

# UL Certified Relays Catalog 2024/2025



[www.elkoepna.com](http://www.elkoepna.com)

**30** years  
of innovations

# ABOUT ELKO EP NORTH AMERICA

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**ELKO EP North America is a fast-growing US-based company representing a globally renowned brand with a 30-year history on the NA market under private labels, exporting to 80 countries with 15 branches worldwide. We are embarking on a new venture, proudly bringing the globally recognized ELKO brand directly to businesses and customers all across North America. With our headquarters nestled in the vibrant city of Miami, we also operate offices in Chicago, and have a strategically located warehouse in Louisville, KY, ensuring prompt service and product availability.**

While our North American operations continue to thrive, our global reach is expansive. Under private labels, we collaborate with renowned entities worldwide, underscoring our global expertise and commitment to excellence. Our products are recognized for their high quality, holding UL, CE and EAC certifications.

Internationally, ELKO EP stands out as the largest DIN Rail Relay Manufacturer in the European Union. Our European headquarters consists of 400 dedicated employees, with 45 specialists engaged in Research & Development, pushing the boundaries of innovation.

With a revenue of 40 million USD, our commitment to quality, innovation, and customer satisfaction remains paramount.



**Jan Pacovsky**  
Managing Member, CEO

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[www.elkoepna.com](http://www.elkoepna.com)

# 5 Reasons to Become a Partner

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- **Work Directly with the Manufacturer**

Forge a direct connection with the visionaries behind the products. Our EU-based R&d and manufacturing are enhanced by US-based warehouse, customer care and tech support.

- **US-Stocked Products**

Our commitment to local stock ensures zero drop-shipping and guarantees a swift delivery window of just 1-10 days.

- **Quality Endorsed by the North American Market**

Manufacturing for industry giants under private labels, ELKO EP products have been tested by the NA market and stood up to the highest standards.

- **US-Based Technical Support and Customer Care**

Our US-based team is ready to support you on all technical inquiries, with regular workshops being held for distributors. Customer care is available through phone and email, with average reply times of under 24h

- **An Unbeatable Price Advantage**

Savor the competitive edge with our direct-to-customer model, presenting partners with a lucrative margin.

## Attained awards & Memberships

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Electronic Components  
Industry Association member



Vodafone  
Company of the  
Year 2012



Electronics  
Representatives  
Association member



Technology Fast 50



Global exporter  
in 2016

...and many others.



## ABOUT ELKO EP HOLDING

**ELKO EP has been your partner in the field for 30 years, developing and manufacturing the highest quality electronic devices for electroinstallation and smart systems for residential and building automation.**

ELKO EP employs more than 400 people across 15 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



**30 %**

Czech

**40 %**

Export

**30 %**

Branches



**WORLDWIDE**

11 Branches  
3 Franchises  
80 Export Countries



**400**

Employees  
in Holding



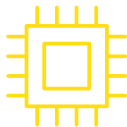
**30 000 +**

iNELS  
Installations



**30 000 000 +**

Manufactured  
Products



**R&D**

Continuously  
Innovative



**MANUFACTURER**

Fully Automated  
Complete Process



**SUPPORT**

24 / 7 / 365

**World leader**  
In DIN Rail Relays Production

# Product lines ELKO EP



## Timers/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.

[www.elkoep.com/relays](http://www.elkoep.com/relays)



## Monitoring/Protection relays

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.

[www.elkoep.com/monitoring](http://www.elkoep.com/monitoring)

## Multifunction current monitoring relay in 1P - PRI-34

It is a new line of PRI-34 current monitoring relays in a **multifunction** design. All types now measure **TRUE RMS** values (thus with minimal fault regardless of the shape of measured current). Of course, it is possible to **connect external current transformers** (possible extension of the measured range up to 1600A). There is a choice of eight functions incl. the memory ones.

**Individual types are divided** according to the nominal monitored current:

- PRI-34/1 A – monitored range AC 0.05 - 1 A
- PRI-34/2 A – monitored range AC 0.1 - 2 A
- PRI-34/5 A – monitored range AC 0.25 - 5 A
- PRI-34/8 A – monitored range AC 0.4 - 8 A
- PRI-34/16 A – monitored range AC 0.8 - 16 A



## Multifunction voltage monitoring relay in 1P - HRN-3x, PMR1

The original HRN-3x types on a DIN rail will be replaced by new ones that are **multifunction** and bring several improvements. Now you have options with **one or two** output contacts. The **design into a socket** is the PMR1 model. As well as the previous novelty, also this one measures **TRUE RMS** values. This is related with monitoring of **DC voltage in higher ranges**. The original DC range was slightly modified for optional monitoring of 24V batteries. Multifunctionality enables the selection of up to nine functions incl. memory ones. Also an **external input** for memory reset was added.

**Individual types are divided** according to the monitored range:

### On DIN rail:

- HRN-31, HRN-31/2, HRN-32/2 – monitored range AC/DC 48 to 276V
- HRN-36, HRN 36/2 – monitored range DC 6 to 30V
- HRN-39, HRN 39/2 – monitored range AC/DC 24 to 150V

### Into a socket:

- PMR1-31, PMR1-31/2 – monitored range AC/DC 48 to 276V
- PMR1-36, PMR1-36/2 – monitored range DC 6 to 30V
- PMR1-39, PMR1-39/2 – monitored range AC/DC 24 to 150V

**TIME RELAYS - MULTIFUNCTION****DESIGN**

CRM-161   Multifunction time relay - <b>economy</b> version .....	(1-MODULE)	11
CRM-91H, CRM-92H, CRM-93H   Multifunction time relays - <b>BESTSELLER</b> .....	(1-MODULE)	12
CRM-111H, CRM-112H, CRM-113H   Multifunction time relays <b>with inhibit delay</b> .....	(1-MODULE)	14
CRM-121H   Multifunction time relay <b>with galvanically separated control input</b> .....	(1-MODULE)	16
CRM-131H   Multifunction time relay <b>with three control inputs</b> .....	(1-MODULE)	18
CRM-82TO   True off delay time relay .....	(1-MODULE)	20

**TIME RELAYS - SINGLEFUNCTION, SPECIAL**

CRM-2T   <b>STAR</b> (Λ)/ <b>DELTA</b> (Δ) time relay .....	(1-MODULE)	21
CRM-181J, CRM-182J, CRM-183J   <b>Singlefunction</b> time relays .....	(1-MODULE)	22
CRM-2H   Asymmetric flasher .....	(1-MODULE)	24

**TIME RELAYS - PLUG-IN**

PTRM-216TP, PTRM-216KP   Multifunction time relays <b>with inhibit delay</b> .....	(11-PIN)	25
PTRM-216T, PTRM-216K   Multifunction time relays <b>with potential-free control input</b> .....	(11-PIN)	27
PTRA-216T, PTRA-216K   Multifunction time relays <b>with three control inputs</b> .....	(11-PIN)	29

**VOLTAGE 1-PHASE**

HRN-31, HRN-32/2, HRN-39   Multifunction voltage monitoring relays <b>in 1P - AC/DC</b> .....	(2-MODULE)	33
HRN-36   Multifunction voltage monitoring relay <b>in 1P - DC</b> .....	(2-MODULE)	33
PMR1-31, PMR1-39   Multifunction voltage monitoring relays <b>in 1P - AC/DC</b> .....	(8-PIN)	35
PMR1-36   Multifunction voltage monitoring relay <b>in 1P - DC</b> .....	(8-PIN)	35

**VOLTAGE 3-PHASES**

HRN-56   Voltage monitoring relays <b>in 3P with adjustable level Umin</b> .....	(1/3-MODULE)	37
HRN3-70, PMR3-70   Voltage monitoring relays <b>in 3P with selectable range</b> .....	(3-MODULE/8-PIN)	38
HRN3-80, HRN3-81   Voltage monitoring relays <b>in 3P - selectable range</b> (HRN3-80), <b>fixed range</b> (HRN3-81) .....	(1-MODULE)	40

**CURRENT**

PRI-32   Current monitoring relay of <b>I<sub>max</sub> level passing through a hole in 1P - AC</b> .....	(1-MODULE)	43
PRI-34   <b>Multifunction</b> current monitoring relays <b>in 1P - AC</b> .....	(1-MODULE)	44
PRI-51   Current monitoring relays of <b>I<sub>max</sub> level in 1P - AC</b> .....	(1-MODULE)	46

**AUXILIARY RELAYS**

VS116U, VS308U,   Auxiliary relays .....	(BOX/1-MODULE)	48
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**DIGITAL TIME SWITCHES**

SHT-13, SHT-13/2   <b>Multifunction digital</b> time switch <b>with Wi-Fi</b> connection .....	(2-MODULE)	51
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**POWER SUPPLIES AND BELL TRANSFORMERS**

PS1M, PS2M, PS3M, PS4M, PS6M   <b>Switching</b> power supplies <b>DC - unregulated</b> .....	(1/2/3/4-MODULE)	53
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**INSTALLATION CONTACTORS**

VS120, VS220, VS325, VS340, VS363, VS425, VS440, VS463   Installation contactors .....	(1/2/3-MODULE)	56
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**NON-UL PRODUCTS**

CRM-91HE, CRM-2HE, CRM-9S, HRN-100, HRH-5, MR-41, MR-42, TER-7, TER-9, SJR-2 .....	(1/2-MODULE)	60
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**USE CASES - TOP 10 NEW RELAYS**

HRN-31, HRN-32/2, HRN-36, HRN-39, HRN3-81, SHT-13 / SHT-13/2, PRI-34, HRN3-70, PMR1-31, PMR1-36/2 .....	(1/2-MODULE)	62
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**USE CASES - TOP 10 NEW RELAYS BY US SALES**

CRM-161, CRM-183J ZR, CRM-2H, CRM-82TO, CRM-91H, CRM-93H, HRN-56, PRI-51, VS116U, VS308U .....	(1-MODULE)	64
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**TECHNICAL DETAILS**

Loadability of products .....		69
Product packaging .....		71
Dimensions .....		72
Examples of use .....		75

## Multifunction



CRM-161

6 functions, 6 time ranges, output contact 1x 8 A changeover, power supply AC 24-240 V, DC 24 V, economy version of CRM-91H. page 11



CRM-91H

10 functions, 10 time ranges, 1x output 16 A changeover/SPDT, multivoltage or 230 V supply. page 12



CRM-92H

10 functions, 10 time ranges, 2x output 16 A changeover/SPDT, multivoltage or 230V supply. page 12



CRM-93H

As CRM-91H, but output 1x 16 A + 2x 8 A changeover/SPDT. page 12



CRM-111H

11 functions 10 time ranges, output contact: 1x 16 A changeover. page 16



CRM-112H

10 functions, 10 time ranges, output contact: 2x 16 A changeover, mode selection of output contact. page 16



CRM-113H

10 functions, 10 time ranges, output contact: 1x 16 A + 2x 8 A changeover, mode selection of output contacts. page 16



CRM-121H

As CRM-111H, but with galvanically separated input. page 18



CRM-131H

11 functions, 10 time ranges, output contact: 1x 16 A changeover, three control inputs. page 18



CRM-82TO

"TRUE OFF DELAY relay - switch off after power supply failure for backup circuits. page 20

## Singlefunction, special



CRM-2T

Star/delta timer relay page 21



CRM-181J

Variants of 4 functions with time range 0.1s - 100 h, output 1x 16 A changeover, UNI power supply. page 22



CRM-182J

Variants of 4 functions with time range 0.1s - 100 h, output 2x 16A changeover, UNI power supply. page 22



CRM-183J

As CRM-181J, but output 1x16A + 2x 8 A changeover. page 22



CRM-2H

Asymmetric flasher, independent time setting ON/OFF. page 24

## PLUG-IN



PTRM-216TP

10 functions, 10 time ranges, output contact: 2x 16 A changeover, voltage dependent input, mode selection of output contact, tuning with dials. page 25



PTRM-216KP

As PTRM-216TP, but fine tuning using a knob. page 25



PTRM-216T

10 functions, 10 time ranges, output contact: 2x 16 A changeover, potential-free input, mode selection of output contact, dial tuning. page 27



PTRM-216K

As PTRM-216T, but fine tuning using a knob. page 27



PTRM-216T

10 function, 10 time ranges, output contact 2x 16 A changeover, three control inputs and mode selection of output contact, tuning with dials. page 29



PTRM-216K

As PTRM-216T, but fine tuning help with a knob. page 29



	CRM-161	CRM-91H	CRM-92H	CRM-93H	CRM-111H	CRM-112H	CRM-113H	CRM-121H	CRM-131H	CRM-82TO	CRM-2T	CRM-181JZR	CRM-181JZN	CRM-181JBL	CRM-181JOD	CRM-182JZR	CRM-182JZN	CRM-182JBL	CRM-182JOD	CRM-183JZR	CRM-183JZN	CRM-183JBL	CRM-183JOD	CRM-2H	PTRM-216TP	PTRM-216KP	PTRM-216T	PTRM-216K	PTRA-216T	PTRA-216K	
<b>Design</b>																															
1-MODULE	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
3-MODULE																															
PLUG-IN																									●	●	●	●	●	●	
Under the switch																															
<b>Control elements</b>																															
Rotary switches/potentiometers	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Large rotary knob																										●		●		●	
Buttons																															
External potentiometer																							●								
<b>Time range</b>																															
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																															
<b>Supply voltage</b>																															
AC 230 V		□	□	□							●													●							
AC/DC 12–240 V	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
AC 24–240 V, DC 24 V	●																														
AC/DC 24–240 V																															
<b>Output contact</b>																															
1x changeover 8 A	●																														
1x changeover 16 A	●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
2x changeover 8 A											●																				
2x changeover 16 A		●														●	●	●	●					●	●	●	●	●	●	●	
1x switching 16 A																															
1x changeover 16 A, 2x changeover 8 A			●		●	●															●	●	●	●							
Solid state (triac)																															

only for CRM-91H, CRM-93H □  
 with the option of extending it to 30 min ■

	CRM-161	CRM-91H	CRM-92H	CRM-93H	CRM-111H	CRM-112H	CRM-113H	CRM-121H	CRM-131H	CRM-82TO	CRM-2T	CRM-181JZR	CRM-181JZN	CRM-181JBL	CRM-181JOD	CRM-182JZR	CRM-182JZN	CRM-182JBL	CRM-182JOD	CRM-183JZR	CRM-183JZN	CRM-183JBL	CRM-183JOD	CRM-2H	PTRM-216x	PTRA-216x		
<b>Functions</b>																												
Staircase switch																												
Programmable staircase switch (with/without signaling)																												
Delayed start	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Delayed start with delay suppression				●	●	●	●	●	●			●			●					●					●	●	●	
Delayed start after switching on the control contact	●																											
Delayed start after opening of the control contact																												
Delayed start after closing and delayed return after opening the control contact		●	●	●	●	●	●	●	●	●	●														●	●	●	
Delayed start (repeatable) until the power is turned off																												
Delayed start star / triangle										●																		
2x delayed start																												
Delayed return	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Delayed return with delay suppression				●	●	●	●	●	●			●			●					●					●	●	●	
Delay off on downward edge																												
TRUE OFF DELAY																												
TRUE SINGLE SHOT																												
TRUE INTERVAL ON																												
TRUE INTERVAL ON/OFF										●																		
Delayed return after closing the control contact		●	●	●	●	●	●	●	●	●	●														●	●	●	
Delayed return after opening the control contact		●	●	●																								
Delayed return after opening the control contact with immediate closing of the output	●	●	●	●	●	●	●	●	●	●	●			●			●					●			●	●	●	
Delayed return after closing the control contact - renewable				●	●	●	●	●	●	●	●														●	●	●	
Delayed return after closing and opening of the control contact				●	●	●	●	●	●	●	●														●	●	●	
Delayed return when closing the control contact with delayed output																												
Emergency light tester																												
Flasher 1:1 starting with an impulse	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Flasher 1:1 starting with a delay-suppressed impulse												●			●					●				●				
Flasher 1:1 starting with an impulse while the control button is pressed																												
Flasher 1:1 starting with a gap		●	●	●	●	●	●	●	●	●	●														●	●	●	
Flasher 1:1 starting with a gap while the control button is pressed																												
Asymmetric flasher starting with an impulse																									●			
Asymmetric flasher starting with a gap																									●			
Impulse relay		●	●	●	●	●	●	●	●	●	●														●	●	●	
Impulse relay with delay	●				●				●	●	●																●	
Pulse generator		●	●	●	●	●	●	●	●	●	●															●	●	●
Pulse generator with delay suppression					●	●	●	●	●	●	●															●	●	●

● functions controlled by inputs START, INHIBIT, RESET

■ functions controlled by inputs START, STOP



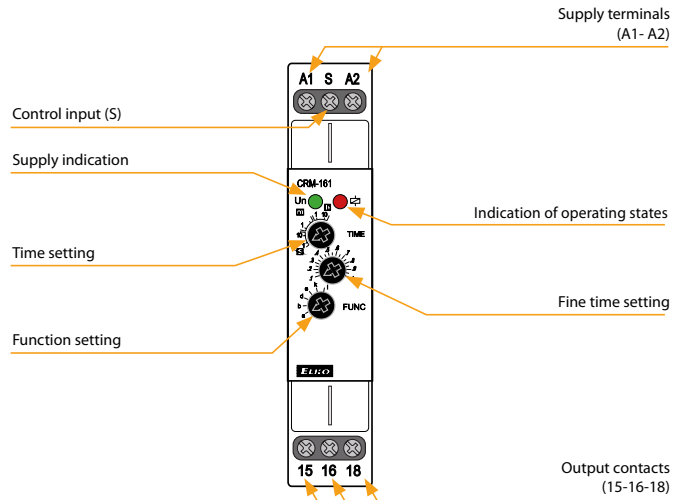
EAN code  
CRM-161: 8595188181617

**Technical parameters CRM-161**

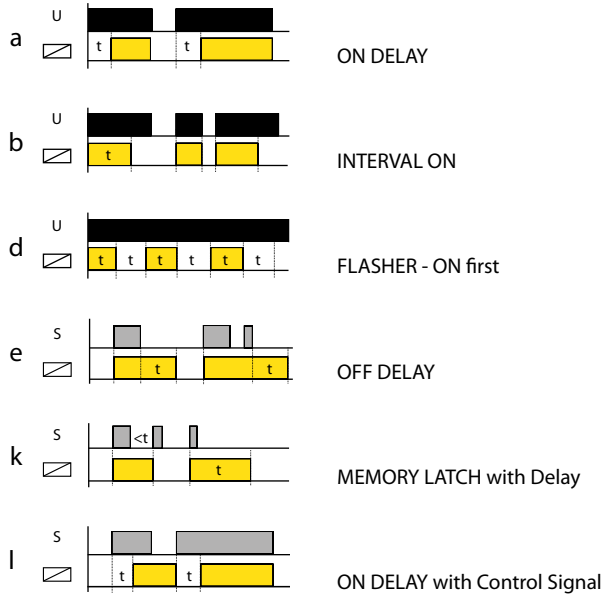
Power supply	
Supply terminals:	A1 - A2
Voltage range:	AC 24 - 240 V   DC 24 V (AC 50-60 Hz)
Power input (max.):	2 VA/1.5 W
Supply voltage tolerance:	-15 %; +10 %
Supply indication:	green LED
Time circuit	
Number of functions:	6
Time ranges:	0.1 s - 10 hrs
Time setting:	rotary switch and potentiometer
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:	8 A/AC1; 1/2 HP 240 Vac, 1/3 HP 120 Vac; PD. B300
Breaking capacity:	2000 VA/AC1, 192 W/DC
Switching voltage:	250 V AC/24 V DC
Max. power dissipation:	0.6 W
Output indication:	multifunction red LED
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:	4kV 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 <sup>2</sup> ):	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:	62 g (2.2 oz.)
Standards:	EN 61812-1

- 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.

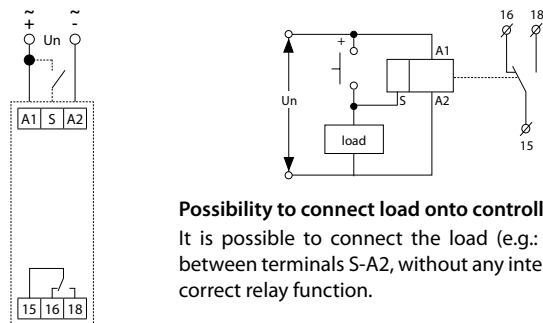
**Description**



**Functions**



**Connection**

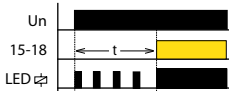


**Possibility to connect load onto controlling input**  
It is possible to connect the load (e.g.: contactor) between terminals S-A2, without any interruption of correct relay function.

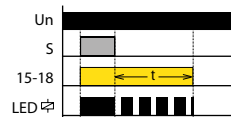
**Indication of operating states**

Examples of signaling

Function a



Function e





EAN code  
 CRM-91H/UNI: 8595188112420  
 CRM-92H/UNI: 8595188176897  
 CRM-93H/UNI: 8595188112468

**Technical parameters** CRM-91H CRM-92H CRM-93H

**Power supply**

Supply terminals:	A1 - A2		
Voltage range:	AC/DC 12 - 240 V (AC 50-60 Hz)		
Power input (max.):	2 VA/1.5 W	2.5 VA/1.5 W	2.5 VA/1.5 W
Voltage range:	AC 230 V (50/60 Hz)		
Power input (max.):	3VA/1.4W	-	4VA/2W
Supply voltage tolerance:	-15 %; +10 %		
Supply indication:	green LED		

**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**

Number of contacts 1:	1x changeover/SPDT (AgNi)		
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; PD. B300		
Breaking capacity:	4000 VA/AC1, 384 W/DC		
Electrical life (AC1):	100.000 ops.		
Number of contacts 2 (3):	x	1x chang./SPDT (AgNi)	2x chang./DPDT (AgNi)
Current rating:	x	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; PD. B300	8 A/AC1; 1/2 HP 240Vac; PD. B300
Breaking capacity:	x	4000 VA/AC1, 384 W/DC	2000 VA/AC1, 192 W/DC
Electrical life (AC1):	x	100.000 ops.	50.000 ops.
Switching voltage:	250 V AC/24 V DC		
Max. power dissipation:	1.2 W	2.4 W	2.4 W
Mechanical life:	10.000.000 ops.		

**Control**

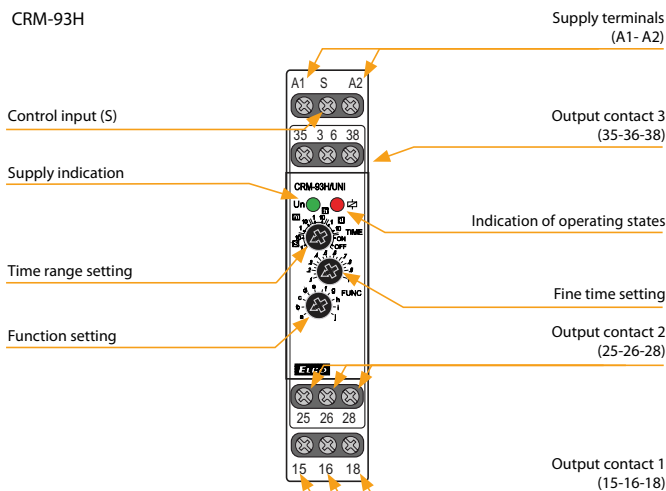
Control. terminals:	A1-S
Load between S-A2:	Yes
Impulse length:	min. 25 ms/max. unlimited
Reset time:	max. 150 ms

**Other information**

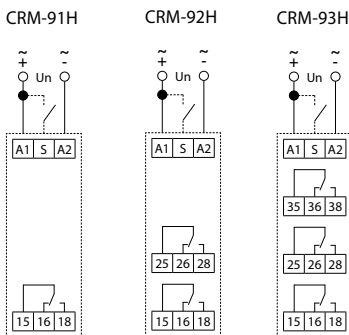
Operating temperature:	-20 .. +55 °C (-4 .. 131 °F)		
Storage temperature:	-30 .. +70 °C (-22 .. 158 °F)		
Dielectric strength:	supply - output 1 4kV AC		
supply - output 2 (3)	x	4kV AC	1kV AC
output 1 - output 2	x	4kV AC	1kV AC
output 2 - output 3	x	x	1kV AC
Operating position:	any		
Mounting:	DIN rail EN 60715		
Protection degree:	IP40 front panel/IP20 terminals		
Overvoltage category:	III.		
Pollution degree:	2		
Max. cable size (mm <sup>2</sup> ):	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 - 62 g (2.2 oz)	UNI - 85 g (3 oz)	UNI - 85 g (3 oz)
	230 - 57 g (2 oz)	-	230 - 80 g (2.8 oz)
Standards:	EN 61812-1		

- 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.

**Description**



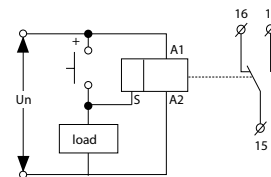
**Connection**



**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 250V AC rms/DC.

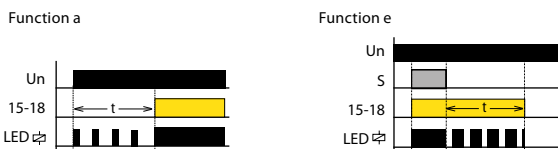
**Possibility to connect load onto controlling input**

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**

**Examples of signaling**



Function



**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.



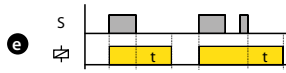
**INTERVAL ON**  
When input voltage U is applied, relay contacts R change state immediately and timing cycle begins. When time delay is complete, contacts return to shelf state. When input voltage U is removed, contacts will also return to their shelfstate. Trigger switch is not used in this function.



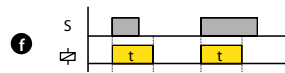
**FLASHER - OFF first**  
When input voltage U is applied, time delay t begins. When time delay t is complete, relay contacts R change state for time delay t. This cycle will repeat until input voltage U is removed. Trigger switch is not used in this function.



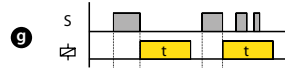
**FLASHER - ON first**  
When input voltage U is applied, relay contacts R change state immediately and time delay t begins. When time delay t is complete, contacts return to their shelf state for time delay t. This cycle will repeat until input voltage U is removed. Trigger switch is not used in this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



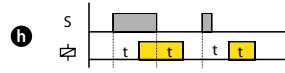
**OFF DELAY**  
Input voltage U must be applied continuously. When trigger switch S is closed, relay contacts R change state. When trigger switch S is opened, delay t begins. When delay t is complete, contacts R return to their shelf state. If trigger switch S is closed before time delay t is complete, 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.



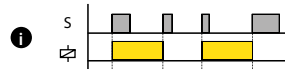
**SINGLE SHOT**  
Upon application of input voltage U, the relay is ready to accept trigger signal S. Upon application of the trigger signal S, the relay contacts R transfer and the preset time t begins. During time-out, the trigger signal S is ignored. The relay resets by applying the trigger switch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



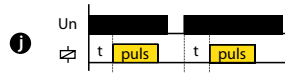
**SINGLE SHOT falling edge**  
Upon application of input voltage U, the relay is ready to accept trigger signal S. Upon application of the trigger signal S, the relay contacts R transfer and the preset time t begins. At the end of the preset time t, the relay contacts R return to their normal condition 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.



**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.



**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.



**PULSE GENERATOR**  
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.



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

**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:	1x 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	1x chang./SPDT (AgNi)	2x 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:	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		

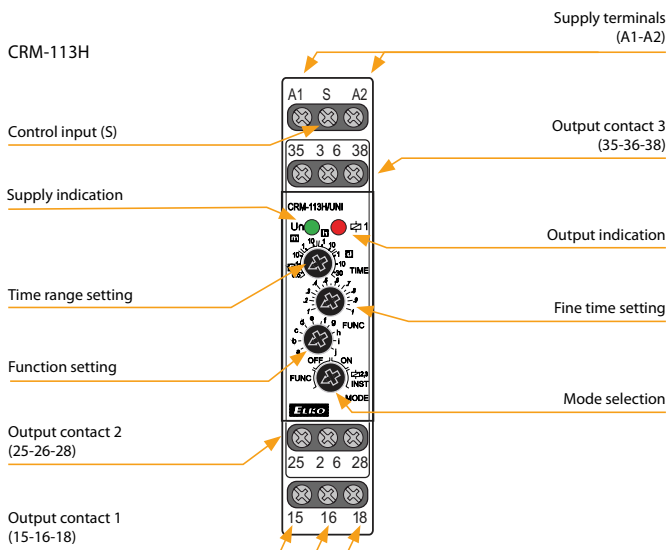
**Other information**

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)	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 <sup>2</sup> ):	max. 1x 2.5 or 2x 1.5/ max. 1x 2.5 (AWG 12)		
Dimensions:	90 x 17.6 x 64 mm (3.5" x 0.7" x 2.5")		
Weight:	62 g (2.2 oz.)	85 g (3 oz.)	85 g (3 oz.)
Standards:	EN 61812-1		

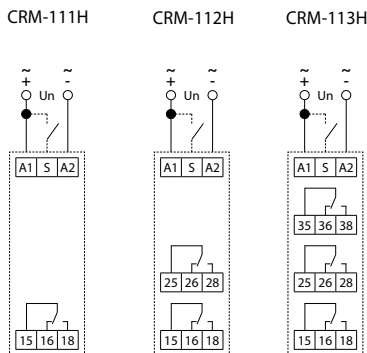
\* for adjustable delay <100 ms, a time deviation of ± 10 ms applies

- 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.

**Description**



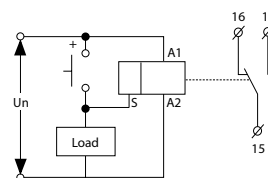
**Connection**



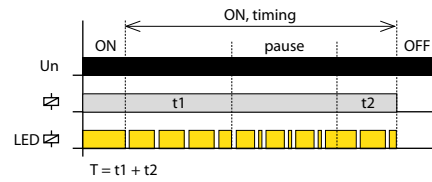
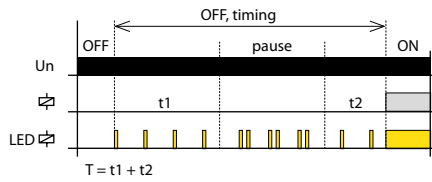
**CRM-113H:**  
 The potential difference between the supply terminals (A1-A2), output contact 2 (25-26-28) and output contact 3 (35-36-38) must be a maximum of 250 V AC rms/DC.

**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



Mode selection

**FUNC. Settings function mode**

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

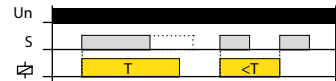
**OFF. Output contact open mode**



**ON. Output contact closed mode**



**i 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 \(page 17\).](#)



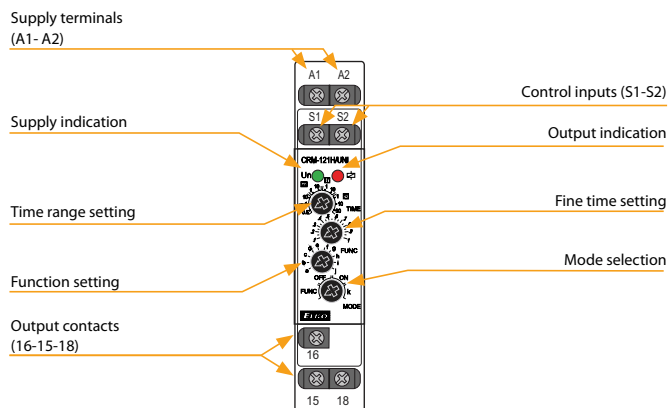
EAN code  
CRM-121H/UNI: 8595188175555

Technical parameters		CRM-121H
<b>Power supply</b>		
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	
<b>Time circuit</b>		
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)	
<b>Output</b>		
Number of contacts	1x changeover/SPDT (AgNi)	
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; 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.	
<b>Control</b>		
Control terminals:	S1-S2	
Impulse length:	min. 25 ms/max. unlimited	
Reset time:	max. 150 ms	
<b>Other information</b>		
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 (mm <sup>2</sup> ):	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	

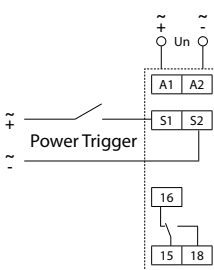
\* for adjustable delay <100 ms, a time deviation of ± 10 ms applies

- 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.

### Description

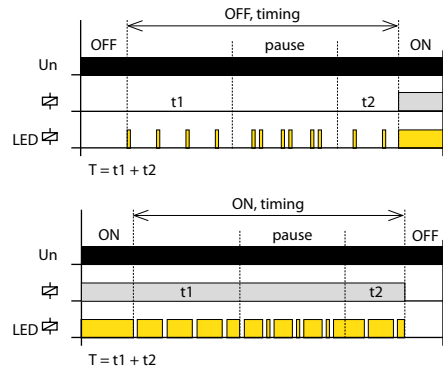


### Connection



(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.



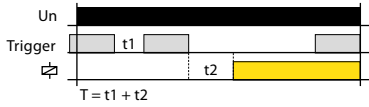
Function

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



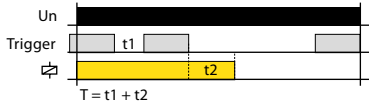
If the control contact is closed and the supply voltage is connected, the relay is opened and timing does not start until the control contact opens. When the timing is complete, the relay closes. If the control contact is closed during timing, the timing is interrupted and continues only after the control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



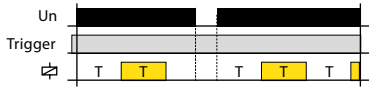
If the control contact is closed and the supply voltage is connected, the relay will close and the timing will start only after the control contact has been opened. When the timing is complete, the relay opens. If the control contact is closed during timing, the timing is interrupted and continues only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

c. FLASHER - ON first



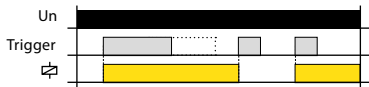
After supply voltage relay closes and starts the delay time T. After the end of the timing relay opens and again runs delay time T. When the timing is complete, the relay closes again and the sequence is repeated until the supply voltage is disconnected. If the control contact is closed during timing,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

FLASHER - OFF first



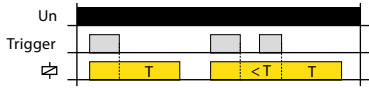
If the control contact is closed during timing; this does not affect the operation of the cycler. If the control contact is closed and the supply voltage is connected, the cycler starts with a pause (relay open).

d. MEMORY LATCH



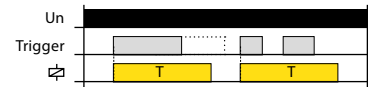
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes. The status does not change when the control contact is opened. When the control contact is closed again, the relay opens. Each time the control contact is closed, the relay changes status.

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



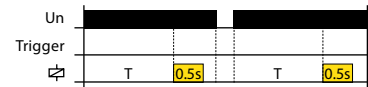
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes and the time delay T begins. Closing the control contact during timing is ignored.

g. WATCHDOG



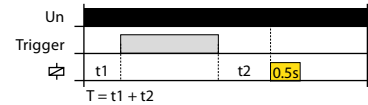
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes and the time delay T begins. Closing the control contact during timing triggers a new time delay T - the relay closing time is thus increased.

h. PULSE GENERATOR 0.5 s



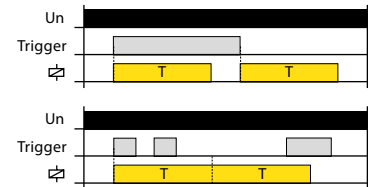
After the supply voltage has been applied, the time delay T begins. When the timing is complete, the relay closes for a fixed time (0.5 s).

PULSE GENERATOR 0.5 s with Inhibit



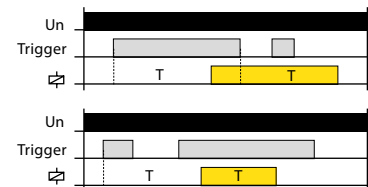
After supply voltage starts the time delay T. By closing timing of the control contact during timing is suspended. When the control contact opens, the time interval is completed and the relay closes for a fixed time (0.5 s).

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.



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; 1 HP 240 Vac, 1/2 HP 120 Vac; 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

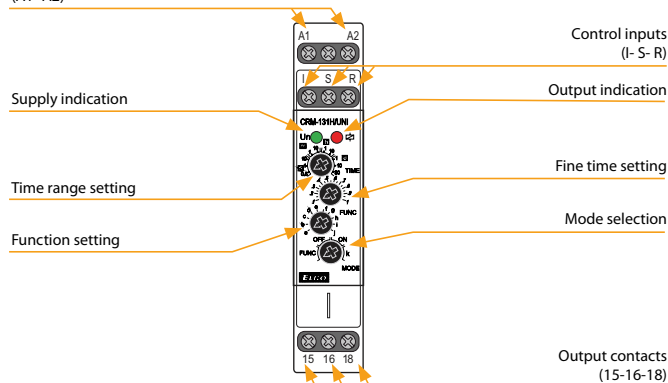
Operating temperature:	-20 .. +55 °C (-4 .. 131 °F)
Storage temperature:	-30 .. +70 °C (-22 .. 158 °F)
Dielectric strength:	4 kV AC (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel/IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm <sup>2</sup> ):	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

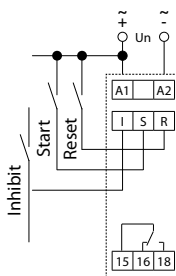
- Multifunction time relay for universal use in automation, control and regulation or in house installations.
- Three control inputs - START, INHIBIT, RESET.
- Mode selection - according to the set function, permanently closed, permanently open, function of MEMORY LATCH with delay.
- Multifunction red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

## Description

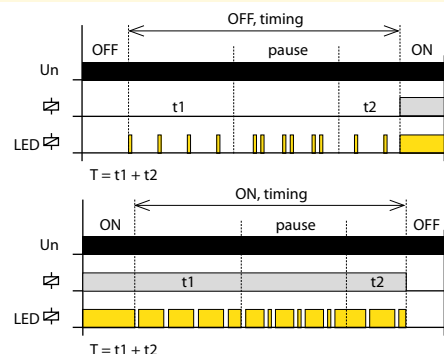
Supply terminals  
(A1 - A2)



## Connection



## Indication of operating states



## Mode selection

### FUNC. Settings function mode

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

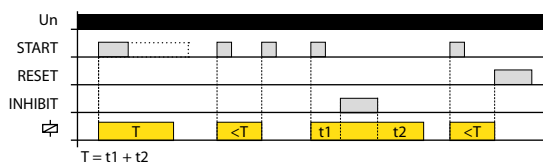
### OFF. Output contact open mode



### ON. Output contact closed mode



### k. MEMORY LATCH with delay



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**

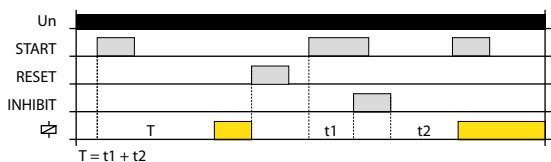
Control input function description:

- 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:

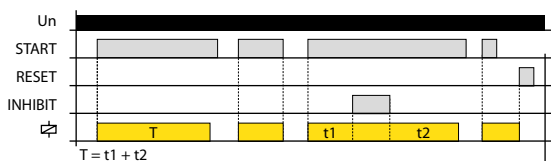
- If the control contact START is closed and the supply voltage is connected, the time function is activated when the supply voltage is connected.
- Closing the control contact INHIBIT pauses the timing, after opening the control contact INHIBIT timing continues from the moment of interruption.
- If 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 with Control Signal**



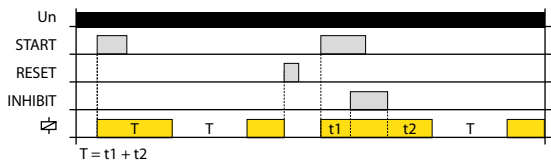
When the supply voltage is applied, the relay is open. If the control contact START is closed, the time delay T starts. The closing of the START control contact during timing is ignored.

**b. INTERVAL ON with Control Signal**



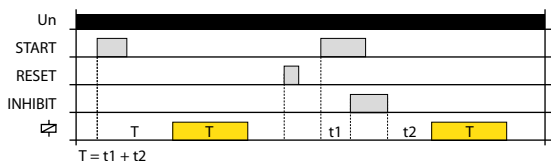
When the supply voltage is applied, the relay is open. When the control contact START is closed, the relay closes and the time delay T begins. If the START control contact is open during timing, the time interval is immediately terminated and the relay opens.

**c. FLASHER - ON first with Control Signal**



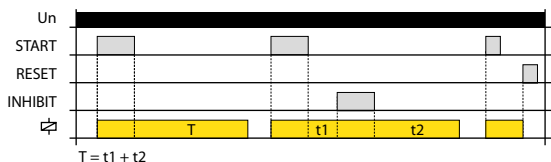
When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time T. After the end of the timing relay opens and again runs delay time T. Upon completion timing again switches, and the sequence is repeated until the supply voltage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

**d. FLASHER - OFF first with Control Signal**



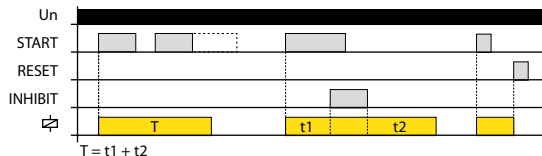
When the supply voltage is applied, the relay is open. When the START control contact is closed, starts the time delay T. After the end of the timing relay closes and again runs delay time T. After the end of the timing relay opens and the sequence is repeated until the supply voltage is disconnected.

**e. OFF DELAY**



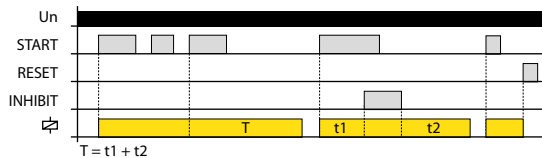
When the supply voltage is applied, the relay is open. If the control contact START is closed, the relay closes. After tripping Contact Start starts the delay time T. After the end of the timing relay is switched off.

**f. SINGLE SHOT**



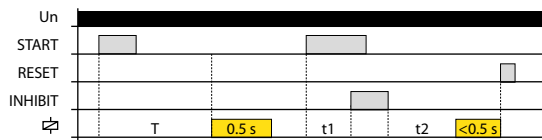
When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time T. After the end of the timing relay is switched off. The closing of the START control contact during timing is ignored.

**g. WATCHDOG**



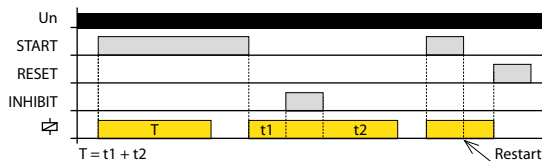
When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time T. After the end of the timing relay is switched off. Closing control contact START during timing triggers a new time delay T - the relay closing time is thus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

**h. PULSE GENERATOR 0.5 s with Control Signal**

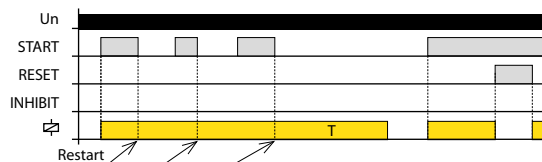


When the supply voltage is applied, the relay is open. When the START control contact is closed, starts the time delay T. After the end of the timing relay switches for the fixed time (0.5 sec).

**i. INTERVAL ON/OFF**

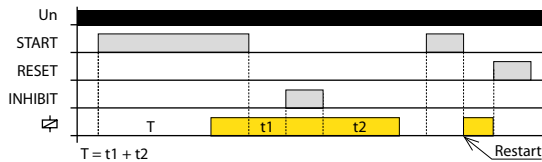


When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time T. After the end of the timing relay is switched off. By opening the control contact start relay again closes and starts the delay time T. After the end of the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

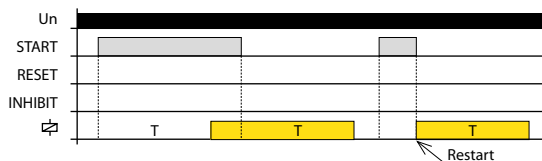


If the START control contact is open during timing, a restart occurs - the relay remains closed and a new time delay T begins. When the timing is complete, the relay opens.

**j. ON/OFF DELAY**



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.



EAN code  
CRM-82TO/UNI: 8595188137614

### Technical parameters

### CRM-82TO

Number of functions:	a - TRUE OFF DELAY / e - ON DELAY
Supply terminals:	A1 - A2
Voltage range:	AC/DC 12 - 240 V (AC 50-60 Hz)
Burden (max.):	3 VA / 1.7 W
Max. dissipated power (Un + terminals):	2.5 W
Supply voltage tolerance:	-15 %; +10 %
Supply indication:	green LED
Time ranges:	0.1 s - 10 min
Time setting:	potentiometer
Time deviation:	5 % - mechanical setting
Repeat accuracy:	0.2 % - set value stability
Temperature coefficient:	0.1 %/°C, at = 20 °C (0.1 %/°F, at = 68 °F)

### Output

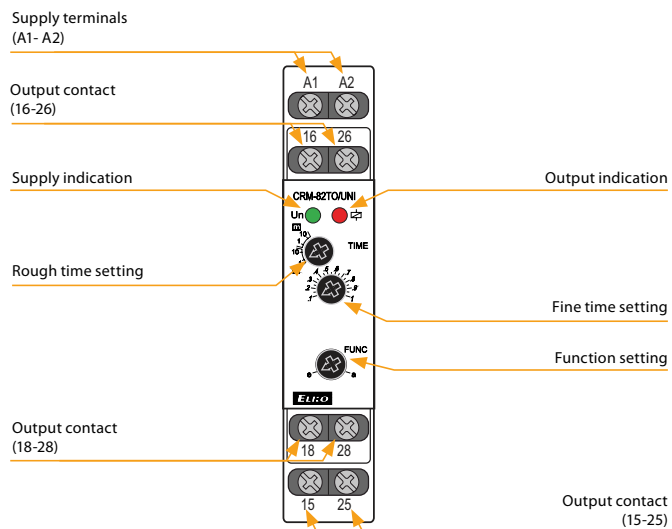
Number of contacts:	2x changeover/DPDT (AgNi/Silver Alloy)
Current rating:	8 A/AC1; 1/2 HP 240 Vac; PD. B300
Breaking capacity:	2000 VA/AC1, 192 W/DC
Inrush current:	10 A/<3 s
Switching voltage:	250 V AC/24 V DC
Output indication:	red LED
Mechanical life:	2.000.000 ops.
Electrical life (AC1):	200.000 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 / IP10 terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm <sup>2</sup> ):	solid wire max. 2x 2.5 or 1x 4, with sleeve max. 2x 1.5 or 1x 2.5 (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 61812-1

- „TRUE OFF DELAY“ relay starts timing after power supply failure. Example of use case: back-up source for DELAY OFF in case power supply failure. (e.g. emergency lighting, emergency respirator, or protection of el. controlled doors - in case of fire).
- 2 time functions adjustable by rotary switch:  
a - delayed return after disconnecting of supply  
e - delayed start.
- Time range (adjustable by rotary switch and fine setting by potentiometer): 0.1 s - 10 min.
- Interruptions in the power supply must take time steps (tens to hundreds of milliseconds).
- Output status indicated by red LED (only in case of supply voltage connection).

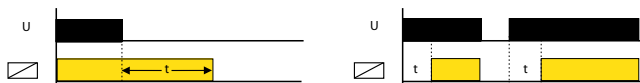
### Description



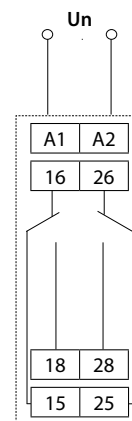
### Function

a - TRUE OFF DELAY

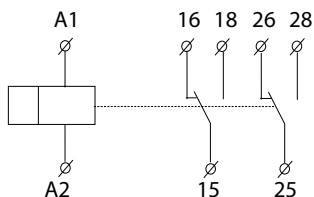
e - ON DELAY



### Connection



### Symbol





EAN code  
CRM-2T/UNI: 8595188112437

**Technical parameters** CRM-2T

Power supply	
Supply terminals:	A1 - A2
Voltage range:	AC/DC 12 - 240 V (AC 50-60 Hz)
Power input (max.):	2 VA/1.5 W
Voltage range:	AC 230 V (50-60 Hz)
Power input (max.):	AC 3 VA/1.4 W
Supply voltage tolerance:	-15 %; +10 %
Supply indication:	green LED

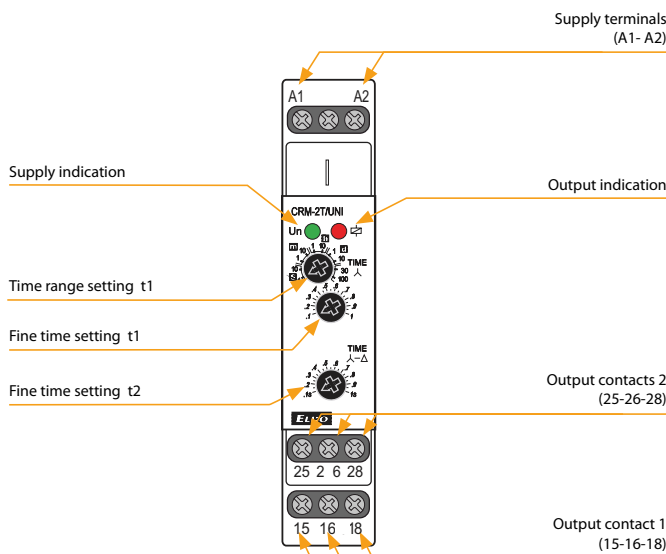
Function	
Time scale:	t1: 0.1 s - 100 days; t2: 0.1 s - 1 s
Time setting:	rotary switch and potentiometer
Time deviation:	5% - mechanical setting
Repeat accuracy:	0.2 % - set value stability
Temperature coefficient:	0.01 %/°C, at = 20 °C (0.01 %/°F, at = 68 °F)

Output	
Number of contacts:	2x changeover/SPDT (AgNi)
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; 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

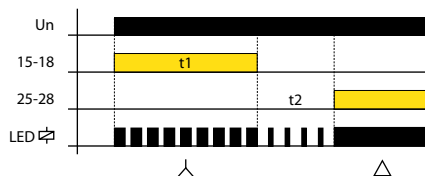
- It serves for delay ON of motors star/delta.
- Time t1 (star):
  - time range setting by rotary switch
  - fine time setting by potentiometer.
- Time t2 (delay) between λ/Δ
  - fine time setting by potentiometer.
- Multifunction red LED flashes or shines depending on the operating status.

**Description**



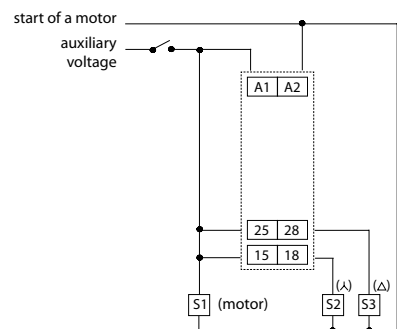
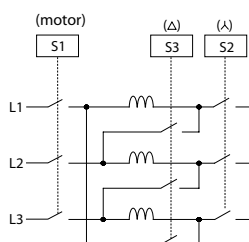
**Function**

STAR/DELTA timer

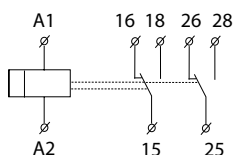


**Connection**

Start up of motor (λ - Δ)



**Symbol**





EAN code	CRM-181J	CRM-182J	CRM-183J
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	

### Technical parameters CRM-181J CRM-182J CRM-183J

#### Power supply

Supply terminals:	A1 - A2		
Voltage range:	AC/DC 12 - 240 V (AC 50-60 Hz)		
Power input (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

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

Output contact 1:	1x changeover/SPDT (AgNi)		
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; PD. B300		
Breaking capacity:	4000 VA/AC1, 384 W/DC1		
Electrical life (AC1):	100.000 ops.		
Output contact 2 (3):	x	1x chang./SPDT (AgNi)	2x chang./DPDT (AgNi)
Current rating:	x	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; PD. B300	8 A/AC1; 1/2 HP 240Vac; 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		
Max. power dissipation:	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		

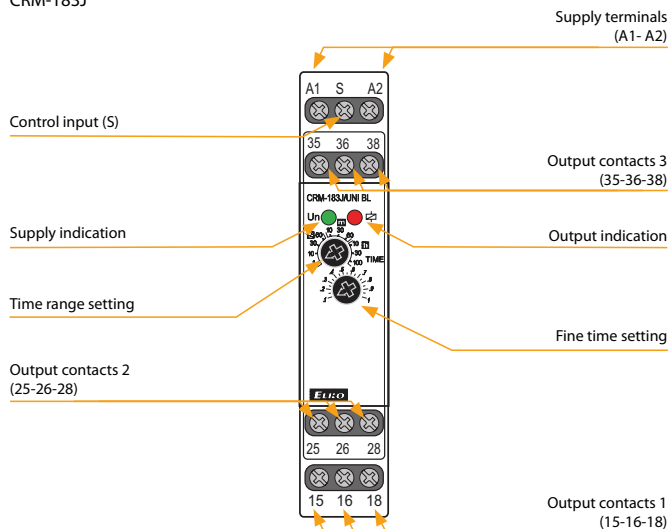
#### Other information

Operating temperature:	-20 .. +55 °C (-4 .. 131 °F)		
Storage temperature:	-30 .. +70 °C (-22 .. 158 °F)		
Dielectric strength:			
supply - output 1	4 kV AC		
supply - output 2 (3)	x	4 kV AC	1 kV AC
output 1 - output 2	x	4 kV AC	1 kV AC
output 2 - output 3	x	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		
Max. cable size (mm <sup>2</sup> ):	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)	84 g (3 oz)	84 g (3 oz)
Standards:	EN 61812-1		

- Single function time relays are suitable for applications where there is a clear function requirement in advance and are suitable for universal use in automation, control and regulation or in house installations.
- Choice of four types: ZR, ZN, BL, OD.
- All functions initiated by the supply voltage can use the control input to inhibit the ongoing delay (pause).
- Multifunction red LED flashes or shines depending on the operating status.

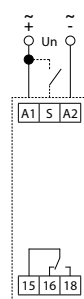
#### Description

CRM-183J

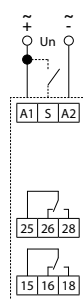


#### Connection

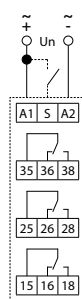
CRM-181J



CRM-182J



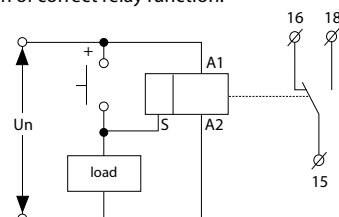
CRM-183J



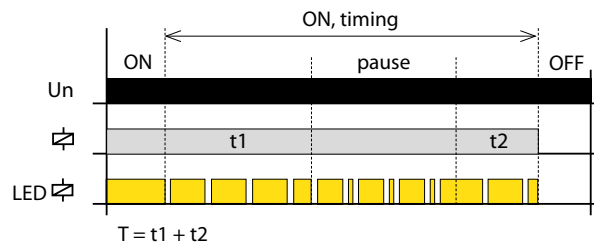
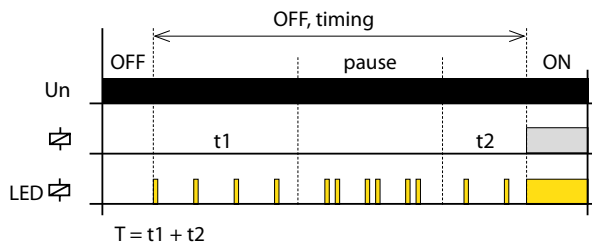
**CRM-183J:**  
The potential difference between the supply terminals (A1-A2), output contact 2 (25-26-28) and output contact 3 (35-36-38) must be a maximum of 250 V AC rms/DC.

#### 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.

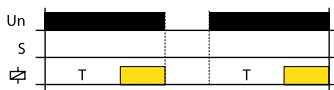


Indication of operating states



Function

ZR: ON DELAY



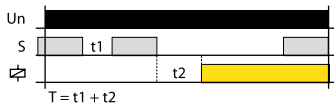
When the supply voltage is applied, the time delay T begins. When the timing is complete, the relay closes and this condition continues until the supply voltage is disconnected.

BL: FLASHER - ON first



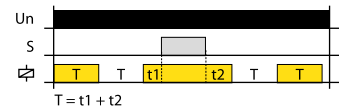
If the control contact is closed and the supply voltage is connected, the relay will close and the timing will start only after the control contact has been opened. When the timing is complete, the relay opens.

ON DELAY with Inhibit



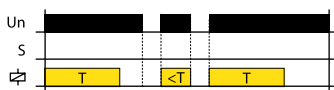
If the control contact is closed and the supply voltage is connected, the relay is opened and timing does not start until the control contact opens. When the timing is complete, the relay closes. If the control contact is closed during timing, the timing is interrupted and continues only after the control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

FLASHER - ON first with Inhibit



If the control contact is closed during an active timer setting, the timing is interrupted and continues only after the control contact opens again.

ZN: INTERVAL ON



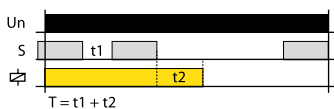
After supply voltage relay closes and starts the delay time T. After the end of the timing relay opens and this state lasts until the supply voltage is disconnected.

OD: 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.

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.

Note:

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



EAN code  
CRM-2H/UNI: 8595188113007

**Technical parameters CRM-2H**

**Power supply**

Supply terminals:	A1 - A2
Voltage range:	AC/DC 12 - 240 V (AC 50-60 Hz)
Power input (max.):	2 VA/1.5 W
Voltage range:	AC 230 V (50/60 Hz)
Power input (max.):	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**

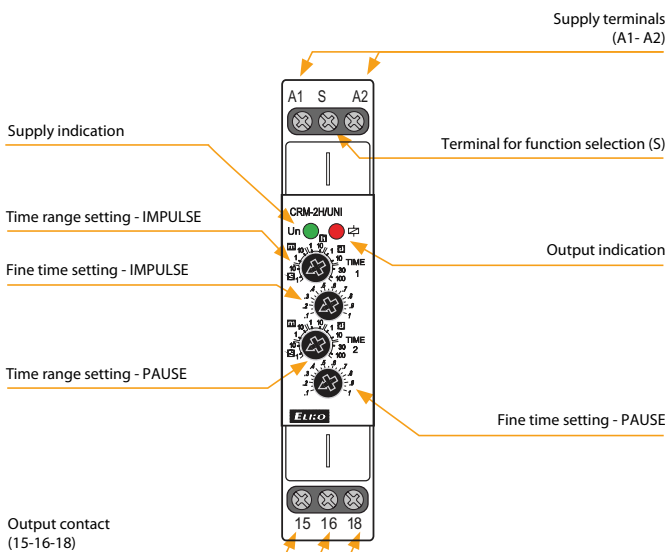
Number of contacts:	1x changeover/SPDT (AgNi)
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; PD. B300
Breaking capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	30 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Max. power dissipation:	1.2 W
Output indication:	multifunction red LED
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.
Reset time:	max. 150 ms

**Other information**

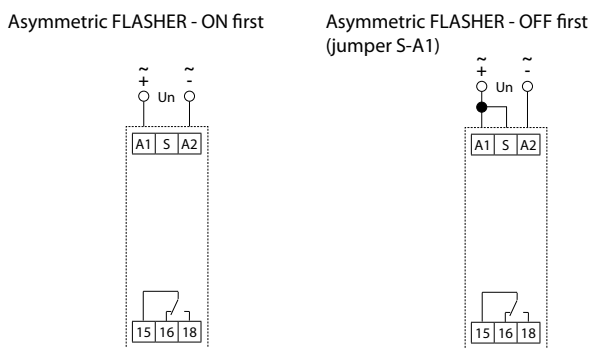
Operating temperature:	-20 .. 55 °C (-4 .. 131 °F)
Storage temperature:	-30 .. 70 °C (-22 .. 158 °F)
Dielectric strength:	4 kV AC (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel/IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Terminal wire capacity (mm <sup>2</sup> ):	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

- 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.

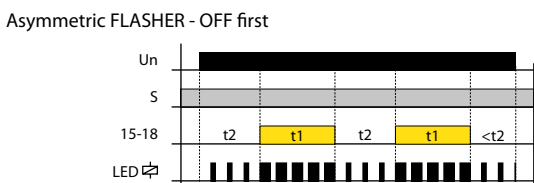
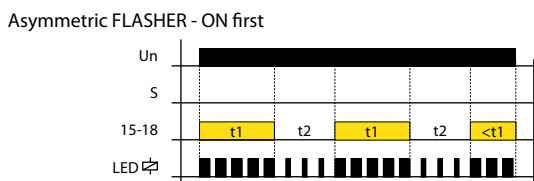
**Description**



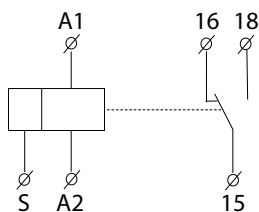
**Connection**



**Function**



**Symbol**







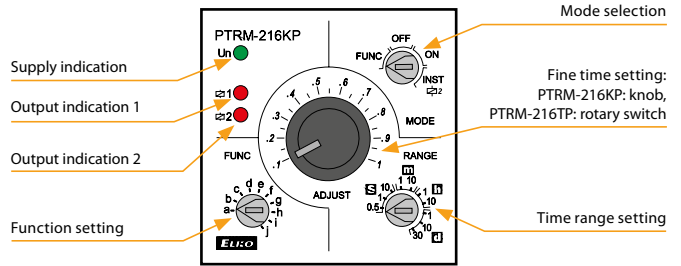
EAN code  
 PTRM-216TP/UNI: 8595188179386  
 PTRM-216KP/UNI: 8595188178617

Technical parameters	PTRM-216TP	PTRM-216KP
<b>Power supply</b>		
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	
<b>Time circuit</b>		
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)	
<b>Output</b>		
Number of contacts:	2x changeover/SPDT (AgNi)	
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; 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.	
<b>Control</b>		
Control pins:	5 (2) -6	
Impulse length:	min. 25 ms/max. unlimited	
Reset time:	max. 150 ms	
<b>Other information</b>		
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

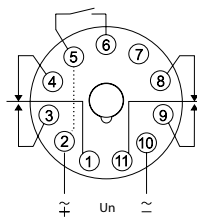
- Multifunction time relay for universal use in automation, control and regulation or in house installations.
- Possibility to select the control element for fine time setting: PTRM-216KP - knob, for easy handling without the need for tools PTRM-216TP - rotary switch, for the possibility of using a sealable 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.

**Description**

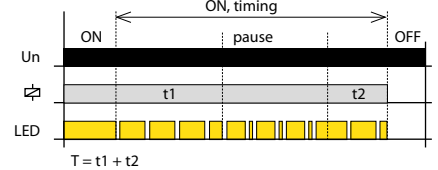
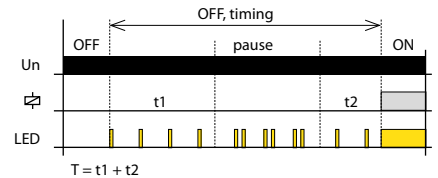


**Connection**

**Indication of operating states**



Pins 2 and 5 are internally connected.



**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**



**ϕ2 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.

**Function**

Functions (page 26).

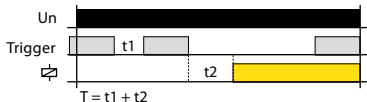
## Function

## 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.

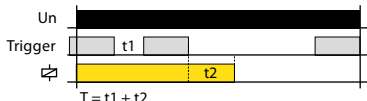
When the timing is complete, the relay closes. If the control contact is closed during timing, the timing is interrupted and continues only after the control contact opens.

## 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 cyclers.

## FLASHER - OFF first



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

## d. MEMORY LATCH



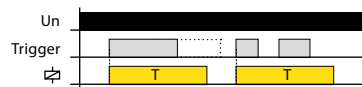
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes. The status does not change when the control contact is opened. When the control contact is closed again, the relay opens. Each time the control contact is closed, the relay changes status.

## 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



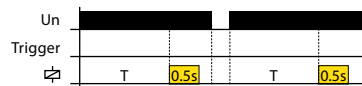
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes and the time delay T begins. Closing the control contact during timing is ignored.

## g. WATCHDOG



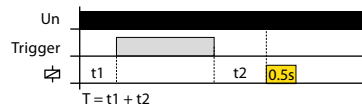
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes and the time delay T begins. Closing the control contact during timing triggers a new time delay T - the relay closing time is thus increased.

## h. PULSE GENERATOR 0.5 s



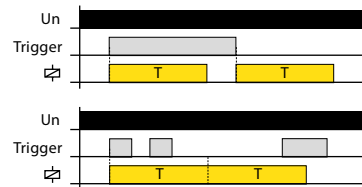
After the supply voltage has been applied, the time delay T begins. When the timing is complete, the relay closes for a fixed time (0.5 s).

## PULSE GENERATOR 0.5 s with Inhibit



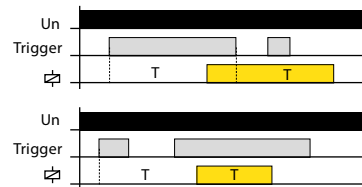
After supply voltage starts the time delay T. By closing timing of the control contact during timing is suspended. When the control contact opens, the time interval is completed and the relay closes for a fixed time (0.5 s).

## i. INTERVAL ON/OFF



When the supply voltage is applied, the relay is open. When the control contact is closed, the 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.



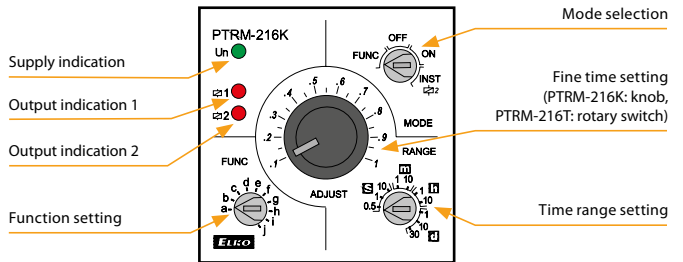
EAN code  
 PTRM-216T/UNI: 8595188175586  
 PTRM-216K/UNI: 8595188175579

Technical parameters	PTRM-216T	PTRM-216K
<b>Power supply</b>		
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	
<b>Time circuit</b>		
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)	
<b>Output</b>		
Number of contacts:	2x changeover/SPDT (AgNi)	
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; 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.	
<b>Control</b>		
Control pins:	5 - 6	
Impulse length:	min. 25 ms/max. unlimited	
Reset time:	max. 150 ms	
<b>Other information</b>		
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	

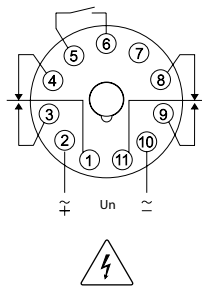
\* for adjustable delay <100 ms, a time deviation of ± 10 ms applies

- 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.

**Description**

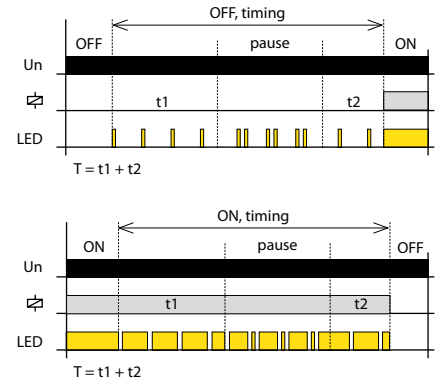


**Connection**



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.

**Function**

Functions (page 28).

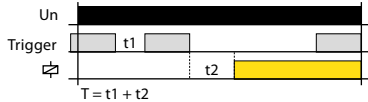
## Function

## 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



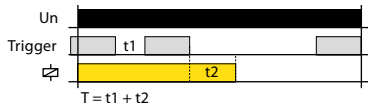
If the control contact is closed and the supply voltage is connected, the relay is opened and timing does not start until the control contact opens. When the timing is complete, the relay closes. If the control contact is closed during timing, the timing is interrupted and continues only after the control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



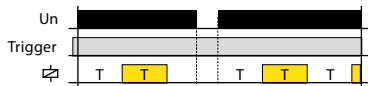
If the control contact is closed and the supply voltage is connected, the relay will close and the timing will start only after the control contact has been opened. When the timing is complete, the relay opens. If the control contact is closed during timing, the timing is interrupted and continues only 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 affect the operation of the cycler. If the control contact is closed and the supply voltage is connected, the cyclor starts with a pause (relay open).

## d. MEMORY LATCH



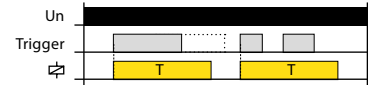
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes. The status does not change when the control contact is opened. When the control contact is closed again, the relay opens. Each time the control contact is closed, the relay changes status.

## 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



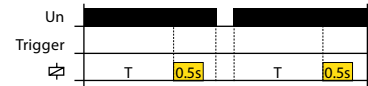
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes and the time delay T begins. Closing the control contact during timing is ignored.

## g. WATCHDOG



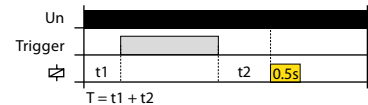
When the supply voltage is applied, the relay is open. When the control contact is closed, the relay closes and the time delay T begins. Closing the control contact during timing triggers a new time delay T - the relay closing time is thus increased.

## h. PULSE GENERATOR 0.5 s



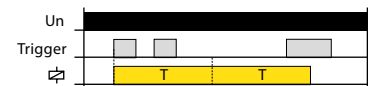
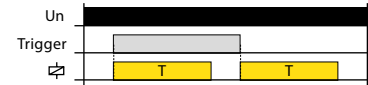
After the supply voltage has been applied, the time delay T begins. When the timing is complete, the relay closes for a fixed time (0.5 s).

## PULSE GENERATOR 0.5 s with Inhibit



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.



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; 1 HP 240 Vac, 1/2 HP 120 Vac; 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

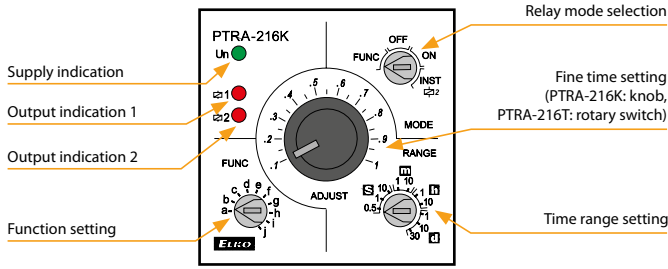
\* for adjustable delay <100 ms, a time deviation of ± 10 ms applies

**Function**

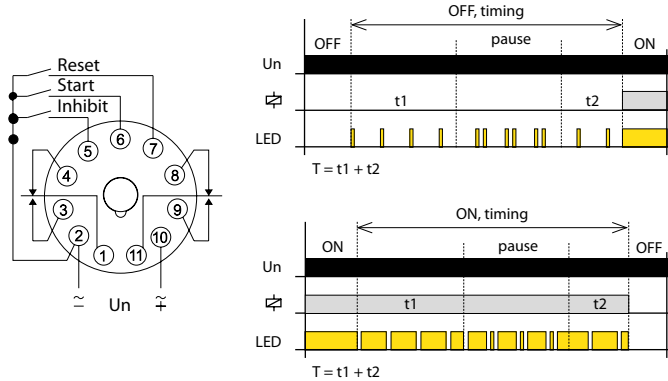
Functions (page 30).

- 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.

**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**



**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.

## Function

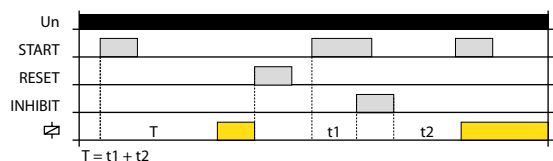
Control input function description:

- 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:

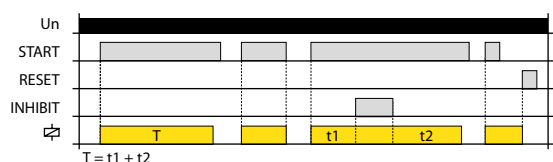
- If the control contact START is closed and the supply voltage is connected, the time function is activated when the supply voltage is connected.
- Closing the control contact INHIBIT pauses the timing, after opening the control contact INHIBIT timing continues from the moment of interruption.
- If 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 with Control Signal



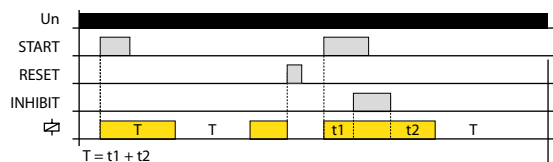
When the supply voltage is applied, the relay is open. If the control contact START is closed, the time delay  $T$  starts. The closing of the START control contact during timing is ignored.

## b. INTERVAL ON with Control Signal



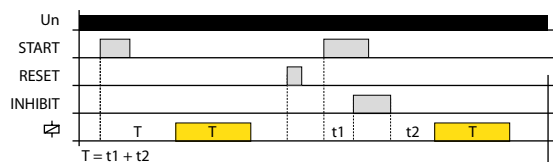
When the supply voltage is applied, the relay is open. When the control contact START is closed, the relay closes and the time delay  $T$  begins. If the START control contact is open during timing, the time interval is immediately terminated and the relay opens.

## c. FLASHER - ON first with Control Signal



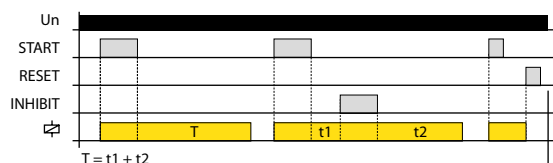
When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time  $T$ . After the end of the timing relay opens and again runs delay time  $T$ . Upon completion timing again switches, and the sequence is repeated until the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

## d. FLASHER - OFF first with Control Signal



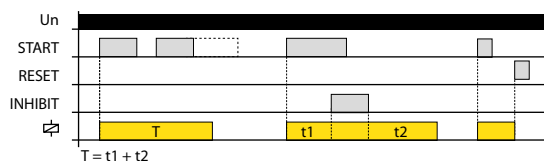
When the supply voltage is applied, the relay is open. When the START control contact is closed, starts the time delay  $T$ . After the end of the timing relay closes and again runs delay time  $T$ . After the end of the timing relay opens and the sequence is repeated until the supply voltage is disconnected.

## e. OFF DELAY



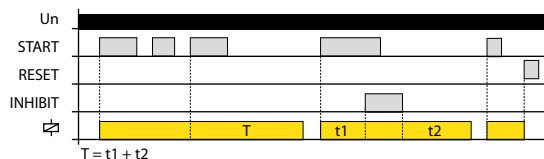
When the supply voltage is applied, the relay is open. If the control contact START is closed, the relay closes. After tripping Contact Start starts the delay time  $T$ . After the end of the timing relay is switched off.

## f. SINGLE SHOT



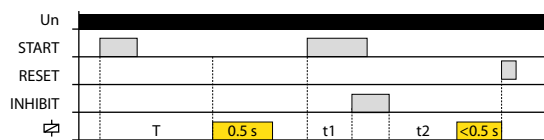
When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time  $T$ . After the end of the timing relay is switched off. The closing of the START control contact during timing is ignored.

## g. WATCHDOG



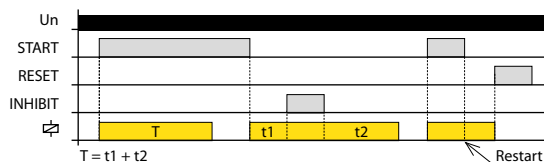
When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time  $T$ . After the end of the timing relay is switched off. Closing control contact START during timing triggers a new time delay  $T$  - the relay closing time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

## h. PULSE GENERATOR 0.5 s with Control Signal

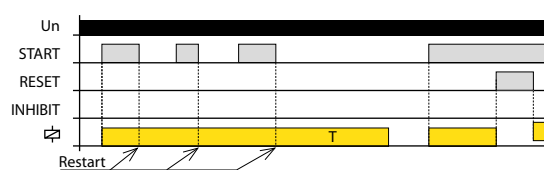


When the supply voltage is applied, the relay is open. When the START control contact is closed, starts the time delay  $T$ . After the end of the timing relay switches for the fixed time (0.5 sec).

## i. INTERVAL ON/OFF

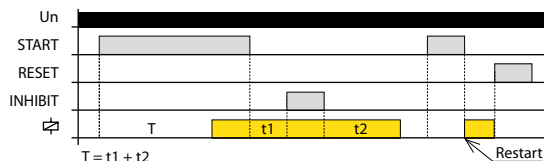


When the supply voltage is applied, the relay is open. When the START control contact is closed, the relay energizes and starts the delay time  $T$ . After the end of the timing relay is switched off. By opening the control contact start relay again closes and starts the delay time  $T$ . After the end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

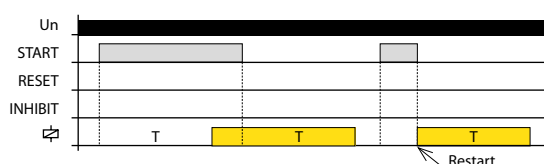


If the START control contact is open during timing, a restart occurs - the relay remains closed and a new time delay  $T$  begins. When the timing is complete, the relay opens.

## j. ON/OFF DELAY



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.

1-phase

AC/DC



**HRN-31, HRN-31/2**

Multifunction, supply and monitored voltage in range of AC/DC 48-276 V, 1x (HRN-31) / 2x (HRN-31/2) output for Umax and Umin with adjustable levels.  
page 33



**HRN-32/2**

As HRN-31/2 but individual output for each level (Umax/Umin).  
page 33



**HRN-39, HRN-39/2**

Multifunction, supply and monitored voltage in range of AC/DC 24-150 V, 1x (HRN-39) / 2x (HRN-39/2) output for Umax and Umin with adjustable levels.  
page 33



**PMR1-31, PMR1-31/2**

Same as HRN-31 and HRN-31/2, but in PLUG-IN design.  
page 35



**PMR1-39, PMR1-39/2**

Same as HRN-39 and HRN-39/2, but in PLUG-IN design.  
page 35

DC



**HRN-36, HRN-36/2**

Multifunction, supply and monitored voltage in range of DC 6-30 V, 1x (HRN-36) / 2x (HRN-36/2) output for Umax and Umin with adjustable levels.  
page 33



**PMR1-36, PMR1-36/2**

Same as HRN-36 and HRN-36/2, but in PLUG-IN design.  
page 35



**HRN-56/208**

Adjustable level Umin.  
page 37



**HRN-56/240**

Adjustable level Umin.  
page 37



**HRN-56/400**

Adjustable level Umin.  
page 37



**HRN-56/480**

Adjustable level Umin.  
page 37



**HRN-56/575**

Adjustable level Umin.  
page 37



**HRN3-81**

Fixed range (208-480 V), asymmetry (2-10 % +OFF), 1x output contact, TRUE RMS.  
page 40



**HRN3-70**

Adjustable range (190-500 V), asymmetry (2-10 % +OFF), undervoltage (80-95 % from the range), restart delay (1-300 s), selectable memory, 2x output contact, TRUE RMS.  
page 38



**PMR3-70**

Same as HRN3-70, but in PLUG-IN design and with 1x output contact.  
page 38

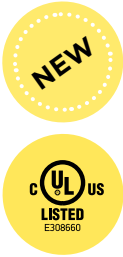


**HRN3-80**

Adjustable range (208-480 V), asymmetry (2-10 % +OFF), undervoltage (80-95 % from the range), 1x output contact, TRUE RMS.  
page 40

Type	Design	Supply from	Galvanically isolated	Features			Phase			Setting				Description	Page		
				Phases	Monitored range	>U	<U	$\geq$ 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).	33
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	●	●	Old types replacement: HRN-33 > HRN-31 HRN-34 > HRN-36 HRN-35 > HRN-32/2 HRN-37 > HRN-39	47
PMR1-31 PMR1-31/2	8-PIN	monitored voltage	x	1	AC/DC 48 - 276 V	●	●	●	x	x	x	●	x	●	●		
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-32/2: separated output contact for overvoltage and undervoltage	
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 is operational even if one phase fails.	37
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	● (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).	38
PMR3-70	3-M	monitored voltage	x	3	AC 3 x 190 - 500 V	x	x	● (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.	40
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.	40





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

- 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 (U<sub>max</sub>) and falling below the lower voltage level (U<sub>min</sub>) – according to the selected function.
- Smooth adjustment of both voltage levels – the lower level U<sub>min</sub> is set in % of the upper level U<sub>max</sub>.
- 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.

Technical parameters	HRN-31 HRN-31/2	- HRN-32/2	HRN-36 HRN-36/2	HRN-39 HRN-39/2
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Supply and measuring	A1-A2			
Supply/monitored terminals:	AC/DC			
Supply/monitored voltage:	48–276 V (AC 50–60 Hz)	48–276 V (AC 50–60 Hz)	6–30 V	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 (U <sub>max</sub> ):	AC/DC 160–276 V	AC/DC 160–276 V	DC 12–30 V	AC/DC 80–150 V
Lower level setting (U <sub>min</sub> ):	30–95%U <sub>max</sub>	30–95%U <sub>max</sub>	50–95%U <sub>max</sub>	30–95%U <sub>max</sub>
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			

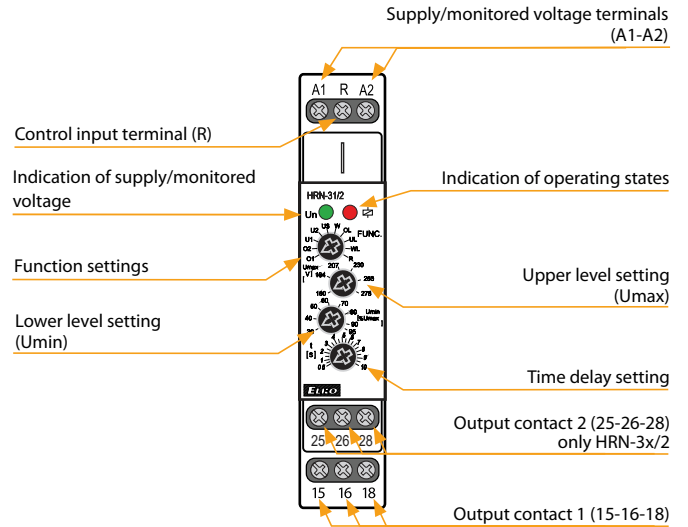
Accuracy				
Setting accuracy (mech.):	5% – mechanical setting			
Repeat accuracy:	< 1%			
Temperature dependency:	< 0.1 %/°C (°F)			
Hysteresis (fault to OK):	5% (functions O1, U1, W) U <sub>max</sub> – U <sub>min</sub> (functions O2, U2, U3)			

Output				
Contact type:	1x changeover 2x changeover	1x changeover for each level	1x changeover 2x changeover	1x changeover 2x changeover
Contact material:	AgNi			
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; 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.			

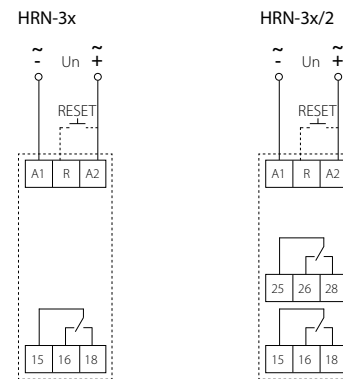
Other information				
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)			
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)			
Dielectric strength:	AC 4 kV (supply – output)			
Operating position:	any			
Mounting:	DIN rail EN 60715			
Protection degree:	IP40 front panel / IP20 terminals			
Overvoltage category:	III.			
Pollution degree:	2			
Cross-wire section – solid/ stranded with ferrule (mm <sup>2</sup> ):	max. 1x 2.5, 2x 1.5/ max. 1x 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**

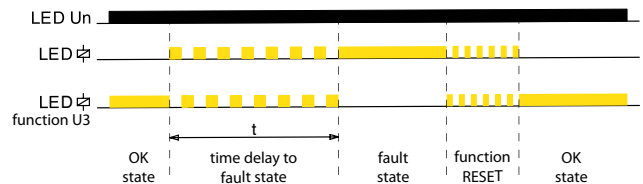
HRN-31/2



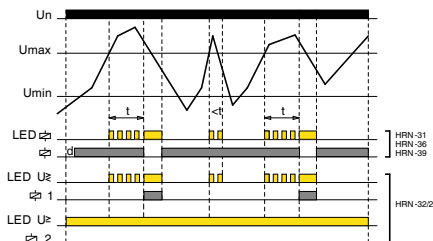
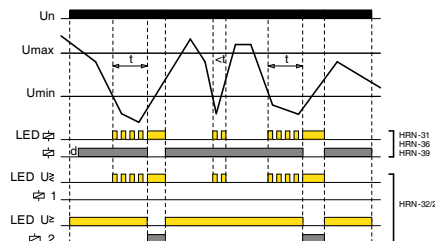
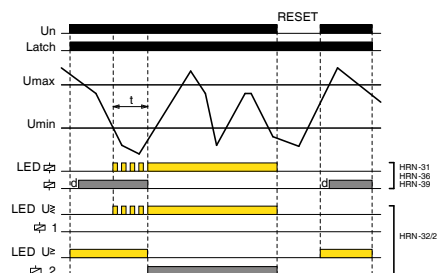
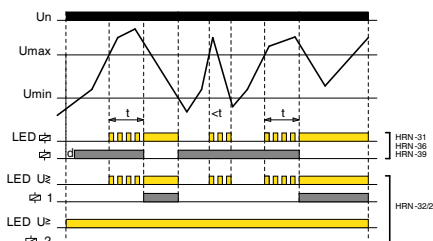
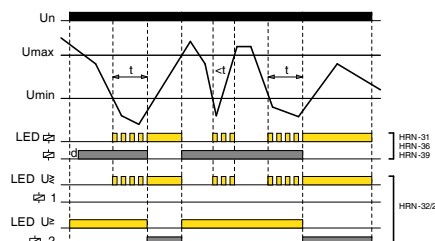
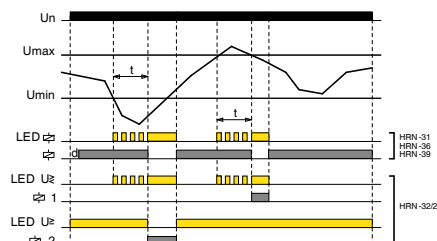
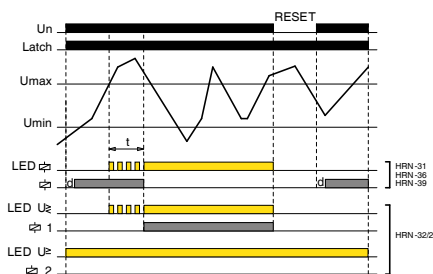
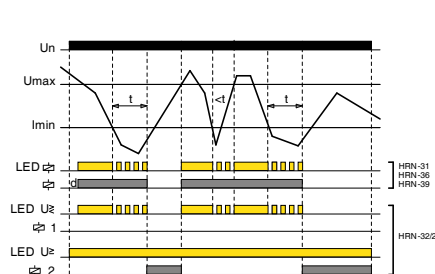
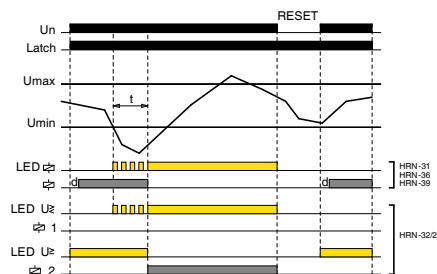
**Connection**



**Indication of operating states**



## Function

**O1** OVER (hysteresis 5%)**U1** UNDER (hysteresis 5%)**UL** UNDER + Latch**O2** OVER (hysteresis to  $U_{min}$ )**U2** UNDER (hysteresis to  $U_{max}$ )**W** WINDOW (hysteresis 5%)**OL** OVER + Latch**U3** UNDER (hysteresis to  $U_{max}$ )**WL** WINDOW + Latch**OVER:**

If the value of the monitored voltage is lower than the set upper level „ $U_{max}$ “, the output contact is closed. If the „ $U_{max}$ “ is exceeded, the output contact will open after the set delay (fault state).

If the voltage falls below the fixed hysteresis (O1 function) or the set lower level „ $U_{min}$ “ (O2 function), the output contact will close again.

If the OL function (OVER + Latch) is selected, when the upper voltage level „ $U_{max}$ “ 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 „ $U_{min}$ “, the output contact is closed. When the voltage drops below the „ $U_{min}$ “, output contact opens after the set delay (fault state).

If the voltage exceeds the fixed hysteresis (function U1) or the set upper level „ $U_{max}$ “ (function U2, U3), the output contact closes again.

If the UL function (UNDER + Latch) is selected, when the voltage drops below the lower level „ $U_{min}$ “, 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 „ $U_{max}$ “ and at the same time higher than lower level „ $U_{min}$ “, the output contact is closed. If the „ $U_{max}$ “ is exceeded or drops below the „ $U_{min}$ “, 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.



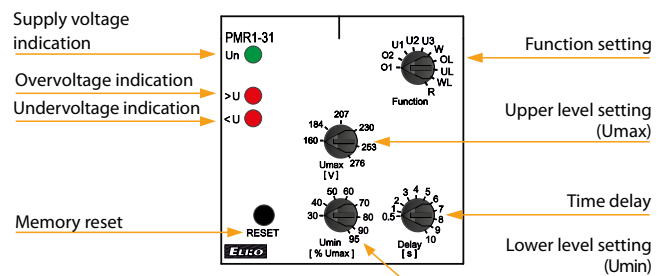
PMR1-31: (8595188188654)  
 PMR1-31/2: (8595188185363)  
 PMR1-36: (8595188188661)  
 PMR1-36/2: (8595188188678)  
 PMR1-39: (8595188188685)  
 PMR1-39/2: (8595188188692)

Technical parameters	PMR1-31 PMR1-31/2	PMR1-36 PMR1-36/2	PMR1-39 PMR1-39/2
<b>Supply and measuring</b>	AC/DC 48 – 276 V	DC 6 – 30 V	AC/DC 24 – 150 V
Supply/monitored terminals:	(AC 50-60 Hz)	2-7	(AC 50-60 Hz)
Supply/monitored voltage:	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
Consumption (max.):	AC 160 – 276 V 30 – 95 %Umax	DC 12 – 30 V 50 – 95 %Umax	AC 80 – 150 V 30 – 95 %Umax
Upper level setting (Umax):	AC 276 V	DC 36 V	AC 276 V
Lower level setting (Umin):	AC 290 V	DC 48 V	AC 290 V
Max. permanent voltage:			
Peak overload (1 s):			
Time delay (d):		300 ms	
Time delay (t):		adjustable, 0.5 – 10 s	
<b>Accuracy</b>			
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)	
<b>Output</b>			
Contact type:	1× changeover 2× changeover	1× changeover 2× changeover	1× changeover 2× changeover
Contact material:	AgNi		
Current rating:	13 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; 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.		
<b>Other information</b>			
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) 105 g (3.7 oz)	94 g (3.32 oz) 105 g (3.7 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27		

- 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.

**Description**

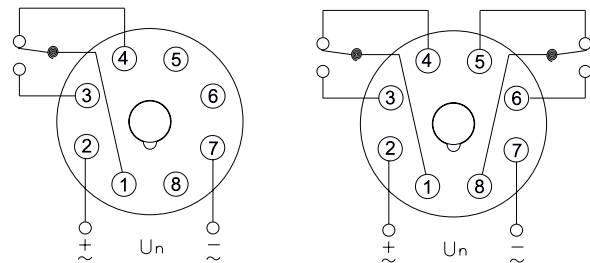
PMR1-31



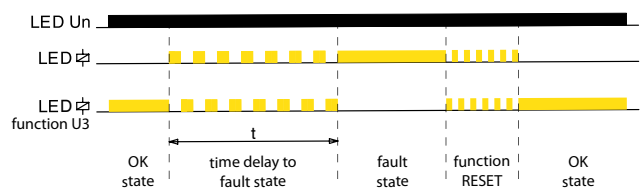
**Connection**

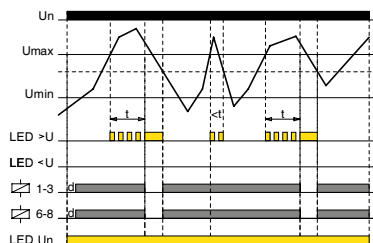
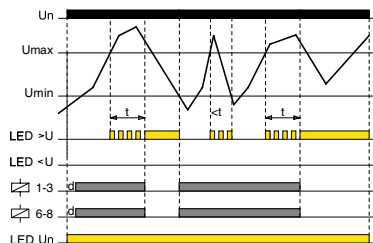
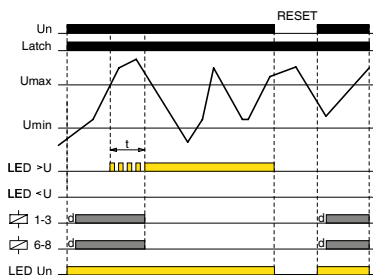
PMR1-3x

PMR1-3x/2



**Indication of operating states**



**O1 OVER (hysteresis 5%)****O2 OVER (hysteresis to  $U_{min}$ )****OL OVER + Latch****OVER:**

If the value of the monitored voltage is lower than the set upper level „ $U_{max}$ “, the output contact is closed. If the „ $U_{max}$ “ 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 „ $U_{min}$ “ (O2 function), the output contact will closes again.

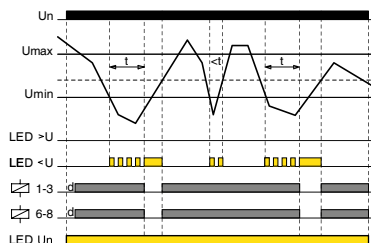
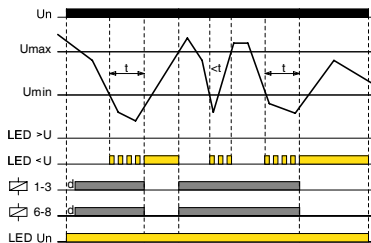
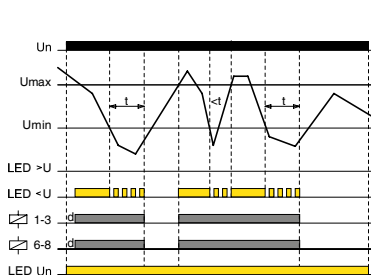
If the OL function (OVER + Latch) is selected, when the upper voltage level „ $U_{max}$ “ is exceeded, the output contact remains open even when the voltage returns from the fault state.

**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).

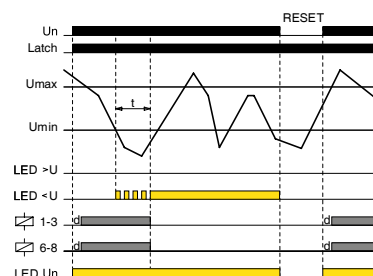
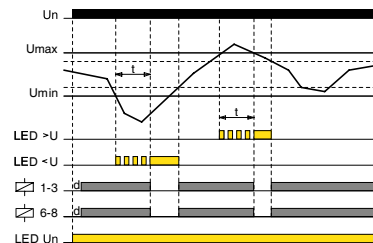
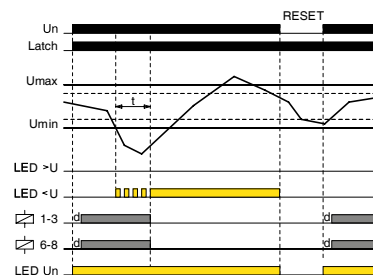
When moving to any other function from the R position, this delay does not apply.

**U1 UNDER (hysteresis 5%)****U2 UNDER (hysteresis to  $U_{max}$ )****U3 UNDER (hysteresis to  $U_{max}$ )****UNDER:**

If the value of the monitored voltage is higher than the set lower level „ $U_{min}$ “, the output contact is closed. When the voltage drops below the „ $U_{min}$ “, output contact opens after the set delay (fault state).

If the voltage exceeds the fixed hysteresis (function U1) or the set upper level „ $U_{max}$ “ (function U2, U3), the output contact closes again.

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

**UL UNDER + Latch****W WINDOW (hysteresis 5%)****WL WINDOW + Latch****WINDOW:**

If the value of the monitored voltage is lower than upper level „ $U_{max}$ “ and at the same time higher than lower level „ $U_{min}$ “, the output contact in closed. If the „ $U_{max}$ “ is exceeded or drops below the „ $U_{min}$ “, 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.



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

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	AC 3x 700 V
Peak overload <1s:	AC 3x 300 V	AC 3x 500 V	AC 3x 600 V	AC 3x 700 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; 1/3 HP 240 Vac, 1/4 HP 120 Vac; 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.)	66 g (2.3 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27	

**Function description**

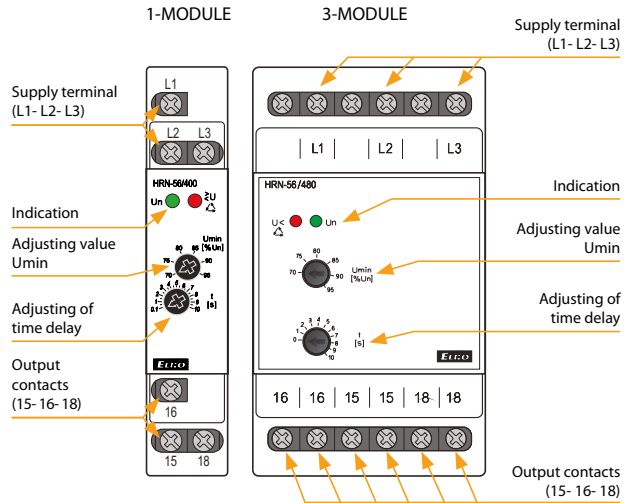
Relay in 3-phase main monitors correct phase sequence and phase failure. Green LED illuminates permanently and indicates energization. In case of phase failure red LED flashes and relay turns off. When changing to faulty state, time delay applies - delay setting is done by potentiometer on the front 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 (U<sub>off</sub> 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.

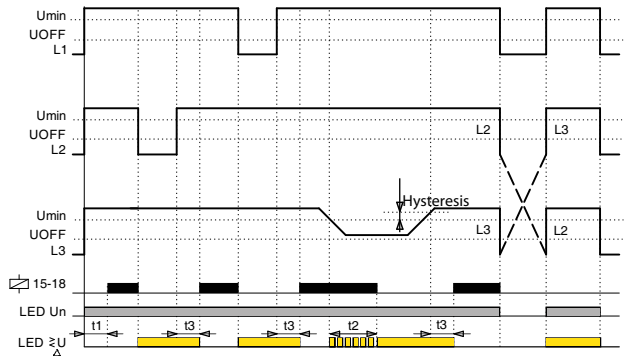
- Relay monitors phase sequence and failure (e.g. control of correct motor winding etc.).
- Relay is designated for monitoring of 3-phase networks.
- Supply from all phases which means that relay is functional also in case of one phase failure.
- Supply and monitored supply Un:
 

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).

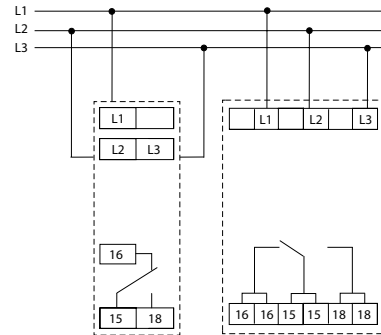
**Description**



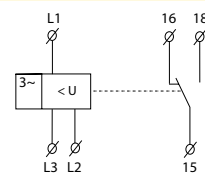
**Function**



**Connection**



**Symbol**





EAN code  
HRN3-70: 8595188188838  
PMR3-70: 8595188185288

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 %
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#### Output

Contact type:	2× changeover (AgNi)	1× changeover (AgNi)
Current rating:	13 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; 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 <sup>2</sup> ):	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:

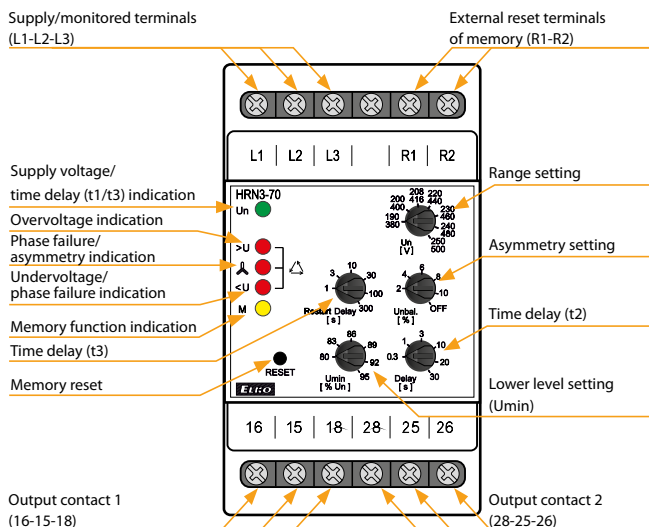
low (190 to 250V) and high (380 to 500V)

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.

- 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 a 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.

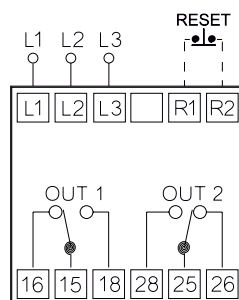
#### Description

##### HRN3-70

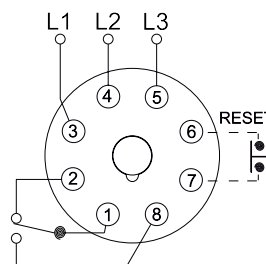


#### Connection

##### HRN3-70

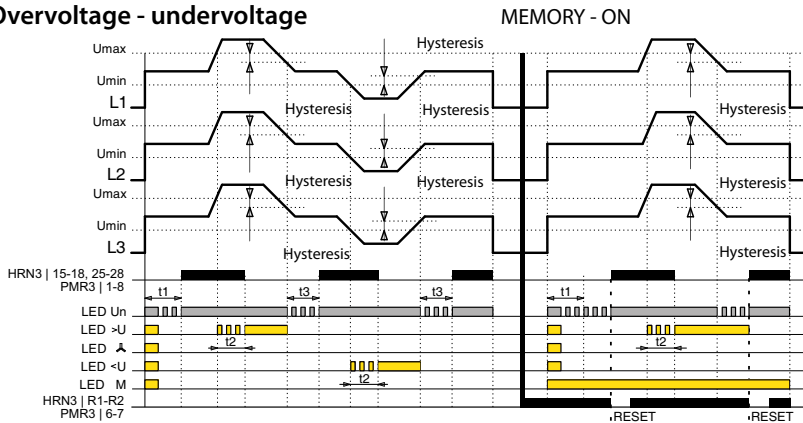


##### PMR3-70



Function

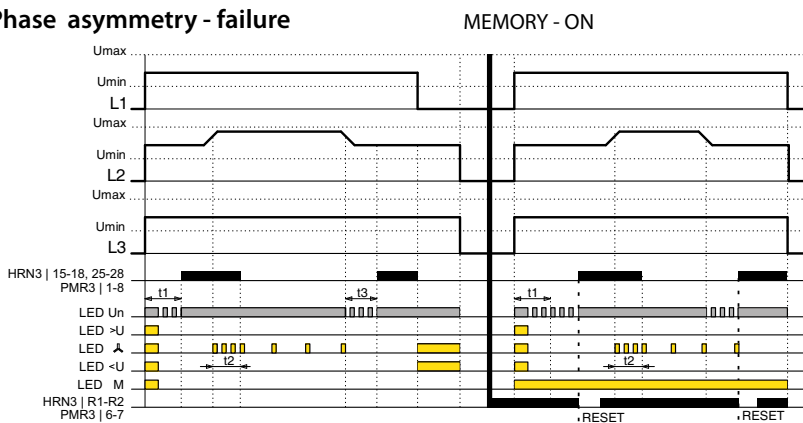
Overvoltage - undervoltage



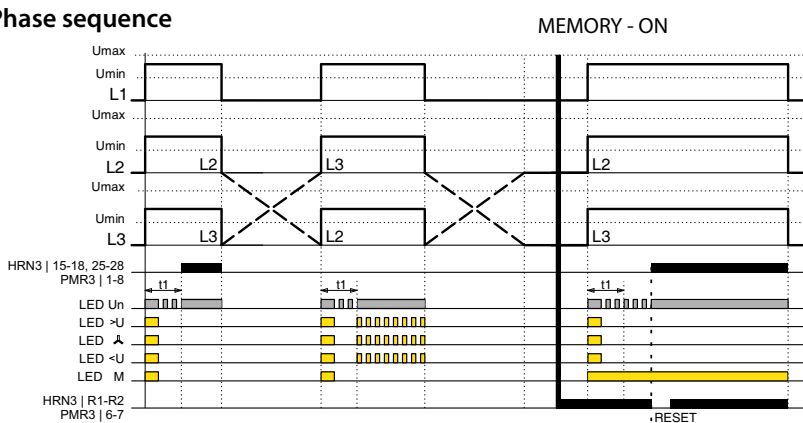
Graphs legend:

- 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 <math><U</math> = undervoltage/phase failure indication
- LED  $\Delta$  = 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  $\leq$ “ 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  $\leq \Delta$ “ 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  $\Delta$ “ 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  $<U$ “ 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.



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

**Technical parameters**      **HRN3-80**      **HRN3-81**

**Supply and measuring**

Supply/monitored terminals:	L1-L2-L3	
Supply/monitored voltage:	AC 3x 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 3x 550 V	
Peak overload (1 s):	AC 3x 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**

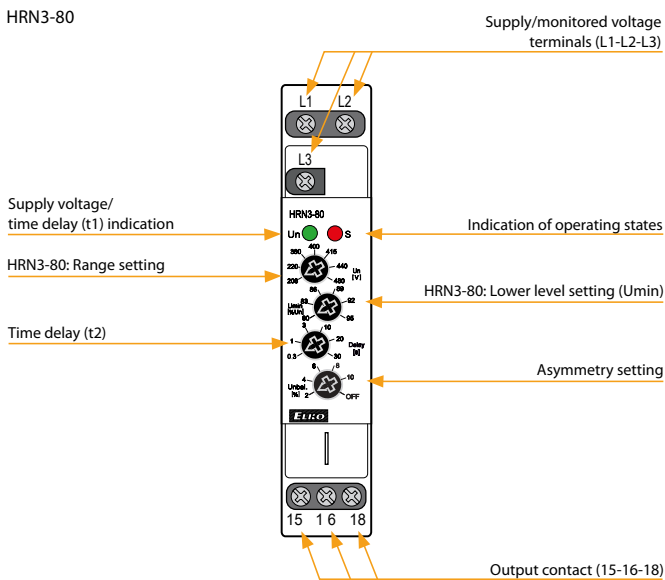
Contact type:	1x changeover/SPDT (AgNi)
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; PD. B300
Breaking capacity:	4000 A/AC1, 384 W/DC1
Switching voltage:	250 V AC/24 V DC
Power dissipation (max.):	1.2 W
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.

**Other information**

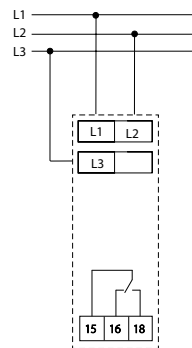
Operating temperature:	-20 .. 55 °C (-4 .. 131 °F)
Storage temperature:	-30 .. 70 °C (-22 .. 158 °F)
Dielectric strength:	AC 4 kV (supply – output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel / IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/stranded with ferrule (mm²):	max. 1x 2.5, 2x 1.5/ max. 1x 2.5 (AWG 14)
Dimensions:	90 x 52 x 66 mm
Weight:	66 g (2.32 oz)      64 g (2.26 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27

- 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).
- **HRN3-81:** 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.

**Description**

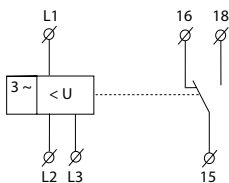


**Connection**

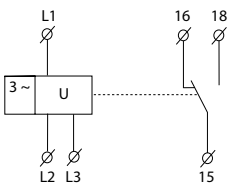


**Symbol**

HRN3-80



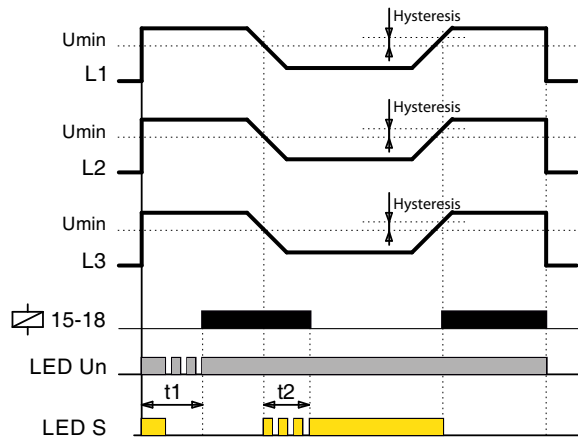
HRN3-81





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  $t_1$  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  $t_2$  has elapsed the green and red LEDs are lit. The output contact is open (fault state).

During the time delay  $t_2$ , the red „LED S“ flashes quickly.

If the phase sequence is incorrect when the power supply is connected, after the time delay  $t_1$  has elapsed the green and red LED flashes quickly. The output contact is open (fault state).

During the time delay  $t_1$ , the green „LED Un“ flashes.

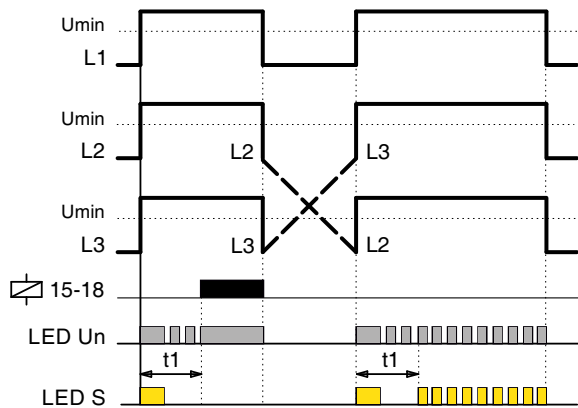
When the set phase asymmetry is exceeded, after the time delay  $t_2$  has elapsed the green LED is lit and the red LED flashes briefly. The output contact is open (fault state).

During the time delay  $t_2$ , the red „LED S“ flashes quickly.

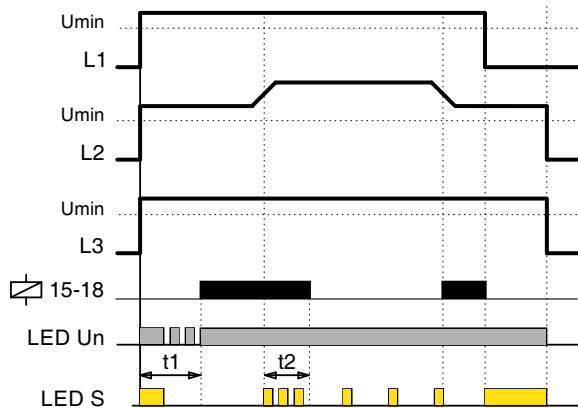
In the event of phase failure, the output contact opens without a time delay  $t_2$  (fault state), the green and red LEDs are lit.

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

Phase sequence:



Phase asymmetry, failure:



## AC

**PRI-32**

Monitoring by current transformer (wire through an opening, galv. separated, without heat loss), adjust. current 1-20 A, multivoltage AC 24-240 and DC 24 V, output 8 A changeover. page 43

**PRI-34**

Multifunction current monitoring relay, measured by built-in current transformer, 5 rated currents (1 A-16 A), 1 A and 5 A range is suitable for external current transformer, AC/DC supply 24-240 V, output 8 A prep. page 44

**PRI-51**

Monitoring of current by in-built transformer, 7 ranges, range 5 A is suitable for current transformer, supply and output as PRI-32, difference from PRI-32: direct monitoring and finer ranges (higher sensitivity) = higher accuracy in measuring. page 46

Type	Design	Supply voltage	Galvanically separated	Monitored parameters					Setting			Description	Page
				Phases	Range	> I	< I	< I >	Delay	Hysteresis	Memory fault <sup>5</sup>		
PRI-32	1-M	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.	43
PRI-34/1A PRI-34/2A PRI-34/5A PRI-34/8A PRI-34/16A	1-M	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 the current 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.	44
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	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	Monitors the excess current flowing through the conductor connected to the monitored terminals. The power supply is galvanically isolated from the monitored current terminals. It is possible to connect ext. current transformer.	46

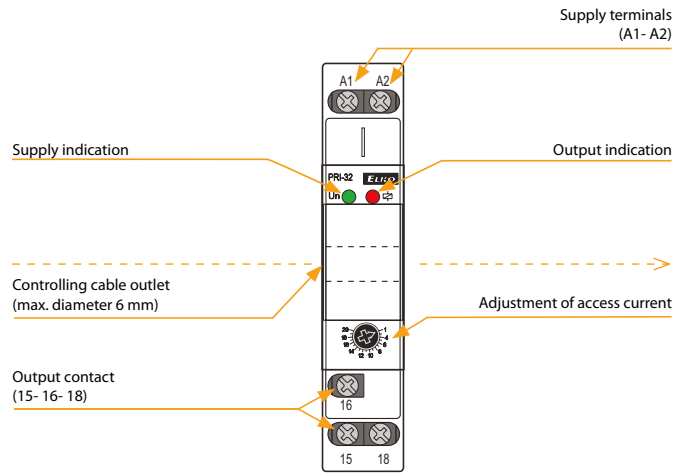


EAN code  
PRI-32: 8595188121965

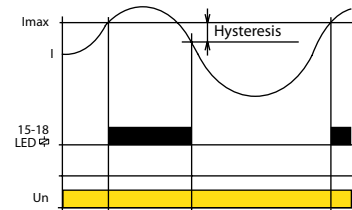
Technical parameters		PRI-32
<b>Supply circuit</b>		
Supply terminals:	A1 - A2	
Voltage range:	AC 24 - 240 V, DC 24 V (AC 50-60 Hz)	
Burden:	max. 1.5 VA/1 W	
Max. dissipated power (Un + terminals):	2 W	
Operating range:	-15 %; +10 %	
<b>Measuring circuit</b>		
Current range:	1 - 20 A (AC 50-60 Hz)	
Current adjustment:	potentiometer	
<b>Accuracy</b>		
Setting accuracy (mech.):	5 %	
Repeat accuracy:	< 1 %	
Temperature dependency:	< 0.1 %/°C (°F)	
Limit values tolerance:	5 %	
Overload capacity:	max. 100 A/10 s	
<b>Output</b>		
Number of contacts:	1x changeover/SPDT (AgNi/Silver Alloy)	
Current rating:	8 A/AC1; 1/3 HP 240 Vac, 1/4 HP 120 Vac; 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.	
<b>Other information</b>		
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 (mm <sup>2</sup> ):	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	

- 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.

**Description**



**Function**

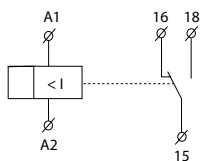


Monitoring relay PRI-32 serves to monitor current level in single phase AC circuits. Due to its fluent adjustment of release current, it is predestined for applications with necessity of current flow indication, and can be used as precedence relay. Output relay is off in normal state. In case the set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

**Connection**



**Symbol**





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

**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

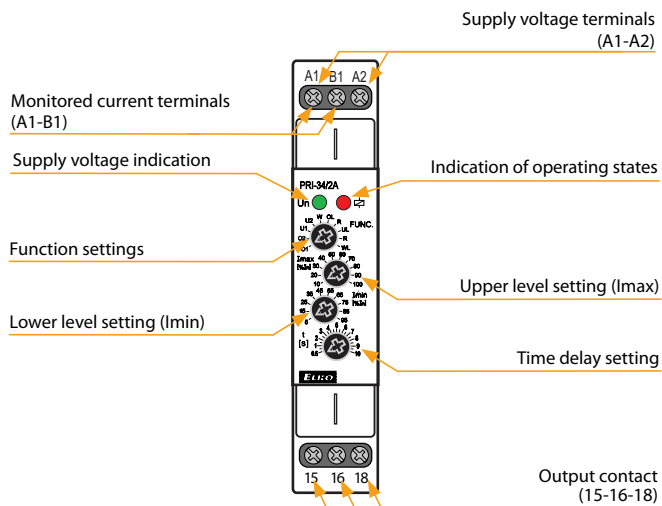
Accuracy	
Setting accuracy (mech.):	5 %
Repeat accuracy:	< 1 %
Temperature dependency:	< 0.1 %/°C
Limit values tolerance:	5 %
Hysteresis (fault to OK):	5 % (function O1, U1, W) Imax – Imin (function O2, U2)

Output	
Contact type:	1x changeover (AgNi)
Current rating:	13 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; 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.

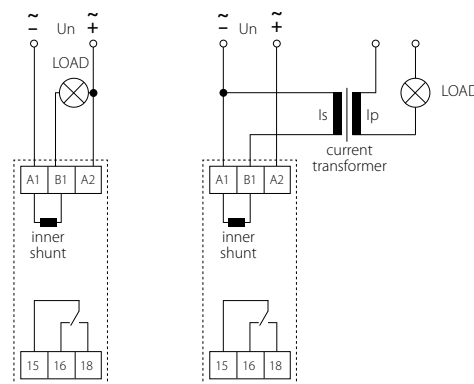
Other information	
Operating temperature:	-20 .. +55 °C (-4 .. 131 °F)
Storage temperature:	-30 .. +70 °C (-22 .. 158 °F)
Dielectric strength:	AC 4 kV (supply – output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel / IP20 terminals
Oversvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/stranded with ferrule (mm²):	max. 1x 2.5, 2x 1.5/ max. 1x 2.5 (AWG 14)
Dimensions:	90 x 17.6 x 64 mm (3.5" x 0.7" x 2.5")
Weight:	60 g (2.15 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27

- 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.

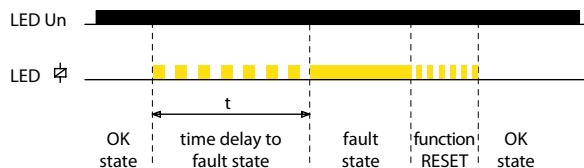
**Description**



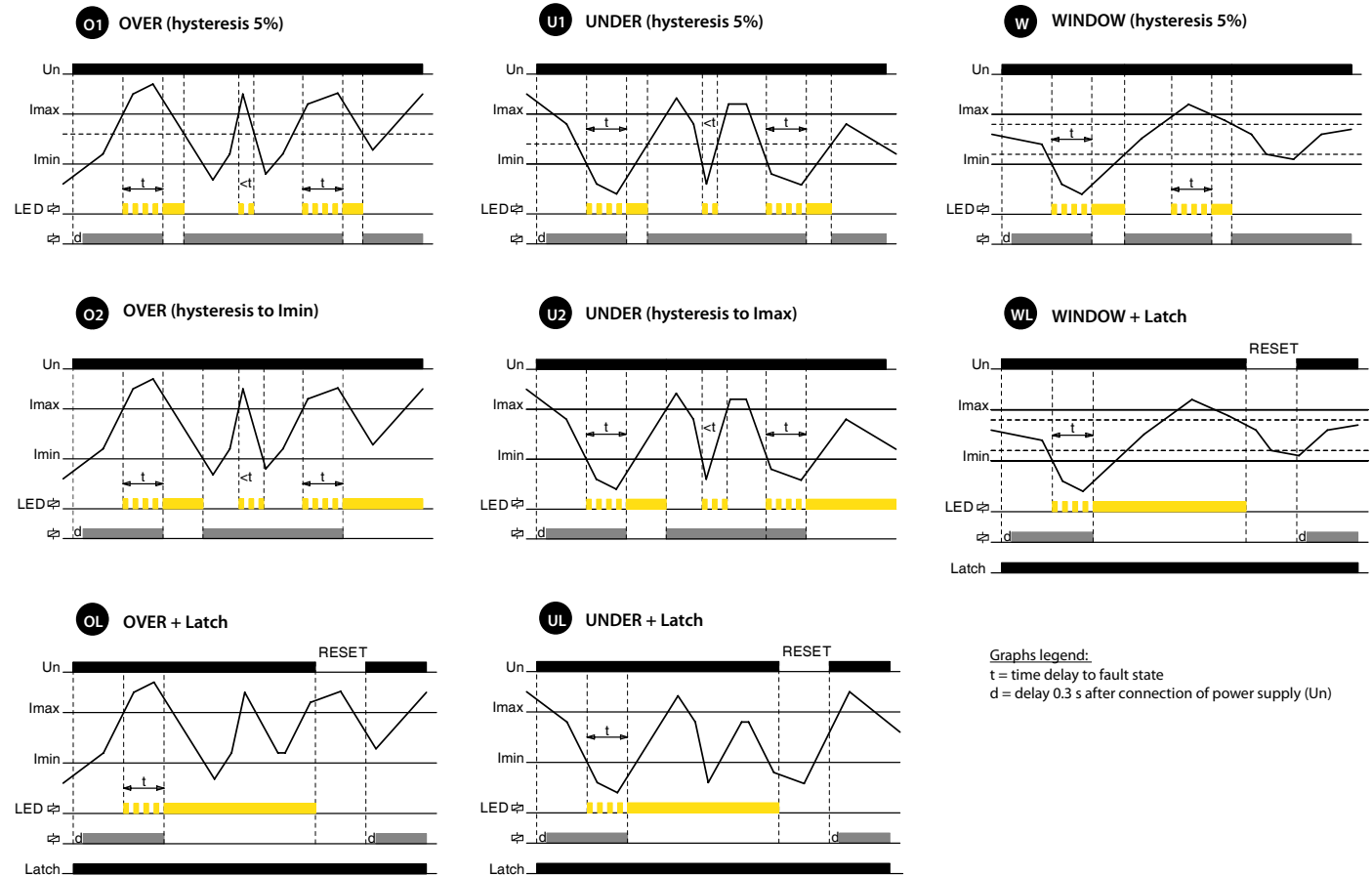
**Connection**



**Indication of operating states**



Function



**OVER:**

- If the value of the monitored current is lower than the set upper level „ $I_{max}$ “, the output contact is closed. If the „ $I_{max}$ “ 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 „ $I_{min}$ “ (function O2), the output contact will closes again.
- If the OL function (OVER + Latch) is selected, when the upper current level „ $I_{max}$ “ 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 „ $I_{min}$ “, the output contact is closed. When the current drops below the „ $I_{min}$ “, output contact opens after the set delay (fault state).
- If the current exceeds the fixed hysteresis (function U1) or the set upper level „ $I_{max}$ “ (function U2), the output contact closes again.
- If the UL function (UNDER + Latch) is selected, when the current drops below the lower level „ $I_{min}$ “, 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 „ $I_{max}$ “ and at the same time higher than lower level „ $I_{min}$ “, the output contact in closed. If the „ $I_{max}$ “ is exceeded or drops below the „ $I_{min}$ “, 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.



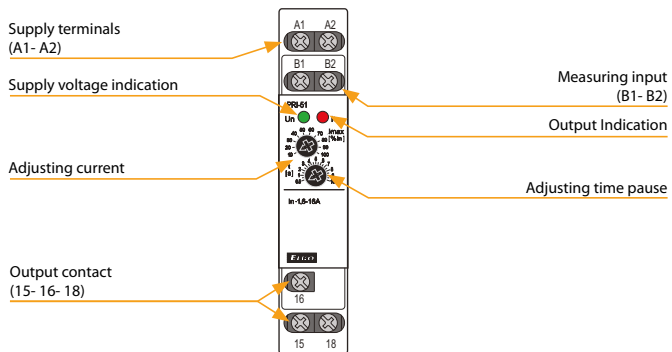
EAN code  
 PRI-51/1A: 8595188124904  
 PRI-51/2A: 8595188124911  
 PRI-51/5A: 8595188124928  
 PRI-51/8A: 8595188124935  
 PRI-51/16A: 8595188124942

Technical parameters		PRI-51
<b>Supply circuit</b>		
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 %	
<b>Measuring circuit</b>		
Load:	between B1 - B2	
Current range:	PRI-51/1 A: AC 0.1-1 A      PRI-51/8 A: AC 0.8-8 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-51/1 A: 4 A PRI-51/2 A: 8 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	
<b>Accuracy</b>		
Setting accuracy (mechanical):	5 %	
Repeat accuracy:	< 1 %	
Temperature dependency:	< 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.	
<b>Output</b>		
Number of contacts:	1x changeover/SPDT (AgNi/Silver Alloy)	
Current rating:	8 A/AC1; 1/3 HP 240 Vac, 1/4 HP 120 Vac; PD. B300	
Breaking capacity:	2000 VA/AC1, 240 W/DC	
Output indication:	red LED	
<b>Other information</b>		
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 (mm <sup>2</sup> ):	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	

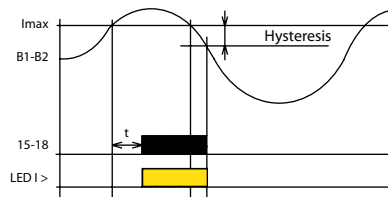
\* applicable also for current transformer

- 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.

### Description



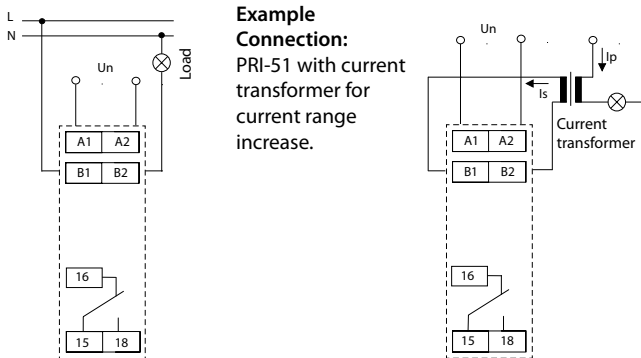
### Function



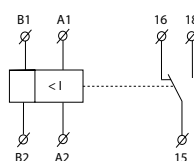
Monitoring relay PRI-51 serves to monitor current level in one-phase AC circuits. Gradual setting of actuating current of monitoring relay enables many different applications. Output relay is in normal state opened. After the set current level is reached, relay closes after the set delay (0.5 - 10 s). When returning from faulty to normal state there is a hysteresis (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



### Symbol



### Example of an order

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

VS



**VS116U**

Supply voltage:  
AC/DC 12-240 V  
Output contact:  
1x changeover/SPDT 16 A.  
page 48



**VS308U**

Supply voltage:  
AC/DC 12-240 V  
Output contacts:  
3x changeover/TPDT 8 A.  
page 48

Type	Design	Supply voltage	Output contact	Other features			Description	Page
				LED signal light	RC unit	Parallel diode		
VS116U	1M-DIN	AC/DC 12 – 240 V	1x16 A changeover/ SPDT	●	●	●	Universal supply voltage	48
VS308U	1M-DIN	AC/DC 12 – 240 V	3x 8 A changeover/ TPDT	●	●	●	Universal supply voltage	



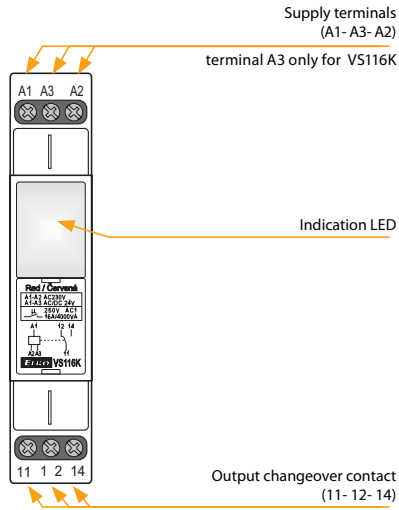
- Power relay used for switching larger load output, strengthen or „multiplying“ contacts of the existing device.
- In the design 1-MODULE , DIN rail mounting, output status indicated by high intensity LED with choice of LED color (red, green, blue or white LED\*).

Technical parameters	VS116U	VS308U
Supply terminals:	A1 - A2	
Voltage range:	AC/DC 12-240 V (50-60 Hz)	AC/DC 12-240 V (50-60 Hz)
Burden (max.):	AC 0.7 - 3 VA/DC 0.5 - 1.7 W	AC 0.7 - 3 VA/DC 0.5 - 1.7 W
Supply terminals:	x	x
Voltage range:	x	x
Burden:	x	x
Supply voltage tolerance:	-15%; +10%	
Max. dissipated power (Un + terminals):	4 W	3 W
<b>Output</b>		
Number of contacts:	1 x changeover/SPDT (AgSnO <sub>2</sub> )	3 x changeover/TPDT (AgNi/Silver Alloy)
Current rating:	16 A/AC1; 1 HP 240Vac; 1/2 HP 120Vac; PD. B300	8 A/AC1; 1/2 HP 240Vac; PD. B300
Breaking capacity:	4000VA/AC1, 384W/ DC	2000VA/AC1, 192W/ DC
Inrush current:	30 A/<3 s	10 A/<3 s
Switching voltage:	250V AC/24V DC	
Output indication:	high intensity LED	
Mechanical life:	30.000.000 ops.	
Electrical life (AC1):	100.000 ops.	60.000 ops.
Time between switching:	min. 2s	
<b>Other information</b>		
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 (mm <sup>2</sup> ):	max. 1x 2.5 or 2x 1.5 max. 1x 2.5 (AWG 12)	
Dimensions:	90 x 17.6 x 64 mm (3.5" x 0.7" x 2.5")	
Weight:	59 g (2.1 oz.)	80 g (2.8 oz.)
Standards:	EN 60669-1, EN 60669-2-1	

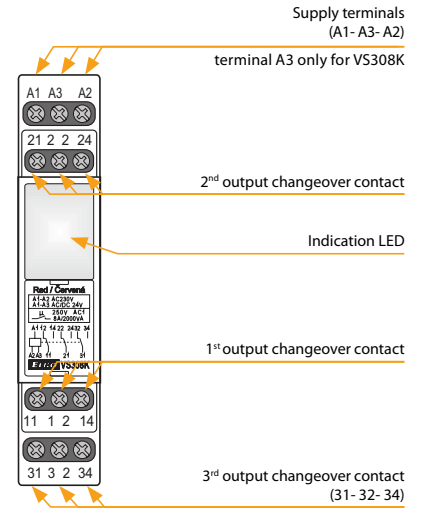


Description

VS116U

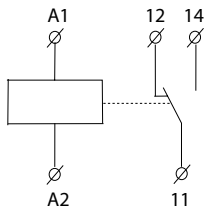


VS308U

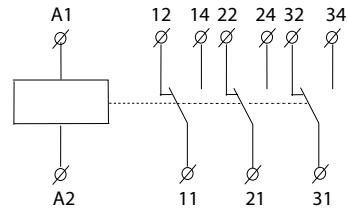


Symbol

VS116U



VS308U



## EAN codes

VS116U/red	8595188124607	VS308U/red	8595188130103
VS116U/green	8595188136433	VS308U/green	8595188136440
VS116U/white	8595188138482	VS308U/white	8595188138512
VS116U/blue	8595188138475	VS308U/blue	8595188138505

## Order code

	<b>VS116U/red:</b> 2460	<b>VS308U/red:</b> 3010
	<b>VS116U/green:</b> 3643	<b>VS308U/green:</b> 3644
	<b>VS116U/white:</b> 3848	<b>VS308U/white:</b> 3851
	<b>VS116U/blue:</b> 3847	<b>VS308U/blue:</b> 3850

## Notes

Max. time of changeover of contact is 10 ms.

\* 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

Number of contacts:  
1x20 A. Configuration  
of switching and  
breaking contacts:  
10, 01.  
page 56



VS220

Number of contacts:  
2x20 A. Configuration  
of switching and  
breaking contacts: 20,  
11, 02.  
page 56



VS425

Number of contacts:  
4x25 A. Configuration  
of switching and  
breaking contacts:  
40, 31, 22, 04.  
page 56



VS440

Number of contacts:  
4x40 A. Configuration  
of switching and  
breaking contacts:  
40, 31, 22, 04.  
page 56



VS463

Number of contacts:  
4x63 A. Configuration  
of switching and  
breaking contacts:  
40, 31, 22.  
page 56

ALL IN ONE  
daily  
weekly  
yearly  
astro  
PROGRAM

WEB  
SERVER

Wi-Fi  
2.4 GHz

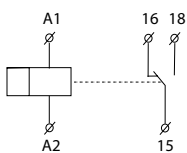


EAN code  
SHT-13/1: 8595188189071  
SHT-13/2: 8595188184854

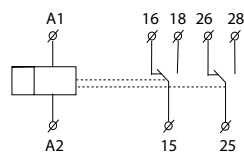
Technical parameters	SHT-13/1	SHT-13/2
Supply terminals:	A1-A2	
Supply voltage:	AC/DC 24 – 240 V (AC 50-60 Hz)	
Consumption (max.):	Wi-Fi "OFF" 0.5 W/2 VA   "ON" 1 W/3 VA	
Supply voltage tolerance:	-15 %; +10 %	
<b>Output</b>		
Contact type:	1x changeover (AgSnO <sub>2</sub> )	2x changeover (AgSnO <sub>2</sub> )
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; 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.	
<b>Time circuit</b>		
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)	
<b>Program circuit</b>		
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)	
<b>Other information</b>		
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	
Oversvoltage category:	III.	
Pollution degree:	2	
Cross-wire section – solid/ stranded with ferrule (mm <sup>2</sup> ):	max. 1x 2.5, 2x 1.5/ max. 1x 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	

**Symbol**

SHT-13/1

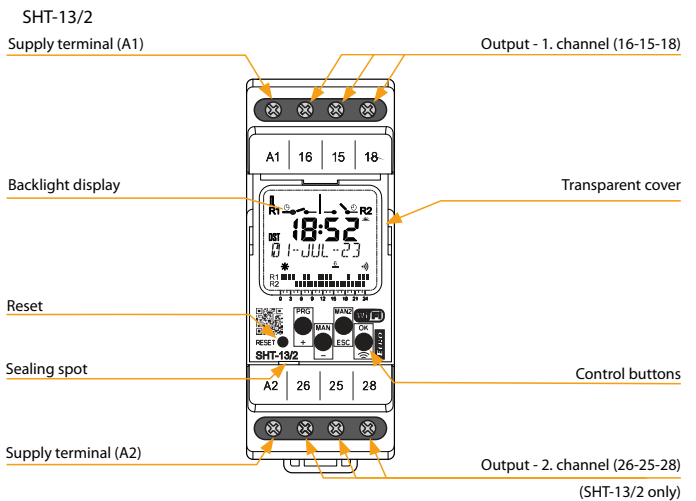


SHT-13/2

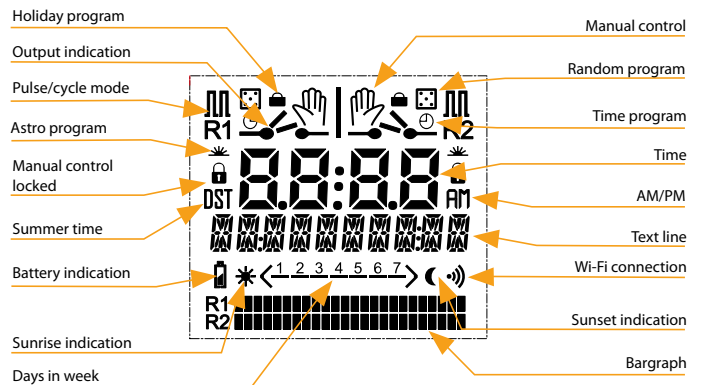


- All programs in one device (daily, weekly, yearly and astronomical).
- UNiversal supply voltage in range of AC/DC 24 – 240 V (AC 50-60 Hz).
- Simple setting after the first start-up.
- User replaceable battery to back up the set time during power outages.
- Built-in web server for setup and control via Wi-Fi connection.
- Time synchronization through NTP server (require internet connection).
- Possibility of permanent connection to the local network.
- New well-arranged display with white backlight.
- ASTROnomic program: manual entry of coordinates or selecting from one of more than 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 - **current version 1.46**

**Description**

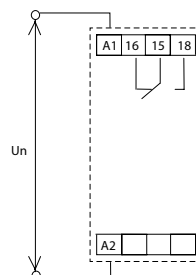


**Description of displayed elements**

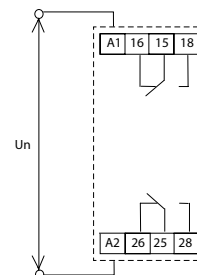


**Connection**

SHT-13/1



SHT-13/2



## Switching power supplies DC, unregulated

### Voltage 12 V



**PS1M-15/12V**  
Input: AC 100 - 240 V  
Output: DC 12 V stab.  
load: 1.25 A/15 W.  
- short circuit protection  
- overload protection  
- overvoltage protection  
page 53



**PS2M-24/12V**  
Input: AC 100 - 240 V  
Output: DC 12 V stab.  
Load: 2 A/24 W.  
- short circuit protection  
- overload protection  
- overvoltage protection  
page 53



**PS3M-54/12V**  
Input: AC 100-240 V  
Output: DC 12V stab.  
Load: 4.5 A/54 W.  
- short circuit protection  
- overload protection  
- overvoltage protection  
page 53



**PS4M-85/12V**  
Input: AC 100-240 V  
Output: DC 12 V stab.  
Load: 7.1 A/85 W.  
- short circuit protection  
- overload protection  
- overvoltage protection  
page 53



**PS6M-135/12V**  
Input: AC 100-240 V  
Output: DC 12 V stab.  
Load: 10.2 A/122W.  
- short circuit protection  
- overload protection  
- overvoltage protection  
page 53

### Voltage 24 V



**PS1M-15/24V**  
Input: AC 100 - 240 V  
Output: DC 24 V stab.  
load: 0.625 A/15 W.  
- short circuit protection  
- overload protection  
- overvoltage protection  
page 53



**PS2M-30/24V**  
Input: AC 100 - 240 V  
Output: DC 24 V stable  
load: 1.25 A/30 W.  
- short circuit protection  
- overload protection  
- overvoltage protection  
page 53



**PS3M-60/24V**  
Input: AC 100-240 V  
Output: DC 24 V stab.  
load: 2.5 A/60 W.  
- short circuit protection  
- overload protection  
- overvoltage protection  
page 53



**PS4M-92/24V**  
Input: AC 100 - 240 V  
Output: DC 24 V stab.  
load: 3.83 A/92 W  
- short circuit protection  
- overload protection  
- overvoltage protection  
page 53



**PS6M-150/24V**  
Input: AC 100-240 V  
Output: DC 24V stab.  
Load: 5.3 A/127W.  
- short circuit protection  
- overload protection  
- overvoltage protection  
page 53

Type	Design	Supply voltage	Galvanically isolated	Output					Output protection against			Description	Page
				Analog	Switching	Stabilized DC	Output voltage	Loadability	Overcurrent	Short circuit	Temperature		
PS1M-15/12V	1M-DIN	AC 100 - 240 V	X	X	●	●	DC 12 V	1.25 A	●	●	X	Fixed output voltage DC 12 V. Power: 15 W.	53
PS1M-15/24V	1M-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	2M-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	2M-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	3M-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	3M-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	4M-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	4M-DIN	AC 100 - 240 V	X	X	●	●	DC 24 V	3.83 A	●	●	X	Fixed output voltage DC 24 V. Power: 92 W.	
PS6M-135/12V	6M-DIN	AC 100 - 240 V	X	X	●	●	DC 12 V	10.2 A	●	●	X	Fixed output voltage DC 12 V. Power: 122 W (120 V), 135 W (230 V)	
PS6M-150/24V	6M-DIN	AC 100 - 240 V	X	X	●	●	DC 24 V	5.3 A	●	●	X	Fixed output voltage DC 12V. Power: 85 W.	



- 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  
 PS6M-135/12V: 8595188199698  
 PS6M-150/24V: 8595188199704

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	PS6M-135/12V*	PS6M-150/24V*
<b>Input</b>										
Voltage range:	AC 100 - 240 V (50/60 Hz), DC 145 - 330 V									
Tolerance:	± 10%									
Efficiency:	85%	86%	88%	89%	88%	90%	88%	90%	89%	90%
Consumption 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	TBD	TBD
Consumption with full load (max.):	16W/30VA	17.5W/32VA	30W/50VA	33W/60VA	60W/95VA	70W/111VA	95W/150VA	105W/160VA	TBD	TBD
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		max. 35A at 115V AC/60Hz max. 70A at 240V AC/50Hz	
<b>Output</b>										
Rated voltage:**	12V DC	24V DC	12V DC	24V DC	12V DC	24V DC	12V DC	24V DC	12V DC	24V DC
Voltage setting range:	11 - 13V	23 - 25V	11 - 13V	23 - 25V	11.4 - 12.6V	22.8 - 25.2V	11 - 13V	23 - 25V	11 - 13V	23 - 25V
Rated current:	1.25A	0.625A	2A	1.25A	4.5A	2.5A	7.1A	3.83A	11.3A/230V 10.2A/120V	6.25A/230V 5.3A/120V
Rated power:	15W	15W	24W	30W	54W	60W	85W	92W	135W	150W
Ripple & Noise:	120mV	150mV	120mV	150mV	120mV	150mV	120mV	150mV	100mV	150mV
Output indication:	blue LED		blue LED		green LED		blue LED		blue LED	
Tolerance of output voltage:	5 %									
Overload protection:	from 130 % - 200% rated output power									
Overvoltage protection:	from 110 % - 145% rated output power								from 105 % - 135% rated output power	
Overcurrent protection:	from 110 % - 180% rated output power									
Short circuit protection:	temporarily disconnecting the output									
<b>Other information</b>										
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									
Insulation resistance:	100M Ω/500V DC/25°C (77°F)/70% RH									
Overvoltage category:	III.									
Pollution degree:	2									
Max. cable size:	max. 1x 2.5 mm <sup>2</sup> , max. 2x 1.5 mm <sup>2</sup> solid wire/with sleeve max. 1x 2,5 mm <sup>2</sup>									
Terminal torque:										
input terminals	0.5 Nm		0.3 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")	90 x 105 x 58 mm (3.5" x 4.1" x 2.3")					
Weight:	78 g (2.8 oz)	120 g (4.2 oz)	190 g (6.7 oz)	270 g (9.5 oz)	380 g (13.8 oz)					
Standards:	IEC60950-1, UL62368-1, TUV EN61558-2-16									

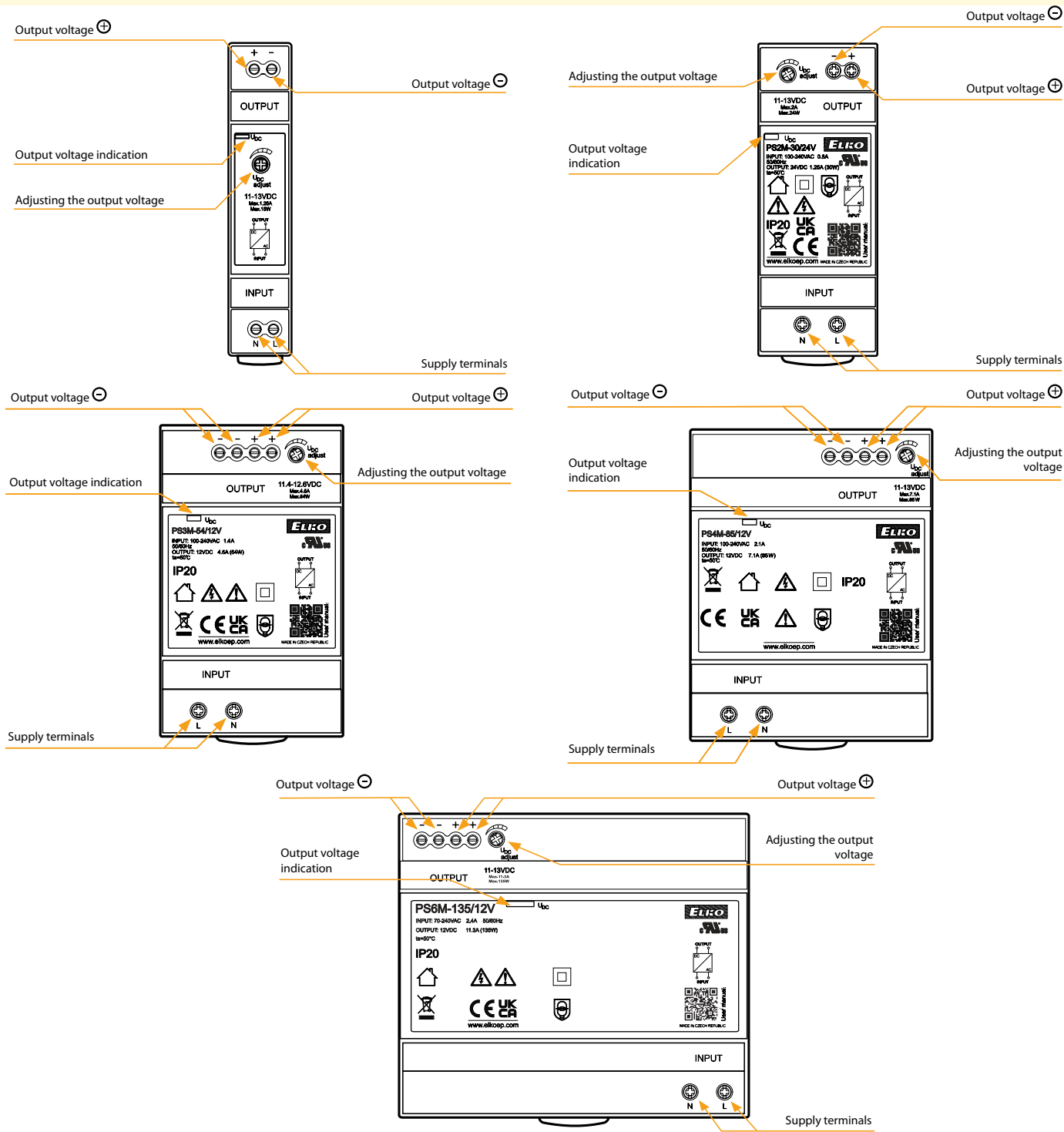
\* PS6M-135/12V & PS6M-150/24V on request

\*\* different rated voltage on request: PS1M, PS2M, PS3M - 5V, 15V, 48V; PS4M, PS6M - 15V, 48V

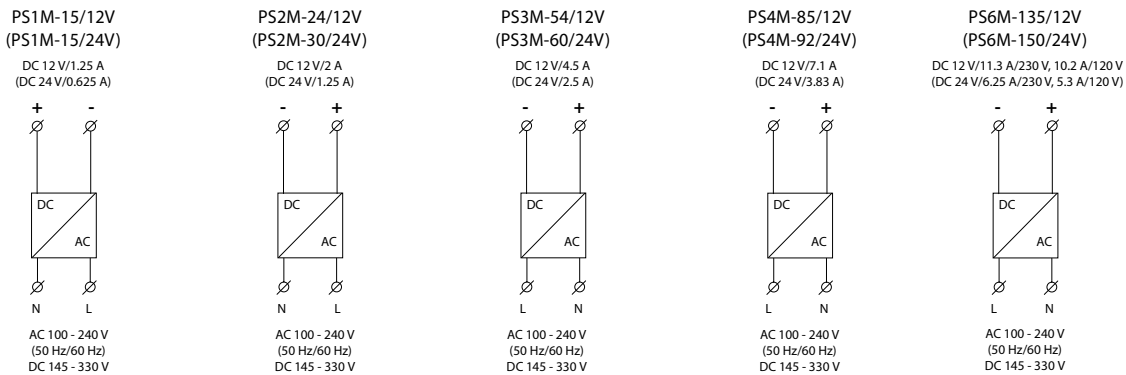
\*\*\* PS6M - max. operating temperature limited to 45°C (113°F)

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







Description



Connection



## 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 <sup>1</sup>	LED <sup>2</sup>

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<sup>1</sup> - dimmable LED bulbs, designed for dimmers with phase-controlled rising edge (triac dimmers)

LED<sup>2</sup> - 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.



- For switching electric circuits, especially for resistive loads and 3-phase induction motors
- Number of contacts: **VS120 - 1, VS220 - 2, VS325, VS340, VS363 - 3, VS425, VS440, VS463 - 4**
- It is produced in configuration of switching and breaking contacts:  
**VS120: 10, 01 VS220: 20, 11, 02**  
**VS325: 30 VS425: 40, 31, 22, 13 04**  
**VS340: 30 VS440: 40, 31, 22, 04**  
**VS363: 30 VS463: 40, 31, 22**
- It is possible to connect auxiliary contacts VSK to contactors VS425, VS440, VS463

EAN code  
see page 38

Technical parameters	VS120	VS220	VS325/VS425	VS340/VS440	VS363/VS463
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Rated insulation voltage (Ui):	230 V	230 V	440 V	440 V	440 V
Rated thermo-current $I_{th}$ (in AC):	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

#### Switched operation

AC-1 for 400 V, 3 phase:	x	x	16 kW	26 kW	40 kW
AC-1 for 230 V:	4 kW, 1 phase	4 kW, 1 phase	9 kW, 3 phase	16 kW, 3 phase	24 kW, 3 phase
AC-3 for 400 V, 3 phase:	x	x	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	2.2 kW, 3 phase	5.5 kW, 3 phase	8.5 kW, 3 phase
AC-7a for 400 V, 3 phase:	x	x	16 kW	26 kW	40 kW
AC-7a for 230 V:	4 kW, 1 phase	4 kW, 1 phase	9 kW, 3 phase	16 kW, 3 phase	24 kW, 3 phase
AC-7b for 400 V, 3 phase:	x	x	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	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
AC-15 for 230 V, 1 phase:	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	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.	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	100.000	100.000
AC-3-power load:	300.000	300.000	500.000	500.000	150.000
AC-5a - high-intensity discharge lamp:	100.000 by 30 $\mu$ F	100.000 by 30 $\mu$ F	100.000 by 36 $\mu$ F	100.000 by 220 $\mu$ F	100.000 by 330 $\mu$ F
AC-5b - incandescent lamps:	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	100.000	100.000
AC-7b - inductive household devices:	300.000	300.000	300.000	150.000	150.000
Minimal load:	$\geq 17$ V, $\geq 50$ mA	$\geq 17$ V, $\geq 50$ mA	$\geq 17$ V, $\geq 50$ mA	$\geq 17$ V, $\geq 50$ mA	$\geq 24$ V, $\geq 100$ mA
Short circuit protection with the fuse char. aM:	20 A	20 A	25 A	63 A	80 A
Coordination Type according EN 60 947-4-1:	2	2	2	2	2
Dielectric strength:	4 kV	4 kV	4 kV	4 kV	4 kV

#### Contacts - max. cable size

Solid conductor:	AWG 7 (10 mm <sup>2</sup> )	AWG 7 (10 mm <sup>2</sup> )	AWG 10 (10 mm <sup>2</sup> )	AWG 10 (25 mm <sup>2</sup> )	AWG 10 (25 mm <sup>2</sup> )
Stranded conductor:	AWG 8 (6 mm <sup>2</sup> )	AWG 8 (6 mm <sup>2</sup> )	AWG 8 (6 mm <sup>2</sup> )	AWG 4 (16 mm <sup>2</sup> )	AWG 4 (16 mm <sup>2</sup> )
Maximal torque:	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 mm <sup>2</sup> )	AWG 14 (2.5 mm <sup>2</sup> )	AWG 14 (2.5 mm <sup>2</sup> )	AWG 14 (2.5 mm <sup>2</sup> )	AWG 14 (2.5 mm <sup>2</sup> )
Stranded conductor:	AWG 14 (2.5 mm <sup>2</sup> )	AWG 14 (2.5 mm <sup>2</sup> )	AWG 14 (2.5 mm <sup>2</sup> )	AWG 14 (2.5 mm <sup>2</sup> )	AWG 14 (2.5 mm <sup>2</sup> )
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)

#### Operating

Coil control voltage:	AC/DC 24 V, 120 V, 230 V	AC/DC 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	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	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**
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.)	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 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.

\*\*\* HP rating: VS120 & VS220: 1-phase 1 HP|240 Vac, 1/3 HP|120 Vac; PD. B300, P300

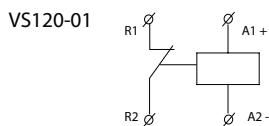
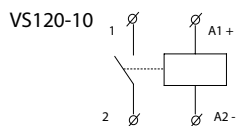
VS325 & VS425: 1-phase 1 HP|240 Vac, 1/3 HP|120 Vac; 3-phase 3 HP|240 Vac, 5 HP|460 Vac; PD. B300, P300

VS340 & VS440: 1-phase 3 HP|240 Vac, 1 HP|120 Vac; 3-phase 7 HP|240 Vac, 15 HP|460 Vac; PD. B300, P300

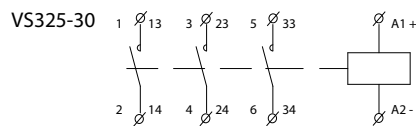
VS363 & VS463: 1-phase 5 HP|240 Vac, 2 HP|120 Vac; 3-phase 10 HP|240 Vac, 20 HP|460 Vac; PD. B300, P300



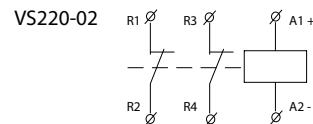
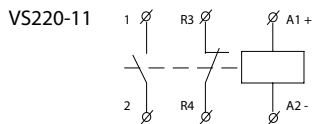
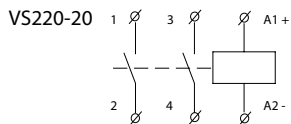
## VS120



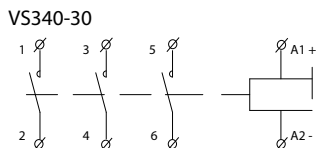
## VS325



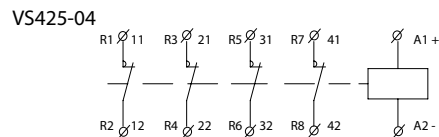
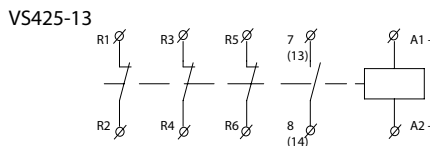
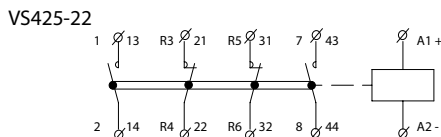
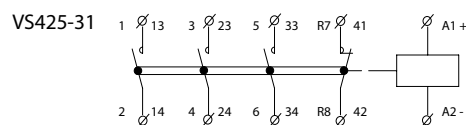
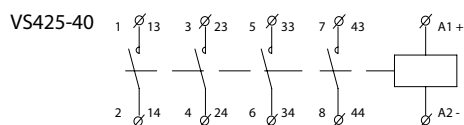
## VS220



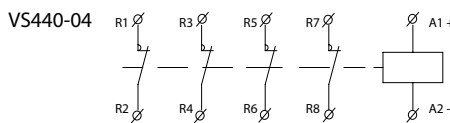
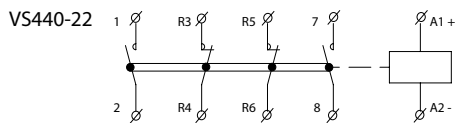
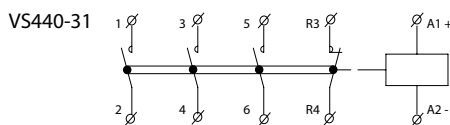
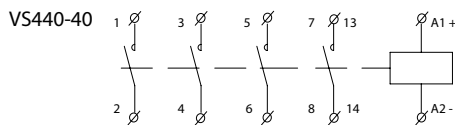
## VS340



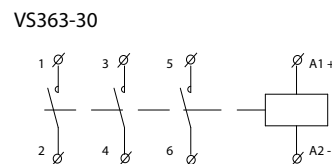
## VS425



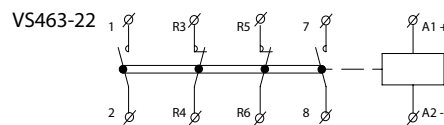
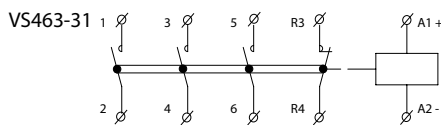
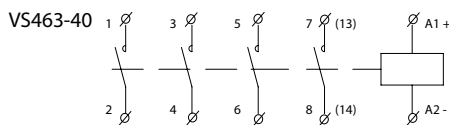
## VS440



## VS363



## VS463



### Auxiliary contacts for VS425, VS440, VS463

#### 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 frequency:	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 mm <sup>2</sup> /2.5 mm <sup>2</sup> (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")

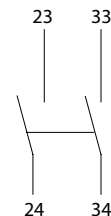
### Connection of auxiliary contact VSK-11 and VSK-20

EAN code  
see page 59

VSK-11



VSK-20



Number of lights on one contactor's contact

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

## 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

**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

**VS340**

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

## EAN codes for VSK and covers

VSK-11: 8595188121613  
 VSK-20: 8595188121606

## Explore our best-selling non-UL products, including high-quality relays and other essential components.

Trusted by professionals across the U.S. market and providing reliable performance and exceptional value for various applications.



### CRM-91HE

(10 functions)  
Multifunction Timer Relay  
with External Potentiometer



- Control by external control unit - potentiometer (can be placed/mounted for example on switch board doors or in panel).



### CRM-2HE

(2 functions)  
Asymmetric Flasher with  
External Potentiometers



- Control by external control unit - potentiometer (can be placed/mounted for example on switch board doors or in panel).



### CRM-9S

(10 functions)  
Multifunction  
Timer Relay



- Multifunction time relay for universal use in automation, control, and regulation or in-house installations.



### HRN-100

(4-wire connection)  
Multifunction Voltage  
Monitoring Relay in 3P with  
LCD Display



- Multifunction and in many ways universal monitoring relay which protects devices and equipment connected to a 3-phase network.



**HRH-5**  
(2 functions)  
**Asymmetric Flasher with External Potentiometers**



- Control by external control unit - potentiometer (can be placed/ mounted for example on switch board doors or in panel).



**MR-41**  
**MR-42**  
**Memory Relays**



- 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.



**TER-7**  
(10 functions)  
**Temperature Monitoring Thermostat**



- It monitors motor coil temperature.
- Fixed levels of switching.



**TER-9**  
(10 functions)  
**Digital Thermostat**



- Digital thermostat with 6 functions and built-in time switch clock with day, week and year program. You can also limit temperature functions and courses this way in real time.



**SJR-2**  
(10 functions)  
**ON DELAY Time Relay**



- For gradual switching of high power, prevents current strokes in the main.

**HRN-31**

(replaces HRN-33, -63)

**1P AC/DC Multifunction Voltage Monitoring Relay**

Described Function  
Overvoltage Monitoring

**Manufacturing****CNC Machining Center**

- Prevents CNC machine control unit damage by monitoring for states above the voltage limit.
- Maintains operational precision, reduces downtime, and repair costs by ensuring voltage is within safe limits for the equipment.

**HRN-32/2**

(replaces HRN-35)

**1P AC/DC Multifunction Voltage Monitoring Relay**

Described Function  
Dual Overvoltage Monitoring

**Data Centers****Dual Power Supply Units for Servers**

- Prevents CNC machine control unit damage by monitoring for states above the voltage limit.
- Maintains operational precision, reduces downtime, and repair costs by ensuring voltage is within safe limits for the equipment.

**HRN-36**

(replaces HRN-34, -64)

**1P DC Multifunction Voltage Monitoring Relay**

Described Function  
Overvoltage + Latch

**Public Transportation****Ticket Vending Machines**

- Prevents vending machine failure by monitoring for states above the voltage limit.
- Maintains service reliability, reduces downtime, and repair costs by ensuring voltage is within operational safety limits.

**HRN-39**

(replaces HRN-37, -67)

**1P AC/DC Multifunction Voltage Monitoring Relay**

Described Function  
Undervoltage Monitoring

**Healthcare****Medical Laboratory Refrigerators**

- Prevents damage to sensitive samples by monitoring for states below the voltage limit.
- Ensures critical temperature control is maintained, reduces risk of sample spoilage, and supports compliance with healthcare standards.

**HRN3-81****3P AC Undervoltage and Phase Monitoring Relay**

Described Function  
Phase Failure Monitoring

**Utilities****Electrical Substation Transformer**

- Detects phase failure in transformers to prevent damage and maintain power distribution efficiency.
- Ensures consistent electrical supply, reducing the risk of power outages and associated costs by maintaining grid reliability.



**SHT-13 / SHT-13/2**  
**Multifunction Digital Time Switch With Wi-Fi Connection**

Described Function  
 Smart Control and Monitoring

**Conference Rooms**  
**Automated Light Adjustment**

- Adjusts lighting based on schedule meetings and ambient light, ensuring optimal lighting conditions.
- Wi-Fi connectivity allows for remote adjustments and monitoring, providing flexibility and ease of use.



**PRI-34**  
**1P AC Multifunction Current Monitoring Relay**

Described Function  
 Window

**Renewable Energy**  
**Solar Panel Inverters**

- Prevents inverter damage by monitoring for current outside operational ranges.
- Maintains system efficiency, reduces downtime, and repair costs by ensuring current is within safe limits for the equipment.



**HRN3-70**  
**3P AC Overvoltage and Phase Monitoring Relay**

Described Function  
 Overcurrent with Hysteresis

**Construction**  
**Electric Floor Heating**

- Prevents floor heating system overload by monitoring for current beyond safe limits.
- Enhances safety and efficiency, using hysteresis to minimize unnecessary switching, maintaining a consistent and optimal heating environment.



**PMR1-31**  
**1P AC/DC Multifunction Voltage Monitoring Relay**

Described Function  
 Window + Latch

**Industrial Automation**  
**Automated Assembly Line Equipment**

- Monitors voltage levels to ensure automated equipment operates within safe electrical conditions.
- The latch function locks the system in a safe state, requiring a manual restart, preventing damage due to persistent unstable conditions.



**PMR1-36/2**  
**1P DC Multifunction Voltage Monitoring Relay**

Described Function  
 Dual Window Monitoring

**Water Treatment**  
**Pump Control Systems in Water Distribution**

- Ensures pumps operate within precise voltage windows, critical for water flow consistency.
- Dual circuits allow monitoring of two systems, improving reliability and efficiency in water distribution.

**CRM-161**

(10 functions)

**Multifunction  
Time Relay**Described Function  
On Delay**Automotive Industry****Assembly line**

- Coordination of timing between individual production line stations:
- When one station completes its part of the work (e.g., engine assembly), the timing relay triggers the next station (e.g., body assembly) after a set delay.

**CRM-183J ZR****Singlefunction  
Time Relay**

On Delay

**Water Treatment and Waste Management****Pumps in a water treatment plant**

- Delayed activation of individual pumps:
- When starting multiple pumps (e.g., during the transfer of waste to the biological treatment tanks), the relay ensures that the pumps are activated one after another, with a defined delay.

**CRM-2H****Singlefunction  
Time Relay**

Asymmetric Cycler

**HVAC Industry****Building ventilation system**

- Warehouse cyclic ventilation:
- In rooms that need to be regularly ventilated (e.g., a storage room), the relay can be programmed to regularly turn the ventilation system on and off, allowing for effective and precise control of ventilation cycles.

**CRM-82TO**

(2 functions)

**Multifunction  
Time Relay**Described Function  
Off Delay Without  
Supply Voltage**Security Industry****Emergency lighting**

- Delayed shutdown of emergency lighting after the main power source is restored:
- It allows the emergency lighting to be powered by a backup source for up to 10 minutes after the main power source is restored, avoiding a complete blackout in case of a repeated power outage.

**CRM-91H**

(10 functions)

**Multifunction  
Time Relay**Described Function  
Impulse Generator**Textile Industry****Fabric feeding machine**

- Feeding machine timing:
- The relay generates pulses at a specific interval to ensure precise timing and control of the fabric feeding machine. It guarantees its efficient and reliable operation with precisely set parameters.





**CRM-93H**

(10 functions)

**Multifunction Time Relay**

Described Function  
Memory (Impulse) Relay

**Elevator Manufacturing**

Passenger elevator

- Floor buttons and consequent elevator movement:
- After pressing a floor button, the relay activates the corresponding circuit and keeps it active even after the impulse ended, keeping the elevator in motion, until a second pulse is received, this time to stop the elevator.



**HRN-56**

**Voltage Monitoring Relay**

**Food Industry**

Motor in an industrial mixer

- Stopping the motor in case of a phase failure:
- In case of a phase failure, the relay stops the mixer motor to prevent any damage that may occur due to its improper rotation.



**PRI-51**

**Current Monitoring Relay**

**Electronics Manufacturing**

Assembly line

- Overcurrent monitoring in component motors:
- In case of overcurrent in the motor of an assembly line component, the relay will turn off this motor to prevent it from overloading or jamming.



**VS116U**

**Power Relay**

**Mining industry**

Mining excavator

- Control of mining excavator components:
- The components of an excavator are controlled by massive motors, operating at currents too high to be controlled directly. The relay splits the circuit into a control part and a power part. The control part operates at a low current, which can be handled by the control panel inside the driver's cabin.



**VS308U**

**Power Relay**

**Construction**

Construction crane

- Control of mining excavator components:
- The components of an excavator are controlled by massive motors, operating at currents too high to be controlled directly. The relay splits the circuit into a control part and a power part. The control part operates at a low current, which can be handled by the control panel inside the driver's cabin.

### Agriculture, Forestry, Farming - Dryers, Grain Processing Machines

#### Time Relays

- Starting equipment in sequence (inrush current prevention)

#### Auxiliary Relays

- Electrically separating circuits

#### Monitoring / Protection Relays

- Detecting and preventing overload



### Buildings, Complexes, Stadiums, Amusement Parks - Gate & Garage Door Panels

#### Time Relays

- Delayed start / extended operation

#### Auxiliary Relays

- Switching single phase load

#### Monitoring / Protection Relays

- Indicating current flow



### Car Washing Stations - Compressors

#### Time Relays

- Cyclic control

#### Auxiliary Relays

- Utilizing a range of AC/DC supply voltages

#### Monitoring / Protection Relays

- Safe stop / off in case power loss



### Cement / Concrete Plants - Grinder / Crusher Motor Auxiliary Heaters / Cooling Fans

#### Time Relays

- Starting and stopping loads at a specific time of day

#### Auxiliary Relays

- Electrically separating circuits

#### Monitoring / Protection Relays

- Indicating overcurrent / overvoltage



### EV Charging (Station Manufacturing & Servicing) - Fast Charging Station Auxiliary Circuits

#### Time Relays

- Timing signal lamps, horns

#### Auxiliary Relays

- Switching single phase load

#### Monitoring / Protection Relays

- Preventing damage in case of overcurrent / overvoltage



### Food & Beverage (Production & Processing) - Conveyor Systems, Automated Lines, Injectors, Fillers

#### Time Relays

- Cyclic light & heat control

#### Auxiliary Relays

- Utilizing a range of AC/DC supply voltages

#### Monitoring / Protection Relays

- Controlling switching between power sources



### Heavy Industry, Metals - High Power Motor Auxiliary Heaters / Cooling Fans

#### Time Relays

- Starting equipment in sequence (inrush current prevention)

#### Auxiliary Relays

- Electrically separating circuits

#### Monitoring / Protection Relays

- Detecting and preventing overload



### Lighting - High Power Street Lamps

#### Time Relays

- Delayed start / extended operation

#### Auxiliary Relays

- Switching single phase load

#### Monitoring / Protection Relays

- Indicating current flow



### Mining Sites - Kiln Auxiliary Drives & Heaters

#### Time Relays

- Cyclic control

#### Auxiliary Relays

- Electrically separating circuits

#### Monitoring / Protection Relays

- Safe stop / off in case power loss



### Oil & gas - Pump Motor Auxiliary Heaters

#### Time Relays

- Starting and stopping loads at a specific time of day

#### Auxiliary Relays

- Switching single phase load

#### Monitoring / Protection Relays

- Indicating overcurrent / overvoltage



### Plastic Produce – Single Phase DOL Starters

#### Time Relays

- Cyclic control

#### Auxiliary Relays

- Utilizing a range of AC/DC supply voltages

#### Monitoring / Protection Relays

- Preventing damage in case of overcurrent / overvoltage



### Pulp & paper – DC Drive Field Circuits

#### Time Relays

- Delayed start / extended operation

#### Auxiliary Relays

- Electrically separating circuits

#### Monitoring / Protection Relays

- Controlling switching between power sources



### Pump stations & Water Treatment Plants – Single Phase Motors & Actuators

#### Time Relays

- Starting and stopping loads at a specific time of day

#### Auxiliary Relays

- Switching single phase load

#### Monitoring / Protection Relays

- Preventing damage in case of overcurrent / overvoltage



### Renewable Energy (Solar, Wind) – Battery Storage Units

#### Time Relays

- Timing signal lamps, horns

#### Auxiliary Relays

- Utilizing a range of AC/DC supply voltages

#### Monitoring / Protection Relays

- Indicating current flow



### Warehouse & Other Logistics Operations – Automated Shelving Systems

#### Time Relays

- Cyclic light & heat control

#### Auxiliary Relays

- Electrically separating circuits

#### Monitoring / Protection Relays

- Safe stop / off in case power loss



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,  $\cos\phi = P/S$  (-)

AC-1	Non-inductive or slightly inductive load, resistance furnace Includes all appliances supplied by AC current with power factor ( $\cos \phi$ ) $\geq 0.95$ 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 than 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

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 catalog, 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:



















- AgCd – suitable for switching ohmic loads. Before of harmfulness of Cd, this type of contact is remitted.
- 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.
- AgSn or AgSnO<sub>2</sub> – 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.
- Wf (wolfram)-special contact designated for switching surge currents with inductive component.
- with gold (AgNi/Au)- Used for "improving" contacts for low currents/ voltages , prevents oxidation.

## Product loadability



















CRM-2H; CRM-2T; CRM-181J; CRM-91H; CRM-111H; CRM-183J / CRM-93H / CRM-113H (1. kontakt); CRM-121H; CRM-131H; HRN-31; HRN-31/2; HRN-32/2; HRN-36; HRN-39; HRN3-70; HRN3-80; HRN3-81; PMR1-31; PMR1-31/2; PMR1-36; PMR1-36/2; PMR1-39; PMR1-39/2; PMR3-70; PRI-34; PTRM-216K; PTRM-216T; PTRM-216KP; PTRM-216TP; PTRM-216K; PTRM-216T;

type of load	 cos φ ≥ 0.95								
Material of contact AgNi, 16A	AC1 250V/16A	AC2 250V/5A	AC3 250V/3A	AC5a uncompensated 230V/3A (690VA)	AC5a compensated x	AC5b 800W	AC6a x	AC7b 250V/3A	AC12 250V/10A
type of load									
Material of contact AgNi, 16A	AC13 250V/6A	AC14 250V/6A	AC15 250V/6A	DC1 24V/16A	DC3 24V/6A	DC5 24V/4A	DC12 24V/16A	DC13 24V/2A	DC14 24V/2A

## VS116U

type of load	 cos φ ≥ 0.95								
Material of contact AgSnO <sub>2</sub> , 16A	AC1 250V/16A	AC2 250V/5A	AC3 250V/3A	AC5a uncompensated 230V/3A (690VA)	AC5a compensated 230V/3A (690VA) till max output C=14UF	AC5b 1 000W	AC6a x	AC7b 250V/3A	AC12 x
type of load									
Material of contact AgSnO <sub>2</sub> , 16A	AC13 x	AC14 250V/6A	AC15 250V/6A	DC1 24V/16A	DC3 24V/3A	DC5 24V/2A	DC12 24V/16A	DC13 24V/2A	DC14 x

## CRM-82TO; CRM-183J / CRM-93H / CRM-113H (2. + 3. kontakt); VS308U; CRM-161; HRN-56; PRI-32; PRI-51;

type of load	 cos φ ≥ 0.95								
Material of contact AgNi, 8A	AC1 250V/8A	AC2 250V/3A	AC3 250V/2A	AC5a uncompensated 230V/1.5A (345VA)	AC5a compensated x	AC5b 300W	AC6a x	AC7b 250V/1A	AC12 250V/1A
type of load									
Material of contact AgNi, 8A	AC13 x	AC14 250V/3A	AC15 250V/3A	DC1 24V/8A	DC3 24V/3A	DC5 24V/2A	DC12 24V/8A	DC13 24V/2A	DC14 x

## VS120; VS220

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	NO9A NC6A	8,8A	8,8A	4A	6A	20A, 15A	10A, 5A	10A, 4A	6A	2,4A per contact	switching capacity 30 uF

## VS425

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

Packing of 1-MODULE relay - 1 pc



Packing of 1-MODULE relay - 10 pcs



Packing of 1-MODULE relay with accessories



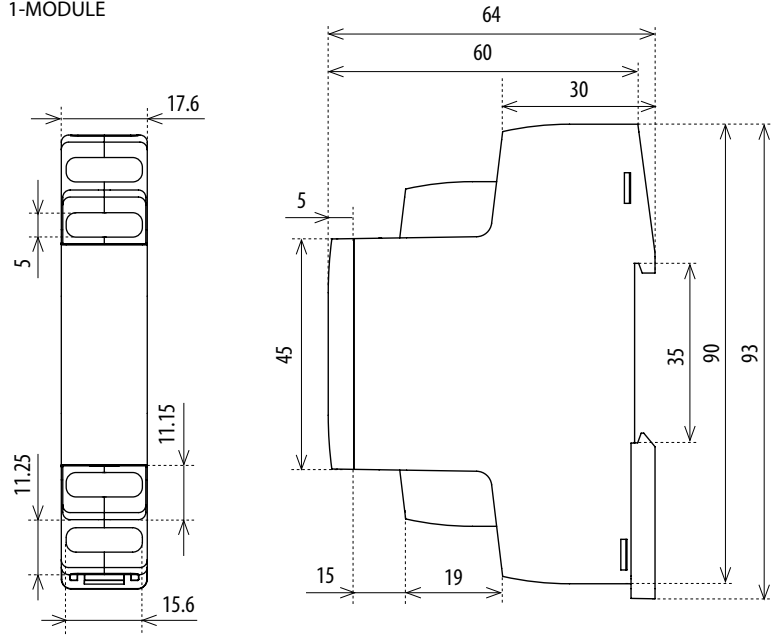
Packing of 2-MODULE relay - 1 pc



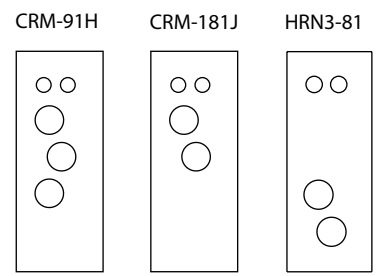
Packing of 3-MODULE relay - 1 pc



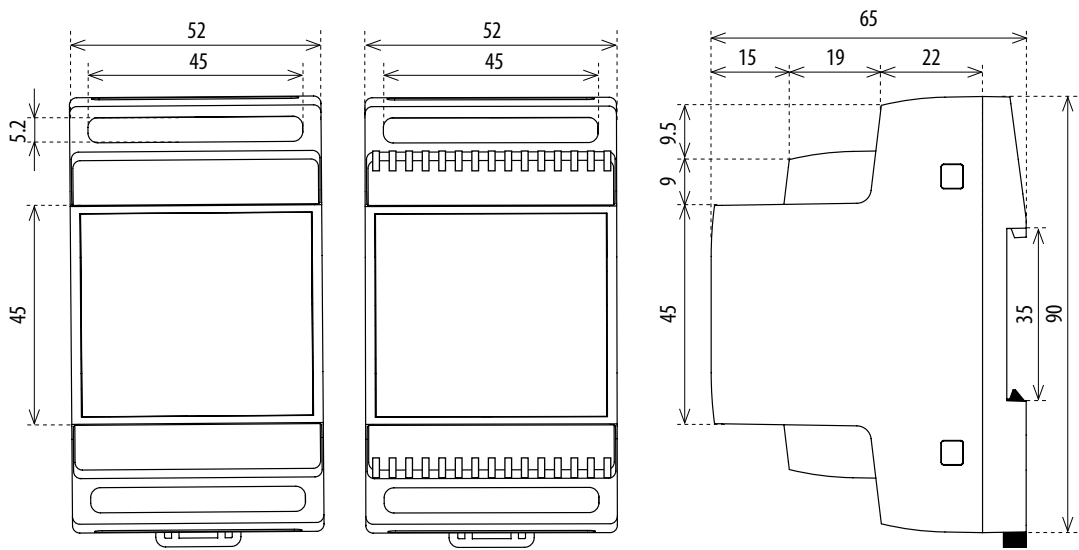
1-MODULE



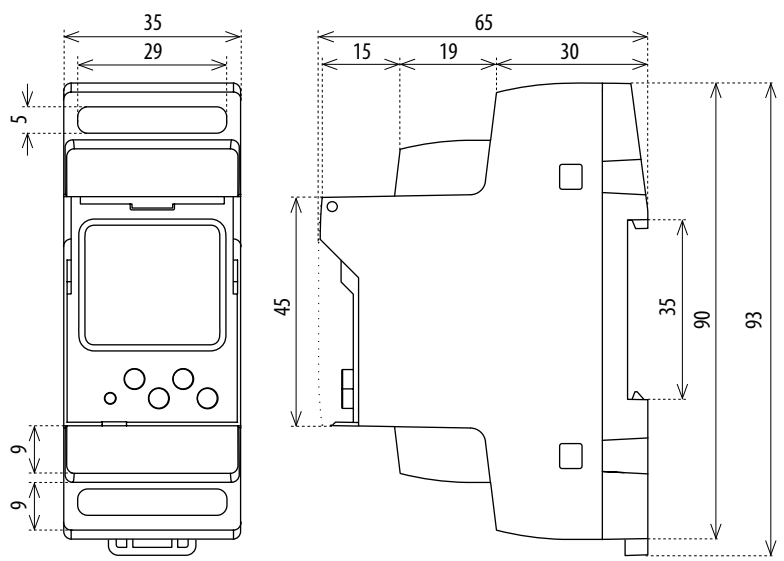
Front panels for 1-MODULE, examples of use:



3-MODULE

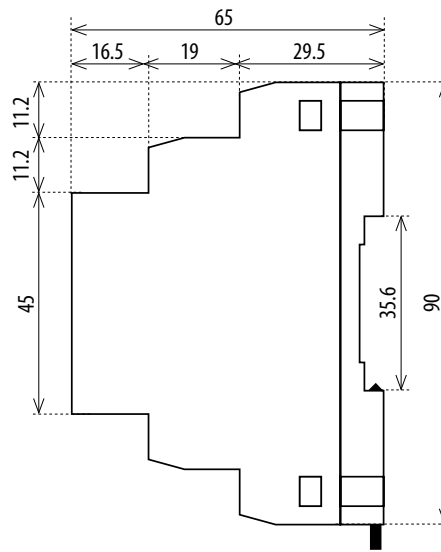
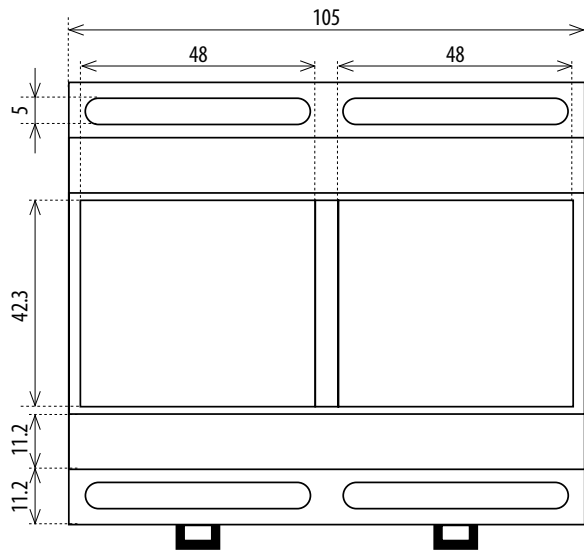


2-MODULE

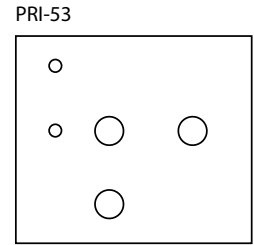




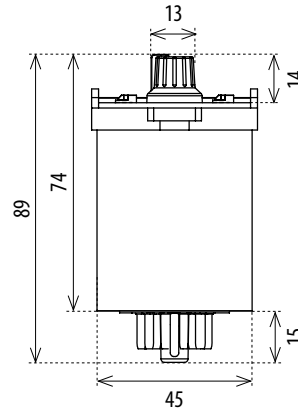
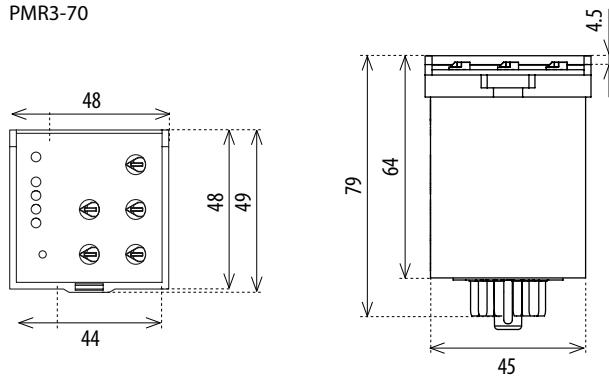
## 6-MODULE



Front panels for 6-MODULE, examples of use:

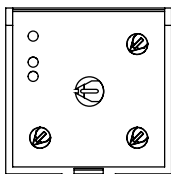


## PMR3-70

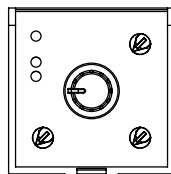


front panels PLUG-IN, examples of use:

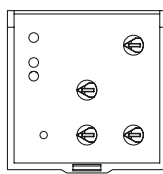
### PTRx-216T



### PTRx-216K



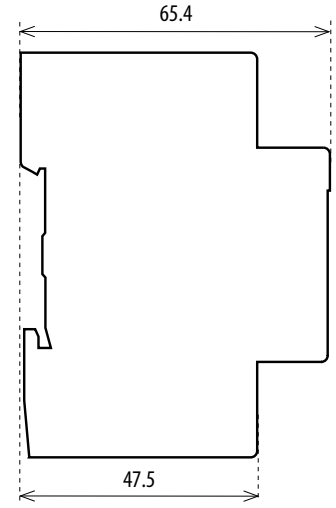
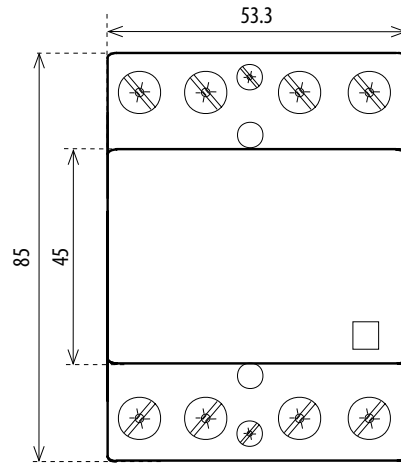
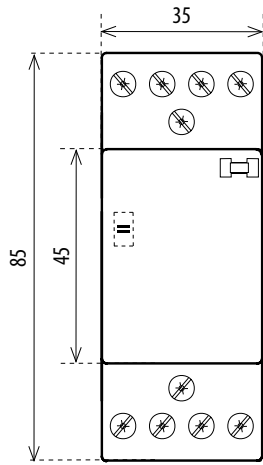
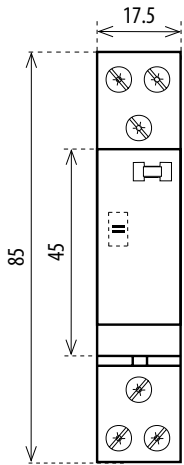
### PMR1-3x



VS120  
VS220

VS425

VS440  
VS463

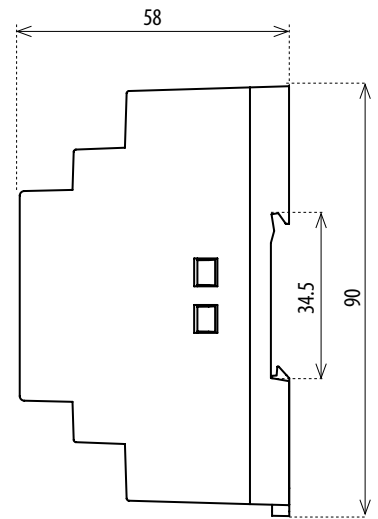
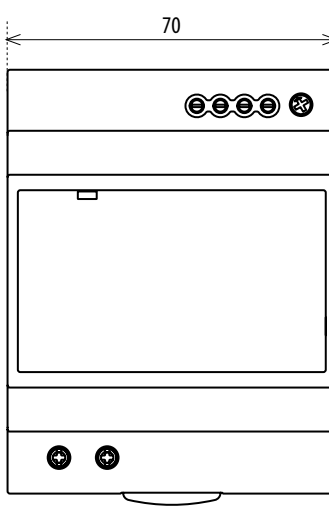
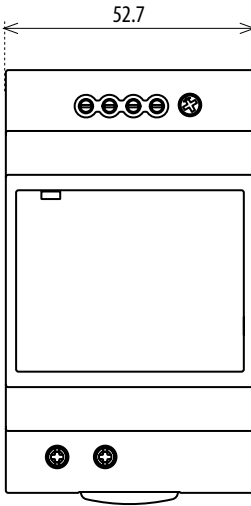
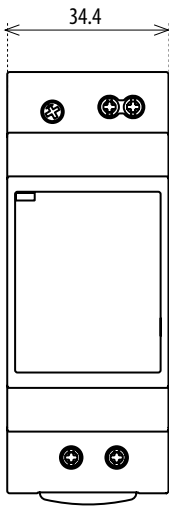
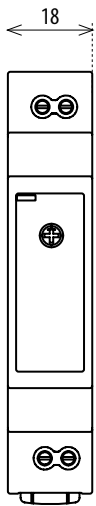


PS1M-15/12V  
PS1M-15/24V

PS2M-24/12V  
PS2M-30/24V

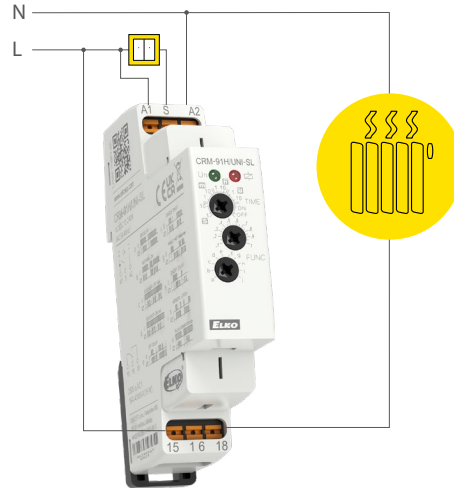
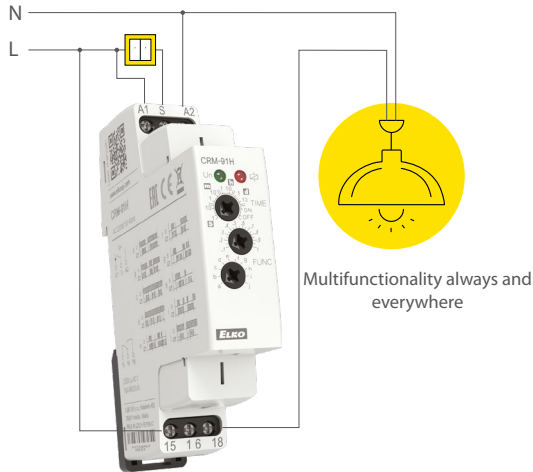
PS3M-54/12V  
PS3M-60/24V

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



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

- for electric appliances, where is necessary to change the exact timing - controlling of the illumination, heating, motors, machines, ventilators, contactors



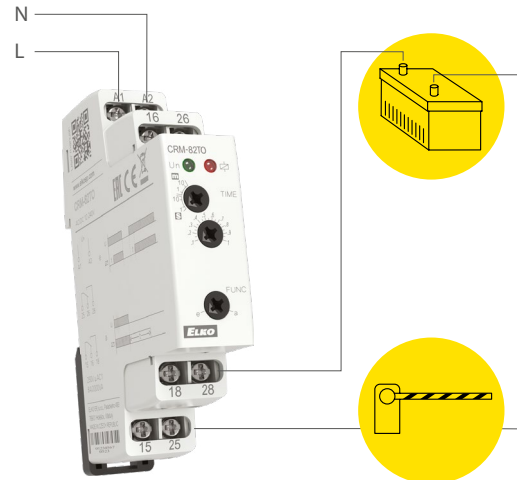
## Time relay PLUG-IN type PTRM-216TP

- serves to control light signalization, heating, motor and fan control etc.



## Delay OFF without supply voltage CRM-82TO

- delayed back-up switch off at current failure (emergency illumination, emergency respirator)



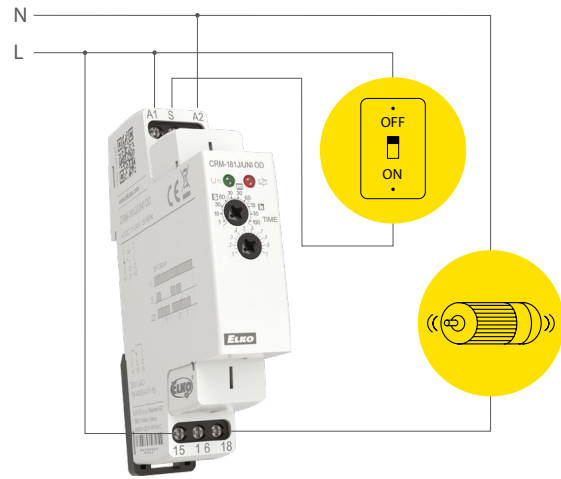
## Asymmetric flasher CRM-2H

- regular rooms ventilation, cyclic humidity exhaustion, illumination controlling, circulation pump, flash, warning appliances, regular pump down, regular irrigation via electromagnetic valve



## Singlefunction time relay CRM-181J

- time switch, using for run down the pump after switch off the heating, switching of ventilators

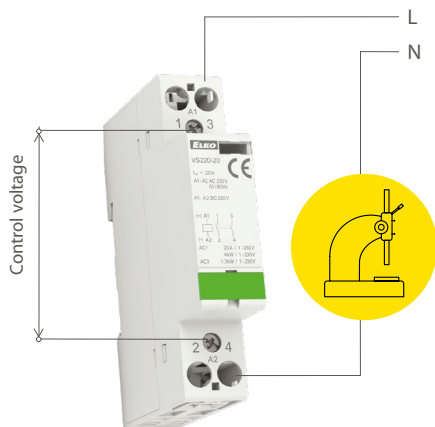


Examples of usage

**Modular contactor VS120, VS220, VS425**

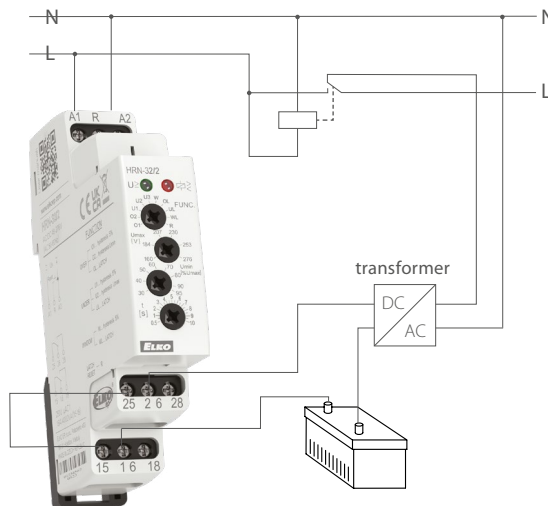
- to switch circuits for supply and control heating, lights, air-conditioning and other el. devices.

Switches loads AC-1, AC-3, AC-7a, AC-7b, AC-15.



**Voltage monitoring relay HRN-32/2**

- start of back-up supply in case of failure

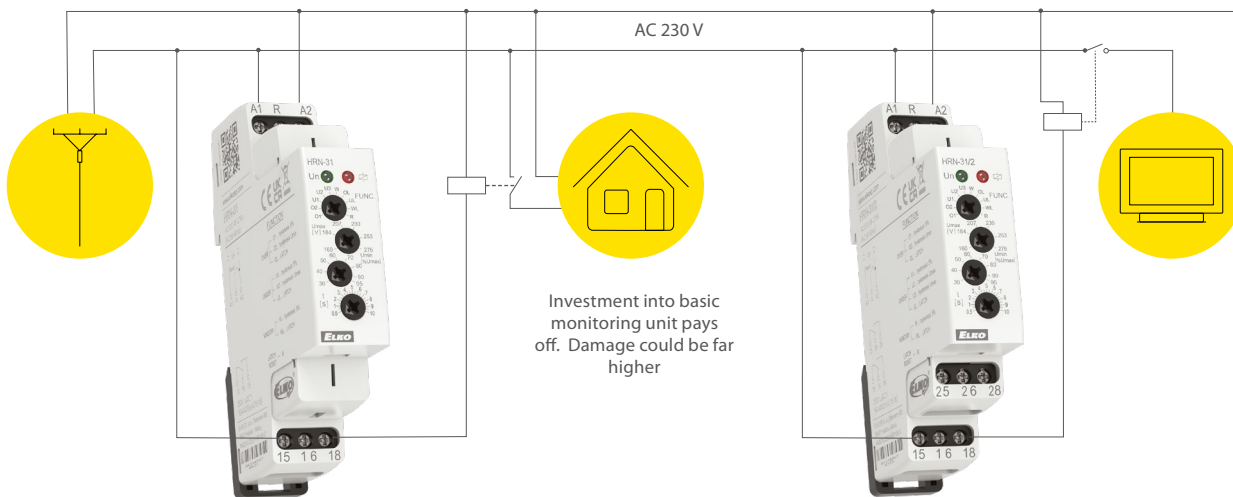


**Monitoring voltage relay HRN-31 (HRN-31/2)**

- monitoring of mains voltage for appliances inclinable to supply tolerance

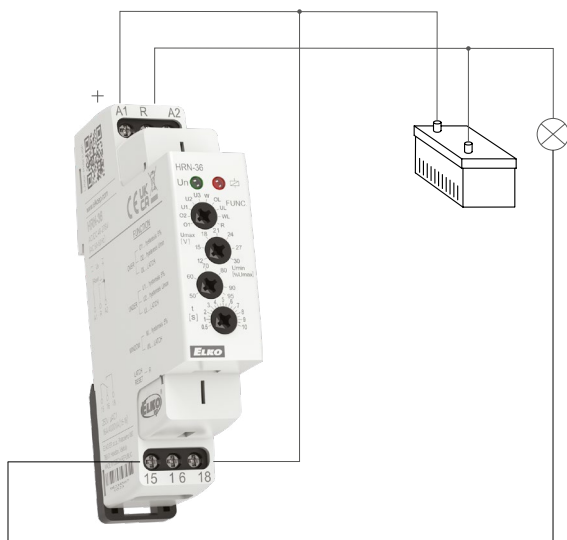
**Monitoring voltage relay HRN-31 (HRN-31/2)**

- protection of appliances against under-/overvoltage



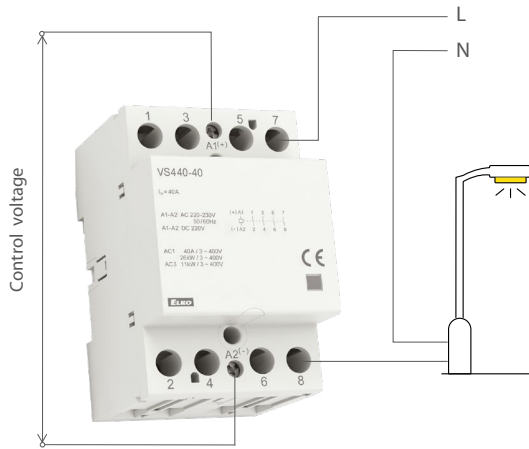
**Monitoring voltage relay HRN-36**

- load disconnected when voltage declines or battery is discharged



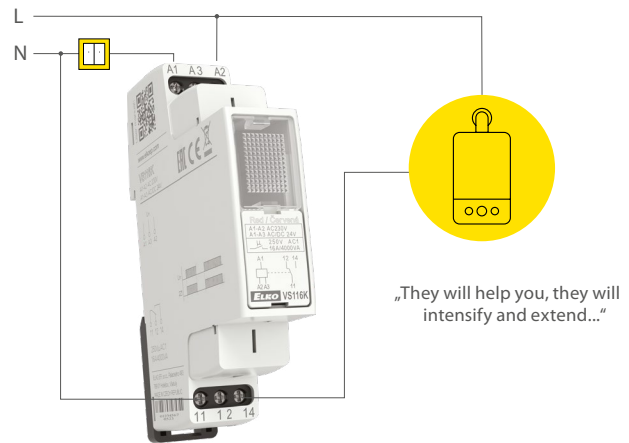
### Modular contactors VS440, VS463

- to switch supply and control circuits for heating, air-conditioning and other el. devices, switching 3-phase motors
- Switches loads A-1, AC-3, AC-3, AC-7a, AC-7b, and AC-15



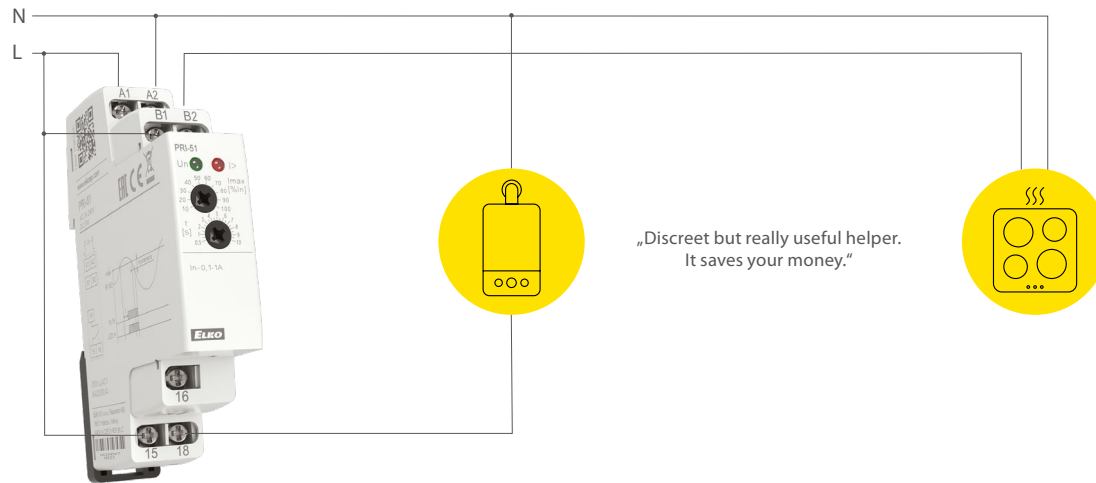
### Power relays VS

- switching of higher load than is capacity of switched unit = repeater
- assistant light controlling, signalling, boilers, ...



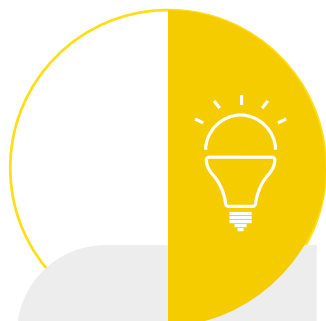
### Monitoring current relay PRI-51, PRI-32

- 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



# More Than Just Resellers

We innovate, develop and manufacture out products in-house



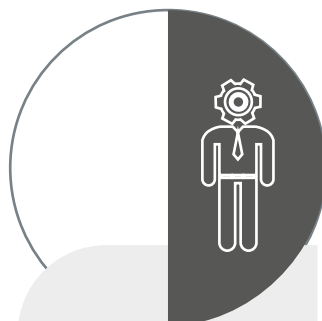
**30 Years**

On the Market



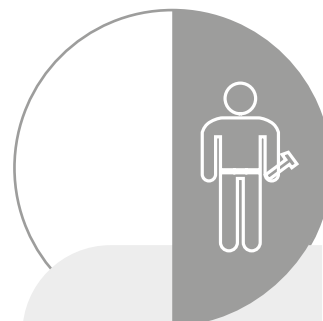
**16 Years**

ISO Certification



**40**

Developers



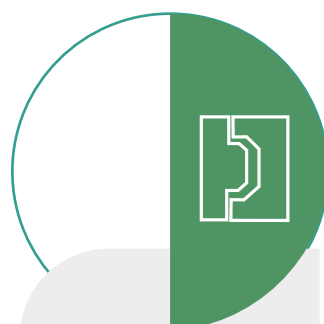
**400**

Employees



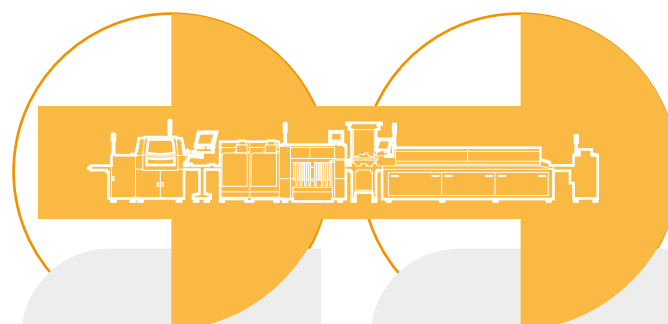
**21 500 sq ft**

Manufacturing  
Space



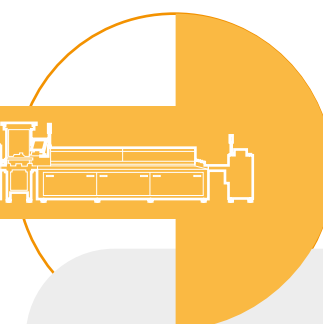
**200**

Proprietary Plastic  
Mods



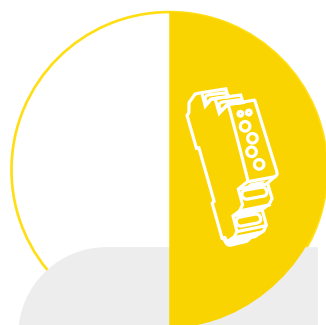
**3**

SMD Lines



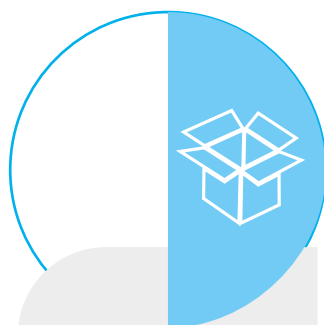
**1 Mil.**

Components  
per Day



**600 000**

Products  
per Year



**21 500 sq ft**

Finalization  
and Dispatch



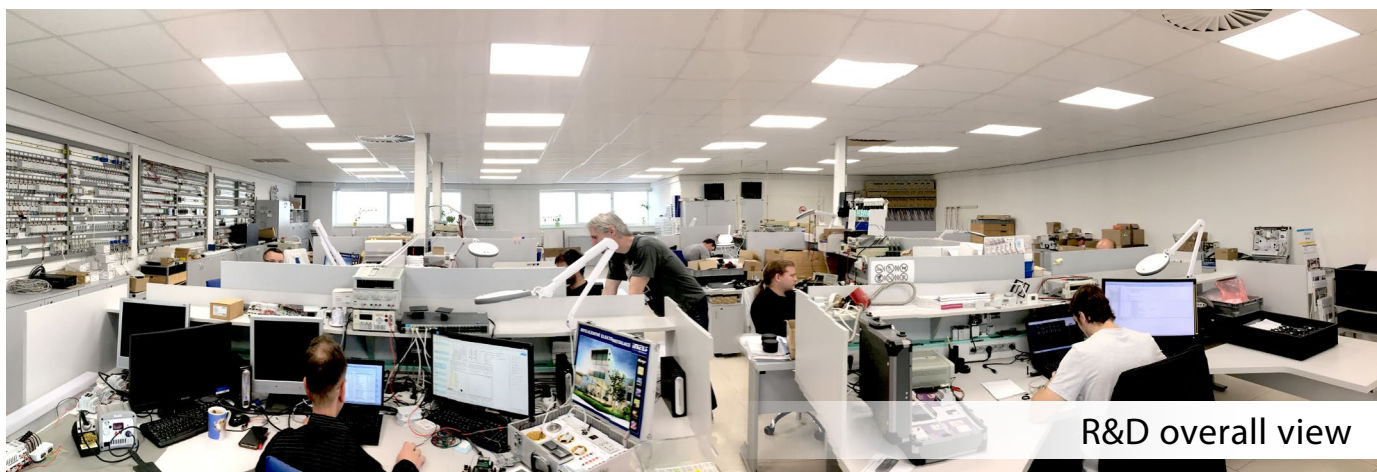
**2 000**

Warehousing  
Spaces



**3**

Printing Lasers



R&amp;D overall view



Manufacturing hall



Testing lab



Finalization and dispatch



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Managing member, CEO

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[www.elkoepna.com](http://www.elkoepna.com)

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