500V
- Output: 2x chang. 5A
3/4 wire connection.
Supply from monitored voltage (L1, L2, L3, N optional).
pg. 110

HRN3-70
- Function: phase fail/sequence/asymmetry, adj. UV and fixed OV + optional memory
- Range: 3x 190-500V (adjustable)
- Output: 2x chang. 16A
Supply from monitored voltage (L1, L2, L3).
TRUE RMS.
pg. 106

PMR3-70
Like HRN3-70, but
- Output: 1x chang. 16A
In PLUG-IN version (8-PIN).
pg. 106

HRN3-80
- Function: phase fail/sequence/asymmetry, adj. UV
- Range: 3x 208-480V (adjustable)
- Output: 1x chang. 16A
Supply from monitored voltage (L1, L2, L3).
TRUE RMS.
pg. 108

Optical signaling in 3-phase network

MPS-1
- Function: no phase sequence monitoring
- Supply: 3x 50-253V
The voltage level in each phase is indicated by RGB LED.
pg. 113

Power factor

COS-2
- Function: monitors lower and upper level
- Range: 3x 84-480V (1/3-P connection)
- Output: 2x chang. 16A
- Supply: AC/DC 24V; AC 110; 230; 400V (galv. separated)
Evaluates the phase shift between current and voltage (cos φ).
pg. 114

Frequency

HRF-10
- Function: monitors lower and upper level
- Range: 40-480Hz (adj.)
- Output: 2x chang. 16A
- Supply: AC 161-500V (galv. separated)
Monitors frequency of the connected voltage.
pg. 116

MONITORING RELAY - VOLTAGE, SPECIAL

Type	Design	Supply from	Galvanically isolated	Features					Phase			Setting				Description	Page
				Phases	Monitored range	>U	<U	≷U	Failure	Sequence	Asymmetry	Delay	Restart delay	Hysteresis	Memory		
HRN-31 HRN-31/2	1-M	monitored voltage	x	1	AC/DC 48 - 276 V	●	●	●	x	x	x	●	x	●	●	All types have 9 functions in total. The delay is adjustable from 0 - 10 seconds (to eliminate short-term outages or peaks). The lower voltage level (Umin) is set in % of the upper level (Umax). HRN-3x, PMR1-3x: 1x output contact HRN-3x/2, PMR1-3x/2: 2x output contact Old types replacement: HRN-33 > HRN-31 HRN-34 > HRN-36 HRN-35 > HRN-32/2 HRN-37 > HRN-39 HRN-32/2: separated output contact for overvoltage and undervoltage	94
HRN-32/2	1-M	monitored voltage	x	1	AC/DC 48 - 276 V	●	●	●	x	x	x	●	x	●	●		
HRN-36 HRN-36/2	1-M	monitored voltage	x	1	DC 6 - 30 V	●	●	●	x	x	x	●	x	●	●		
HRN-39 HRN-39/2	1-M	monitored voltage	x	1	AC/DC 24 - 150 V	●	●	●	x	x	x	●	x	●	●		
PMR1-31 PMR1-31/2	8-PIN	monitored voltage	x	1	AC/DC 48 - 276 V	●	●	●	x	x	x	●	x	●	●		96
PMR1-36 PMR1-36/2	8-PIN	monitored voltage	x	1	DC 6 - 30 V	●	●	●	x	x	x	●	x	●	●		
PMR1-39 PMR1-39/2	8-PIN	monitored voltage	x	1	AC/DC 24 - 150 V	●	●	●	x	x	x	●	x	●	●		
HRN-41/UNI HRN-41/400 V	3-M	AC/DC 24-240 V AC 400 V	●	1	AC/DC 50 V AC/DC 160 V AC/DC 500 V	x	x	●	x	x	x	●	x	●	●	Second relay function (independent or parallel). Galvanically separated power supply from measuring inputs. **HRN-41:** lower level for undervoltage (Umin) is set in % from the set upper level (Umax). **HRN-42:** lower level for undervoltage (Umin) is set in % of the nominal value of the selected input, as for the upper level (Umax).	98
HRN-42/UNI HRN-42/400 V	3-M	AC/DC 24-240 V AC 400 V	●	1	AC/DC 50 V AC/DC 160 V AC/DC 500 V	x	x	●	x	x	x	●	x	●	●		
HRN-55	1-M	monitored voltage	x	3	AC 3 x 300 - 500 V	x	x	● (fixed)	●	●	x	●	x	x	x	Power supply from all phases, i.e. the relay function is preserved even if one phase fails.	100
HRN-55N	1-M	monitored voltage	x	3	AC 3 x 172 - 287 V	x	x	● (fixed)	●	●	x	●	x	x	x	Power supply L1, L2, L3-N, i.e. the relay also monitors the neutral wire interruption.	100
HRN-57	1-M	monitored voltage	x	3	AC 3 x 300 - 500 V	x	x	●	●	x	x	●	x	x	x	Power supply from all phases, i.e. the relay function is preserved even if one phase fails.	102
HRN-57N	1-M	monitored voltage	x	3	AC 3 x 172 - 287 V	x	x	●	●	x	x	●	x	x	x	Power supply L1, L2, L3-N, i.e. the relay also monitors the neutral wire interruption.	102
HRN-54	1-M	monitored voltage	x	3	AC 3 x 300 - 500 V	x	x	●	●	●	x	●	x	x	x	Power supply from all phases, i.e. the relay function is preserved even if one phase fails.	101
HRN-54N	1-M	monitored voltage	x	3	AC 3 x 172 - 287 V	x	x	●	●	●	x	●	x	x	x	Power supply L1, L2, L3-N, i.e. the relay also monitors the neutral wire interruption.	101
HRN-43/UNI HRN-43/400 V	3-M	AC/DC 24-240 V AC 400 V	●	3	AC 3 x 84 - 480 V	x	x	●	●	●	● (+ OFF)	●	x	●	●	2 output relays, functions of the second relay may be selected (independent/parallel). Galvanically separated power supply.	104
HRN-43N/UNI HRN-43N/400 V	3-M	AC/DC 24-240 V AC 400 V	●	3	AC 3 x 48 - 276 V	x	x	●	●	●	● (+ OFF)	●	x	●	●		
HRN-56/208 HRN-56/240 HRN-56/400	1-M	monitored voltage	x	3	AC 3 x 125 - 276 V AC 3 x 144 - 276 V AC 3 x 240 - 460 V	x	●	x	●	●	x	●	x	x	x	Thanks to the power supply from all three phases, the relay isoperational even if one phase fails.	103
HRN-56/480 HRN-56/575	3-M	monitored voltage	x	3	AC 3 x 228 - 550 V AC 3 x 345 - 660 V	x	●	x	●	●	x	●	x	x	x		
HRN3-70	3-M	monitored voltage	x	3	AC 3 x 190 - 500 V	x	x	● (o-fixed)	●	●	● (+ OFF)	●	●	x	●	Selectable nominal voltage from 190 to 500 V. Adjustable restart delay from 1 to 300 s. Two output contacts, changeover 16 A. * (o-fixed) = over voltage value is fixed (110% from selected range).	106
PMR3-70	8-PIN	monitored voltage	x	3	AC 3 x 190 - 500 V	x	x	● (o-fixed)	●	●	● (+ OFF)	●	●	x	●		
HRN3-80	1-M	monitored voltage	x	3	AC 3 x 208 - 480 V	x	●	x	●	●	● (+ OFF)	●	x	x	x	Selectable nominal voltage from 208 to 480 V.	108
HRN3-81	1-M	monitored voltage	x	3	AC 3 x 208 - 480 V	x	x	x	●	●	● (+ OFF)	●	x	x	x	Works in range from 208 to 480 V.	108
HRN-100/2	2-M	monitored voltage	x	3	U_{LL} = 3 ~ 155 - 500 V U_{LN} = 3 ~ 90 - 288 V	●	●	●	●	●	●	●	●	●	●	Configurable 3 or 4-wire connection. Extensive setting options. Each output can be configured individually.	110

Relay for optical signalization in 3-phase network

Type	Design	Supply from	Phases	Monitored range	>U	<U	≷U	Failure	Sequence	Asymmetry	Delay	Description	Page
MPS-1	1-M	monitored voltage	3	AC 3 x 50 - 253 V	x	●	●	●	x	x	x	Optical signaling of three-phase network.	113

Relay for frequency monitoring

Type	Design	Supply/ monitored voltage	Monitored parameters				Setting				Description	Page
			Phases	Frequency range	Frequency ∧	Frequency ∨	Delay	Hysteresis	Frequency ∧	Frequency ∨		
HRF-10	3-M	AC 161 - 500 V	1	40 - 60 Hz 48 - 72 Hz 320 - 480 Hz	●	●	●	●	●	●	Switchable ranges of rated frequency.	116

Relay for power factor monitoring

Type	Design	Supply voltage	Monitored parameters				Setting			Description	Page
			Phases	Range cos φ	> cos φ	< cos φ	Delay	Hysteresis	Memory fault		
COS-2/230 V COS-2/110 V COS-2/400 V COS-2/24 V	3-M	AC 230 V AC 110 V AC 400 V AC/DC 24 V	3	0.1 - 0.99	●	●	●	●	●	Configurable 3 or 4-wire connection. Extensive setting options. Each output can be configured individually.	114

HRN-3x | Multifunction voltage monitoring relays in 1P - AC/DC

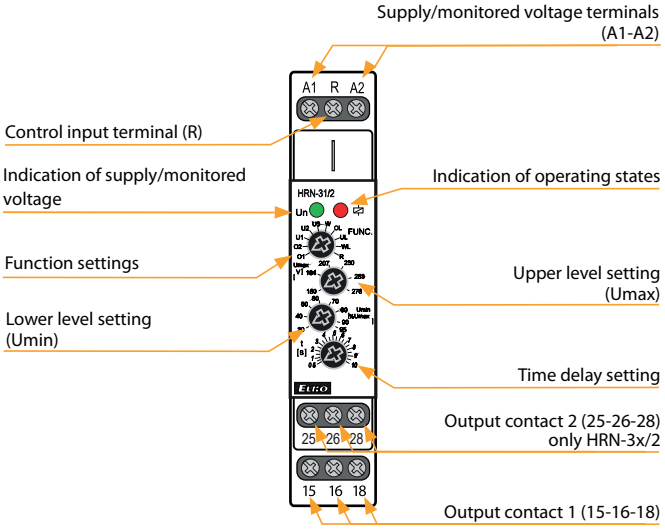
- It is used to monitor the value of alternating or direct voltage in 1-phase circuits.
- Supply voltage from monitored voltage.
- Monitors voltage exceeding the upper voltage level (Umax) and falling below the lower voltage level (Umin) – according to the selected function.
- Smooth adjustment of both voltage levels – the lower level Umin is set in % of the upper level Umax.
- Adjustable time delay (to eliminate short-term voltage drops and spikes).
- Option to select functions with fault state memory (Latch).
- The fault state memory can be reseted by the control input (R).
- Measures true root mean square value of the voltage - TRUE RMS.
- Type HRN-32/2 has an independent output contact for each voltage level.

EAN code
HRN-31: 8595188184946
HRN-31/2: 8595188184380
HRN-32/2: 8595188185394
HRN-36: 8595188184953
HRN-36/2: 8595188182553
HRN-39: 8595188184960
HRN-39/2: 8595188184939

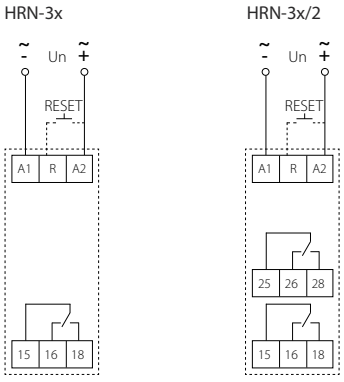
Technical parameters	HRN-31 HRN-31/2	- HRN-32/2	HRN-36 HRN-36/2	HRN-39 HRN-39/2
Supply and measuring				
Supply/monitored terminals:	A1-A2			
Supply/monitored voltage:	AC/DC 48 – 276 V (AC 50-60 Hz)	AC/DC 48 – 276 V (AC 50-60 Hz)	DC 6 – 30 V -	AC/DC 24 – 150 V (AC 50-60 Hz)
Consumption (max.):	2.5 VA/0.55 W 2.7 VA/0.65 W	- 2.7 VA/0.65 W	0.35 W 0.5 W	2.5 VA/0.55 W 2.7 VA/0.65 W
Upper level setting (Umax):	AC/DC 160 – 276 V	AC/DC 160 – 276 V	DC 12 – 30 V	AC/DC 80 – 150 V
Lower level setting (Umin):	30 – 95 %Umax	30 – 95 %Umax	50 – 95 %Umax	30 – 95 %Umax
Max. permanent voltage:	AC/DC 276 V	AC/DC 276 V	DC 36 V	AC/DC 276 V
Peak overload (1 s):	AC/DC 290 V	AC/DC 290 V	DC 48 V	AC/DC 290 V
Time delay (d):	300 ms			
Time delay (t):	adjustable, 0.5 – 10 s			
Accuracy				
Setting accuracy (mech.):	5 % – mechanical setting			
Repeat accuracy:	< 1 %			
Temperature dependency:	< 0.1 %/°C (°F)			
Hysteresis (fault to OK):	5 % (functions O1, U1, W) Umax – Umin (functions O2, U2, U3)			
Output				
Contact type:	1× changeover 2× changeover	1× changeover for each level	1× changeover 2× changeover	1× changeover 2× changeover
Contact material:	AgNi			
Current rating:	16 A/AC1; PD. B300			
Breaking capacity:	4000 VA/AC1, 384 W/DC1			
Switching voltage:	250 V AC/24 V DC			
Power dissipation (max.):	HRN-3x (1.2 W) | HRN-3x/2 (2.4 W)			
Mechanical life:	10.000.000 ops.			
Electrical life (AC1):	100.000 ops.			
Other information				
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)			
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)			
Dielectric strength:	AC 4 kV (supply – output)			
Operating position:	any			
Mounting:	DIN rail EN 60715			
Protection degree:	IP40 front panel / IP20 terminals			
Overvoltage category:	III.			
Pollution degree:	2			
Cross-wire section – solid/ stranded with ferrule (mm^2):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)			
Dimensions:	90 × 17.6 × 64 mm (3.5″ × 0.7″ × 2.5″)			
Weight:	60 g (2.11 oz) 77 g (2.72 oz)	- 77 g (2.72 oz)	60 g (2.11 oz) 77 g (2.72 oz)	60 g (2.11 oz) 77 g (2.72 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27			

Description

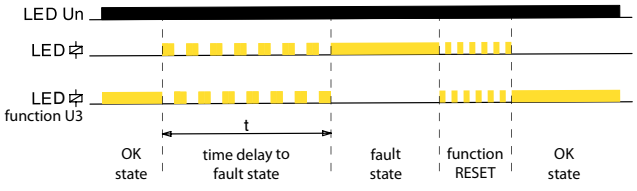
HRN-31/2



Connection

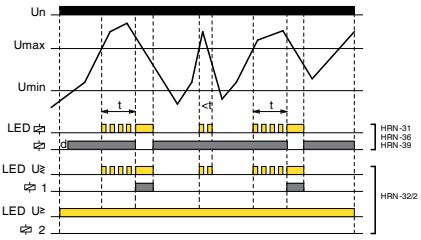


Indication of operating states

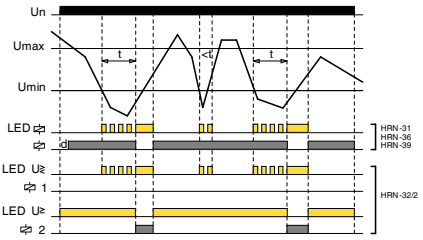


Function

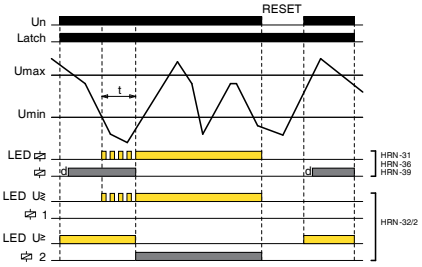
O1 OVER (hysteresis 5%)



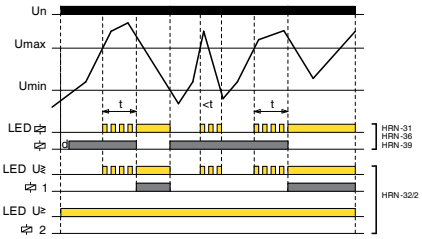
U1 UNDER (hysteresis 5%)



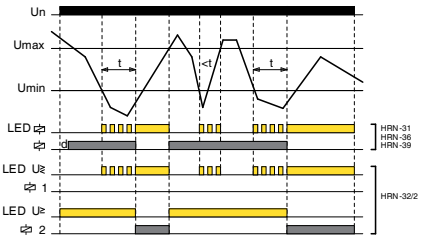
UL UNDER + Latch



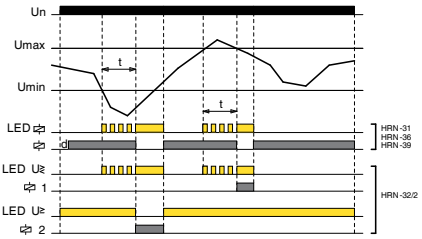
O2 OVER (hysteresis to Umin)



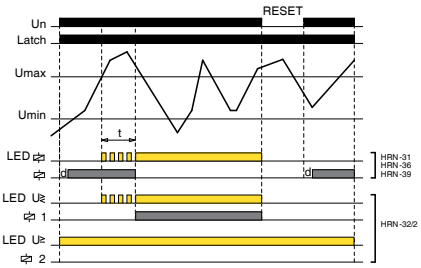
U2 UNDER (hysteresis to Umax)



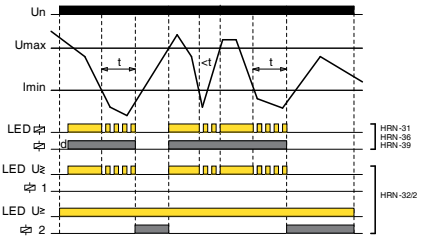
W WINDOW (hysteresis 5%)



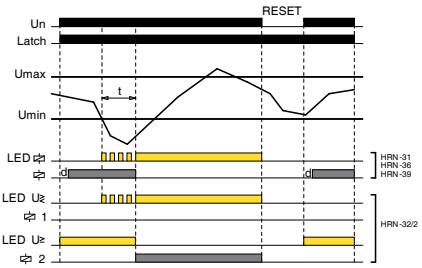
OL OVER + Latch



U3 UNDER (hysteresis to Umax)



WL WINDOW + Latch



OVER:

If the value of the monitored voltage is lower than the set upper level „Umax", the output contact is closed. If the „Umax" is exceeded, the output contact will opens after the set delay (fault state).

If the voltage falls below the fixed hysteresis (O1 function) or the set lower level „Umin" (O2 function), the output contact will closes again.

If the OL function (OVER + Latch) is selected, when the upper voltage level „Umax" is exceeded, the output contact remains open even when the voltage returns from the fault state.

Fault memory reset can be done in three ways:

- Short-term interruption of supply voltage
- Using the control input (R)
- By setting the function switch to position R (RESET) or any function without memory fault

The RESET state lasts for 3 s after switching the function switch from the R position to a function with a memory fault (UL, OL, WL).

When moving to any other function from the R position, this delay does not apply.

UNDER:

If the value of the monitored voltage is higher than the set lower level „Umin", the output contact is closed. When the voltage drops below the „Umin", output contact opens after the set delay (fault state).

If the voltage exceeds the fixed hysteresis (function U1) or the set upper level „Umax" (function U2, U3), the output contact closes again.

If the UL function (UNDER + Latch) is selected, when the voltage drops below the lower level „Umin", the output contact remains open even when returning from the fault state. Fault memory reset can be done as in the previous case.

WINDOW:

If the value of the monitored voltage is lower than upper level „Umax" and at the same time higher than lower level „Umin", the output contact in closed. If the „Umax" is exceeded or drops below the „Umin", output contact opens after the set delay (fault state).

To return from the fault state, a fixed hysteresis is applied.

If the WL function (WINDOW + Latch) is selected, the fault state is again stored in memory and output contact stays open, even when returning from the fault state. Fault memory reset can be done as in the previous cases.

PMR1-31, PMR1-36, PMR1-39 | Multifunction voltage monitoring relays in 1P - AC/DC

c UL us LISTED E308660

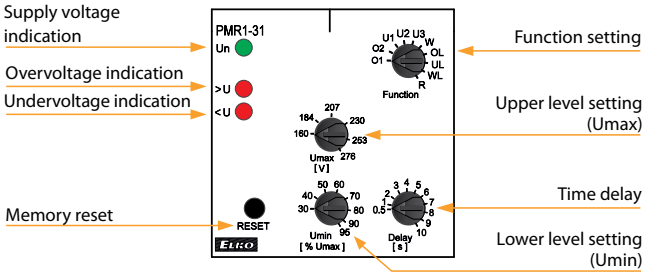
EAN code
PMR1-31: (8595188188654)
PMR1-31/2: (8595188185363)
PMR1-36: (8595188188661)
PMR1-36/2: (8595188188678)
PMR1-39: (8595188188685)
PMR1-39/2: (8595188188692)

- It is used to monitor the value of alternating or direct voltage in 1-phase circuits.
- Supply voltage from monitored voltage.
- Monitors voltage exceeding the upper voltage level (Umax) and falling below the lower voltage level (Umin) – according to the selected function.
- Smooth adjustment of both voltage levels – the lower level Umin is set in % of the upper level Umax.
- Adjustable time delay (to eliminate short-term voltage drops and peaks).
- Option to select functions with fault state memory (Latch).
- The fault state memory can be reseted with a button on the panel (RESET).
- Measures true root mean square value of the voltage - TRUE RMS.

Technical parameters	PMR1-31 PMR1-31/2	PMR1-36 PMR1-36/2	PMR1-39 PMR1-39/2
Supply and measuring			
Supply/monitored terminals:	2-7		
Supply/monitored voltage:	AC/DC 48 – 276 V (AC 50-60 Hz)	DC 6 – 30 V -	AC/DC 24 – 150 V (AC 50-60 Hz)
Consumption (max.):	2.5 VA/0.55 W 2.7 VA/0.65 W	0.35 W 0.5 W	2.5 VA/0.55 W 2.7 VA/0.65 W
Upper level setting (Umax):	AC 160 – 276 V	DC 12 – 30 V	AC 80 – 150 V
Lower level setting (Umin):	30 – 95 %Umax	50 – 95 %Umax	30 – 95 %Umax
Max. permanent voltage:	AC 276 V	DC 36 V	AC 276 V
Peak overload (1 s):	AC 290 V	DC 48 V	AC 290 V
Time delay (d):	300 ms		
Time delay (t):	adjustable, 0.5 – 10 s		
Accuracy			
Setting accuracy (mech.):	5 % – mechanical setting		
Repeat accuracy:	< 1 %		
Temperature dependency:	< 0.1 %/°C (°F)		
Hysteresis (fault to OK):	5 % (functions O1, U1, W) Umax – Umin (functions O2, U2, U3)		
Output			
Contact type:	1× changeover 2× changeover	1× changeover 2× changeover	1× changeover 2× changeover
Contact material:	AgNi		
Current rating:	16 A/AC1; PD. B300		
Breaking capacity:	4000 VA/AC1, 384 W/DC1		
Switching voltage:	250 V AC/24 V DC		
Power dissipation (max.):	PMR1-3x (1.2 W) | PMR1-3x/2 (2.4 W)		
Mechanical life:	10.000.000 ops.		
Electrical life (AC1):	100.000 ops.		
Other information			
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)		
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)		
Dielectric strength:	AC 4 kV (supply – output)		
Operating position:	any		
Mounting:	DIN rail EN 60715		
Protection degree:	IP40 front panel / IP20 terminals		
Overvoltage category:	III.		
Pollution degree:	2		
Dimensions:	48 × 48 × 79 mm (1.89˝ × 1.89˝ × 3.11˝)		
Weight:	94 g (3.32 oz) 105 g (3.7 oz)	94 g (3.32 oz) 105g (3.7 oz)	94 g (3.32 oz) 105g (3.7 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27		

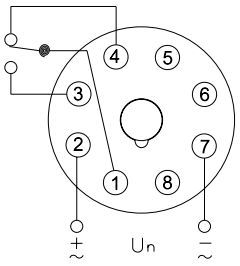
Description

PMR1-31

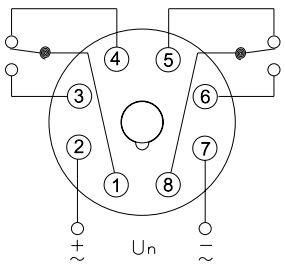


Connection

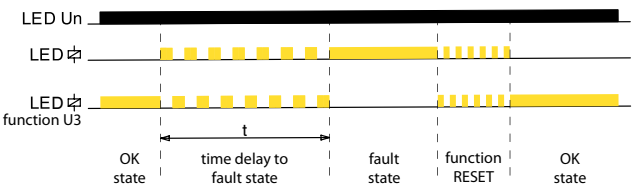
PMR1-3x



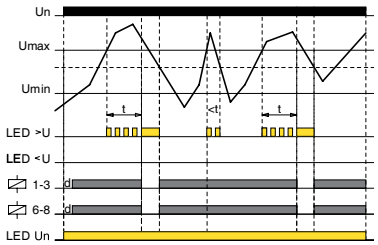
PMR1-3x/2



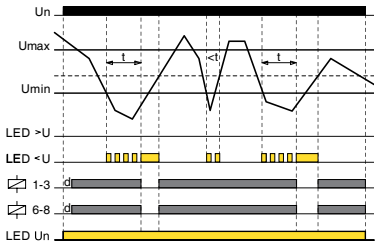
Indication of operating states



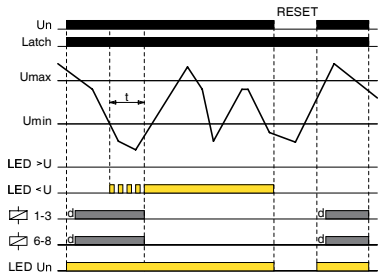
O1 **OVER (hysteresis 5%)**



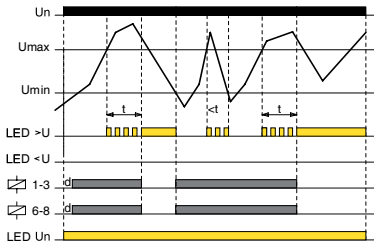
U1 **UNDER (hysteresis 5%)**



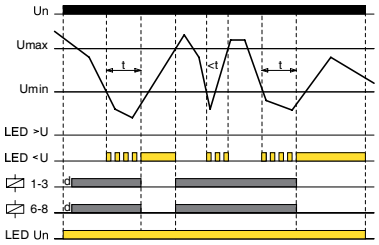
UL **UNDER + Latch**



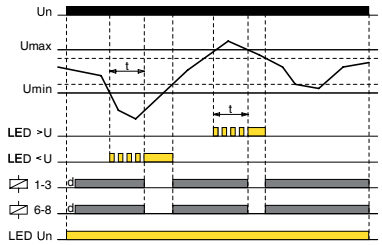
O2 **OVER (hysteresis to Umin)**



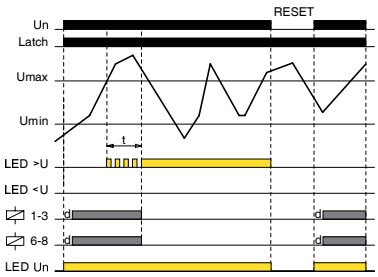
U2 **UNDER (hysteresis to Umax)**



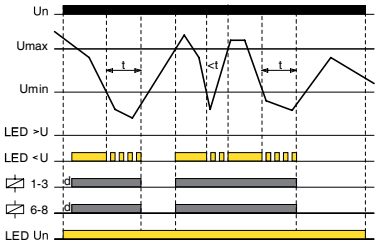
W **WINDOW (hysteresis 5%)**



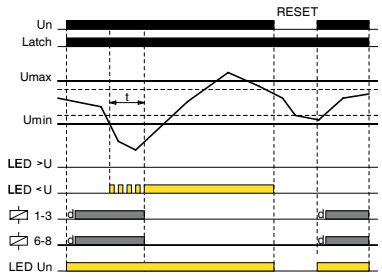
OL **OVER + Latch**



U3 **UNDER (hysteresis to Umax)**



WL **WINDOW + Latch**



OVER:

If the value of the monitored voltage is lower than the set upper level „Umax", the output contact is closed. If the „Umax" is exceeded, the output contact will opens after the set delay (fault state).

If the voltage falls below the fixed hysteresis (O1 function) or the set lower level „Umin" (O2 function), the output contact will closes again.

If the OL function (OVER + Latch) is selected, when the upper voltage level „Umax" is exceeded, the output contact remains open even when the voltage returns from the fault state.

Fault memory reset can be done in three ways:

- Using memory reset button on the panel
- Short-term interruption of supply voltage
- By setting the function switch to position R (RESET) or any function without memory fault

The RESET state lasts for 3 s after switching the function switch from the R position to a function with a memory fault (UL, OL, WL).

When moving to any other function from the R position, this delay does not apply.

UNDER:

If the value of the monitored voltage is higher than the set lower level „Umin", the output contact is closed. When the voltage drops below the „Umin", output contact opens after the set delay (fault state).

If the voltage exceeds the fixed hysteresis (function U1) or the set upper level „Umax" (function U2, U3), the output contact closes again.

If the UL function (UNDER + Latch) is selected, when the voltage drops below the lower level „Umin", the output contact remains open even when returning from the fault state. Fault memory reset can be done as in the previous case.

WINDOW:

If the value of the monitored voltage is lower than upper level „Umax" and at the same time higher than lower level „Umin", the output contact in closed. If the „Umax" is exceeded or drops below the „Umin", output contact opens after the set delay (fault state).

To return from the fault state, a fixed hysteresis is applied.

If the WL function (WINDOW + Latch) is selected, the fault state is again stored in memory and output contact stays open, even when returning from the fault state. Fault memory reset can be done as in the previous cases.

HRN-41, HRN-42 | Voltage monitoring relays in 1P - AC/DC

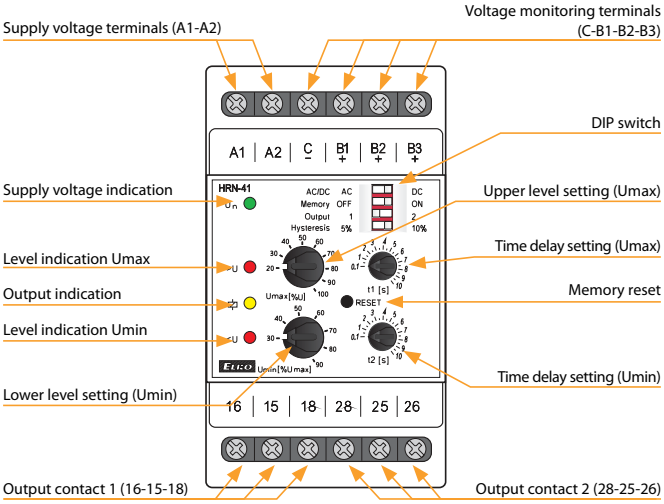
EAN code
HRN-41/UNI: 8595188185295
HRN-41/400V: 8595188140423
HRN-42/UNI: 8595188185301

- Relay is used for monitoring AC or DC voltage in three ranges.
- Monitors level of voltage in two independent levels (Umin, Umax).
- Setting the monitored upper level (Umax) in % of range.
- Setting the monitored lower level (Umin):
  in % of the set upper limit (HRN-41, function HYSTERESIS)
  in % of range (HRN-42, function WINDOW)
- Selectable function of output contacts (independently/in parallel).
- Independent adjustable time delay of both levels (eliminating short-term drops and spikes).
- Galvanically separated power supply from monitoring inputs.
- Output contact for each monitored voltage level.

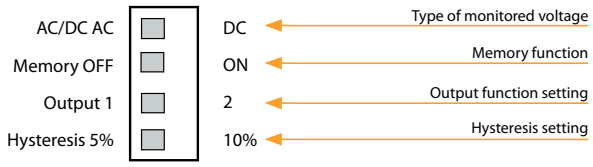
Technical parameters		HRN-41	HRN-42	
Supply				
Supply terminals:		A1-A2		
Supply voltage:	UNI	AC/DC 24 – 240 V (AC 50-60 Hz)		
Consumption (max.):	UNI	3 VA/1 W		
Supply voltage:	400V	AC 400 V (50-60 Hz)		
Consumption (max.):	400V	5 VA/2.5 W		
Supply voltage tolerance:		–15 %; +10 %		
Measuring				
Monitored terminals:		C-B1	C-B2	C-B3
Monitored ranges*:		AC/DC 10 – 50 V (AC 50-60 Hz)	AC/DC 32 – 160 V (AC 50-60 Hz)	AC/DC 100 – 500 V (AC 50-60 Hz)
Input resistance:		212 kΩ	676 kΩ	2.12 MΩ
Max. permanent voltage:		100 V	300 V	600 V
Peak overload (1 s):		250 V	700 V	1 kV
Time delay Umax (t1):		adjustable, 0.1 – 10 s		
Time delay Umin (t2):		adjustable, 0.1 – 10 s		
Accuracy				
Setting accuracy (mech.):		5 %		
Repeat accuracy:		< 1 %		
Temperature dependance:		< 0.1 %/°C (°F)		
Limit values tolerance:		5 %		
Hysteresis (fault to OK):		selectable, 5 %/10 % from the upper range value		
Output				
Contact type:		2× changeover/SPDT (AgNi)		
Current rating:		16 A/AC1; PD. B300		
Breaking capacity:		4000 VA/AC1, 384 W/DC1		
Inrush current:		30 A/< 3 s		
Switching voltage:		250 V AC/24 V DC		
Power dissipation (max.):		2.4 W		
Mechanical life:		10.000.000 ops.		
Electrical life (AC1):		100.000 ops.		
Other information				
Operating temperature:		–20 .. +55 °C (–4 .. 131 °F)		
Storage temperature:		–30 .. +70 °C (–22 .. 158 °F)		
Dielectric strength:				
supply – output		AC 4 kV		
output 1 – output 2		AC 4 kV		
Operating position:		any		
Mounting:		DIN rail EN 60715		
Protection degree:		IP40 front panel / IP20 terminals		
Overvoltage category:		III.		
Pollution degree:		2		
Cross-wire section – solid/ stranded with ferrule (mm^2):		max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)		
Dimensions:		90 × 52 × 65 mm (3.5″ × 2″ × 2.6″)		
Weight:		UNI – 148 g (5.2 oz), 400 V – 249 g (8.8 oz)		
Standards:		EN 60255-1, EN 60255-26, EN 60255-27		

* Only one input can be monitored at a time.

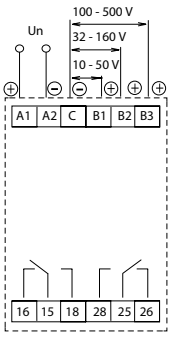
Description



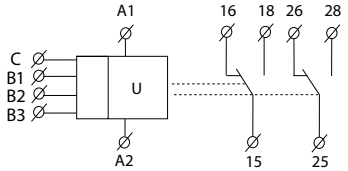
Description of DIP switch



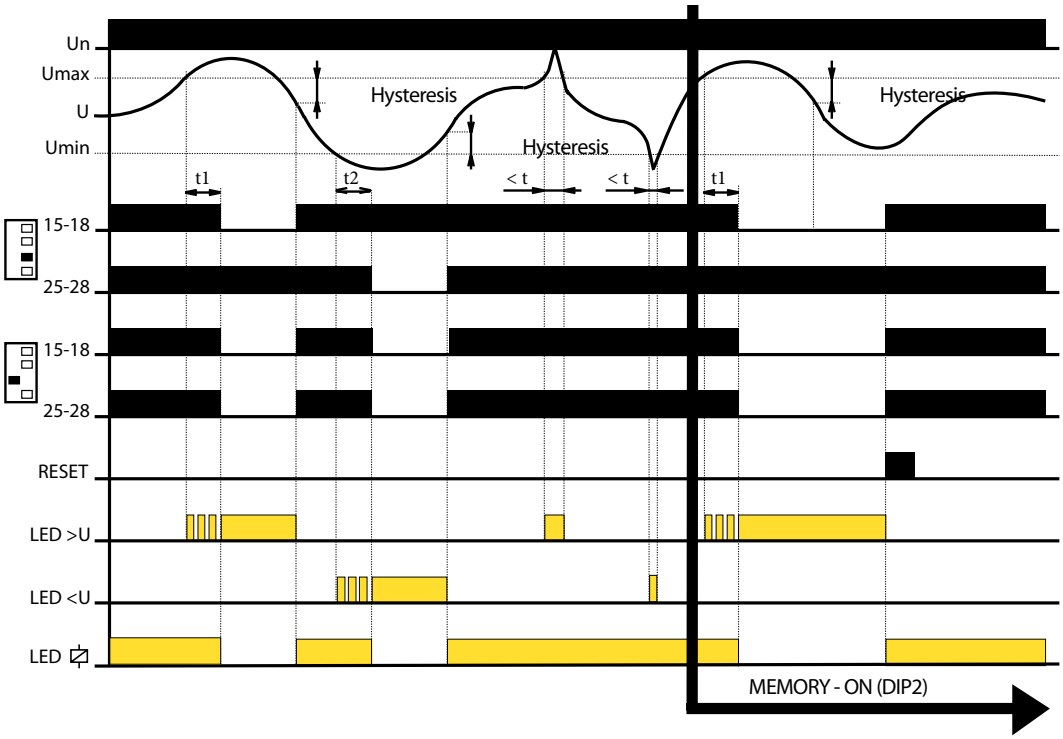
Connection



Symbol



Function



- If the value of the monitored voltage is in the zone between the set upper and lower levels, the OK state occurs, both output contacts are closed and the yellow LED illuminates. If the value of the monitored voltage is outside the set limits (> Umax or < Umin), a fault state occurs.
- When moving to a fault state (U > Umax), time delay t1 is running and red LED >U simultaneously flashes. After the time t1 elapses, the red LED >U illuminates and the relevant output contact opens.
- When moving to a fault state (U < Umin), time delay t2 is running and red LED <U simultaneously flashes. After the time t2 elapses, the red LED <U illuminates and the relevant output contact opens.
- When moving from a fault state to the OK state, the relevant red LED immediately goes out, and the corresponding output contact closes.

HRN-55, HRN-55N | Voltage monitoring relays in 3P with fixed levels

EAN code
HRN-55: 8595188137225
HRN-55N: 8595188137232

- Relay monitors phase sequence and failure, exceeding of monitored voltage in 3-phase main.
- **HRN-55**: supply from all phases, which means that function of relay is applicable also if 1-phase fails.
- **HRN-55N:** supply L1, L2, L3-N, it means that relay also monitors break of neutral point.
- Fixed delay t1 (500 ms), adjustable delay t2 (0.1 - 10 s) and fixed delay t3 (max. 1 s).

Technical parameters	HRN-55	HRN-55N
Monitoring terminals:	L1, L2, L3	L1, L2, L3, N
Supply terminals:	L1, L2, L3	L1, L2, L3, N
Voltage:	3x 400 V (50-60 Hz)	3x 400 V/230 V (50-60 Hz)
Burden:	max. 2 VA/1 W	
Max. dissipated power (Un + terminals):	1 W	
Level Umax:	125 % Un	
Level Umin:	75 % Un	
Hysteresis:	2 %	
Max. permanent:	AC 3x 460 V	AC 3x 265 V
Peak overload <1ms:	AC 3x 500 V	AC 3x 288 V
Time delay t1:	max. 500 ms	
Time delay t2:	adjustable 0.1 - 10 s	
Time delay t3:	max. 1 s	
Output		
Number of contacts:	1x changeover/SPDT (AgNi/Silver Alloy)	
Current rating:	8 A/AC1; PD. B300	
Breaking capacity:	2000 VA/AC1, 240 W/DC	
Inrush current:	10 A	
Switching voltage:	250 V AC/24 V DC	
Output indication:	red LED	
Mechanical life:	60.000.000 ops.	
Electrical life (AC1):	150.000 ops.	
Other information		
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)	
Electrical strength:	4 kV (supply - output)	
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP40 from front panel/IP10 terminals	
Overvoltage category:	III.	
Pollution degree:	2	
Max. cable size (mm²):	solid wire max. 2x 2.5 or 1x 4 with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)	
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)	
Weight:	61 g (2.15 oz.)	63 g (2.22 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27	

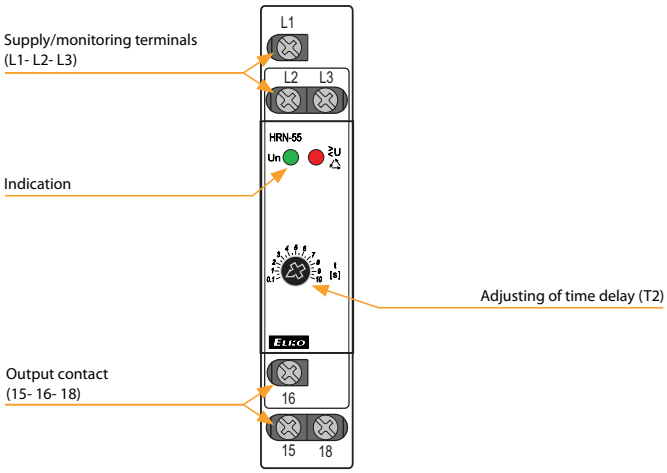
Function description

Relay in 3-phase main monitors correct phase sequence and failure of any phase. Green LED is permanently ON and indicates presence of power supply voltage. In case of phase failure or exceeding voltage level red LED flashes and relay breaks. When changing to faulty state, time delay applies. Time delay setting is set by a potentiometer on front panel of the device. In case of incorrect phase sequence red LED shines permanently and relay is open. In case supply voltage falls below 60 % Un (UOFF lower level) relay immediately opens with no delay and faulty state is indicated by red LED.

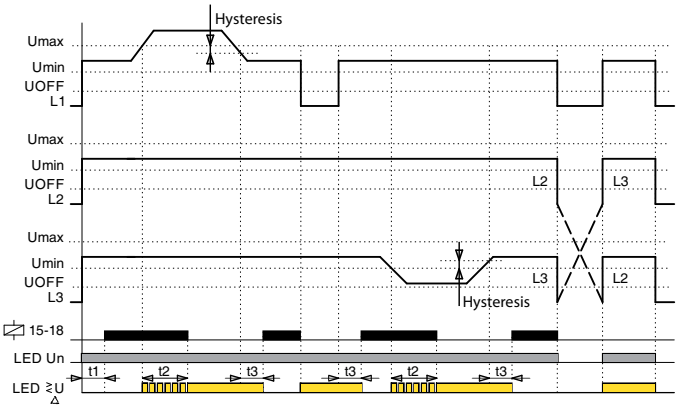
HRN-55 - thanks to supply form all phases, this relay is able to stay operational also if one phase is out.

HRN-55N -supply L1, L2, L3-N, means that relay monitor also failure in neutral wire.

Description

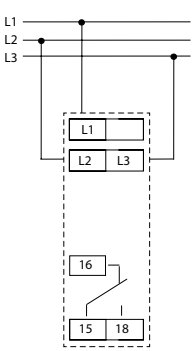


Function

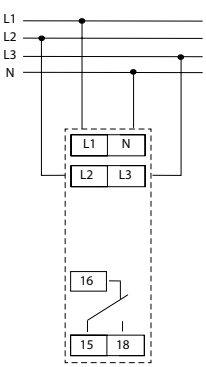


Connection

HRN-55

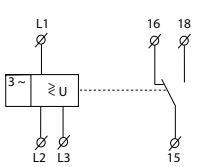


HRN-55N

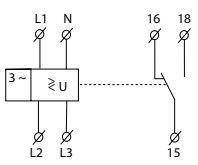


Symbol

HRN-55



HRN-55N



HRN-54, HRN-54N | Voltage monitoring relays in 3P with adjustable levels

EAN code
HRN-54: 8595188137201
HRN-54N: 8595188137218

Technical parameters	HRN-54	HRN-54N
Supply/monitored terminals:	L1-L2-L3	L1-L2-L3-N
Supply/monitored voltage:	3× 400 V (50-60 Hz)	3× 400 V/230 V (50-60 Hz)
Consumption (max.):	2 VA/1 W	
Upper level (Umax):	105 - 125 %Un	
Lower level (Umin):	75 - 95 %Un	
Max. permanent voltage:	AC 3× 460 V	AC 3× 265 V
Peak overload (<1ms):	AC 3× 500 V	AC 3× 288 V
Start delay (t1):	max. 500 ms	
Response delay (t2):	adjustable, 0.1 - 10 s	
Restart delay (t3):	max. 1 s	
Accuracy		
Hysteresis:	2 %	
Output		
Contact type:	1× changeover/SPDT (AgNi)	
Current rating:	8 A/AC1; PD. B300	
Breaking capacity:	2000 VA/AC1, 240 W/DC1	
Inrush current:	10 A	
Switching voltage:	AC 250 V/DC 24 V	
Power dissipation (max.):	0.6 W	
Mechanical life:	60.000.000 ops.	
Electrical life (AC1):	150.000 ops.	
Other information		
Operating temperature:	–20 .. +55 °C (–4 .. +131 °F)	
Storage temperature:	–30 .. +70 °C (–22 .. +158 °F)	
Dielectric strength:	AC 4 kV (supply – output)	
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP40 front panel/IP10 terminals	
Overvoltage category:	III.	
Pollution degree:	2	
Cross-wire section – solid/ stranded with ferrule (max.):	1× 4; 2× 2.5 mm² (1× 12; 2× 14 AWG)/ 1× 2.5; 2× 1.5 mm² (1× 14; 2× 16 AWG)	
Dimensions:	90 × 17.6 × 64 mm (3.5″ × 0.7″ × 2.5″)	
Weight:	62 g (2.19 oz)	63 g (2.22 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27	

Function description

The relay in a 3-phase network monitors the phase voltages magnitude. Two independent voltage levels can be set to monitor undervoltage and overvoltage separately.

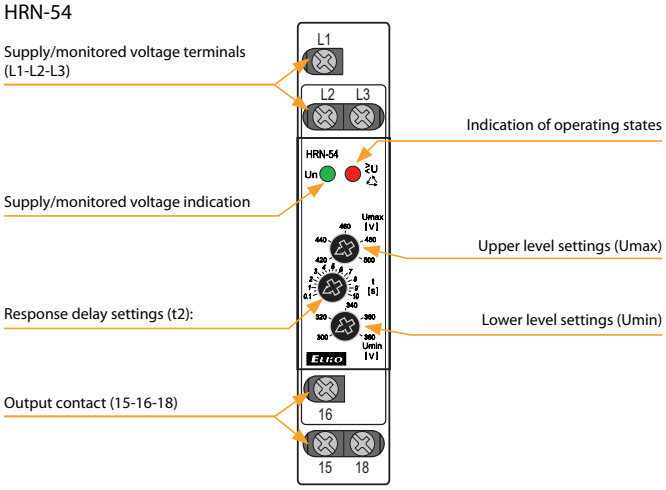
Under normal conditions, the output contact remains closed when the voltage stays within the set levels, the red LED stays off. If the voltage exceeds or drops below the set levels, the output contact opens, and the red LED turns on to indicate a fault state (flashing during delay).

If the monitored voltage falls below 60 %Un (UOFF bottom level, phase failure), the output contact opens immediately without response delay (t2), and the red LED signals a fault state as in the previous case. If a phase failure occurs during an ongoing response delay the output contact opens immediately.

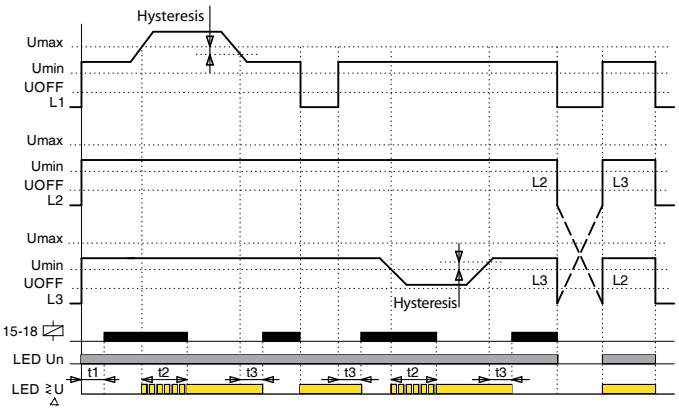
- Functionality: Designed to monitor overvoltage, undervoltage, phase sequence/failure in a 3-phase network, ensuring equipment protection.
- Power supply: The relay is powered by the monitored voltage.
- Adjustable levels: Both the upper (Umax) and lower (Umin) voltage levels can be customized.
- Response delay: Adjustable response delay to eliminate the effects of short-term voltage drops and spikes.
- Fault state indication: Indicated by an illuminated red LED and by the opening of output contact.
- Phase failure protection: If any monitored phase drops below 60 %Un (UOFF bottom level), the output contact opens immediately without delay.
- **HRN-54:** Supply from L1-L2-L3, ensuring the relay remains operational even if one phase fails.
- **HRN-54N:** Supply from L1-L2-L3-N, allows the relay to monitor for neutral wire interruption.

Description

HRN-54

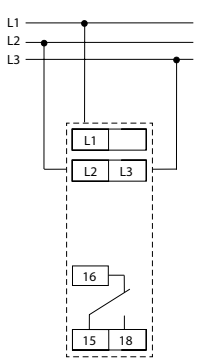


Function

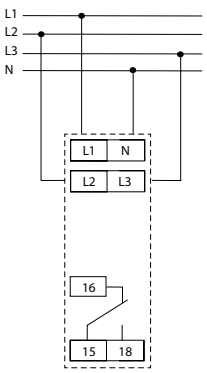


Connection

HRN-54

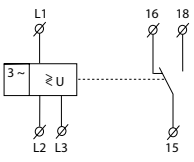


HRN-54N

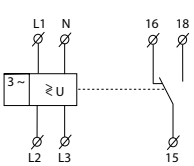


Symbol

HRN-54



HRN-54N



HRN-57, HRN-57N | Voltage monitoring relays in 3P with adjustable levels

- It serves to monitor voltage in a switchboard, protection of devices in 3-phase main.
- It monitors value of voltage in 3-phase main.
- It is possible to set upper and lower level independently.
- Adjustable time delay eliminated short voltage peaks and failures in the main.
- Relay doesn't monitor phase sequence.
- **HRN-57**: supply from all phases, means that relay is functional also in case of failure in one phase.
- **HRN-57N:** supply L1, L2, L3-N, means that relay monitors also failure of neutral wire.

EAN code
HRN-57: 8595188137256
HRN-57N: 8595188137249

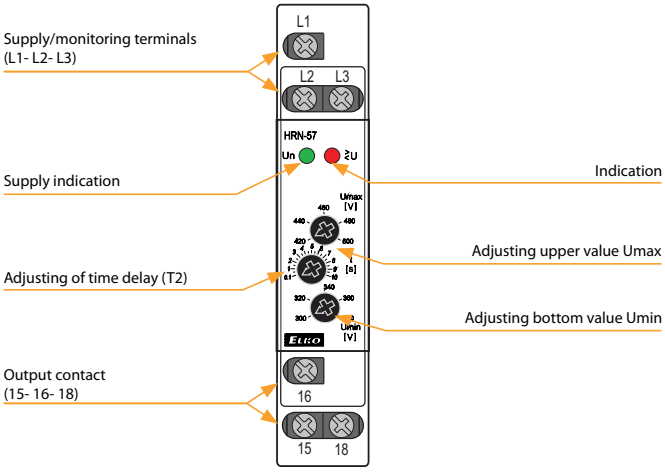
Technical parameters	HRN-57	HRN-57N
Monitoring terminals:	L1, L2, L3	L1, L2, L3, N
Supply terminals:	L1, L2, L3	L1, L2, L3, N
Voltage:	3x 400 V (50-60 Hz)	3x 400 V/230 V (50-60 Hz)
Burden:	max. 2 VA/1 W	
Max. dissipated power (Un + terminals):	2 W	
Level Umax:	105 - 125 % Un	
Level Umin:	75 - 95 % Un	
Hysteresis:	2 %	
Max. permanent overload:	AC 3x 460 V	AC 3x 265 V
Peak overload <1ms:	AC 3x 500 V	AC 3x 288 V
Time delay t1:	max. 500 ms	
Time delay t2:	adjustable 0.1-10 s	
Time delay t3:	max. 1 s	
Output		
Number of contacts:	1x changeover/SPDT (AgNi/Silver Alloy)	
Current rating:	8 A/AC1; PD. B300	
Breaking capacity:	2000 VA/AC1, 240 W/DC	
Inrush current:	10 A	
Switching voltage:	250 V AC/24 V DC	
Output indication:	red LED	
Mechanical life:	60.000.000 ops.	
Electrical life (AC1):	150.000 ops.	
Other information		
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)	
Electrical strength:	4 kV (supply - output)	
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP40 from front panel/IP10 terminals	
Overvoltage category:	III.	
Pollution degree:	2	
Max. cable size (mm²):	solid wire max. 2x 2.5 or 1x 4/ with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)	
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)	
Weight:	62 g (2.19 oz.)	63 g (2.22 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27	

Function description

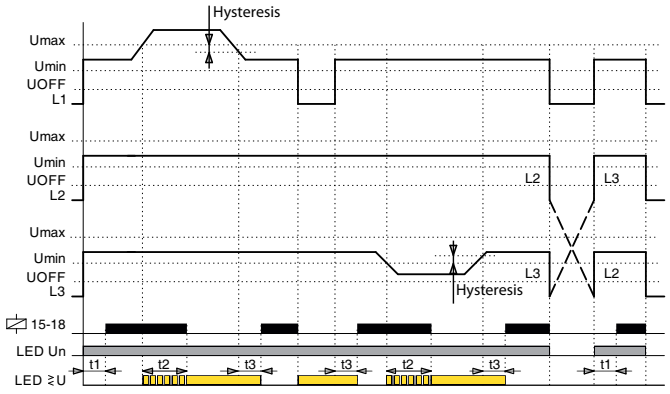
Relay in 3-phase main monitors size of phase voltage. It is possible to set two independent voltage levels and thus it is possible to set two independent voltage levels and monitor e.g. undervoltage and overvoltage independently. In normal state when voltage is within set levels, output relay is closed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

Description

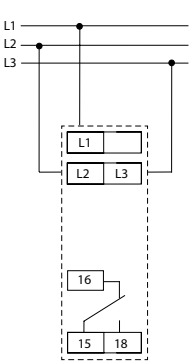


Function

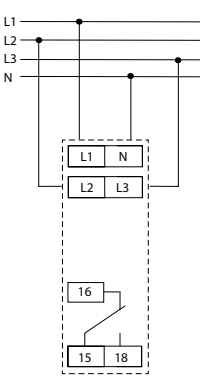


Connection

HRN-57

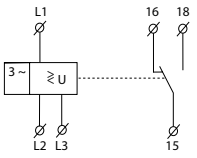


HRN-57N

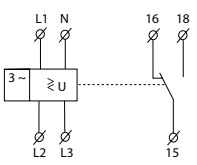


Symbol

HRN-57



HRN-57N



HRN-56 | Voltage monitoring relays in 3P with adjustable level Umin

EAN code
HRN-56/208V: 8595188130134
HRN-56/240V: 8595188137119
HRN-56/400V: 8595188137126
HRN-56/480V: 8595188130189
HRN-56/575V: 8595188130196

- Relay monitors phase sequence and failure (e.g. control of correct motor winding etc.).
- Relay is designated for monitoring of 3-phase networks.
- Supply from all phases which means that relay is functional also in case of one phase failure.
- Supply and monitored supply Un:

1-MODULE	3-MODULE
HRN-56/208 - 3x 208 V	HRN-56/480 - 3x 480 V
HRN-56/240 - 3x 240 V	HRN-56/575 - 3x 575 V
HRN-56/400 - 3x 400 V	

- Fixed delay t1 (500 ms), adjustable delay t2 (0.1 - 10 s) and fixed delay t3 (max. 1 s).

Technical parameters

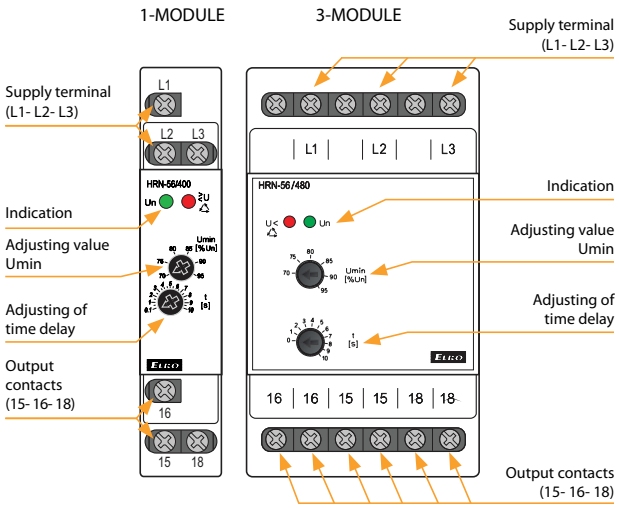
	HRN-56				
	208	240	400	480	575
Supply/monitoring terminals:	L1, L2, L3				
Supply/measured voltage:	3x 208 V L-L (3x120 V L-N) (50-60 Hz)	3x 240 V L-L (3x139 V L-N) (50-60 Hz)	3x 400 V L-L (3x230 V L-N) (50-60 Hz)	3x 480 V L-L (3x277 V L-N) (50-60 Hz)	3x 575 V L-L (3x332 V L-N) (50-60 Hz)
Burden:	max. 2 VA/1 W				
Max. dissipated power (Un + terminals):	2 W				
Level Umin:	adjustable 70 - 95 % Un				
Level Uoff:	60 % Un				
Hysteresis:	2 %				
Max. permanent overload:	AC 3x 276 V		AC 3x 460 V	AC 3x 550 V	AC 3x 660 V
Peak overload <1s:	AC 3x 300 V		AC 3x 500 V	AC 3x 600 V	AC 3x 700 V
Time delay t1:	max. 500 ms				
Time delay t2:	adjustable 0 -10 s				
Time delay t3:	max. 1 s				
Output					
Number of contacts:	1x changeover/SPDT (AgNi/Silver Alloy)				
Current rating:	8 A/AC1; PD. B300				
Breaking capacity:	2000 VA/AC1, 240 W/DC				
Inrush current:	10 A				
Switching voltage:	250 V AC/24 V DC				
Indication of state:	red LED				
Mechanical life:	60.000.000 ops.			30.000.000 ops.	
Electrical life (AC1):	150.000 ops.			200.000 ops.	
Other information					
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)				
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)				
Dielectrical strength:	4 kV (supply - output)				
Operating position:	any				
Mounting:	DIN rail EN 60715				
Protection degree:	IP40 from front panel/ IP10 terminals			IP40 from front panel/ IP20 terminals	
Overvoltage category:	III.				
Pollution degree:	2				
Max. cable size (mm²):	solid wire max. 2x 2.5 or 1x 4/ with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)			max.1x 2.5, max. 2x 1.5/ with sleeve max. 1x 1.5 (AWG 12)	
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)			90 x 52 x 65 mm (3.5˝ x 2˝ x 2.6˝)	
Weight:	65 g (2.3 oz.)	65 g (2.3 oz.)	66 g (2.3 oz.)	110 g (3.9 oz.)	110 g (3.9 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27				

Function description

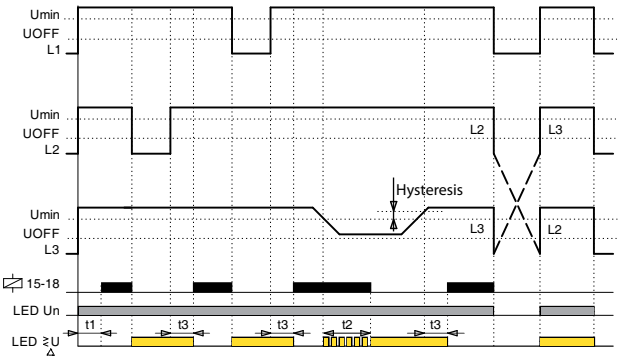
Relay in 3-phase main monitors correct phase sequence and phase failure. Green LED illuminates permanently and indicates energization. In case of phase failure red LED flashes and relay turns off. When changing to faulty state, time delay applies - delay setting is done by potentiometer on the front panel of the device. In case of incorrect phase sequence, red LED shines permanently and relay is open. In case supply voltage falls below 60 % Un (UOFF lower level), relay immediately opens with no delay and faulty state is indicate by red LED.

HRN-56: Thanks to supply from all phases, relay is functional also in case of one phase failure.

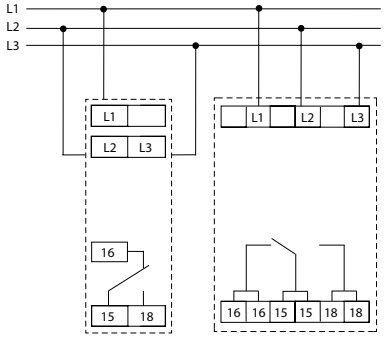
Description



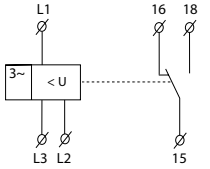
Function



Connection



Symbol



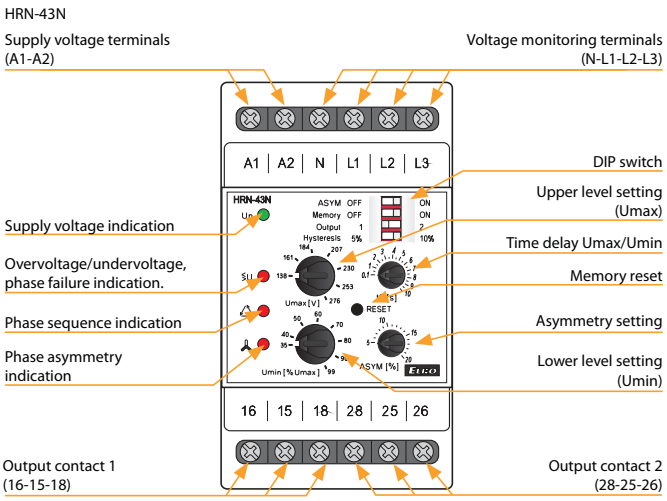
HRN-43, HRN-43N | Voltage monitoring relays for complete control in 3P incl. asymmetry

EAN code
HRN-43/UNI: 8595188185318
HRN-43/400V: 8595188121316
HRN-43N/UNI: 8595188185325
HRN-43N/400V: 8595188120258

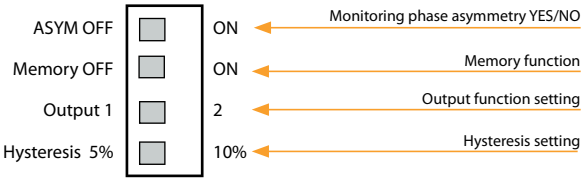
- Relay is designed to monitor voltage in 3-phase networks:
  HRN-43: delta connection 3× 400 V (without neutral)
  HRN-43N: star connection 3× 400/230 V (with neutral)
- Monitors level of voltage in two independent levels (Umax, Umin)
  overvoltage and undervoltage: system 3× 400 V: range 240 – 480 V
  system 3× 400/230 V: range 138 – 276 V
- Other monitored parameters:
  phase failure, sequence, asymmetry (adjustable, can be switched off)
- Setting the monitored lower level (Umin) in % of the set upper level Umax.
- Adjustable time delay (eliminanting short-term drops and spikes).
- Selectable function of output contacts (independently/in parallel).
- Galvanically separated supply voltage AC/DC 24 – 240 V, AC 400 V.
- Output contact for each monitored voltage level.

Technical parameters		HRN-43	HRN-43N
Supply			
Supply terminals:		A1-A2	
Supply voltage:	UNI	AC/DC 24 – 240 V (AC 50-60 Hz)	
Consumption (max.):	UNI	3 VA/1 W	
Supply voltage:	400V	AC 400 V (50-60 Hz)	
Consumption (max.):	400V	5 VA/2.5 W	
Supply voltage tolerance:		–15 %; +10 %	
Measuring circuit			
Monitored terminals:		L1-L2-L3	L1-L2-L3-N
Voltage system:		3× 400 V (50-60 Hz)	3× 400 V/230 V (50-60 Hz)
Upper level setting (Umax):		240 – 480 V	138 – 276 V
Lower level setting (Umin):		35 – 99 %Umax	
Max. permanent voltage:		3× 480 V	
Asymmetry:		adjustable, 5 – 20 % + OFF	
Peak overload (1 s):		600 V	350 V
Time delay (t1):		fixed, max. 200 ms	
Time delay Umax/Umin (t2):		adjustable, 0.1 – 10 s	
Accuracy			
Setting accuracy (mech.):		5 %	
Repeat accuracy:		< 1 %	
Temperature dependance:		< 0.1 %/°C (°F)	
Limit values tolerance:		5 %	
Hysteresis (fault to OK):		selectable, 5 %/10 % from the upper range value	
Output			
Contact type:		2× changeover/SPDT (AgNi)	
Current rating:		16 A/AC1; PD. B300	
Breaking capacity:		4000 VA/AC1, 384 W/DC1	
Inrush current:		30 A/< 3 s	
Switching voltage:		250 V AC/24 V DC	
Power dissipation (max.):		2.4 W	
Mechanical life:		10.000.000 ops.	
Electrical life (AC1):		100.000 ops.	
Other information			
Operating temperature:		–20 .. 55 °C (–4 .. 131 °F)	
Storage temperature:		–30 .. 70 °C (–22 .. 158 °F)	
Dielectric strength:			
supply – output		AC 4 kV	
output 1 – output 2		AC 4 kV	
Operating position:		any	
Mounting:		DIN rail EN 60715	
Protection degree:		IP40 front panel / IP20 terminals	
Overvoltage category:		III.	
Pollution degree:		2	
Cross-wire section – solid/		max. 1× 2.5, 2× 1.5/	
stranded with ferrule (mm2):		max. 1× 2.5 (AWG 14)	
Dimensions:		90 × 52 × 65 mm (3.5˝ × 2˝ × 2.6˝)	
Weight:		UNI – 148 g (5.2 oz), 400V – 248 g (8.7 oz)	
Standards:		EN 60255-1, EN 60255-26, EN 60255-27	

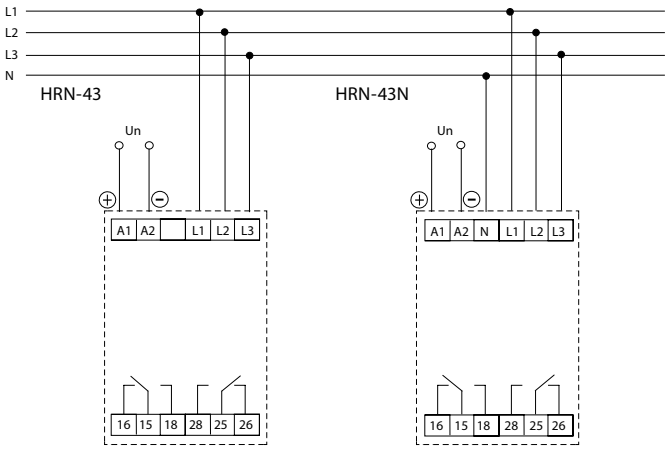
Description



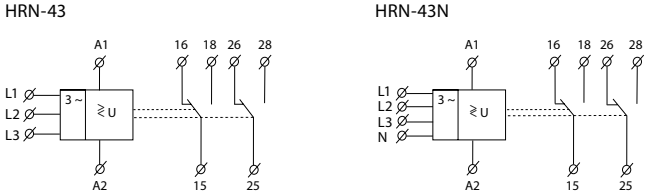
Description of DIP switch



Connection

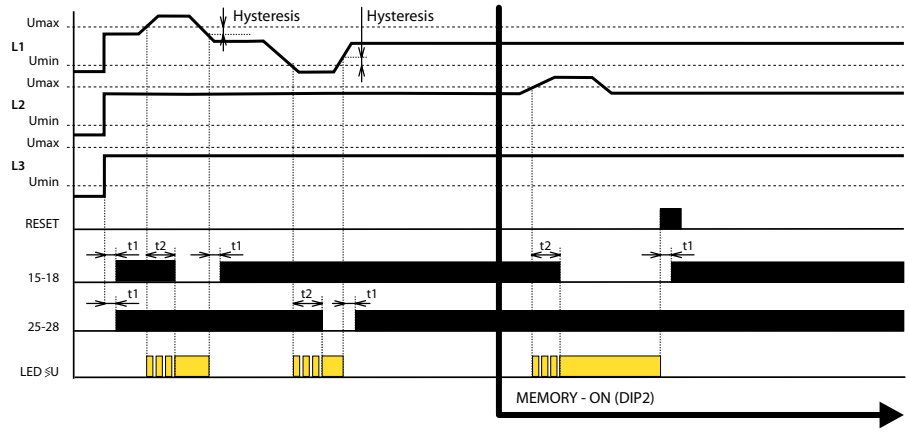


Symbol



Function

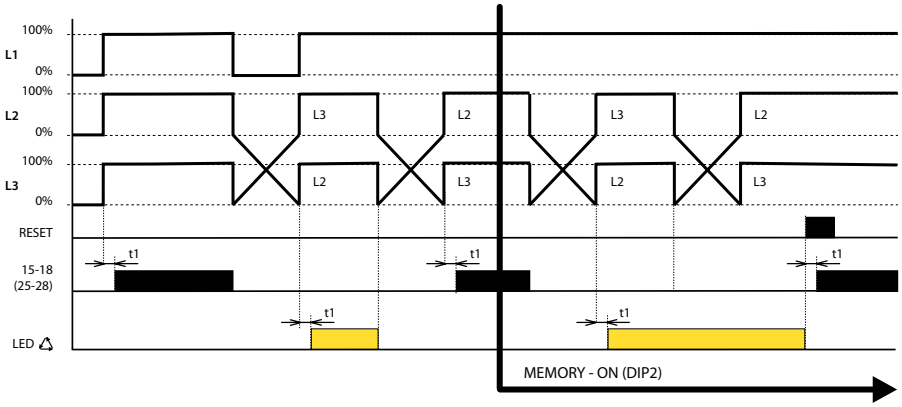
Overvoltage - undervoltage



Graphs legend:
L1, L2, L3 = 3-phase voltage
RESET = memory reset
t1 = time delay, fixed
t2 = time delay Umax/Umin, adjustable
15-18 = output contact 1
25-28 = output contact 2
LED ≶U = overvoltage/undervoltage indication

Function of output contacts:
In order to monitor two levels of voltage, it is possible to select if output contact will respond to each level individually (see the diagram) or both contacts will switch in parallel (see diagram "phase sequence").
Selection via DIP switch „Output".
Output 1 = output contacts are switched in parallel
Output 2 = output contacts are switched separately for each level

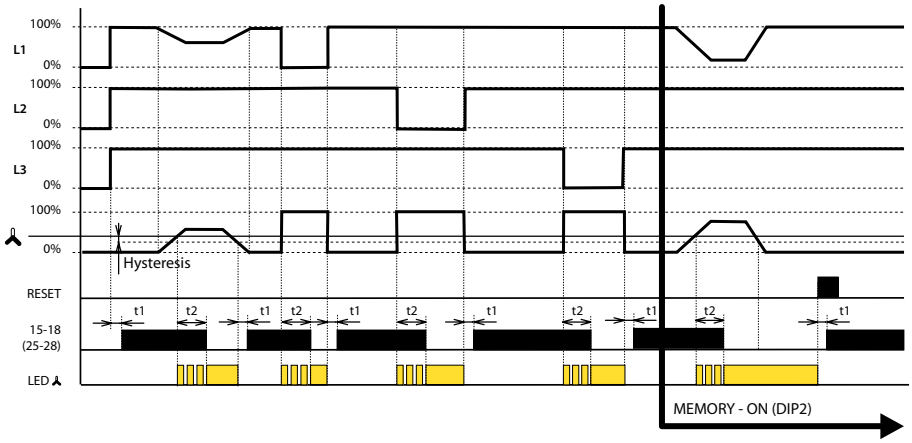
Phase sequence



Graphs legend:
L1, L2, L3 = 3-phase voltage
RESET = memory reset
t1 = time delay, fixed
t2 = time delay Umax/Umin, adjustable
15-18 = output contact 1
25-28 = output contact 2
LED = phase sequence indication

Function of output contacts:
The function is not applicable in the phase sequence monitoring, the contacts are switched in parallel.
DIP switch „Output" is ignored.

Phase asymmetry - failure



Graphs legend:
L1, L2, L3 = 3-phase voltage
RESET = memory reset
t1 = time delay, fixed
t2 = time delay Umax/Umin, adjustable
- adjustable asymmetry level
15-18 = output contact 1
25-28 = output contact 2
LED - asymmetry indication

Function of output contacts:
The function is not applicable in the phase asymmetry and failure monitoring, the contacts are switched in parallel way.
DIP switch „Output" is ignored.

Relay is designated to monitor 3-phase circuits. Type HRN-43 controls the interphase voltage, type HRN-43N controls voltage towards the neutral wire. Relay can monitor: voltage in two levels (overvoltage/undervoltage), phase sequence/failure and asymmetry. Each fault state is indicated by an individual LED. By DIP switch „Output" it is possible to select the function of output contacts: independent function (1× for overvoltage, 1× for undervoltage) or in parallel. Fixed time delay (t1) is applied when changing from fault to OK state or when de-energized. Adjustable time delay (t2) is applied, when changing from OK to fault state. This delay prevents incorrect behavior and oscillation of the output device during short-term voltage drops and peaks.

Voltage monitoring

The upper level Umax is set in the range 138 – 276 V (resp. 240 – 480 V for HRN-43) and the lower level Umin in the range of 35 – 99 %Umax. In case any phase deviates from this set band, after a set delay, output contact opens. Output contact again closes after returning back into the monitored band and exceeding fixed hysteresis (selectable by DIP switch „Hysteresis"). In the event of an outage in two or three phases, the output contacts will open immediately, regardless of the set delay t2.

Phase sequence

Monitors correctness of phase sequence. In case of unwanted change, output contacts open. In case of energization of a relay with incorrect phase sequence, contacts stay open.

Asymmetry

The level of asymmetry between individual phases is set in the range of 5 – 20 %. In case set asymmetry is exceeded, output contacts open and LED indicating asymmetry shines. Time delays t1, t2 and hysteresis are applied when returning to OK state. Monitoring asymmetry can be switched off by the DIP switch „ASYM".

HRN3-70, PMR3-70 | Voltage monitoring relays in 3P with selectable range

EAN code
HRN3-70: 8595188188838
PRM3-70: 8595188185288

- It is used for monitoring of voltage, phase failure, sequence and asymmetry in 3-phase network.
- Wide range of monitored voltage with automatic selection of an low/ high range.
- Fixed overvoltage level (Umax), adjustable undervoltage level (Umin).
- Adjustable time delay t2 (to eliminate short-term voltage drops and peaks).
- Adjustable time delay t3 (to eliminate short-term OK state).
- Adjustable asymmetry level with option to turn it OFF.
- Measures true root mean square value of the voltage - TRUE RMS.
- Fault memory reset can be done by RESET button on the panel or by an external opening contact.

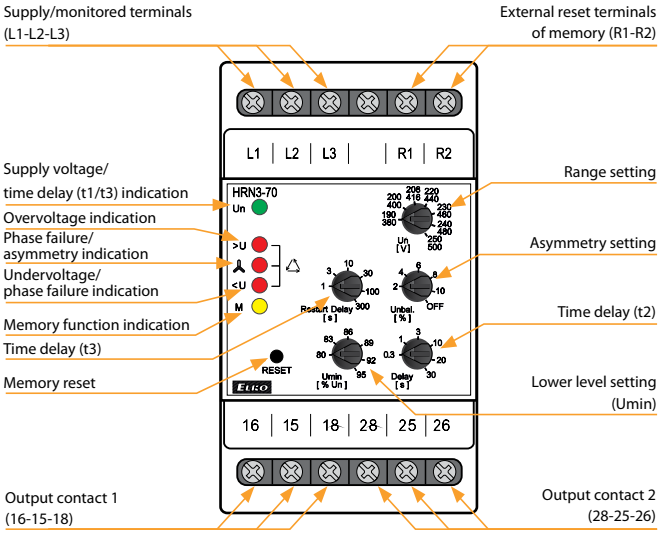
Technical parameters	HRN3-70	PMR3-70
Supply/monitored terminals:	L1-L2-L3	3-4-5
Supply/monitored voltage:	AC 3× 190 – 500 V (50-60 Hz)	
Consumption (max.):	2 VA/1 W	
Upper level (Umax):	110 %Un	
Lower level (Umin):	80 – 95 %Un	
Asymmetry:	adjustable, 2 – 10 %Un + OFF	
Max. permanent voltage:	AC 3× 550 V	
Peak overload (1 s):	AC 3× 600 V	
Time delay (t1):	2 s	
Time delay (t2):	adjustable, 0.3 – 30 s	
Time delay (t3):	adjustable, 1 – 300 s	
Accuracy:		
Hysteresis (fault to OK):	5 %	
Output		
Contact type:	2× changeover (AgNi)	1× changeover (AgNi)
Current rating:	16 A/AC1; PD. B300	
Breaking capacity:	4000 A/AC1, 384 W/DC1	
Switching voltage:	250 V AC/24 V DC	
Power dissipation (max.):	2.4 W	1.2 W
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Other information		
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)	
Dielectric strength:		
supply – output 1	AC 4 kV	AC 2.5 kV
supply – output 2	AC 4 kV	-
output 1 – output 2	AC 4 kV	-
Operating position:	any	
Mounting:	DIN rail EN 60715	into socket (8-pin)
Protection degree:	IP40 front panel / IP20 terminals	IP40
Overvoltage category:	III.	
Pollution degree:	2	
Cross-wire section – solid/ stranded with ferrule (mm^2):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)	max. 1× 4, 2× 2.5/ max. 1× 4 (AWG 12)
Dimensions:	90 × 52 × 66 mm	48 × 48 × 79 mm
Weight:	140 g (4.94 oz)	100 g (3.53 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27	

Range switch (Un)

The range switch has two ranges of phase-to-phase voltage values:
low (190 to 250V) and high (380 to 500V)
After connecting to the supply/monitored voltage, the device evaluates voltage size and selects the corresponding range of values. When switching between individual positions within the selected range, the green „LED Un" will flash briefly.

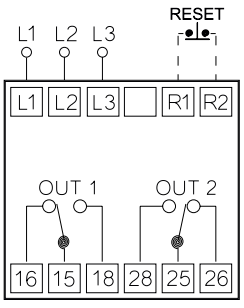
Description

HRN3-70

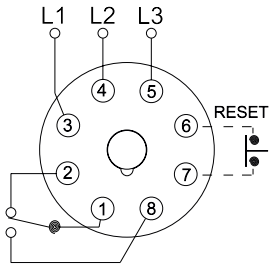


Connection

HRN3-70

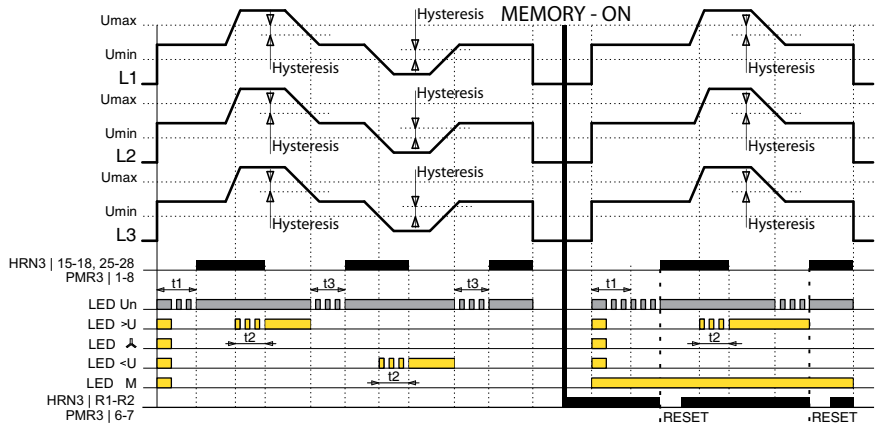


PMR3-70



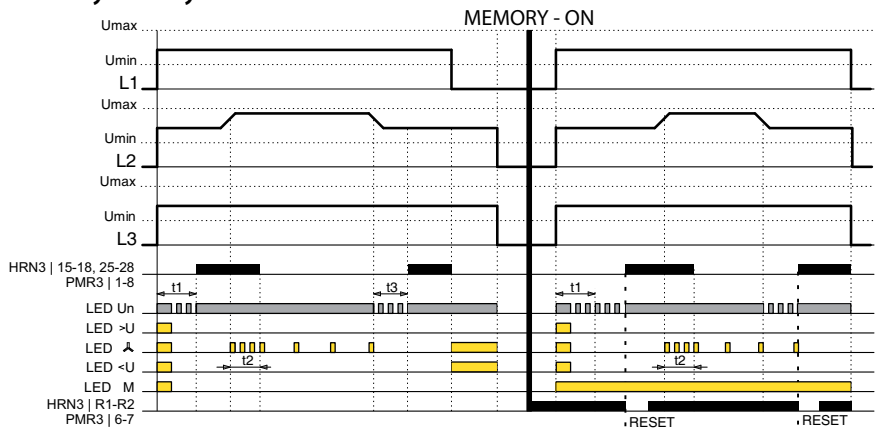
Function

Overvoltage - undervoltage

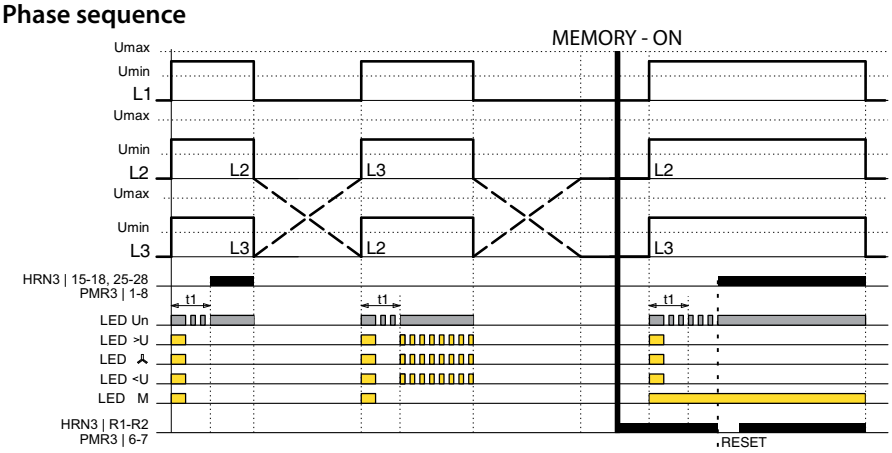


Graphs legend:
L1, L2, L3 = 3-phase voltage
RESET = memory reset
t1 = time delay, after connecting to voltage
t2 = time delay into fault state
t3 = time delay to OK state
15-18 = output contact 1(HRN3)
25-28 = output contact 2 (HRN3)
1-8 = output contact (PMR3)
LED >U = overvoltage indication
LED <U = undervoltage/phase failure indication
LED = phase failure/asymmetry indication
LED M = memory function indication
LED Un = supply/monitored voltage, time delay t1 and t3 indication

Phase asymmetry - failure



Phase sequence



After connecting the device to the supply voltage, all the LEDs on the panel will flash briefly.
If a 3-phase voltage is connected to the monitoring relay and all conditions are met (correct voltage magnitude, sequence and phase asymmetry), the output contacts close after the time delay t1 has elapsed. During the time delay, the green „LED Un" flashes, after the end of the delay it lights up permanently (OK state).
- When the voltage exceeds or falls outside the „Umin" and „Umax" levels, after the time delay t2 the green and the corresponding red „LED " light up.
The output contacts are open (fault state). During the time delay, the red LED flashes.
- If the phase sequence is incorrect when the power is connected, after the time delay t1 the green „LED Un" lights up + all 3 red „LEDs " flash simultaneously.
The output contact is open (fault state). During the time delay, the green LED flashes.
- When the set phase asymmetry is exceeded, after the time delay t2 the green „LED Un" lights up and the red „LED " flashes briefly.
The output contact is open (fault state). During the time delay, the red LED flashes rapidly.
- In the event of a phase failure, the output contacts open without a time delay t2 (fault state), the green „LED Un" and the corresponding red „LED < „ light up.
- To return from the fault state to the OK state, the time delay t3 is always applied. During this time delay, the green „LED Un" flashes.

Reset and fault state memory activation:

By connecting terminals R1-R2 or pins 6-7 in the PLUG-IN version via an external push button with a break contact (RESET), the fault state memory is activated. After turning on the power, the yellow „LED M" on the device panel lights up. If a fault condition occurs, it is stored in memory. The red LED signalize fault just like in mode with fault state memory turned off. If the voltage values return to the set levels, the corresponding red LED will be permanently lit and at the same time the green „LED Un" will start flashing. It is now possible to reset fault memory state, this closes the output contact and the red LED goes out (OK state). Fault memory reset (RESET) is performed either with an external pushbutton or with the pushbutton on device panel.

HRN3-80, HRN3-81 | Voltage monitoring relays in 3P - selectable range/fixed range

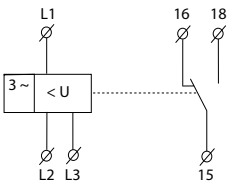
EAN code
HRN3-80: 8595188188814
HRN3-81: 8595188188821

- The relay is designed to monitor undervoltage (HRN3-80), phase loss, sequence and asymmetry in 3-phase network.
- Power supply from monitored circuit.
- **HRN3-80:** Monitors the drop below the lower voltage level (Umin).
- **HRN3-80:** The lower level of Umin is set in % of the selected range.
- Wide range of monitored voltage 208 – 480 V.
- Adjustable time delay (to eliminate short-term voltage drops).
- Measures true root mean square value of the voltage - TRUE RMS.
- Adjustable level of asymmetry with the option to turn it off.

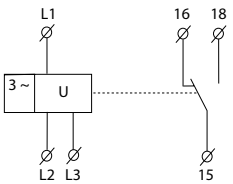
Technical parameters	HRN3-80	HRN3-81
Supply and measuring		
Supply/monitored terminals:	L1-L2-L3	
Supply/monitored voltage:	AC 3× 208 – 480 V (50-60 Hz)	
Consumption (max.):	2 VA/1 W	
Range setting:	adjustable	fixed
Lower level setting (Umin):	80 – 95 %Un	x
Asymmetry setting:	adjustable, 2 – 10 %Un + OFF	
Max. permanent voltage:	AC 3× 550 V	
Peak overload (1 s):	AC 3× 600 V	
Time delay (t1):	2 s	
Time delay (t2):	adjustable, 0.3 – 30 s	
Accuracy		
Setting accuracy (mech.):	5 %	
Repeat accuracy:	< 1 %	
Temperature dependency:	< 0.1 %/°C (°F)	
Hysteresis (fault to OK):	5 %	
Output		
Contact type:	1x changeover/SPDT (AgNi)	
Current rating:	16 A/AC1; PD. B300	
Breaking capacity:	4000 A/AC1, 384 W/DC1	
Switching voltage:	250 V AC/24 V DC	
Power dissipation (max.):	1.2 W	
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Other information		
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)	
Dielectric strength:	AC 4 kV (supply – output)	
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP40 front panel / IP20 terminals	
Overvoltage category:	III.	
Pollution degree:	2	
Cross-wire section – solid/ stranded with ferrule (mm^2):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)	
Dimensions:	90 × 52 × 66 mm	
Weight:	66 g (2.32 oz)	64 g (2.26 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27	

Symbol

HRN3-80

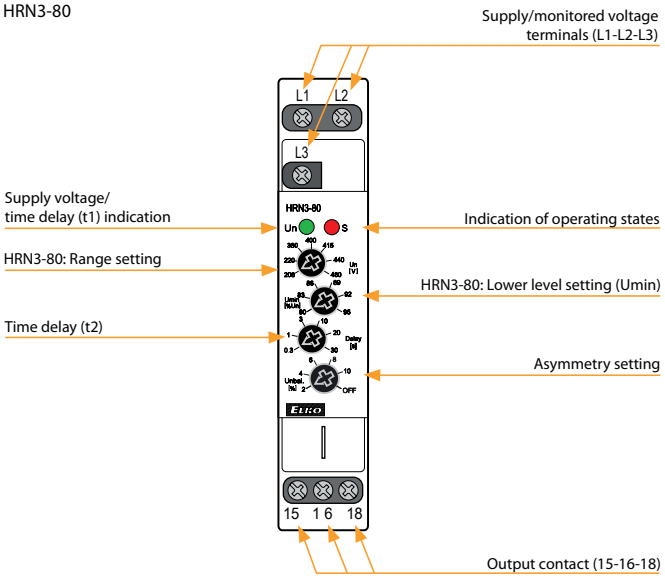


HRN3-81

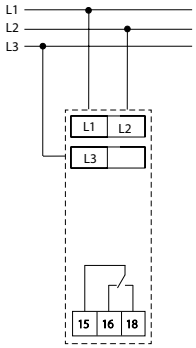


Description

HRN3-80

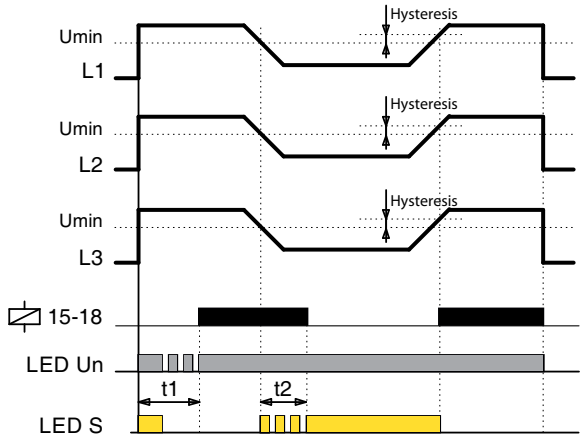


Connection



Function

Undervoltage:



After connecting the device to the supply voltage, both LEDs on the panel will flash briefly.

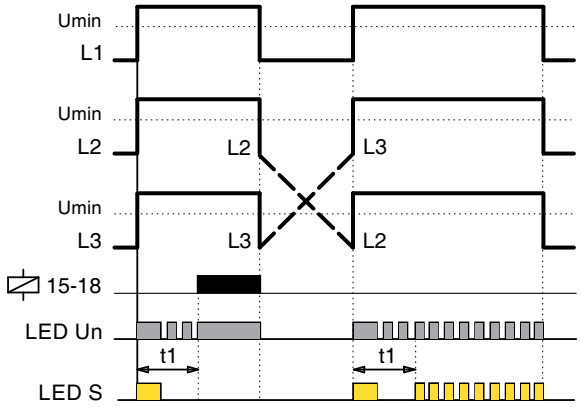
If 3-phase voltage is connected to the monitoring relay and all conditions are met (correct voltage level, phase sequence and asymmetry), the output contact closes after the time delay t1 elapsed.

During the time delay, the green „LED Un" flashes, at the end of the delay „LED Un" lights up continuously (OK state).

When the voltage drops below the lower level „Umin" (HRN3-80 only), after the time delay t2 has elapsed the green and red LEDs are lit. The output contact is open (fault state).

During the time delay t2, the red „LED S" flashes quickly.

Phase sequence:



If the phase sequence is incorrect when the power supply is connected, after the time delay t1 has elapsed the green and red LED flashes quickly. The output contact is open (fault state).

During the time delay t1, the green „LED Un" flashes.

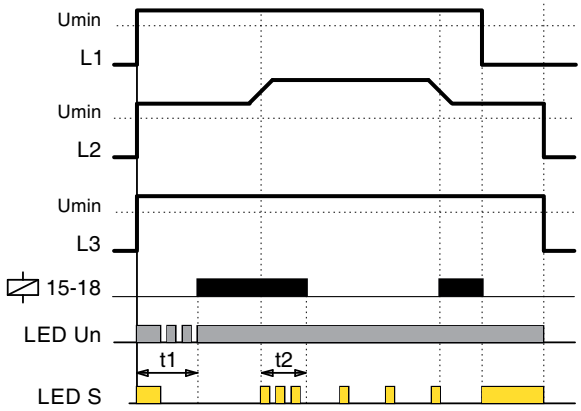
When the set phase asymmetry is exceeded, after the time delay t2 has elapsed the green LED is lit and the red LED flashes briefly. The output contact is open (fault state).

During the time delay t2, the red „LED S" flashes quickly.

In the event of phase failure, the output contact opens without a time delay t2 (fault state), the green and red LEDs are lit.

The return from the fault state to the OK state occurs without a time delay.

Phase asymmetry, failure:



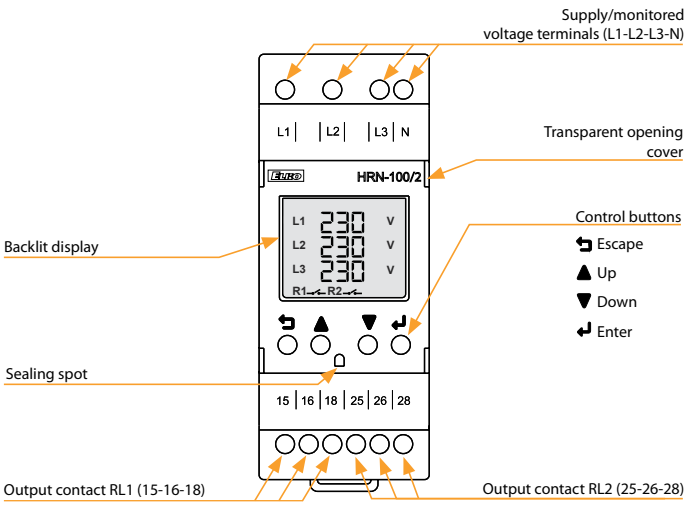
HRN-100/2 | Multifunction voltage/frequency monitoring relay in 3P with LCD display

EAN code
HRN-100: 8595188171229

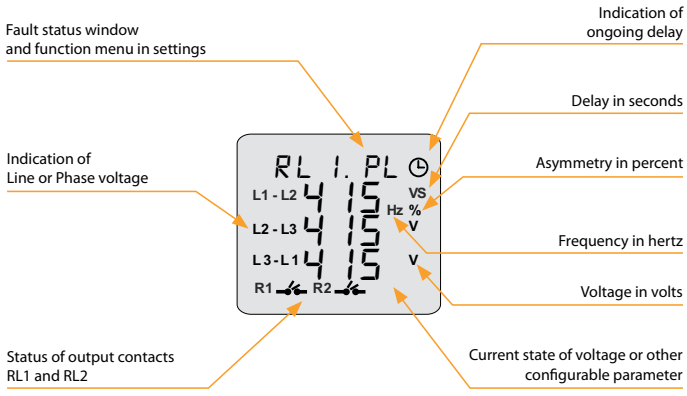
- 3-wire or 4-wire connection (with or without neutral).
- Optionally monitors upper and lower voltage & frequency in 3-phase circuits.
- Allows monitoring of phase sequence, failure and asymmetry incl. neutral fail (only in 4-wire connection).
- The device is supplied from monitored voltage.
- Both 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.

Technical parameters	HRN-100/2
Supply	
Supply/monitored terminals:	L1-L2-L3 (N)
Supply/monitored voltage:	U_{LN} = 3 ~ 90 – 288 V (45-65 Hz) U_{LL} = 3 ~ 155 – 500 V (45-65 Hz)
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:	Absolute: 5 – 99 VAC Percentage: 2 – 50 %
Adjustable voltage and frequency hysteresis level:	3 – 20 VAC (OV, UV, HC, LC) 0.5 – 2 Hz (OF, UF)
Adjustable hysteresis asymmetry:	Absolute: 3 – 99 VAC Percentage: 2 – 15 %
Accuracy of measured voltage:	+/- 5 V
Accuracy of measured frequency:	+/- 0.3 Hz
Adjustable delay after supply connection P_{on}:	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	
Contact type:	2× changeover ($AgSnO_2$)
Current rating:	5 A/AC1
Breaking capacity:	1200 VA/AC1, 150 W/DC1
Switching voltage:	240 V AC/30 V DC
Power dissipation (max.):	5 W
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops
Other information	
Operating temperature:	–10 .. +60 °C (14 .. 140 °F)
Storage temperature:	–20 .. +70 °C (–4 .. 158 °F)
Dielectric strength:	AC 4kV (supply – output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP20 housing & terminals/IP40 front panel with cover
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/ stranded with ferrule (mm^2):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 12)
Dimensions:	90 × 36 × 66.5 mm (3.6″ × 1.5″ × 2.7″)
Weight:	132 g (4.7 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27

Description

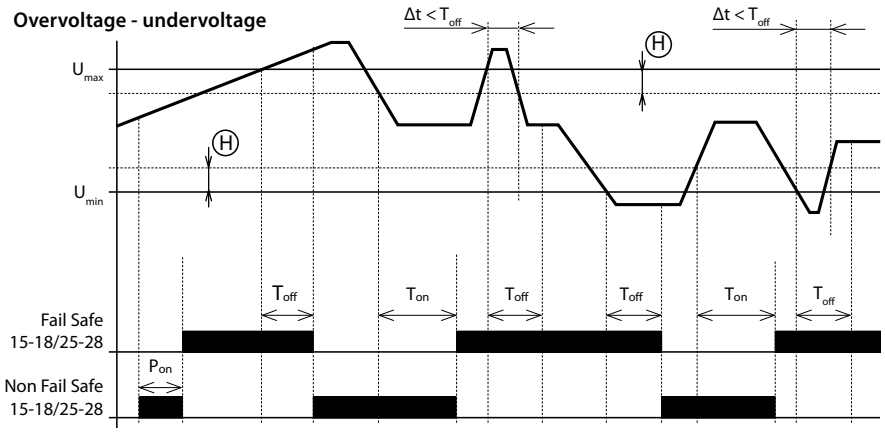


Description of display elements on the screen



Function

Overvoltage - undervoltage

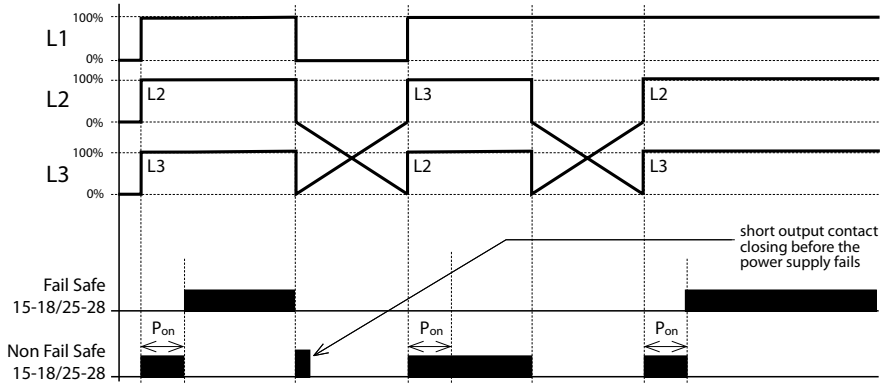


Graph legend:
P_{on} - Power ON delay (delay after power supply connection)
P_{on} = 0 - 999 s (min. 250 ms hardware initialization)
T_{on} - ON Delay (delay to OK state)
T_{on} = 0,5 - 999 s
T_{off} - OFF delay (delay to fault state)
T_{off} = 0,1 - 999 s
T_{off} - Adjustable for OV, UV, OF, UF & asymmetry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

Δt - Duration of the fault state
Ⓗ 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} ... 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.

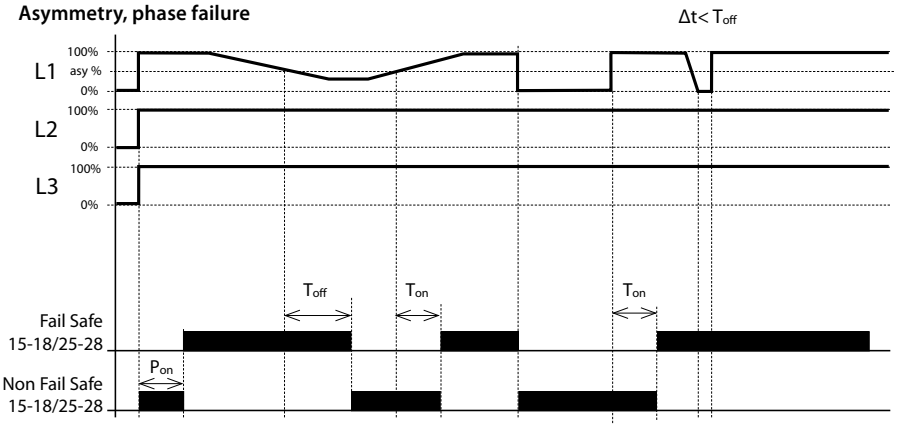
Phase sequence



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

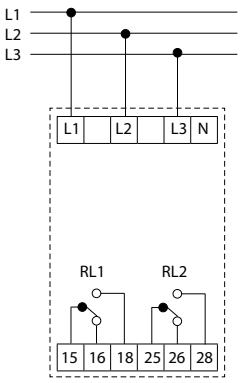
Δt - Duration of the fault state

- 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.

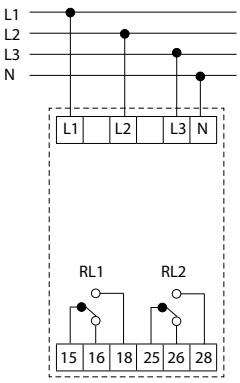
HRN-100/2 | Multifunction voltage/frequency monitoring relay in 3P with LCD display

Connection

3-wire connection



4-wire connection



Description of controls and signaling

Relay contact mode

Mode	OK state	Fault state
Fail Safe	15 & 25 (Pole) — 18 & 28 (NO)	15 & 25 (Pole) — 18 & 28 (NO)
Non Fail Safe	15 & 25 (Pole) — 18 & 28 (NO)	15 & 25 (Pole) — 18 & 28 (NO)

Fault status window

Short-cut	Meaning
"FLT.INT"	Voltage interruption*
"FLT.NF"	Neutral fail
"FLT.LC"	Lower threshold voltage
"FLT.HC"	Upper threshold voltage
"RLx.PL"	Phase failure
"RLx.PR"	Phase sequence
"RLx.ASY"	Phase asymmetry
"RLx.LCH"	Fault memory
"RLx.OF"	Overfrequency
"RLx.UF"	Underfrequency
"RLx.OV"	Overvoltage
"RLx.UV"	Undervoltage

Note: RLx indicates output RL1 or RL2

* Indicated only if all 3-phases fail for 22 ms + max. 3 ms, not longer. In the history, the fault is indicated as "FLT.INT 000V".

Control buttons

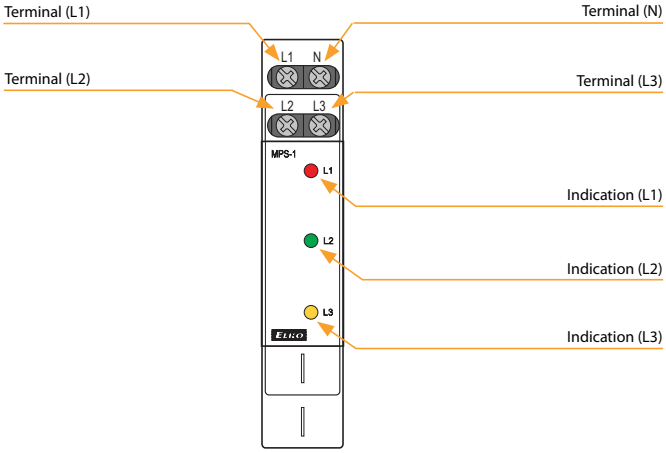
ESCAPE ↩	Enter the settings menu (long press >1 s). Return to the main screen or previous menu in edit or display mode. Step back when changing a value or parameter.
UP ▲	Move parameters up. Change/increase the value of a parameter in edit mode. Selection of the currently measured parameter on the main screen - voltage, frequency, asymmetry (pressing the button <500 ms).
DOWN ▼	Moving parameters down. Change/decrease the value of a parameter in edit mode. Display history of fault states (pressing the button <500 ms).
ENTER ↵	Select and save a parameter value in edit mode. Resetting the product from memory mode (long press >1 s).
ESCAPE ↩ ENTER ↵	Press a key combination to display the read-only settings menu (long press >1 s).

EAN code
MPS-1: 8595188145978

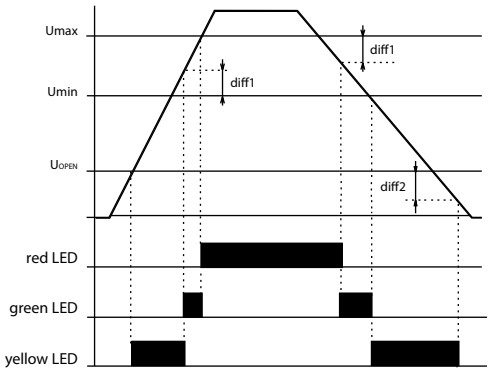
- Used for optical signaling of the voltage level in 3-phases.
- Each phase features LED signaling broken is divided by color into voltage levels:
  - voltage in tolerance of ± 15 % - green
  - overvoltage - red
  - undervoltage - yellow
  - voltage < 50 V - LED not illuminated.
- 4-wire connection - L1, L2, L3, N.
- Monitors phase voltages against neutral wire.
- Not dependent upon order of phases.

Technical parameters	MPS-1
Supply voltage:	AC 3x 400/230 V (50-60 Hz)
Supply voltage tolerance:	+20 %; –75 %
Power consumption:	max. 1 VA/0.5 W
Indication	
LED not illuminated:	0 to 50 V/45 to 0 V
LED illuminated	
yellow:	50 to 207 V/195.5 to 45 V
green:	207 to 264.5 V/253 to 195.5 V
red:	264.5 to 276 V/276 to 253 V
Other information	
Design:	1 MODULE
Mounting:	DIN rail EN60715
Operating position:	any
Coverage:	panel IP40, terminals IP10
Overvoltage category:	III.
Contamination level:	2
Max. cable size (mm²):	solid wire max. 2x 2.5 or 1x 4/ with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)
Working temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	48 g (1.7 oz.)
Standards:	EN 60947-1, EN 60947-5-1

Description of device

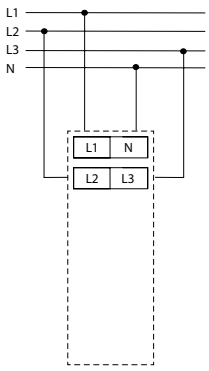


Function



After connecting the supply voltage, the LED illuminates - the color corresponds to the voltage size of individual phases. If the phase voltage drops under 45 V (phase outage), the corresponding LED is not illuminated.

Connection



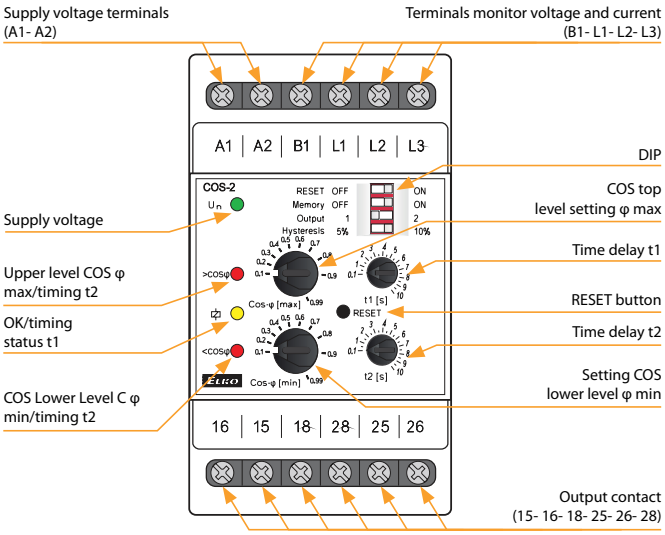
COS-2 | Power factor monitoring relay

EAN code
COS-2/230V: 8595188155434
COS-2/110V: 8595188152280
COS-2/400V: 8595188152365
COS-2/24V: 8595188155441

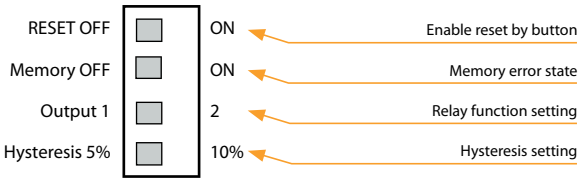
- Relay monitors phase shift between current and voltage in 3-phase or 1-phase networks - evaluates COS φ (replacement COS-1).
- The relay is designed to monitor overload/relieve the motors.
- Relay is designed for 3 x 400/230 V circuits.
- Galvanically isolated power supply AC 230 V, AC 110 V, AC 400 V or AC/DC 24 V.
- Adjustable upper and lower level COS φ.
- Possibility to extend the current range using a current transformer.
- Two output relays (for each level independent).
- Adjustable delay eliminating engine start-up.

Technical parameters	COS-2
Supply	
Supply terminals:	A1 - A2
Voltage range:	AC 230 V, AC 110 V, AC 400 V or AC/DC 24 V (AC 50-60 Hz)
Burden max.:	2.5 W/5 VA (AC 110 V, AC 230 V, AC 400 V), 1.4 W/2 VA (AC/DC 24 V)
Max. dissipated power (Un + terminals):	4 W
Operating range:	–15 %; +10 %
Measuring	
Voltage set:	3x 400 V/230 V (50-60 Hz)
Terminals:	L1, L2, L3, B1
Upper level cos-φ:	adjustable 0.1 - 0.99
Bottom level cos-φ:	adjustable 0.1 - 0.99
Max. permanent voltage:	(input L1, L2, L3) AC 3x 460 V
Current range:	0.1 - 16 A
Current overloading:	20 A (< 3 sec.)
Hysteresis:	adjustable 5 % or 10 %
Time delay t1:	adjustable 0.1 - 10 s
Time delay t2:	adjustable 0.1 - 10 s
Accuracy	
Accuracy setting (mechanical):	5 %
Accuracy of repetition:	< 1 %
Temperature dependance:	< 0.1 %/°C (°F)
Limit values tolerance:	5 %
Output	
Number of contacts:	2x changeover/SPDT (AgNi/Silver Alloy)
Current rating:	16 A/AC1; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	20 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Output indication:	yellow LED
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Other information	
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical 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 (mm^2):	max. 1x 2.5, max. 2x1.5/ with sleeve max. 1x 1.5 (AWG 12)
Dimensions:	90 x 52 x 65 mm (3.5˝ x 2˝ x 2.6˝)
Weight:	243 g/8.6 oz (230 V, 110 V, 400 V); 141 g/5 oz (24 V)
Standards:	EN 60255-1, EN 60255-26, EN 6255-27

Description

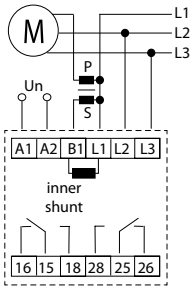


Description and importance of DIP switches

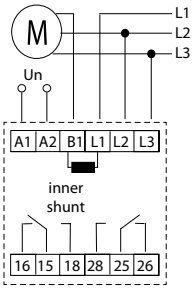


Connection

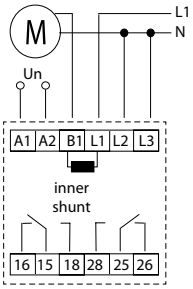
Connection with current transformer



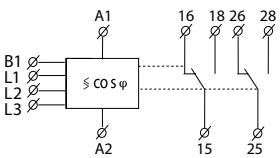
3-phase connection



1-phase connection

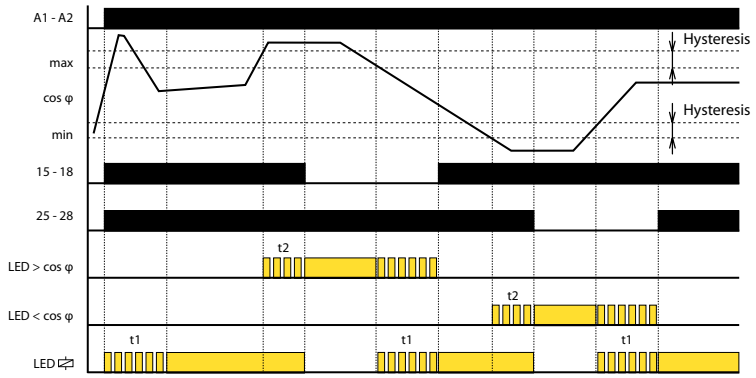


Symbol



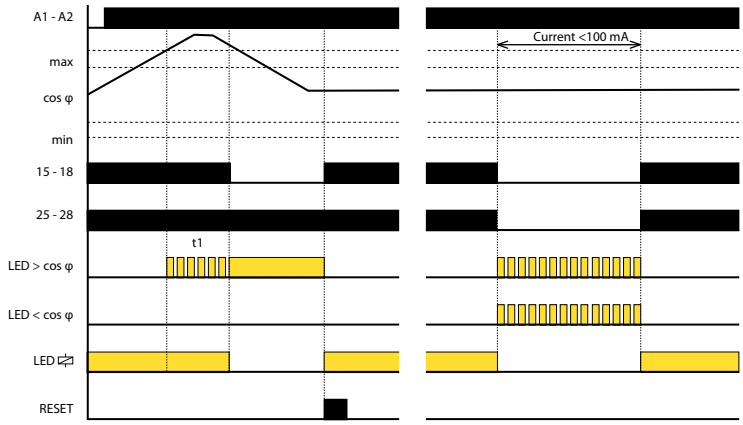
Function

Status after switching on power, two relay mode



Memory on, two relay mode

decrease (loss) of current



After powering on, the device sets the delay time t1 and yellow LED flashes. Both relays are switched on. The delay serves to eliminate a faulty state when starting the motor. After the time delay t1 begins monitoring COS φ only.

If the COS φ is in the band between the upper and lower limits set, both relays are switched on and the yellow LED is on.

If the COS φ is outside the set limits (> COS φ max or <COS φ min), an error condition occurs - the time t2 is delayed while the red LED corresponding to the COS φ blinks at the same time. After the time delay t2 red LED lights and the corresponding relay remains off.

When the COS φ returns to set limits, the time t1 is delayed and the yellow LED flashes at the same time as the corresponding red LED.
After the time delay stops blinking yellow LED, the corresponding red LED turns off and the relay switches on.

At low wattage (<100 mA) or with a power failure, an error is reported by the simultaneous blinking of both red LEDs. After resuming the voltage or the current being watched, the relay returns to the normal state where the COS φ value is monitored.

When the memory is turned off (DIP switch 2 OFF) and the allowable reset (DIP switch 1 ON), the pressing state is reached after the power is turned on, i.e. flashing yellow LED, both relays are switched on, with time delay t1.
When the memory (DIP switch 2 ON) is in an error state (high or low value for cos φ) it should be reset (by pressing the RESET button).

HRF-10 | Frequency monitoring relay

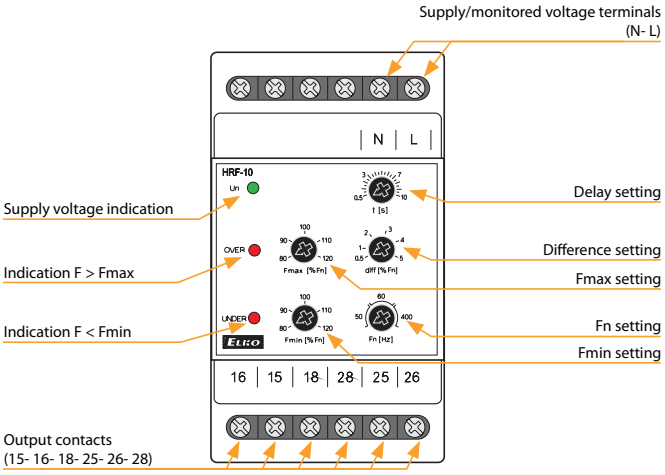
EAN code
HRF-10: 8595188144827

- The relay serves to monitor frequency of AC voltage, e.g. in photovoltaic power stations, generators.
- The monitored frequency 50/60/400 Hz is selected by a switch.
- Two adjustable levels of frequency (Fmin, Fmax) in the range of 80 - 120 % Fn.
- Adjustable difference level.
- Adjustable delay level.

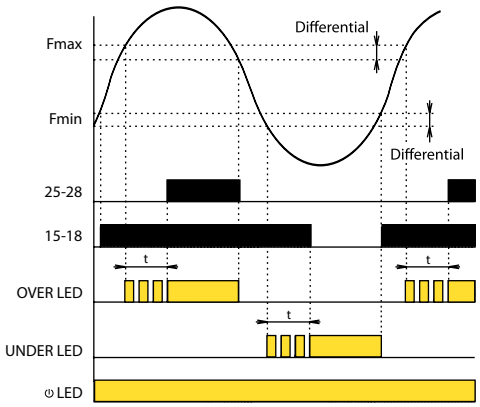
Technical parameters	HRF-10
Supply and monitoring terminals:	L, N
Supply voltage:	AC 161 - 500 V
Rated frequency Fn:	(50/60/400 Hz)
Burden (max):	1.7 VA/1.1 W
Max. dissipated power (Un + terminals):	2 W
Overload capacity	
- continuous:	500 V
- max.10 s:	550 V
Frequency Fmax:	adjustable 80 - 120 % Fn
Frequency Fmin:	adjustable 80 - 120 % Fn
Difference:	adjustable 0.5 - 5 % Fn
Delay (until failure):	adjustable 0.5 - 10 s
Opening level (Uopen):	161 V
Output relay - contact:	2x changeover/SPDT (AgNi) gilded
AC contact capacity:	250 V/8 A, max. 2000 VA*
DC contact capacity:	30 V/8 A
Mechanical life:	30.000.000 ops.
Electrical life (AC1):	200.000 ops.
Other information	
Operational temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storing temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical strenght (supply - relay contact):	4 kV/1 min.
Protection degree:	III.
Overvltage category:	2
Pollution degree:	IP40 from font panel/IP20 terminals
Profile of connecting wires (mm^2):	max. 2x 1.5/1x 2.5 (AWG 12)
Dimensions:	90 x 52 x 64 mm (3.5˝ x 2˝ x 2.6˝)
Weight:	127 g (4.5 oz.)
Standards:	EN 61000-6-2, EN 61000-6-4, EN 60255-1, EN 60255-26, EN 60255-27

* 8 A/AC1; PD. B300

Device description



Functions



After the supply (monitored) voltage is connected, the green LED is on.

If the value of the monitored frequency falls within the range between the two set levels Fmin - Fmax no red LED is on. The relay UNDER is triggered (contacts 15-16-18) and the relay OVER is disconnected (contacts 25-26-28).

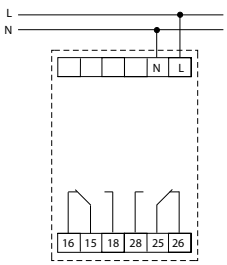
If the monitored frequency exceeds the set level Fmax, the relay OVER is triggered after the set delay timing elapses and the red LED OVER goes on. The red LED flashes during the timing.

If the monitored frequency drops below Fmax - difference, the relay is activated without delay and the red LED OVER goes off.

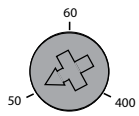
If the monitored frequency drops below the set level Fmin, the relay UNDER is disconnected after the set delay timing elapses and the red LED UNDER goes on. The red LED flashes during the timing. If the monitored frequency exceeds the level Fmin + the difference, the relay is triggered without delay and the red LED UNDER goes off.

If the monitored voltage is lower than the opening level Uopen both the relays are disconnected and both the red LED (UNDER and OVER) start flashing slowly - indicating insufficient supply voltage.

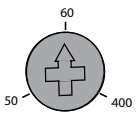
Connection



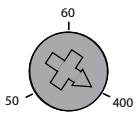
Rated frequency setting



Fn setting = 50 Hz



Fn setting = 60 Hz



Fn setting = 400 Hz

AC

PRI-32
- Function: overcurrent
- Range: 1-20A (adj.)
- Output: 1x clos. 8A
- Supply: AC 24-240V and DC 24V

pg. 118

PRI-52
Like PRI-32, but
- Range: 1-25A (adj.)
- Output: 1x chang. 8A
- Supply: AC 230V

Adjustable delay.

pg. 119

PRI-34
- Functions: 8
- Range: 0.05-16A (adj.)

Divided into multiple types.
- Output: 1x chang. 16A
- Supply: AC/DC 24-240V

pg. 120

PRI-35
- Function: undercurrent
- Range: 0.5-5A (adj.)
- Output: 1x chang. 16A
- Supply: AC/DC 24-240V

pg. 122

PRI-51
- Functions: overcurrent
- Range: 0.05-16A (adj.)

Divided into multiple types.
- Output: 1x chang. 8A
- Supply: AC 24-240V and DC 24V

pg. 124

PRI-53
- Function: undercurrent and overcurrent
- Range: 2-6A (adj.)
- Output: 2x chang. 8A
- Supply: AC/DC 24-240V

3-phase connection.

pg. 125

AC/DC

PRI-41
- Function: undercurrent and overcurrent
- Range: AC/DC 0.32-16A
- Output: 2x chang. 16A
- Supply: UNI; 400V
- Undervoltage: % of set overvoltage

2x adj. delay.

pg. 123

PRI-42
Like PRI-41, but fault state memory, hysteresis, galv. separated supply (also for PRI-41).
- Undervoltage: % of nominal input value

2x adj. delay.

pg. 123

Type	Design	Supply voltage	Galvanically separated	Monitored parameters					Setting			Description	Page
				Phases	Range	I>	I<	I<>	Delay	Hysteresis	Memory fault		
PRI-32	1-M DIN	AC 24-240 V DC 24 V	●	1	AC 1 - 20 A	●	x	x	x	x	x	Monitors the overflow of the current flowing through the guarded conductor, passed through the hole in the panel.	118
PRI-34/1A PRI-34/2A PRI-34/5A PRI-34/8A PRI-34/16A	1-M DIN	AC/DC 24-240 V	x	1	AC 0.05 - 1 A AC 0.1 - 2 A AC 0.25 - 5 A AC 0.4 - 8 A AC 0.8 - 16 A	●	●	●	●	●	●	Monitors current at the input terminals depending on the selected function. The power supply is not galvanically isolated from the monitored current terminals. It is possible to connect ext. current transformer.	120
PRI-35	1-M DIN	AC/DC 24-240 V	x	1	AC 0.5 - 5 A	x	●	x	●	x	x	Protects the pump motor (submersible pump) against dry running by connecting to an external current transformer. The power supply is not galvanically separated from the monitored current terminals. Terminals A2, B2 are internally connected.	122
PRI-51/0.5A PRI-51/1A PRI-51/0.1-10A PRI-51/2A PRI-51/5A PRI-51/8A PRI-51/16A	1-M DIN	AC 24-240 V DC 24 V	●	1	AC 0.05 - 0.5 A AC 0.1 - 1 A AC 0.1-10 A AC 0.2 - 2 A AC 0.5 - 5 A AC 0.8 - 8 A AC 1.6 - 16 A	●	x	x	●	x	x	It monitors the current at the input terminals. The power supply is galvanically isolated from the monitored current terminals. It is possible to connect ext. current transformer.	124
PRI-52	1-M DIN	AC 230 V	●	1	AC 0.5 - 25 A	●	x	x	●	x	x	Monitors the overflow of the current flowing through the guarded conductor, passed through the hole in the sidewall.	119
PRI-53/5	6-M DIN	AC/DC 24 - 240 V	●	3	AC 3 x 2 - 6 A	●	●	x	●	x	x	Monitors current drop or overcurrent in 3-phase connection. The power supply is not galvanically isolated from the monitored current terminals. Current transformers can be connected to the device.	125
PRI-41/UNI	3-M DIN	AC/DC 24 - 240 V	●	1	AC/DC 1.6 A AC/DC 5 A AC/DC 16 A	x	x	●	●	●	●	Monitors current drop or overshoot in 1-phase connection. Galvanically isolated power supply. Choice of three monitored current ranges.	123
PRI-42/UNI	3-M DIN	AC/DC 24 - 240 V	●	1	AC/DC 1.6 A AC/DC 5 A AC/DC 16 A	x	x	●	●	●	●		

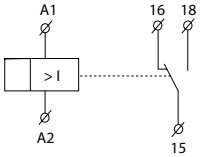
PRI-32 | Current monitoring relay of Imax level passing through a hole in 1P - AC

- Current transformer is a part of the product. Inside this transformer there is a wire which senses the volume of flowing current.
- This construction reduces thermal stress of product when compared with conventional solutions with inbuilt shunt, and increases current range up to 20 Amps, and galvanically separates monitored circuit.
- For heating bars in sliding rails, heating cables, indication of current flow, controlling of 1-phase motor consumption,...
- Supply is galvanically separated from measuring current.
- Current exceeding - current flowing through monitored wire must not exceed 100 A.

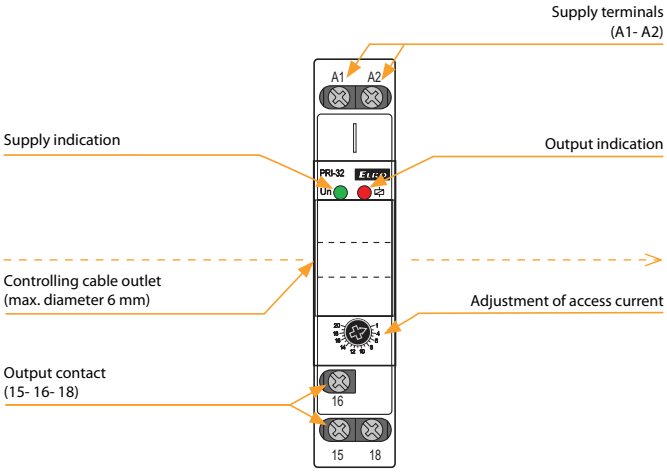
EAN code
PRI-32: 8595188121965

Technical parameters	PRI-32
Supply circuit	
Supply terminals:	A1 - A2
Voltage range:	AC 24 - 240 V, DC 24 V (AC 50-60 Hz)
Burden:	max. 1.5 VA/1 W
Max. dissipated power (Un + terminals):	2 W
Operating range:	–15 %; +10 %
Measuring circuit	
Current range:	1 - 20 A (AC 50-60 Hz)
Current adjustment:	potentiometer
Accuracy	
Setting accuracy (mech.):	5 %
Repeat accuracy:	< 1 %
Temperature dependancy:	< 0.1 %/°C (°F)
Limit values tolerance:	5 %
Overload capacity:	max. 100 A/10 s
Output	
Number of contacts:	1x changeover/SPDT (AgNi/Silver Alloy)
Current rating:	8 A/AC1; PD. B300
Breaking capacity:	2000 VA/AC1, 240 W/DC
Output indication:	red LED
Mechanical life:	60.000.000 ops.
Electrical life (AC1):	150.000 ops.
Other information	
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical strength:	4 kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel/IP10 terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm²):	solid wire max. 2x 2.5 or 1x 4, with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)
Dimensions:	90 x 17.6 x 80.5 mm (3.5˝ x 0.7˝ x 3.2˝)
Weight:	75 g (2.6 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27

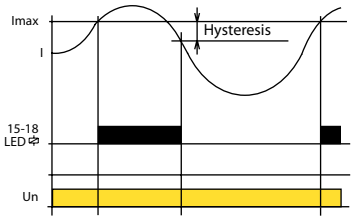
Symbol



Description



Function



Monitoring relay PRI-32 serves to monitor current level in single phase AC circuits. Due to its fluent adjustment of release current, it is predestined for applications with necessity of current flow indication, and can be used as precedence relay. Output relay is off in normal state. In case the set current level is exceeded, it switches. Multivoltage supply is an advantage.

Connection

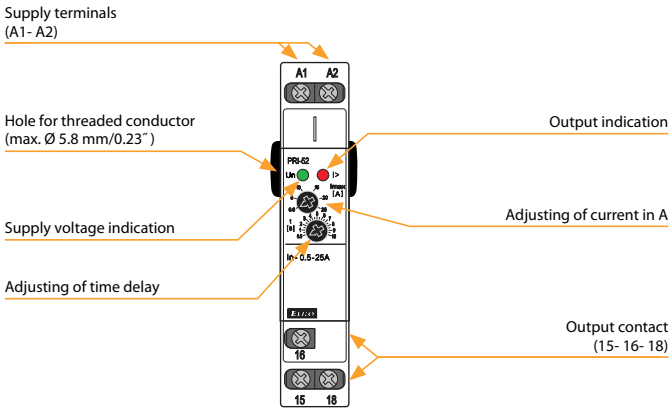
PRI-52 | Current monitoring relay of Imax level passing through a hole in 1P - AC

EAN code
PRI-52: 8595188136556

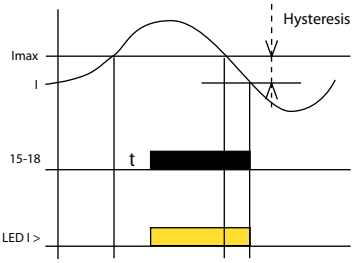
- Relay is designated for:
  - cistant device diagnostic (short circuit, take-off increasing)
  - preferred (priority) relay - two appliances (boiler and floor heating) operating on one phase, but never run together - prevention against current overload and circuit breaker tripping. Enables to save your main breaker expenses
  - current tranzit indicator - informs about heating activation, ceramic hob, ventilator...
  - changing over of appliances according to inverter's (converter) output by photocell applications
- Hole for threaded conductor passes through the body of device.
- Part of device is current transformer, which is sensing size of current in threaded conductor.
- Slight setting (by potentiometer) of tripping current - range AC 0.5 to 25 A.

Technical parameters	PRI-52
Supply	
Supply terminals:	A1 - A2
Voltage range:	AC 230 V (50-60 Hz)
Power input (apparent/loss):	max. 5 VA/1.4 W
Max. dissipated power:	2.5 W (Un + terminals)
Supply voltage tolerance:	–15 %; +10 %
Measuring circuit	
Current range:	AC 0.5 to 25 A (AC 50-60 Hz)
Maximal permanent current:	25 A
Inrush overload < 1s:	50 A
Current adjustment:	potentiometer
Time delay:	adjustable 0.5 to 10 s
Accuracy	
Setting accuracy (mech.):	10 %
Repeat accuracy:	< 1 %
Temperature dependance:	< 0.2 %/°C (°F)
Limit values tolerance:	10 %
Hysteresis:	0.25 A
Output	
Number of contacts:	1x changeover/SPDT (AgNi/Silver Alloy)
Current rating:	8 A/AC1; PD. B300
Breaking capacity:	2000 VA/AC1, 240 W/DC
Output indication:	red LED
Mechanical life:	60.000.000 ops.
Electrical life (AC1):	150.000 ops.
Other information	
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical strengh:	4 kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel/IP10 terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm²):	max. 2x 2.5, max. 1x 4/ with sleeve max. 1x 2.5, max. 2x 1.5 (AWG 12)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	65 g (2.3 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27

Description



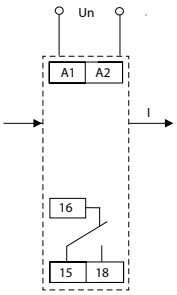
Functions



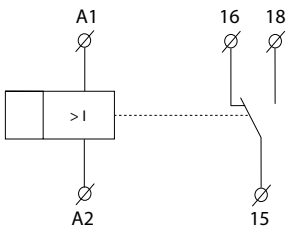
Monitoring relay PRI-52 serves for monitoring of current level in 1-phase AC circuits. Slight setting of release current level designates this relay for many various applications. Output relay is in normal status switched off. When set current level is overrun, relay get closed after preset delay. By return from error to normal status is used hysteresis.

Adventage of PRI-52 is that the hole for threaded conductor is located under the level of covering in the switchboard - thanks that, threaded conductor is not accessible for unwanted manipulation.

Connection



Symbol



PRI-34 | Multifunction current monitoring relays in 1P - AC

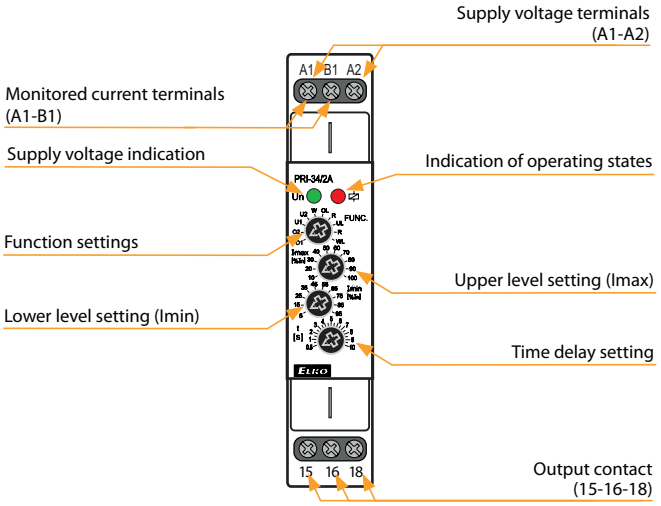
c UL us LISTED E308660

EAN code
PRI-34/1A: 8595188188968
PRI-34/2A: 8595188182829
PRI-34/5A: 8595188182836
PRI-34/8A: 8595188188975
PRI-34/16A: 8595188182843

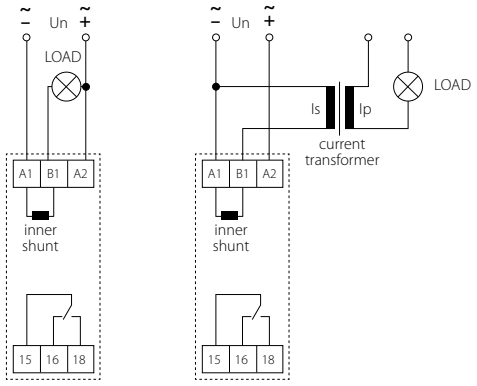
- It is used to monitor the value of alternating current, e.g.: motors, heating cables, lamps and other devices.
- Power supply and monitoring circuits are not galvanically isolated.
- Monitors current exceeding the upper current level (Imax) and falling below the lower current level (Imin) – according to the selected function.
- Smooth adjustment of both current levels.
- Adjustable time delay (to eliminate short-term current drops and spikes).
- Option to select functions with fault state memory (Latch).
- Measures true root mean square value of the current - TRUE RMS.
- Possibility to extend the current range using an external current transformer.

Technical parameters	PRI-34
Supply	
Supply terminals:	A1 – A2
Supply voltage:	AC/DC 24 – 240 V (AC 50-60 Hz)
Consumption (max.):	3.8 VA/0.7 W
Supply voltage tolerance:	–15 %; +10 %
Measuring circuit	
Current range:	PRI-34/1A | In - 1A PRI-34/2A | In - 2A PRI-34/5A | In - 5A PRI-34/8A | In - 8A PRI-34/16A | In - 16A (AC 50-60 Hz)
Max. permanent current | peak overload (1 s):	PRI-34/1A | 2A/10A PRI-34/2A | 4A/10A PRI-34/5A | 10A/16A PRI-34/8A | 16A/16A PRI-34/16A | 17A/32A
Upper level setting (Imax):	10 – 100 %In
Lower level setting (Imin):	5 – 95 %In
Time delay (d):	300 ms
Time delay (t):	adjustable, 0.5 – 10 s
Accuracy	
Setting accuracy (mech.):	5 %
Repeat accuracy:	< 1 %
Temperature dependency:	< 0.1 %/°C
Limit values tolerance:	5 %
Hysteresis (fault to OK):	5 % (function O1, U1, W) Imax – Imin (function O2, U2)
Output	
Contact type:	1× changeover (AgNi)
Current rating:	16 A/AC1; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC1
Switching voltage:	250 V AC/24 V DC
Power dissipation (max.):	1.2 W
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:	AC 4 kV (supply – output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel / IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/ stranded with ferrule (mm^2):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)
Dimensions:	90 × 17.6 × 64 mm (3.5˝ × 0.7˝ × 2.5˝)
Weight:	60 g (2.15 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27

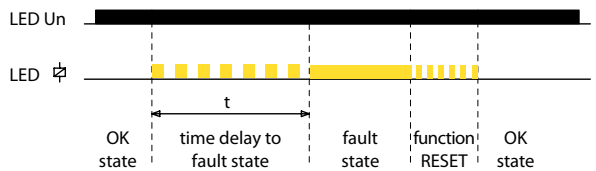
Description



Connection

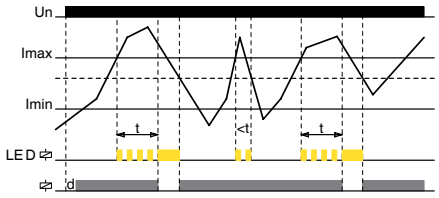


Indication of operating states

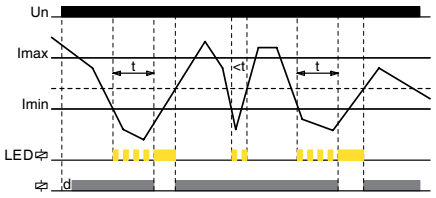


Function

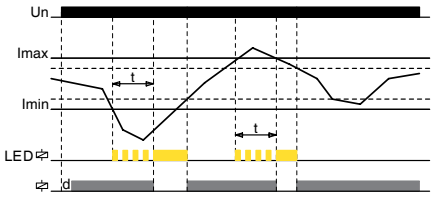
O1 OVER (hysteresis 5%)



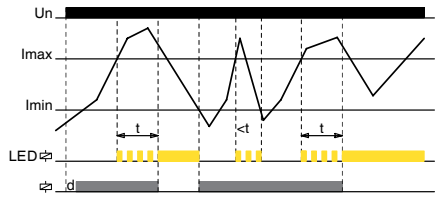
U1 UNDER (hysteresis 5%)



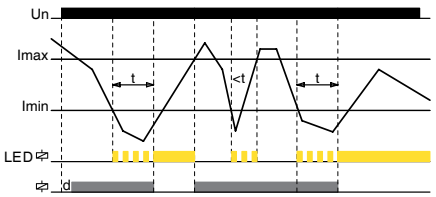
W WINDOW (hysteresis 5%)



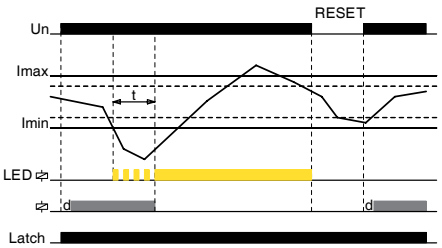
O2 OVER (hysteresis to Imin)



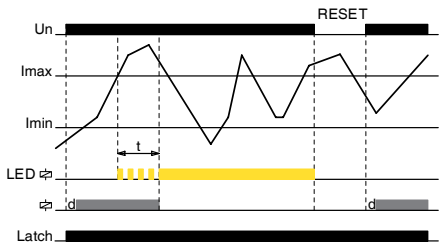
U2 UNDER (hysteresis to Imax)



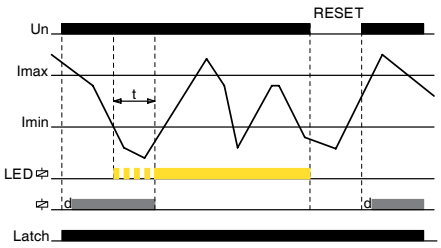
WL WINDOW + Latch



OL OVER + Latch



UL UNDER + Latch



Graphs legend:
t = time delay to fault state
d = delay 0.3 s after connection of power supply (Un)

OVER:

- If the value of the monitored current is lower than the set upper level „Imax", the output contact is closed. If the „Imax" is exceeded, the output contact will open after the set delay (fault state).
- If the current falls below the fixed hysteresis (function O1) or the set lower level „Imin" (function O2), the output contact will closes again.
- If the OL function (OVER + Latch) is selected, when the upper current level „Imax" is exceeded, the output contact remains open even when the current returns from the fault state.

Fault memory reset can be done in two ways:

- Short-term interruption of supply voltage.
- By setting the function switch to position R (RESET) or any function without memory fault.

The RESET state lasts for 3 s after switching the function switch from the R position to a function with memory fault (UL, OL, WL).

When moving to any other function from the R position, this delay does not apply.

UNDER:

If the value of the monitored current is higher than the set lower level „Imin", the output contact is closed. When the current drops below the „Imin", output contact opens after the set delay (fault state).

If the current exceeds the fixed hysteresis (function U1) or the set upper level „Imax" (function U2), the output contact closes again.

If the UL function (UNDER + Latch) is selected, when the current drops below the lower level „Imin", the output contact remains open even when returning from the fault state. Fault memory reset can be done as in the previous case.

WINDOW:

If the value of the monitored current is lower than upper level „Imax" and at the same time higher than lower level „Imin", the output contact in closed. If the „Imax" is exceeded or drops below the „Imin", output contact opens after the set delay (fault state).

To return from the fault state, a fixed hysteresis is applied.

If the WL function (WINDOW + Latch) is selected, the fault state is again stored in memory and output contact stays open, even when returning from the fault state. Fault memory reset can be done as in the previous cases.

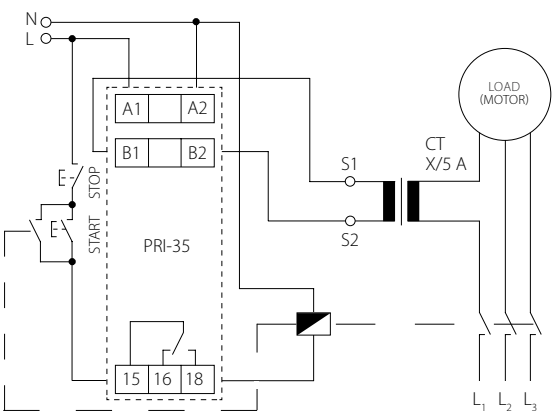
PRI-35 | Undercurrent monitoring relay in 1P - AC by external CT

- Designed to protect a motor of a pump (submersible pump) against dry running.
- Monitor a current of a motor by means of current transformer (CT) X/5A.
- Current level (I_{SET}) and TRIP delay (t) are adjustable by potentiometers
- Indication of operating states by the red LED on the front panel.

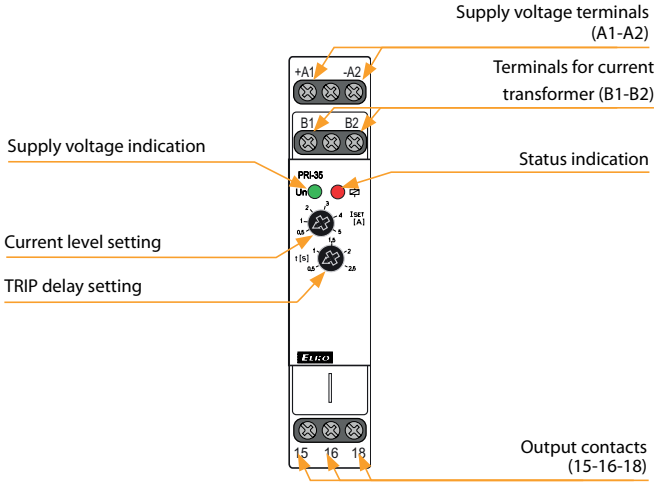
- The power supply is not galvanically separated from the monitored current terminals, terminals A2, B2 are internally connected.
- Wiring between B1, S1 and B2, S2 must be insulated and not connected to any external voltage or ground.
- External current transformer X/5A must be used.

Technical parameters	PRI-35
Supply	
Supply terminals:	A1 - A2
Voltage range:	AC/DC 24 - 240 V (AC 50-60 Hz)
Consumption (max.):	3.8 VA / 0.7 W
Supply voltage tolerance:	–15 %; +10 %
Measuring circuit	
Current range:	adjustable, AC 0.5 - 5A
Max. permanent current:	AC 10 A
Inrush overload < 1s:	30 A
TRIP delay (t):	adjustable, 0.5 - 2.5 s
Accuracy	
Setting accuracy (mech.):	5 %
Temperature dependancy:	< 0.1 % / °C (°F)
Limit values tolerance:	5 %
Hysteresis (fault to OK):	10 %
Output	
Number of contacts:	1x changeover / SPDT (AgNi)
Rated current:	16 A/AC1; PD. B300
Switching power:	4000 VA/AC1, 384 W/DC
Switching voltage:	250 V AC/24V DC
Power dissipation (max.):	1.2 W
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strenght:	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
Cable size (mm²):	max. 1x 2.5, max. 2x 1.5/ with sleeve max. 1x 2.5
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	65 g (2.3 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27

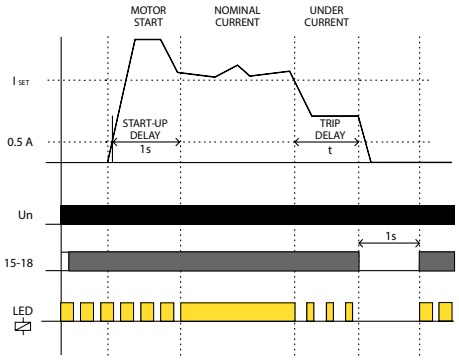
Connection



Description



Function



Right after connecting a supply voltage, an output relay is immediately closed and waits for a motor to be started by a START button. Once the START button is activated
a contactor closes and the motor starts. An auxiliary contact of the contactor bridges the START button and keeps the contactor closed.

Fixed START-UP delay prevents undercurrent spikes when the contactor contacts bounce.

If the motor current is higher than the ISET value after the START-UP delay, the output relay and contactor remain closed.

If the motor current falls below the ISET value, the TRIP delay is triggered and after running out a set time the output relay opens and contactor drops out.

The output relay is open for 1s, then the output relay closes again and waits for the next start activated by the START button.

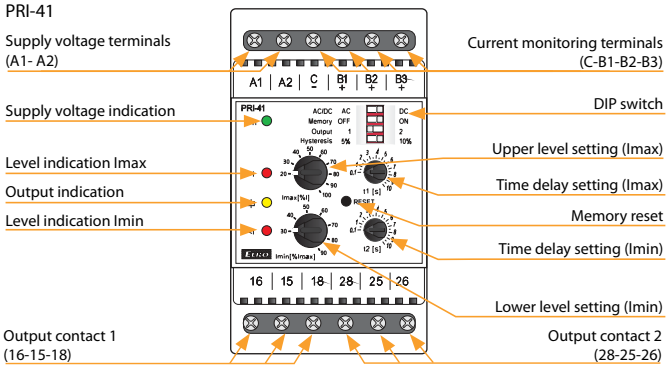
EAN code
PRI-41/UNI: 8595188185349
PRI-41/400V: 8595188147446
PRI-42/UNI: 8595188185356
PRI-42/400V: 8595188147484

Technical parameters		PRI-41		PRI-42
Supply circuit				
Supply terminals:		A1-A2		
Supply voltage:	UNI	AC/DC 24 – 240 V (AC 50-60 Hz)		
Consumption (max.):	UNI	3 VA/1 W		
Supply voltage:	400V	AC 400 V (50-60 Hz)		
Consumption (max.):	400V	5 VA/2.5 W		
Supply voltage tolerance:		–15 %; +10 %		
Measuring circuit				
Monitored terminals:		C-B1	C-B2	C-B3
Monitored ranges*:		AC/DC 3.2 – 16 A (AC 50-60 Hz)	AC/DC 1 – 5 A (AC 50-60 Hz)	AC/DC 0.32 – 1.6 A (AC 50-60 Hz)
Input resistance:		2.3 mΩ	11 mΩ	23 mΩ
Max. permanent current:		16 A	8 A	3 A
Inrush overload (1 s):		20 A	16 A	6 A
Time delay Imax (t1):		adjustable, 0.1 – 10 s		
Time delay Imin (t2):		adjustable, 0.1 – 10 s		
Accuracy				
Setting accuracy (mech.):		5 %		
Repeat accuracy:		< 1 %		
Temperature dependance:		< 0.1 %/°C (°F)		
Limit values tolerance:		5 %		
Hysteresis (fault to OK):		selectable, 5 %/10 % from the upper range value		
Output				
Contact type:		2× changeover/SPDT (AgNi)		
Current rating:		16 A/AC1; PD. B300		
Breaking capacity:		4000 VA/AC1, 384 W/DC1		
Inrush current:		30 A/< 3 s		
Switching voltage:		250 V AC/24 V DC		
Power dissipation (max.):		2.4 W		
Mechanical life:		10.000.000 ops.		
Electrical life (AC1):		100.000 ops.		
Other information				
Operating temperature:		–20 .. 55 °C (–4 .. 131 °F)		
Storage temperature:		–30 .. 70 °C (–22 .. 158 °F)		
Dielectric strength:				
supply – output		AC 4 kV		
output 1 – output 2		AC 4 kV		
Operating position:		any		
Mounting:		DIN rail EN 60715		
Protection degree:		IP40 front panel / IP20 terminals		
Overvoltage category:		III.		
Pollution degree:		2		
Cross-wire section – solid/ stranded with ferrule (mm^2):		max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)		
Dimensions:		90 × 52 × 65 mm (3.5″ × 2″ × 2.6″)		
Weight:		UNI – 166 g (5.86 oz), 400V – 248 g (8.7 oz)		
Standards:		EN 60255-1, EN 60255-26, EN 60255-27		

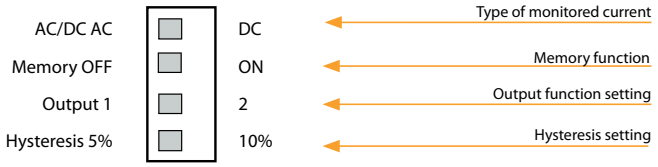
* Only one input can be monitored at a time.

- Used to monitor overload/relief (machines, motors, etc.), check consumption, diagnostic on a remote device (burning, short circuit, increased current draw, etc.)
- Relay is used for monitoring AC or DC current in three ranges.
- Monitors level of current in two independent levels (Imax, Imin).
- Setting the monitored upper level (Imax) in % of range.
- Setting the monitored lower level (Imin):
  in % of the set upper limit (PRI-41, function HYSTERESIS)
  in % of range (PRI-42, function WINDOW)
- Selectable function of output contacts (independently/in parallel).
- Independent adjustable time delay of both levels (eliminating short-term drops and spikes).
- Galvanically separated power supply from monitoring inputs.
- Output contact for each monitored current level.

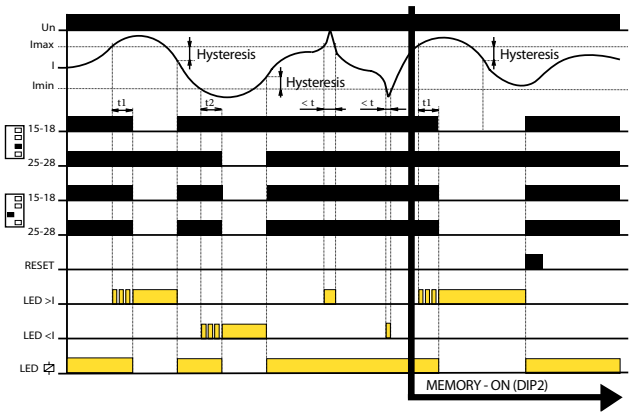
Description



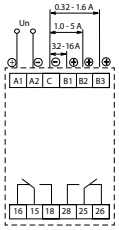
Description of DIP switch



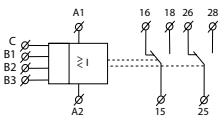
Function



Connection



Symbol



- If the value of the monitored current is in the zone between the set upper and lower levels, the OK state occurs, both output contacts are closed and the yellow LED illuminates. If the value of the monitored current is outside the set limits (> Imax or < Imin), a fault state occurs.
- When moving to a fault state (I > Imax), time delay t1 is running and red LED >I simultaneously flashes. After the time t1 elapses, the red LED >I illuminates and the relevant output contact opens.
- When moving to a fault state (I < Imin), time delay t2 is running and red LED <I simultaneously flashes. After the time t2 elapses, the red LED <I illuminates and the relevant output contact opens.
- When moving from a fault state to the OK state, the relevant red LED immediately goes out, and the corresponding output contact closes.

PRI-51 | Current monitoring relays of Imax level in 1P - AC

EAN code

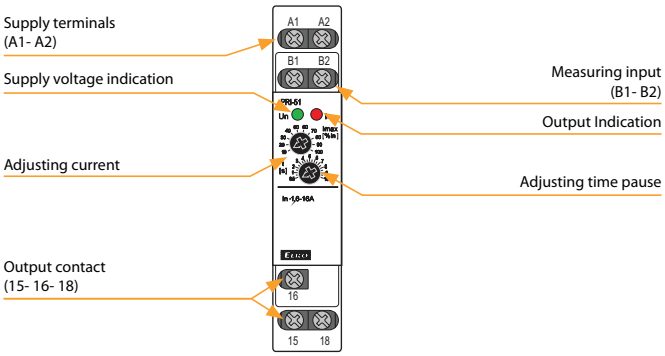
PRI-51/0.5A:	8595188142885
PRI-51/1A:	8595188124904
PRI-51/2A:	8595188124911
PRI-51/5A:	8595188124928
PRI-51/8A:	8595188124935
PRI-51/0.1-10A:	8595188155717
PRI-51/16A:	8595188124942

- It serves for monitoring of heating in rail-switches, heating cables, consumption of 1-phase motors, indicates current flow.
- Flexible adjustment by potentiometer.
- Adjustable delay 0.5 - 10 s to eliminate short current peaks.
- It is possible to use for current scanning from current transformer.
- Supply is galvanically separated from measured current, it must be in the same phase.

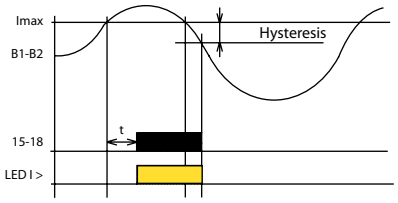
Technical parameters	PRI-51
Supply circuit	
Supply terminals:	A1 - A2
Voltage range:	AC 24 - 240 V and DC 24 V (AC 50-60 Hz)
Burden:	max. 25 VA/1.6 W
Max. dissipated power (Un + terminals):	2.5 W
Supply voltage tolerance:	–15 %; +10 %
Measuring circuit	
Load:	between B1 - B2
Current range:	PRI-51/0.5 A: AC 0.05-0.5 A; PRI-51/8 A: AC 0.8-8 A; PRI-51/1 A: AC 0.1-1 A; PRI-51/0.1-10 A: AC 0.1-10 A; PRI-51/2 A: AC 0.2-2 A; PRI-51/16 A: AC 1.6-16 A; PRI-51/5 A*: AC 0.5-5 A; (AC 50-60 Hz)
Max. permanent current:	PRI-51/0.5 A: 2 A; PRI-51/1 A: 4 A; PRI-51/2 A: 8 A; PRI-51/0.1-10 A: 10 A; PRI-51/5 A, PRI-51/8 A, PRI-51/16 A: 17 A
Inrush overload <1ms:	50 A
Current adjustment:	potentiometer
Time delay:	adjustable 0.5 - 10 s
Accuracy	
Setting accuracy (mechanical):	5 %
Repeat accuracy:	< 1 %
Temperature dependancy:	< 0.1 %/°C (°F)
Limit values tolerance:	5 % (10 % for 0.05 - 0.5 A and 0.1 - 10 A range)
Hysteresis (fault to OK):	5 %
Mechanical life:	60.000.000 op.
Electrical life (AC1):	150.000 op.
Output	
Number of contacts:	1x changeover/SPDT (AgNi/Silver Alloy)
Current rating:	8 A/AC1; PD. B300
Breaking capacity:	2000 VA/AC1, 240 W/DC
Output indication:	red LED
Other information	
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical strength:	4 kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel/IP10 terminals
Overvoltage cathegory:	III.
Pollution degree:	2
Max. cable size (mm^2):	solid wire max. 2x 2.5 or 1x 4, with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	72 g (2.5 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27

* applicable also for current transformer

Description



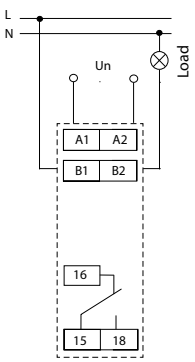
Function



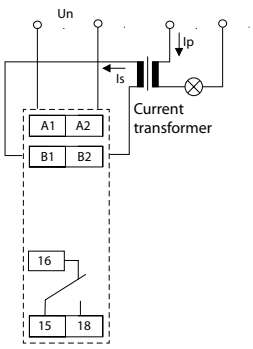
Monitoring relay PRI-51 serves to monitor current level in one-phase AC circuits. Gradual setting of actuating current of monitoring relay enables many different applications. Output relay is in normal state opened. After the set current level is reached, relay closes after the set delay (0.5 - 10 s). When returning from faulty to normal state there is a hystersis (5 %). Multi-voltage of this relay is an advantage. It is possible to monitor load which doesn´t have the same supply as monitoring relay PRI-51.

Range of PRI-51 can be increased by an external current transformer.

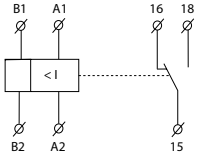
Connection



Example Connection: PRI-51 with current transformer for current range increase.



Symbol



Example of an order

Always specify all reference name of current relay according to required range, for example PRI-51/5.

PRI-53 | Current monitoring relay of Imin or Imax level in 3P

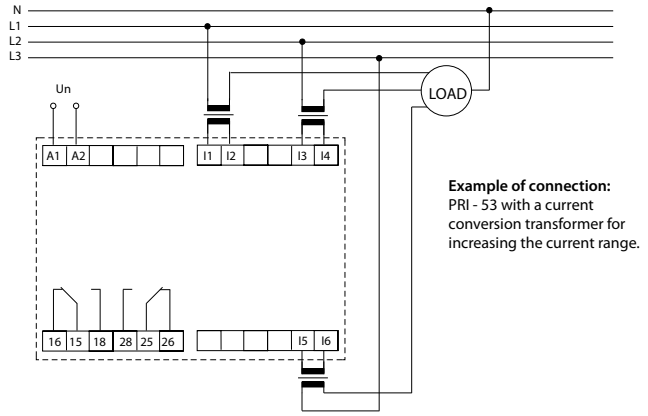
EAN code
PRI-53/5: 8595188142144

- It is intended for monitoring the current in 3-phase devices (e.g. cranes, motors, etc.).
- 24 - 240 V AC/DC power supply, galvanically separated from the circuit of the monitored current.
- Adjustable delay level (when exceeding the preset limit).
- Adjustable function:
  - UNDER - monitors the drop in the strength of current below the preset value (I)
  - OVER - exceeding the preset value (I).
- Nominal current value 5 A.
- Option of connecting via the current transformers to increase the value of the monitored current.

Technical parameters	PRI-53/5
Supply terminals:	A1, A2
Current monitoring terminals	
1st phase:	I1, I2
2nd phase:	I3, I4
3rd phase:	I5, I6
Supply voltage:	24 – 240 V AC/DC
Tolerance of voltage range:	± 10 %
Operating AC frequency:	(50-60 Hz)
Burden (max):	3 VA/1.2 W
Max. dissipated power (Un + terminals):	2.5 W
Rated current In:	AC 5 A
Current level - I:	adjustable 40 – 120 % In
Overload capacity	
Continuous:	10 A
Max. 3s:	50 A
Difference:	fix 1 % In
Delay (until failure):	adjustable 0.5 – 10 s
Output relay - contact:	2x changeover/SPDT (AgNi) gilded
AC contact capacity:	250 V/8 A, max. 2000 VA*
DC contact capacity:	30 V/8 A
Mechanical life:	30.000.000 ops.
Electrical life (AC1):	200.000 ops.
Other information	
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storing temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectric strength	4 kV (power supply – output)
Overvoltage category:	III.
Pollution level:	2
Protection degree:	IP40 from font panel/IP20 terminal
Max. cable size (mm²):	max. 2× 1.5/1× 2.5 (AWG 12)
Dimensions:	90 × 105 × 64 mm (3.5" × 4.1" × 2.5")
Weight:	213 g (7.5 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27

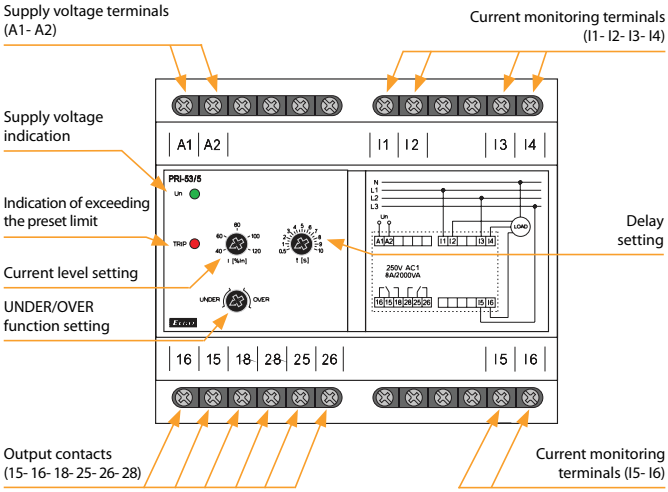
*8 A/AC1; PD. B300

Connection

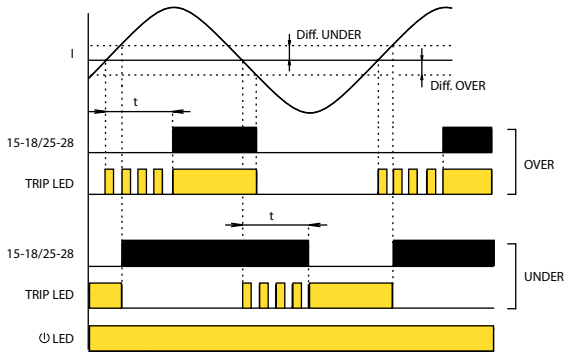


Example of connection:
PRI - 53 with a current conversion transformer for increasing the current range.

Description



Functions



After the supply voltage is connected the green LED is on.

UNDER function:

If the strength of the monitored current in all phases exceeds the preset level I, the relay is triggered and the red LED is off. If the strength of the monitored current drops in any phase below the level I, the relay is disconnected after the preset delay timing elapses and the red LED goes on. The red LED flashes during the delay.

If the strength of the monitored current returns above the level I+difference, the relay is triggered without delay and the red LED goes off.

OVER function:

If the strength of the monitored current is lower in all phases than the preset level I, the relay is disconnected and the red LED is off.

If the strength of the monitored current exceeds in any phase the level I, the relay is triggered after the preset delay timing elapses and the red LED goes on. The red LED flashes during the delay.

If the strength of the monitored current again drops below the level I - difference, the relay is disconnected without delay and the red LED goes off.

Liquid level switches

HRH-5

- Functions: 2
- Range: 5-100kΩ
- Output: 1x clos. 8A
- Supply: AC/DC 24-240V (galvanically separated)

Monitors 1 or 2 levels.
pg. 127

HRH-6

- Functions: 2
- Range: 10-200kΩ
- Output: 6x clos. 10A
- Supply: AC 230V (galvanically separated)

Monitors 5 levels.
pg. 128

HRH-7

Like HRH-5, but in IP65 protection designed for operation in harsh conditions.
pg. 130

HRH-8

- Functions: 8
- Range: 5-100kΩ
- Output: 1x clos. 8A
- Supply: AC/DC 24V; AC 110V; AC230 V; AC 400V (galvanically separated)

Monitors 1 or 2 levels.
pg. 132

HRH-9

- Function: universal
- Range: 10-470kΩ
- Output: 6x clos. 10A
- Supply: AC/DC 24-240V (galvanically separated)

Monitors up to 6 levels.
pg. 134

HRH-9/S

Additional probe status signaling to HRH-9.
pg. 134

Level sets

HRH-4

Set of level switch HRH-5 and contactor VS425.
pg. 136

Accessories

Level probes

SHR-1(M, N) - basic probe made of brass or steel.
SHR-2- stainless steel probe stored in PVC housing.
SHR-3 - probe for demanding and industrial environment.
pg. 137

Cable, wire

D03VV-F 3x0,75/3,2 - cable to SHR-1 and SHR-2 probes.
D05V-K 0,75/3,2 - wire to SHR-1 and SHR-2 probes.
pg. 138

Type	Design	Supply voltage	Sensitivity	Monitored parameters		Settings		Description	Page
				Level max.	Level min.	Time delay	Function		
HRH-5	1-M DIN	AC/DC 24-240 V	5 - 100 kΩ	●	●	●	2	Measuring the frequency of 10 Hz will protect liquid from polarisation and measuring probes from increased oxidation. Galv. separated power supply.	127
HRH-7	IP65 BOX	AC/DC 24-240 V	5 - 100 kΩ	●	●	●	2	Suitable to work in harsh conditions due to the high degree of protection IP65.	130
HRH-8/24V HRH-8/110 V HRH-8/230 V	3-M DIN	AC/DC 24 V AC 110 V AC/DC 230 V	5 - 100 kΩ	●	●	●	8	Sensitivity adjustable by potentiometer. Galvanically separated power supply.	132
HRH-9	6-M DIN	AC/DC 24-240 V	10 - 470 kΩ	●	●	●	Universal	It monitors up to 6 level levels, each with its own output contact. Optional filling/draining function for each probe separately incl. delay options. Sensitivity can be set automatically or manually.	134
HRH-6/AC	IP65 BOX	AC 230 V	10 - 200 kΩ	●	●	●	2	Device monitors 5 of liquid levels using 6 probes.	128
HRH-4/230 V HRH-4/24 V	IP65 BOX	AC 230 V AC/DC 24 V	5 - 100 kΩ	●	●	●	2	Unit with no protection devices - adequate protection element needs to be integrated before the unit. Ingress protection of the assembly is IP65.	136

HRH-5 | Level switch for monitoring 1 or 2 levels

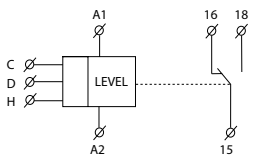
EAN code
HRH-5: 8595188136396

- Relay is designed for monitoring levels in wells, basins, reservoirs, 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).
- Adjustable time delay on the output (0.5 - 10s).
- Sensitivity adjustable by a potentiometer (5 - 100 kΩ).
- Measuring frequency 10 Hz prevents polarization of liquid and raising oxidation of measuring probes.
- Galvanically separated supply voltage UNI 24 to 240 V AC/DC.

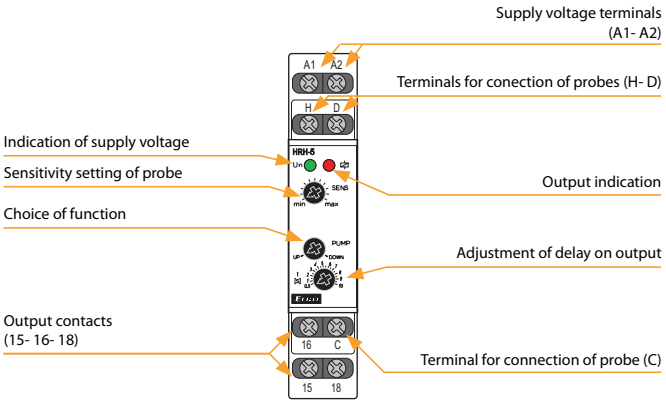
Technical parameters	HRH-5
Functions:	2
Supply terminals:	A1 - A2
Voltage range:	AC/DC 24 - 240 V (AC 50-60 Hz)
Input:	max. 2 VA/1.5 W
Max. dissipated power (Un + terminals):	2 W
Toleration of voltage range:	–15 %; +10 %
Measuring circuit	
Sensitivity (input resistance):	adjustable in range 5 kΩ - 100 kΩ
Voltage n electrodes:	max. AC 3.5 V
Current in probes:	AC < 0.1 mA
Time response:	max. 400 ms
Max. capacity of probe cable:*	800 nF (sensitivity 5 kΩ), 100 nF (sensitivity 100 kΩ)
Time delay (t):	adjustable, 0.5 -10 sec
Time delay after switching on (t1):	1.5 sec
Accuracy	
Accuracy in setting (mech.):	± 5 %
Output	
Number of contacts:	1x changeover/SPDT (AgNi/Silver Alloy)
Current rating:	8 A/AC1; PD. B300
Switching voltage:	2000 VA/AC1, 240 W/DC
Switched voltage:	250 V AC/24 V DC
Mechanical life (AC1):	60.000.000 ops.
Electrical life:	150.000 ops.
Other information	
Operational temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storing temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical strenght:	2.5 kV (supply - sensors)
Operational position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from font panel/IP10 terminals
Overvltage category:	II.
Pollution degree:	2
Profile of connecting wires (mm^2):	max. 2x 2.5, max. 1x 4/ with sleeve max. 1x 2.5, max. 2x 1.5 (AWG 12)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	73 g (2.6 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, EN 60669-1, EN 60669-2-1
Recommended measuring probes:	see pg. 137

* Max. line length is limited by the capacity between the individual cable cores.

Symbol

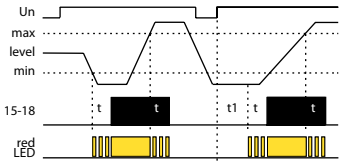


Device description

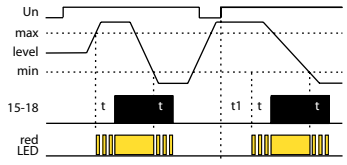


Function

Function PUMP UP



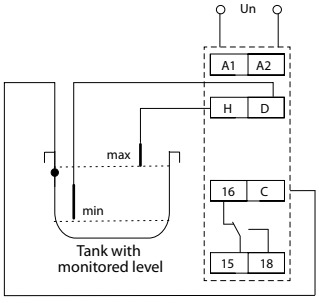
Function PUMP DOWN



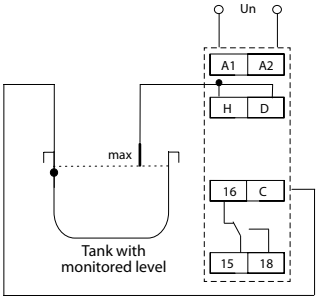
Relay is designated for monitoring of levels of conductive liquids with possibility of functions: PUMP UP or PUMP DOWN. To prevent polarization and liquid electrolysis of liquid, and undesirable oxidation of measuring probes, alternating current is used. For measuring use three measuring probes: H- upper 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 neccessary to connect inputs H and D and connect them to one probe - in this case sensitivity is lowered by half (2.5 to 50 kΩ). 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 infuences of undesirable switching of output contacts by liquid gorgle in tanks, it is possible to set delay of output reaction 0.5 - 10 s.

Connection

Monitoring of two levels



Monioring of one level



HRH-6 | Level switch for monitoring 5 levels in increased protection

EAN code
HRH-6/AC: 8595188136990

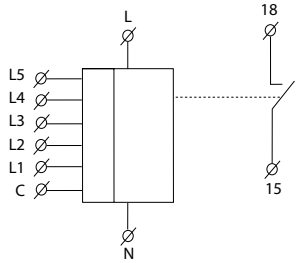
- Function 1 monitors minimal and maximal level depth, for example in fire engine cars, tanks etc.
- Function 2 monitors level depth in water collectors, basins, pools etc.
- Selection of particular function is made by jumper on the front panel.
- Device monitors 5 levels by using six probes (one probe is common).
- Level indicationby six LED's on the front panel of the device.
- Measuring frequency 10 Hz to prevent polarization of liquid.
- Galvanically separated 230 V AC for general use.
- Contact relay 10 A for signalization of full/empty tank (according to a chosen function).
- Choice of functions PUMP UP/OFF/PUMP DOWN by a switch located on the front panel of the device.

Technical parameters	HRH-6/AC
Function:	2
Voltage range:	AC 230 V (50-60 Hz)
Burden:	max. 3.8 VA
Max. dissipated power (Un + terminals):	3 W
Supply tolerance:	–20 % .. +10 %
Measuring circuit	
Sensitivity adjustable in the range*:	min. 10 kΩ max. 200 kΩ
Voltage on probes:	max. 3 V AC
Probe cable maximum capacity:	500 nF (for min. sensitivity), 50 nF (for max. sensitivity)
Time delay:	adjustable 1 to 10 s
Output	
Number of contacts:	1x swiching (AgNi)
Current rating:	10 A/AC1
Switching voltage:	2500 VA/AC1, 200 W/DC
Peak current:	16 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Mechanical life (AC1):	10.000.000 ops.
Electrical life:	100.000 ops.
Other information	
Operating temperature:	–20 .. +55 °C (–20 .. +55 °F)
Storage temperature:	–30 .. +70 °C (–30 .. +70°F)
Diel. strength (supply - probes):	3.75 kV
Operating position:	any
Protection degree:	IP65
Overvoltage category:	III.
Pollution degree:	2
Dimensions:	110 x 130 x 72 mm
Weight:	385 g
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, EN 60669-1, EN 60669-2-1
Recommended measuring probe:	see pg. 137

* sensitivity is higher at both ends of a range of values.

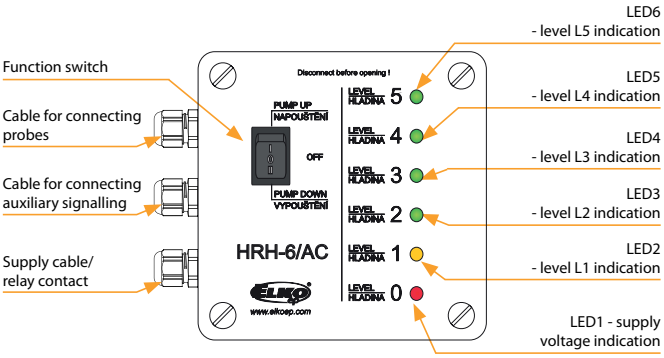
Connection

HRH-6/AC

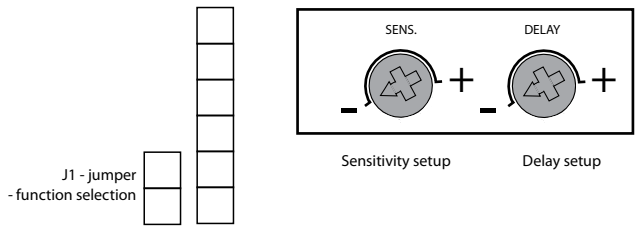


Description

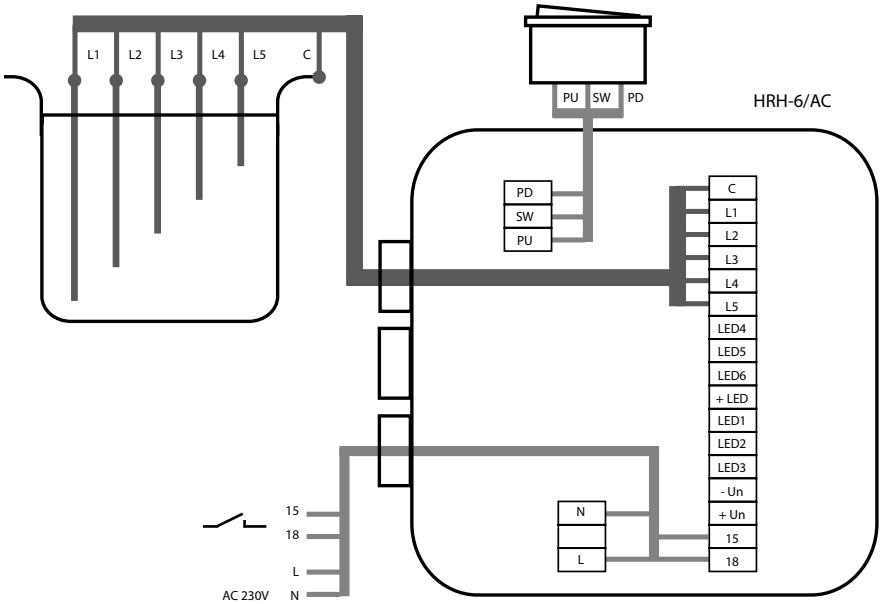
HRH-6/AC



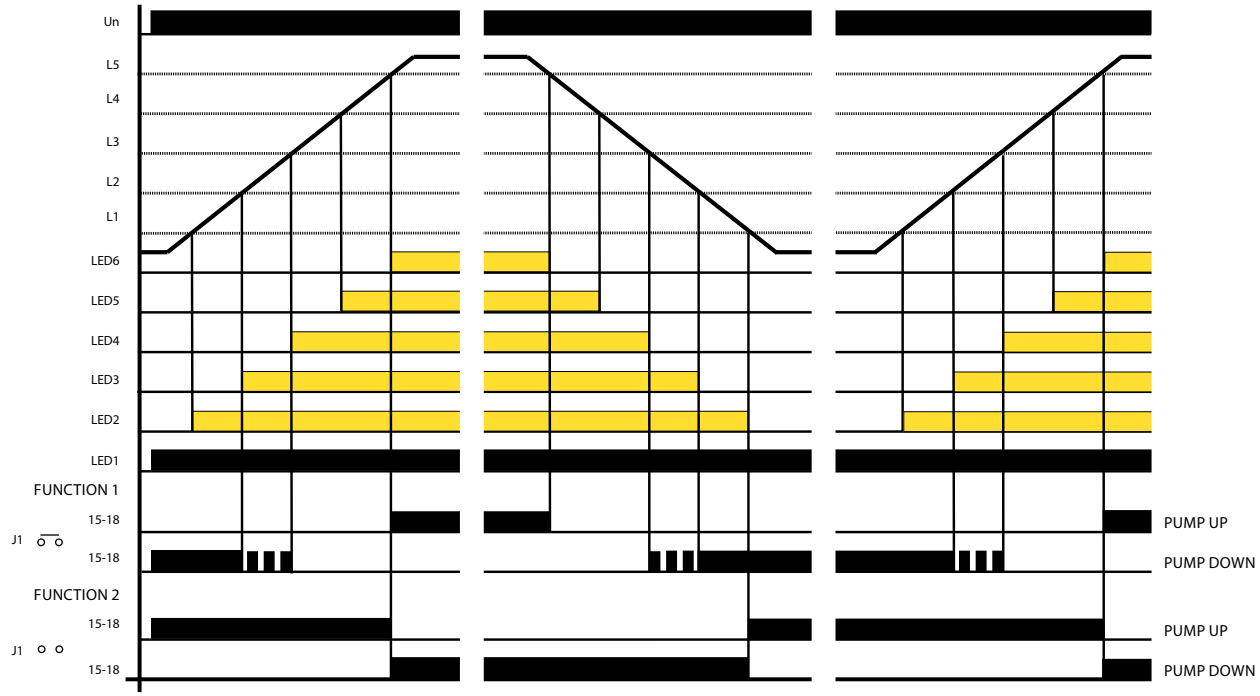
Setup elements (inside unit)



HRH-6 block connecting



Functions



This device monitors level of a conuctive liquid in a tank by using six single probes or one 6-fold probe. In case you use a tank made of a conductive material, it is possible to use it as a common probe C.

In case of supply voltage 230 V AC, the circuits are galvanically separated from the main.

The device is controlled by a three-position switch PUMP UP/OFF/PUMP DOWN. After switching into a position PUMP UP or PUMP DOWN, red LED1 shines and then also LED2 to LED6 according to liquid level. Output relay has 2 selectable functions.

Funtion setting is done by a jumper on basic board of HRH-6.

Function 1: (for use in fire-engines) - jumper is applied. In case of function PUMP UP and level reaching L5, the relay controlling e.g. acustic signalization, permanently closes and indicated full tank. In case of PUMP DOWN function and level dropunder level L3, relay priodically switches and under L2 it switches permanently (indicates almost empty tank).

Function 2: (for keeping liquid level) - jumper is not applied. In case of PUMP UP, sensor is switched until liquid reaches level L5. Then relay opens and switches again in case the liguid level falls under level L1. In case of PUMP DOWN - relay is switched until liquid falls under level L1. Then relay opens and switches again on level L5.

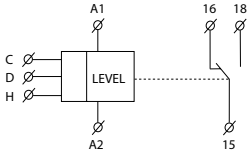
To eliminate LED flashing while level gurgle it is possible to delay reaction of probes (set delay 1 to 10 s). According to conductivity of liquid it is possible to set sensitivity of probes (corresponding to “resistance” of liquid).

HRH-7 | Level switch for monitoring 1 or 2 levels in increased protection

EAN code
HRH-7: 8595188149471

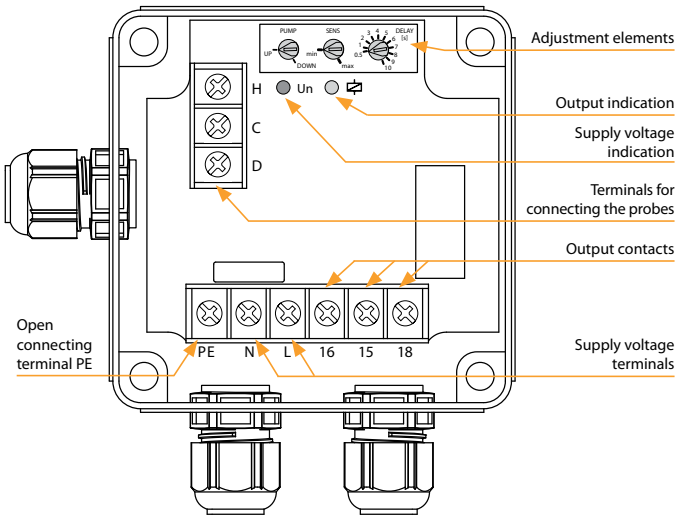
Technical parameters	HRH-7
Function:	2
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 24 - 240 V (AC 50-60 Hz)
Burden:	max. 2 VA/1.5 W
Max. dissipated power (Un + terminals):	3 W
Supply voltage tolerance:	–15 %; +10 %
Max. value of overcharge protection:	16 A
Measuring circuit	
Sensitivity (input resistance):	adjustable from 5 kΩ - 100 kΩ
Voltage on electrodes:	max. AC 3.5 V
Current on probes:	AC < 0.1 mA
Time response:	max. 400 ms
Max. capacity of probe cable:	800 nF (sensitivity 5kΩ), 100 nF (sensitivity 100 kΩ)
Time delay (t):	adjustable, 0.5 -10 sec
Time delay (t1):	1.5 sec
Accuracy	
Setting accuracy (mechanical):	± 5 %
Output	
Number of contacts:	1x changeover/DPDT ($AgSnO_2$)
Current rating:	16 A/AC1; PD. B300
contact NO:	15-18: 6 A/AC3
contact NC:	15-16: 3 A/AC3
Switching capacity:	4000 VA/AC1, 384 W/DC
Switching voltage:	250 V AC/24 V DC
Mechanical life:	30.000.000 ops.
Electrical life (AC1):	100.000 ops.
Other information	
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical strength:	3.75 kV (supply - sensor)
Operating position:	any
Protection:	IP65
Overvoltage category:	III.
Contamination degree:	2
Cable size (mm^2):	max. 2x 2.5/ with sleeve max. 2x 1.5 (AWG 12)
Dimension:	139 x 139 x 56 mm (5.5" x 5.5" x 2.2")
Weight:	241 g (8.5 oz.)
Related standards:	EN 60255-1, EN 60255-26, EN 60255-27, EN 60669-1, EN 60669-2-1
Recommended measuring probes:	see pg. 137

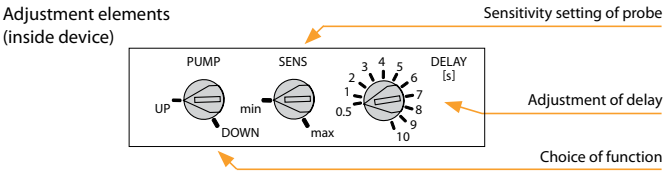
Symbol



- Suitable to operate/work in harsh conditions due to the high degree of protection IP65.
- Swich monitors the level changes in wells, reservoirs, tanks, tankers etc.
- It is possible to select the following configurations:
  - one-level switch of conductive liquids monitors one level (by connecting H and D)
  - two-level switch of conductive liquids monitors two levels (switches on at one level and switched off at another level).
- Adjustable time delay of output (0.5 - 10 s).
- Adjustable sensitivity using potentiometer (5 -100 kΩ).
- Measuring frequency 10 Hz prevents liquid polarization and increased oxidation of measuring probes.
- Measuring circuits are galvanically separated from the power source of the product and circuits of the relay contact by enhanced insulation according to EN 60664-1 for overvoltage category III.

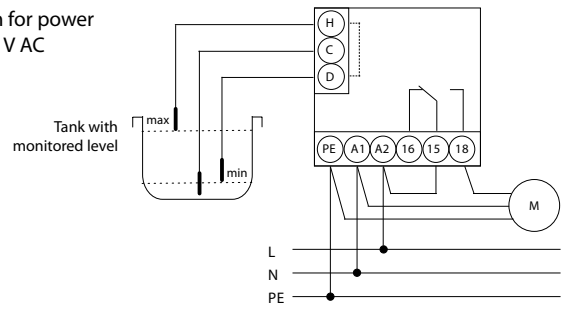
Device description



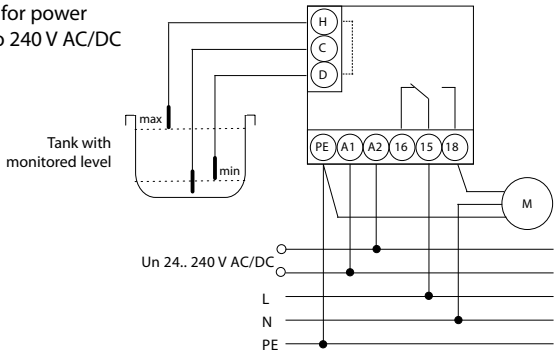


Connection

connection for power supply 230 V AC



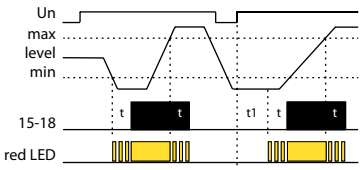
connection for power supply 24 to 240 V AC/DC



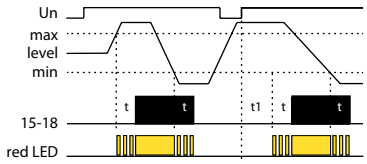
HRH-7 | Level switch for monitoring 1 or 2 levels in increased protection

Function

Function PUMP-UP



Function PUMP-DOWN



An AC current is used for measuring to prevent polarization and electrolysis of fluid and unwanted oxidation of measuring probes. Three probes are used for measuring: H - upper level, D - lower level and C - common probe. If using a tank made from conductive material, it is possible to use the tank itself as probe C.

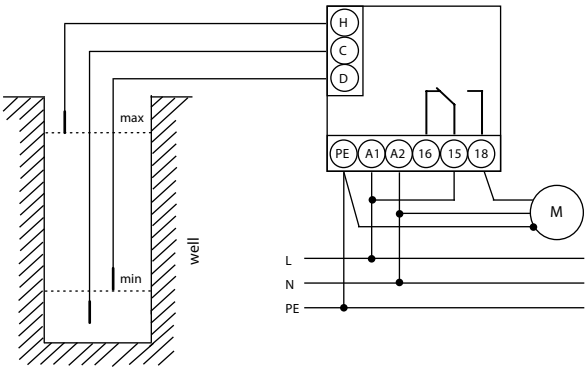
If it is necessary to monitor only one level, there are two connection options:

1. Inputs H and D are connected to a single probe - in this case the sensitivity is decreased to half (2.5 to 50 kΩ).
2. Inputs H and C are connected and the probe is connected to input D - in this case, the original sensitivity remains (5 to 100 kΩ).

It is also possible to connect probe C with a protective conductor of the power system (PE).

Example of connecting the level switch to a 1-phase pump at a well, borehole

wiring for supply 230 V AC (for monitoring two levels)



Monitoring TWO LEVELS of the FLUID LEVEL minimum/maximum - DRAINING function - (PUMP DOWN)

Description of draining function:

This function is used in a well or borehole, where the difference between the upper and lower probes determines, how much water the pump can pump out and protect against running dry.

After detecting the maximum level, the set reaction delay begins running. After this period, the output contact immediately switches on the pump, until the minimum level is reached, when the set delay begins running once again. The pump then switches off.

Monitoring TWO LEVELS minimum/maximum - REPLENISHING function - (PUMP UP)

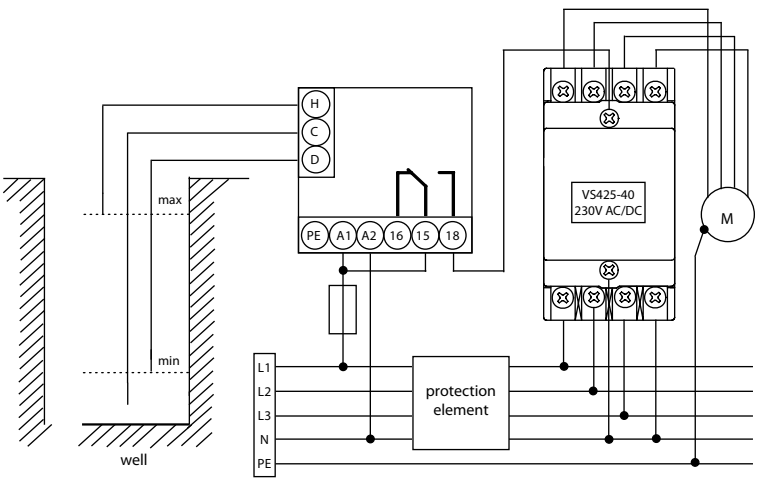
Description of replenishing function:

This function is used when you need to regularly pump in water to a well or borehole, which is leaking.

After detecting the minimum level, the set reaction delay begins running. After this period, the output contact immediately switches on the pump for the period, until it reaches the maximum level, where the set delay begins running once again. The pump then switches off.

Example of connecting the level switch to a 3-phase pump at the well, borehole

wiring for supply 230 V AC (for monitoring two levels)



Monitoring TWO LEVELS minimum/maximum - DRAINING function - (PUMP DOWN)

Description of draining function:

The function is used to protect against overflows and flooding of areas. After detecting the maximum level, the set reaction delay begins running. After this period, the output contact immediately switches on the 3-phase pump, until the minimum level is reached, when the set delay begins running once again. The pump then switches off.

HRH-8 | Multifunction level switch for monitoring 1 or 2 levels

EAN code
HRH-8/230V: 8595188155427
HRH-8/24V: 8595188155564
HRH-8/400V: 8595188171199

- Relay is designed to control the level of conductive liquids in wells, tanks, pools, tankers, reservoirs,... (replacement 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).
- 10 Hz watch frequency prevents polarization of the liquid and increases resistance to interference by network frequency.

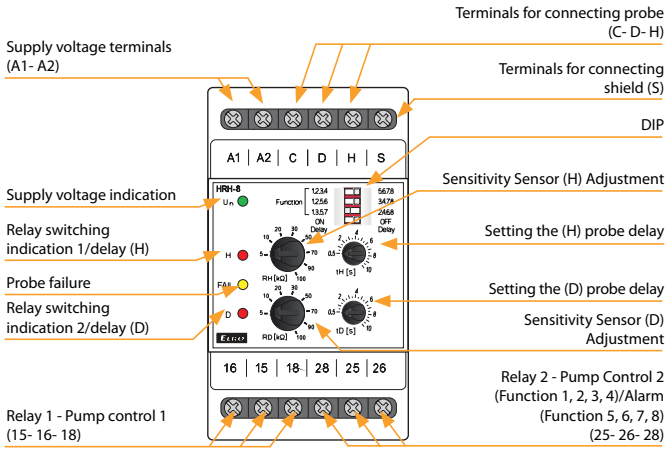
Technical parameters	HRH-8
Function:	8
Supply terminals:	A1 - A2
Voltage range:	AC 230 V, AC 400 V or AC/DC 24V galvanicaly separated (AC 50-60Hz)
Burden max.:	2.5 W/5 VA (AC 230 V, AC 400 V), 1.4 W/2 VA (AC/DC 24 V)
Max. dissipated power (Un + terminals):	4 W (230 V, 400 V); 3 W (24 V)
Supply voltage tolerance:	–15 %; +10 %
Measuring circuit	
Hysteresis (input - opening):	in an adjustable range 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:	adjustable 0.5 -10 sec
Accuracy	
Setting accuracy (mech.):	± 5 %
Output	
Number of contacts:	2x changeover/SPDT (AgNi/Silver Alloy)
Current rating:	16 A/AC1; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	30 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Output indication:	red LED
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Other information	
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectric 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 or 2x1.5/with cavern max. 1x 1.5 (AWG 12)
Dimensions:	90 x 52 x 65 mm (3.5˝ x 2˝ x 2.6˝)
Weight:	247 g/8.7 oz (110 V, 230 V, 400 V); 145 g/5.1 oz (24 V)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, EN 60669-1, EN 60669-2-1
Measuring sensors:	see pg. 137

Measuring probes

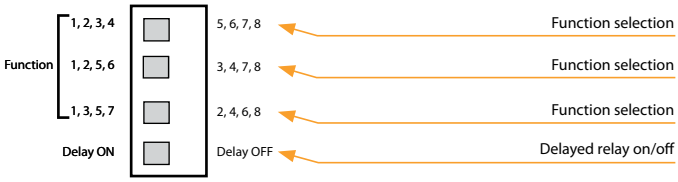
There can be any measuring probe (any conductive contact, it is recommended to use brass or stainless steel).
The probe wire does not need to be shielded, but it is recommended.
When using a shielded wire, the shielding is connected to terminal S.

Description

HRH-8/24V

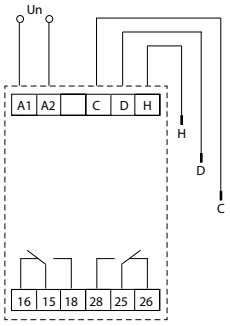


Description and importance of DIP switches

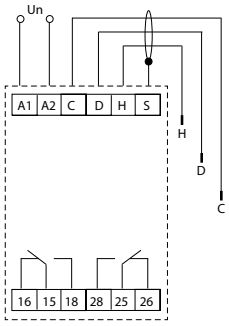


Connection

HRH-8 (230V, 400V)

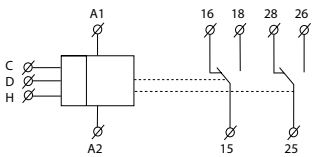


HRH-8/24V

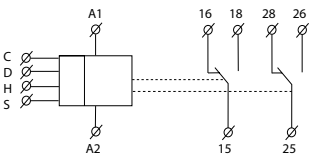


Symbol

HRH-8 (230V, 400V)

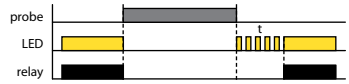


HRH-8/24V

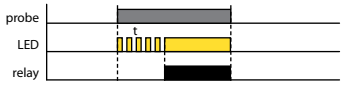


Functions

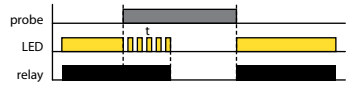
PUMP UP, ON DELAY (Function 1,3,4)



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

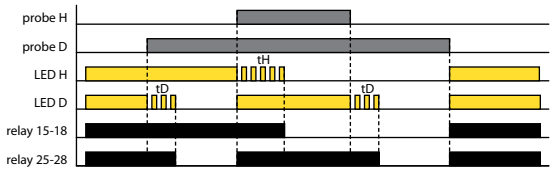


PUMP UP, OFF DELAY (Function 1,3,4)

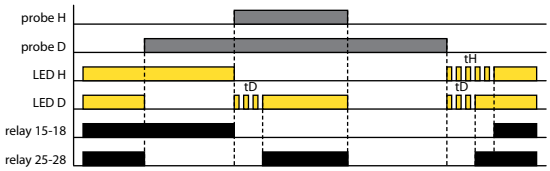


PUMP DOWN, OFF DELAY (Function 2,3,4)

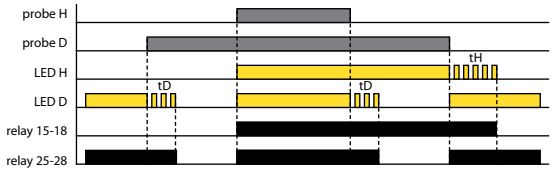
PUMP UP, OFF DELAY (Function 5)



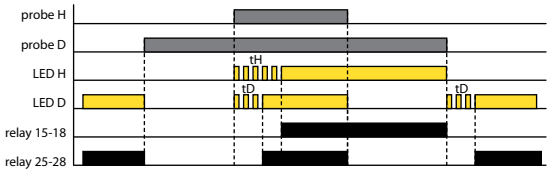
PUMP UP, ON DELAY (Function 5)



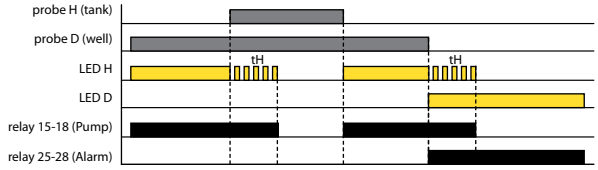
PUMP DOWN, OFF DELAY (Function 6)



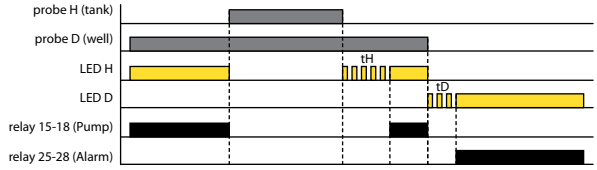
PUMP DOWN, ON DELAY (Function 6)



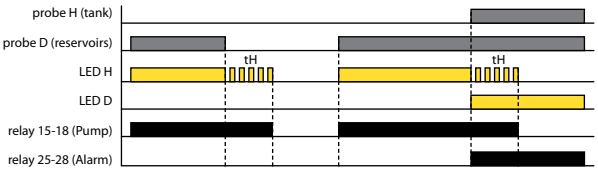
WELL - TANK, OFF DELAY (Function 7)



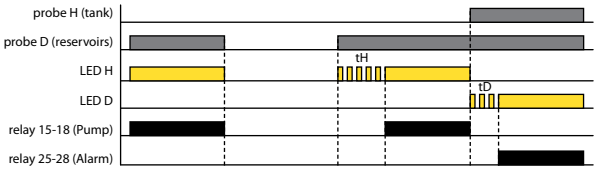
WELL - TANK, ON DELAY (Function 7)



RESERVOIRS - TANK, OFF DELAY (Function 8)



RESERVOIRS - TANK, ON DELAY (Function 8)



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 sump to the tank - probe D in the sump, probe H in the tank. The pump only runs if the probe D is flooded (full tank) and the tank is not full (probe H). The alarm reports the status of full tank and sump (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.

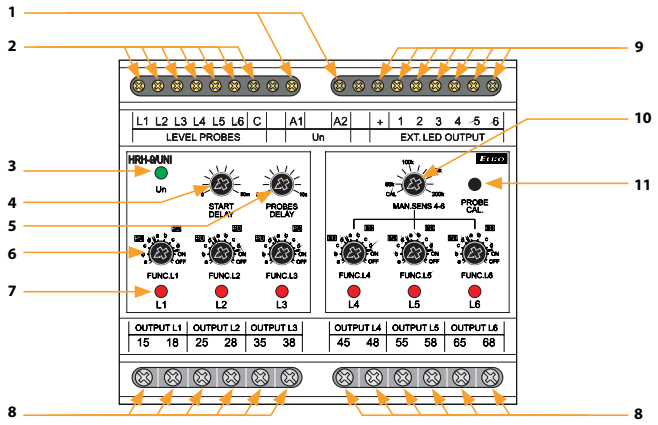
HRH-9 | Universal level switch for monitoring up to 6 levels

EAN code
HRH-9: 8595188181334
HRH-9/S: 8595188181853

- The relay is designed to control the level of conductive liquids in wells, sumps, tanks, pools, tankers, reservoirs ...
- Galvanically separated power and monitoring circuits.
- Possibility to connect up to 6 level probes (+ one common probe).
- Each probe has its own output relay function selection for each probe separately.
- Adjustable delay after power on (START Delay).
- Adjustable relay closing delay (Probe Delay) - common for all probes.
- Automatic calibration of the sensitivity of the probes according to the conductivity of the monitored liquid.
- For probes 4, 5, 6 possibility of manual sensitivity adjustment.
- A monitoring frequency of 10 Hz prevents polarization of the liquid and increases the resistance to mains frequency interference.

Technical parameters	HRH-9
Supply	
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 24 to 240V (AC 50-60Hz)
Supply voltage tolerance:	–15% +10%
galvanicaly separated voltage:	yes
Burden max.:	2W, 4VA
Max. dissipated power (Un + terminals):	10 W
Power indication:	green LED
Measuring circuit	
Number of level probes:	6 + 1 common
Adjustable probe function:	PUMP UP, PUMP DOWN, ON, OFF
Voltage on probes:	5V AC max./10Hz
Time reaction in probes:	1,1s
Time delay (PROBE DELAY):	adjustable 0.5 - 10s
Max. capacity of probe cable:	16nF (sensitivity 470 kΩ), 500nF (sensitivity 9,1 kΩ)
Probe sensitivity calibration range:	10kΩ to 470kΩ
Sensitivity range of probes manually (for probes 4, 5, 6):	50kΩ to 470 kΩ
Time delay (START DELAY):	adjustable 0 to 30min
Probe status indication:	red LED + external LED
Output	
Number of contacts:	6x NO ($AgSnO_2$)
Current rating:	10 A/AC1; PD. B300
Switching voltage max.:	250V AC
Breaking capacity max.:	2500VA
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Other information	
Operating temperature:	
Storage temperature:	–20 .. +55°C (–4 .. 131 °F)
Dielectrical strength:	–30 .. +70°C (–22 .. 158 °F)
power supply - probes	AC 4kV
power supply - relay contacts	AC 4kV
contacts of adjacent relays	AC 4kV
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 (mm^2)	
probes/power supply/signaling:	solid wire max. 1x 2.5 or 2x1.5/with cavern max. 1x 1.5 (AWG 12)
output part:	solid wire max. 1x 2.5 or 2x1.5/with cavern max. 1x 1.5 (AWG 12)
Dimensions:	90 x 105 x 65mm (3.5˝ x 4.1˝ x 2.6˝)
Weight:	252 g (8.9 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, EN 60669-1, EN 60669-2-1

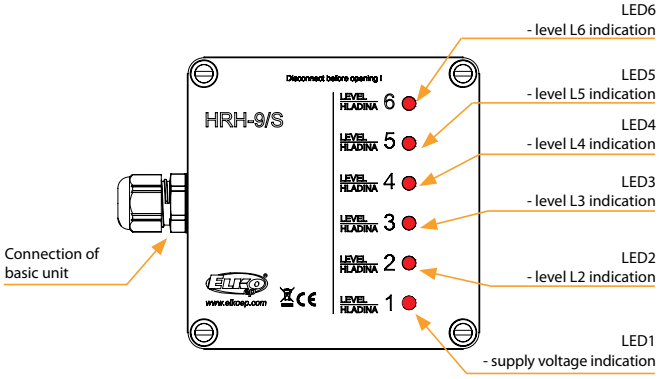
Description



1 Supply voltage terminals
2 Terminals for probes connection
3 Supply voltage indication
4 Setting delay after switching on
5 Delay setting relay closing
6 Probe function setting (L1)
7 Probe status indication (L1)
8 Probe output contact (L1)
9 Terminals for connecting external signaling HRH-9/S
10 Manual adjustment of probe sensitivity L4,L5, L6
11 Calibration button of connected probes

Description

HRH-9/S



Function

Green LED Un:
- Flashes for START DELAY after the power is turned on
- During this time the device does not respond to the state of the level probes
- After START DELAY, the green LED lights up permanently

START DELAY control:
- sets the START DELAY, delay in the range 0 to 30 minutes

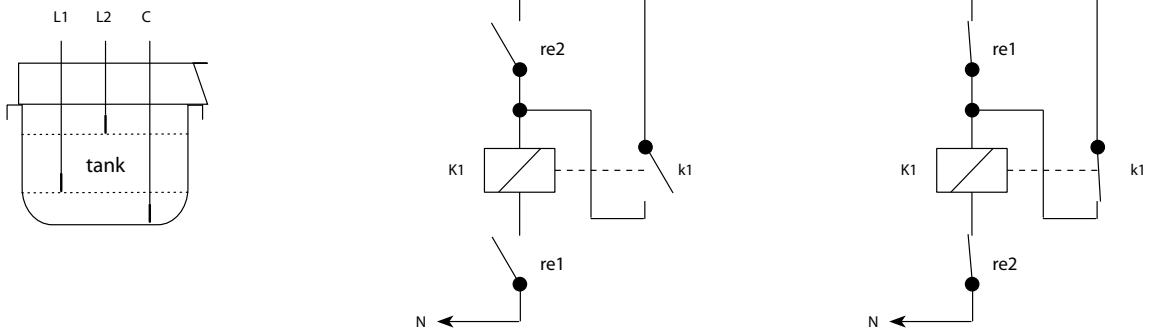
Level probe function switch FUNC. L1 (L2 to L6):
A total of 6 level probes L1 to L6 + common probe C can be connected to the device. Each probe has its own function switch, which sets the functions PUMP UP, PUMP DOWN, ON - permanently
Relay closed, OFF - permanently open relay.
- Positions 1 - 4 = PUMP UP
- Positions 5 - 8 = PUMP DOWN
- Position 9 = ON (relay permanently closed, red LED lit)
- Position 10 = OFF (relay open, red LED not lit)

Each of the PUMP UP, PUMP DOWN functions has 4 response delay setting options:
a - function without delay
b - ON DELAY - delayed closing of the relay
c - OFF DELAY - delayed opening of the relay
d - ON/OFF DELAY - delayed closing and opening of the relay

Each probe then controls its output relay depending on the function switch setting. If a probe is not used, its switch must be set to OFF or ON.
PROBES DELAY control:
- sets the delay of the relay response to the change of the state of the level probes
- Delay is standard for all probes - range 0.5 to 10s

LED indication of the status of probes L1 to L6:
Each probe has its own red LED, indicating the status of the probe + output for external LED additional signalling, which copies the status of the internal red LED:
- Probe is not immersed - the red LED is off
- Probe is immersed, the delay is not running - the red LED is lit.
- Probe has just been immersed and the delay is running - red LED flashes (shorter pulse)
- Probe has just surfaced and a delay is running - red LED flashes (longer pulse)
- Calibration error - red LED flashes quickly

Wiring example

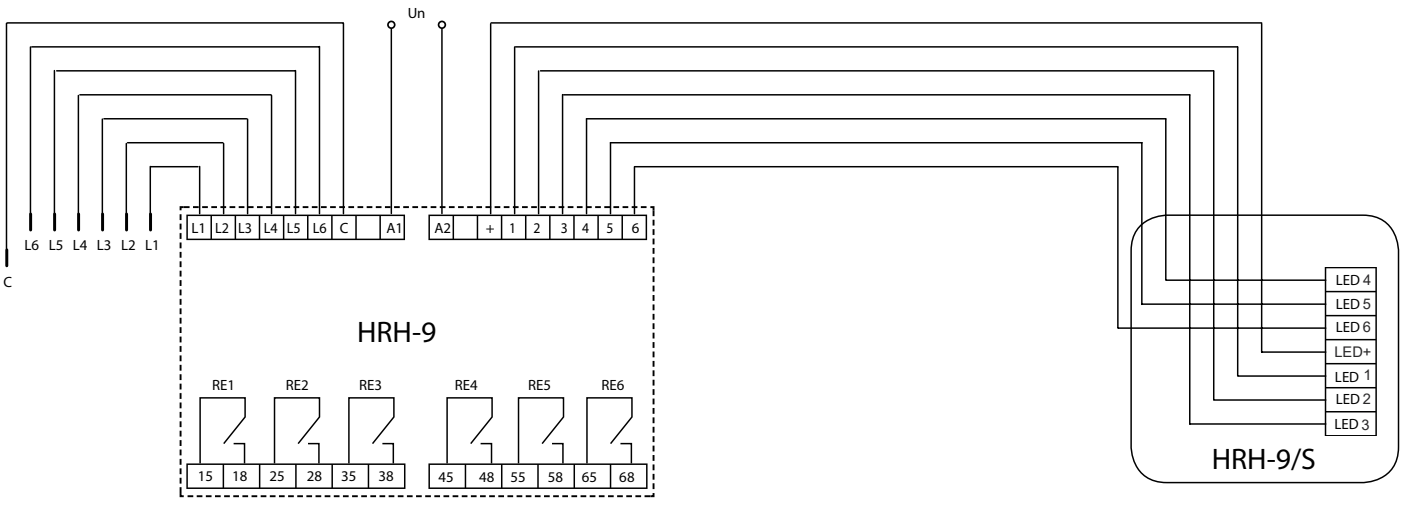


Level probes in the tank:
- the common probe C is positioned so that it is always immersed
- the position of the L1 probe determines the lower level, the position of the L2 probe determines the upper level
- the connection is used to maintain the level between the L1 and L2 probes

Description of the PUMP DOWN function:
- if the tank is empty, both probes L1 and L2 are not immersed, both relays re1 and re2 are open. Contactor K1 controlling the pump is also open (pump stopped)
- if the tank is filled, after reaching the L1 level the relay re1 closes and the state does not change further
- after reaching the level L2 the relay re2 closes and at the same time the contactor K1 closes (the pump works)
- when the level drops below L2, relay re2 opens, but the contactor remains closed via its switching contact k1
- when the level drops below L1, relay re1 opens and at the same time contactor K1 opens (pump stops)

Description of the PUMP UP function:
- if the tank is empty, both probes L1 and L2 are not immersed, both relays re1 and re2 are closed. Contactor K1 controlling the pump is closed (pump is running)
- if the tank is filled, after reaching the level L1 the relay re1 opens - the state does not change - the contactor remains closed via its switching contact k1
- after reaching the level L2, the relay re2 opens and at the same time the contactor K1 (the pump stops)
- when the level drops below L2, relay re2 closes and the state does not change further
- when the level drops below L1, relay re1 closes and at the same time contactor K1 closes (pump starts)

Connection with additional signalization HRH-9/S



HRH-4 | Set of level switch HRH-5 and contactor VS-425 in increased protection

EAN code
HRH-4/230V: 8595188117517
HRH-4/24V: 8595188117500

- In an easy way it automates operations of pumps depending on level.
- Control of level in wells, tanks, reservoirs,...
- It is delivered as a connected set - easy installation.
- Possibility to monitor level of any type of conductive liquid.
- It serves for an automatic operation in 1-phased and 3-phased pumps.
- Set of level switch HRH-5 and a contactor VS425.
- Function choice - pumping up or down.
- Unit requires incoming over-current protection.
- Protection degree of the set is IP65.
- There is a possibility of 4 types of probes in a various design (they are not a part of this set, it is possible to deliver).
- Unit is placed in a plastic box with dimensions 160 x 135 x 83 mm (6.3"x 5.3"x 3.3").

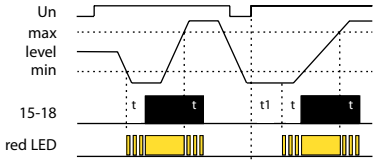
Technical parameters	HRH-4
Function:	2
Voltage range:	AC/DC 230 V or AC/DC 24 V (AC 50-60 Hz)
Burden:	max. 7 VA/1.5 W
Max. dissipated power (Un + terminals):	4 W
Operating range:	–15 %; +10 %
Measuring circuit	
Sensitivity (input resistance):	adjustable in range 5 kΩ - 100 kΩ
Voltage on electrodes:	max. AC 3.5 V
Current on probes:	AC < 0.1 mA
Time response:	max. 400 ms
Max. capacity of probe cable:	800 nF (sensitivity 5 kΩ), 100 nF (sensitivity 100 kΩ)
Time delay (t):	adjustable, 0.5 - 10 sec
Time delay (t1):	1.5 sec
Accuracy	
Setting accuracy (mech.):	± 5 %
Output	
Number of contacts:	4x switching
Rated thermal current:	25 A*
Loading in AC3:	4 kW/400 V
Mechanical life:	6.000.000 ops.
Electrical life (AC1):	150.000 ops.
Other information	
Operation temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical strength (supply-output):	3.75 kV, galvanically insulated
Operating position:	any
Protection degree:	IP65
Pollution degree:	2
Dimensions:	160 x 135 x 83 mm (6.3˝ x 5.3˝ x 3.3˝)
Weight:	743 g (26.2 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, EN 60669-1, EN 60669-2-1
Recommended measuring probes:	see pg. 137

Function description

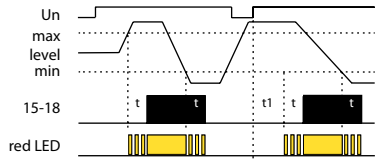
1) PUMP UP - in case the level falls under a lower limit (sensor D), a relay switches and a pump pumps a liquid up until it reaches an upper limit (probe H), then a relay opens and a pump stops pumping. When a level reaches a lower limit again, all process is repeated. After the device is energized, relay automatically closes and a pump pumps liquid to upper limit.
2) PUMP DOWN - in case a level reaches over an upper limit, a relay closes and a pump pumps liquid down. In case a level reaches a lower limit, a relay opens and a pump stops pumping. When energized, a relay is in an open state and a pump operates only after an upper limit is exceeded.
3) In case you combine inputs H and D and connect them to one probe, the device will keep only one level (upper and lower limit will become one). In function PUMP UP relay closes in case the level falls under a probe level. A pump pumps liquid up and in case the level reaches a probe level, a relay opens and a pump stops. The level is kept in a small range around the probe. In function PUMP DOWN relays closes in case a level reaches a probe level. A pump pumps down until the level reaches a probe, then relay opens and pump stops.

Function

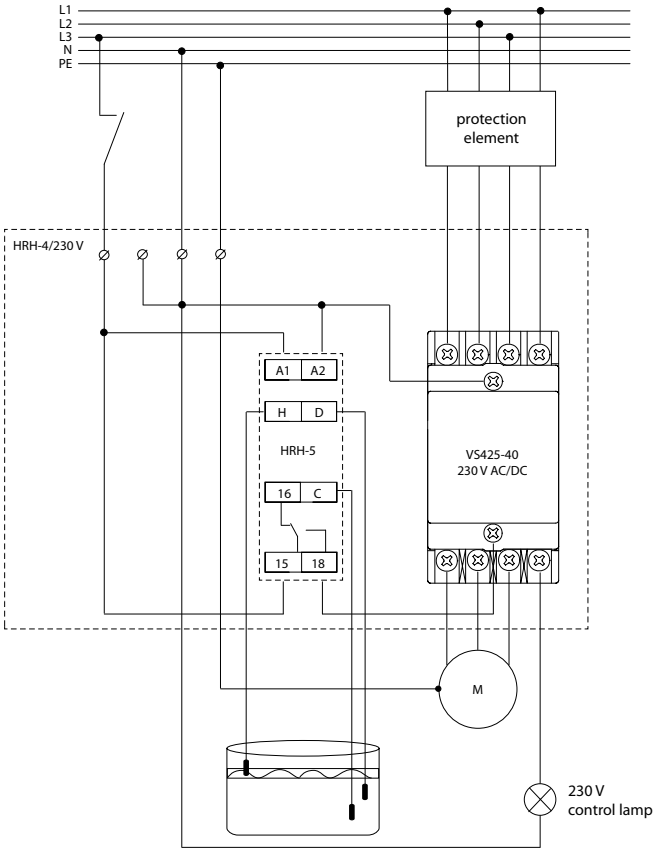
Function PUMP UP



Function PUMP DOWN



Connection



SHR-1-M, SHR-1-N

SHR-1-M SHR-1-N

EAN code
SHR-1-M: 8595188110105
SHR-1-N: 8595188111379

SHR-1-M: brass sensor
SHR-1-N: stainless steel sensor

- Sensor to control flooding.
- Electrode with diametr 4 mm (0.2") is placed in plastic cover.
- Panel or to holder mounting.
- Suitable for use in drinking water.
- Conductor is connected to terminal board, shrink bushing for feeder place insulation is a part of device.
- Max. wire profile: 2.5 mm^2 (AWG10).
- Installation: after connecting a wire to the sensor, run the shrink bushing over the wire onto the sensor.
- Heat the sensor and by shrinking the connection of sensor and wire will be hermetical.
- Weight: 9.7 g (0.3 oz.)
- Operating temperature: -25 °C to +60 °C (-13 °F to 140 °F)
- Total sensor lenght: 65.5 mm (2.58")

SHR-2

EAN code
SHR-2:8595188111263

Level probe **SHR-2**

- Detection sensor is electrode, which in connection with switchable device is used for level detection for example in wells, tanks,...
- To be ued in electric conductive fluids and mechanically polluted fluids with temperature: 1°C to 80°C (33.8 °F to 176°F).
- Suitable for use in drinking water.
- Stainless steel one-pole electrode reside in PVC cover, intended for tank wall mounting or mounting by socket.
- To ensure corret function of the sensor, it is necessary to have the electrode without dirt which could disable the connection of the electrode and fluid and thus lead to malfunction.
- Max. wire profile: 2.5 mm^2 (AWG 10).
- Recomended wire D05V-K0.75/3.2.
- Installation:
  - conductor wire is connected by feazing of two brass screws to stainless steel electrode,
  - conductor is caulked by bushing Pg7 with protection degree IP68.
- Weight: 48.6 g (1.7 oz.)
- Dimensions: max. diameter 21 mm (0.8"), lenght 96 mm (3.8")

SHR-2 in open state

SHR-3

EAN code
SHR-3: 8595188111270

Level probe **SHR-3**

- Stainless probe to be used into demanding industrial environments, designated for screwing into tank wall or cover.
- The probe is installed in horisontal, vertical or in sidelong position on tank side or in tank cover. Installation is done by soldering or by fixing nut. It is necessary to use 24 mm (1") screw. It is necessary to use an adequate torque with regards to a seal and operational overpressure in a tank.
- Sensor has connecting wire - lenght 3 m, which is connected to sensor to scan electrode and sensor bushing connecting wire is double-wire PVC AWG 18 (0.75 mm^2), connection of wires: brown - scan electrode, blue - sensor bushing.
- Connection M18x1.5 screw.
- Protection degree IP67.
- Sensor weight without cable: 100 g (3.3 oz.).
- Operating surroundings: place without the danger of detonation, temperature on screw: max. 95°C (203°F).
- Pressure immunity: on 25 °C (77 °F) 4 MPa, on 95 °C (203 °F) 1.5 MPa.
- Weight: 239 g (8.4 oz.).
- Material: bushing and sean electrode: stainless steel W.Nr. 1.4301, insulation insert of electrode: PTFE.
- Internal material: self - extinguishing epoxide resin.
- Operating temperature: -25 °C to 60 °C (-13 °F to 140 °F).
- Total sensor lenght: 65.5 mm (2.58 ").
- Dimensions to see on page 165

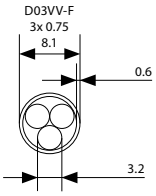
D03VV-F | Cables 3x 0.75 mm²

- Cable to probes SHR-1 and SHR-2, 3x 0.75 mm² (AWG 18), 1m (39.37´).
- Suitable for use in drinking water.
- Construction:
  - bright copper stranded core of hole
  - core insulation of special PVC
  - sheath of special PVC.
- Technical specifications and usage:
  - usable up to 70 °C (158 °F)
  - suitable for submersible conductivity probes for the boreholes, wells and tanks
  - suitable for probes used for level detection of conductive liquids
  - cable capacity is max. 12.3 nF/100 m (328´).

EAN code
D03VV-F 3x0.75/3.2: 8595188165884

Technical parameters	D03VV-F 3x0.75/3.2
Rated voltage:	300/300 V
Test voltage:	2 kV
Capacity:	max. 12.3 nF/100 m (328´)
Core diameter with insulation:	3.2 mm (0.12″)
Overall diameter of cable:	8.1 mm (0.31″)
Section:	0.75 mm² (AWG 18)
Length:	1 m (39.37″)

Cross-section



D05V-K | Wire 1x 0.75 mm²

- Cable to probes SHR-1 and SHR-2, 3x 0.75 mm² (AWG 18), 1m (3.4´).
- Suitable for use in drinking water.
- Construction:
  - bright copper stranded core of hole
  - insulation of special PVC.
- Technical specifications and usage:
  - usable up to 70 °C (158 °F)
  - suitable for probes used for level detection of conductive liquids.

EAN code
D05V-K 0.75/3.2: 8595188165945

Technical parameters	D05V-K 0.75/3.2
Rated voltage:	300/500 V
Test voltage:	2 kV
Capacity:	max. 12.3 nF/100 m (328´)
Core diameter with insulation:	3.2 mm (0.12″)
Section:	0.75 mm² (AWG 18)
Length:	1 m (3.4´)

Analog modular

TER-3A
- Function: heating, cooling
- Range: –30..+10°C
- Output: 1x clos. 16A
- Supply: AC/DC 24-240V
- Sensor: external NTC

pg. 141

TER-3B
- Function: heating, cooling
- Range: 0..+40°C
- Output: 1x clos. 16A
- Supply: AC/DC 24-240V
- Sensor: external NTC

pg. 141

TER-3C
- Function: heating, cooling
- Range: +30..+70°C
- Output: 1x clos. 16A
- Supply: AC/DC 24-240V
- Sensor: external NTC

pg. 141

TER-3D
- Function: heating, closing
- Range: 0..+60°C
- Output: 1x clos. 16A
- Supply: AC/DC 24-240V
- Sensor: external NTC

pg. 141

TER-3G
- Function: heating, closing
- Range: 0..+60°C
- Output: 1x clos. 16A
- Supply: AC/DC 24-240V
- Sensor: external Pt100

pg. 141

TER-3H
- Function: heating, closing
- Range: –15..+45°C
- Output: 1x clos. 16A
- Supply: AC/DC 24-240V
- Sensor: external NTC

pg. 141

TER-3E
- Function: heating
- Range: 0..+60°C
- Output: 1x clos. 16A
- Supply: AC/DC 24-240V
- Sensor: external NTC

pg. 142

TER-3F
- Function: heating
- Range: 0..+60°C
- Output: 1x clos. 16A
- Supply: AC/DC 24-240V
- Sensor: internal NTC (10cm)

pg. 142

Digital + Wi-Fi

TER-7
- Function: heating, cooling
- Range: 1.8-3.3kΩ
- Output: 2x chang. 8A
- Supply: AC/DC 24-240V
- Sensor: motor PTC

Monitors temperature of motor winding.
Optional memory and int./ext. reset.
pg. 143

TER-4
- Functions: 4
- Range: –40..+110°C
- Output: 2x chang. 16A
- Supply: AC/DC 24-240V (galvanically separated)
- Sensor: external NTC

Optional memory and hysteresis.
pg. 144

TER-13/2
Thermostat with time switch + Wi-Fi.
- Functions: 6
- Range: –40..+110°C
- Prog.: daily, weekly, yearly
- Output: 2x chang. 8A

Backup with replaceable battery.
Does not require an internet connection.
Remote control via WRC.
pg. 146

Analog in IP65 protection

TEV-1
- Function: heating, cooling
- Range: –20..+20°C
- Output: 1x chang. 16A
- Supply: AC 230V
- Sensor: external NTC

Thermostat with "dead zone".
Protection against freezing.
pg. 148

TEV-2
- Function: heating, cooling
- Range: –20..+20°C
- Output: 1x chang. 16A
- Supply: AC 230V
- Sensor: external NTC

pg. 149

TEV-3
- Function: heating, cooling
- Range: +5..+35°C
- Output: 1x chang. 16A
- Supply: AC 230V
- Sensor: external NTC

Suitable for frequent changes of temperature (pot. on panel).
pg. 149

TEV-4
- Function: heating, cooling
- Range: –30..+60°C
- Output: 1x clos. 12A
- Supply: AC 230V
- Sensor: internal NTC

Adjustable hysteresis.
3/4-wire connection.
pg. 150

Hygro-thermostat

RHT-1
- Functions: 10
- Range: 0..+60°C, 50..90%
- Output: 1x clos. 16A
- Supply: AC/DC 24-240V
- Sensor: internal

pg. 151

Hygrostat

RHV-1
- Functions: 2
- Range: 0..90%
- Output: 1x clos. 12A
- Supply: AC 230V
- Sensor: internal

Adjustable hysteresis.
3/4-wire connection.
pg. 152

Thermovalve

ATV-1
Energy-saving digital thermostat for radiators, with temperature range 8..28°C (48..82°F).
pg. 153

Accessories

Telva-2
Suitable control element for a wide range of thermostatic valves.
pg. 154

TC, TZ, Pt100
External temperature sensors for thermostats in lengths 10cm, 11cm, 3m, 6m, 12m.
- TC/TZ: NTC thermistor 12kΩ/25°C
- Pt100: only for TER-3G

pg. 155

Type	Design	Type		Sensor			Supply				Heating/cooling	Temperature range	Hysteresis	Relative humidity	Description	Page
		Analog	Digital	Built-in	External	Type	AC 230V	AC 85 - 265V, DC 120 - 370V	AC/DC 24 – 240V	Galv. separated						
TER-3A	1-M DIN	●	x	x	●	NTC	x	x	●	x	●	–30 .. 10 °C (–22 .. 50 °F)	0.5 .. 10 °C (32.9 .. 41 °F)	x	Single thermostat into a switchboard with external sensor for temperature in cooling and against freezing.	141
TER-3B	1-M DIN	●	x	x	●	NTC	x	x	●	x	●	0 .. 40 °C (32 ..104 °F)	0.5 .. 5 °C (32.9 .. 41 °F)	x	Single thermostat into a switchboards with external sensor for sensing room and operational temperature.	
TER-3C	1-M DIN	●	x	x	●	NTC	x	x	●	x	●	+30 .. 70 °C (86 ..158 °F)	0.5 .. 5 °C (32.9 .. 41 °F)	x	Single thermostat into a switchboards with external sensor for sensing temperature in devices (overheating,...).	
TER-3D	1-M DIN	●	x	x	●	NTC	x	x	●	x	●	0 .. 60 °C (32 ..140 °F)	0.5 .. 5 °C (32.9 .. 41 °F)	x	Single thermostat into a switchboard with external sensor for sensing operational temperature of machines and devices.	
TER-3G	1-M DIN	●	x	x	●	Pt100	x	x	●	x	●	0 .. 60 °C (32 ..140 °F)	1°C (34 °F)	x	As TER-3D but with fixed hysteresis.	141
TER-3H	1-M DIN	●	x	x	●	NTC	x	x	●	x	●	0 .. 60 °C (32 .. 113 °F)	1°C (34 °F)	x	Single thermostat into a switchboard with in-built sensor, monitors operational temperature in a switchboard.	
TER-3E	1-M DIN	●	x	x	●	NTC	x	x	●	x	x	0 .. 60 °C (32 ..140 °F)	0.5 .. 5 °C (32.9 .. 41 °F)	x	As TER-3D but with input for sensor Pt100.	142
TER-3F	1-M DIN	●	x	●	x	NTC	x	x	●	x	x	–15 .. 45 °C (5 .. 113 °F)	0.5 .. 5 °C (32.9 .. 41 °F)	x	As TER-3A but with a different temperature range - for cooling and heating.	
TER-7	1-M DIN	●	x	x	●	PTC	x	x	●	x	x	x	Resistance 1.8 - 3.3 kΩ	x	Thermistor relay for protection of motor overheating, input designated for sensor PTC in-built in motor winding.	143
TER-4	3-M DIN	●	x	x	● (2x)	NTC	x	x	●	●	●	–40 .. 110 °C (–40 .. 230 °F)	0.5 .. 2.5 °C (32.9 .. 37 °F)	x	Two-state thermostat (2 inputs, 2 outputs), two independent or dependent thermostats, accurate setting, wide temperature range.	144
TEV-1	BOX IP65	●	x	x	●	NTC	●	x	x	x	●	–20 .. 20 °C (–4 .. 68 °F)	1.5 °C (35 °F)	x	Thermostat with "dead zone", control of heating and protection against freezing, box for outdoor use with IP65.	148
TEV-2	BOX IP65	●	x	x	●	NTC	●	x	x	x	●	–20 .. 20 °C (–4 ..68 °F)	1.5 °C (35 °F)	x	Single thermostat for regulation of heating, short sensor is a part of this device, protection degree IP65.	149
TEV-3	BOX IP65	●	x	x	●	NTC	●	x	x	x	●	5 .. 35 °C (41 .. 149 °F)	1.5 °C (35 °F)	x	As TEV-2 but potentiometer and indication are placed on front panel.	149
TEV-4	BOX IP65	x	x	x	●	NTC	●	x	x	x	x	–30 .. 65 °C (–22 ..149 °F)	0.5/1.5/4 °C (32.9/35/39 °F)	x	Single exteriors thermostat for monitoring and regulation of temperature in demanding enviroments.	150
TER-13/2	2-M DIN	x	●	x	● (2x)	NTC	x	●	x	●	●	–40 .. 110 °C (–40 .. 230 °F)	0.5 .. 50 °C (32.9 .. 122 °F)	x	Multifunction (6thermo functions) digital thermostat with in-built time switch clock, 2 inputs/2 outputs. Wi-Fi connection.	146
RHT-1	1-M DIN	●	x	●	x	–	x	x	●	x	–	0 .. 60 °C (32 .. 140 °F)	H - 4 % T - 2.5°C (36.5°F)	50 - 90 %	Hygro-thermostat for temperature monitoring and regulation in range 0 .. +60 °C (32 .. 140 °F) and relative humidity in range 50 .. 90 %.	151
RHV-1	IP65	●	x	●	x	–	x	x	x	x	–	–30 .. 60 °C (–22 .. 140 °F)	2%, 3%, 4%	0 - 30 % 30 - 60 % 60 - 90 %	Hygrostat for humidity monitoring and regulation in range 0 .. 90 % RH.	152
ATV-1	valve	x	●	●	x	–	x	x	x	x	–	8 .. 28 °C (46 .. 82°F)	x	x	Thermostatic direction valves, temperature regulation +8 .. +28 °C (46 .. 82 °F).	153

EAN code
TER-3A: 8595188138390
TER-3B: 8595188138406
TER-3C: 8595188138413
TER-3D: 8595188138420
TER-3G: 8595188138451
TER-3H: 8595188138468

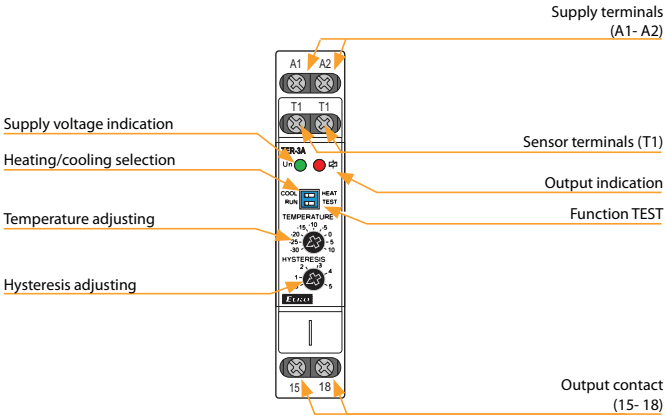
Technical parameters	TER-3	
Function:	single level	
Supply terminals:	A1-A2	
Voltage range:	AC/DC 24 - 240 V (galvanically unseparated) (AC 50-60 Hz)	
Burden:	max. 2 VA/1 W	
Max. dissipated power (Un + terminals):	2.5 W	
Supply voltage tolerance:	–15 %; + 10 %	
Measuring circuit		
Measuring terminals:	T1 - T1	
Temperature range (according to product type sensitivity):	TER-3A: 30 .. 10 °C (–22 .. 50 °F) TER-3B: 0 .. 40 °C (32 .. 104 °F) TER-3C: 30 .. 70 °C (86 .. 158 °F)	TER-3D 0 .. 60 °C (32 .. 140 °F) TER-3G 0 .. 60 °C (32 .. 140 °F) TER-3H –15 .. 45 °C (5 .. 113 °F)
Hysteresis:	adjustable in range 0.5 .. 5°C/0.9 .. 9 °F	
Sensor:	external, thermistor NTC, except for TER-3G (Pt100)	
Sensor fault indication (short circuit/disconnect):	flashing red LED	
Accuracy		
Setting accuracy (mech.):	5 %	
Switching difference:	0.5 °C/0.9 °F	
Temperature dependance:	< 0.1 %/°C (< 0.1 %/°F)	
Output		
Number of contacts:	1x NO-SPST ($AgSnO_2$)	
Current rating:	16 A/AC1, 10 A/24 V DC	
Breaking capacity:	4000 VA/AC1, 300 W/DC	
Switching voltage:	250 V AC/24 V DC	
Output indication:	red LED	
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Other information		
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)	
Dielectrical strength:	2.5 kV (supply - output)	
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP40 from front panel/IP10 terminals	
Overvoltage category:	III.	
Pollution degree:	2	
Max. cable size (mm^2):	solid wire max. 2x 2.5 or 1x 4 with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)	
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)	
Weight:	64 g (2.3 oz.); TER-3G: 68 g (2.4 oz.)	
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, IEC 60730-2-9	

Example of an order

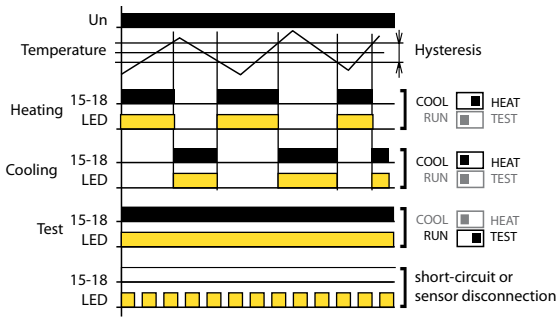
Always specify the type of thermostat (TER-3A, TER-3B .. or TER-3H) in the order according to the required temperature range.

- Single thermostat for temperature monitoring and regulation in range -30 °C to +70 °C (-22 °F to 158 °F) in six ranges.
- It can be used for monitoring temperature e.g. in switchboards, heating systems, cooling systems, liquids, radiators, motors, devices, open spaces, etc.
- Possibility to set function “heating”/”cooling”.
- Adjustable hysteresis (sensitivity), switching by potentiometer in range 0.5 to 5 °C (0.9 to 9 °F).
- Choice of external temperature sensors with double insulation in standard lengths 3, 6 and 12 m (9.8´,19.7´ and 39.4´).
- It is possible to place sensor directly on terminal block - for temperature monitoring in a switchboard or in its surroundings.
- Red LED indicates status of output, green LED indicates energization of the device.

Description

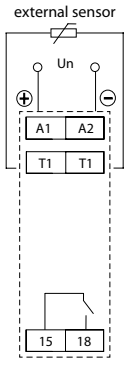


Function

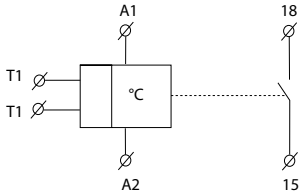


It is a single but practical thermostat with separated sensor for monitoring temperature. Device is placed in a switchboard and external sensor senses temperature of required space, object, or liquid. Supply is not galvanically separated from sensor. Sensor is double insulated. Maximal length of delivered sensor is 12 m/39.4´. 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.

Connection



Symbol



TER-3 (E, F) | Single-level thermostats with range from 0 .. +60° C

EAN code
TER-3E: 8595188138437
TER-3F: 8595188138444

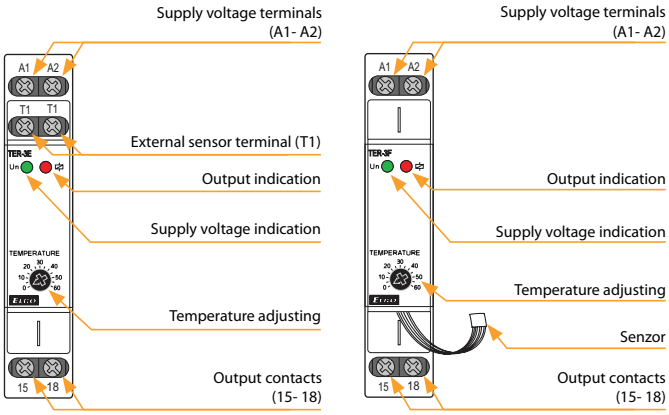
- Single thermostat for temperature monitoring and regulation in range 0 .. +60 °C (32 .. 140 °F).
- It can be used for temperature monitoring e.g. in switchboards, heating systems, liquids, radiators, motors, devices, open spaces, etc.
- Fixed hysteresis at 1 °C/(1.8 °F).
- **TER-3E:** choice of external temperature sensors with double insulation in standard lengths 3 (9.8´), 6 (19.7´) and 12 m (39.4´).
- **TER-3F:** sensor is a part of device, serves for monitoring temperature in a switchboard.

Technical parameters	TER-3E	TER-3F
Function:	single level	
Supply terminals:	A1-A2	
Voltage range:	AC/DC 24 - 240 V (AC 50-60 Hz)	
Burden:	max. 2 VA/1 W	
Max. dissipated power (Un + terminals):	2.5 W	
Supply voltage tolerance:	–15 %; +10 %	
Measuring circuit		
Measuring terminals:	T1 - T1	x
Temperature range:	0 .. +60 °C/(32 .. 140 °F)	
Hysteresis:	fixed 1 °C/(1.8 °F)	
Sensor:	thermistor NTC	built-in
Sensor fault indic. (short-circuit/disconnection):	flashing red LED	
Accuracy		
Setting accuracy (mech.):	5 %	
Switching difference:	0.5 °C (0.9 °F)	
Temperature dependance:	< 0.1 %/°C (°F)	
Output		
Number of contacts:	1x NO - SPST ($AgSnO_2$)	
Current rating:	16 A/AC1,10 A/24 V DC	
Breaking capacity:	4000 VA/AC1, 300 W/DC	
Switching voltage:	250 V AC/24 V DC	
Output indication:	red LED	
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Other information	–20 .. 55 °C (–4 .. 131 °F)	
Operating temperature:	–30 .. 70 °C (–22 .. 158 °F)	
Storage temperature:	2.5 kV (supply - output)	
Dielectrical strength:	any	
Operating position:	DIN rail EN 60715	
Mounting:	IP40 from front panel/IP10 terminals	
Protection degree:	III.	
Overvoltage category:	2	
Pollution degree:	solid wire max. 2x 2.5 or 1x 4	
Max. cable size (mm^2):	with sleeve max. 1x 2.5 or 2x 1.5 (AWG 12)	
	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)	
Dimensions:	90 x 17.6 x 64 mm	
Weight:	64 g (2.3 oz.)	60 g (2.1 oz.)
Standards:	EN 60255-1, EN 60255-26,	EN 60255-27, IEC 60730-2-9

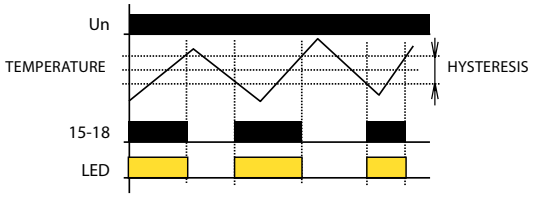
Example of an order

Please specify a type of thermostat in your order (TER-3E , TER-3F).

Description

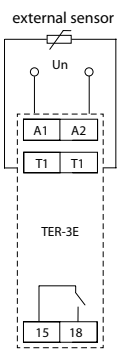


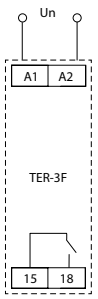
Function



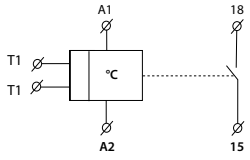
It is a single thermostat for temperature monitoring with separated sensor (except for TER-3F). Device is located in a switchboard and external sensor senses temperature of required space, object or liquid. Supply is not galvanically separated from sensor but sensor is double insulated. Maximal length of sensor cable is 12 m (39.4´). Temperature sensing 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.

Connection





Symbol



EAN code
TER-7: 8595188137164

- It monitors motor coil temperature.
- Fixed levels of switching.
- PTC sensor is used for sensing, it is in-built in motor winding by its manufacturer or there is used an external PTC sensor.
- MEMORY function - relay is blocked in an error state until until operator intervention (press RESET button).
- RESET of faulty state:
  a) button on the front panel
  b) by external contact (remote by two wires).
- Terminals of sensor are galvanically separated, they can be shorted out by terminal PE without damaging the device.
- In case device is supplied from network, neutral wire must be connected to terminal A2.

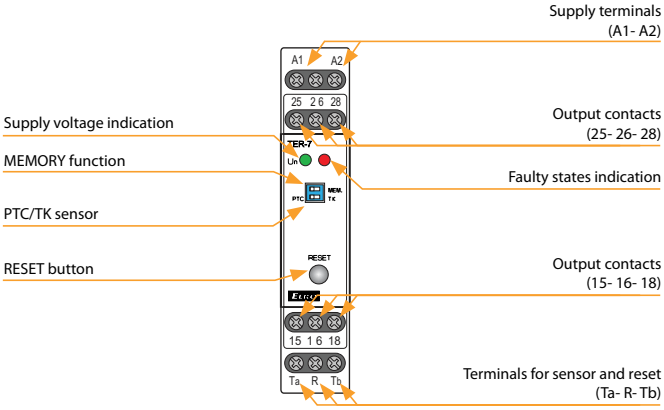
Technical parameters	TER-7
Function:	monitoring temperature of motor winding
Supply terminals:	A1-A2
Voltage range:	AC/DC 24 - 240 V (AC 50-60 Hz)
Burden:	max. 2 VA/1 W
Max. dissipated power (Un + terminals):	2.5 W
Supply voltage tolerance:	–15 %; +10 %
Measuring circuit	
Measuring terminals:	Ta-Tb
Cold sensor resistance:	50 Ω - 1.5 kΩ
Upper level:	3.3 kΩ
Botton level:	1.8 kΩ
Sensor:	PTC temperature of motor winding
Sensor failure indication:	blinking red LED
Accuracy	
Accuracy in repetition:	< 5 %
Switching difference:	± 5 %
Temperature dependance:	< 0.1 %/°C
Output	
Number of contacts:	2x changeover/DPDT (AgNi/Silver Alloy)
Current rating:	8 A/AC1; PD. B300
Breaking capacity:	2000 VA/AC1, 192 W/DC
Inrush current:	10 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Mechanical life:	30.000.000 ops.
Electrical life (resistive):	100.000 ops.
Other information	
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical 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 or 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	71 g (2.5 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, IEC 60730-2-9

Note

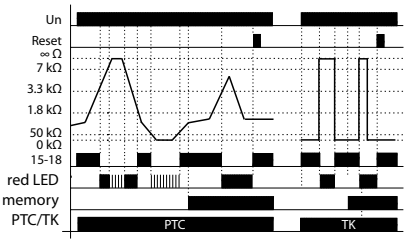
Sensors could be in series in abide with conditions in technical specification - switching limits.

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

Description

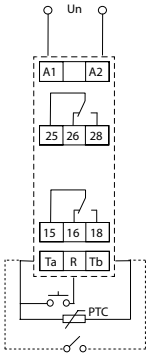


Function

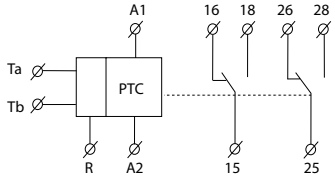


The device controls temperature of motor winding with PTC thermistor which is mostly placed in motor winding or very close to it. Resistance of PTC thermistor run to max 1.5 kΩ in cold stage. By temperature increase the resistance goes strongly up and by overrun the limit of 3.3 kΩ the contact of output 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 possibel 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).

Connection



Symbol



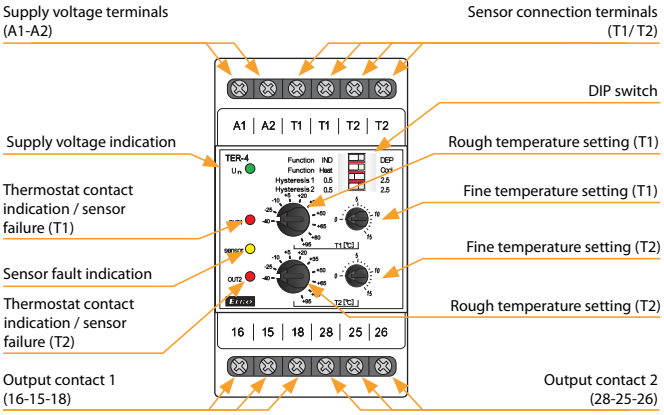
TER-4 | Double thermostat with a range of –40 .. +110 °C

EAN code
TER-4/UNI: 8595188185332

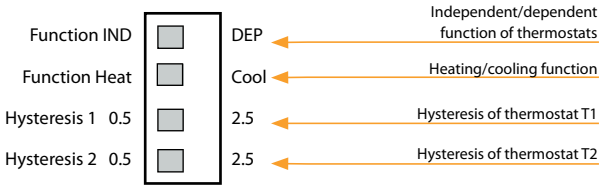
- Used for temperature monitoring in switchboards, heating or cooling systems, engines, liquids, open spaces, etc.
- Double thermostat for temperature monitoring and regulation over a wide range.
- Rough and fine temperature setting for each thermostat.
- Galvanically isolated power supply AC/DC 24 – 240 V.
- 2× input for temperature sensor NTC 12 k/25 °C.
- Setting the independent or dependent function of thermostats.
- Selection of heating/cooling function.
- Selectable hysteresis (sensitivity) of switching.
- Two output contacts (separate for each thermostat).

Technical parameters	TER-4	
Number of functions:	4	
Supply terminals:	A1-A2	
Supply voltage:	AC/DC 24 – 240 V (AC 50-60 Hz) galvanically isolated	
Consumption (max.):	3 VA/1 W	
Supply voltage tolerance:	–15 %; +10 %	
Measuring circuit		
Measuring terminals:	T1-T1 & T2-T2	
Rough temperature ranges:	–40 .. –25 °C (–40 .. –13 °F)	+35 .. +50 °C (95 .. 122 °F)
(selectable by rotary switch)	–25 .. –10 °C (–13 .. 14 °F)	+50 .. +65 °C (122 .. 149 °F)
	–10 .. +5 °C (14 .. 41 °F)	+65 .. +80 °C (149 .. 176 °F)
	+5 .. +20 °C (41 .. 68 °F)	+80 .. +95 °C (176 .. 203 °F)
	+20 .. +35 °C (68 .. 95 °F)	+95 .. +110 °C (203 .. 230 °F)
Fine temperature setting:	0 – 15 °C, within the selected range	
Hysteresis (sensitivity) for T1:	optional, 0.5 or 2.5 °C (by DIP switch)	
Hysteresis (sensitivity) for T2:	optional, 0.5 or 2.5 °C (by DIP switch)	
Sensor:	thermistor NTC 12 kΩ/25 °C (°F)	
Sensor fault indication:	yellow LED lights up + red LED flashing	
Accuracy		
Setting accuracy (mech.):	5 %	
Temperature dependence:	< 0.1 %/°C	
Output		
Contact type:	2× changeover/SPDT (AgNi)	
Current rating:	16 A/AC1; PD. B300	
Breaking capacity:	4000 VA/AC1, 384 W/DC1	
Inrush current:	30 A/< 3 s	
Switching voltage:	250 V AC/24 V DC	
Power dissipation (max.):	2.4 W	
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Other information		
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)	
Dielectric strength:		
supply – output	AC 4 kV	
output 1 – output 2	AC 4 kV	
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP40 front panel / IP20 terminals	
Overvoltage category:	III.	
Pollution degree:	2	
Cross-wire section – solid/ stranded with ferrule (mm²):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)	
Dimensions:	90 × 52 × 66 mm (3.5″ × 2.05″ × 2.6″)	
Weight:	147 g (5.2 oz)	
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, EN 60947-1	

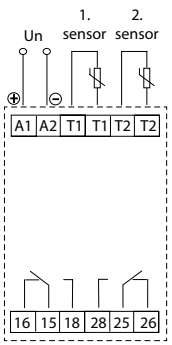
Description



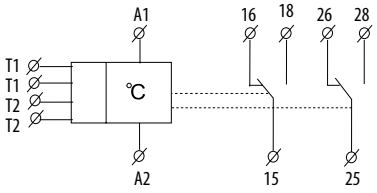
Description of DIP switch



Connection



Symbol



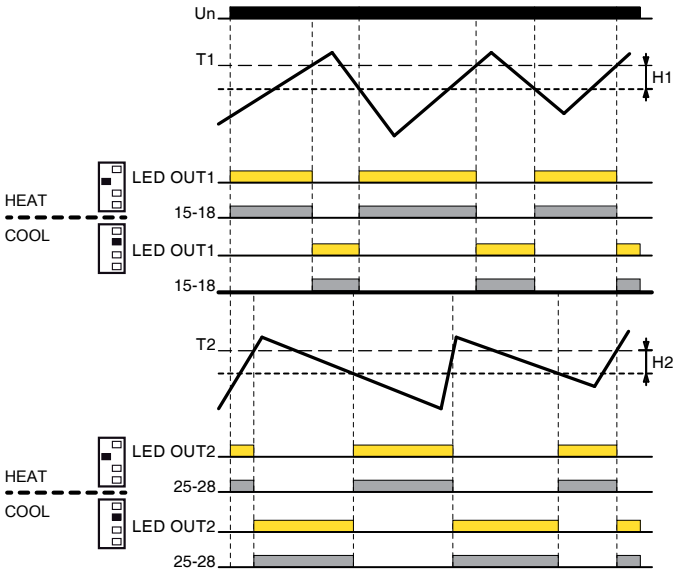
Function

Each thermostat has its own sensor, rough and fine temperature setting, selectable hysteresis and its separated output contact.
The desired temperature is set as the sum value of the selected rough and fine temperature setting.
Example: Required temperature ..... +25 °C (77 °F)
Rough setting ..... +20 °C (68 °F)
Fine setting ..... 5 °C (41 °F)

The device monitors the fault state of each sensor (short circuit or interruption) - if a sensor malfunction occurs, the yellow LED lights up and the corresponding red LED flashes. The respective output contact is opened in the event of a failure.

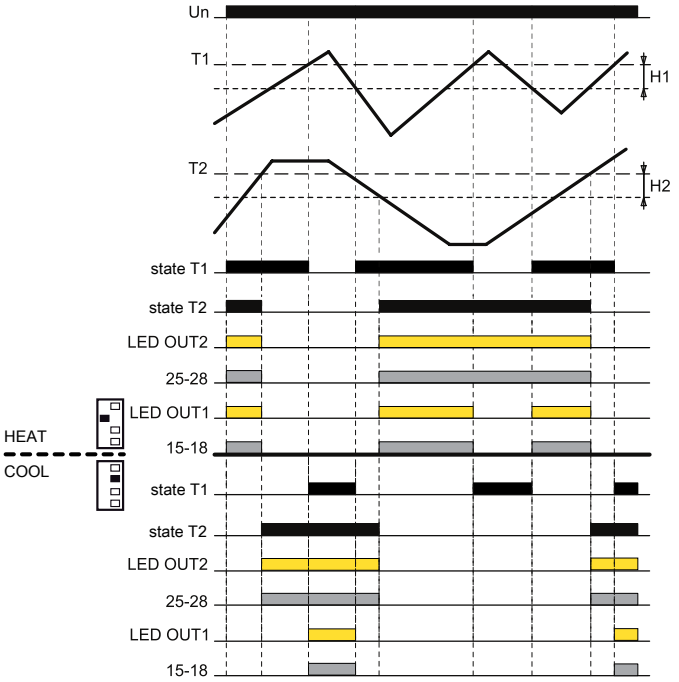
The device can also be operated as a simple thermostat (with one sensor). In this case, it is necessary to connect a 10 kΩ resistor instead of a sensor to the unused input (included in the product package).

Independent function of thermostats
The device acts as two separate simple thermostats.



Graphs legend:
T1(2) - set thermostats temperature
H1(2) - thermostats hysteresis

Dependent function of thermostats
Thermostats are connected "in series" - i.e. thermostat T1 is blocked by thermostat T2. This can be used e.g. so that thermostat T1 is operational and thermostat T2 is interlocking (emergency – e.g. when the device overheats).



TER-13 | Digital thermostat with time switches + Wi-Fi connection

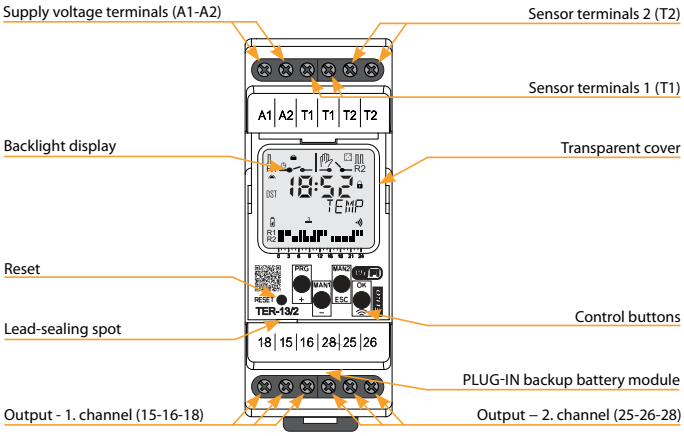
EAN code
TER-13/2: 8595188192255

Technical parameters	TER-13/2
Supply terminals:	A1-A2
Supply voltage:	AC 100 – 240 V (50-60 Hz), DC 145 – 335 V
Consumption (max.):	Wi-Fi "OFF" 1.2 W/2 VA | "ZAP" 1.7 W/3.1 VA
Supply voltage tolerance:	–15 %; +10 %
Measuring circuit	
Measuring terminals:	T1-T1, T2-T2
Temperature range:	–40 .. +110 °C (–40 .. +230 °F)
Hysteresis (sensitivity):	adjustable, 0.5 .. 100 °C (33 .. 212 °F)
Diference (for differential thermostat):	adjustable, 1 .. 50 °C (34 .. 122 °F)
Sensor failure indication:	displayed on LCD*
Output	
Contact type:	2× changeover ($AgSnO_2$)
Current rating:	AC 10 A/DC 5 A; PD. B300
Breaking capacity:	2500 VA/AC1, 150 W/DC1
Switching voltage:	AC 250 V/DC 30 V
Power dissipation (max.):	1.2 W
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Time circuit	
Accuracy:	max. ±0.5 s day (23 °C/73.4 °F)
Min. switching interval:	1 s
Program data storage period:	min. 10 year
Set time backup:	up to half a year with 60 outages (CR 2032 - 3V)
Program circuit	
Number of memory locations:	200 - time programs, 30 - holidays
Program type:	daily, weekly, yearly + temperature
Displayed data:	LCD display with white backlight
Settings via website:	by Wi-Fi (2.4 GHz)
Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:	
supply – output	AC 4 kV
output 1 – output 2	AC 4 kV
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel/IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section; solid/ stranded with ferrule (max.):	1× 2.5 mm² (14 AWG), 2× 1.5 mm² (16 AWG)/ 1× 2.5 mm² (14 AWG), 2× 1.0 mm² (17 AWG)
Dimensions:	90 × 35 × 64 mm (3.5"× 1.4"× 2.5")
Weight:	126 g (4.4 oz)
Standards:	EN 61812-1, EN 18031-1

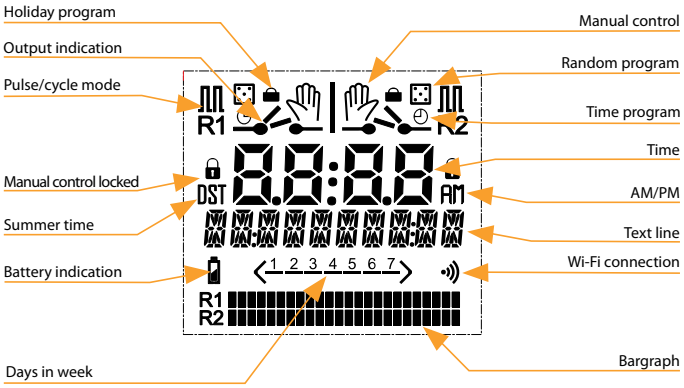
*** ERROR** - *short circuit, sensor interruption*

- Switching control based on measured temperature with built-in time switch allowing daily, weekly, and yearly program. This way, the thermostat function can be limited in real-time as needed.
- The thermostat is subordinate to the time switch programs.
- Simple setting after the first start-up.
- Complex control of home and water heating, incl. solar heating.
- Two thermostats in one, two temperature inputs, 2-channel design (each with an operating hours counter).
- Functions: 2 independent single-stage thermostats, depending functions of 2 thermostats, differential thermostat, 2-stage thermostat, thermostat with "WINDOW", thermostat with dead zone.
- Wide operating temperature settings, option unit selection (°C and °F).
- User replaceable battery to back up the set time during power outages.
- Built-in web server for setup and control via Wi-Fi connection.
- Time synchronization through NTP server (require internet connection of thermostat).
- Possibility of permanent connection to the local network.
- WRC: web remote control and setup from anywhere (require internet connection of thermostat).
- New well-arranged display with white backlight.
- Pulse/cycle output mode.
- Transition of summer/winter time – AUTO or OFF.
- PIN code protection against unauthorized changes.
- Wireless firmware update.

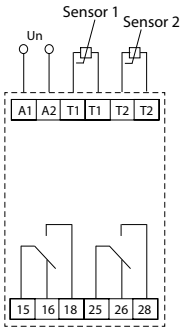
Description



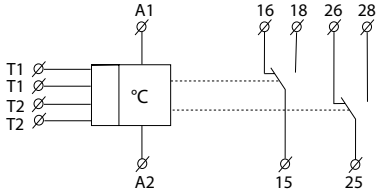
Description of displayed elements



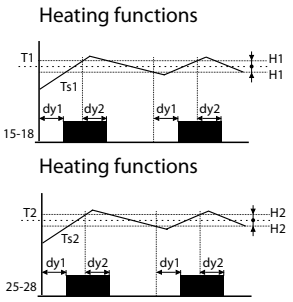
Connection



Symbol



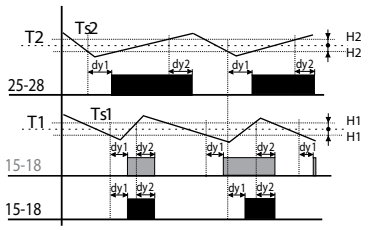
1. 2 independent single-stage thermostats



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
15-18 output contact (for T1)
25-28 output contact (for T2)

Classic function of thermostat, output contact switched until adjusted temperature is reached. Hysteresis eliminates frequent switching - output oscillation.

2. Depending functions of 2 thermostats

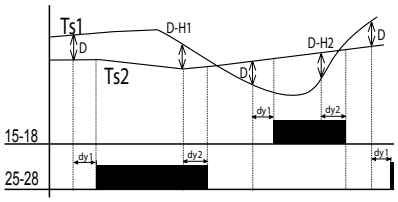


Legend:
Ts1 - real (measured) temperature 1
Ts2 - real (measured) temperature 2
T1 - adjusted temperature T1
T2 - adjusted temperature T2
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1- set switching delay of the output
dy2 - set delay on output breaking
25-28 output contact (for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

Output 15 - 18 is closed, if temperature of both thermostats is bellow an adjusted level. When any thermostat reaches adjusted level, the contact 15 - 18 opens.

Serial inner connection of thermostats (logic function AND).

3. Differential thermostat

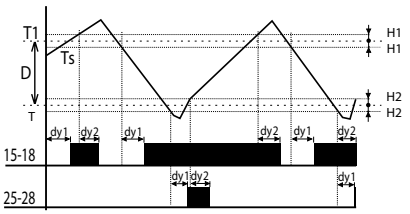


Legend:
Ts1 - real (measured) temperature T1
Ts2 - real (measured) temperature T2
D - adjusted difference
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1- set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact (for T1)
25-28 output contact (for T2)

Switching of output corresponds with input, which has lower temperatures when diffference is exceeded.

Differencial 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.

4. 2-stage thermostat

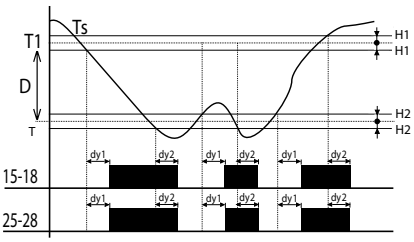


Legend:
Ts - real (measured) temperature
T1 - adjusted temperature
T=T1-D
D - adjusted difference
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T
dy1- set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact
25-28 output contact

Typical example of use for two-stage thermostat is e.g in boiler-room, where there are two biolers 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 set difference (D) output 15-18 functions as normal thermostat to input 1 (type 1). In case temperature falls under set difference, second output switches too.

5. Thermostat with "WINDOW"

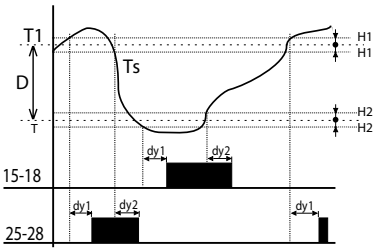


Legend:
Ts - real (measured) temperature
T1 - adjusted temperature
T=T1-D
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T
dy1- set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact
25-28 output contact

Output is closed (heating) only if temperature is within adjusted range. If temperature is out of range, the contact opens. T is set as T1-D.

The function is used for protection of gutters against freezing.

6. Thermostat with dead zone



Legend:
Ts - real (measured) temperature
T1 - adjusted temperature
T=T1-D
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T
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). If temperature is higher than T1, output contact of cooling switches ON; if the temperature gets bellow T1, the contact switches OFF.

If the temperature gets bellow temperature T, the contact of heating switches ON and it switches OFF when temperature T is exceeded. 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 T.

TEV-1 | Two-level thermostat with a range of –20 .. + 20° C in increased protection

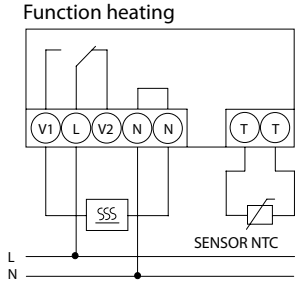
EAN code
TEV-1: 8595188129121

- Two-level thermostat with function "WINDOW" meaning that output is switched in case, the measured temperature is within set range (adjustable in range -20 .. +20 °C/-4 °F .. +68 °F).
- Used as protection against freezing (water-shoots, pavements, drives, pipes, etc.) heating is on, when temperature falls under set upper level (e.g. +5 °C/+41 °F) and off in case it falls under lower level (e.g. -10 °C/ -50 °F, when heating is not able effectively operate).
- Thermostat is placed in water-proof box with IP65, which allows installation outside, with in-built sensor TZ-0.
- Thermostat status is indicated by LED (3 colours) under transparent cover.
- Function monitoring short-circuit and sensor disconnection (break).

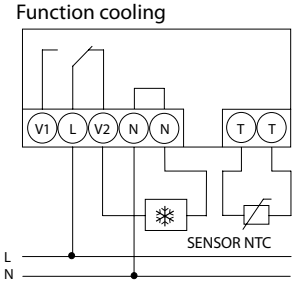
Technical parameters	TEV-1
Function:	two-level thermostat
Supply terminals:	L - N
Voltage range:	AC 230 V (50-60 Hz)
Input:	max. 2.5 VA/0.5 W
Max. dissipated power (Un + terminals):	3 W
Tolerance of voltage range:	±15 %
Measuring circuit	
Measuring terminals:	T - T
Temperature ranges	
thermostat 1:	–20 .. 20 °C (–4 .. 68 °F)
thermostat 2:	–20 .. 20 °C (–4 .. 68 °F)
Hysteresis (sensitivity):	3°C (± 1.5 °C)/37.4 °F (± 34.7 °F)
Sensor:	thermistor NTC 12 kΩ/25 °C (77 °F)
Faulty sensor indication:	red LED flashing
Accuracy	
Accuracy of settings (mech.):	5 %
Dependance on temperature:	< 0.1 %/°C (°F)
Output	
Number of contacts:	1x changeover/SPDT (AgNi/Silver Alloy)
Current rating:	16 A/AC1; PD. B300
Max. breaking capacity:	4000 VA/AC1, 384 W/DC
Peak current:	30 A/< 3 s
Switched voltage:	250 V AC
Output indication:	LED
Mechanical life:	10.000.000 ops.
Electrical life:	100.000 ops.
Other information	
Operation temperature:	–30 .. 50 °C (–22 ..140 °F)
Operation position:	any
Protection degree:	IP65
Overvoltage category:	III.
Pollution level:	2
Max. cable size (mm²):	solid wire 2.5/ with sleeve 1.5 (AWG 12)
Dimensions:	110 x 135 x 66 mm (4.33 ˝x 5.3 ˝x 6.6 ˝)
Weight:	270 g (9.5 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, IEC 60730-2-9

Connection

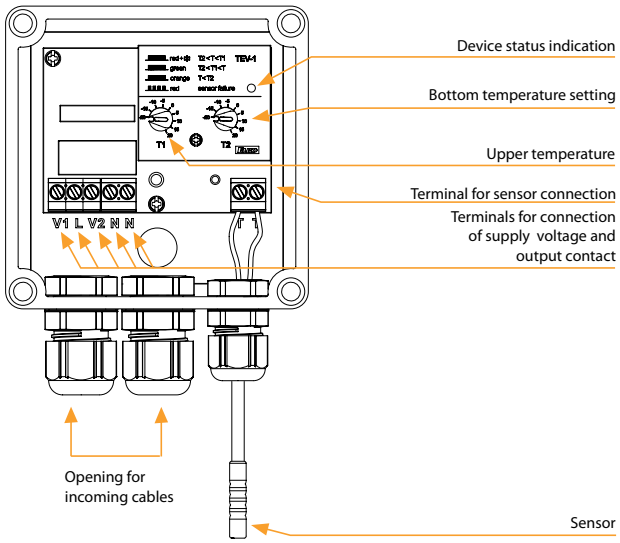
Function heating



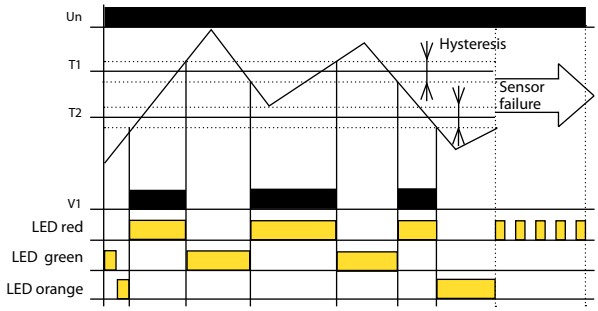
Function cooling



Description

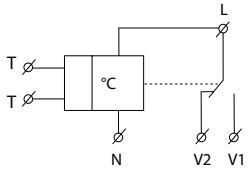


Function



TEV-1 is a double thermostat designated for system of protection of roof water- shoots against freezing. The device is placed in a waterproof box (IP65), sensor with double insulation, which is a part of the device, senses ambientrature. The device operates as zonal thermostat with independent setting of upper and bottom operational temperature. In case the ambient temperature is higher than T1 (upper temperature), thermostat switches heating of watershoots off (icing melts down). In case the ambient temperature is lower than T2 (bottom temperature), thermostat also switches heating off (to big freezing-heating cannot manage to melt the ice).

Symbol



TEV-2, TEV-3 | Single-level thermostats with ranges of –20 .. + 35° C in increased protection

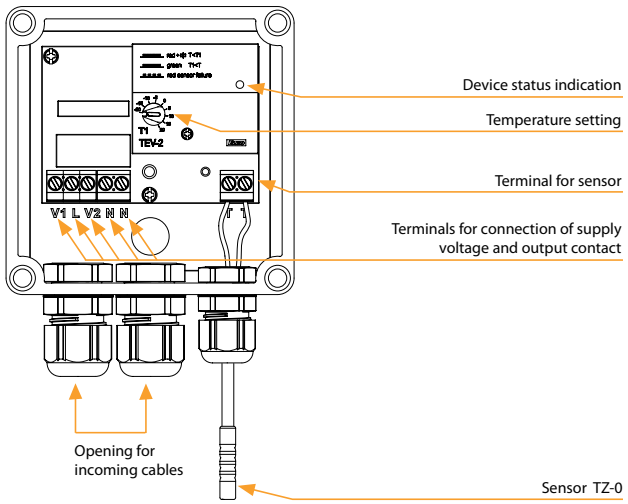
TEV-2 TEV-3

EAN code
TEV-2: 8595188129251
TEV-3: 8595188129268

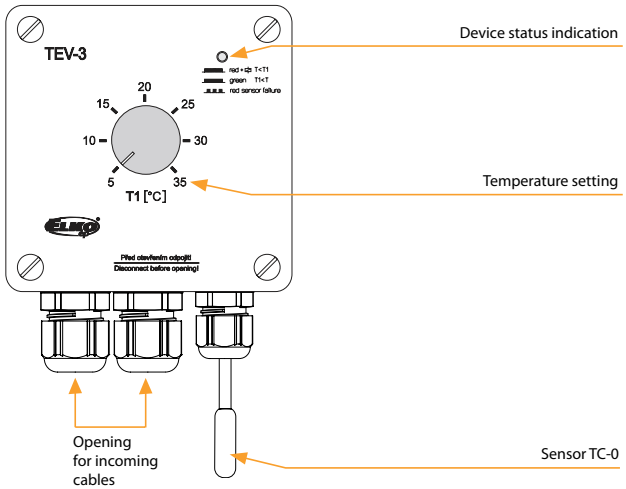
- Single level thermostat with possibility of temperature management in adjustable range.
- Used to regulate heating (or cooling) in demanding spaces (outdoor environment, humidity, dust).
- Thermostat is placed in water-proof box with IP65 protection, which enables installation outside, with in-built sensor.
- TEV-2: control and indication elements are placed under transparent cover.
- TEV-3: control and indication elements are placed directly on the cover (for easy orientation and frequent change of temperature).
- Thermostat status is indicated by two-tone LED.
- Function of monitoring sensor disconnection and short-circuit.

Technical parameters	TEV-2	TEV-3
Function:	single-level thermostat	
Supply terminals:	L-N	
Supply voltage:	AC 230 V (50-60 Hz)	
Consumption (max.):	2.5 VA/0.5 W	
Supply voltage tolerance:	± 15 %	
Measuring circuit		
Measuring terminals:	T-T	
Temperature ranges:	–20 .. +20 °C (–4 .. 68 °F)	+5 .. +35 °C (41 .. 95 °F)
Hysteresis (sensitivity):	3 °C (± 1.5 °C)/37.4 °F (± 34.7 °F)	
Sensor:	thermistor NTC 12 kΩ	
Accuracy		
Setting accuracy (mech.):	5 %	
Temperature dependency:	< 0.1 %/°C (°F)	
Output		
Contact type:	1× changeover/SPDT (AgNi)	
Current rating:	16 A/AC1	
Breaking capacity:	4000 VA/AC1, 384 W/DC1	
Inrush current:	30 A/< 3 s	
Switching voltage:	250 V AC/24 V DC	
Power dissipation (max.):	1.2 W	
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Other information		
Operating temperature:	–30 .. +50 °C (–22 .. 122 °F)	
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)	
Operating position:	any	
Protection degree:	IP65	
Overvoltage category:	III.	
Polution degree:	2	
Cross-wire section – solid/ stranded with ferrule (mm²):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 12)	
Dimensions:	110 × 135 × 66 mm (4.33″ × 5.3″ × 2.3″)	
Weight:	270 g (9.5 oz)	274 g (9.7 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27	

Description TEV-2 (without cover)

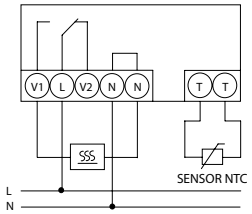


Description TEV-3 (with cover)

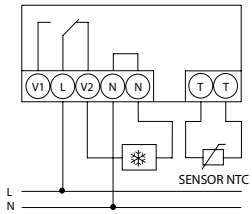


Connection

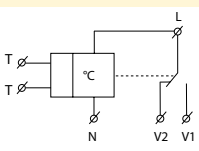
Heating function



Cooling function

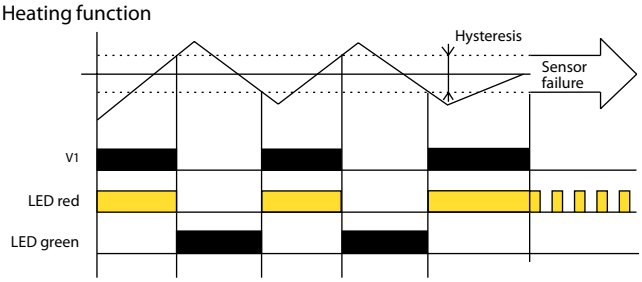


Symbol



Function TEV-2, TEV-3

Heating function



TEV-2 and TEV-3 are universal single thermostats for universal use. In case ambient temperature is higher than set temperature relay is open (function HEATING). For cooling function (opposite function) is possible to use NC contact of relay (V2).

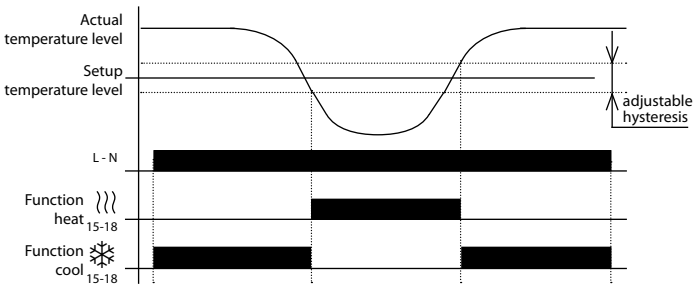
TEV-4 | Single-level thermostat with range of –30 .. + 60° C in increased protection

- Single point thermostat for monitoring and regulation of temperature in demanding enviroments (humid and contaminated, agressive and defective, industrial workshops, washing rooms, green-houses, cellars and cooling boxes,...).
- External version in IP65, box for mounting on the wall.
- Built-in thermo-sensor is integrated in the device.
- Two fuctions adjustable by jumper: heating and cooling.
- 3 adjustable (by jumper) ranges of temperature, and fine adjustment through potentiometer.
- 3 adjustable (by jumper) levels of hysteresis.
- Potentialless NO-SPST contact 12 A AC1 switching.

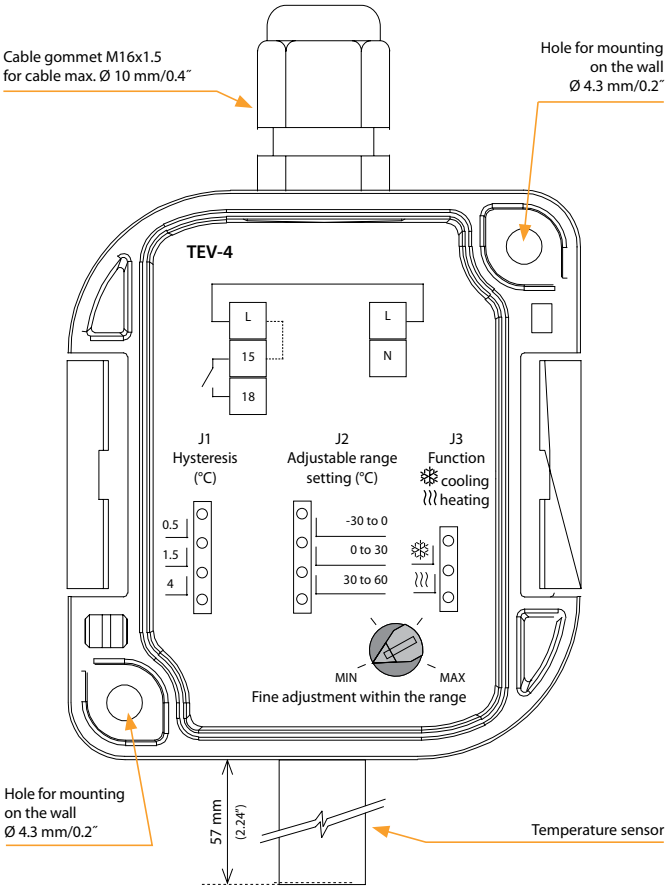
EAN code
TEV-4: 8595188140577

Technical parameters	TEV-4
Supply	
Supply terminals:	L - N
Voltage range:	AC 230 V (50-60 Hz)
Input (apparent / loss):	max. 6 VA/0.7 W
Max. dissipated power (Un + terminals):	2.5 W
Tolerance of voltage range:	- 15 % to +10 %
Function	setting by jumper J3
Function - ❄:	cooling
Function - ≀≀≀:	heating
Temperature setting	by jumper J2
range 1:	–30 .. 0 °C (–22 .. 32 °F)
range 2:	0 .. 30 °C (32 .. 86 °F)
range 3:	30 .. 60 °C (86 .. 140 °F)
Slight temperature setting:	potentiometer
Hysteresis	0.5/1.5/4 °C (32.9/34.7/39.2 °F)
Hysteresis setting:	by jumper J1
Output	
Output contact:	1 x NO-SPST ($AgSnO_2$)
Current rating:	12 A/AC1
Max. breaking capacity:	3000 VA/AC1, 384 W/DC
Peak current:	30 A/< 3 s
Switched voltage:	250 V AC/24 V DC
Mechanical life:	30.000.000 ops.
Electrical life:	100.000 ops.
Other information	
Operation temperature:	–30 .. 65 °C (–22 .. 149 °F)
Storing temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical strengh:	4 kV (supply-output)
Operation position:	sensor-side down
Protection degree:	IP65
Overvoltage cathegory:	III.
Pollution degree:	2
Max. cable size (mm^2):	max.1x 2.5, max. 2x 1.5/ with sleeve max.1x 2.5 (AWG 12)
Suggested power-supply cable:	CYKY 3x2.5 (CYKY 4x1.5)
Dimensions:	153 x 62 x 34 mm (6˝ x 2.4˝ x 1˝)
Weight:	123 g (4.3 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, IEC 60730-2-9

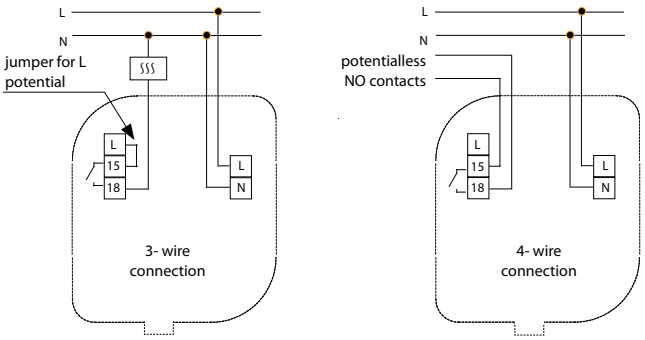
Function



Description



Connection



Description of function

Device is standardly supplied with jumper L-15 (3-wire connection).
For the correct function of device is neccesary sensor-side down device mounting.

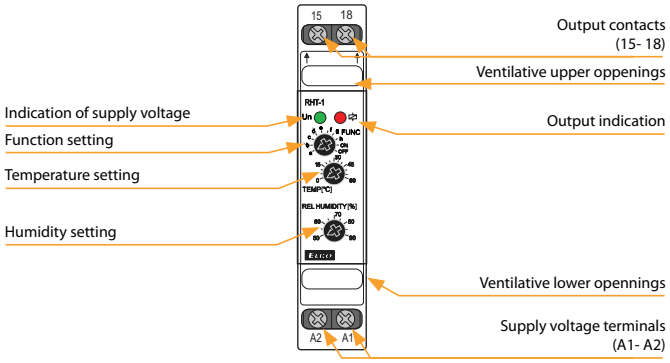
RHT-1 | Hygrothermostat with temperature range 0 .. + 60° C and humidity 50 - 90%

EAN code
RHT-1: 8595188137263

- Hygro-thermostat for temperature monitoring and regulation in range 0 °C to 60 °C (32 °F to 140 °F) and relative humidity monitoring and regulation in range 50 to 90 %.
- Possibility of setting of up to 8 conditions for contact switching and function permanently ON/OFF.
- Sensor is a part of the device - designated for measuring in switchboards.
- Function of sensor control (damage, disturbances,...).
- Fixed setting of temperature hysteresis at 2.5 °C (4.5 °F) and humidity at 4 %.

Technical parameters	RHT-1
Function:	hygro-thermostat
Supply terminals:	A1 - A2
Voltage range:	AC/DC 24 - 240 V (AC 50-60 Hz)
Input:	max. 1 VA/0.5 W
Max. dissipated power (Un + terminals):	2.5 W
Tolerance of voltage range:	–15 %; +10 %
Measuring circuit	
Temperature range:	0 .. 60 °C (32 .. 140 °F)
Humidity range:	50 - 90 %
Temperature hysterisis:	2.5 °C (4.5 °F)
Humidity hysterisis:	4 %
Sensor:	internal
Indication of sensor´s fault:	red LED flashing
Accuracy	
Setting accuracy (mechanical):	5 %
Long-term stability of humidity:	typical < 0.8 %/year
Output	
Number of contacts:	1x NO-SPST ($AgSnO_2$)
Current rating:	16 A/AC1, 10 A/24 V DC
Switched output:	4000 VA/AC1, 300 W/DC
Switched voltage:	250 V AC/24 V DC
Output indication:	red LED shines
Mechanical life:	10.000.000 ops.
Electrical life:	100.000 ops.
Other information	
Operational temperature:	–20 .. 60 °C (–4 .. 140 °F)
Storing temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectrical strengh:	2.5 kV (supply-output)
Operational position:	vertical, with correct orientation
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel, IP10 on terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm^2):	max. 2x 2.5, max. 1x 4 with sleeve max. 1x 2.5, max. 2x 1.5 (AWG 12)
Dimensions:	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)
Weight:	63 g (2.2 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, IEC 60730-2-9

Device description



Functions

Choice of function	Relay switched under the following conditions		
A	T > Tset	or	RH > RHset
B	T < Tset	or	RH > RHset
C	T > Tset	or	RH < RHset
D	T < Tset	or	RH < RHset
E	T < Tset	and	RH < RHset
F	T > Tset	and	RH < RHset
G	T < Tset	and	RH > RHset
H	T > Tset	and	RH > RHset
ON	relay permanently ON		
OFF	relay permanently OFF		

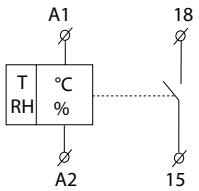
This device is designated for monitoring of parameters of environment (meaning temperature and relative humidity) in switchboards. It enables setting of eight conditions of constact closing and therefore it is usable for various types of load (e.g. fans, heating, air-conditioning, dehydrating units,...).

While installing it is neccessary to take into account the fact that hysterisis rises by persistence of measured values between sensor and ambient environment.

The device is equipped by sensor fault detection. In case of sensor fault, exceeding allowed limits (for temperature -30 °C/-22 °F and +80 °C/176 °F; for humidity 5 % and 95 %) or in case of faulty internal communcation higher than 50 % (due to e.g. high ambient disturbances) contact opens and sensor fault is indicated. Sensor fault doesn´t have influence on function permanently ON or pemanently OFF.

Note: In case the conditions for switching are not applied, relay is open.

Symbol



Connection

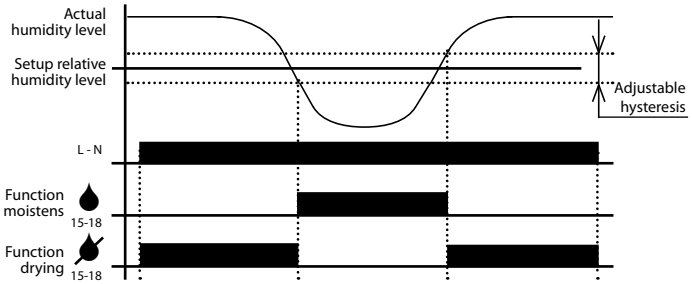
RHV-1 | Hygrostat with humidity range 0 - 90% in increased protection

EAN code
RHV-1: 8595188140584

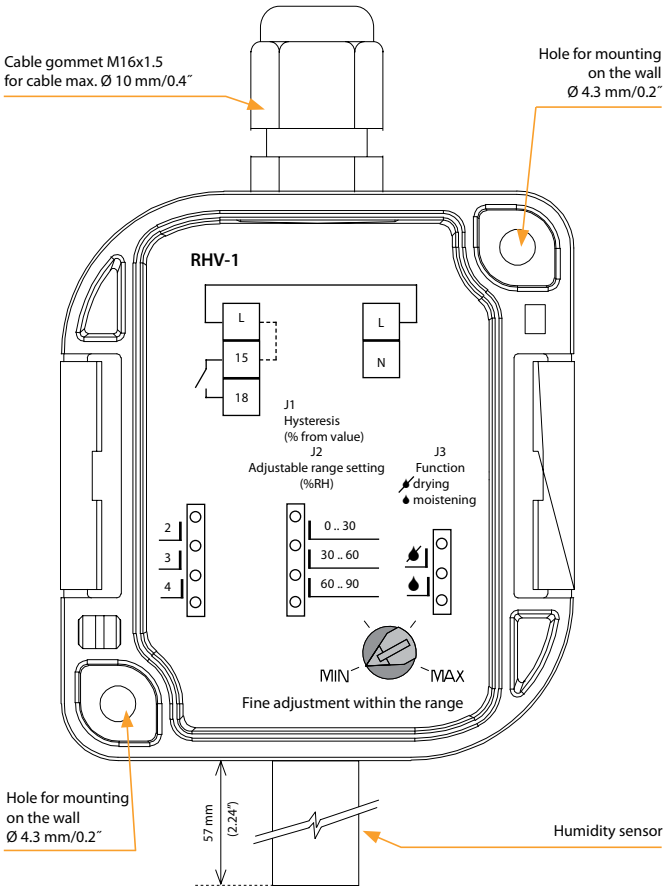
- Single hygrostat is used for regulation of humidity in harsh environments (washdown, greenhouse, refrigeration).
- External version in IP65, box for mounting on the wall.
- Built-in hygro-sensor is integrated in the device.
- Two functions adjustable by jumper: moisting and drying.
- 3 adjustable relative humidity ranges, fine-tuning of relative humidity within the range by potentiometer.
- 3 adjustable (by jumper) levels of hysteresis.

Technical parameters	RHV-1
Supply	
Supply terminals:	L - N
Voltage range:	AC 230 V (50-60 Hz)
Input (apparent/loss):	max. 6 VA/0.7 W
Max. dissipated power:	2.5 W (Un + terminals)
Input voltage range:	- 15 % to +10 %
Setting function	Setting function Jumper J3
Function - 💧:	moistening
Function - 🔥:	drying
Set. the scale of relative humidity	Humidity setting Jumper J2
range 1:	0 to 30 % RH
range 2:	30 to 60 % RH
range 3:	60 to 90 % RH
Slight setting of relative humidity:	Relative Humidity Setting Potentiometer
Hysteresis	2, 3, 4 % from setup rate
Hysteresis setting:	Jumper J1
Output	
Output contact:	1x NO-SPST ($AgSnO_2$)
Current rating:	12 A/AC1
Switching output:	3000 VA/AC1, 384 W/DC
Peak current:	30 A/< 3 s
Switched voltage:	250 V AC/24 V DC
Mechanical life:	30.000.000 ops.
Electrical life:	100.000 ops.
Other information	
Operation temperature:	–30 .. 60 °C (–22 ..140 °F)
Storing temperature:	–30 .. 70 °C (–22 ..158 °F)
Electrical strengh:	4 kV (supply-output)
Operation position:	sensor-side down
Protection degree:	IP65
Overvoltage cathegory:	III.
Pollution degree:	2
Max. cable size (mm^2):	max. 1x 2.5, max. 2x 1.5/ with sleeve max. 1x 2.5 (AWG 12)
Suggested power-supply cable:	CYKY 3x2.5 (CYKY 4x1.5)
Dimensions:	153 x 62 x 34 mm (6˝ x 2.4˝ x 1.3˝)
Weight:	124 g (4.4 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27, IEC 60730-2-9

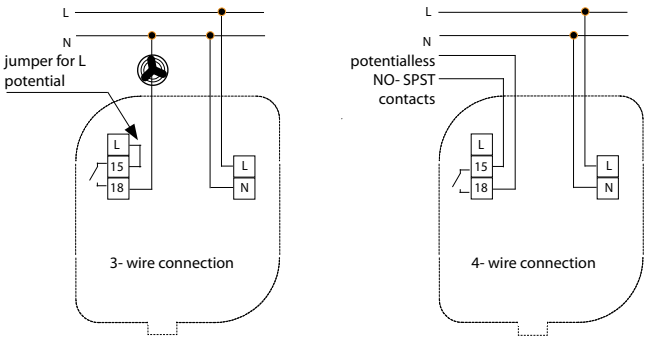
Function



Description



Connection



Description of function

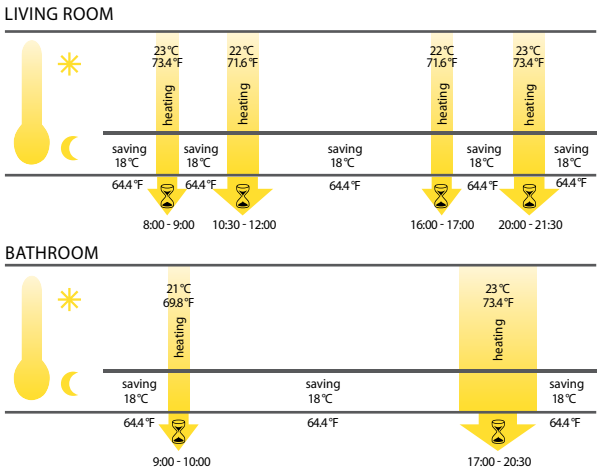
Device is supplied with a standard jumper.
For the device to operate correctly, it must be mounted with the sensor side down.

ATV-1 | Energy-saving digital thermo-valve

EAN code
ATV-1:8595188160889

Technical parameters	ATV-1
Operating voltage:	3 V/DC (2 AA batteries 1.5 V/DC AA)
Temperature range:	8 .. 28 °C (46 .. 82 °F)
Colour:	white
Dimensions (L x W x H):	76.5 x 53.5 x 63 mm (3“ x 2.1“ x 2.4“)
Design:	thermostatic direction valves, electronic

Examples of daily heating program

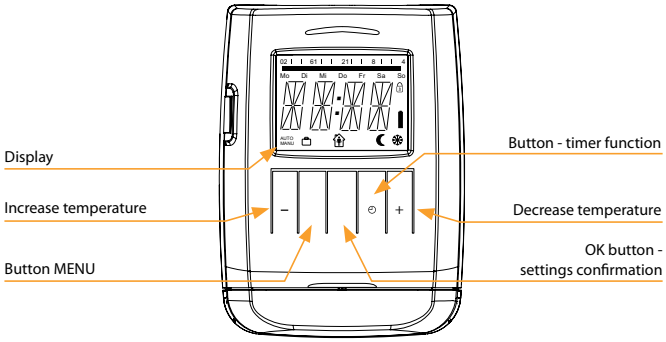


Adapters

Type of valve	Type of adapter
Heimeier, Junkers Landys+Gyr, MNG, Honeywell, Braukmann thread size M 30x1.5	No adapter necessary + enclosed pin; only for RAV
Danfoss RAV (the valve plunger must be fitted with the enclosed pin)	
Danfoss RA	
Danfoss RAVL	

- This energy-saving digital thermo-valve is a programmable regulation device for various heaters, but mainly radiators.
- It can be used to regulate temperature in closed rooms, thus helping to lower heat energy consumption.
- Functions:
  - manual mode - measuring and checking a manually set temperature
  - automatic mode - control between two temperatures based on a set time program:
    - Comfort temperature (factory settings 21 °C/70 °F)
    - Energy-saving temperature (factory settings 16 °C/61 °F).
- Intervals of heating and energy-saving operation can be set using a freely adjustable time program.
  - 8 individually programmable switching times per day:
    - 4 heating intervals
    - 4 energy-saving intervals.
- The device features very quiet operation and long battery life (up 5 years).
- Quick and easy installation.

Description of device



Other functions

1. Time function - the desired temperature can be set for a certain adjustable time interval.
2. Vacation function - while you’re gone, you can set and maintain the desired temperature.
3. Open window function - when the temperature drops, the heating valve automatically closes in order to save energy.
4. Child safety block - blocking against undesired interference with the thermostat.
5. Freeze protection - if the temperature drops below 6 °C (43 °F), the valve opens until the temperature again exceeds 8 °C (46 °F). This keeps heaters from freezing.

EAN code
TELVA-2 230 V, NO: 8595188181969
TELVA-2 230V, NC: 8595188181976
TELVA-2 24 V, NO: 8595188181983
TELVA-2 24 V, NC: 8595188181990

Technical parameters	TELVA-2 230V NO	TELVA-2 230V NC	TELVA-2 24V NO	TELVA-2 24V NC
Operating voltage:	230 V (50-60 Hz)		24 V (50-60 Hz)	
Switching current max:	300 mA		500 mA	
Operating current:	13 mA		100 mA	
Closing/opening time:	3-5 min		3-5 min	
Power imput:	2.9 W		2.4 W	
Protection:	IP54		IP54	
Settings:	4 mm (0.16")		4 mm (0.16")	
Stopping force:	90-110 N		90-110 N	
Cable lenght:	800-1000 mm (31 - 39")		800-1000 mm (31 - 39")	
Connecting wire:	2 x 0.75 mm^2		2 x 0.75 mm^2	
Media temperature:	–5 .. 60 °C (23 .. 140 °F)		–5 .. 60 °C (23 .. 140 °F)	
Colour:	white RAL 9003		white RAL 9003	
Dimensions h/w/d:	63 x 42 x 45 mm (2.5 x 1.7 x 1.8 ")		63 x 42 x 45 mm (2.5 x 1.7 x 1.8 ")	
Connection size:	M30 x 1.5 mm (1.2" x 0.06")		M30 x 1.5 mm (1.2" x 0.06")	

- Thermodrive is intended for opening or closing valves in heating, cooling or air conditioning systems. It is also suitable for use in a floor heating or ceiling cooling manifolds.
- Available in NO (open without voltage), NC (closed without voltage) and for 230V and 24V.
- The internal principle of operation of the thermo drive mechanism = its movement so that the valve opens/closes is provided by an electric heating element with expansion material, which expands due to temperature changes in the supply voltage.
- The thermodrive is maintenance-free and works completely silently.
- The thermodrive is fitted with a metal nut M30 x 1.5, thanks to which it becomes a 100% fixed part of the valve with this corresponding thread size after installation.
- The stated nut size predetermines the use of a thermocouple with valves from manufacturers such as Herz, HoneyWell, Danfoss, Oventrop and others.

- Telva thermodrive:
  - is characterized by absolutely quiet and maintenance-free operation
  - is designed for installation - control of heating and cooling systems
  - method of mounting the actuator on the controlled valve using an M30 x 1.5 nut
  - any working position.

- Type of use:
  Underfloor heating - the RFTC-50/G wireless controller measures the room temperature and, based on the set program, sends a command to the RFSA-66M switching element to open/close the TELVA thermo drive on the distributor.

EAN code

TC-0:	8595188110075	TZ-0:	8595188140591	Pt100-3:	8595188136136
TC-3:	8595188110617	TZ-3:	8595188110600	Pt100-6:	8595188136143
TC-6:	8595188110082	TZ-6:	8595188110594	Pt100-12:	8595188136150
TC-12:	8595188110099	TZ-12:	8595188110587		

- Thermister temperature sensors are made of Negative Temperature Coefficient (NTC) embedded in a PVC or metal sleeve with a thermally-conductive sealer.
- **Sensor TC**
  - lead-in cable to sensor TC is made of wire 2 x 0.25 mm²/0.01"
- **Sensor TZ**
  - cable 2 x 0.34 mm²/0.015" with silicone insulation for use in high temperature applications
  - silicone insulation for use in high temperature applications
- **Sensor Pt100**
  - shielded silicon 2x 0.22 mm²/0.01", shielding connected with a case
- Temperature sensors can be connected directly to the terminal block.
- Cable lengths can not be changed, connected or modified.

Technical parameters	TC	TZ	Pt100
Range:	–20 .. +80 °C (-4 ..176 °F)	–40 .. +125°C (–40 .. 257°F)	–30 .. +200°C (–22 .. 392°F)
Scanning element:	NTC 12K	NTC 12K	Pt100
Tolerance:	±(0.15°C + 0.002|t|)	±(0.15°C + 0.002|t|)	±(0.3°C + 0.005|t|)
In air/in water:	(τ0.5) ≤ 18 s	(τ65) 62 s/8 s	(τ0.5) - /7 s
In air/in water:	(τ0.9) ≤ 48 s	(τ95) 216 s/23 s	(τ0.9) - /19 s
Cable material:	PVC unshielded, 2x 0.25 mm²	PVC unshielded, 2 x 0.34 mm²	shielded silicone 2 x 0.22 mm²
Terminal material:	polyamide	stainless steel	brass
Protection degree:	IP67	IP67	IP67
Electrical strength:	2500 VAC	2500 VAC	2500 VAC
Insulation resistance:	> 200 MΩ at 500 VDC	> 200 MΩ at 500 VDC	> 200 MΩ at 500 VDC
Types of temperature sensors			
	TC-0	**TZ-0**	-
Length:	100 mm	110 mm	-
Weight:	5 g	4.5 g	-
	TC-3	**TZ-3**	**Pt100-3**
Length:	3 m	3 m	3 m
Weight:	70 g	106 g	68 g
	TC-6	**TZ-6**	**Pt100-6**
Length:	6 m	6 m	6 m
Weight:	130 g	216 g	149 g
	TC-12	**TZ-12**	**Pt100-12**
Length:	12 m	12 m	12 m
Weight:	250 g	418 g	249 g

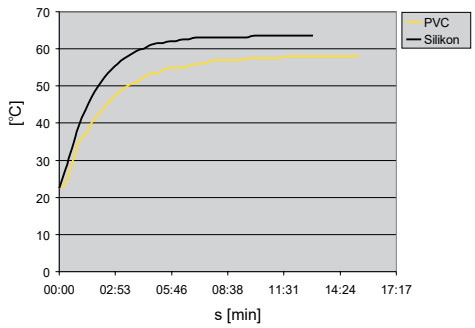
τ65 (95): time, which sensor needs to heat up on 65 (95) % of ambient temperature of environment, in which is located.

Resistive values of sensors in dependance on temperature

Temperature (°C/°F)	Sensor NTC (kΩ)	Sensor Pt100 (Ω)
20/68	14.7	107.8
30/86	9.8	111.7
40/104	6.6	115.5
50/122	4.6	119.4
60/140	3.2	123.2
70/158	2.3	127.1

Tolerance of sensor NTC 12 kΩ is ± 5 % by 25 °C/77 °F.
Long-term resistence stability by sensor Pt100 is 0.05 % (10 000 hours).

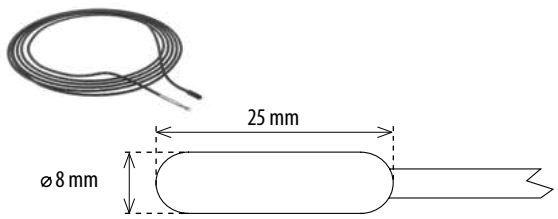
Diagramm of sensor warm up via air



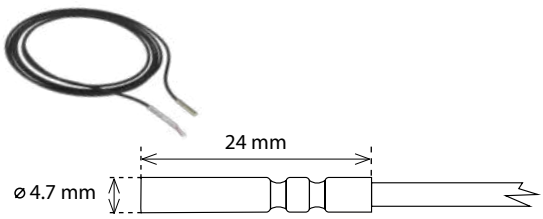
PVC - reaction to air temperature from 22.5 °C .. 58 °C (from 72.5 ..136.4 °F).
Silicone - reaction to air temperature from 22.5 °C .. 63.5 °C (from 72.5 .. 144.5 °F).

Design and dimensions

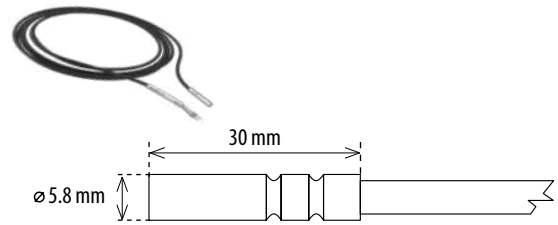
TC



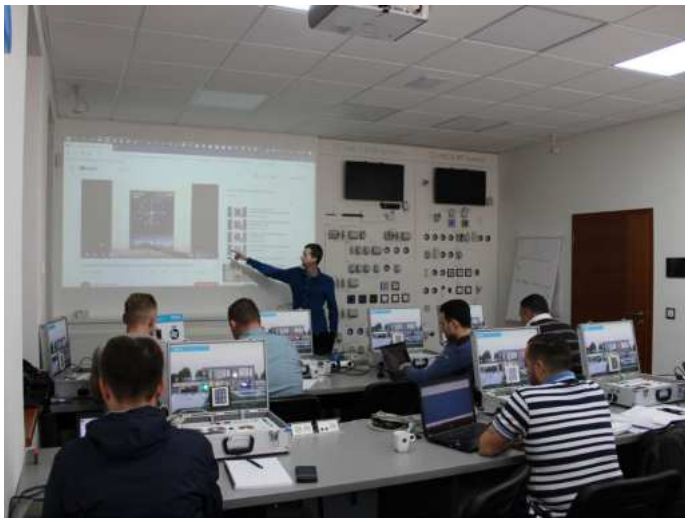
Pt100



TZ



Notes



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All trainings at: www.elkoep.com/trainings-and-exhibitions

Technical support

In case of technical questions, contact our technical support by phone or email:

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balla@elkoep.com

+420 800 100 671
support@elkoep.com

Alternatively, you can contact us using the contact form on our website:

www.elkoep.com/tech-support

Product loadability

Problematic choice of suitable relay contact for a particular load switched with a product is described below. Mostly we experience problems with incorrect choice of load (meaning incorrect relay for a particular load) which results in permanent switching of contact (sealing) or damage on relay contact – which then results in malfunction.
What load can you use? Detailed types of load according to standard EN 60947 are described in charts below – categories of use.

Category of use	Typical use	EN
AC current, cosφ = P/S (-)		
AC-1	Non-inductive or slightly inductive load, resistance furnace Includes all appliances supplied by AC current with power factor (cos φ) ≥ 0.95 Examples of usage: resistance furnace, industrial loads	60947-4
AC-2	Motors with slip-ring armature, switching off	60947
AC-3	Motors with short-circuit armature, motor switching when in operation This category applies to switching off motors with short-circuit armature while in operation. While switching, contactor switches current which is 5 up to 7 times rated current of motor.	60947-4
AC-4	Electro-motors with short-circuit armature: start up, braking by backset, changeover	60947
AC-5a	Switching of electrical gas-filled lights, fluorescent lights	60947-4
AC-5b	El. bulb switching Enables low contact loading due to resistance of cold fiber is many times smaller that the one of hot fiber.	60947-4
AC-6a	Switching of transformers	60947-4
AC-6b	Switching of capacitors	60947-4
AC-7a	Switching low inductive loads of home appliances and similar applications	60947
AC-7b	Load of motors for home appliances	60947
AC-8a	Switching of hermetically sealed motors of cooling compressors with manual reset switches against overload Hermetically sealed cooling compressors have to be placed in one box without external shaft or shaft padding and motor must operate with cooling liquid	60947
AC-8b	Switching of hermetically sealed motors of cooling compressors with manual reset switches against overload Hermetically sealed cooling compressors have to be placed in one box without external shaft or shaft padding and motor must operate with cooling liquid	60947
AC-12	Switching of semiconductor loads with separation transformers	60947-5
AC-13	Switching of semiconductor loads with separation transformers	60947-5-1
AC-14	Switching of low electro-magnetic loads (max.72 VA)	60947-5-1
AC-15	Management of alternating electro-magnetic loads This category applies to switching inductive loads with input for closed electro-magnetic circuit higher than 72 VA Use: switching coils of contactors	60947-5
AC-20	Connecting and disconnecting in unloaded states	60947-3
AC-21	Switching resistive loads, including low loading	60947-3
AC-22	Switching of mixed resistive and inductive loads, including low overloading	60947-3
AC-23	Switching of motor loads or other high inductive loads	60947-3
AC-53a	Switching of motors with short-circuit armature with semiconductor contactors	60947

Note: Category AC 15 replaces formerly used category AC 11

DC current, t = L/R (s)		
DC-1	Non-inductive or low inductive load, resistive furnaces	60947-4
DC-3	Shunt motors: start-up, braking by backset, reversion, resistive braking	60947-4-1
DC-5	Series motor: start-up, braking by backset, reversion, resistive braking	60947-4-1
DC-6	Non-inductive or low inductive loads, resistive furnaces – el. bulbs	60947-4-1
DC-12	Management of resistive loads and fixed loads with insulation by opto-electric element	60947-5-1
DC-13	Switching of electromagnets	60947-5-1
DC-14	Switching of electromagnetic loads in circuits with limiting resistor	60947-5-1
DC-20a(b)	Switching and breaking without load(a: frequent switching ,b: occasional switching)	60947-3
DC-21a(b)	Switching ohmic loads including limiting overloading (a: frequent switching ,b: occasional switching)	60947-3
DC-22a(b)	Switching of compound ohmic and inductive loads including limited overloads (e.g. shunt motors) (a: frequent switching, b: random switching)	60947-3
DC-23	Switching of highly inductive loads (e.g. series motors)	60947-3

How can you distinguish for which load is our product (relay) designated?
Our company record this information on a products and also in our catalogue, instruction manual and other promotional and technical material (website etc.).
It is important to realize that it is not always possible to point out load because of lack of information about the device (user cannot measure cos) or it is not possible because of inconstancy of parameters of switched device. Manufacturer of relays records always guaranteed parameters in ideal conditions which are done by a norm (temperature, pressure, humidity, etc.) and reality can be in a lot of cases different. Category of use (classification) of a particular relay is done by material of output contacts.
Basic types of materials which are used for production of contacts for high-performance relay are:

a) AgCd – suitable for switching ohmic loads. Before of harmfulness of Cd, this type of contact is remitted.
b) AgNi –designated for switching resistive loads, good quality switching and conducting (contact doesn't oxidate) small currents/voltages, it is not designated for surge currents and loads with inductive component.
c) AgSn or $AgSnO_2$ –suitable for switching loads with inductive component, not suitable for switching small currents/voltages, it is more resistive to surge currents, suitable for DC voltage switching, less suitable for switching loads of ohmic type.
d) Wf (wolfram)-special contact designated for switching surge currents with inductive component.
e) with gold (AgNi/Au)- Used for "improving" contacts for low currents/ voltages , prevents oxidation.

Product loadability

COS-2; CRM-2H; CRM-2HE; CRM-2T; CRM-181J; CRM-182J; CRM-91H; CRM-91H-SL ;CRM-92H; CRM-111H; CRM-112H; CRM-91HE; CRM-101; CRM-183J / CRM-93H / CRM-93H-SL / CRM-113H (1. contact); CRM-121H; CRM-131H; HRH-8; HRN-31; HRN-31/2; HRN-32/2; HRN-36; HRN-36/2; HRN-39; HRN-39/2; HRN-41; HRN-42; HRN-43; HRN-43N; HRN3-70; HRN3-80; HRN3-81; PMR1-31; PMR1-31/2; PMR1-36; PMR1-36/2; PMR1-39; PMR1-39/2; PMR3-70; PDR-2; PRI-34; PRI-35; PRI-41; PRI-42; PTRM-216K; PTRM-216T; PTRM-216KP; PTRM-216TP; PTRA-216K; PTRA-216T; SJR-2; TER-4; TEV-1; TEV-2; TEV-3

type of load	cos φ ≥ 0.95 AC1	AC2	AC3	AC5a uncompensated	AC5a compensated	HAL.230V AC5b	AC6a	AC7b	AC12
Material of contact **AgNi, 16A**	250V/16A	250V/5A	250V/3A	230V/3A (690VA)	x	800W	x	250V/3A	250V/10A

type of load	AC13	AC14	AC15	DC1	DC3	DC5	DC12	DC13	DC14
Material of contact **AgNi, 16A**	250V/6A	250V/6A	250V/6A	24V/16A	24V/6A	24V/4A	24V/16A	24V/2A	24V/2A

CRM-71TO; CRM-4; CRM-48; HRH-7; MR-41; MR-42; SHT-1; SHT-1/2; SHT-13/1; SHT-13/2; SHT-14/1; SMR-B; SOU-1; RHT-1; TER-3A; TER-3B; TER-3C; TER-3D; TER-3E; TER-3F; TER-3G; TER-3H ; VS116K; VS116U; VS316/24V; VS316/230V; VS116B

type of load	cos φ ≥ 0.95 AC1	AC2	AC3	AC5a uncompensated	AC5a compensated	HAL.230V AC5b	AC6a	AC7b	AC12
Material of contact **$AgSnO_2$, 16A**	250V/16A	250V/5A	250V/3A	230V/3A (690VA)	230V/3A (690VA) till max output C=14UF	1 000W	x	250V/3A	x

type of load	AC13	AC14	AC15	DC1	DC3	DC5	DC12	DC13	DC14
Material of contact **$AgSnO_2$, 16A**	x	250V/6A	250V/6A	24V/16A	24V/3A	24V/2A	24V/16A	24V/2A	x

CRM-72TO; CRM-183J / CRM-93H / CRM-93H-SL / CRM-113H (2. + 3. contact); TER-7; VS308K; VS308U; CRM-161; HRH-5; HRN-54; HRN-54N; HRN-55; HRN-55N; HRN-56; HRN-57; HRN-57N; PRI-32; PRI-51; PRI-52; PRI-53; HRF-10

type of load	cos φ ≥ 0.95 AC1	AC2	AC3	AC5a uncompensated	AC5a compensated	HAL.230V AC5b	AC6a	AC7b	AC12
Material of contact **AgNi, 8A**	250V/8A	250V/3A	250V/2A	230V/1.5A (345VA)	x	300W	x	250V/1A	250V/1A

type of load	AC13	AC14	AC15	DC1	DC3	DC5	DC12	DC13	DC14
Material of contact **AgNi, 8A**	x	250V/3A	250V/3A	24V/8A	24V/3A	24V/2A	24V/8A	24V/2A	x

RHV-1; SOU-3; TEV-4

type of load	cos φ ≥ 0.95 AC1	AC2	AC3	AC5a uncompensated	AC5a compensated	HAL.230V AC5b	AC6a	AC7b	AC12
Material of contact **$AgSnO_2$, 12A**	250V/12A	250V/3.7A	250V/2.2A	230V/2.2 (510VA)	230V/2.2A (510VA) till max output C=14UF	1 120W	x	250V/2.2A	250V/7.5A

type of load	AC13	AC14	AC15	DC1	DC3	DC5	DC12	DC13	DC14
Material of contact **$AgSnO_2$, 12A**	250V/4.5A	250V/4.5A	250V/4.5A	24V/12A	24V/4.5A	24V/3A	24V/12A	24V/1.5A	24V/1.5A

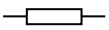
HRH-6

type of load	cos φ ≥ 0.95 AC1	AC2	AC3	AC5a uncompensated	AC5a compensated	HAL.230V AC5b	AC6a	AC7b	AC12
Material of contact **AgNi, 10A**	250V/10A	250V/3A	250V/2A	230V/2A (460VA)	x	500W	x	250V/2A	250V/6A

type of load	AC13	AC14	AC15	DC1	DC3	DC5	DC12	DC13	DC14
Material of contact **AgNi, 10A**	250V/3.8A	250V/3.8A	250V/3.8A	24V/10A	24V/3.8A	24V/2.5A	24V/10A	24V/1.3A	24V/1.3A

Product loadability

HRH-9, SMR-B-SL, SOU-13/1, TER-13/2

type of load	AC1	 AC2	 AC3	 AC5a uncompensated	 AC5a compensated	 AC5b	 AC6a	AC7b	 AC12
Material of contact **$AgSnO_2$, 10A**	250V/10A	250V/5A	250V/4A	x	x	250W	250V/4A	250V/1A	250V/1A
type of load	 AC13	AC14	 AC15	DC1	 DC3	 DC5	DC12	DC13	DC14
Material of contact **$AgSnO_2$, 10A**	x	250V/4A	250V/3A	24V/5A	24V/1.5A	24V/1A	24V/5A	24V/1A	x

VS120; VS220; VSM220

type of load	AC-1, AC-7a, AC-21	AC-2	AC-3, AC-3e, AC-7b, AC23	AC-5a (230V)	AC-5b (230V)	AC-6a (230V)	AC-15 (230V)	DC-1 (24V, 48V)	DC-3 (24V, 48V)	DC-5 (24V, 48V)	DC-13 (24V, 48V)	LED	AC-6b, AC-7c (230V)
rated current	20A	12A	NO:9A NC:6A	8,8A	8,8A	4A	6A	20A, 15A	10A, 5A	10A, 4A	6A	2,4A per contact	switching capacity 30 uF

VS420

type of load	AC-1, AC-7a, AC-21	AC-2	AC-3, AC-3e, AC-7b, AC23	AC-5a (230V)	AC-5b (230V)	AC-6a (230V)	AC-15 (230V)	DC-1 (24V, 48V)	DC-3 (24V, 48V)	DC-5 (24V, 48V)	DC-13 (24V, 48V)	LED	AC-6b, AC-7c (230V)
rated current	20A	10A	5A	8,8A	8,8A	4A	6A	20A, 12A	10A, 5A	10A, 4A	6A	2,4A per contact	switching capacity 30 uF

VS425; VSM425

type of load	AC-1, AC-7a, AC-21	AC-2	AC-3, AC-3e, AC-7b, AC23	AC-5a (230V)	AC-5b (230V)	AC-6a (230V)	AC-15 (230V)	DC-1 (24V, 48V)	DC-3 (24V, 48V)	DC-5 (24V, 48V)	DC-13 (24V, 48V)	LED	AC-6b, AC-7c (230V)
rated current	25A	14A	8,5A	11,2A	8,8A	2,8A	6A	25A, 20A	15A, 8A	15A, 5A	6A	3,8A per contact	switching capacity 36 uF

VS440

type of load	AC-1, AC-7a, AC-21	AC-2	AC-3, AC-3e, AC-7b, AC23	AC-5a (230V)	AC-5b (230V)	AC-6a (230V)	AC-15 (230V)	DC-1 (24V, 48V)	DC-3 (24V, 48V)	DC-5 (24V, 48V)	DC-13 (24V, 48V)	LED	AC-6b, AC-7c (230V)
rated current	40A	25A	22A	20A	17,6A	10,8A	6A	40A, 25A	22A, 10A	20A, 8A	6A, 4A	11A per contact	switching capacity 220 uF

VS463

type of load	AC-1, AC-7a, AC-21	AC-2	AC-3, AC-3e, AC-7b, AC23	AC-5a (230V)	AC-5b (230V)	AC-6a (230V)	AC-15 (230V)	DC-1 (24V, 48V)	DC-3 (24V, 48V)	DC-5 (24V, 48V)	DC-13 (24V, 48V)	LED	AC-6b, AC-7c (230V)
rated current	63A	32A	30A	32A	22A	17,2A	6A	63A, 26A	25A, 11A	25A, 10A	6A, 4A	18A per contact	switching capacity 330 uF

1-MODULE relay package - 1 pc

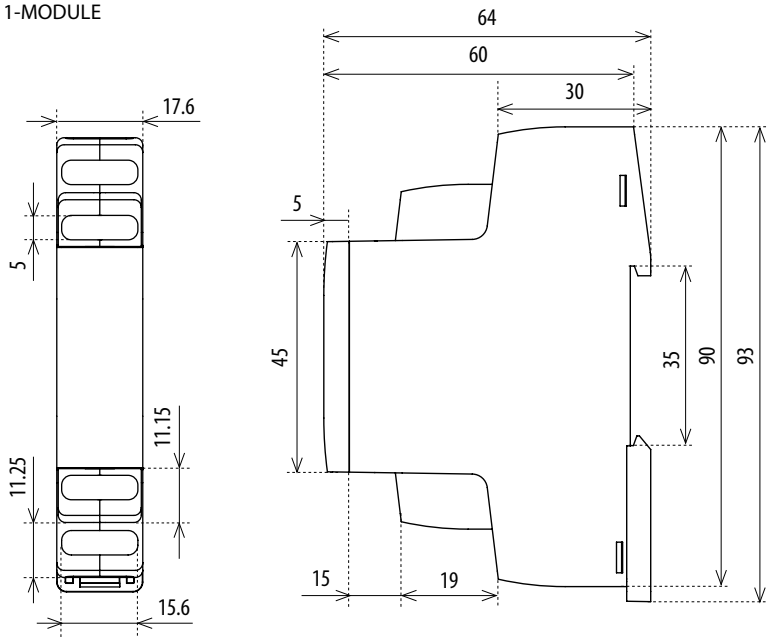
1-MODULE relay package - 10 pcs

1-MODULE relay package with accessories

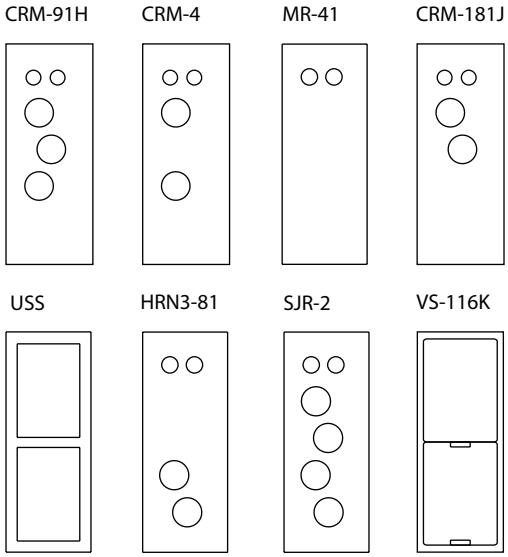
2-MODULE relay package - 1 pc

3-MODULE relay package - 1 pc

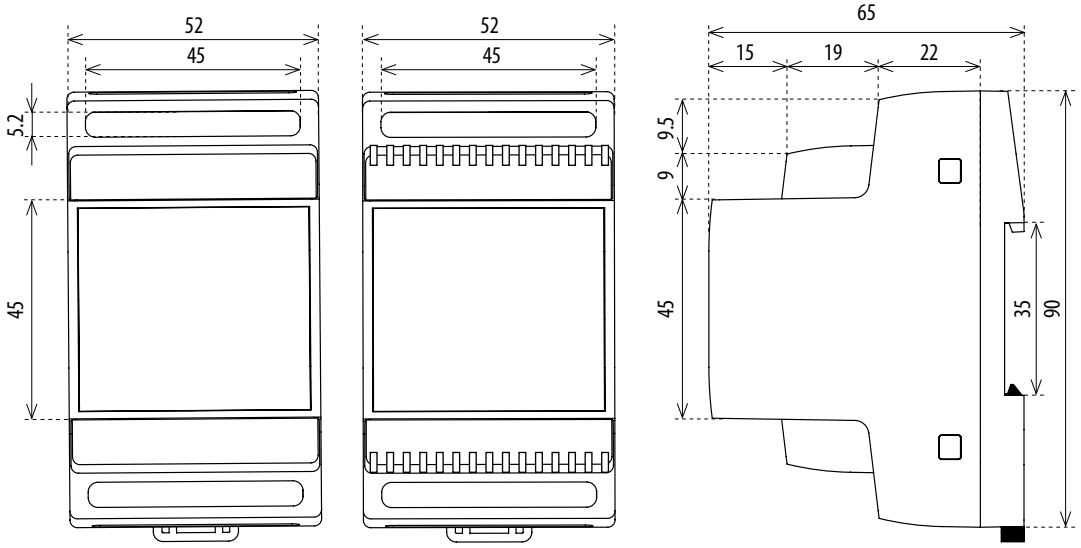
1-MODULE



Front panels for 1-MODULE, examples of use:

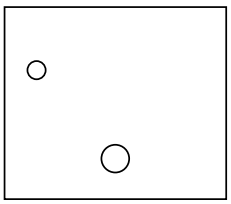


3-MODULE

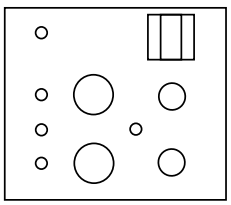


Front panels for 3-MODULE, examples of use:

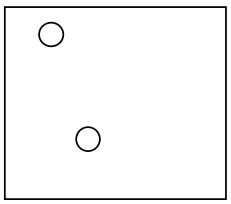
PS-30-R



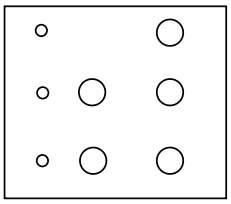
HRN-41



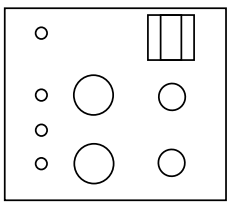
ZSR-30



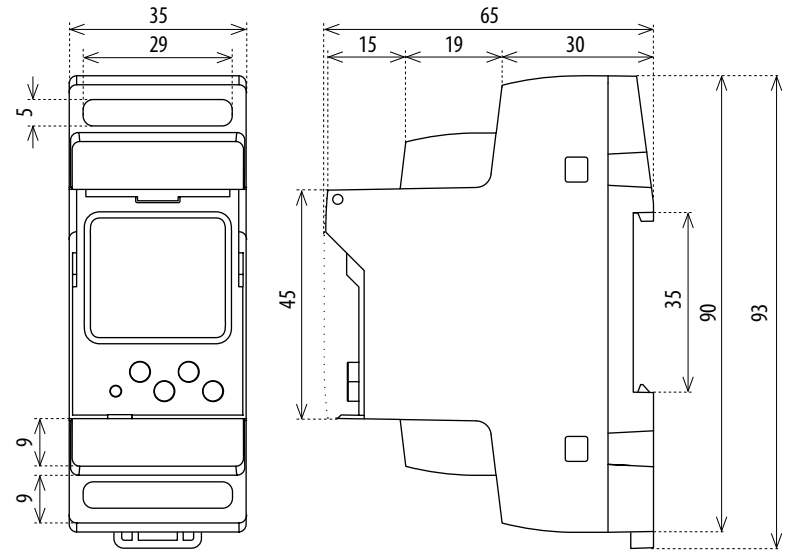
HRF-10



HRH-8

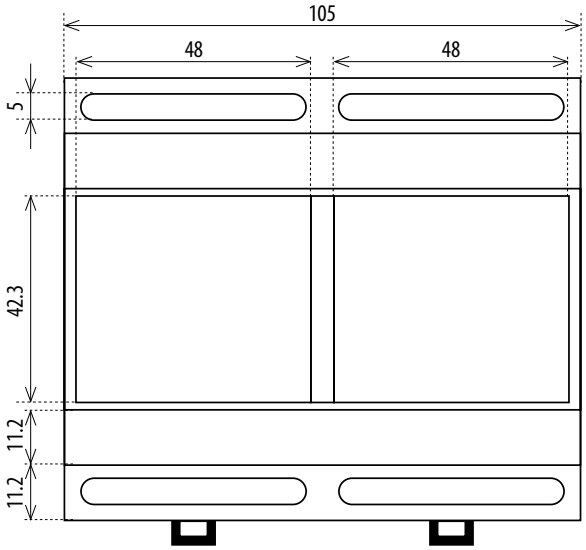


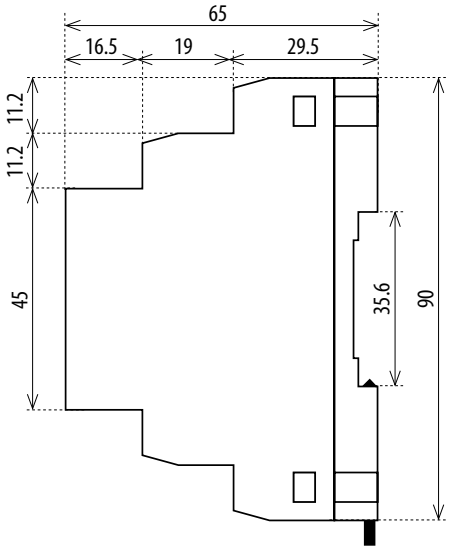
2-MODULE



Dimensions

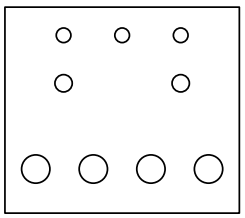
6-MODULE



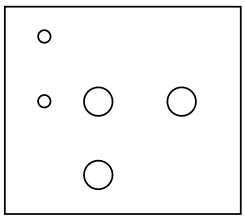


Front panels for 6-MODULE, examples of use:

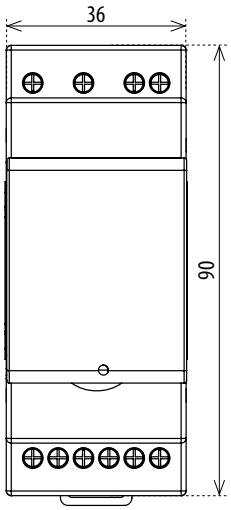
DIM-7

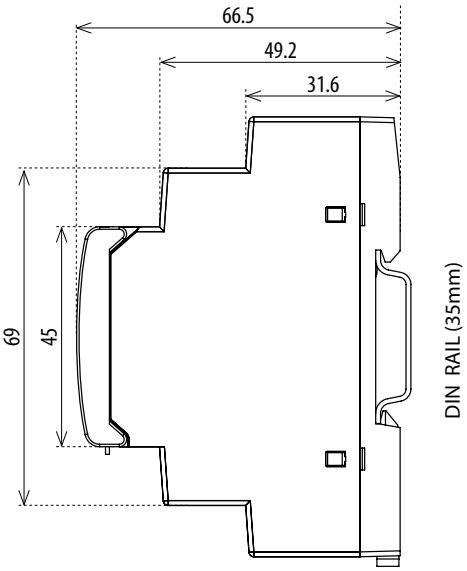


PRI-53

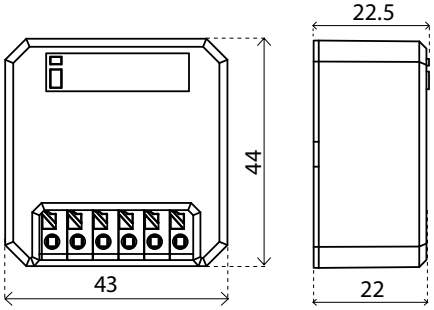


HRN-100/2

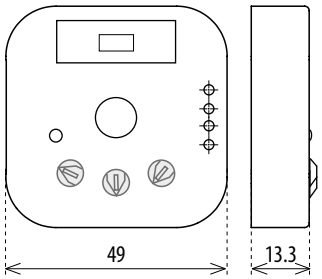




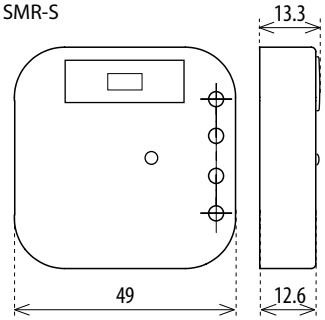
SMR-B-SL



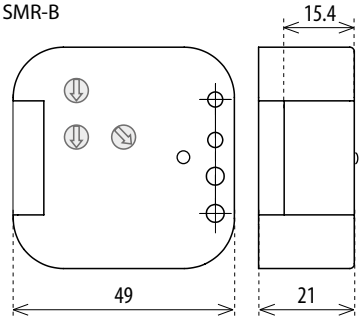
SMR-T, SMR-H, SMR-K



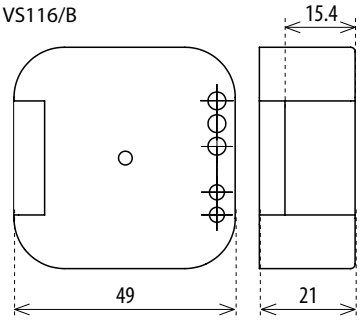
SMR-S



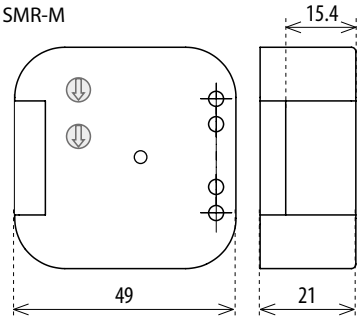
SMR-B



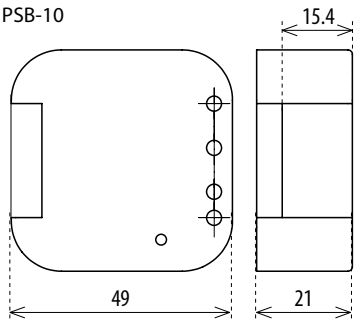
VS116/B



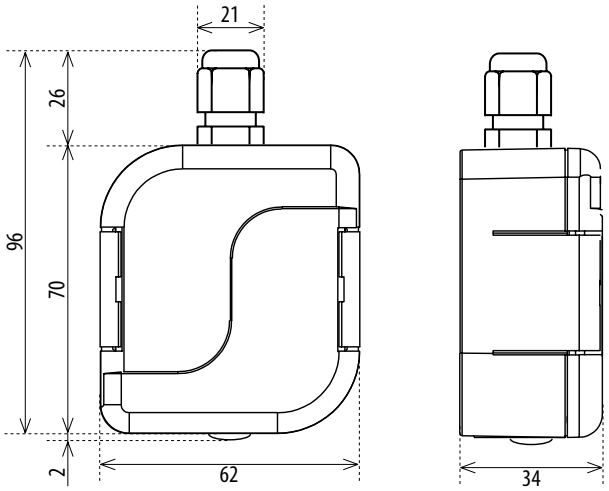
SMR-M



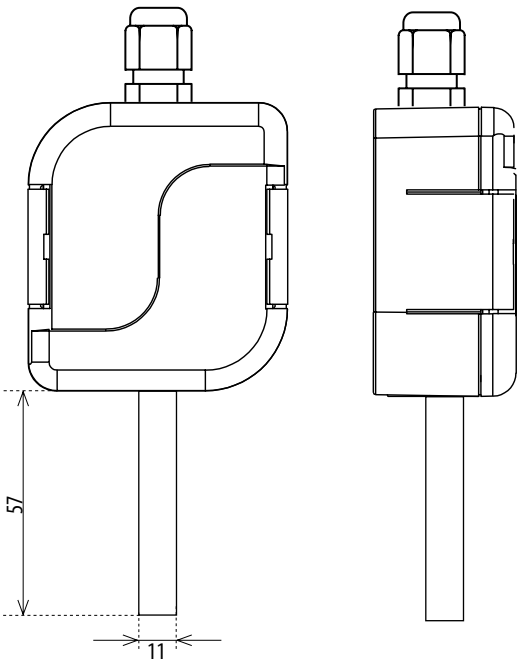
PSB-10



SOU-3

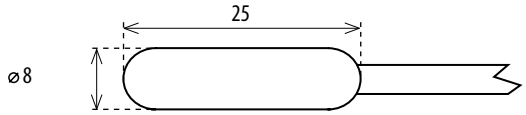


RHV-1, TEV-4

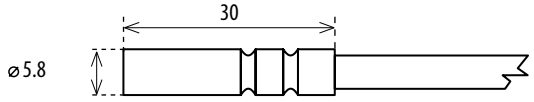


Temperature sensors

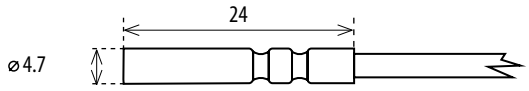
TC



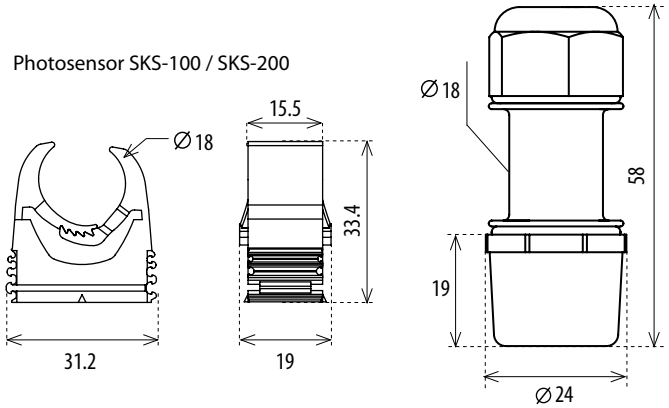
TZ



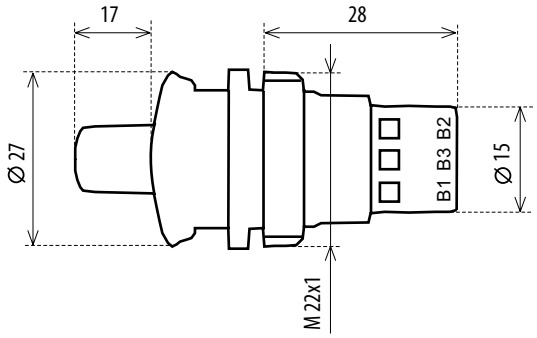
Pt100



Photosensor SKS-100 / SKS-200

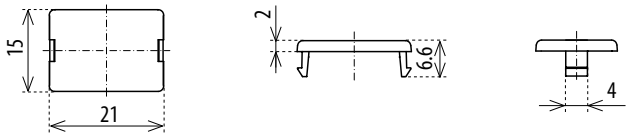


External potentiometer
for CRM-2HE, CRM-91HE

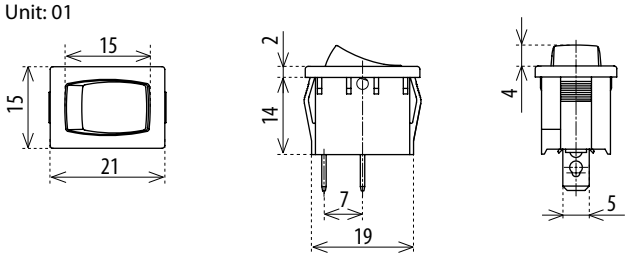


USS

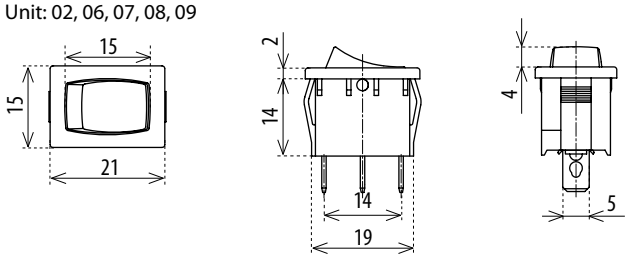
Unit: 00



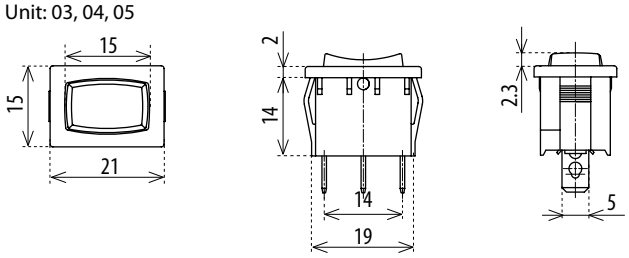
Unit: 01



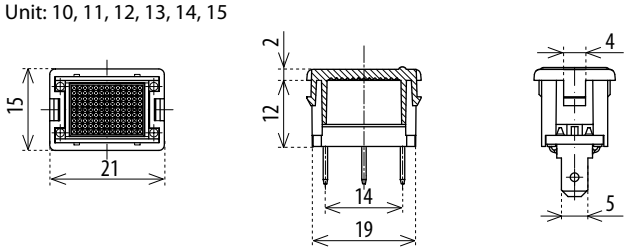
Unit: 02, 06, 07, 08, 09



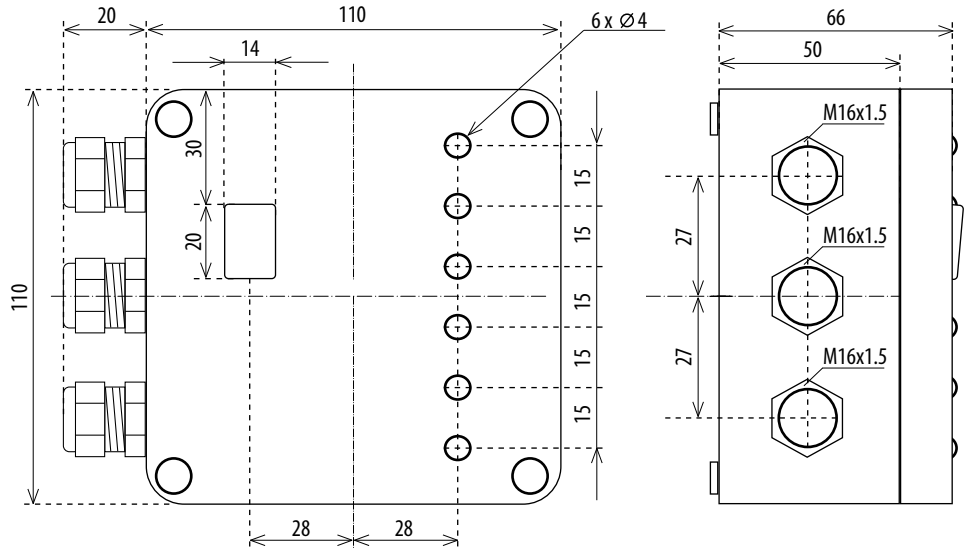
Unit: 03, 04, 05



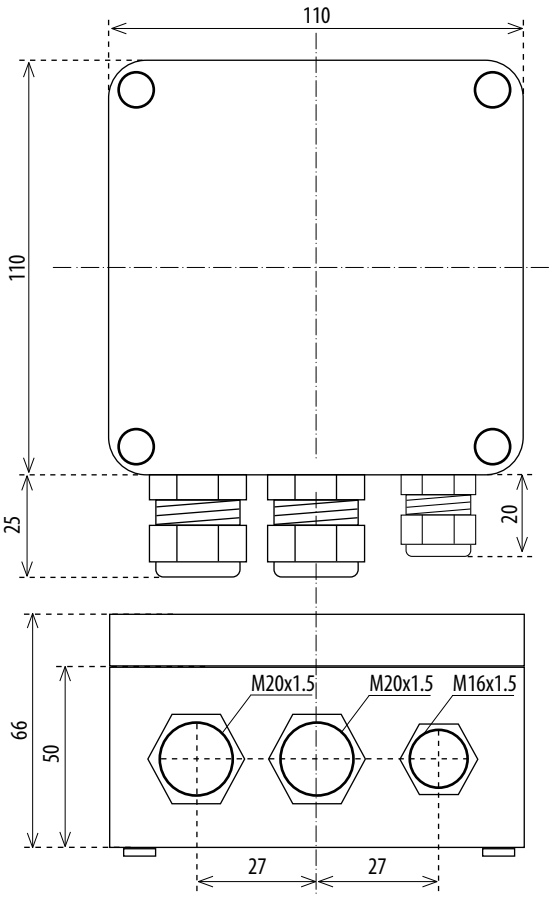
Unit: 10, 11, 12, 13, 14, 15



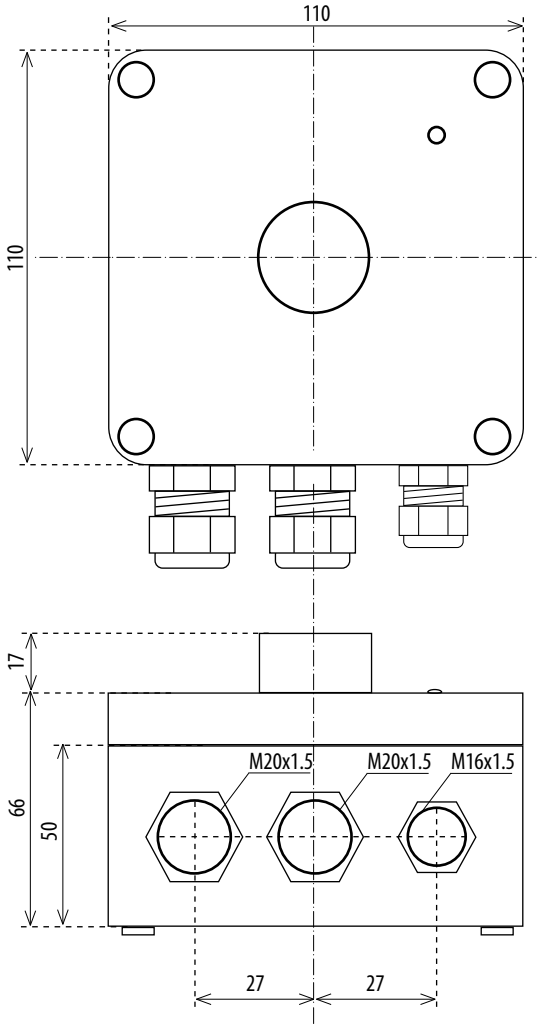
HRH-6



TEV-1, TEV-2

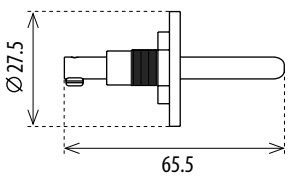


TEV-3

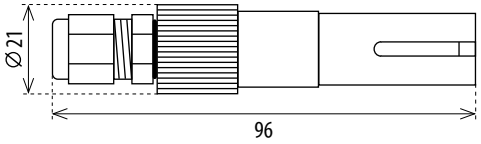


Level probes

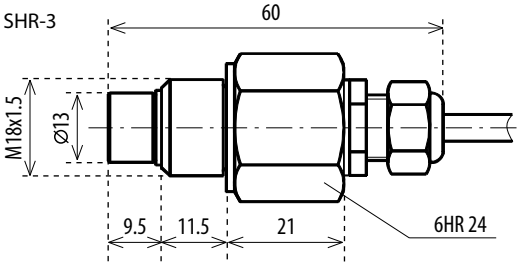
SHR-1



SHR-2

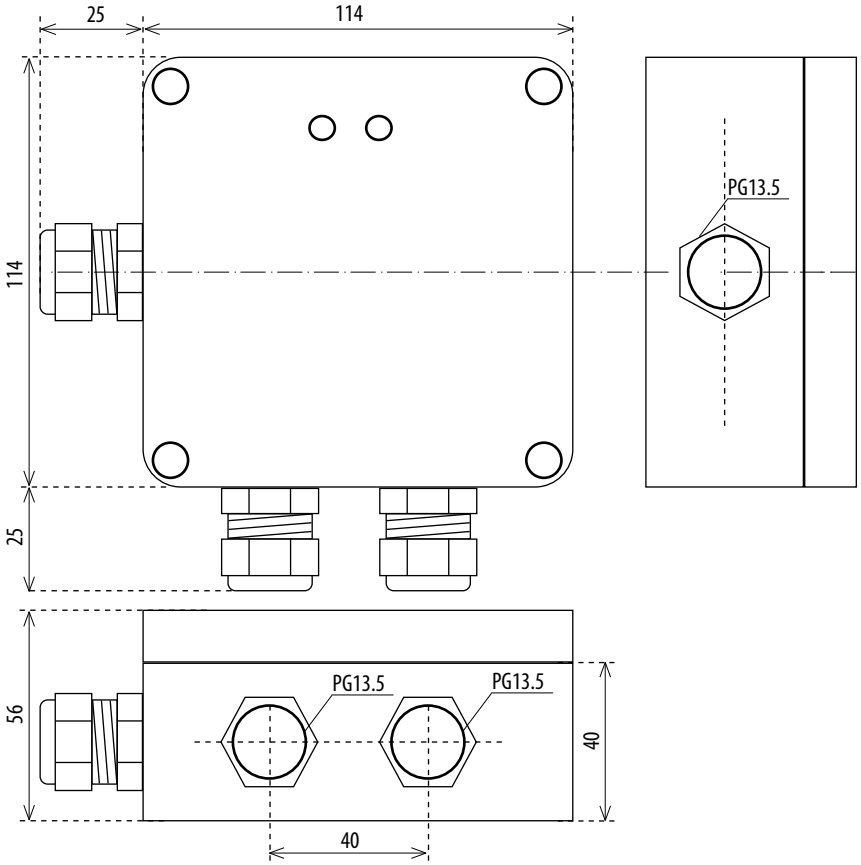


SHR-3

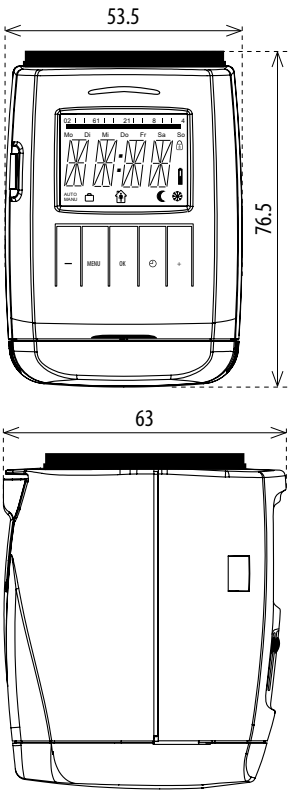


Dimensions

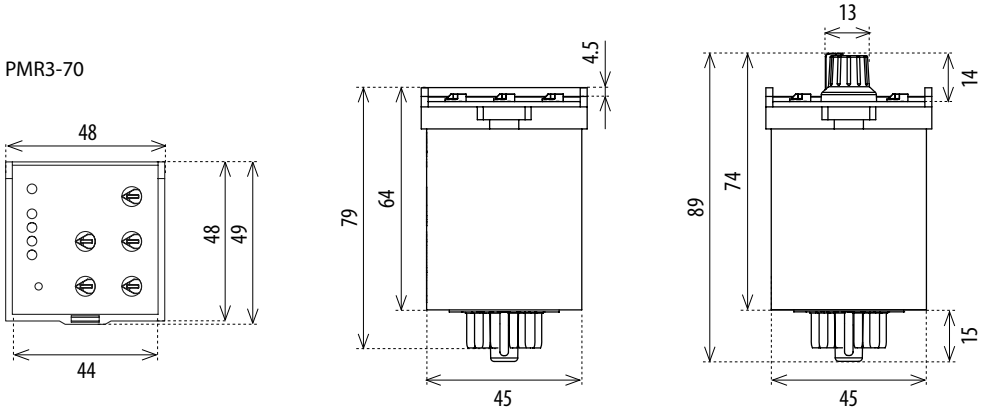
HRH-7



ATV-1

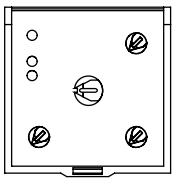


PMR3-70

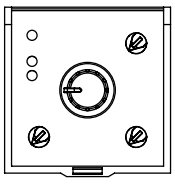


Front panels for PLUG-IN, examples of use:

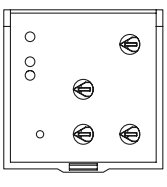
PTRx-216T



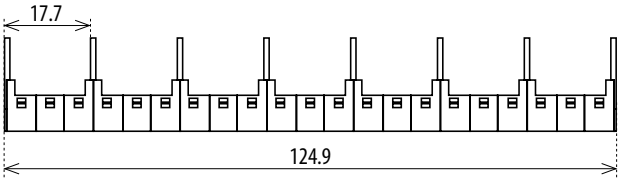
PTRx-216K



PMR1-3x

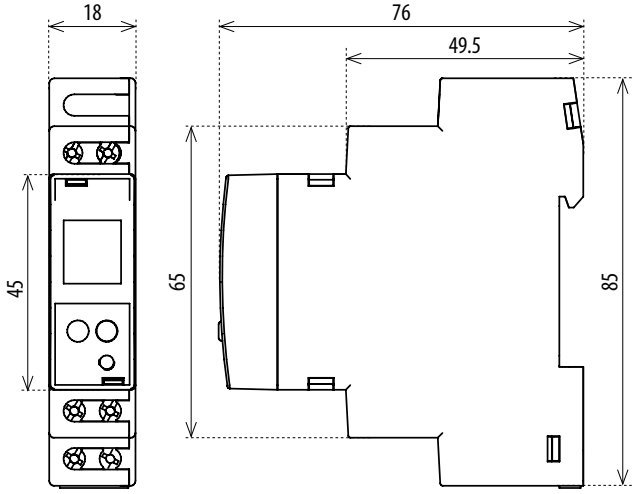


Comb busbar CB-17-8



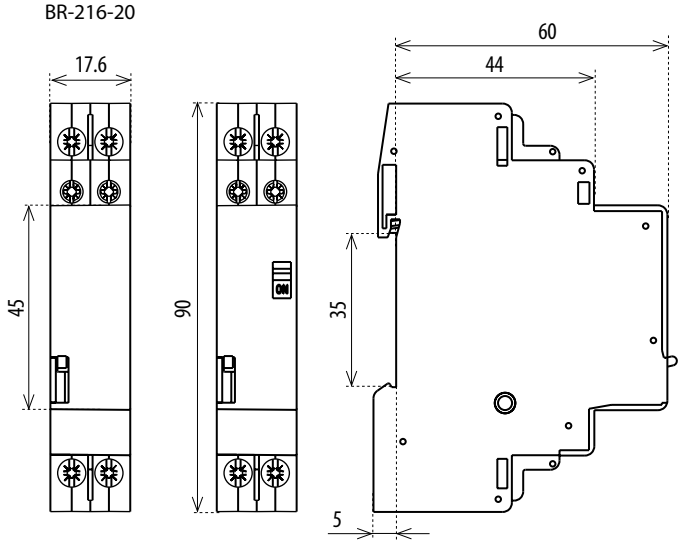
Dimensions

CRM-100



BR-216-10
BR-216-11
BR-216-20

BR-220-20
BR-232-20

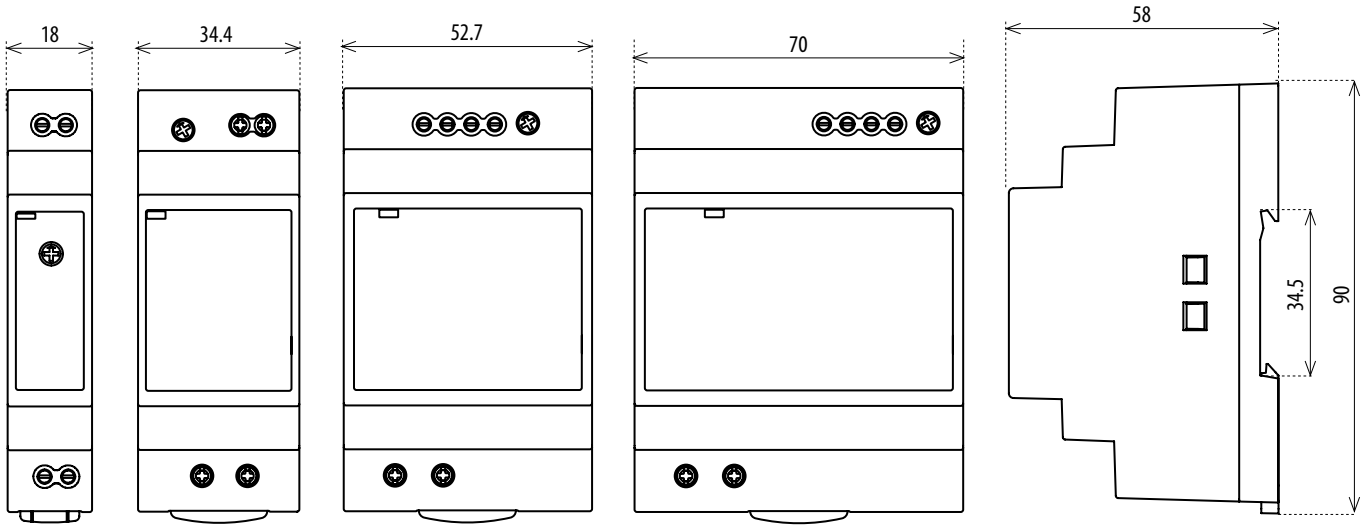


PS1M-15/12V
PS1M-15/24V

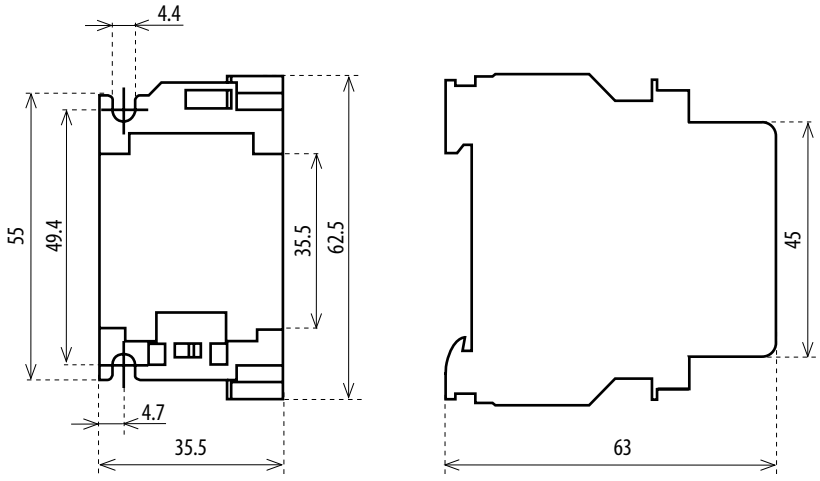
PS2M-24/12V
PS2M-30/24V

PS3M-54/12V
PS3M-60/24V

PS4M-85/12V
PS4M-92/24V

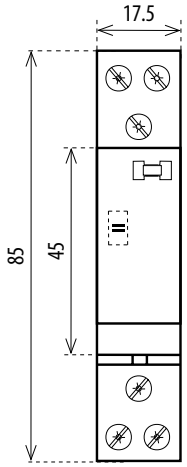


VS420

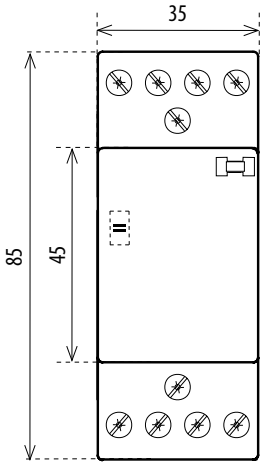


Dimensions

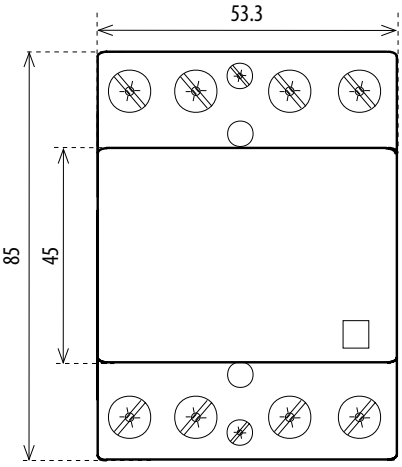
VS120
VS220
VSM220

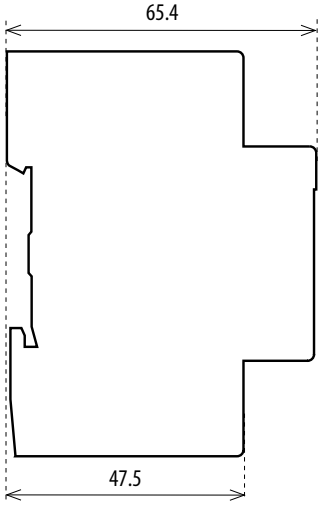


VS425
VSM425

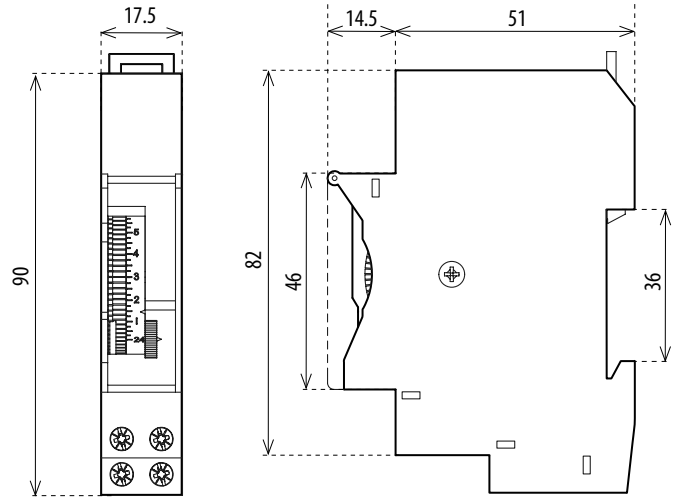


VS440
VS463

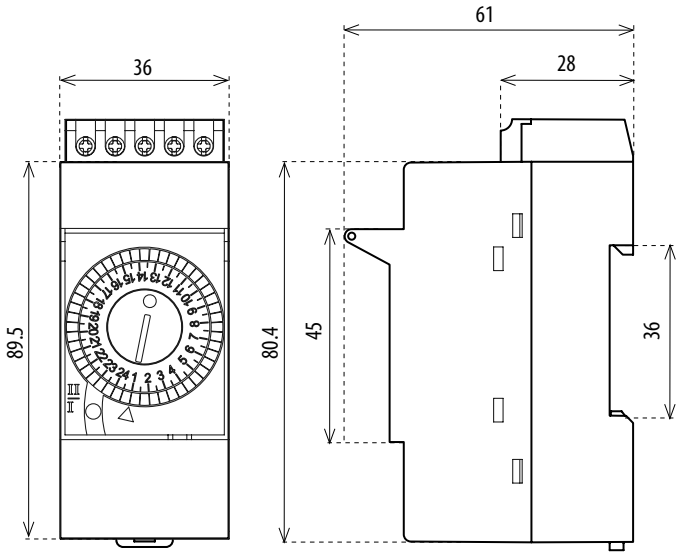




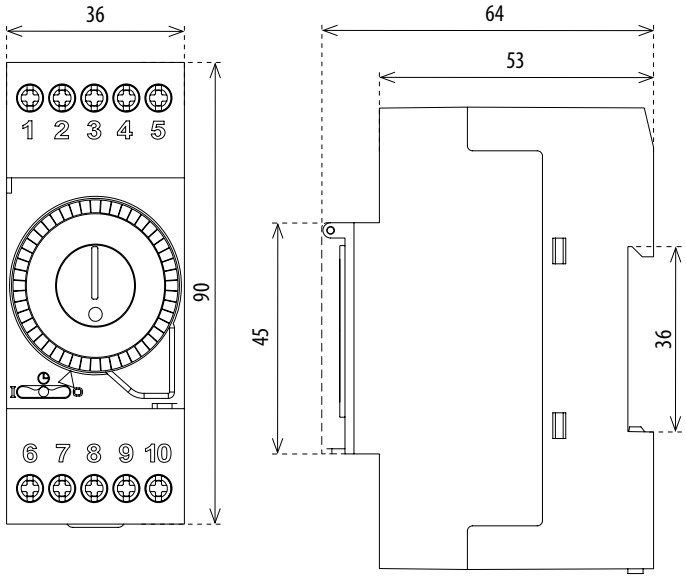
ATS-1DR



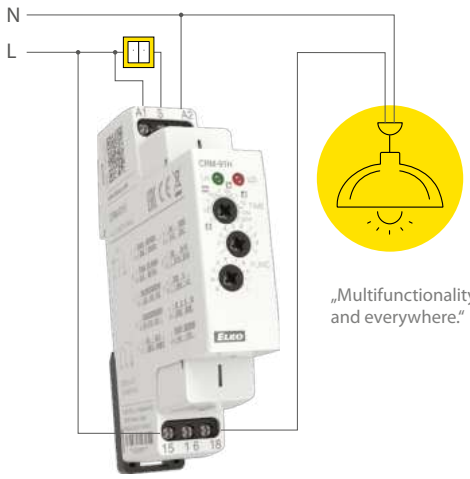
ATS-2D, ATS-2DR

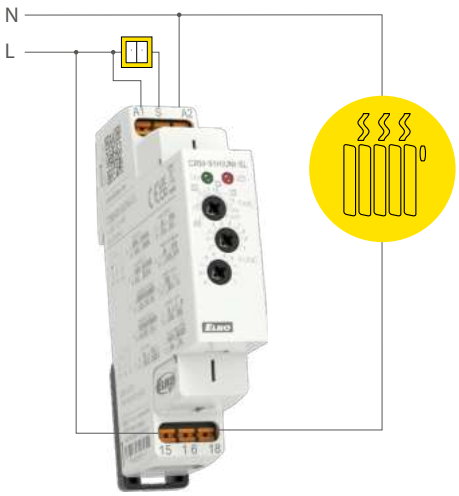


ATS-2WR

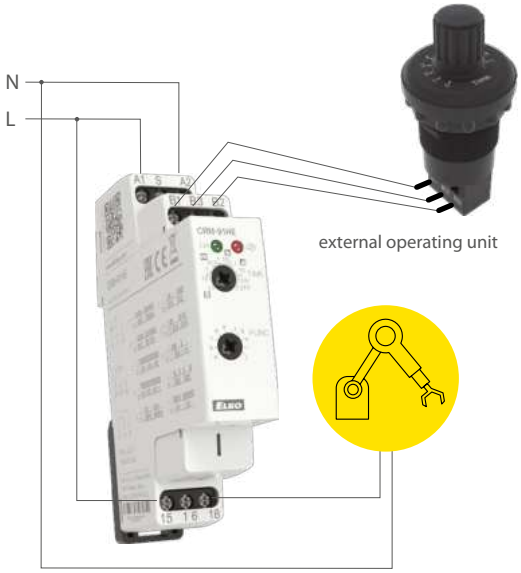


Multifunction time relay CRM-91H, CRM-93H, CRM-91-SL, CRM-93H-SL
- for electric appliances, where is necessary to change the exact timing - controlling of the illumination, heating, motors, machines, ventilators, contactors

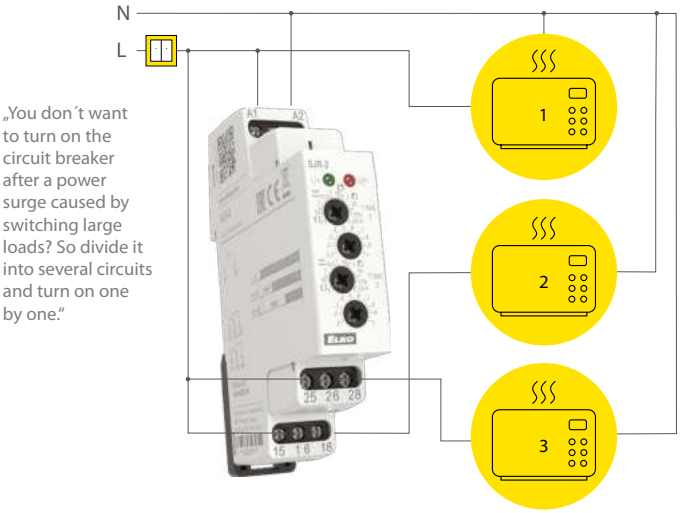




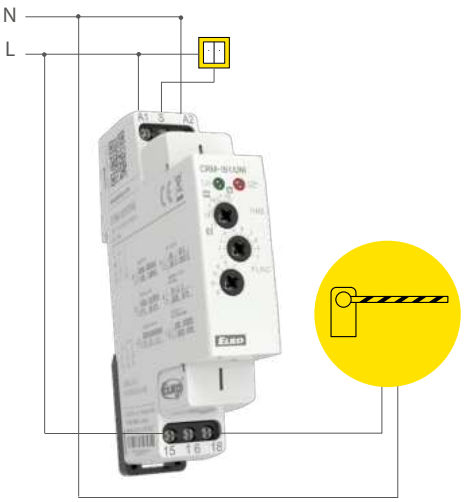
Multifunction time relay with external potentiometer CRM-91HE
- time adjusting via external operating unit, operating on panel, switchboard doors



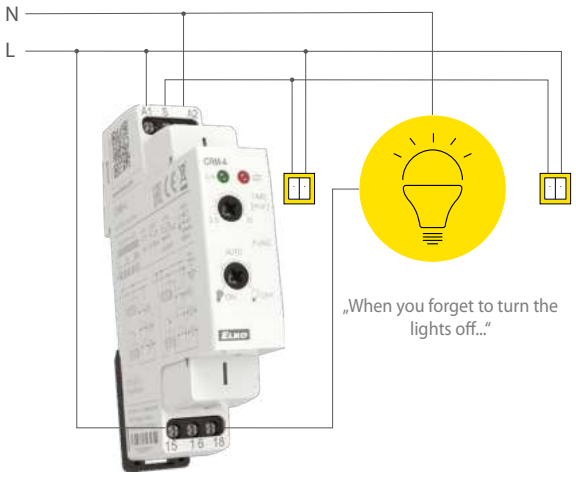
Doublestage delay unit SJR-2
- for sequential load switching, electric furnaces, heaters



Multifunction time relay CRM-161
- for electronic appliances, light control, heating, motors, fans



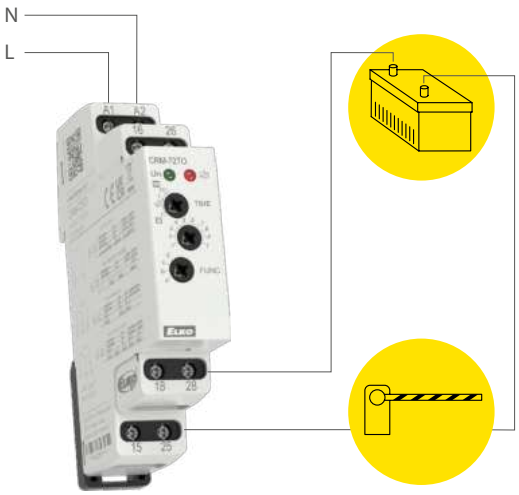
Staircase switch CRM-4
- staircase automatic systems, ventilators switching, for multiplace operating illumination on the staircases and halls



Examples of usage

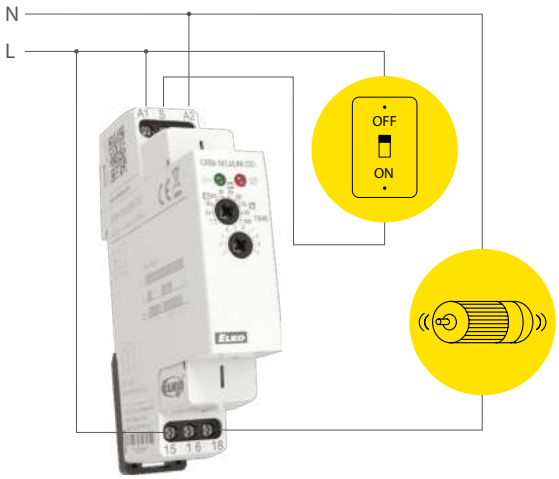
PLUG-IN time relay PTRM-216TP
- serves to control light signallization, heating, motor and fan control etc.

Delay OFF without supply voltage CRM-72TO
- delayed back-up switch off at current failure (emergency illumination, emergency respirator)

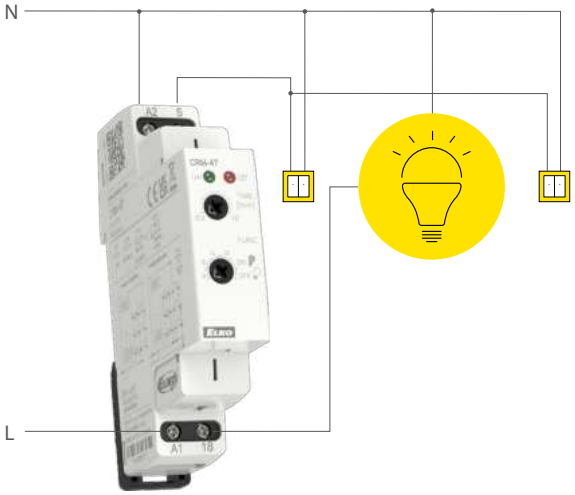


Asymmetric flasher CRM-2H
- regular rooms ventilation, cyclic humidity exhaustion, illumination controlling, circulation pump, flash, warning appliances, regular pump down, regular irrigation via electromagnetic valve

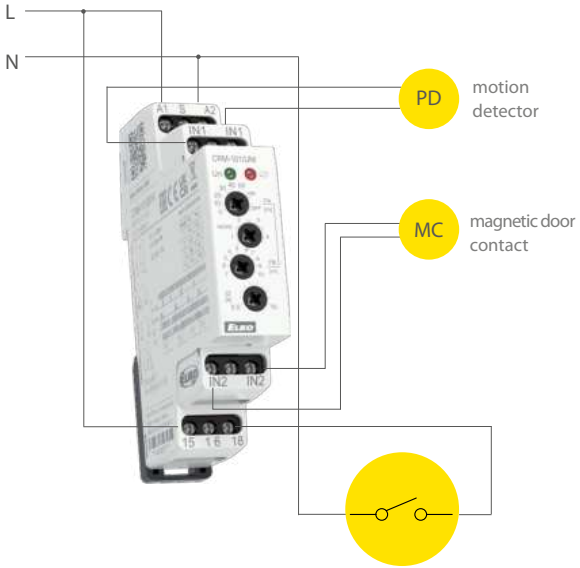
Single function time relay CRM-181J
- time switch, using for run down the pump after switch off the heating, switching of ventilators



Programmable staircase switch with possible signaling before switch off CRM-47
- starcaise illumination operation
- on-coming switch off signalling (flash = comfort + safety together)
- prodloužení zpoždění počtem stisků tlačítka



Room energy saving relay CRM-101
- replacement of the card switch (energy saving in the absence of guests)
- the relay controls e.g. the hotel room contactor by means of a magnetic door contact and a motion detector



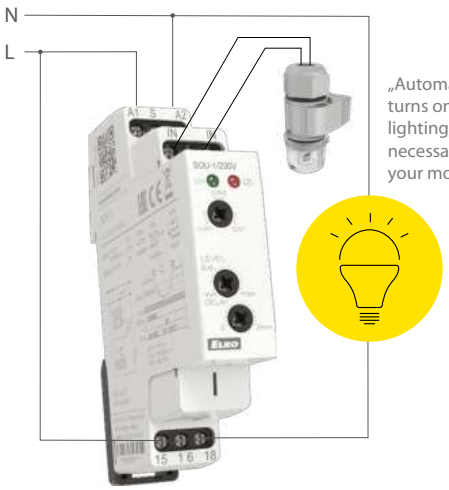
Digital time switch SHT-13/1, SHT-13/2
- for controlling of all appliances that depend on real time, appliances could be controlled in regular cycles, or according to adjusted program (blocking of main door out of working hours or night)
- in combination with other devices, controlling could be combinated (rooms ventilation, irrigation controlling, bell at school or in church...)

„When you need to switch heating in your cottage before you arrive... e.g. on Friday 13th at 1:13 p.m."

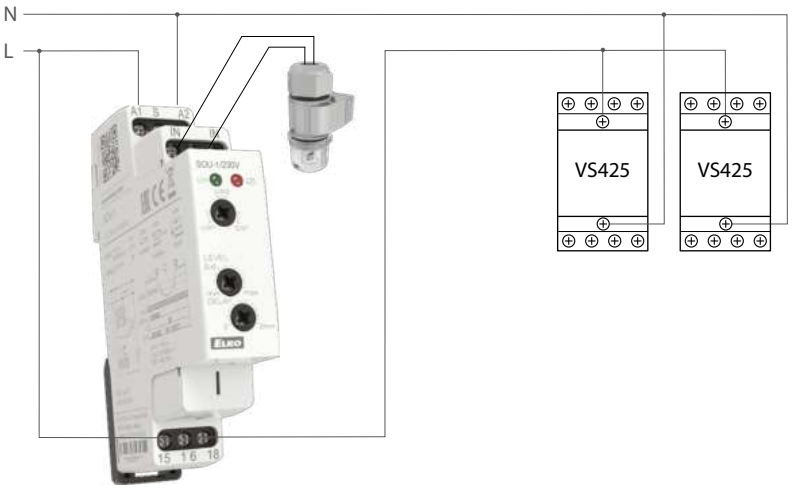
Programmable digital relay PDR-2
- illumination, ventilators, contactors controlling, controlling of interlocking plans, system of time abate and blocking (billiards, pin-balls....), away control via external buttons

„When you need maximum and accurate information about time - then you need a display."

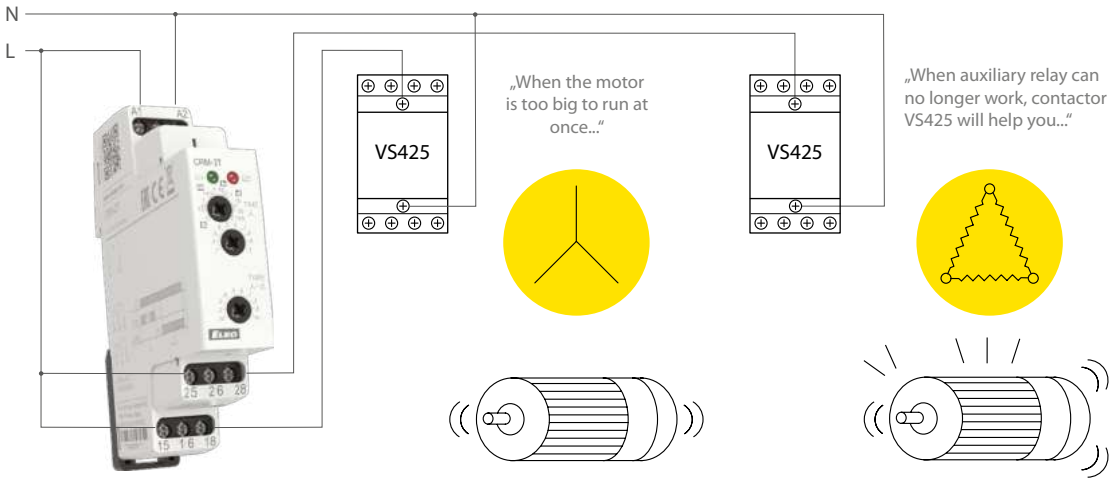
Twilight switch SOU-1
- outdoor illumination switching (garden illumination), flash, shop-window, hall and office illumination (switch off in desired light level, controlling of intensity)



„Automatically turns on / off lighting, if it is necessary. Save your money."

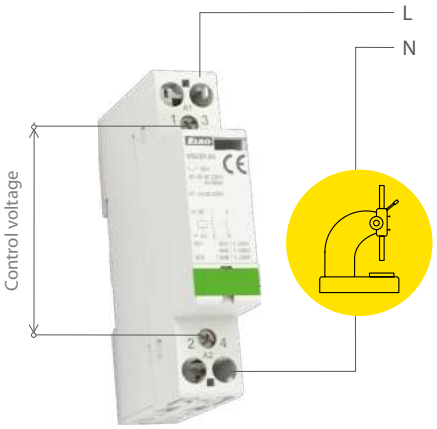


Star/delta timer CRM-2T
- motor starting more than 3 kW, electronic switchover from mode start to mode operation with device CRM-2T, what assures exact timing

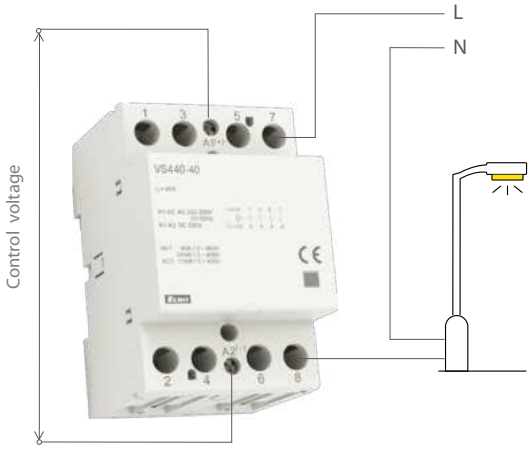


Installation contactor VS425
- switching of the higher loads, especially in other categories than AC1

Installation contactor VS120, VS220, VS420, VS425
- to switch circuits for supply and control of heating, lights, air-conditioning and other el. devices.
- switches loads AC-1, AC-3, AC-7a, AC-7b, AC-15.

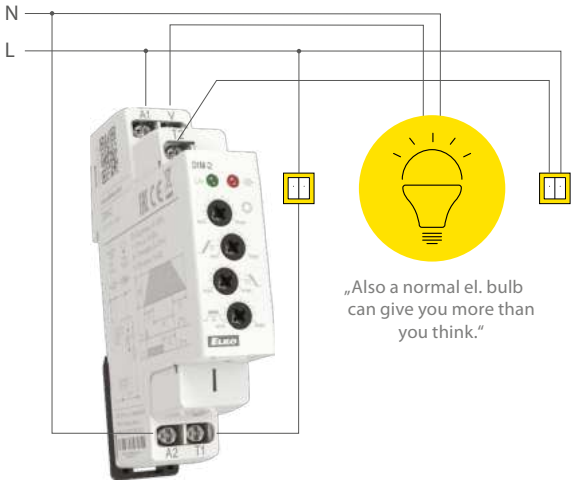


Installation contactors VS440, VS463
- to switch supply and control circuits for heating, air-conditioning and other el. devices, switching 3-phase motors
- switches loads AC-1, AC-3, AC-7a, AC-7b, and AC-15

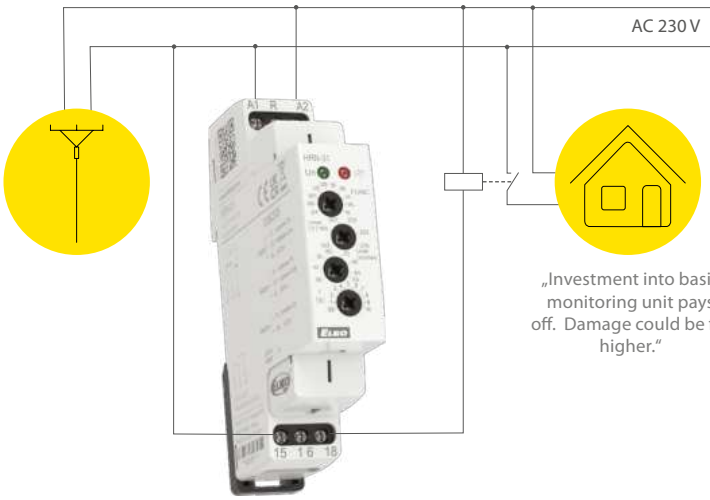


Digital time switch SHT-1, SHT-1/2
- for controlling of all appliances that depend on real time, in daily, weekly or yearly program

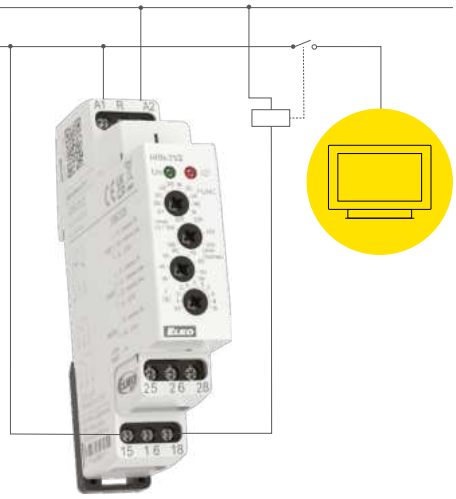
Staircase switch with dimming DIM-2
- step by step (fluent) dim up, adjusted time is ON and fluent dim down (e.g. possible to adjust permanent shine to min. brightness everlasting light)
- block of flats (entry, halls, staircases), garden lighting



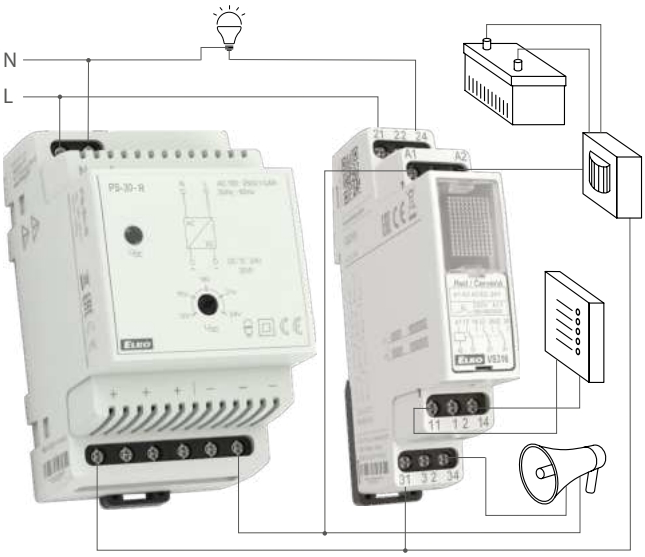
Monitoring voltage relay HRN-31 (HRN-31/2)
- monitoring of mains voltage for appliances inclinable to supply tolerance



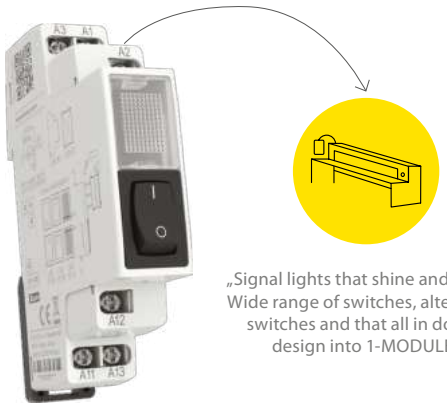
Monitoring voltage relay HRN-31 (HRN-31/2)
- protection of appliances against under-/overvoltage



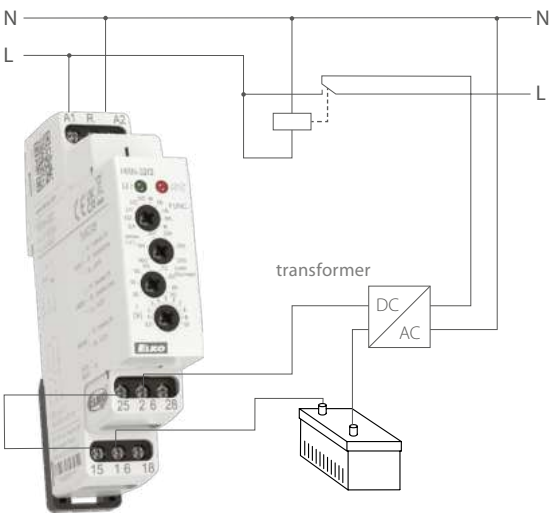
Switching power supply PS-30-R
- power supply of any devices and appliances via safe voltage with full galvanically separated from mains
- power supply of driving systems, interlocking plants and use in measurement and control



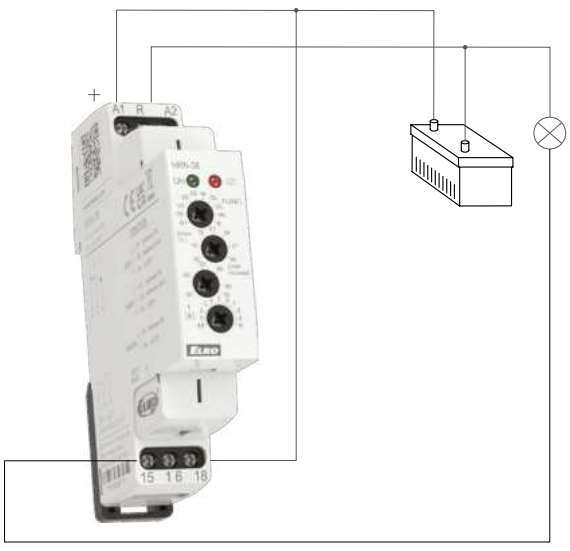
Controlling and signalling units USS
- compact dimensions, elegant design, wide range of use, configuration for request
- switching and signalling in switchboard, controlling centre, automation...



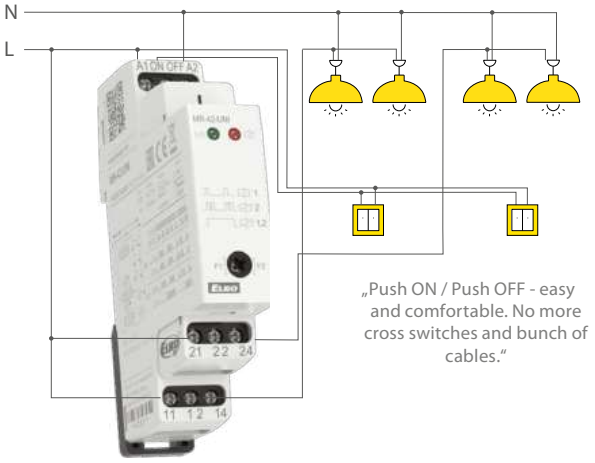
Monitoring voltage relay HRN-32/2
- start of back-up supply in case of failure



Monitoring voltage relay HRN-36
- load disconnected when voltage declines or battery is discharged



Memory relay MR-41, MR-42
- because of 2-wire parallel buttons connection save money, place and time during the installation
- light switching, hall, staircase, big rooms, controlling systems, automation

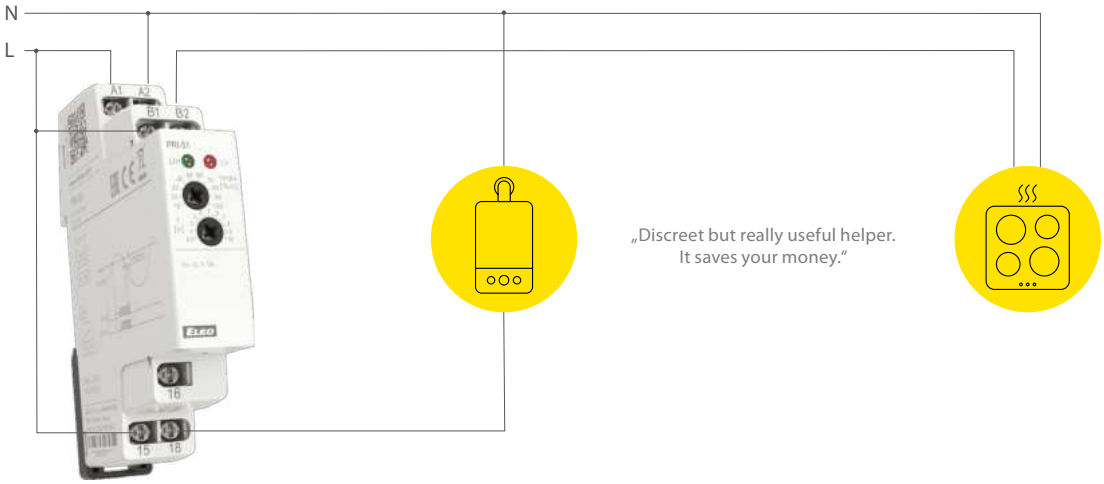


„Push ON / Push OFF - easy and comfortable. No more cross switches and bunch of cables."

Power relays VS
- switching of higher load than is capacity of switched unit = repeater
- assistant light controlling, signalling, boilers, ...

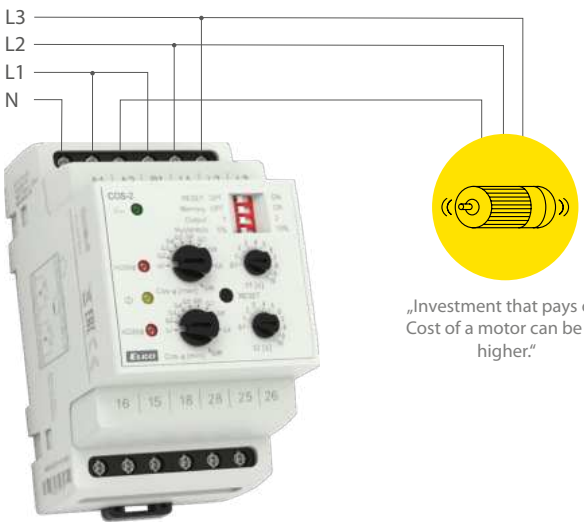
„They will help you, they will intensify and extend..."

Monitoring current relay PRI-51, PRI-32
- current-limiting relay (on one branch two appliances, which never work together), controlling systems, motors, heating, current indication, controlling of 1-phase motor run down, during the installation of main housing switchboard could be controlled via eye, if the cooker is not switched
- in connection with current transformers, it is possible to extend current ranges up to 600A, which makes more things possible



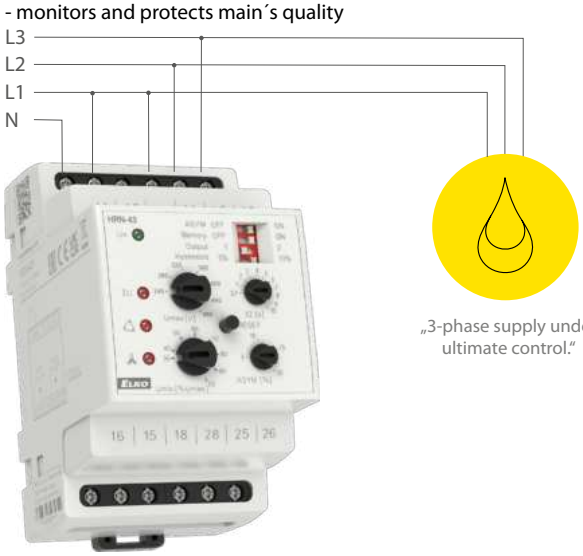
„Discreet but really useful helper. It saves your money."

Relay monitoring power factor COS-2
- monitors power-factor in 3-phase mains / unloading of motors, pumps, lift systems



„Investment that pays off. Cost of a motor can be far higher."

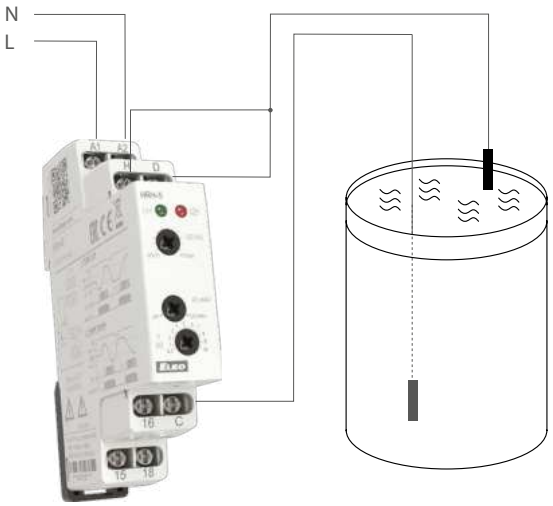
Monitoring voltage relay HRN-43
- regulation of voltage from generator, water el. plants, 3-phase control in the main
- monitors and protects main´s quality



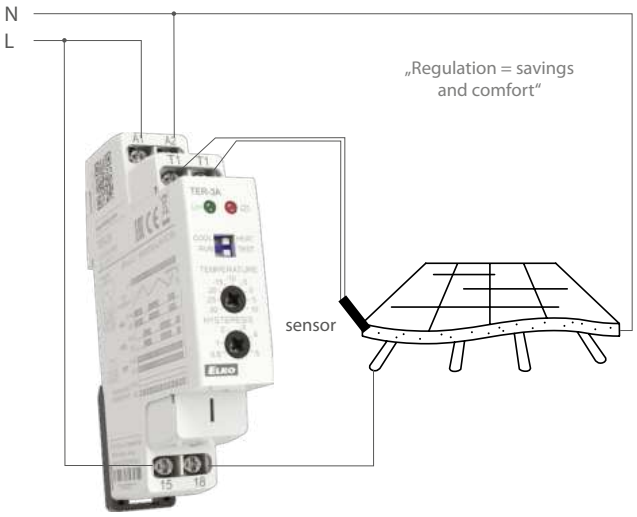
„3-phase supply under ultimate control."

Level switch HRH-8
- monitoring level in wells, tanks, pools, etc.

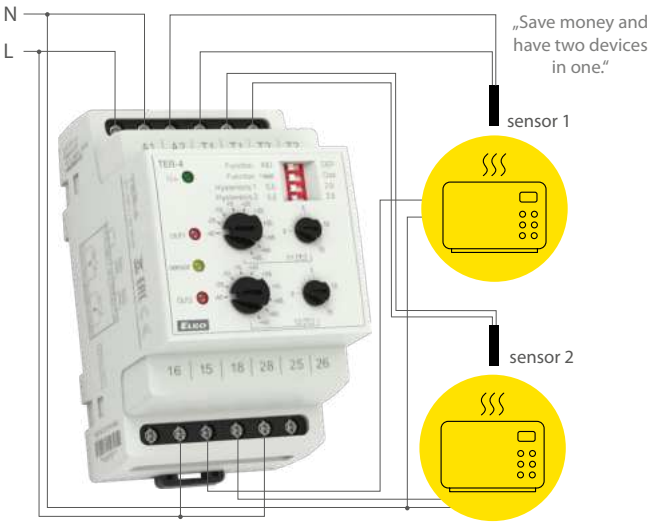
Level switch HRH-5
- monitoring level in well, sump, tanks, silo...



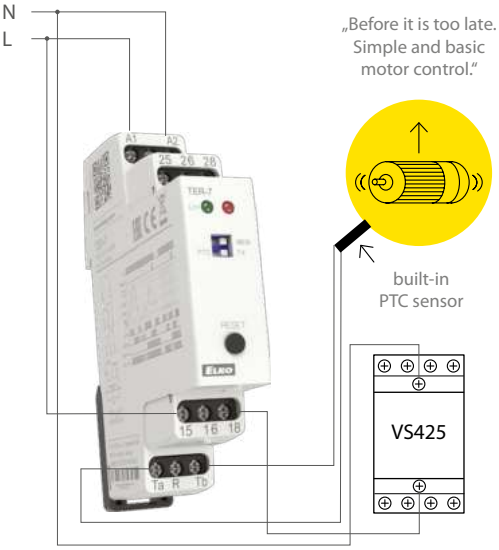
Thermostat TER-3 with external sensor
- control of temperature of floor heating



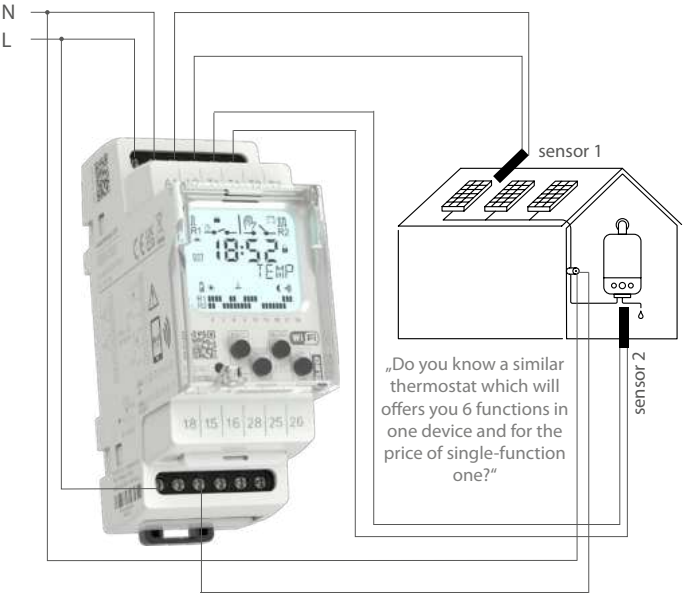
2 stage thermostat TER-4 with 2 external sensors
- control of temperature of e.g. gas/electric boiler



Thermostat for thermal protection of motors TER-7
- protection of motors against thermal overload

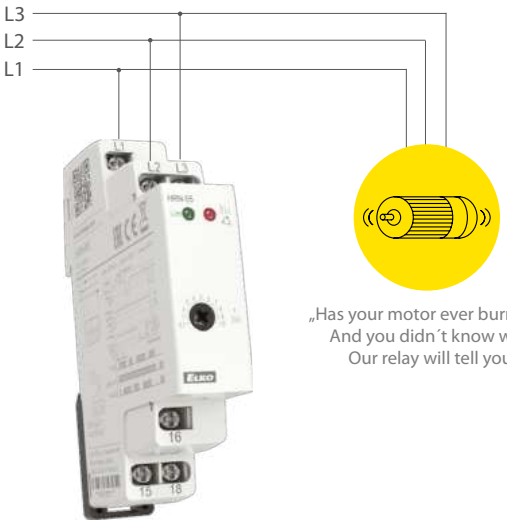


Multifunction digital thermostat TER-13
- complex control of heating and water heating in a house

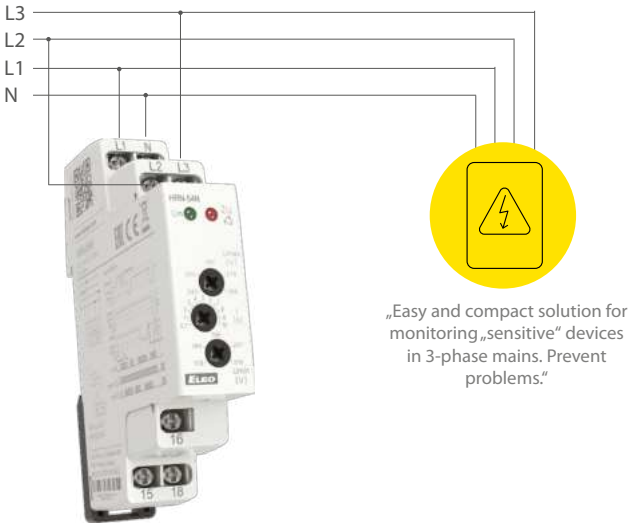


Examples of usage

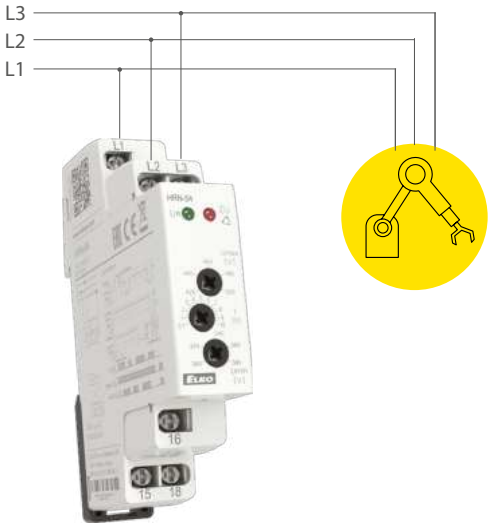
Relay monitoring sequence and failure of phases HRN-55, HRN-55N
- monitoring of proper motor rotation, electric drive, etc.



Relay monitoring over-/undervoltage in 3-phase mains HRN-54N
- monitoring voltage in switchboard, protection of appliances



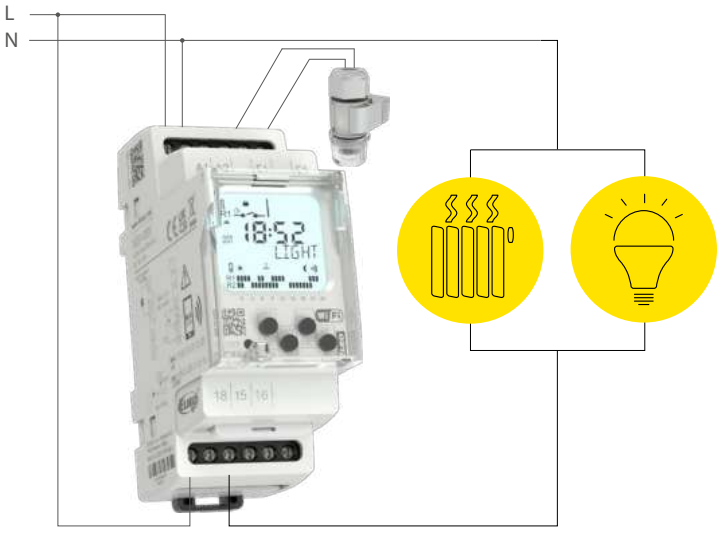
Monitoring voltage relay for under/vervoltage for 3-phase mains HRN-54
- confortable monitoring of 3-phase mains



Monitoring current relay PRI-41
- monitoring over-/-underload (machine, motor ...)
- monitoring consumption, diagnostics of distant appliance (short circuit, increased consump. ...)

Multifunction time relay with solid state output CRM-9S
- used for road warning lights, flashers, cyclers, often switched systems

Twilight/light switch with time switch SOU-13
- used for heat and lighting control in green houses based on light intensity



Others just resell,

WE DEVELOP AND MANUFACTURE PRODUCTS OURSELVES!

32 years
on the market

ISO 9001
certification

30
engineers

350
employees

2 000 m²
manufacturing space

200
proprietary moulds

4
SMD lines

pick-up & place

1 mil.
components per day

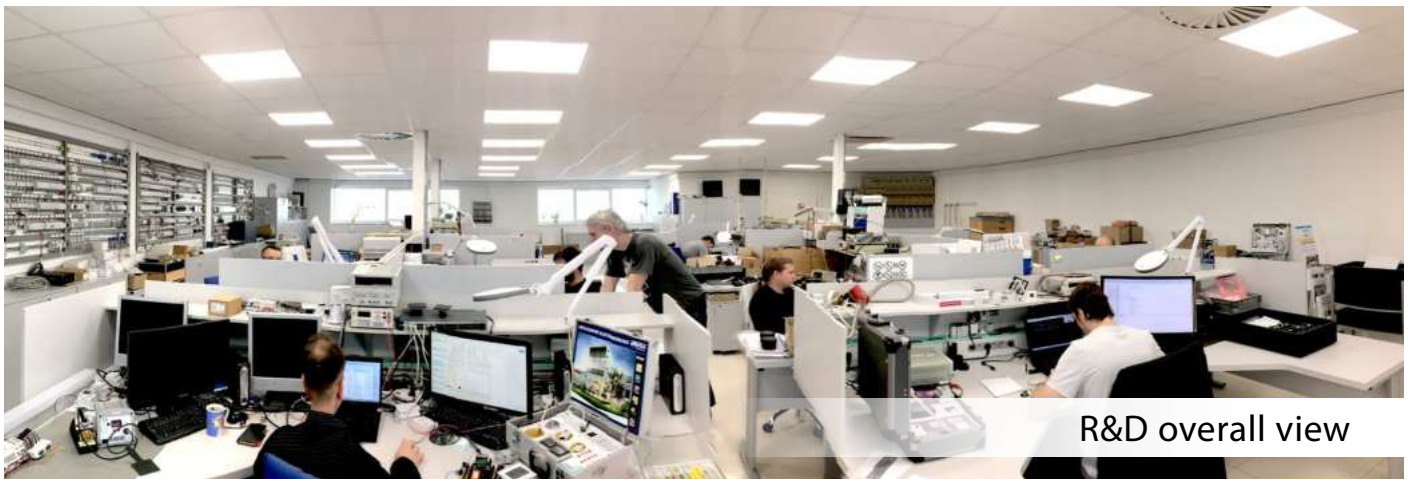
1 000 000
products per year

24 /7/ 365
support

2 000 m²
warehousing spaces

3
robotic lines

Notes



R&D overall view

Manufacturing hall

Testing lab

Finalization and dispatch

Headquarters

ELKO EP Holding SE, Czech Republic

Branches

Europe

ELKO EP Balkan d.o.o
ELKO EP Bulgaria OOD
ELKO EP Germany GmbH
ELKO EP Hungary Kft.
ELKO EP POLAND Sp. z o.o.
ELKO EP SLOVAKIA, s.r.o.
ELKO EP UK Ltd.
ELKO EP UKRAINE LLC

Africa & Middle East

ELKO EP Egypt LLC
ELKO EP Kuwait Ltd.
ELKO EP MEA UAE
ELKO EP Saudi Arabia Ltd.
ELKO EP South Africa PTY Ltd.

America

ELKO EP North America LLC

Manufacturers

INSPINIA Touch screen panels

BJC Switches & sockets

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