











Electronic Timers & Monitoring Relays



-  Delay ON/OFF Time Relay
-  Multifunction Time Relay
-  Asymmetric cycler Time Relay
-  Digital Time Switch
-  Voltage Monitoring Relays
-  Current Monitoring Relays
-  Modular Contactors
-  Level Control Relays
-  Power Supplies
-  Thermistor Relay





IPD Industrial Products is an Australian owned distributor of a wide variety of low voltage electrical and automation products for the Australian Industry.

IPD Industrial Products traces its beginnings to the General Electric Company Ltd of England, founded in 1889. Over the years, the company integrated the major electrical businesses of GEC, English Electric, Marconi, Henley and A.E.I to comprise one of the most extensive and diverse electrical engineering and manufacturing organisation in the world.

In 1956, English Electric opened its operation at Regents Park in Sydney, and has provided employment and training to thousands of people in the Australian electrical industry. Today it remains as a much changed and diverse organisation, IPD Industrial Products, a 100% Australian owned, managed and operated company.

IPD Industrial Products delivers strong brand names and leading-edge developments, providing world class manufacturers a powerful presence in Australia. IPD Industrial Products is committed to offering the customer a technically compliant solutions based offering.

IPD Industrial Products designs and manufactures a large range of products specifically suited to the local environment. An in-house engineering team is employed to develop and test equipment, ensuring conformity to Australian Standards and the highest customer satisfaction.



»»»» IPD Distributes the following brands:



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PDR-2
Programmable Digital Timer



CRM-82TO
Delay ON/OFF Timer



HRN-43N
3-phase Voltage Relay



PRI-32
1-phase current Relay



TER-7
Thermistor Relay



Modular Contactors

IPD Industrial Products, Exclusive Distributor of the Elko Monitoring & Control Relays is pleased to introduce the Electronic Time relays, Voltage Monitoring and Current Monitoring relay range.

IPD Industrial Products has successfully obtained the Australian standards EMC "C TICK"  approvals, mandated by the Australian Communication Authority (ACA).

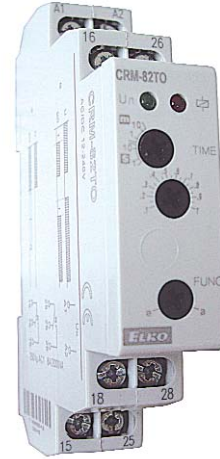
DELAY ON/OFF TIME RELAY CRM-82TO

- true off delay timer (without supply voltage)



Features:

- »»» Universal supply voltage AC/DC 12 - 240V
- »»» 2 time functions adjustable:
 - E - delay ON
 - A - delay OFF after the supply is switched off - after supply failure relay times for time t and switches off
- »»» Time range: 0.1s - 10min
- »»» Output contact: 2x changeover 8A
- »»» Output status indicated by LED
- »»» Clamp terminal
- »»» 1-MODULE, DIN rail mounting



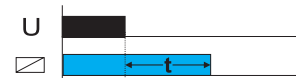
Technical parameters	CRM-82TO
Number of functions:	2
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 12-240V (AC50-60Hz)
Consumption:	AC 0.7 - 3VA/DC 0.5 - 1.7W
Supply voltage tolerance:	-15%; +10%
Supply indication:	green LED
Time ranges:	0.1s - 10min
Time setting:	Rotary switch
Time deviation:	5%-mechanical setting
Repeat accuracy:	0.2%-set value stability
Temperature coefficient:	0.1%/°C, at= 20°C
Output	
Changeover contacts:	2, (AgNi)
Rated current:	8A/AC1
Switching capacity:	2000 VA/AC1, 192 W/DC
Inrush current:	10A/<3s
Switching voltage:	250V AC1/24V DC
Minimum breaking capacity DC:	500mW
Output indication:	red LED
Mechanical life:	3 x 10 ⁷
Electrical life (AC1)	0.7 x 10 ⁵
Other information	
Operating temperature:	-20.. +55°C
Storage temperature:	-30.. +70°C
Electrical strength:	4kV (supply - output)
Operating position:	any
Mounting/DIN rail:	DIN rail EN 60715
Protection degree:	IP40
Overvoltage category:	III
Pollution degree:	2
Maximum cable size:	max. 2.5mm ² /with sleeve 1.5mm ²
Dimensions:	90 x 17.6 x 64mm
Weight:	93g
Standards:	EN 61812-1, EN 61010-1

Functions

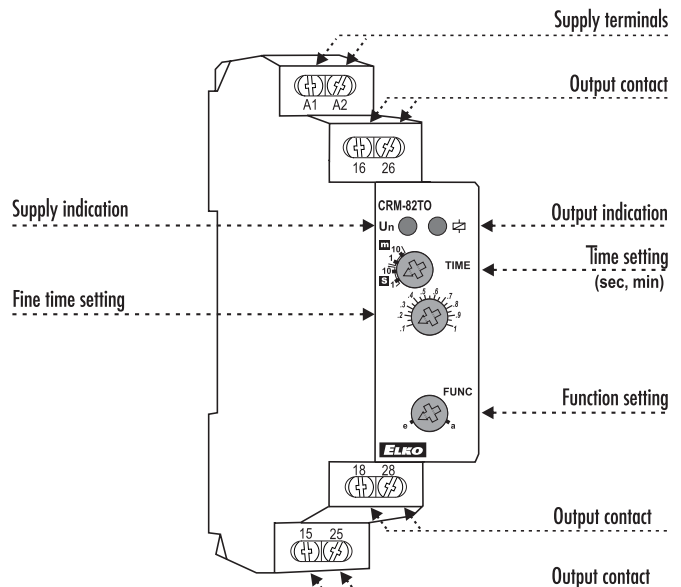
e - Delay ON



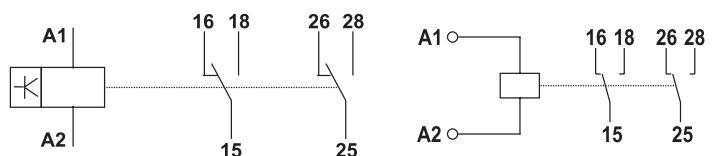
a - Delay OFF the power supply is switched off (min. time is 0.5 s)



Description



Connection



MULTIFUNCTION TIME RELAY CRM-91HE

- 10 functions

(functions the same as CRM-93H page 4)

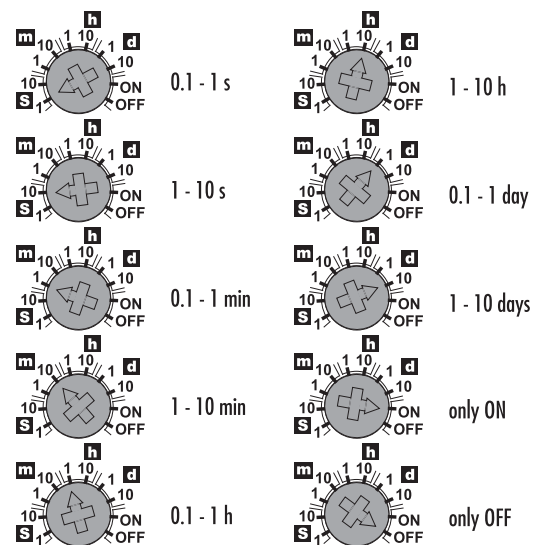


Technical parameters	CRM-91HE
Number of functions:	10
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 12-240V (AC50-60Hz)
Consumption:	AC 0.7 - 3VA/DC 0.5 - 1.7W
Supply voltage tolerance:	-15%; +10%
Supply indication:	green LED
Time ranges:	0.1s - 10days
Time setting:	rotary switch, external potentiometer
Time deviation:	5%-mechanical setting
Repeat accuracy:	0.2%-set value stability
Temperature coefficient:	0.01 % / °C, at= 20°C
Output	
Changeover contacts:	1, (AgNi)
Rated current:	16A / AC1
Switching capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	30A / <3s
Switching voltage:	250V AC1 / 24V DC
Minimum breaking capacity DC:	500 mW
Output indication:	multifunction red LED
Mechanical life:	3 x 10 ⁷
Electrical life (AC1)	0.7 x 10 ⁵
Controlling	
Consumption of input:	AC 0.025-0.2VA / DC 0.1-0.7W
Load between S-A2:	YES
Control terminals:	A1-S
Impulse length:	min.25 ms / max.unlimited
Reset Time:	max.150ms
Other information	
Operating temperature:	-20.. +55°C
Storage temperature:	-30.. +70°C
Electrical strength:	4kV (supply - output)
Operating position:	any
Mounting/DIN rail:	DIN rail EN 60715
Protection degree:	IP40
Overvoltage category:	III
Pollution degree:	2
Maximum cable size:	max. 2.5mm ² /with sleeve 1.5mm ²
Dimensions of potentiometer:	see page 29
Weight of potentiometer:	15g
Dimensions:	90 x 17.6 x 64mm
Weight:	68g
Standards:	EN 61812-1, EN 61010-1

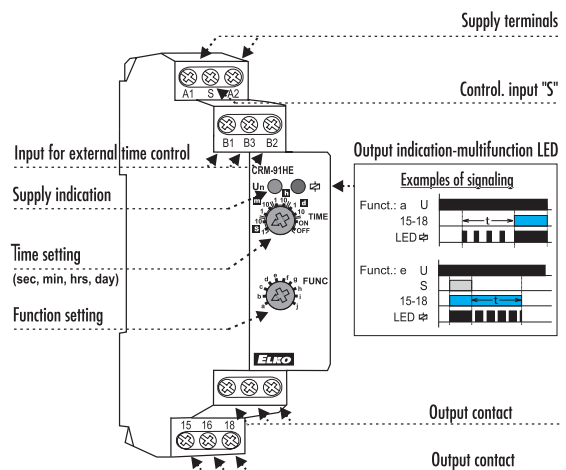
Features:

- »»» Universal supply voltage AC/DC 12-240V
- »»» 10 functions:
 - 5 time functions controlled by supply voltage
 - 4 time functions controlled by control input
 - 1 function of memory (latching) relay
- »»» Time scale 0.1s - 10 days divided into 10 ranges
- »»» Remote control by external control unit - potentiometer
- »»» Output contact: 1x changeover 16A
- »»» Output indication: multifunction red LED
- »»» 1-MODULE, DIN rail mounting

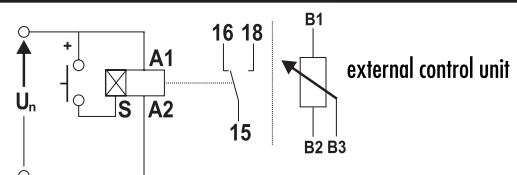
Time ranges



Description



Connection



MULTIFUNCTION TIME RELAY CRM-93H

- 10 functions



Features:

- »»» Universal supply voltage AC/DC 12-240V
- »»» 10 functions:
 - 5 time functions controlled by supply voltage
 - 4 time functions controlled by control input
 - 1 function of memory (latching) relay
- »»» Time scale 0.1s - 10 days divided into 10 ranges
- »»» Output contact: 3x changeover 8A
- »»» Output indication: multifunction red LED
- »»» 1-MODULE, DIN rail mounting



Technical parameters	CRM-93H
Number of functions:	10
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 12-240V (AC50-60Hz)
Consumption:	AC max. 12VA / 1.9W
Supply voltage tolerance:	-15%; +10%
Supply indication:	green LED
Time ranges:	0.1s - 10days
Time setting:	rotary switch
Time deviation:	5% - mechanical setting
Repeat accuracy:	0.2% - set value stability
Temperature coefficient:	0.01% / °C, at= 20°C
Output	
Changeover contacts:	3, (AgNi)
Rated current:	8 A/AC1
Switching capacity:	2000 VA/AC1, 192 W/DC
Inrush current:	10 A/<3s
Switching voltage:	250V AC1/24V DC
Minimum breaking capacity DC:	500 mW
Output indication:	multifunction red LED
Mechanical life:	3 x 10 ⁷
Electrical life (AC1)	0.7 x 10 ⁵
Controlling	
Power on control input:	AC 0.025-0.2VA (AC12-240V)
Load between S-A2:	YES
Control terminals:	A1-S
Impulse length:	min.2ms / max. unlimited
Reset Time:	max.150ms
Other information	
Operating temperature:	-20.. +55°C
Storage temperature:	-30.. +70°C
Electrical strength:	4kV (supply - output)
Operating position:	any
Mounting/DIN rail:	DIN rail EN 60715
Protection degree:	IP40
Overvoltage category:	III
Pollution degree:	2
Maximum cable size:	max. 2.5mm ² / with sleeve 1.5mm ²
Dimensions:	90 x 17.6 x 64mm
Weight:	89g
Standards:	EN 61812-1, EN 61010-1

Functions

Delay ON
after energisation



Delay OFF
after energisation



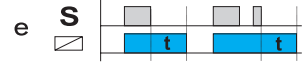
Cycler beginning with pause
after energisation



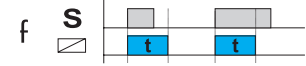
Cycler beginning with impulse
after energisation



Delay OFF
after de-energisation, instant make of output



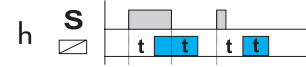
Delay OFF responding to make
of control. contact regardless its length



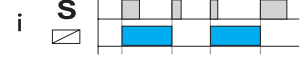
Delay OFF
after break of control. contact with instant output



Delay OFF
after make and break of control. contact



Memory (latching) relay

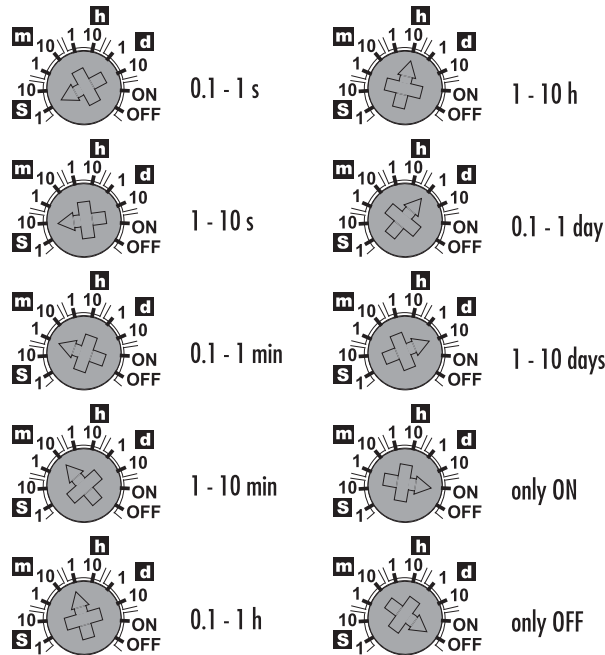


Pulse generator (PULSE=0.5s)

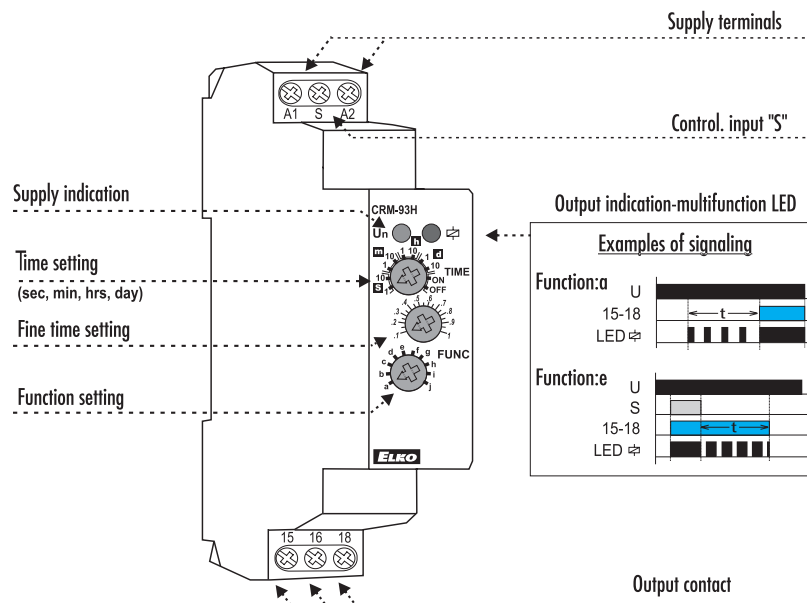


MULTIFUNCTION TIME RELAY CRM-93H

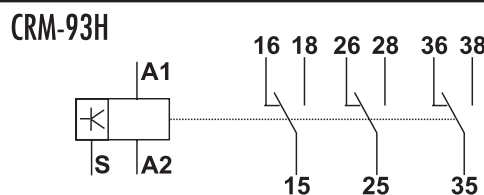
Time ranges



Description



Connection



Load with control. input possible.

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

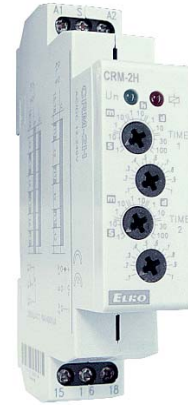
ASYMMETRIC CYCLER TIME RELAY CRM-2H

- cycler beginning with pause
- cycler beginning with pulse



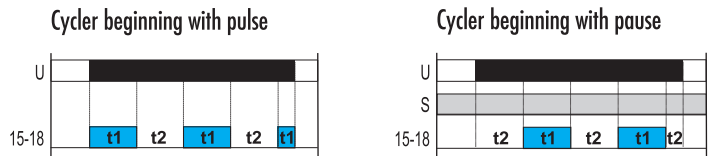
Features:

- »»» Universal supply voltage: AC/DC 12-240V
- »»» 2 time functions:
 - 1) Cycler beginning with pulse
 - 2) Cycler beginning with pause
- »»» Function selected via external wired link on control input 'S'
- »»» Time scale 0.1s - 100 days divided into 10 time ranges
- »»» Output contact: 1x changeover 16A
- »»» Output indication: multifunction red LED
- »»» 1-MODULE, DIN rail mounting

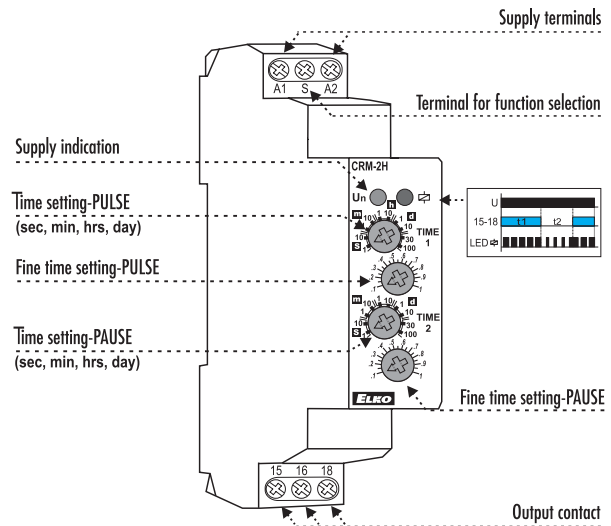


Technical parameters	CRM-2H
Number of functions:	2
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 12-240V (AC50-60Hz)
Consumption:	AC 0.7 - 3VA/DC 0.5 - 1.7W
Supply voltage tolerance:	-15%; +10%
Supply indication:	green LED
Time ranges:	0.1s - 100 days
Time setting:	Rotary switch
Time deviation:	5% - mechanical setting
Repeat accuracy:	0.2% - set value stability
Temperature coefficient:	0.01% / °C, at= 20°C
Output	
Changeover contacts:	1, (AgNi)
Rated current:	16A / AC1
Switching capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	30 A/<3s
Switching voltage:	250V AC1/24V DC
Minimum breaking capacity DC:	500 mW
Output indication:	multifunction red LED
Mechanical life:	3 x 10 ⁷
Electrical life (AC1)	0.7 x 10 ⁵
Reset time:	max. 150ms
Other information	
Operating temperature:	-20.. +55°C
Storage temperature:	-30.. +70°C
Electrical strength:	4kV (supply - output)
Operating position:	any
Mounting/DIN rail:	DIN rail EN 60715
Protection degree:	IP40
Overtoltage category:	III
Pollution degree:	2
Maximum cable size:	max. 2.5mm ² /with sleeve 1.5mm ²
Dimensions:	90 x 17.6 x 64mm
Weight:	65g
Standards:	EN 61812-1, EN 61010-1

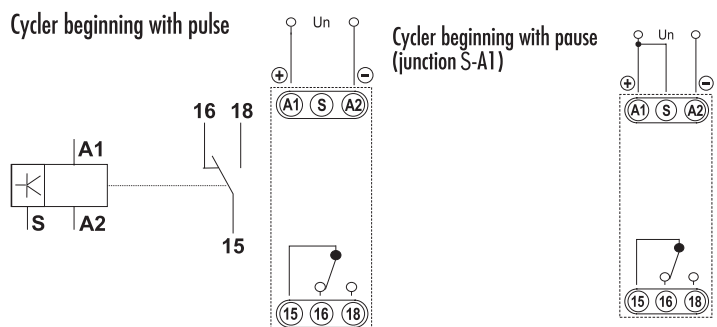
Functions



Description



Connection



DELAY ON START/DELTA TIME RELAY CRM-2T

- star/delta timer



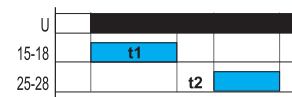
Features:

- »»» Universal supply voltage: AC/DC 24-480V
- »»» 1 time function: Delay ON star/delta
- »»» Time t1 (delta):
 - Time scale 0.1s - 1h, 5 time ranges
- »»» Time t2 (delay) between λ/Δ :
 - Time range 0.1s - 1s
- »»» Output contact: 2 x normally open (NO) 3A
- »»» Output indication: multifunction red LED
- »»» 1-MODULE, DIN rail mounting

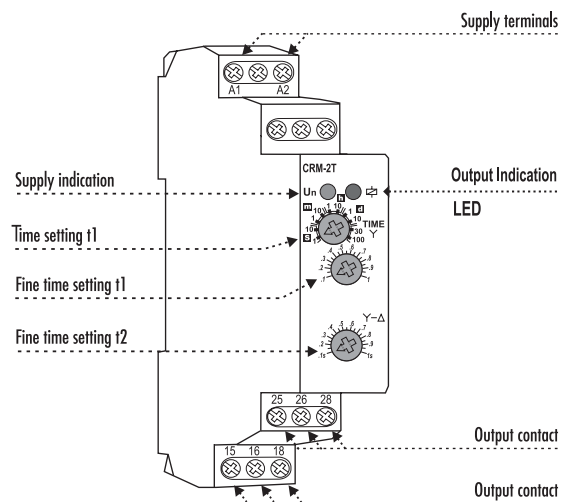
Technical parameters	CRM-2T
Number of functions:	1
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 24-480V (AC50-60Hz)
Consumption:	AC max. 3 VA / DC max. 1.5W
Supply voltage tolerance:	-15%; +10%
Supply indication:	green LED
Time ranges:	t1: 0.1s - 1h : t2: 0.1s - 1s
Time setting:	Rotary switch
Time deviation:	5% - mechanical setting
Repeat accuracy:	0.2% - set value stability
Temperature coefficient:	0.01% / °C, at = 20°C
Output	
Number contacts:	2, (AgNi)
Rated current:	3A / AC1
Switching capacity:	1250 VA/AC1, 150 W/DC
Switching voltage:	max. 250V AC1/30V DC
Output indication:	multifunction red LED
Mechanical life:	1 x 10 ⁶
Electrical life (AC1)	1 x 10 ⁵
Reset time:	max. 150ms
Other information	
Operating temperature:	-20.. +55°C
Storage temperature:	-30.. +70°C
Electrical strength:	4kV (supply - output)
Operating position:	any
Mounting/DIN rail:	DIN rail EN 60715
Protection degree:	IP40
Overvoltage category:	III
Pollution degree:	2
Maximum cable size:	max. 2.5mm ² /with sleeve 1.5mm ²
Dimensions:	90 x 17.6 x 64mm
Weight:	95g
Standards:	EN 61812-1, EN 61010-1

Functions

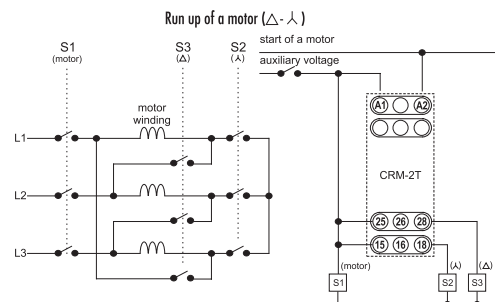
Delay ON star/delta



Description



Connection



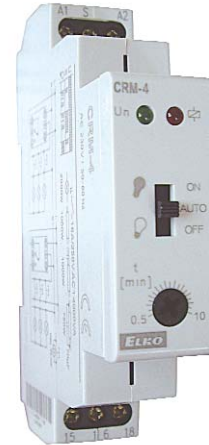
STAIRCASE TIME RELAY CRM-4



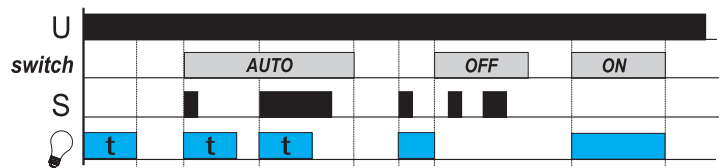
Features:

- »»» Supply voltage: AC230V
- »»» Function delay OFF reacts to control closing
 - Protection against button blocking
- »»» Time range: 0.5min - 10min
- »»» Operation switch:
 - AUTO - normal function acc. to set time
 - OFF - permanent off (e.g. service of lights)
 - ON - permanent on
- »»» Output contact: 1 x changeover 16A
- »»» 1-MODULE, DIN rail mounting

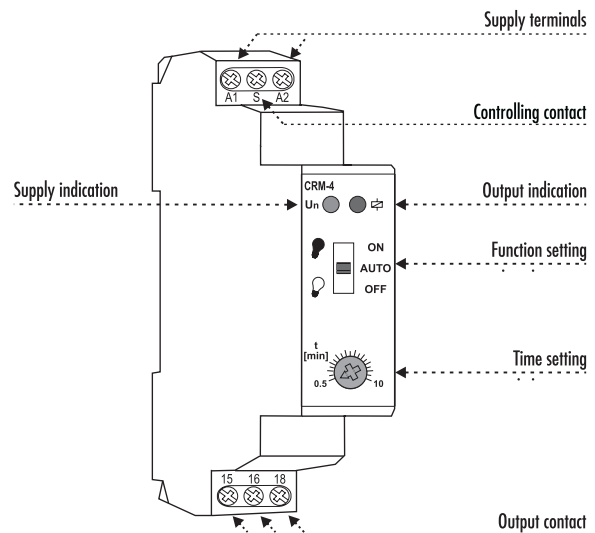
Technical parameters	CRM-4
Function:	Delay off
Supply terminals:	A1 - A2
Supply voltage:	AC 230V / 50-60Hz
Consumption:	AC max. 12 VA/1.8W
Supply voltage tolerance:	-15%; +10%
Supply indication:	green LED
Time ranges:	0.5s - 10min
Time setting:	Rotary switch
Time deviation:	10% - mechanical setting
Repeat accuracy:	5% - set value stability
Temperature coefficient:	0.05% / °C, at= 20°C
Output	
Changeover contacts:	1, (AgSnO ₂)
Rated current:	16A / AC1
Switching capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	30A / <3s
Switching voltage:	250V AC1/24V DC
Minimum breaking capacity DC:	500mW
Output indication:	red LED
Mechanical life:	3 x 10 ⁷
Electrical life (AC1)	0.7 x 10 ⁵
Control	
Control Voltage:	AC 230V
Power on input:	AC 0.53VA
Load between S-A2:	YES
Control. terminals:	A1-S
Impulse length:	min. 25ms / max. unlimited
Reset time:	max. 150ms
Other information	
Operating temperature:	-20.. +55°C
Storage temperature:	-30.. +70°C
Electrical strength:	4kV (supply - output)
Operating position:	any
Mounting/DIN rail:	DIN rail EN 60715
Protection degree:	IP40
Oversvoltage category:	III
Pollution degree:	2
Maximum cable size:	max. 2.5mm ² / with sleeve 1.5mm ²
Dimensions:	90 x 17.6 x 64mm
Weight:	62g
Standards:	EN 60669-2-3, EN 61010-1



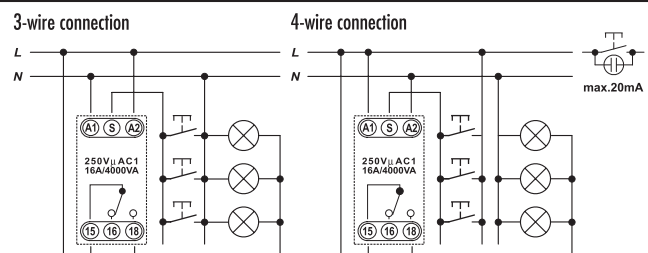
Functions



Description



Circuit connection



DIGITAL TIME SWITCH SHT-1/2

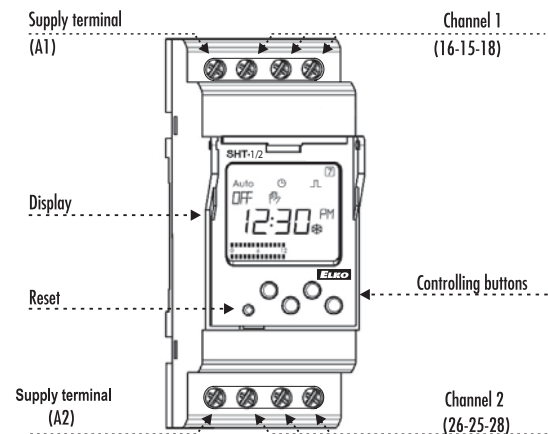
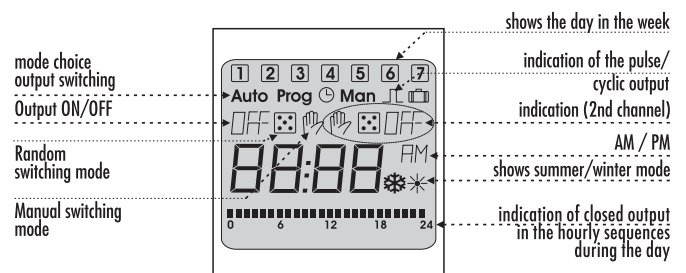


Features:

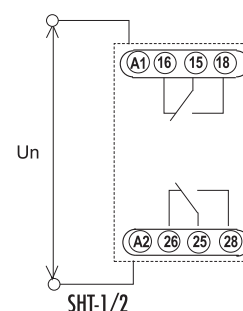
- »»» Universal supply voltage: AC/DC 12-240V
- »»» SHT-1/2: two channel
- »»» Daily, weekly program in one device
- »»» Automatic conversion summer / winter time
- »»» Switching: program (AUTO)/ constantly manually/ manually to next program change / random (CUBE)
- »»» 'Holiday program': season selection option, when the device will not switch according the standard program, but will be blocked
- »»» Sealable cover
- »»» High accuracy due to special calibration
- »»» Easy controlling via 4 buttons, clear LCD display, min. interval 1s
- »»» Pulse/cyclic output, output contact: 2x changeover 16A
- »»» 2-MODULE, DIN rail mounting

Technical parameters	SHT-1/2
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 12-240V (AC50-60Hz)
Consumption:	AC 0.5 - 2VA/DC 0.4 - 2W
Supply voltage tolerance:	-15%; +10%
Back-up supply:	YES
Summer/winter time:	automatic
Output	
Changeover contacts:	2, (AgSnO ₂)
Rated current:	16 A / AC1
Switching capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	30A / <3s
Switching voltage:	250V AC1/24V DC
Minimum breaking capacity DC:	500 mW
Mechanical life:	>3 x 10 ⁷
Electrical life (AC1)	>0.7 x 10 ⁵
Time circuit	
Power back-up:	3 years
Accuracy:	max. +/- 1s / day at 20°C
Minimum interval:	1s
Data stored for:	min. 10 years
Program circuit	
Program:	daily, weekly
Data readout:	LCD display
Other information	
Operating temperature:	-20.. +60°C
Storage temperature:	-30.. +70°C
Electrical strength:	4kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP20
Overvoltage category:	III
Pollution degree:	2
Maximum cable size:	max. 2.5mm ² /with sleeve 1.5mm ²
Dimensions:	90 x 35.6 x 64mm
Weight:	130g
Standards:	EN 61812-1, EN 61010-1

Description



Connection



PROGRAMMABLE DIGITAL TIME RELAY PDR-2



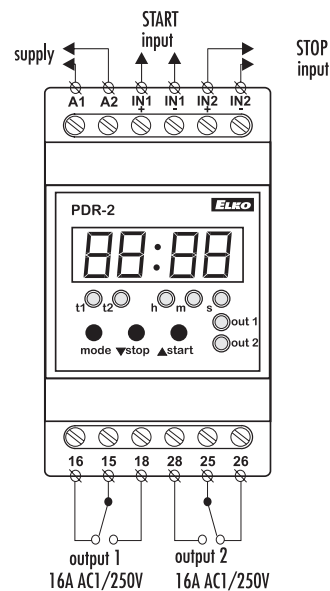
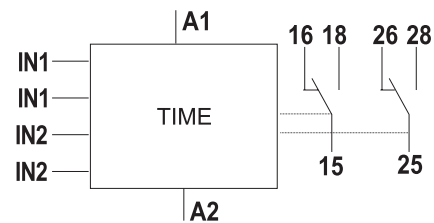
Features:

- »»» Universal supply voltage AC/DC 12-240V
- »»» 16 functions, selectable
- »»» 2 independent times in range: 0.01s - 100h
- »»» Output contact: 2 x changeover 16A
- »»» START and STOP inputs galvanically separated
- »»» 3-MODULE, DIN rail mounting



Technical parameters	PDR-2
Number of functions:	16
Supply terminals:	A1 - A2
Supply voltage:	AC/DC 12-240V (AC50-60Hz)
Consumption:	AC 0.5 - 2.5VA/DC 0.4 - 2.5W
Supply voltage tolerance:	-15%; +10%
Time ranges:	0.01s - 100h
Repeat accuracy:	0.2% - set value stability
Temperature coefficient:	0.01%/°C at = 20°C
Output	
Changeover contacts:	2, (AgNi)
Rated current:	16 A / AC1
Switching capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	30A / <3s
Switching voltage:	250V AC1 / 24V DC
Minimum breaking capacity DC:	500 mW
Output indication:	red LED
Mechanical life:	3 x 10 ⁷
Electrical strength (AC1)	0.7 x 10 ⁵
Control	
Control. input consumption:	AC 0.01 - 0.25 VA
Control. impulse length:	min. 1 ms / max. unlimited
Reset time:	max. 200ms
Display - colour:	red
Number and height of numerals:	4 digits with separating column, height 10mm
Luminance:	2200 - 3800 ucd
Light wavelength:	635nm
Brightness setting:	range 20-100% in 10steps
Memory - memory locations:	20
Data stored for:	min. 10 years
Other information	
Operating temperature:	-20..+55°C
Storing temperature:	-30..+70°C
Electrical strength:	4kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40
Overvoltage category:	III
Pollution degree:	2
Max. cable size:	max. 2.5mm ² / with sleeve 1.5mm ²
Dimensions:	90 x 52 x 65mm
Weight:	143g
Standards:	EN 61812-1, EN 61010-1

Connection



Time data

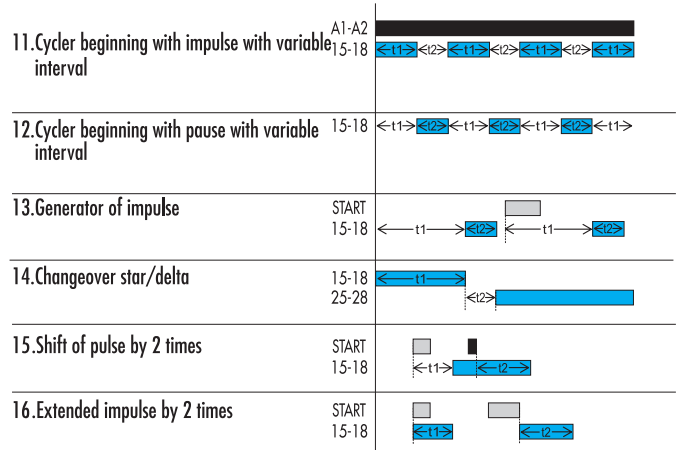
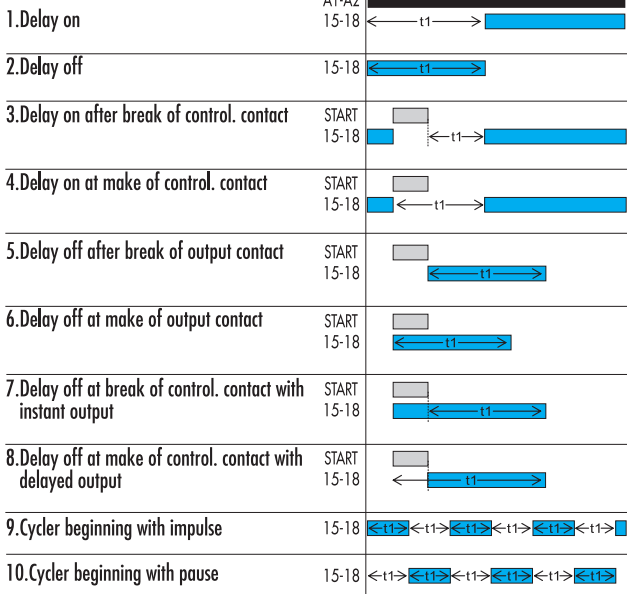
Time range	0.01s - 99h 59min 59sec 99ss
Minimal time step	0.01s
Time deviation	0.01% of set value
Setting error	0%
Setting, reset accuracy	100%
Digital places	selected via program

PROGRAMMABLE DIGITAL TIME RELAY PDR-2

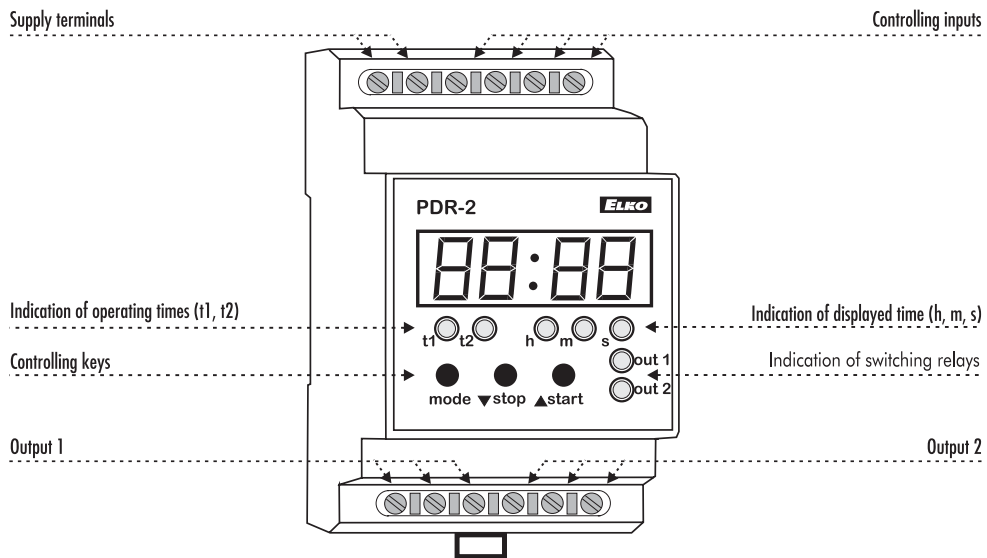
Functions

Functions for PDR-2

Supply voltage



Description



CONTROL & MONITORING RELAYS



HRN-41
Voltage Relay



HRN-51
Voltage Relay



PRI-32
Current Relay



HRH-2
Liquid Level Relay



MODULAR CONTACTORS

CONTENTS:

VOLTAGE MONITORING RELAYS

1-Phase Voltage Monitoring Relay	HRN-41	13
1-Phase Voltage Monitoring Relay	HRN-35	14
3-Phase Voltage Monitoring Relay	HRN-43N	16
3-Phase Monitoring Relay	HRN-55	18
3-Phase Voltage Monitoring Relay	HRN-54/54N	19

CURRENT MONITORING RELAYS

1-Phase Current Monitoring Relay	PRI-32	20
1-Phase Current Monitoring Relay	PRI-41	21

LIQUID LEVEL CONTROL RELAY HRH-2

22

LIQUID LEVEL CONTROL SENSORS SHR

23

THERMISTOR PROTECTION RELAY TER-7

24

1-PHASE VOLTAGE MONITORING RELAY HRN-41

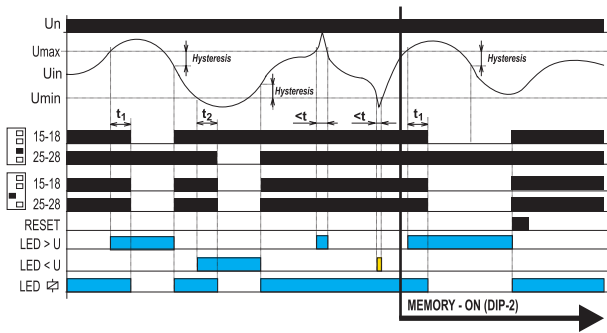
- over/undervoltage
- 3 ranges



Features:

- »»» Supply voltage: AC230V
- »»» Monitoring DC/AC 1-phase in 3 ranges
- »»» Monitoring voltage in 2 independent levels
- »»» Galvanically separated supply
- »»» Adjustable delay for all levels
- »»» "MEMORY" function - manual reset
- »»» "RESET" pushbutton
- »»» Function of second relay (independent/parallel)
- »»» Output contact: 2 x changeover 16A
- »»» 3-MODULE, DIN rail mounting

Functions



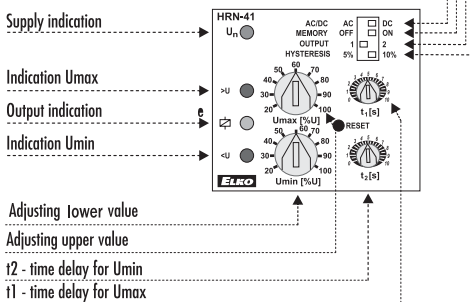
Description

Hysteresis from fault to normal state

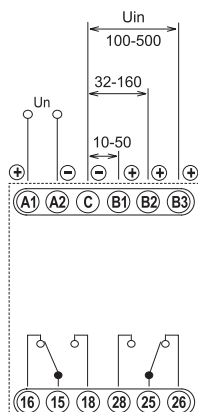
Function of 2nd relay (1-parallel, 2-independent)

Selection of MEMORY function

Measured voltage AC or DC



Connection



Technical parameters

HRN-41

Supply

Supply Terminals:	A1 - A2
Supply voltage:	AC 230V or AC 400V or AC/DC 24V
Consumption:	max. 4.5VA
Supply voltage tolerance:	-15%; +10%

Measuring circuit

Ranges:	10-50V	32-160V	100-500V
Terminals:	C-B1	C-B2	C-B3
Input resistance:	110k Ω	360k Ω	1.1M Ω
Max. permanent:	100V	300V	600V
Peak overload <1ms:	250V	700V	1kV

Time delay for Umax: adjustable, 0-10sec

Time delay for Umin: adjustable, 0-10sec

Measuring accuracy: 5%

Repeat accuracy: <1%

Temperature dependence: <0.1% / °C

Limit values tolerance: 5%

Hysteresis (fault to OK): selectable 5% / 10%

Number of contacts: 2x changeover, (AgNi)

Rated current: 16 A / AC1

Switching capacity: 4000 VA / AC1, 384 W / DC

Inrush current: 30 A / <3s

Switching voltage: 250V AC1 / 24V DC

Min. breaking capacity DC: 500mW

Output indication: yellow LED

Mechanical life: 3x10⁷

Electrical life (AC1): 0.7x10⁵

Other information

Operating temperature: -20..+55°C

Electrical strength: 4kV (input-output)

Mounting: DIN rail EN 60715

Overvoltage category: III

Max. cable size: max. 2.5mm² / with sleeve 1.5mm²

Dimensions: 90 x 52 x 65mm

Weight: 239g

Standards: EN 60255-6, EN 61010-1

1-PHASE VOLTAGE MONITORING RELAY HRN-35

- over/undervoltage



Features:

- »»» Supply from monitored voltage (monitors level of its own supply)
- »»» 3-state indication - LEDs indicating normal state and 2 fault states
- »»» Voltage U_{min} adjusted as % of U_{max}
- »»» Adjustable delay 0 - 10sec
- »»» Adjustment of voltage levels and delay by potentiometers
- »»» Independent output relays for each voltage level.
 - switching of other loads possible
- »»» Output contact: 2 x changeover 16A
- »»» 1-MODULE, DIN rail mounting



Technical parameters

HRN-35

Supply and measuring

Terminals:	A1 - A2
Supply voltage:	in range of monitored voltage
Consumption:	AC/DC max. 1.2VA
Upper level (U_{max}):	AC 160-276V
Lower level (U_{min}):	30-99% U_{max}
Time delay:	adjustable 0-10s

Accuracy

Setting accuracy (mechanical):	5%
Repeat accuracy:	<1%
Dependence on temperature:	<0.1%/°C
Tolerance of limit values:	5%
Hysteresis:	2-6% of adjusted value

Output

Changeover contacts:	2, (AgNi)
Rated current:	16A / AC1
Switching capacity:	4000 VA / AC1, 384 W / DC
Inrush current:	30A / <3s
Switching voltage:	250V AC1 / 24V DC
Min. breaking capacity DC:	500 mW
Output indication:	red / green LED
Mechanical life:	3×10^7
Electrical life (AC1):	0.7×10^5

Other information

Operating temperature:	-20..+55°C
Storage temperature:	-30..+70°C
Electrical strength:	4kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40
Overvoltage category:	III
Pollution degree:	2
Max. cable size:	max. 2.5mm ² / with sleeve 1.5mm ²
Dimensions:	90 x 17.6 x 64mm
Weight:	85g
Standards:	EN 60255-6, EN 61010-1

Functions

Legend:

U_{max} - upper adjustable level of voltage

U_n - measured voltage

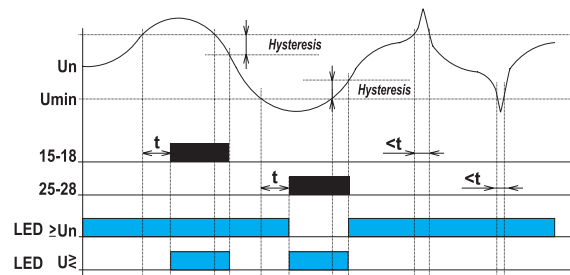
U_{min} - lower adjustable level of voltage

15-18 - switching contact of output relay No.1

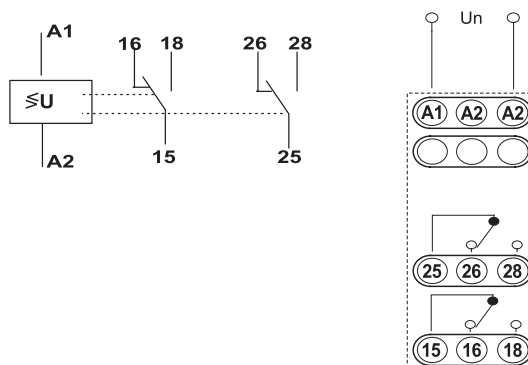
25-28 - switching contact of output relay No. 2

LED $\geq U_n$ - indication green

LED $\geq U_{\geq}$ - indication red



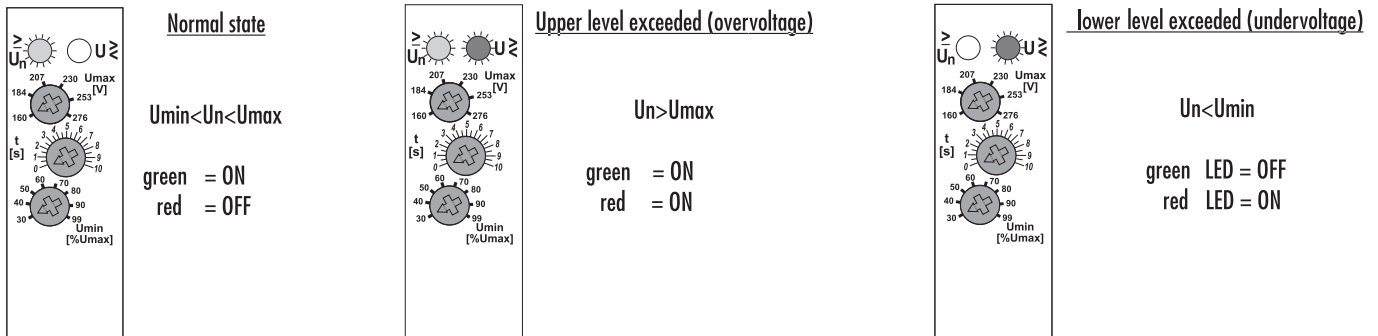
Connection



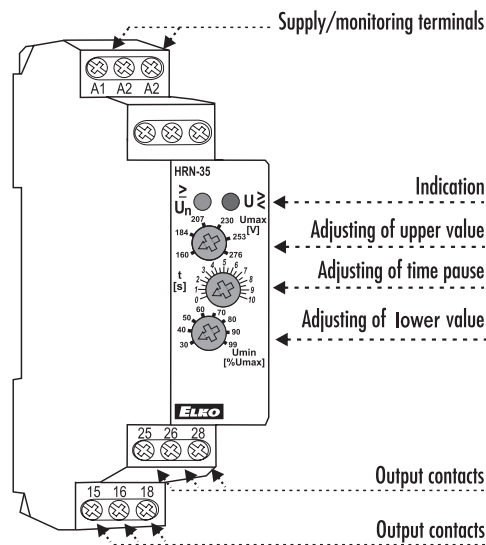
1-PHASE VOLTAGE MONITORING RELAY HRN-35

LED indication

LED indication; the unit is equipped with a green and red LED, the LED's state of illumination at any one time indicates the status of the monitored supply as follows. (Monitored voltage not reaching the minimum required voltage for the unit will not illuminate any LED).



Description



HRN-35 is a 1-phase voltage monitoring relay. The monitored voltage serves as the supply voltage. It is possible to set two independent levels of voltage. If the upper level is exceeded (for example overvoltage) 1st relay switches on, when the lower level (e.g. undervoltage) is exceeded 2nd relay switches. Adjustable time delay function provided prevents the relay being operated by momentary voltage surges in the system.

3-PHASE VOLTAGE MONITORING RELAY HRN-43N

- over/undervoltage
- phase failure
- phase sequence
- phase asymmetry



Features:

- » Supply voltage: AC230V
- » HRN-43N - for circuits 3x400/230V (incl. neutral)
- » Immune against the voltage from rotary machines connected to two phases
- » Fixed (t1), adjustable (t2) - delay
- » Function 'MEMORY' - manual reset. 'RESET' button on front panel
- » 2 output relays, selectable function of 2nd relay (independent/parallel)
- » Output contact: 2x changeover 16A
- » 3-MODULE, DIN rail mounting

Technical parameters

HRN-43N

Supply

Supply Terminals:	A1 - A2
Supply voltage:	AC 230V or AC 400V or AC/DC 24V
Consumption:	max. 4.5VA
Supply voltage tolerance:	-15%; +10%

Measuring circuit

Set of voltage:	3 x 400/230V
Terminals:	L1, L2, L3, N
Upper level Umax:	138 - 276V
Lower level Umin:	30 - 99% Umax
Max. permanent:	AC 3 x 480V
Hysteresis:	adjust. 5% or 10% of set value
Asymmetry:	5 - 20%
Peak overload <1ms:	350 V < 1ms
Time delay t1:	fixed, max. 200ms
Time delay t2:	adjustable, 0-10sec

Accuracy

Set. accuracy (mechanical):	5%
Repeat accuracy:	<1%
Temperature dependance:	<0.1% / °C
Limit values tolerance:	5%

Output

Number of contacts:	2 x changeover, (AgNi)
Rated current:	16 A / AC1
Switching capacity:	4000 VA / AC1, 384 W/DC
Inrush current:	30A / <3s
Switching voltage:	250V AC1/24V DC
Min. breaking capacity DC:	500 mW
Mechanical life:	3 X 10 ⁷
Electrical life (AC1):	0.7 x 10 ⁶

Other information

Operating temperature:	-20..+55°C
Storage temperature:	-30..+70°C
Electrical strength:	4kV (input - output)
Operating positing:	any
Mounting:	DIN rail EN 60715
Protection:	IP40
Overvoltage category:	III
Pollution degree:	2
Max. cable size:	max. 2.5mm ² / with sleeve 1.5mm ²
Dimensions:	90 x 52 x 65mm
Weight:	239g
Standards:	EN 60255-6, EN 61010-1



Description

Hysteresis from faulty to normal state

Function of 2. relay (1.-parallel, 2.-independent)

Selection of function MEMORY

Supply voltage

Indication overvoltage/
undervoltage,
failure

Sequence indication

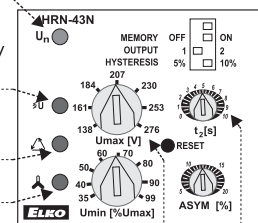
Asymmetry indication

Umin adjusting

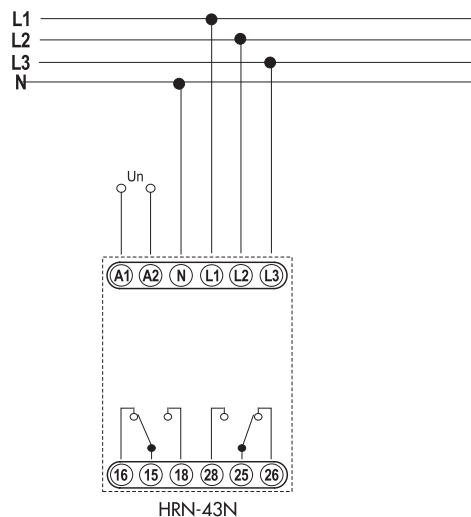
Umax adjusting

Asymmetry 5-20 % setting

Time pause t2



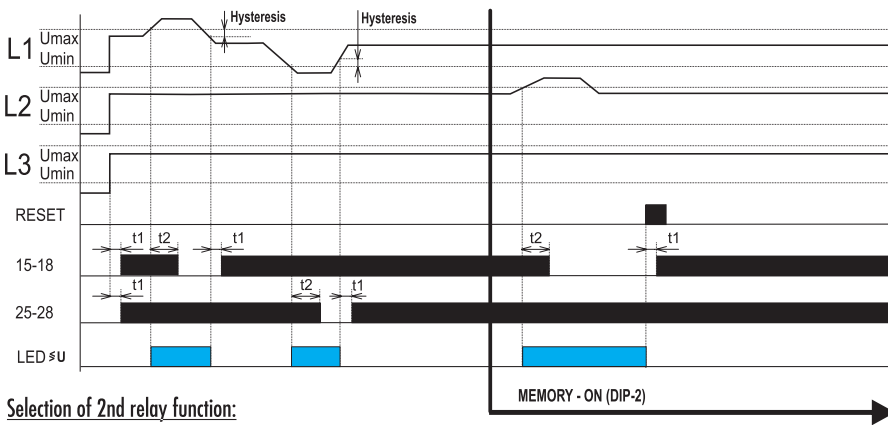
Connection



3-PHASE VOLTAGE MONITORING RELAY HRN-43N

Functions

Overvoltage - undervoltage



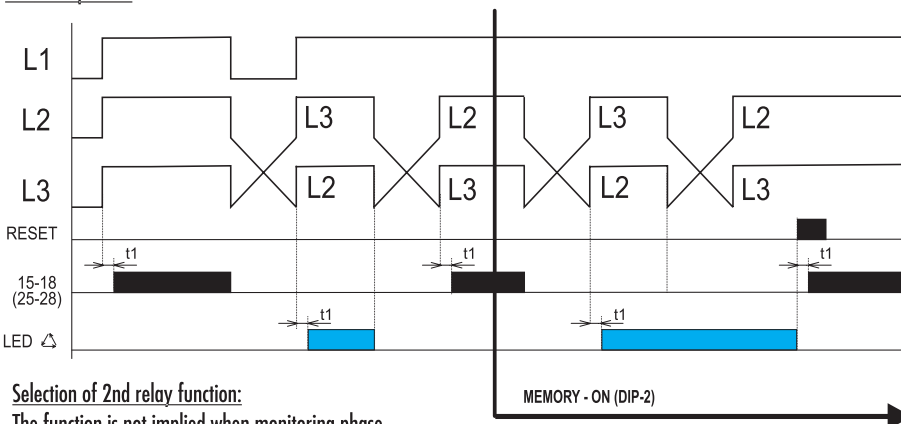
Legend:

- L1, L2, L3 - 3-phase voltage
- RESET - press of the button on front panel
- t1 - time delay, fixed
- t2 - time delay, adjustable 0-10 sec
- 15-18 output relay 1
- 25-28 output relay 2
- LED \neq U indication overvoltage / undervoltage

Selection of 2nd relay function:

In order to monitor 2 levels of voltage, it is possible to select if output relay will respond to each level individually (see the diagram) or both relays will switch in parallel way (see diagram "phase sequence").
Selection via DIP switch.

Phase sequence



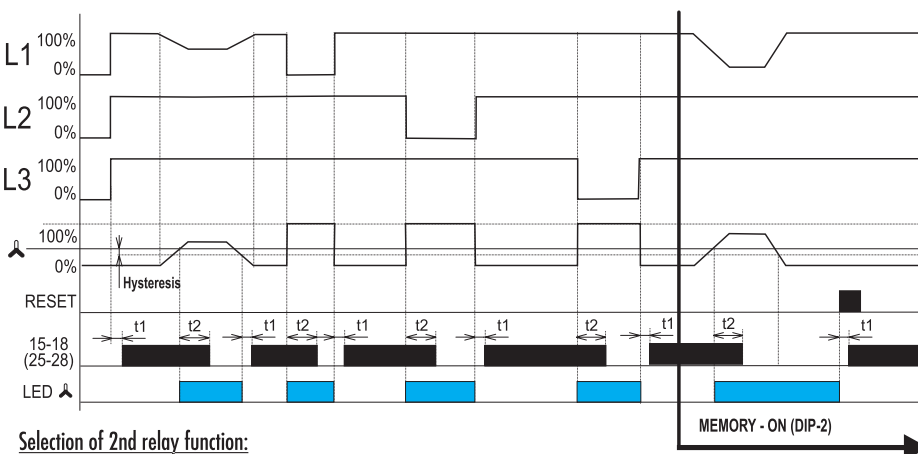
Legend:

- L1, L2, L3 - 3-phase voltage
- RESET - press of the button on front panel
- t1 - time delay, fixed
- t2 - time delay, adjustable 0-10 sec
- 15-18 output relay 1
- 25-28 output relay 2
- LED \triangle indication of range of phases

Selection of 2nd relay function:

The function is not implied when monitoring phase sequence, the relays are switched in parallel.
DIP switch is ignored.

Asymmetry - phase failure



Legend:

- L1, L2, L3 - 3-phase voltage
- RESET - press of the button on front panel
- t1 - time pause, fixed
- t2 - time pause, adjustable 0-10 sec
- \neq - adjustable asymmetry 5-20%
- 15-18 output contact of relay 1
- 25-28 output contact of relay 2
- LED \neq - asymmetry indicator

Selection of 2nd relay function:

The function is not implied when monitoring phase sequence, the relays are switched in parallel.
DIP switch is ignored.

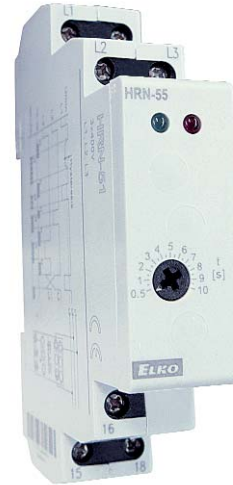
3-PHASE MONITORING RELAY HRN-55

- phase failure
- phase sequence



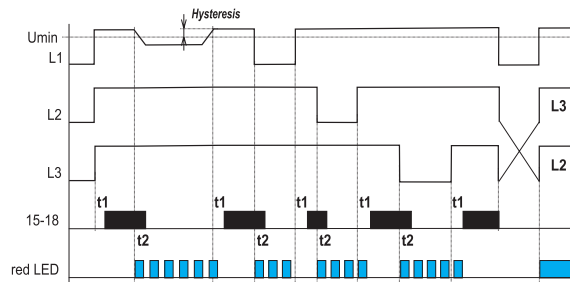
Features:

- Supply from monitored voltage
- Easy and fast installation
- LED indication of failure
- Fixed delay T1 (500ms) and T2 (0.5-10s)
- Output contact: 1x changeover 16A
- 1-MODULE, DIN rail mounting

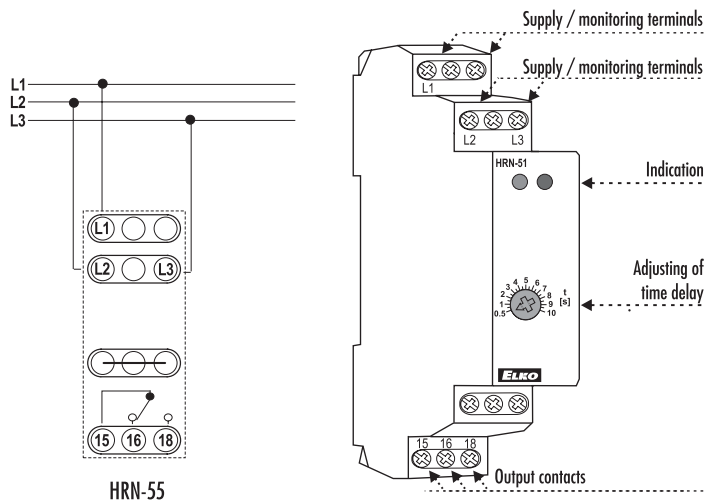


Technical parameters	HRN-51
Supply and measuring	
Monitoring terminals:	L1, L2, L3
Supply Terminals:	L1, L2, L3
Voltage:	3 x 400V
Consumption:	max. 2VA
Level Umin:	75% Un
Hysteresis:	5%
Time delay T1:	max. 500ms
Time delay T2:	adjustable, 0.1-10sec
Output	
Number of contacts:	1 x changeover, (AgNi)
Rated current:	8 A / AC1
Switching capacity:	2500 VA/AC1, 240 W/DC
Inrush current:	10A
Switching voltage:	250V AC1 / 24 V DC
Min. breaking capacity DC:	500 mW
Output indication:	red / green LED
Mechanical life:	1 x 10 ⁷
Electrical life (AC1):	1 x 10 ⁵
Other information	
Operating temperature:	-20..+55°C
Storage temperature:	-30..+70°C
Electrical strength:	4 kV (supply-output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40
Overvoltage category:	III
Pollution degree:	2
Max. cable size:	max. 2.5mm ² / with sleeve 1.5mm ²
Dimensions:	90 x 17.6 x 64mm
Weight:	73g
Standards:	EN 60255-6, EN 61010-1

Functions



Connection, Description



Functions

HRN-55 is a 3-phase relay monitoring correct sequence & failure of any phase. Green LED ON indicates the supply voltage. Red LED flashes when there is a phase failure and relay switches off.

If the phase sequences are not correct the red LED glows permanently and the relay is switched off.

*Replace HRN-51 relay

3-PHASE VOLTAGE MONITORING RELAY HRN-54/54N

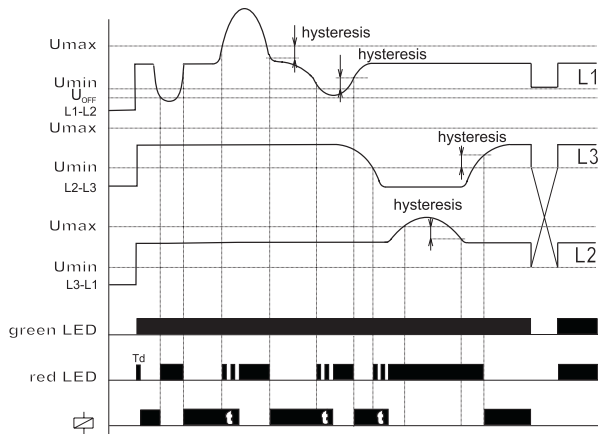
- over/undervoltage
- phase failure
- phase sequence



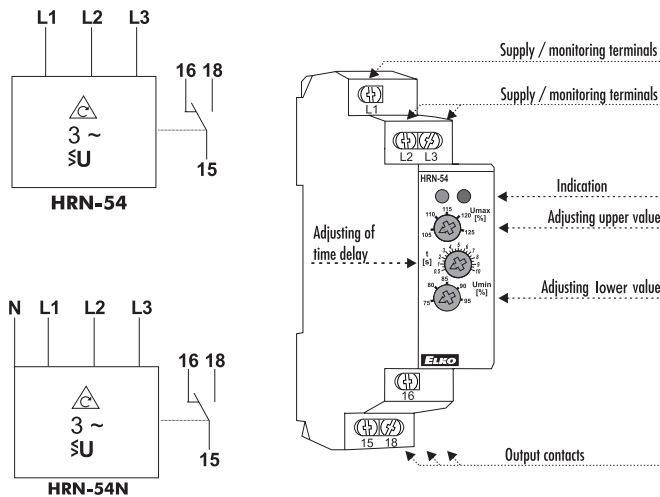
Features:

- Supply from monitored voltage
- Monitors voltage in 3-phases
- Upper and lower voltage levels adjustable
- Adjustable time delay
- Red LED indication of fault
- For circuits: 3x 400V & 3x 400V/230V (neutral monitoring: HRN-54N)
- Output contact: 1x changeover 8A
- Clamp terminal
- 1-MODULE, DIN rail mounting

Function



Connection, Description



Technical parameters

HRN-54 / 54N

Supply and measuring

Supply Terminals: L1, L2, L3 / L1, L2, L3, N

Supply/measured voltage: 3 x 230V / 400V

Consumption: max. 2VA

Upper level U_{max}: 420 - 500V (105-125% U_n) /
242 - 288V ± 5%

Lower level U_{min}: 300 - 380V (75 - 95% U_n) /
173 - 219V ± 5%

Time delay: adjustable 0.5-10s

Setting accuracy: 5%

Output

Number of contacts: 1 x changeover, (AgNi)

Rated current: 8A / AC1

Switching capacity: 2500 VA/AC1, 240 W/DC

Inrush current: 30A / <3s / AC 3 x 288V

Switching voltage: 250V AC1 / 24V DC

Min. breaking capacity DC: 500 mW

Indication of state: red LED

Mechanical life: 1 x 10⁷

Electrical life (AC1): 1 x 10⁵

Other information

Operating temperature: -20.. + 55°C

Storage temperature: -30.. + 70°C

Electrical strength: 4 kV (supply - output)

Operating position: any

Mounting: DIN rail EN 60715

Protection degree: IP40

Overvoltage category: III

Pollution degree: 2

Max. cable size: max. 2.5mm²/with sleeve 1.5mm²

Dimensions: 90 x 17.6 x 64mm

Weight: 69g

Standards: EN 60255-6, EN 61010-1

Function description

The relay monitors voltages between-phases in 3-phase mains. It is possible to adjust two independent voltage levels and control e.g. overvoltage or undervoltage separately. In the normal state, when the voltage moves between adjusted levels, the output relay is closed and the red LED is off. If the voltage limits are exceeded, the output relay is opened and the red LED is on. By phase switching the red LED is on (relay contact is opened). If the supply voltage drops under 70% of U_n (U_{OFF} - lower level) the relay immediately opens with no delay, and a faulty state is signalled by the red LED. If the timing is running in this faulty state, it is immediately stopped.

1-PHASE CURRENT MONITORING RELAY PRI-32

- over current
- internal CT



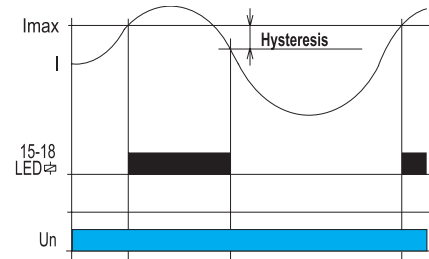
Features:

- »»» Universal supply AC24 - 240V and DC 24V
- »»» Controls only AC current
- »»» Output contact: 1x changeover 8A
- »»» Adjustable setting 1 - 20A (max. overcurrent 5A)
- »»» Clamp terminal
- »»» 1-MODULE, DIN rail mounting

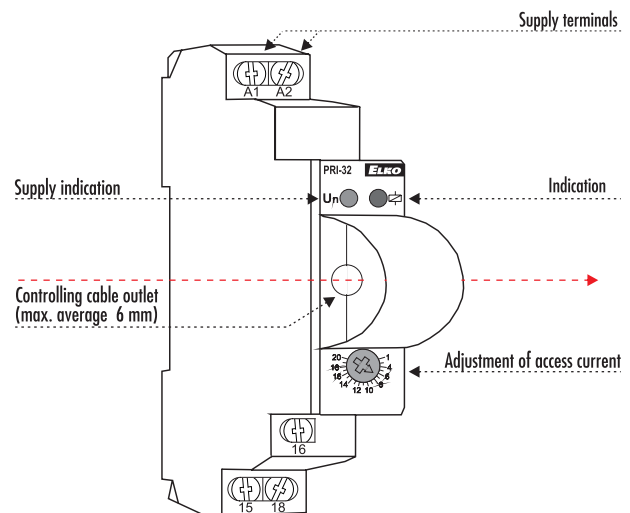


Technical parameters	PRI-32
Supply circuit	
Supply Terminals:	A1 - A2
Supply voltage:	AC 24-240V and DC 24V (AC 50-60Hz)
Consumption:	max. 1.5VA
Supply voltage tolerance:	-15%; +10%
Measuring circuit	
Current range:	1-20A
Current adjustment:	rotary switch
Setting accuracy (mechanical):	5%
Repeat accuracy:	<1%
Temperature dependancy:	<0.1%/°C
Limit values tolerance:	5%
Hysteresis (fault to OK):	0.6-1.2% of the range
Overload capacity:	max. 5A (10s long)
Output	
Number of contacts:	1x changeover, (AgSnO ₂)
Rated current:	8A / AC1
Switching capacity:	2500 VA / AC1, 240W / DC
Output indication:	red LED
Other information	
Operating temperature:	-20.. + 55°C
Storage temperature:	-30.. + 70°C
Electrical strength:	4 kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40
Overvoltage category:	III
Pollution degree:	2
Max. cable size:	max. 2.5mm ² /with sleeve 1.5mm ²
Dimensions:	90 x 17.6 x 64mm
Weight:	68g
Standards:	EN 60255-6, EN 61010-1

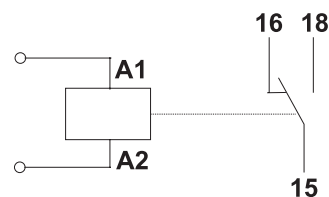
Functions



Description



Connection



PRI-32 is 1-phase current monitoring relay used in AC circuits. The output relay is off in the normal state. By exceeding the adjusted current level, the relay is closed.

1-PHASE CURRENT MONITORING RELAY PRI-41

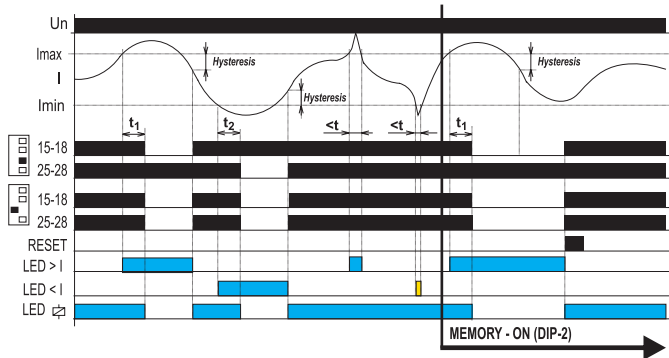
- over/undercurrent
- 3 ranges



Features:

- »»» Monitors AC/DC 1-phase current in 3 ranges
- »»» Monitoring adjusted current in 2 independent levels
- »»» Galvanically separated supply
- »»» Adjustable time delay for each level
- »»» 'MEMORY' function - manual reset.
- »»» 'RESET' button on the front panel
- »»» Function of 2nd relay (independent/parallel)
- »»» Output contact: 2 x changeover 16A
- »»» 3-MODULE, DIN rail mounting

Functions

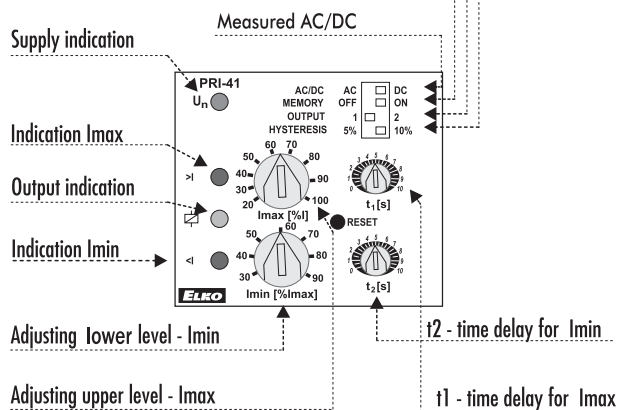


Description

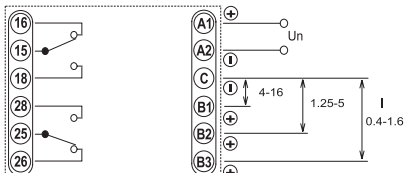
Hysteresis from faulty to OK normal state

Function of 2nd relay (1st-parallel, 2st-independent)

MEMORY function



Connection



Technical parameters

PRI-41

Supply

Supply Terminals: A1 - A2

Supply voltage: AC 230V or AC/DC 24V

Consumption: max. 4.5VA

Supply voltage tolerance: -15%; +10%

Measuring circuit

Ranges: 4-16A | 1.25-5A | 0.4-1.6A

Terminals: C-B1 | C-B2 | C-B3

Input resistance: 5mΩ | 11mΩ | 50mΩ

Max. permanent current: 16A | 5A | 1.6A

Inrush overload <1ms: 20A | 6.3A | 2A

Time delay for Imax: adjustable, 0-10sec

Time delay for Imin: adjustable, 0-10sec

Measuring accuracy: 5%

Repeat accuracy: <1%

Temperature dependence: <0.1%/°C

Limit values tolerance: 5%

Hysteresis (fault to OK): selectable 5% / 10%

Output

Number of contacts: 2 x changeover, (AgNi)

Rated current: 16A / AC1

Switching capacity: 4000 VA / AC1, 384 W / DC

Inrush current: 30A / < 3s

Switching voltage: 250V AC1 / 24V DC

Min. breaking capacity DC: 500mW

Output indication: yellow LED

Mechanical life: 3 x 10⁷

Electrical life (AC1): 0.7 x 10⁵

Other information

Operating temperature: -20.. + 55°C

Storage temperature: -30.. + 70°C

Electrical strength: 4 kV (input - output)

Operating positing: any

Mounting: DIN rail EN 60715

Protection: IP40

Overvoltage category: III

Pollution degree: 2

Max. cable size: max. 2.5mm² / with sleeve 1.5mm²

Dimensions: 90 x 52 x 65mm

Weight: 239g

Standards: EN 60255-6, EN 61010-1

LIQUID LEVEL CONTROL RELAY HRH-2



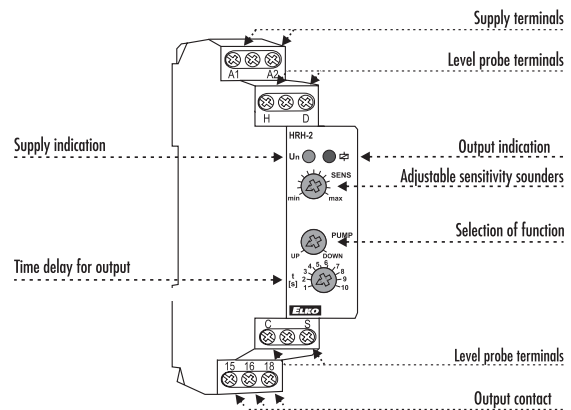
Features:

- »»» Supply voltage AC/DC 230V or AC/DC 24V
- »»» Single switch with single-state monitoring
- »»» Single switch with double-state monitoring
- »»» Selection function of:
 - Pump up (filling)
 - Pump down (emptying)
- »»» Adjustable hysteresis (5-100kΩ)
- »»» Adjustable time delay of output (1-10s)
- »»» Output contact: 1x changeover 16A
- »»» 1-MODULE, DIN rail mounting



Technical parameters	HRH-2
Function:	2
Supply Terminals:	A1 - A2
Supply voltage:	AC/DC 230V or AC/DC 24V
Consumption:	2.5VA
Supply voltage tolerance:	-15%; +10%
<i>Measuring circuit</i>	
Hysteresis (input resistance):	5kΩ- 100kΩ
Voltage on electrode:	max. AC 5V
Current in probes:	AC < 0.5mA
Time reaction:	max. 400ms
Max. probe capacity:	3 nF
Time delay:	adjustable, 1-10s
<i>Accuracy</i>	
Setting accuracy (mech):	+/-5%
<i>Output</i>	
Number of contacts:	1 x changeover, (AgNi)
Rated current:	16A/AC1
Switching capacity:	4000 VA / AC1, 384 W / DC
Inrush current:	30A / < 3s
Switching voltage:	250V AC1 / 24V DC
Min. breaking capacity DC:	500mW
Mechanical life:	3 x 10 ⁷
Electrical life (AC1):	0.7 x 10 ⁵
<i>Other information</i>	
Operating temperature:	-20.. + 55°C
Storage temperature:	-30.. + 70°C
Electrical strength:	4 kV (input - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection:	IP40
Overvoltage category:	III
Pollution degree:	2
Max. cable size:	max. 2.5mm ² / with sleeve 1.5mm ²
Dimensions:	90 x 17.6 x 64mm
Weight:	76g
Standards:	EN 60255-6, EN 61010-1
Measuring sensors:	see page 22

Description



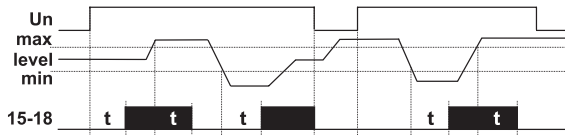
Function description

The HRH-2 is a liquid level control relay. The HRH-2 can be used with two probes if the body of the holding tank is metal. HRH-2 can use three probes for measuring: H-high level, D-down level, C-common probe. C-probe is also connectable with protective conductor of supply system (PE). The HRH-2 is selectable for pump up or pump down (filling or emptying). It is possible to set the device sensitivity according to liquid conduction (appropriate to liquid resistance in range 5Kohms to 100Kohms). When requested controlling of only one level inputs H+D, must be connected and link to sole sensor. When the HRH-2 is set for pump up (filling), and the level is between the min and max the output relay will be de-energised. When the level falls below the min, the relay output will energise after the set time delay. When the HRH-2 is set for pump down (emptying) and the level is between the min and max, the output relay will be de-energised. For unwanted switching of output contacts due to level swirling, it is possible to adjust output delay of 1 - 10sec.

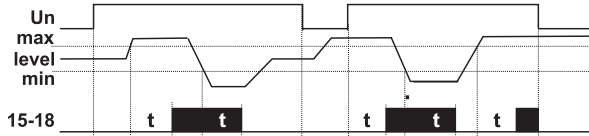
LIQUID LEVEL CONTROL RELAY HRH-2

Functions

PUMP UP (FILLING)

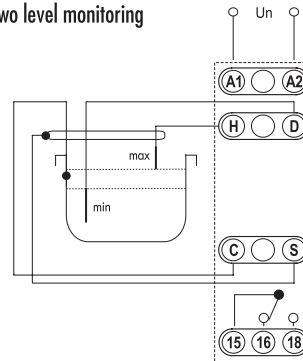


PUMP DOWN (EMPTYING)

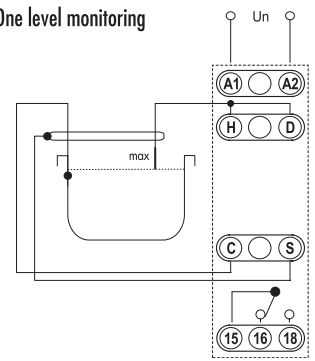


Connection

Two level monitoring



One level monitoring



LIQUID LEVEL CONTROL SENSORS SHR



SHR-1

Features:

- »»» Sensor to control flooding
- »»» Electrode with diameter 4mm is placed in plastic cover with 12mm screw with nut
- »»» Panel or to holder mounting
- »»» Conductor is connected to terminal board, shrink bushing for feeder place insulation is a part of device
- »»» Maximum wire profile: 2.5mm²
- »»» Installation: after connecting a wire to the sensor, run the shrink bushing over the wire onto the sensor. Heat the sensor and by shrinking the connection of sensor and wire will be hermetical
- »»» Weight: 9.7g
- »»» Operating temperature: -25... + 60°C
- »»» Total sensor length: 65.5mm



SHR-2

Features:

- »»» Detection sensor is electrode, which in connection with suitable device is used for level detection for example in wells, tanks,...
- »»» To be used in electric conductive fluids and mechanically polluted fluids with temperature: +1... + 80°C
- »»» Stainless steel one-pole electrode reside in PVC cover, intended for tank wall mounting or mounting by socket.
- »»» To ensure correct function of the sensor, it is necessary to have the electrode without dirt which could disable the connection of the electrode and fluid and thus lead to malfunction.
- »»» Max. wire profile: 2.5mm²
- »»» Installation;
 - Conductor wire is connected by freezing of two brass screws to stainless steel electrode
- »»» Weight: 48.6g, dimensions: max diameter 21 mm, length 96mm



SHR-3

Features:

- »»» Stainless steel sensor is used to severe and industrial surroundings, wall or cover tank mounting
- »»» Sensor has connecting wire - length 3m, which is connected to sensor to scan electrode and sensor bushing
- »»» Connecting wire is double-wire PVC 2 x 0.75mm², connection of wires: brown - scan electrode, blue - sensor bushing
- »»» Connection M18 x 1.5 screw
- »»» Protection degree IP67, Sensor weight without cable: 100g
- »»» Operating surroundings: place without the danger of detonation, temperature on screw: max. 95°C, pressure immunity: on 25°C 4 MPa, on 95°C 1.5 MPa
- »»» Weight: 239g
- »»» Material: bushing and seam electrode: stainless steel W.Nr. 1.4301, insulation insert of electrode: PTFE, internal material: self-extinguishing epoxies resin

THERMISTOR PROTECTION RELAY TER-7



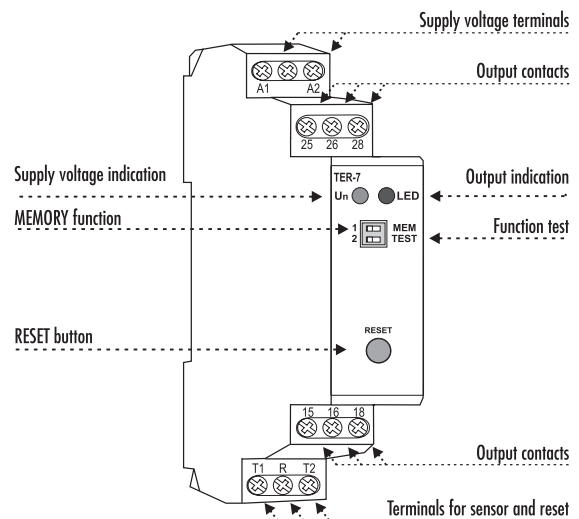
Features:

- »»» Universal supply AC/DC 24-240V
- »»» Monitors temperature in range of PTC thermistor
- »»» PTC sensor in motor windings
- »»» MEMORY function - manual reset
- »»» Possibility of remote reset
- »»» Monitoring short circuit or sensor disconnecting
- »»» Output contact: 2x changeover 8A
- »»» LED indication
- »»» 1-MODULE, DIN rail mounting

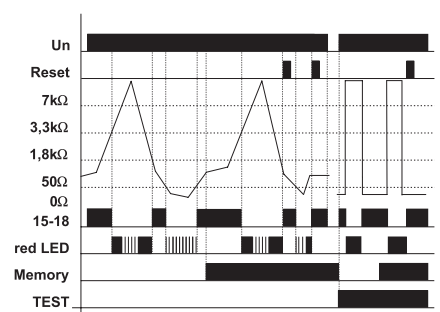
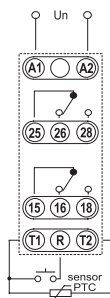


Technical parameters	TER-7
Function:	temperature of motor winding
Supply Terminals:	A1 - A2
Supply voltage:	AC 24-240V, DC 24V
Consumption:	2VA
Supply voltage tolerance:	-15%; +10%
Measuring circuit	
Measuring terminals:	T1 - T2
Cold sensor resistance:	50Ω - 1.5kΩ
Upper level:	3.3kΩ
Lower level:	1.8kΩ
Sensor:	PTC (part of motor)
Sensor failure indication:	red LED
Accuracy	
Accuracy in repetition:	<0.5%
Switching difference:	+/-5%
Temperature dependance:	<0.1%/°C
Output	
Number of contacts:	2 x changeover, (AgNi)
Rated current:	8A / AC1
Switching capacity:	2000 VA / AC1, 192 W / DC
Inrush current:	10A / < 3s
Switching voltage:	250V AC1 / 24V DC
Min. breaking capacity DC:	500mW
Output indication:	red LED
Mechanical life:	3 x 10 ⁷
Electrical life (AC1):	0.7 x 10 ⁵
Other information	
Operating temperature:	-20.. + 55°C
Storage temperature:	-30.. + 70°C
Electrical strength:	4 kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection:	IP40
Overvoltage category:	III
Pollution degree:	2
Max. cable size:	max. 2.5mm ² / with sleeve 1.5mm ²
Dimensions:	90 x 17.6 x 64mm
Weight:	67g
Standards:	EN 60730-2-9, EN 61010-1

Description



Connection, Functions



Function description

The relay monitors temperature of the motor winding with a PTC thermistor which is mostly placed inside the motor winding. Resistance of the PTC thermistor runs to a max 1.5 kΩ in the cold stage. When temperature increases the resistance goes up and when it exceeds the limit of 3.3 kΩ, the contact of output relay switches off the contactor controlling the motor. When temperature decreases and thereby decreases thermistor resistance under 1.8 kΩ, the output contact of the relay again switches on.

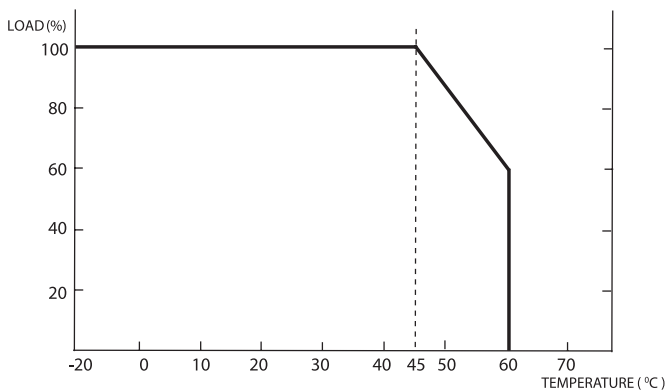
POWER SUPPLIES DR-60-12 AND DR-60-24



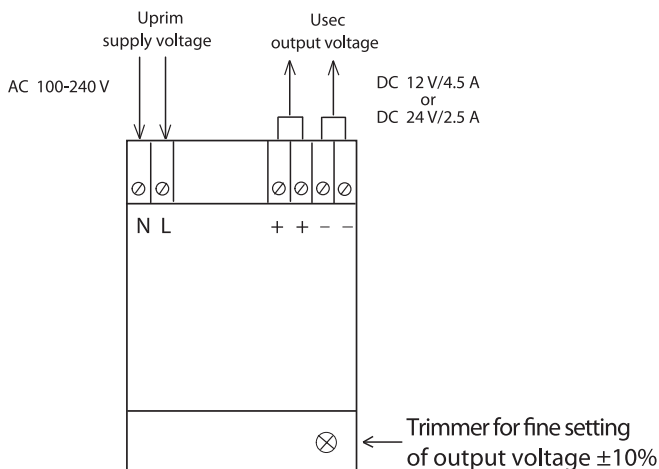
Features:

- »»» Input voltage (U_{prim}) in a wide range 100-240V AC
- »»» Output voltage (U_{sec}) in 12V DC or 24V DC versions
- »»» Max. load 12V - 4.5A, 24V - 2.5A
- »»» Electronic protection of short-circuit, over-loading, over-voltage
- »»» Fine setting of output voltage by trimmer in a range $\pm 10\%$ U_{sec}
- »»» LED indicator for energization - U_{sec} from front panel
- »»» Cooling by free air circulation - perforated housing
- »»» Approvals: UL/CUL/TUV/CB/CE
- »»» 4.5-MODULE, DIN rail mounted, isolation class II

Chart of loadability vs. operational temperature



Connection



Technical parameters

	DR-60-12	DR-60-24
Input (U_{prim})	100-240V AC / 47-63Hz	
Supply voltage:	100-240V AC / 47-63Hz	
Output (U_{sec})		
Output voltage: (DC)	12V	24V
Max. load:	4.5A / 54W	2.5A / 60W
Ripple output voltage:	120mV	150mV
Efficiency:	82%	84%
Output voltage tolerance:	+1%	
Electronic protections:	short circuit, over load, over voltage	
DC adjustment range:	$\pm 10\%$	
Overload protection:	105 - 160% of rated output	
Time delay after energization:	100ms to 100% loading and AC 230V	
Other information		
Working humidity:	20 - 90%RH	
Thermal coefficient:	0.03% / °C	
Operating temp. to 100% loading:	-20..+45°C	
Operating temp. to 60% loading:	-20..+60°C	
Storage temperature:	-40..+85°C	
Electrical strength (prim/sec):	3kV	
Protection degree:	IP20 device/IP40 in-built in distribution board	
Max. cable size:	max. 2.5mm ² /with sleeve 1.5mm ²	
Dimensions:	78 x 93 x 56mm	
Weight:	300g	
Standards:	EN 55022, B, EN 61000-3-2, 3, EN 61000-6-2, EN 61000-4, 2, 3, 4, 5, 6, 8,11, EN 61204-3, ENV 50204	

MODULAR CONTACTORS



Features:

- »» For switching of electric circuits, especially for resistive loads and three-phase induction motors
- »» Number of contacts of VS120: 1
Number of contacts of VS220: 2
Number of contacts of VS420, VS425, VS440, VS463: 4
- »» Can be produced with closing and disconnecting contacts:
 - VS120: 10, 01
 - VS220: 20, 11, 02
 - VS420: 40, 31
 - VS425, VS440: 40, 31, 22, 04
 - VS463: 40, 31, 22
- »» Protection degree IP20 - for higher protection there are screw covers
- »» DIN rail or panel mounting

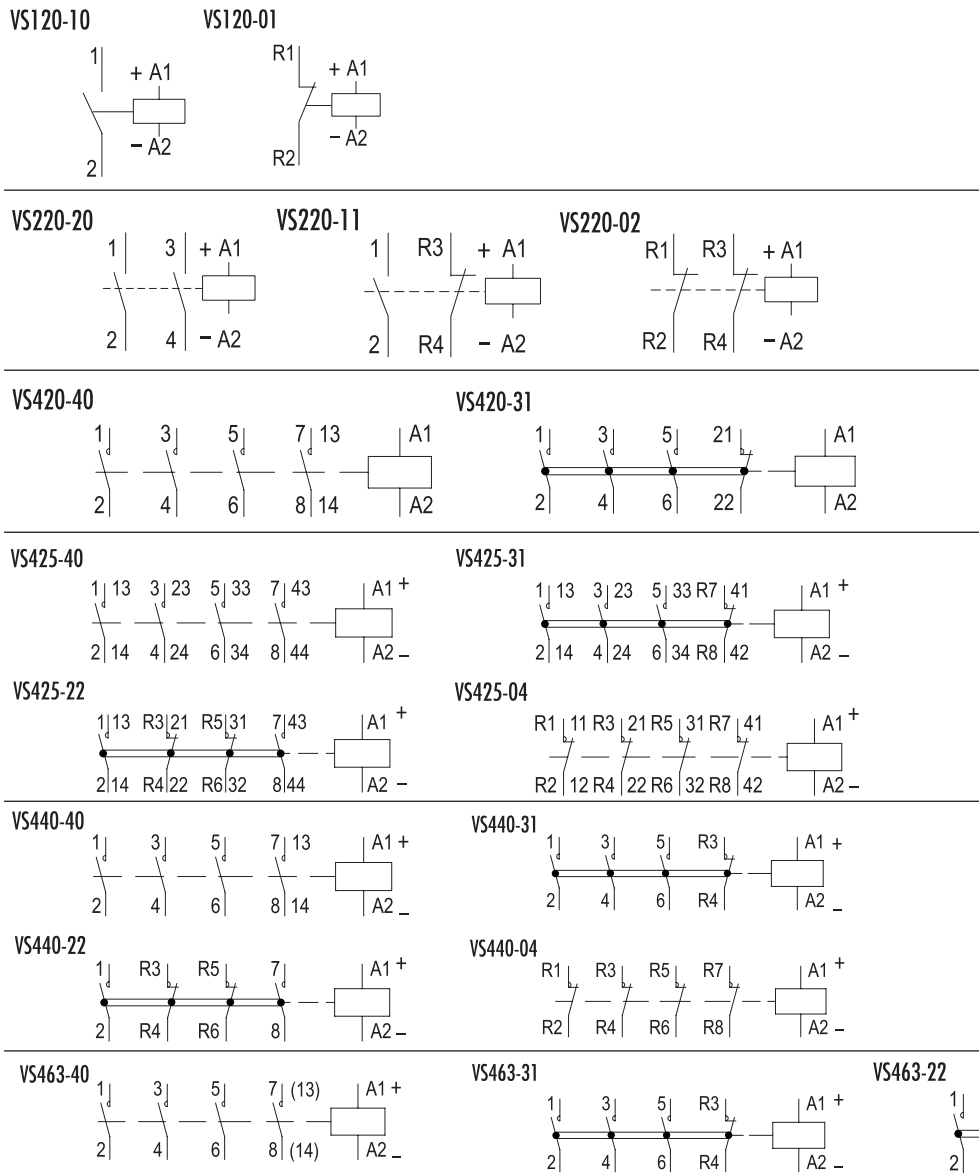


Technical parameters

	VS120	VS220	VS420	VS425	VS440	VS463
Rated insulating voltage	440 V	440 V	415 V	440 V	500 V	500 V
Rated thermo-current I _{th} (in AC1): Rated operation current I _e :	20 A	20 A	20 A	25 A	40 A	63 A
AC-1 for 400 V:	×	×	13 kW	16 kW	26 kW	40 kW
AC-1 for 230 V:	4 kW	4 kW	7.5 kW	9 kW	16 kW	24 kW
AC-3 for 400 V:	×	×	2.2 kW	4 kW	11 kW	15 kW
AC-3 for 230 V:	1.3 kW	1.3 kW	1.1 kW	2.2 kW	5.5 kW	8.5 kW
AC-7a for 400 V:	×	×	13 kW	16 kW	26 kW	40 kW
AC-7a for 230 V:	4 kW	4 kW	7.5 kW	9 kW	16 kW	24 kW
AC-7b for 400 V:	×	×	2.2 kW	4 kW	11 kW	15 kW
AC-7b pro 230 V:	1.3 kW only NO	1.3 kW only NO	1.1 kW	2.2 kW	5.5 kW	8.5 kW
AC-15 for 400 V:	4 A	4 A	4 A	4 A	4 A	4 A
AC-15 for 230 V:	6 A	6 A	6 A	6 A	6 A	6 A
DC1 U _e = 24 V	20 A	20 A	25 A	25 A	40 A	63 A
DC1 U _e = 110 V	1 A	1 A	2 A	2 A	4 A	4 A
DC1 U _e = 220 V	0.5 A	0.5 A	0.5 A	0.5 A	0.8 A	0.8 A
The max. number of switching for max. load						
in AC-7a:	600 switch/hr	600 switch/hr	600 switch/hr	600 switch/hr	120 cycle/hr	600 switch/hr
v AC-7b:	600 switch/hr	600 switch/hr	600 switch/hr	1200 switch/hr	120 cycle/hr	600 switch/hr
v AC-15:	1200 switch/hr	1200 switch/hr	1200 switch/hr	3600 switch/hr	120 cycle/hr	1200 switch/hr
Electrical life						
in AC-7a for 400 V, 25 A:	0.2x10 ⁶	0.2x10 ⁶	0.2x10 ⁶	0.2x10 ⁶	0.1x10 ⁶	0.1x10 ⁶
v AC-7b for 400 V, 12 A:	0.3x10 ⁶	0.3x10 ⁶	0.2x10 ⁶	0.5x10 ⁶	0.15x10 ⁶	0.15x10 ⁶
v AC-15 for 400 V, 2 A:	×	×	×	10 ⁶	×	×
v AC-15 for 230 V, 4 A:	×	×	×	0.8x10 ⁶	×	×
Short circuit protection with the fuse with char. aM:	20 A	20 A	25 A	35 A	63 A	80 A
Coordination type according to EN 60 947-4-1:	1	1	1	1	1	1
Mechanical life:	3x10 ⁶	3x10 ⁶	3x10 ⁶	3x10 ⁶	3x10 ⁶	3x10 ⁶
Electrical strength:	4 kV	4 kV	4 kV	4 kV	4 kV	4 kV
Max. cable size:	10 mm ²	10 mm ²	2.5 mm ²	10 mm ²	25 mm ²	25 mm ²
Control						
Coil control voltage :	AC/DC 24 V, 48 V, 110 V, 230 V	AC/DC 24 V, 48 V, 110 V, 230 V	AC 24 V, 48 V, 110 V, 230 V	AC/DC 24 V, 48 V, 110 V, 230 V	AC/DC 24 V, 48 V, 110 V, 230 V	AC/DC 24 V, 48 V, 110 V, 230 V
Coil permanent supply +/- 10 %:	1.7 W	2.5 W	1.9 W	3 W	5W	5 W
Coil gear supply +/- 10 %:	1.7 W	2.5 W	21.5 W	3 W	5 W	5 W
Weight:	120 g	130 g	170 g	213 g	400 g	400 g
Dimensions:	17.5x85x60 mm	17.5x85x60 mm	35x62.5x57 mm	35x85x60 mm	53.3x84x60 mm	53.3x84x60 mm

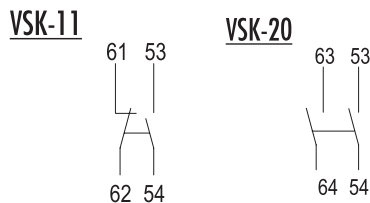
MODULAR CONTACTORS

Connection



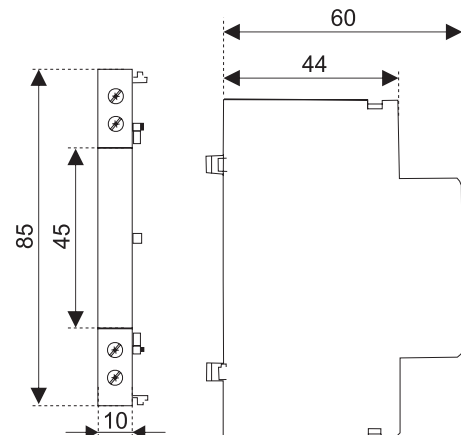
Auxiliary contacts for VS120, VS220 and VS425

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



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

Ambient temperature:	-5 .. +55 °C
Rated voltage:	440 V
Electrical strength	4 kV
Rated current 220 V (AC15):	6 A
Rated current 400 V (AC15):	4 A
Max. switching frequency	600 cycle
Back up fuse - max. value:	6 A



UTILIZATION CATEGORIES



Utilization category	Typical application
AC-1	Non-inductive or slightly inductive loads, resistive furnaces. Example: resistive furnaces
AC-2	Slip-ring motors: starting, plugging and reversing. Example: squirrel-cage motors, lifts, elevators, compressors, pumps, air-conditioning
AC-3	Squirrel-cage motors: starting, disconnecting while running
AC-4	Squirrel-cage motors: starting, plugging, reversing, jogging. Example: lifts, elevators, compressors, pumps, air-conditioning, motor mixers.
AC-5a	Switching of electric discharge lamps
AC-5b	Switching of incandescent lamps
AC-6a	Switching of power transformers
AC-6b	Switching capacitor banks
AC-7a	Small inductive loads in domestic appliances and similar applications
AC-7b	Motor loads for domestic appliances
AC-15	Control of electromagnetic loads (>72 VA)
AC-20	Connecting and disconnecting under no-load conditions
AC-21	Switching of resistive loads including moderate overloads
AC-22	Switching of mixed resistive and inductive loads, including moderate overloads
AC-23	Switching of motors or other highly inductive loads
DC-1	Non-inductive or slightly inductive loads, resistance furnaces
DC-3	Shunt-wound motors: plugging, reversing, jogging, dynamic braking
DC-5	Series-wound motors: starting, plugging, reversing, jogging, dynamic braking
DC-6	Switching of incandescent lamps
DC-13	Control of electromagnets
DC-20	Connecting and disconnecting under no-load conditions
DC-21	Switching of resistive loads including moderate overloads
DC-23	Switching of highly inductive loads (e.g. series-wound motors)

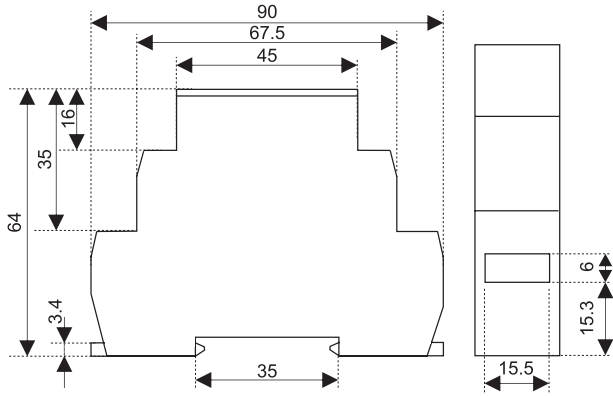
Note: AC-11 is changed to AC-15 and DC-11 to DC-13 respectively

Basic materials types, which are used for contact production of power relays are:

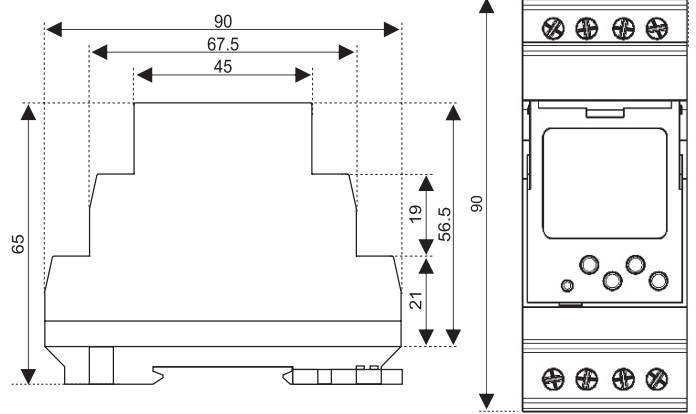
- AgCd** - for resistive loads (because of Cd malignity is this contact on recess).
- AgNi** - for resistive loads, good switches and transfers (no oxidation) low currents/voltages, is not for peak currents and loads with inductive factors.
- AgSn or AgSnO₂** - for switching the loads with inductive part, not good for low currents/voltages, has better immunity for peak currents, good for switching DC, not so good for switching the resistive loads.
- Wf (tungsten)** - special contact for switching peak currents with inductive loads.
- gold alloy (AgNi/Au)** - for the 'better' contact for low currents/voltages, antioxidant.

DIMENSIONS

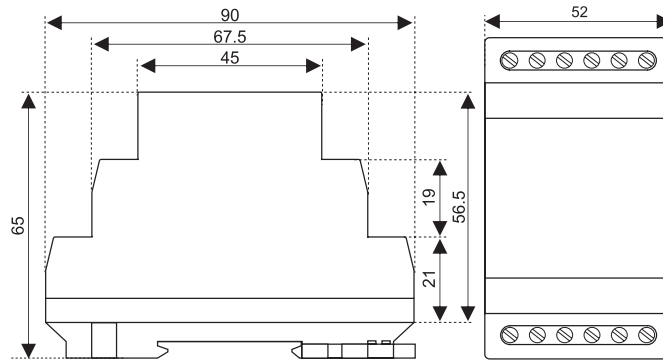
1-MODULE DESIGN



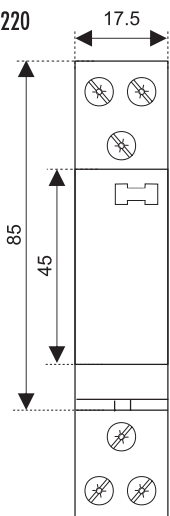
SHT - 1/2



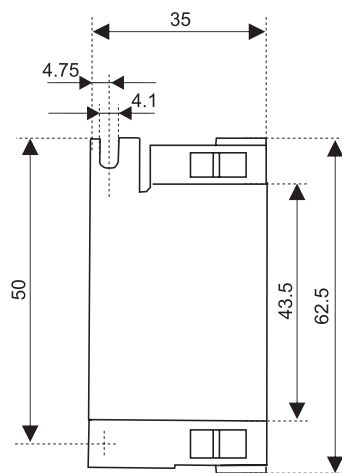
3-MODULE DESIGN



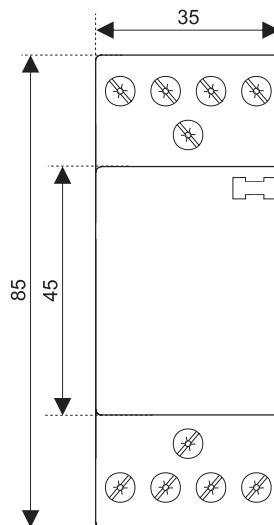
VS120
VS220



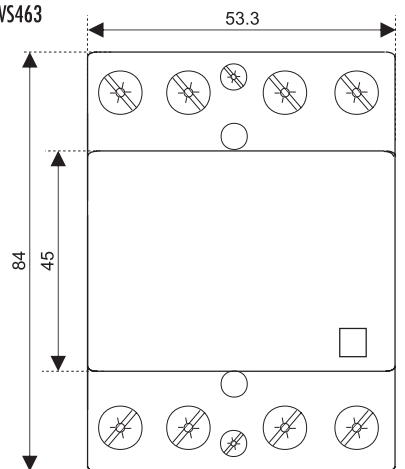
VS420



VS425

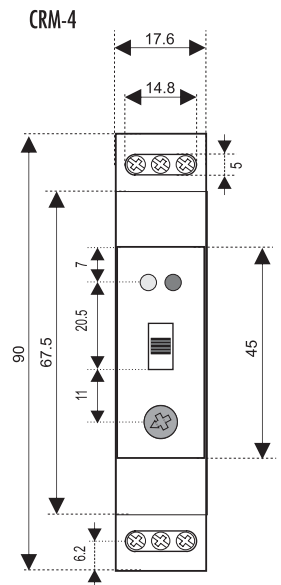
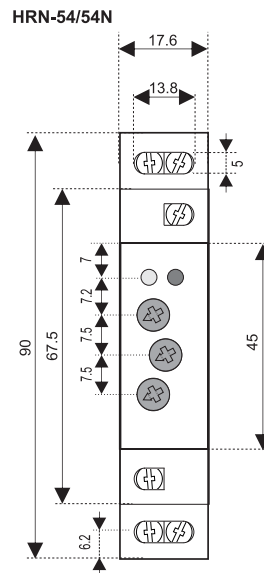
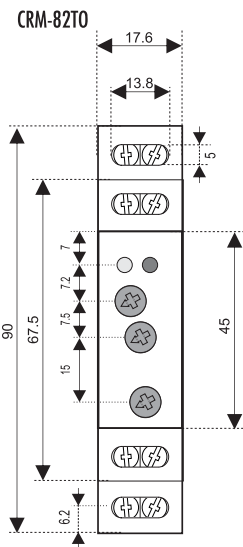
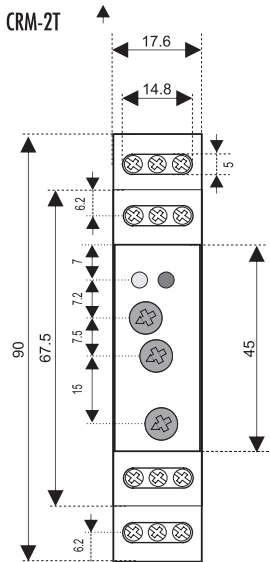
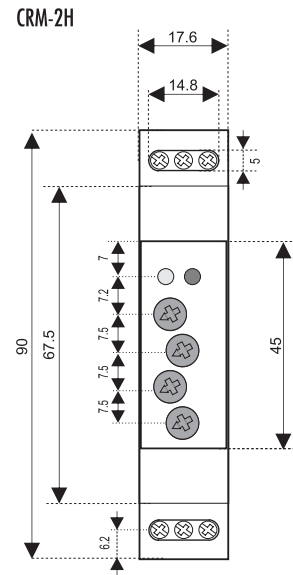
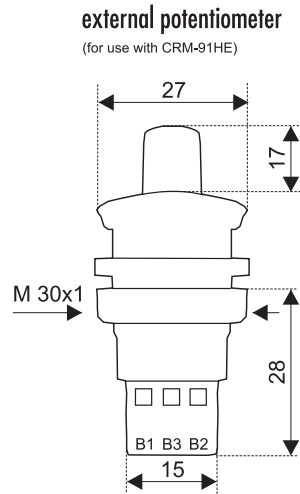
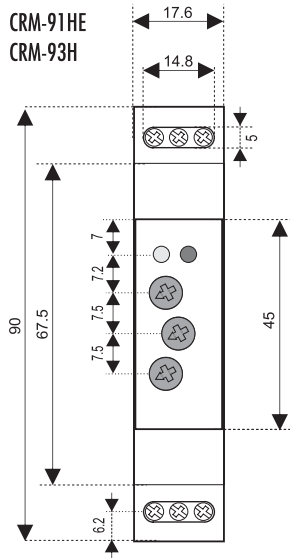


VS440
VS463

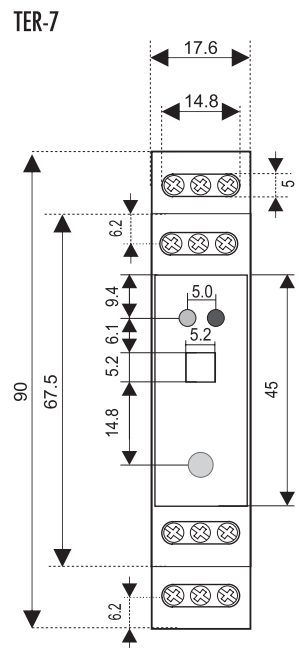
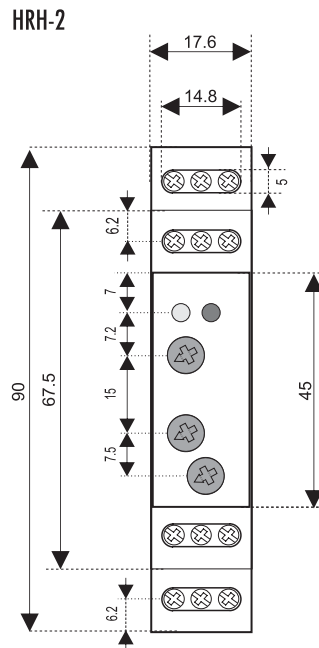
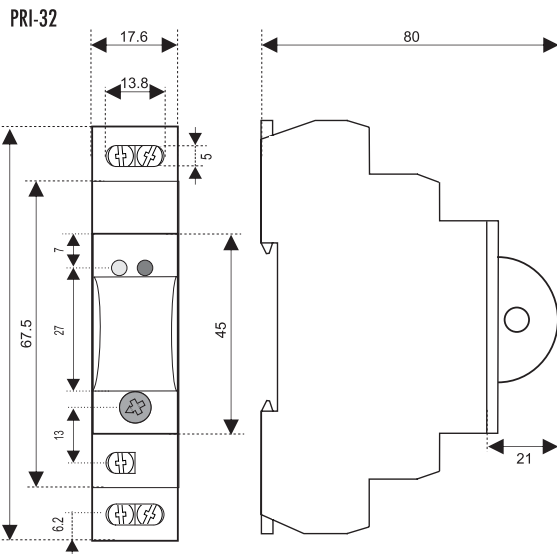
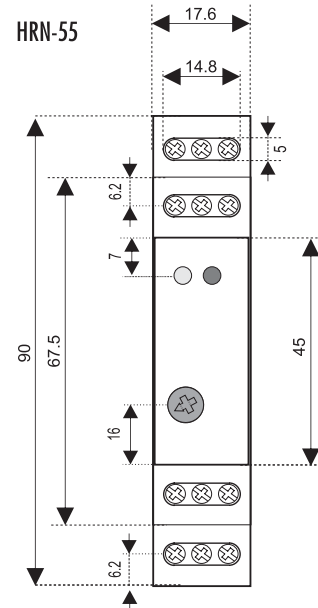
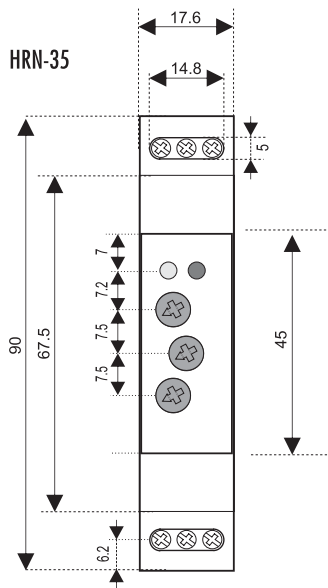




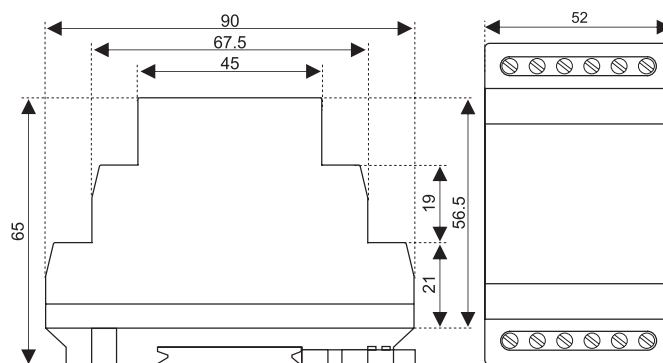
DIMENSIONS



DIMENSIONS



PDR-2, PRI-41, HRN-41, HRN-43N



MONITORING RELAYS FUNCTION CHART



	HRN-35 1-phase Voltage Relay		HRN-43N 3-phase + N Voltage Relay		HRN-54/54N 3-phase + N Voltage Relay		PRI-41 1-phase Current Relay (3 ranges)		HRH-2 Liquid Level Relay		TER-7 Thermistor Relay
	HRN-41 1-phase Voltage Relay (3 ranges)		HRN-55 3-phase Phase Fail/Seq. Relay		PRI-32 1-phase Current Relay						

Type	Phases	Modules	Over (max)	Under (min)	Failure	Sequence	Asymmetry	Type	Function	Supply (V)	Galvanic separation	Monitored voltage/current range		Hysteresis	Delay	MAX independ	independ. MIN	Contacts	Function 2nd relay	Memory	Description					
												Upper level - MAX	WINDOW Bottom level - MIN													
Voltage monitoring Relays																										
HRN-35	1	1	●	●	●	●	●	●	●	from monitored			160-276V	30-99%	●	2		2			- 2 output contacts, for each level independent					
HRN-41	1	3	●	●	●	●	●	●	●	AC230, AC/DC24V AC400V	●	12.5-50V 40-160V	30-90%	●	2	●	●	2	●	●	- monitors AC and DC, galvanically separated measured and supply circuits - 3 measuring ranges, Umin adjusted as % of Umax - 2 output independent relays for each level					
																						125-500V	30-90%	●		
																						160-276V	30-99%	●		
HRN-43N	3	3	●	●	●	●	●	●	●	AC230, 400, AC/DC24V	●	160-276V	30-99%	●	2	●	●	●	●	●	- in 3-phase mains monitoring voltage, failure, sequence and asymmetry of phases. For 3x400/230V					
HRN-55	3	1	●	●	●	●	●	●	●	from monitored		420-500V/ 242-288V		●	1		1				- simple version of HRN-43N, controlling failure and sequence of phases					
HRN-54/54N	3	1	●	●	●	●	●	●	●	from monitored		300-380V/ 173-219V		●	1		1				- for circuits 3x400V (HRN-54), 3x400V/230V (HRN-54N)					
Current monitoring Relays																										
PRI-32	1	1	●							AC2+240, DC24V		1-20A		●	1			1			- adjustable current value, output contact closes when value exceeded					
PRI-41	1	3	●	●	●	●	●	●	●	AC230, AC/DC24V AC400V AC110V	●	0.4-1.6A 1.25-5A 4-16A	30-90%	●	2	●	●	2	●	●	●	- monitors AC and DC, galvanically separated measured and supply circuits - 3 measuring ranges, Imin adjusted as % of Imax - 2 output independent relays for each level				
																								30-90%	●	
																								30-90%	●	
Level switch																										
HRH-2	1	1	●	●	●	●	●	●	●	AC110V/AC/DC30V AC/DC24V	●	5-100kΩ		●	1			1			- selectable function of pump in/out and sensitivity of sounders acc. to resistance of liquid.					
Thermistor Relay																										
TER-7	1	1	●							AC230V AC/DC24-240V		3.3kΩ	1.8kΩ								- temperature monitoring of motors via PTC thermistor in winding					



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