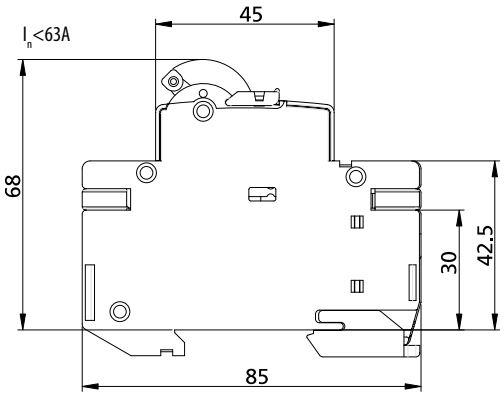
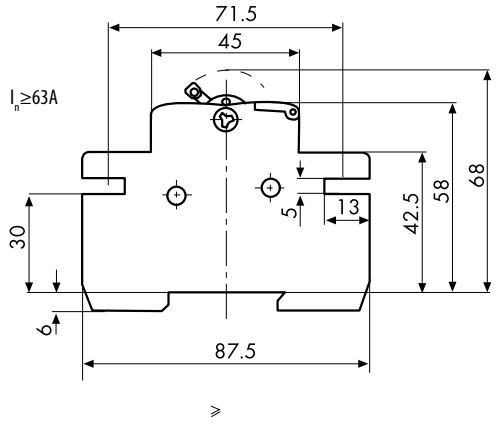
Build-in switch SV

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

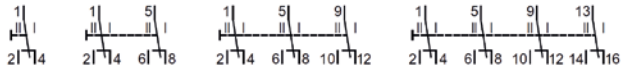


Technical data	
Type	**63-125A**
Electrical	
Number of poles	1p, 2p, 3p, 4p
Rated operational voltage Ue	1p: 230/400V AC, 24V DC 2p: 400V AC, 48V DC 3p, 4p: 400V AC
Rated current In	63, 80, 100, 125A
Rated Insulation voltage Ui	AC: 1000V; DC:1500V
Rated impulse withstand voltage Uimp	4 kV
Utilization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

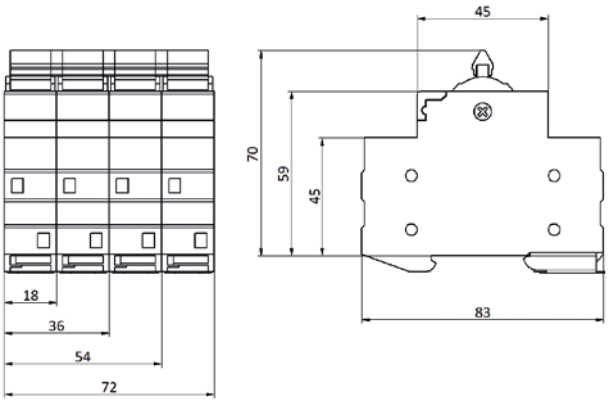


Build-in devices "EVESYS"

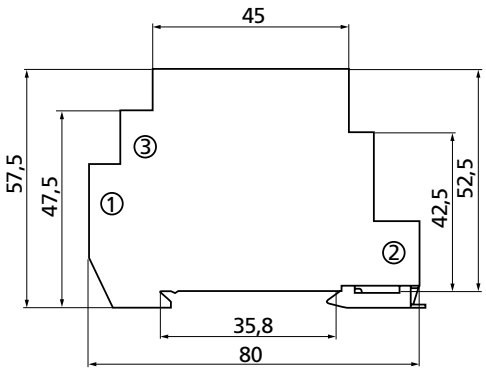
Technical data	
Rated voltage U_n	230/400V AC
Rated current I_n	25A, 40A
Rated frequency f_n	50/60 Hz
Terminals	1,5 - 16 mm², max 1,8 Nm
Electrical insulation	>3mm contact space
Rated short-circuit making capacity	2,5 kA
Pollution degree	3 (for Switch)
Degree of protection	IP20
Width of the switch	18mm
Standards	PN-IEC 60947-3
Mounting position	any



SSQ 125 SSQ 140 | SSQ 225 SSQ 240 | SSQ 325 SSQ 340 | SSQ 425 SSQ 440

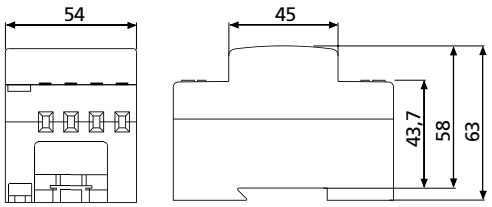


Technical data				
	SON H-1R	SON H-1G	SON H-3R	SON H-3K
Rated voltage U_n	240V AC		3x240V AC	
Voltage tolerance	-25%...+10%			
Rated frequency f_n	50/60Hz			
Power consumption	0,267W (240V AC)		1,04W (240V AC)	
Diode colour	1 red	1 green	3 red	1 red, 1 yellow, 1 green
Protection class	Casing: IP40, terminals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

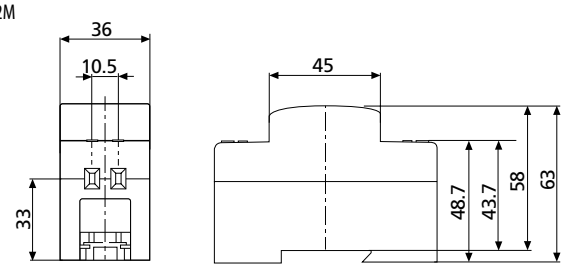


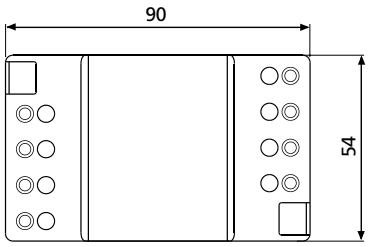
Bell/Buzzer

3M

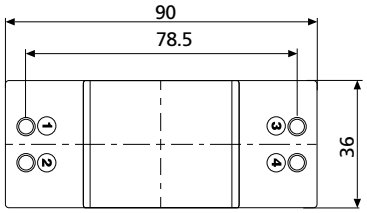


2M

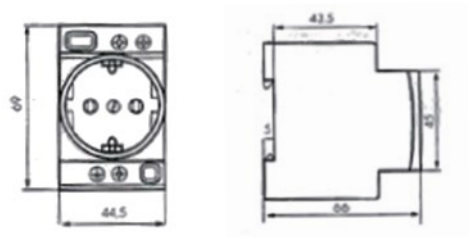




Bell transformer type 3M



Bell transformer type 2M



DIN socket

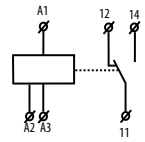
Power relays VS116K, VS316K

Technical data

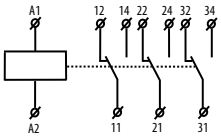
	VS116K	VS316/24	VS316/230
Supply terminals	A1 - A2		
Voltage range	230 V AC/50-60 Hz	24 V AC/DC/ 50-60 Hz	230 V AC/ 50-60 Hz
Burden	AC max. 7.5 VA/ 1W	1.6 VA/ 1.2 W	2.5 VA
Supply terminals	A1-A3	x	
Voltage range	24 V AC/DC (50-60 Hz)	x	
Burden	1 VA AC/ 1W DC	x	
Supply voltage tolerance	-15%; +10%		
Output			
Number of contacts	1 x changeover/ SPDT (AgSnO2)	3 x changeover/ 3PDT ($AgSnO_2$)	
Current rating	16 A/ AC1	16A/ AC1	
Breaking capacity	4000VA/ AC1, 384W/ DC	4000VA/ AC1, 384W/ DC	
Inrush current	30 A/ <3s	30 A/ <3s	
Switching voltage	250 V AC1/ 24 V DC		
Min. breaking capacity DC	500 mW		
Output indication	high intensity of LED		
Mechanical life	3x107	1x107	
Electrical life (AC1)	0.7x105	1x105	
Time between switching	min. 2s	20 ms	50 ms
Other information			
Operating temperature	-20 °C ... +55 °C (-4 °F ... 131 °F)		
Storage temperature	-30 °C ... +70 °C (-22 °F ... 158 °F)		
Electrical strength	4 kV (supply-output)		
Operating position	any		
Mounting/DIN rail	DIN rail EN 60715		
Protection degree	IP 40 from front panel		
Overvoltage category	III.		
Pollution degree	2		
Max. cable size (mm^2)	max.1x 2.5 / 2x1.5		
	max. 1x2.5 (AWG 12)		
Dimensions	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)		
Weight	54 g (1.9 oz.)	90 g (3.17 oz.)	92 g (3.25 oz.)
Standards	EN 61810-1, EN 61010-1		

Symbol

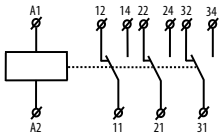
VS116K



VS316/24

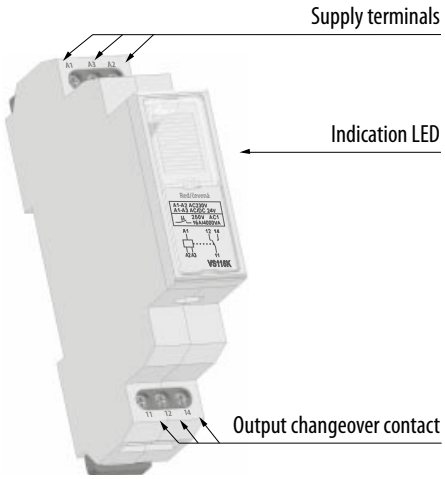


VS316/230



Description

VS116K

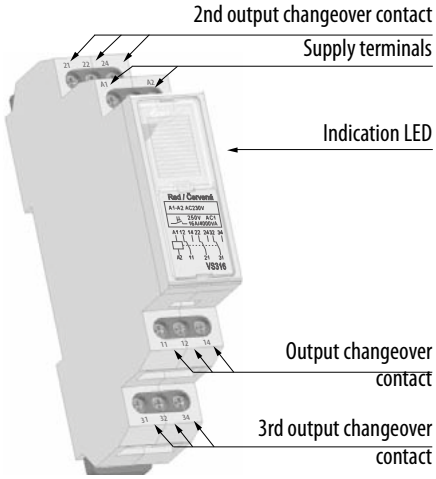


terminal A3 only for VS116K

Notes

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

VS316/24, VS316/230

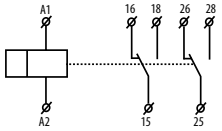


Delay OFF without supply voltage CRM-82TO

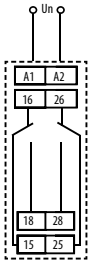
Technical data

	CRM-82TO
Number of functions	a - On Delay (Power On)/ e - Off Delay (S Break)
Supply terminals	A1 - A2
Voltage range	12 - 240 V AC/DC(AC 50 - 60 Hz)
Burden	0.7 - 3 VA AC/ 0.5 - 1.7 W DC
Supply voltage tolerance	-15 %; +10 %
Supply indication	green LED
Time ranges	0.1 s - 10 min
Time setting	potentiometer
Time deviation	5 % - mechanical setting
Repeat accuracy	0.2 % - set value stability
Temperature coeffi cient	0.01 % / °C, at = 20 °C (0.01 % / °F, at = 68 °F)
Output	
Number of contacts	2x changeover/SPDT (AgNi/ Silver Alloy)
Current rating	8 A / AC1
Breaking capacity	2000 VA / AC1, 192 W / DC
Inrush current	10 A / <3 s
Switching voltage	250 V AC1 / 24 V DC
Min. breaking capacity DC	500 mW
Output indication	red LED
Mechanical life	3x107
Electrical life (AC1)	0.7x105
Other information	
Operating temperature	-20 °C ... +55 °C (-4 °F ... 131 °F)
Storage temperature	-30 °C ... +70 °C (-22 °F ... 158 °F)
Electrical strength	4 kV (supply-output)
Mounting/DIN rail	DIN rail EN 60715
Protection degree	IP 40 from front panel / IP 10 terminals
Operating position	any
Overvoltage category	III.
Pollution degree	2
Max. cable size(mm^2)	solid wire max. 2x2.5 or 1x4 (AWG 12)
	with sleeve max. 2x1.5 or 1x2.5 (AWG 12)
Dimensions	90 x 17.6 x 64 mm (3.5″ x 0.7″ x 2.5″)
Weight	93 g (3.3 oz.)
Standards	EN 61812-1, EN 61010-1

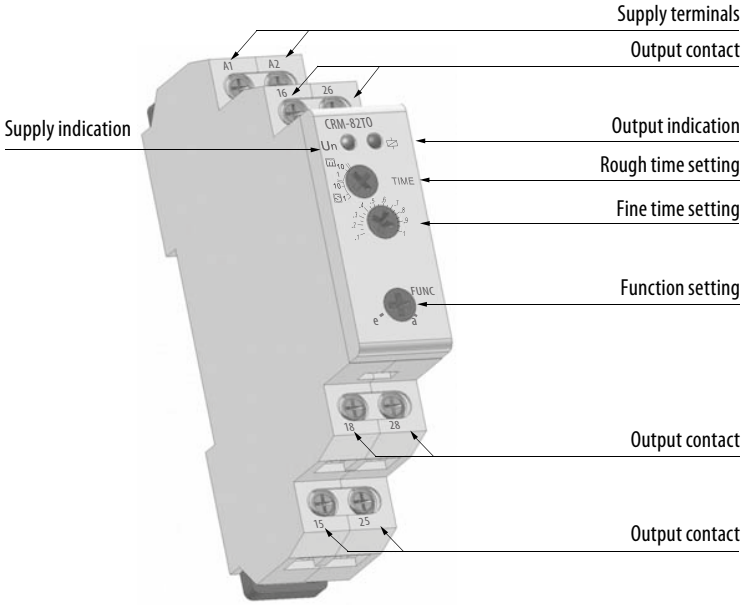
Symbol



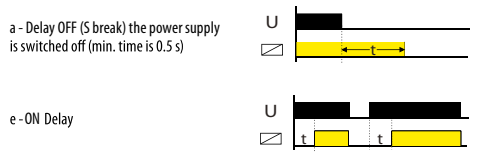
Connection



Description



Function



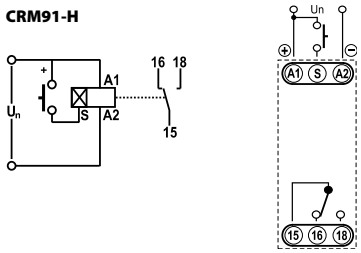
Multifunction time relay CRM-91H, CRM-93H

Technical data

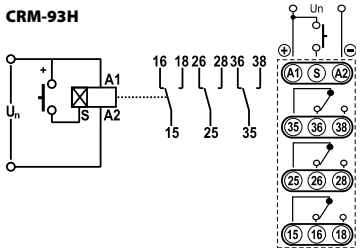
	CRM-91H	CRM-93H
Number of functions	10	
Supply	A1-A2	
Supply voltage	12-240 V AC/DC(50-60 Hz AC)	
Consumption	AC 0,7-3 VA / DC 0,5 - 1,7 W	
Supply indication	green LED	
Time ranges	0.1 s-10 days	
Time settings	rotary switch	
Time deviation	5%-mechanical setting	
Repeat accuracy	0,2%-set value stability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

Connection

CRM91-H

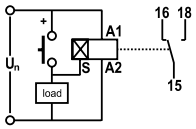


CRM-93H



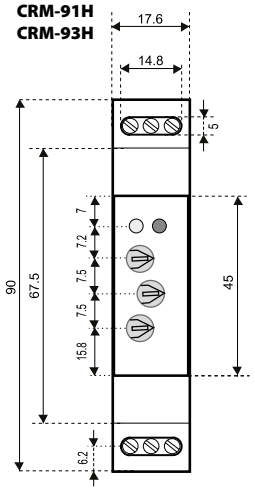
Load with control input possible.

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

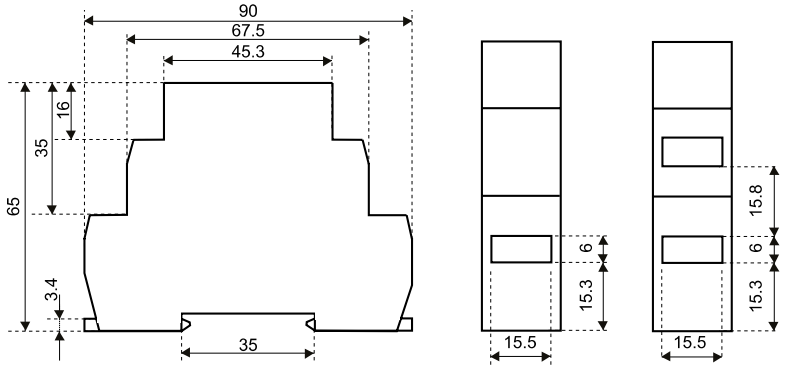


Dimensions

CRM-91H
CRM-93H



1-module design



Functions

a) Delay ON after energisation

b) Delay OFF after energisation

c) Cycler beginning with pause after energisation

d) Cycler beginning with impulse after energisation

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

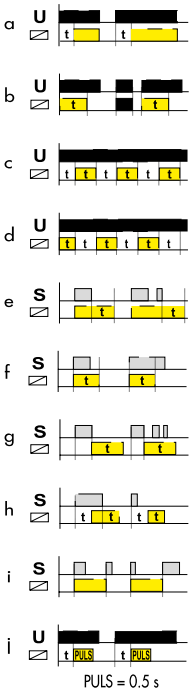
f) Delay OFF responding to make of control contact regardless its length

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

h) Delay OFF after make and break of control. contact

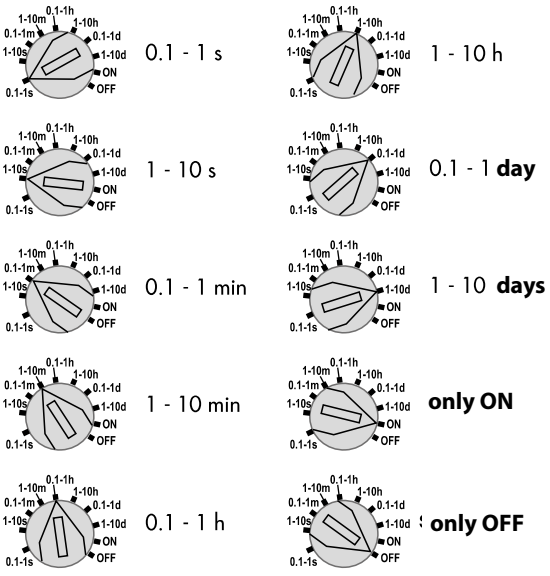
i) Memory (latching) relay

j) Pulse generator

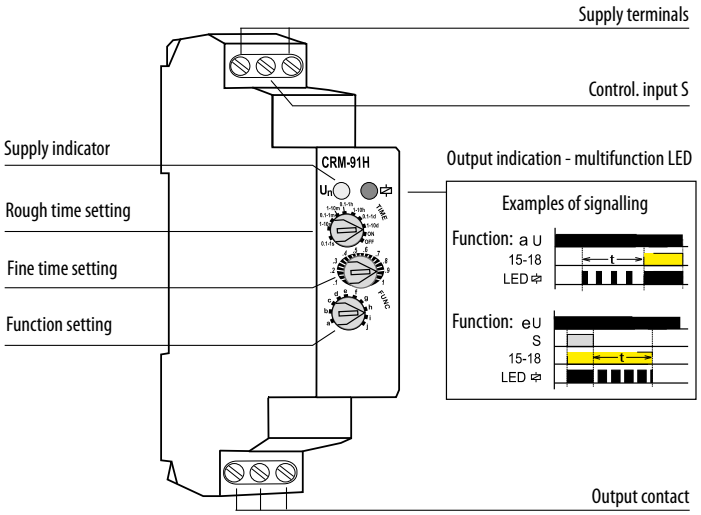


PULS = 0.5 s

Time ranges



Description



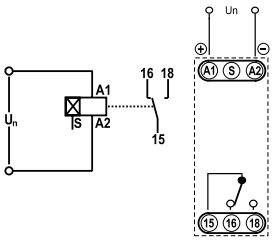
Time relay CRM-2H

Technical data

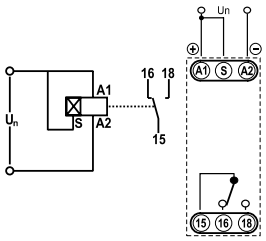
Number of functions	2
Supply	A1-A2
Supply voltage	12-240 V AC/DC (50-60 Hz AC)
Consumption	AC 0,7-3 VA / DC 0,5 - 1,7 W
Supply indication	green LED
Time ranges	0.1 s-100 days
Time setting	rotary switch and potentiometer
Time deviation	5% mechanical setting
Repeat accuracy	0,2% set value stability
Temperature coefficient	0,01% / °C -> 20 °C
Output	
Changeover contacts	1
Rated current	16A / AC1
Breaking capacity	4000 VA / AC1, 384 W /DC
Inrush current (duty factor 10%)	30 A / <3 s
Switching voltage	250 V AC1 / 24 V DC
Min. breaking capacity DC	500 mW
Output indication	multifunction red LED
Mechanical life	$3x10^7$
Electrical life	$0,7x10^5$
Reset time	max. 150 ms
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV (supply-output)
Operating position	any
Mounting/DIN rail	EN 60715
Protection degree	IP 40 from frontal panel
Overvoltage category	III
Pollution degree	2
Max. cable size	2,5 mm^2
Dimensions	90x17,6x64 mm^2
Standards	EN 61812-1, EN 61010-1

Connection

Cycler beginning with pulse

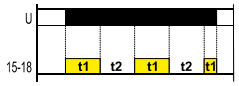


Cycler beginning with pause

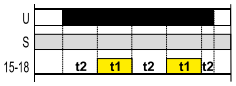


Functions

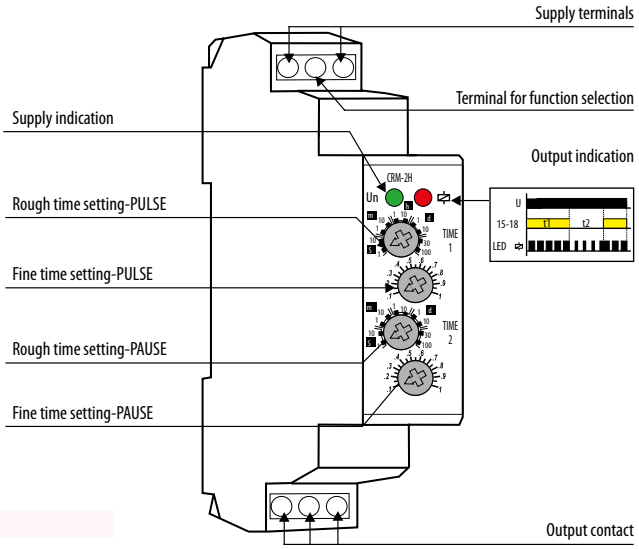
Cycler beginning with pulse



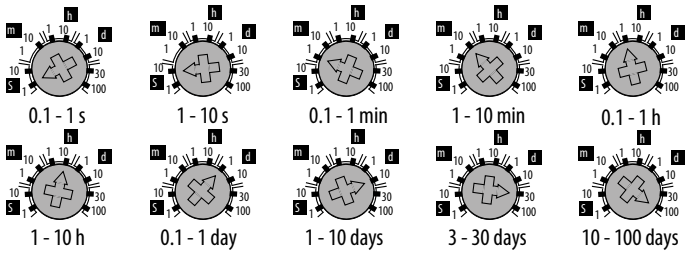
Cycler beginning with pause



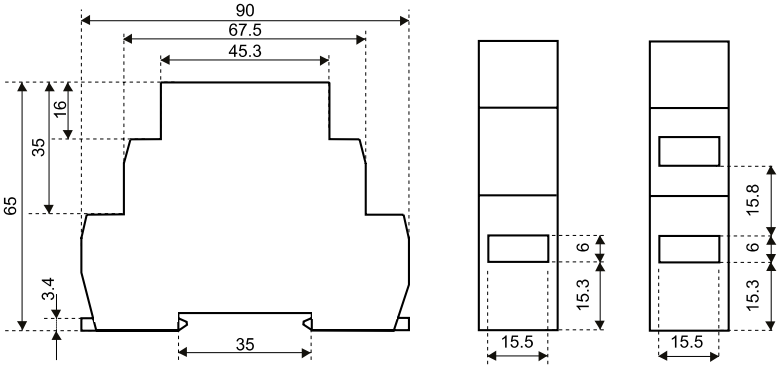
Description



Time ranges

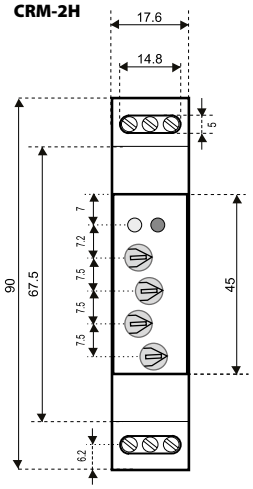


1-module design



Dimensions

CRM-2H

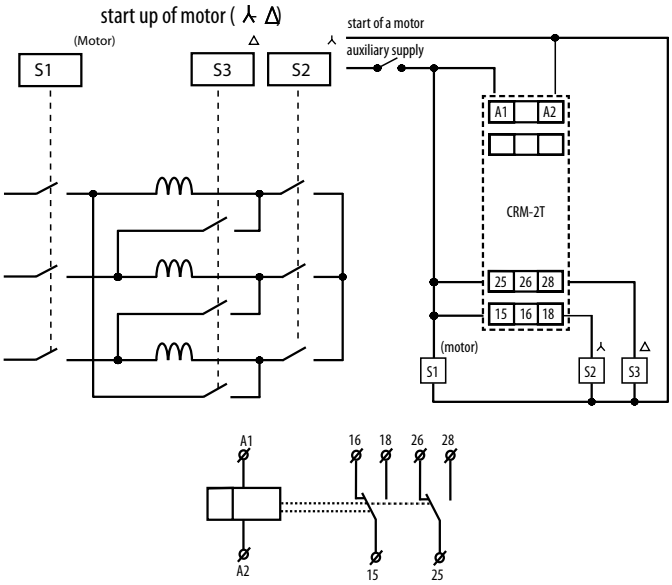


Delay ON star/delta CRM-2T

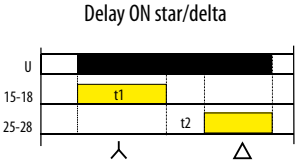
Technical data

	CRM-2T
Number of functions	1
Supply	A1-A2
Universal supply	AC/DC 12-240 V (AC 50-60 Hz)
Consumption	AC 0,7-3VA/DC 0,5-1,7 W
Supply voltage tolerance	-15% - +10%
Supply indication	green LED
Time ranges	t1: 0.1 s - 100 days
Time setting	rotary switch and potentiometer
Time deviation	5%-mechanical setting
Repeat accuracy	0,2%-set value stability
Temperature coefficient	0,01% / °C at 20 °C
Output	
Number of contacts	2 x changeover (AgNi)
Rated current	16 A / AC1
Breaking capacity	4000 VA / AC1, 384 W / DC
Inrush current (duty factor 10%)	30A/<3s
Switching voltage	max. 250 V AC1 / 24 V DC
Min. breaking capacity DC	500 mW
Output indication	multifunction red LED
Mechanical life	$3x10^7$
Electrical life	$0.7x10^5$
Reset time	max. 150 ms.
Controlling	
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from front panel
Overvoltage category	III
Pollution degree	2
Max. cable size	2.5 mm^2
Dimensions	90 x 17,6 x 64 mm
Standards	EN 61812-1, EN 61010-1

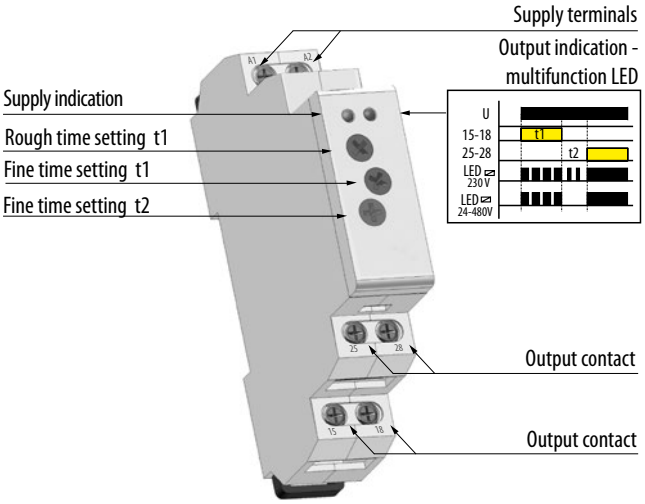
Connection



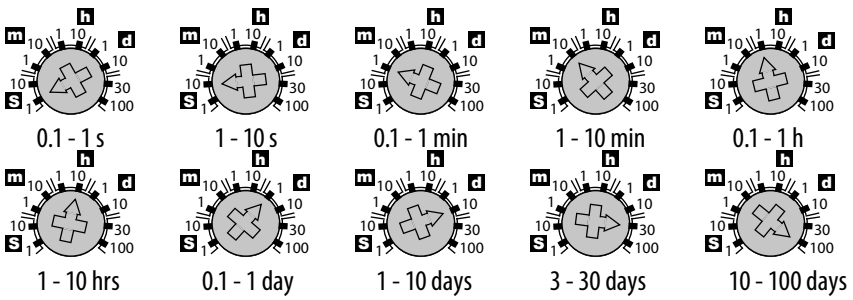
Functions



Description



Time ranges

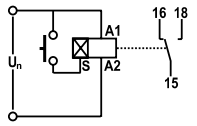


Staircase switch CRM-4

Technical data

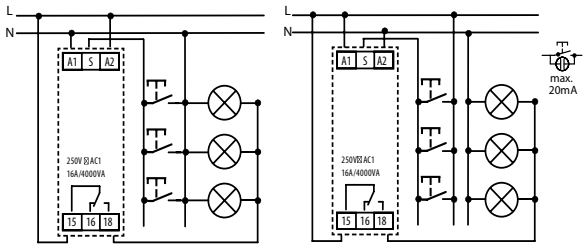
Function	delay OFF
Supply	A1-A2
Supply voltage	230 V AC/50-60 Hz
Consumption	max. 12 VA AC/1.8 W
Supply voltage tolerance	- 15%; + 10%
Supply indication	green LED
Time ranges	0,5 - 10 min
Time setting	potentiometer
Time deviation	10% mechanical setting
Repeat accuracy	5% set value stability
Temperature coefficient	0,05% / °C -> 20 °C
Output	
Changeover contacts	1
Rated current	16 A / AC1
Breaking capacity	4000 VA / AC1, 384 W /DC
Inrush current (duty factor 10%)	30 A / <3 s
Switching voltage	250 V AC1 / 24 V DC
Min. breaking capacity DC	500 mW
Output indication	red LED
Mechanical life	$3x10^7$
Electrical life	$0,7x10^5$
Controlling	
Control. voltage	230 V AC
Consumption of input	0,53 VA AC
Load between S-A2	yes
Glow-tubes	yes, max. 20 pcs. (at 1 mA)
Control. terminals	A1-S
Impulse length	min. 25 ms/max. unlimited
Reset time	max. 150ms
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from frontal panel
Overvoltage category	III
Pollution degree	2
Max. cable size	$2,5\ mm^2$
Dimensions	90x17, 6x64 mm
Standards	EN 60669-2-3, EN 61010-1

Connection

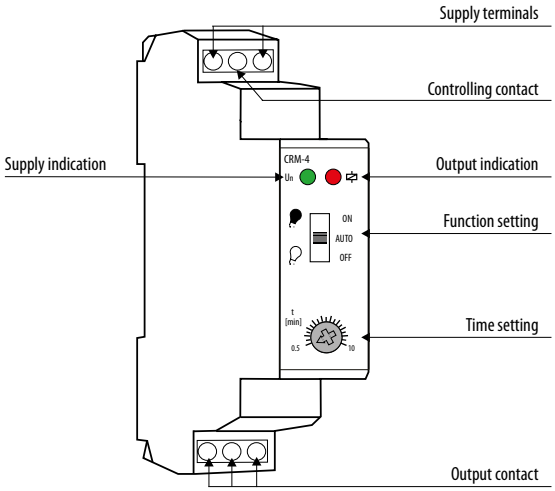


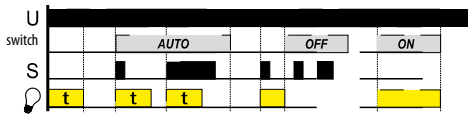
3-wire connection

4- wire connection



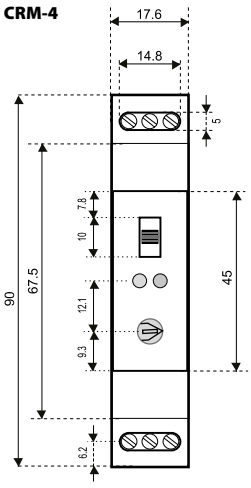
Description



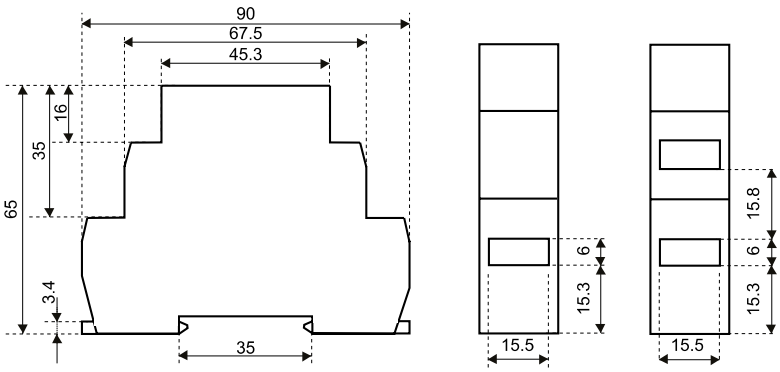


Dimensions

CRM-4



1-module design



Programmable staircase switch CRM-46

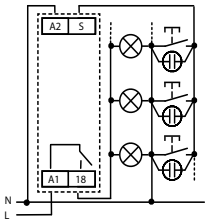
Technical data

	CRM-46
Number of functions	6
Supply	A1-A2
Supply voltage	230 V AC / 50-60Hz
Consumption	max. 3VA AC / 1.6 W
Max. dissipated power (U_n + terminals)	4 W
Supply voltage tolerance	-15% - +10%
Supply indication	green LED
Time ranges	0.5 - 10 min
Time setting	potentiometer
Time deviation	5%-mechanical setting
Repeat accuracy	5%-set value stability
Temperature coefficient	0.01 % / °C, at = 20 °C
Output	
Number of contacts	1x NO - SPST($AgSnO_2$), switching potential A1
Rated current	16 A / AC1
Breaking capacity	4000 VA / AC1, 384W / DC
Inrush current	30A / < 3s.
Switching voltage	max. 250 V AC / 24 V DC
Output indication	red LED
Mechanical life	10^7
Electrical life (AC1)*	$5x10^4$
Control	
Control Voltage	230 V AC
Power the control input max.	4.5 VA / 0.3 W
Glow tubes	✓
Max. current of connected glow lamps	100 mA
Control terminals	A1-S / A2-S
Impulse length	min 40ms. / max.unlimited
Reset time	max. 320 ms.
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from front panel / IP10 terminals
Overvoltage category	III.
Pollution degree	2
Max. cable size	
- Solid wire max.	2x2.5 mm^2 / 1x4 mm^2
- with sleeve max.	1x2.5 mm^2 / 2x1.5 mm^2
Dimensions	90 x 17,6 x 64 mm
Standards	EN 61812-1

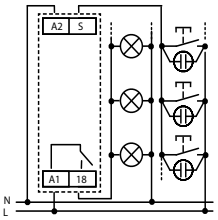
* For higher loads and frequent switching, it is recommended to strengthen the relay contact with a power contactor.

Connection

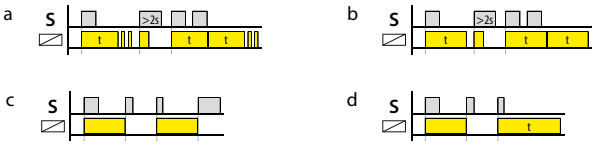
3-wire connection



4-wire connection



Functions



When switching between functions, the red LED flashes.

a - STAIRCASE SWITCH, programmable with signalization

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

b - STAIRCASE SWITCH, programmable without signalization

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

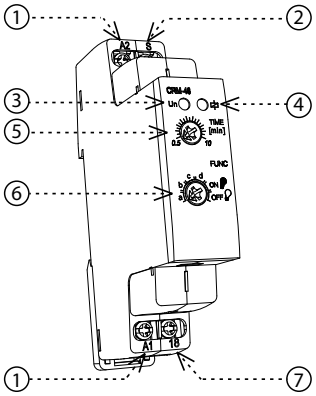
c - MEMORY LATCH (press to switch on, press to switch off)

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

d - MEMORY LATCH with delay

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

Description



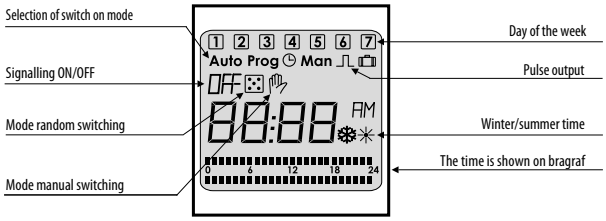
1. Supply terminal
2. Controlling input
3. Supply indication
4. Output contact timing / closing indication
5. Time delay setting 0.5 - 10 min
6. Function setting
7. Output contact

Type of load	AC1	AC2	AC3	AC5a uncompensated	AC5a compensated	AC5b	AC6a	AC7b	AC12
mat. contacts $AgSnO_2$, contact 16A	250V / 16A	250V / 5A	250V / 3A	230V / 3A (690VA)	230V / 3A (690VA) max. input C=14uF	1000W	x	250V / 3A	x
Type of load	AC13	AC14	AC15	DC1	DC3	DC5	DC12	DC13	DC14
mat. contacts $AgSnO_2$, contact 16A	x	250V / 6A	250V / 6A	24V / 10A	24V / 3A	24V / 2A	24V / 6A	24V / 2A	x

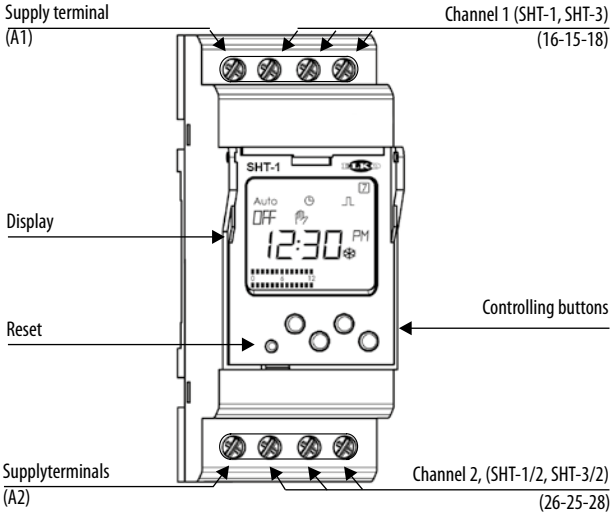
Digital time switch SHT-1, SHT-1/2, SHT-3 and SHT-3/2

Technical data		
Supply terminals	A1-A2	
Supply voltage	UNI	12 - 240 V AC/DC (50 AC - 60 Hz)
Consumption		0,5 - 2 VA AC/ 0,4 - 2 W DC
Supply voltage	230	230 V AC/50 - 60 Hz
Consumption		max. 14 VA AC / 2 W
Supply voltage tolerance	-15%; +10%	
Back-up supply	yes	
Summer/winter time	automatic	
Output		
Number of contacts	1x CO → SHT-1, SHT-3; 2X CO → SHT-1/2, SHT-3/2	
Rated current	16 A / AC1	
Breaking capacity	4000 VA /AC1, 384 W / DC	
Inrush current (duty factor 10%)	30 A / < 3 s	
Switching voltage	250 V AC1 /24 V DC	
Min. breaking capacity DC	500 mW	
Mechanical life	$>3x10^7$	
Electrical life (AC1)	$>0,7x10^5$	
Time circuit		
Power back-up	3 years	
Accuracy	max. +/-1s/dat / 23°C	
Minimum interval	1 s	
Data stored for	min. 10 years	
Program circuit		
Program SHT-1, SHT-1/2	daily, weekly	
Program SHT-3, SHT-3/2	daily, weekly, monthly, yearly	
Data readout	LCD display	
Other information		
Operating temperature	-20...+55°C	
Storage temperature	-30...+70°C	
Electrical strength	4 kV (supply-output)	
Operating position	any	
Mounting	DIN rail EN 60715	
Protection degree	IP 20	
Overvoltage category	III	
Pollution degree	2	
Max. cable size	max. 2x1,5 mm^2, 2x2,5 mm^2	
Dimensions	90x35, 6x64mm	
Standards	EN 61812-1, EN 61010-1	

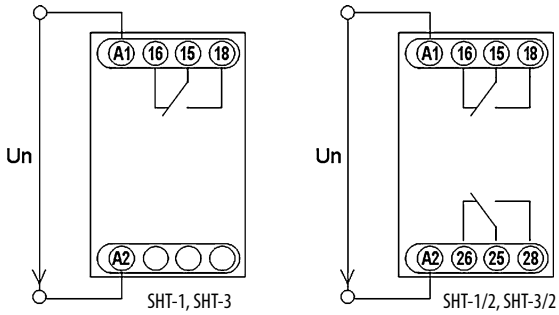
Controlling elements



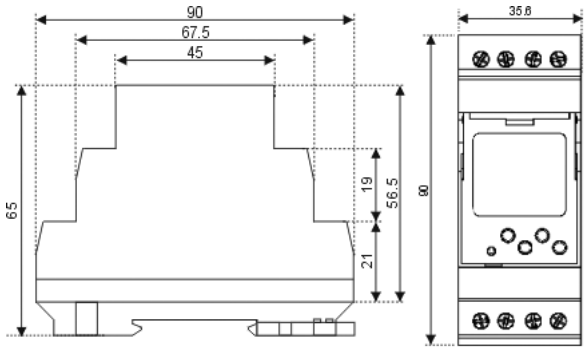
Description



Connection



Dimensions

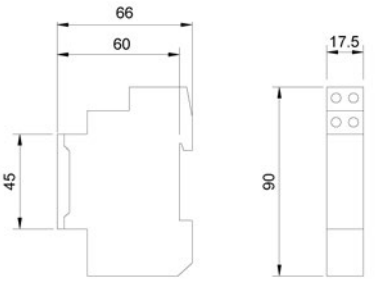


Analog electromechanical time switch APC-D1, APC-DR1

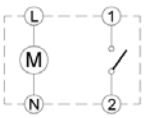
Technical data

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

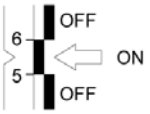
Dimensions



Connection



Programming



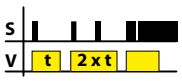
Multifunction relays SMR-T, SMR-H, SMR-B

Technical data

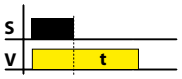
	SMR-T	SMR-H	SMR-B
Number of functions	9	9	10
Connection	3-wires, without neutral	4-wires, with neutral	4-wires, with neutral
Supply voltage	230 V AC / 50-60 Hz		
Consumption (no operation/make)	0,8/3 VA	0,8/3 VA	3 VA
Supply voltage tolerance	- 15%; + 10%		
Time ranges	0,1 s-10 days	0,1 s-10 days	x
Time setting via	via rotary switch and potentiometer	via rotary switch and potentiometer	x
Time deviation	10% mechanical setting	10% mechanical setting	x
Repeat accuracy	2% set value stability	2% set value stability	x
Temperature coefficient	0,1%, °C at 20 °C	0,1%, °C at 20 °C	x
Output	1x triac		1xNO (AgSnO2)
Resistive load	10-160 VA	0-200 VA	16A 125/250 V AC1
Inductive load	10-100 VA	0-100 VA	8A 250 V AC (cos fi > 0,4)
Controlling			
Voltage	230 V AC		
Current	3 mA		
Impulse length	min. 50 ms/ max. unlimited		
Operating temperature	0...+50 °C		
Operating position	any		
Mounting	free at connecting wires		
Protection degree	IP 30 from front panel		
Overvoltage category	III		
Pollution degree	2		
Fuse	F1 A / 250 V	F1 A / 250 V	F1,6 A / 250 V
Outlets	3 x solid wires 0,75 mm² length 90 mm		
Glow-laps in button (pcs)	max. 10		
Dimensions	48,5 x 48,5 x 13 mm		
Standards	EN 61010-1		

Function

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



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



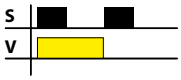
Function c - delay off on downward edge
after switching off output switches on and times.

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

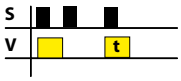
Function e - puls shift
delay on after the switch is switched on and delay on after it is switched off

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

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

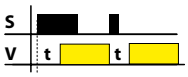


Function h - impulse relay with delay
one press switches on, another one switches the output off in case it is done before the end of timing



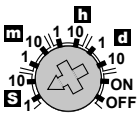
Function i - delay on after switched off
output cycles in regular intervals, cycler starts with a gap

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

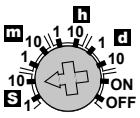


*function j is valid only for SMR-B

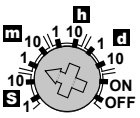
Time ranges



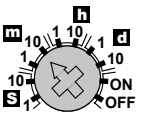
0.1 - 1 s



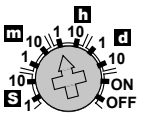
1 - 10 s



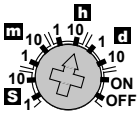
0.1 - 1 min



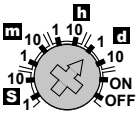
1 - 10 min



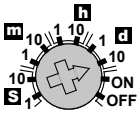
0.1 - 1 hrs



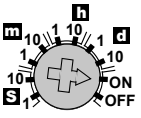
1 - 10 hrs



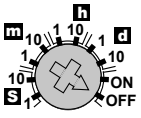
0.1 - 1 day



1 - 10 days

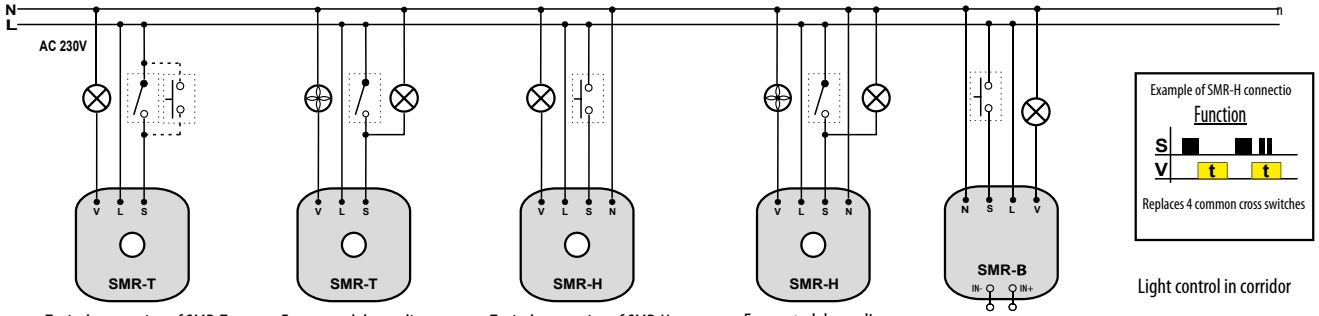


only ON



only OFF

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



Typical connection of SMR-T - timer for light

Fan control depending on light

Typical connection of SMR-H - timer fot light

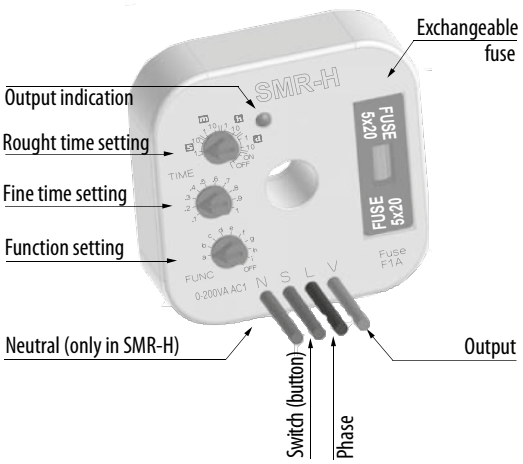
Fan control depending on light

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

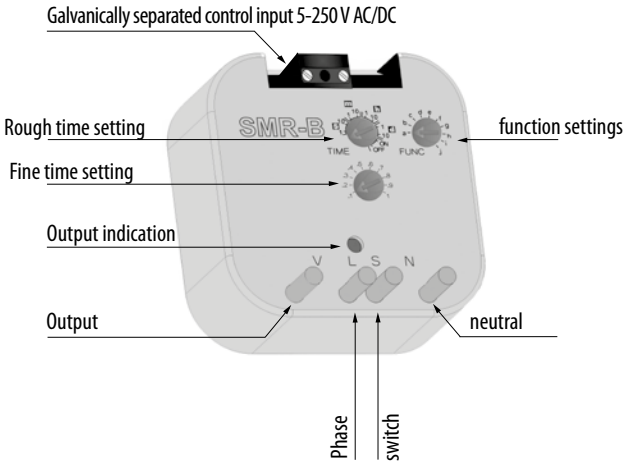
Light control in corridor

Description

SMR-T, H

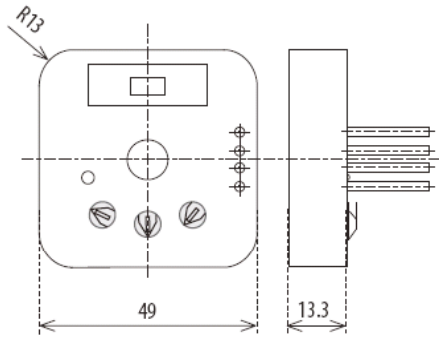


SMR-B

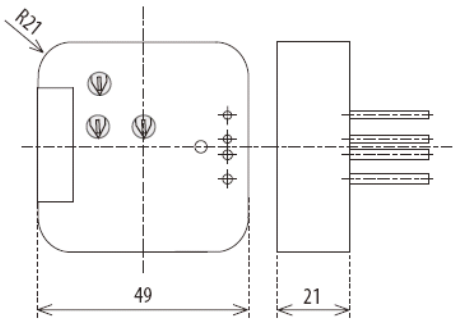


Dimension

SMR-T, SMR-H



SMR-B



Dimmer flush mounting SMR-S, SMR-U

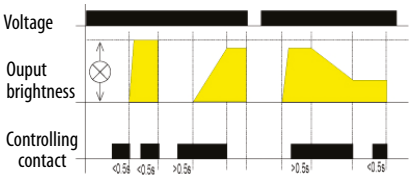
Technical data

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

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

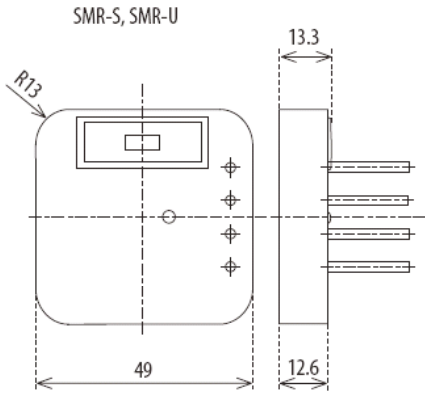
Warning: it cannot be used for fluorescent lights and energy saving lights!
SMR-U: It is not allowed to connect together loads of inductive and capacitive type at the same time

Functions

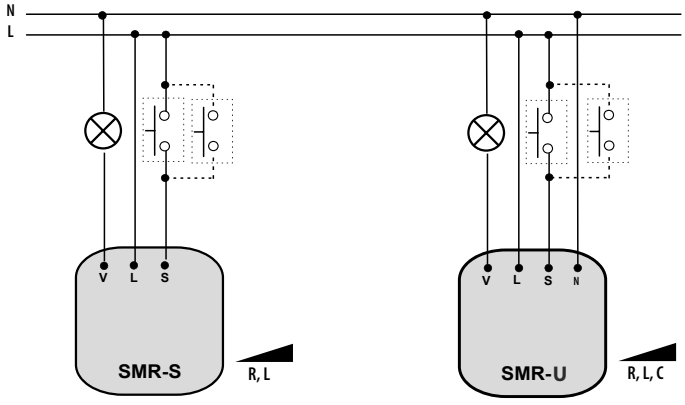


KA short press (<0.5s) turns a light on, another short press turns it off . A longer press (>0.5s) causes a gradual regulation of light intensity min-max-min round until the button is released. After releasing a set intensity is kept in memory, further short presses turn the light on/off keeping the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

Dimensions



Connection SMR-S, SMR-U

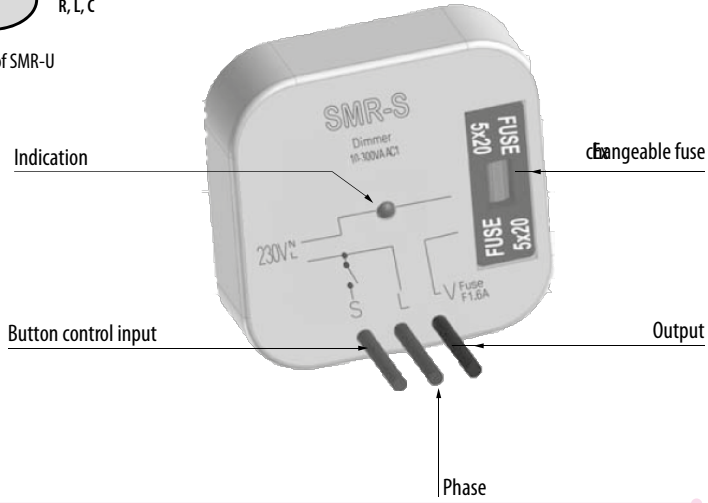


Typical connection of SMR-S - dimmer of lights

Typical connection of SMR-U - dimmer of lights

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

Description SMR-S

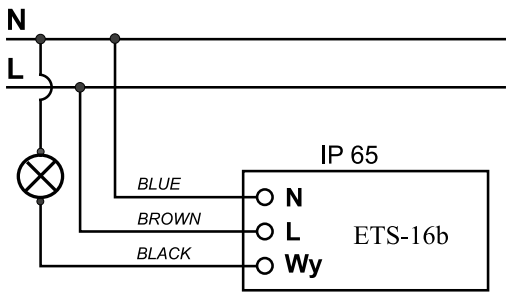


Twilight switch in IP65 ETS-16b

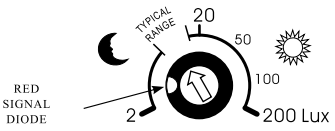
Technical data

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

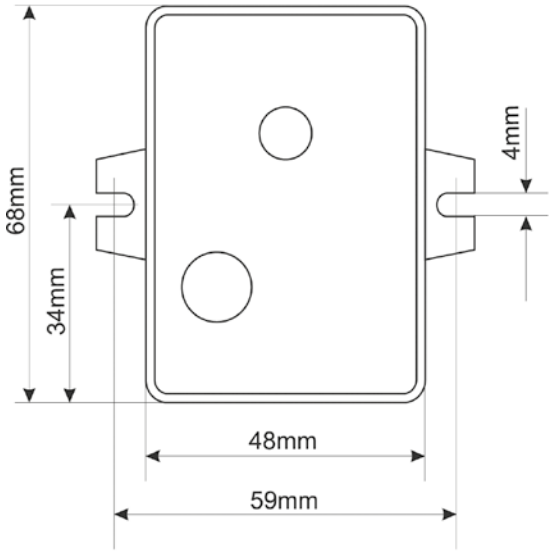
Connection

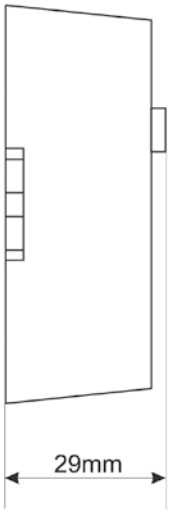


Setting



Dimensions



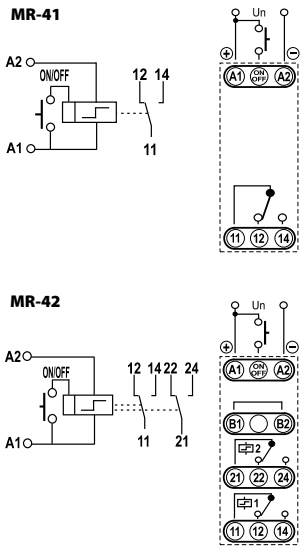


Memory and latching relays MR-41, MR-42

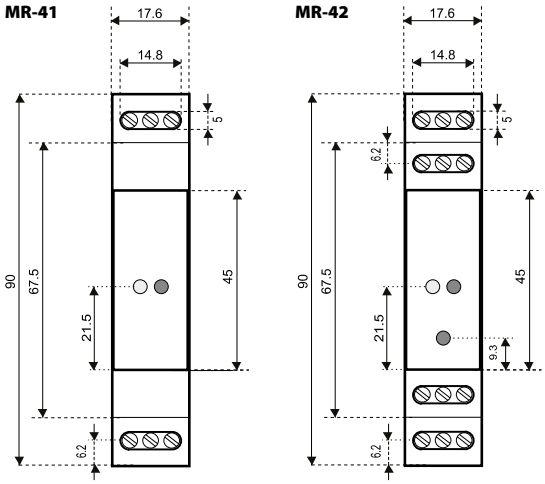
Technical data

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

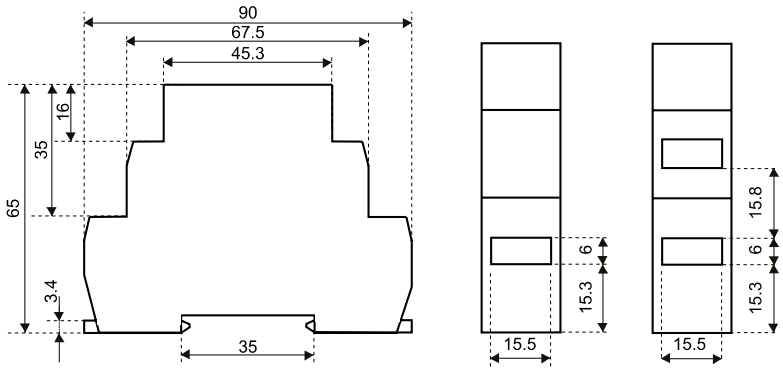
Connection



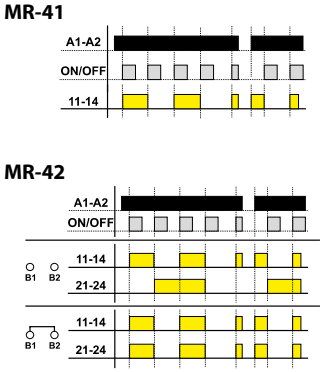
Dimensions



1-module design



Function

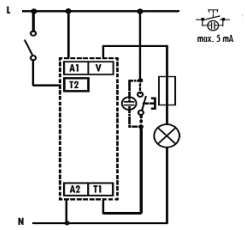


Staircase switch with dimming DIM-2

Technical data

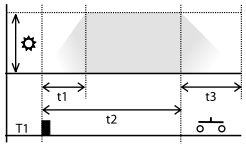
Supply	A1-A2
Supply voltage	230 V AC (50 Hz)
Consumption	max. 5 VA
Supply voltage tolerance	- 15%; + 10%
Supply indication	green LED
Time setting via	potentiometer
Time deviation	10% mechanical setting
Repeat accuracy	5% set value stability
Temperature coefficient	0,01% / °C / 20 °C
Controlling T1	
Terminals	T1-A1
Voltage	230 V AC
Power on control input	max. 1,5 VA
Impulse length	min. 100 ms / max. unlimited
Glow-lamps	yes, max. 5 pcs (at 1 mA)
Controlling T2	
Terminals	T2-A1
Voltage	230 V AC
Power control input	max. 0,1 VA
Impulse length	min. 100 ms / max. unlimited
Glow-lamps	no
Output	contactless - triac
Rated current	2 A
Resistive load	10-500 VA
Inductive load	10-250 VA
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from front panel
Overvoltage category	III
Pollution degree	2
Max. cable size	2,5 mm^2
Dimensions	90x17,6x64 mm
Standards	EN 60669-2-1, EN 61010-1

Connection

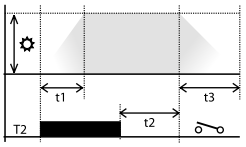


Function

Controlled via input T1 (button)



Controlled via input T2 (switch)



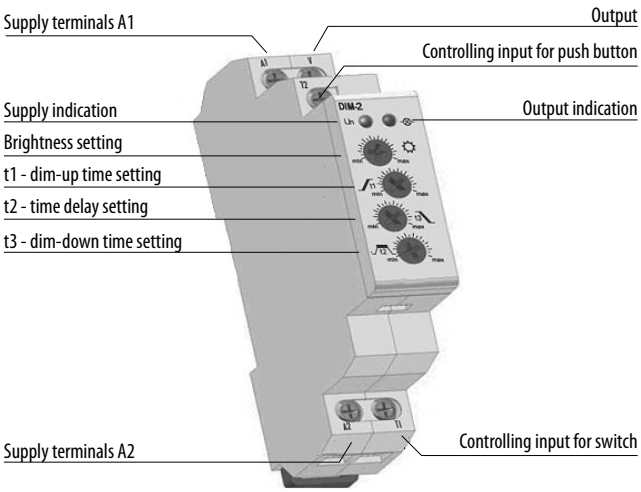
Cycle dim-up time is activated by pressing the button; By repressing the button (during the cycle) it is possible to prolong the time of the cycle.

Legend:

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

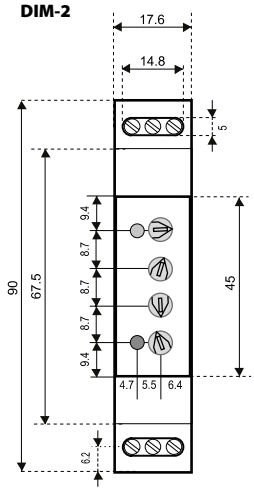
The cycle is started by activating the switch and breaks on max. adjusted brightness level. After the switch is turned off the switch cycle is complete.

Description

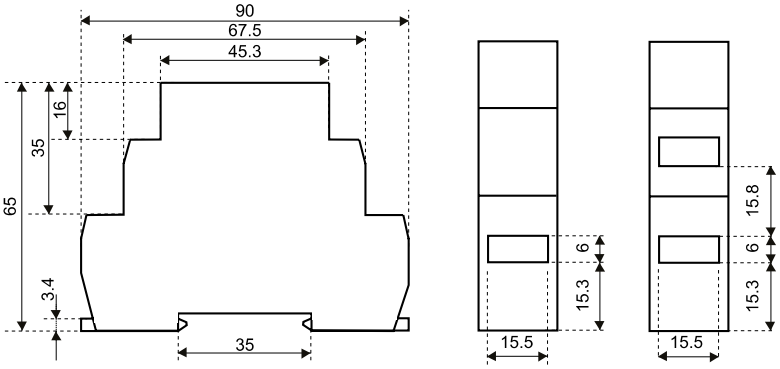


Dimensions

DIM-2



1-module design



Dimmer DIM-14

Technical data

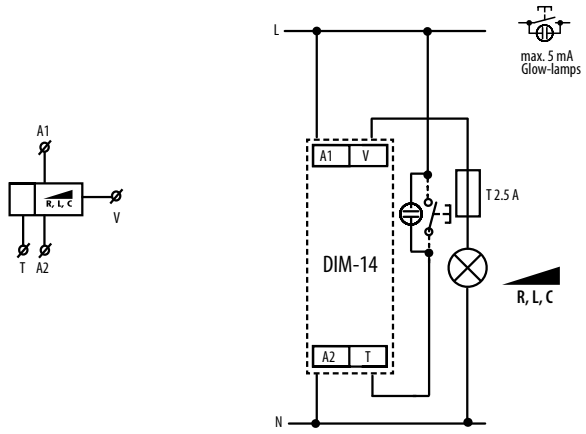
	DIM-14
Supply	A1-A2
Supply voltage	230 V AC (50 Hz)
Consumption	1,3 W
Supply voltage tolerance	- 15%; + 10%
Supply indication	green LED
Indication output	6 VA
Controlling	
Terminals	T1-A1
Control Voltage	230 V AC
Power control input	0,3 - 0,6 VA AC
Impulse length	min. 80 ms / max. unlimited
Glow-lamps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

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

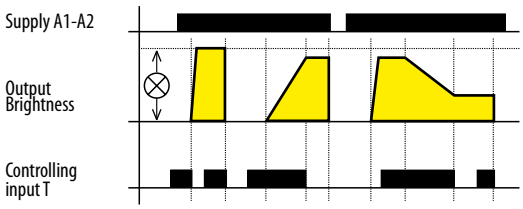
Recommendation for mounting: leave a gap of min. 0,5 module (approx. 9 mm) on side of the device to ensure better cooling of the device.

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

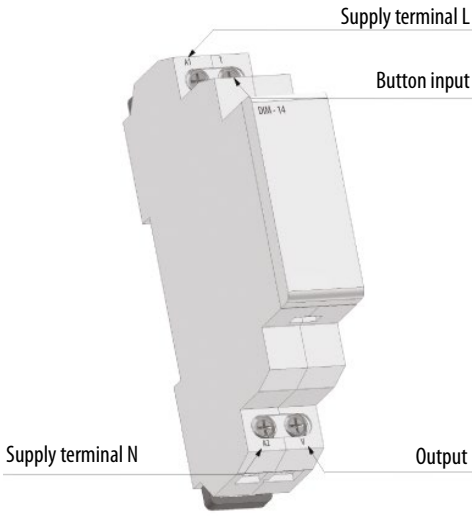
Connection



Functions



Description



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

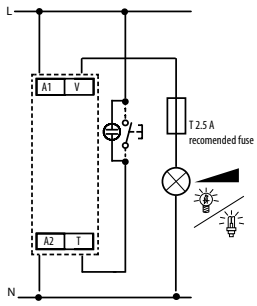
Technical data

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

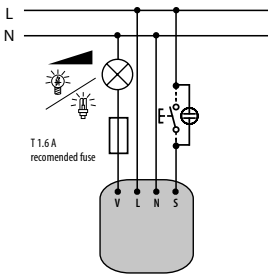
* Due to a large number of light source types, the maximum load depends on the internal construction of dimmable LEDs and ESL bulbs and their power factor cos φ.
The power factor of dimmable LEDs and ESL bulbs ranges from cos φ = 0.95 to 0.4.
An approximate value of maximum load may be obtained by multiplying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

Connection

DIM-15



SMR-M

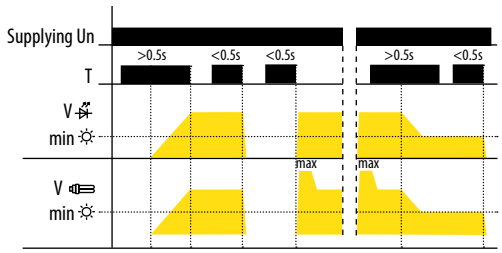


Light source type setting

dimmable saving fluorescent lamps

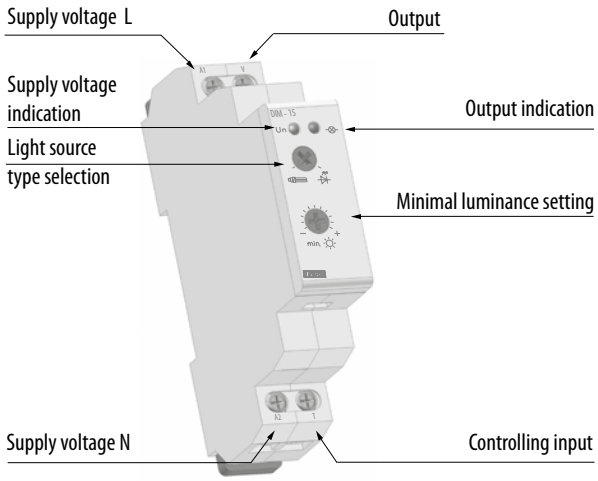
LED bulbs

Functions and controlling



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

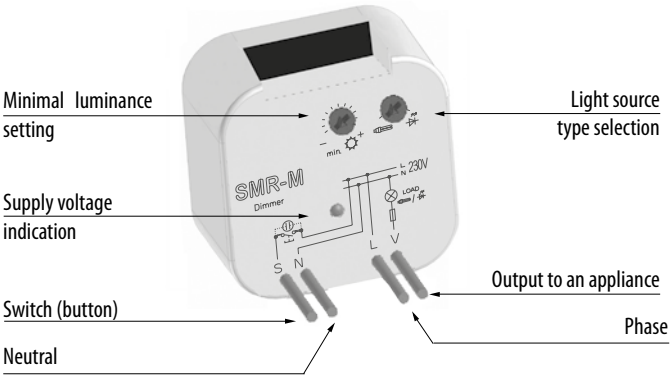
Devices description



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

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

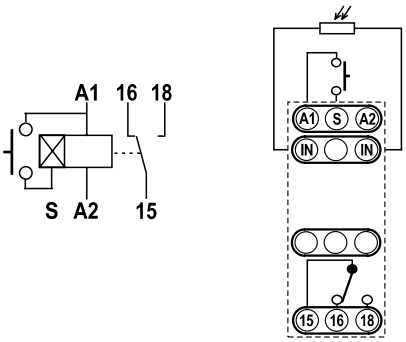
Additional information
- it is possible to dim only LED bulbs equipped with capacitator supplying
- it is not possible to dim saving fluorescent lamps without marking: dimmable
- an incorrect setting of light source has effect only on dimming range, it means neither dimmer or load get demaged
- maximal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



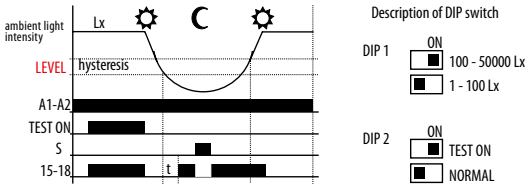
Twilight switch SOU-1 + sensor

Technical data	
Supply	A1-A2
Supply voltage AC 230	230 V AC (50-60 Hz)
Consumption AC 230	max. 12 VA AC / 1,8 W
Supply voltage tolerance	- 15%; + 10%
Supply indication	green LED
Time dwell	0-2 min
Time dwell setting	potentiometer
Measuring range 1)	1-100 Lx
Measuring range 2)	100-50000 Lx
Output	
Number of contacts	1xCO
Rated current	16/AC1
Breaking capacity	4000 VA/AC1, 384 W/DC
Inrush current (duty factor 10%)	30 A/<3 s
Switching voltage	250 V AC1/24 V DC
Min. breaking capacity DC	500 mW
Output indication	red LED
Mechanical life	$3x10^7$
Electrical life	$0,7x10^5$
Controlling	
Voltage	230 V AC
Consumption of input	0,8-530 mVA
Load between S-A2	yes
Glow-lamps	yes, max. 4 pcs (at 1 ms)
Terminals	A1-S
Impulse length	min. 25 ms/ max. unlimited
Reset time	150 ms
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from frontal panel
Connection cable length for sensor	max. 50 m (standard wire)
Overvoltage category	III
Pollution degree	2
Max. cable size	$2,5\ mm^2$
Dimensions	90x17, 6x64 mm
Standards	EN 60255-6, EN 61010-1

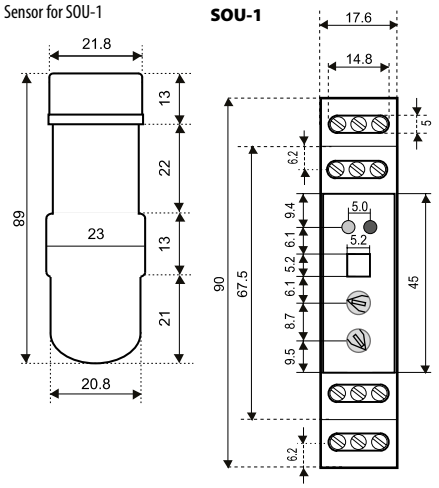
Connection



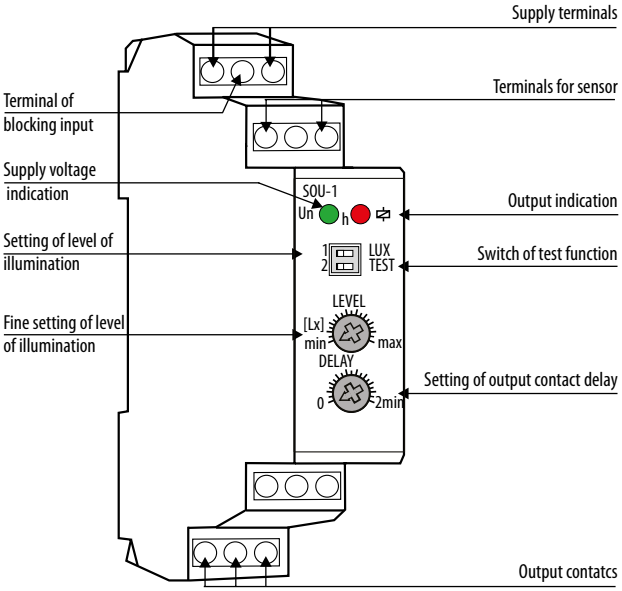
Function



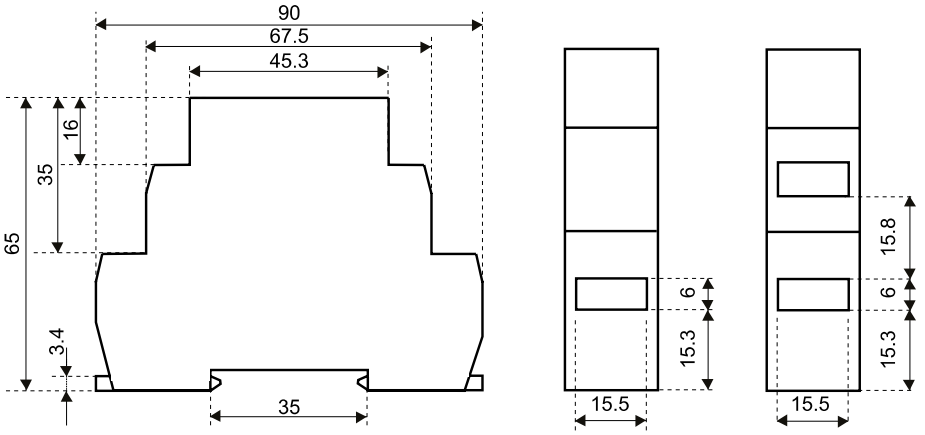
Dimensions



Description



1-module design

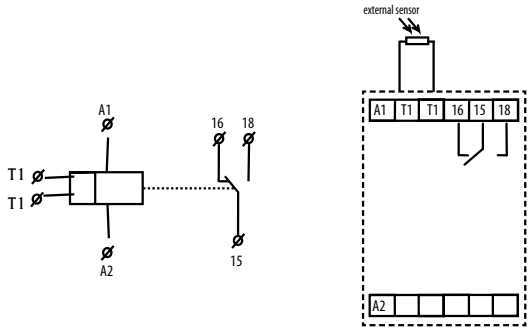


Twilight switch with digital time switch SOU-2 + sensor

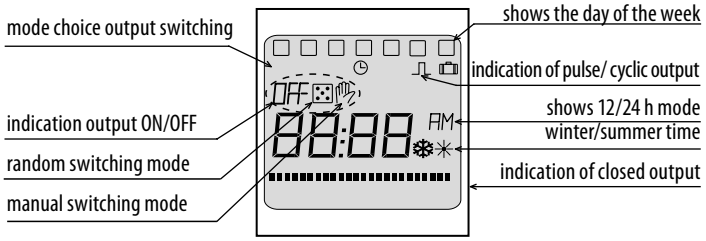
Technical data

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

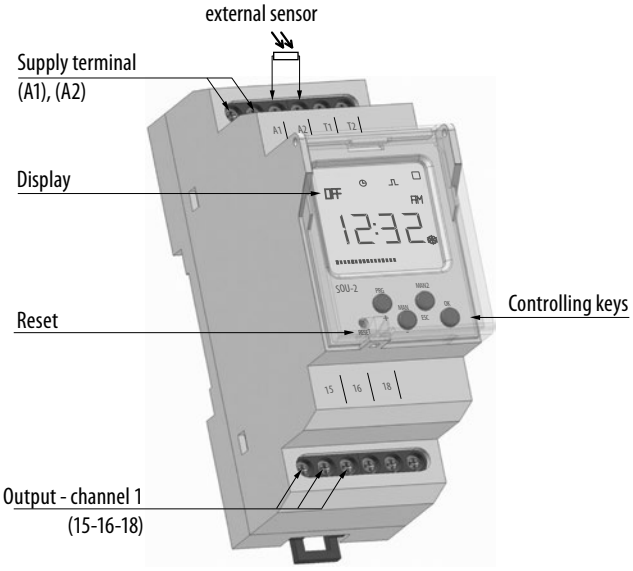
Connection



Controlling elements



Description

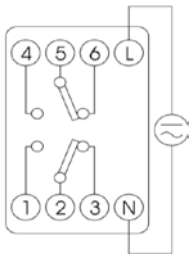


Time switch ASTROCLOCK-2

Technical data

Rated voltage As indicated in the device	230V~ /50-60Hz
Tolerance	± 10%
No. of output contacts	2
Rated current/switching voltage	2x 16A / 250 V~
Maximum recommended loads (N.A)	See Electrical scheme and parameters
Consumption	16 VA (1,3 W)
Display	back-lit liquid crystal display
Accuracy	± 1 s / day at 23 °C
Temperature effect on accuracy	± 0.15 s / °C / 24 h
Power reserve	4 years (without connection to mains), 48 h (without battery and without connection to mains)
Software class and structure	Class A
Memory spaces	40
Types of manoeuvres	SUNRISE, SUNSET, FIXED TIME: ON/ OFF, REDUC.
Astronomical adjustment	Daily
Operating temperature	-10 °C ... +45 °C
Transport and storage temperature	-20 °C ... +60 °C
Pollution degree	2
Protection level	IP 20 (EN60529)
Overvoltage category	Class II under correct mounting conditions
Transient impulse voltage	2.5 kV
Keyboard access cover	Sealable
Connection	With screw terminal for section conductors of 4mm² maximum section
Battery	CR2032 - 3 V - 220 mAh
Size	2 DIN modules (35 mm)

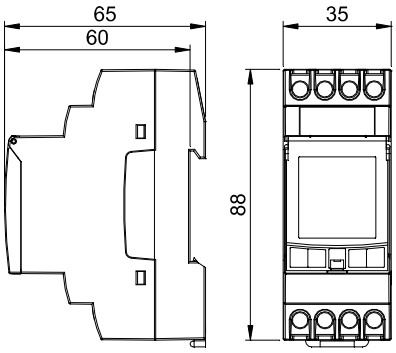
Electrical scheme and parameters

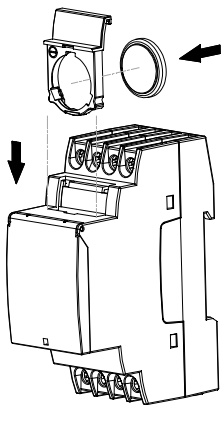


Incandescent	Fluorescent	Low voltage halogen (12 V AC)	Halogen (230 V AC)
3000 W	1200 VA	2000 VA	3000 W

Low consumption lamps	Downlights	LED
600 VA	400 VA	90 VA

Dimensions



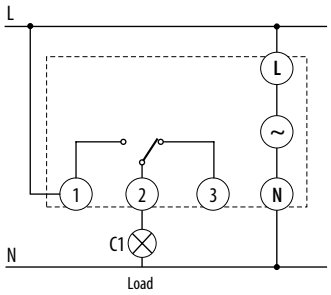


Digital time switch ETICLOCK-R1

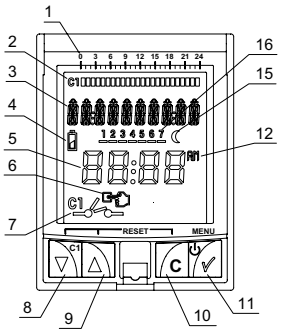
Technical data

	ETICLOCK-R1
Rated voltage and frequency As indicated on the device	(230 V~ 50-60Hz)
Breaking capacity	μ 1x16 (10) A / 250 V AC
Own consumption	16 VA (1.3 W) max.
Contact	AgSnO2 switched
Display screen	LCD
Running accuracy	± 1 s / day at 23 °C
Accuracy variation with temperature	± 0.15 s / °C / 24 h
Power reserve	4 years (with battery and no network connection)
	48 h (no battery and no network connection)
Memory spaces	40
No. of channels	1
Types of operations	ON/OFF, PULSE (1 ... 59 sec.) & CYCLES (1 ... 59 sec. / 1 min ... 23h, 59 min)
Operating temperature	-10 °C ... +45 °C
Transport and storage temperature	-20 °C ... +60 °C
Pollution degree	2
Protection level	IP 20 (EN60529)
Protection class	II under correct mounting conditions
Transient impulse voltage	2.5 kV
Temperature for the ball test	+ 80 °C (21.2.5)
Keyboard access cover	Sealable
Connection	With screw terminal for wire cross section of up to 4mm²
Battery	CR2032 - 3 V - 220 mAh
Size	2x DIN mod. (35 mm)

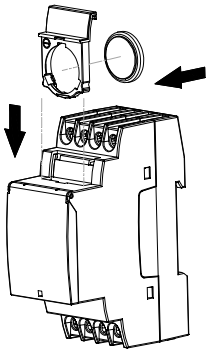
Connection



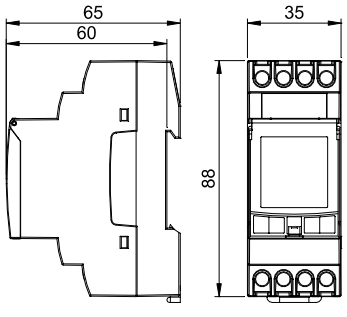
Controlling elements



1. Time scale
2. Schedules
3. Text line
4. Low-battery symbol
5. Hour / Date
6. C1 manual operation (blinking)/ C1 permanent manual (fixed)
7. C1 relay status symbol
8. Scroll down / C1 manual operation
9. Go up
10. Cancel option / Go back
11. Accept option / Enter the menu / Switch on the device without power
12. 12 H / 24 H
13. Days of the week



Dimensions



Maximum recommended loads

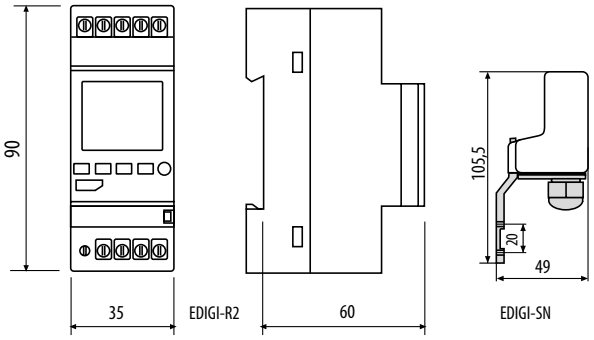
Load	Designation	Max. load
Incandescent		3000 W
Fluorescent		1200 VA
Low voltage halogen (12 V)		2000 VA
Halogen (230 V)		3000 W
Low consumption lamps		600 VA
Downlights		400 VA
LED	LED	90 VA

Digital time relay EDIGI-R2

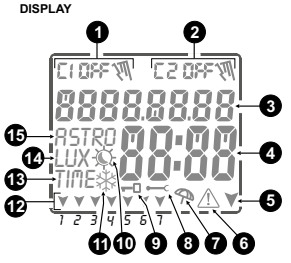
Technical data

		EDIGI-R2
Supply voltage		230 V c.a. +/- 10%
Frequency		50 Hz
Protection rating		IP20
Output type		
Potential-free changeover contact relay	N.O. contact Zero Crossing	16(10)A / 250V~
	N.C. contact	16(2)A / 250V~
Type of action, disconnection and unit		1 B S U / electronic
Section of the cables to the terminals		1...6mm²
Replaceable backup battery		3V lithium code CR2032
Power reserve in case of power failure		about 6 years from the first start-up, guaranteed by the lithium battery (replaceable)
Rated impulse voltage		4kV
Software class		A
Operating accuracy		+/- 1 sec/day at 25 °C
Consumption/Stand-by consumption		8 VA mono-channel / 6 VA dual-channel
Type of insulation		II
Rate of pollution		normal
Installation		DIN rail
Operating temperature		-20 °C ... +55 °C
Storage temperature		-30 °C ... +60 °C
CE marking regulation		LVD/EMC EN60730-2-7
Languages available in the device		ENG,DE, HRV/SRP/BOS

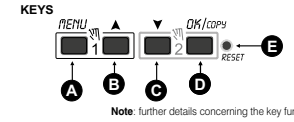
Dimensions



Controlling elements



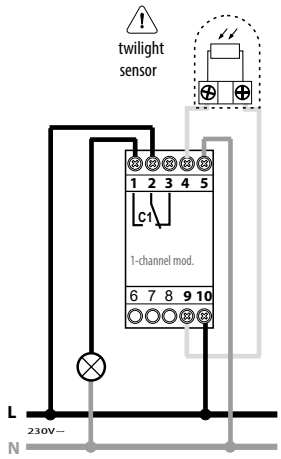
1 **Channel 1** Field (status of relay 1)
2 **Channel 2** Field (status of relay 2) *only dual-channel mod.*
3 Date / Text indication to browse or program
4 Hour and Minutes / Menu functions / Parameter values indication
5 Browsing arrow (menu o next sub-menu)
6 **ATTENTION!** icon
7 **Holiday** icon (suspension of programs in progress)
8 Icon for the set **Maintenance** of the connected load
9 "**Keypad lock**" icon
10 **Summer time** period icon (summer changeover) and/or **for Astro** and **Lux** **programs**
11 **Winter time** period icon (winter changeover)
12 **Day of the week** field
13 **Time programs setting** (TIME)
14 **Twilight programs setting** (LUX)
15 **Astronomical programs setting** (ASTRO)



A **Access / Exit** the menus and sub-menus
B Scroll list **upwards / increase the value**
C Scroll list **downwards / decrease the value**
D **Confirm setting** / copy program
E **Reset** (no setting entered is deleted - para. 1.6.3)

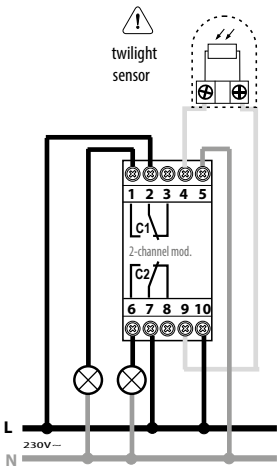
Note: further details concerning the key functions are described in the specific paragraphs of use.

Connection

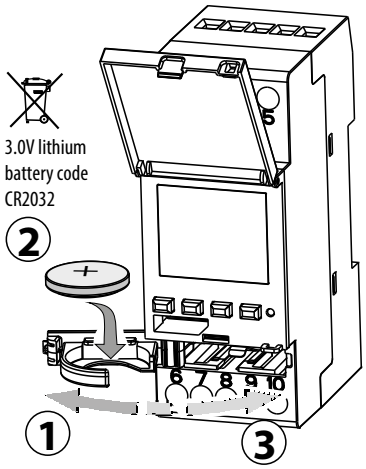


Maximum cable length to connect the twilight sensor: 50 m

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



The electrical connections must only be implemented after having disconnected the 230V~ power supply.



Maximum recommended loads

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

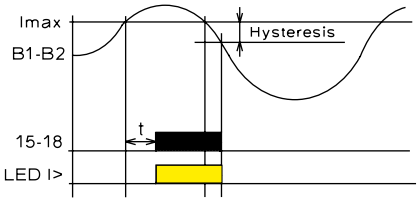
LED lighting: max inrush current 80A/20ms

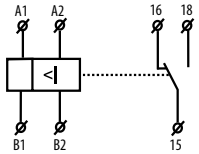
Current monitoring relay PRI-51

Technical data

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

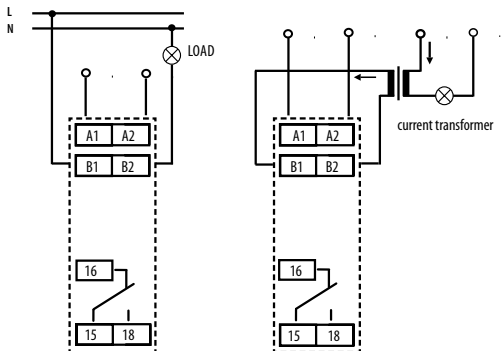
Functions



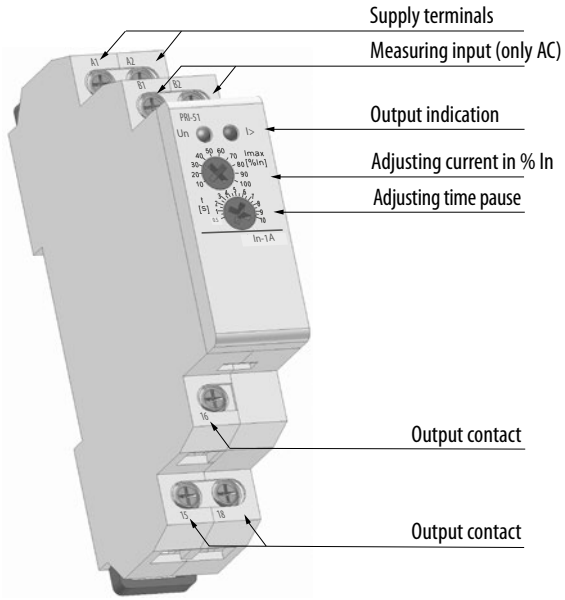


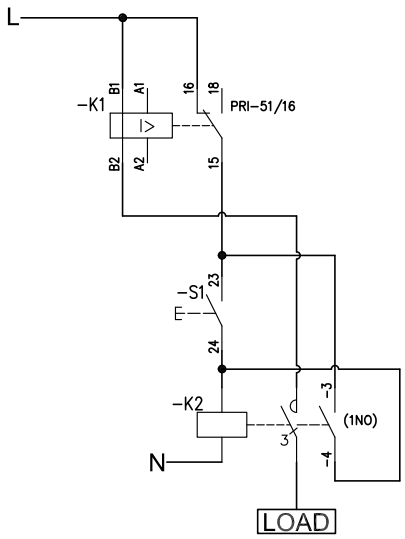
Connection

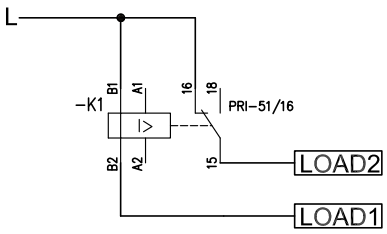
Example connection: PRI-51 with current transformer for current range increase



Description







LOAD1 -> Critical load - always available (Iset<ILOAD1)
LOAD2 -> Optional load - only when LOAD1 not operating

In case of overload, all the loads will shutdown.

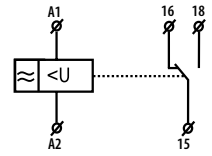
Voltage monitoring relay HRN-33, HRN-34, HRN-35

Technical data

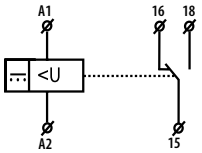
	HRN-33, HRN-34, HRN-35		
Type	HRN-33	HRN-34	HRN-35
Supply	A1-A2	A1-A2	A1-A2
Universal supply	monitoring voltage range	monitoring voltage range	monitoring voltage range
Consumption	max. 1,2 VA AC / DC	max. 1,2 VA AC / DC	max. 1,2 VA AC / DC
Upper level Umax	160-276 V AC	18-30 V DC	160-276 V AC
Bottom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

Symbols

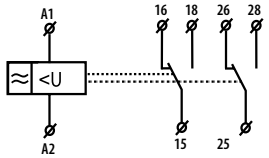
HRN-33



HRN-34



HRN-35



Functions

Legend:

Umax - upper adjustable level of voltage

Un - measured voltage

Umin - bottom adjustable level of voltage

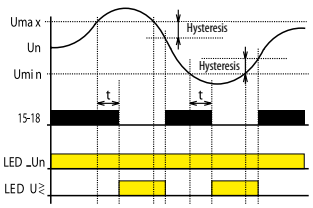
15-18 - switching contact of output relay No.1

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

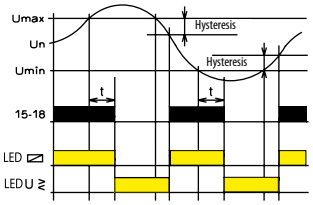
LED ≥ Un - indication green

LED U≤ - indication red

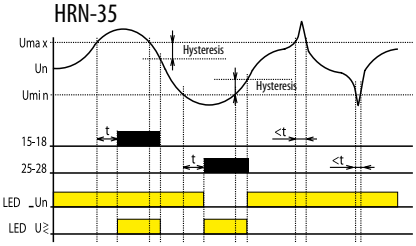
HRN-33



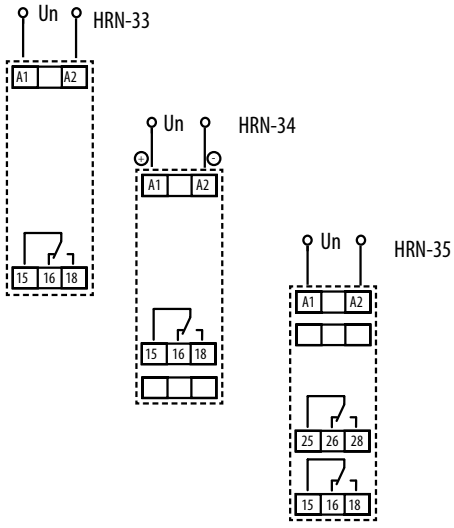
HRN-34



HRN-35

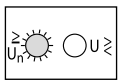


Connection

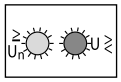


Indication LED

HRN-33

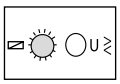


Normal state
Umin<Un<Umax
Green LED = ON
Red LED = OFF

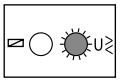


Exceeded Umax (overvoltage)
Drop below Umin (undervoltage)
Un>Umax or Un<Umin.
Green LED = ON
Red LED = ON

HRN-34

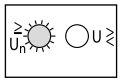


Normal state
Umin<Un<Umax
Green LED = ON
Red LED = OFF

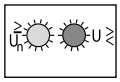


Exceeded Umax (overvoltage)
Drop below Umin (undervoltage)
Un>Umax or Un<Umin.
Green LED = OFF
Red LED = ON

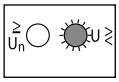
HRN-35



Normal state
Umin<Un<Umax
Green LED = ON
Red LED = OFF



Exceeded Umax (overvoltage)
Un>Umax
Green LED = ON
Red LED = ON



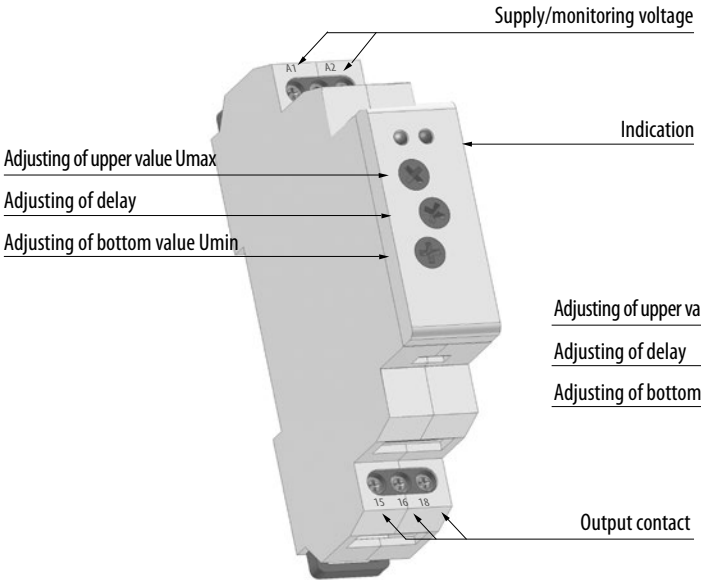
Drop below Umin (undervoltage)
Un<Umin
Green LED = OFF
Red LED = ON

Function description

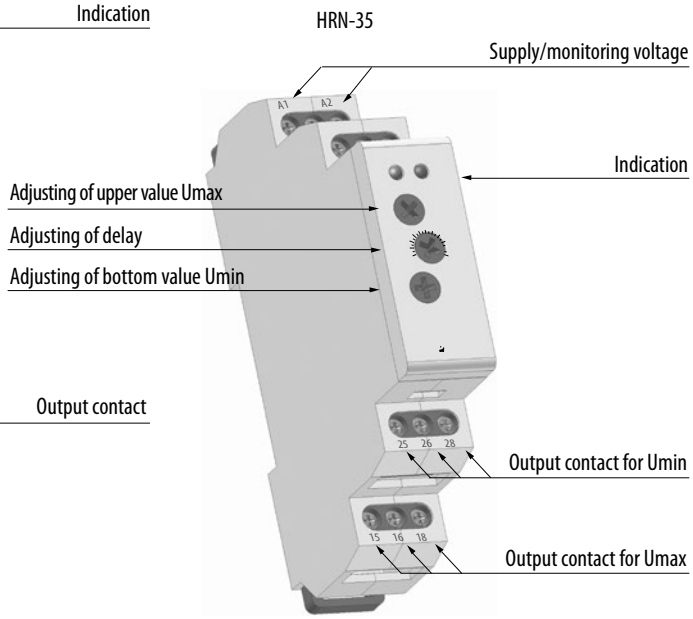
Monitoring relay series HRN-3 monitors level of voltage in single-phase circuits. Monitored voltage serves also as supply voltage. It is possible to set two independent levels of voltage, when exceeded output is activated. HRN-33 and HRN-34 - in normal state the output relay is permanently switched on. It switches off when voltage is below or above deflection. This combination of linkage of the output relay is advantageous when the full failure of supply (monitored) voltage is considered to be a faulty state in the same way as a decrease of voltage within the set level. Output relay is in both situations always switched off. Differently HRN-35 version uses independent relay for each level, in normal state it is switched off . If the upper level is exceeded (for example overvoltage) 1st relay switches on, when the bottom level (e.g. undervoltage) is exceeded 2nd relay switches. It is thus possible to see the particular faulty state. To eliminate short peaks in the main, the time delay, which is possible to be set in range 0 - 10 s, is used. It functions when changing from normal to faulty state and prevents unavailing pulsation of the output relay caused by parasitive peaks. Time delay doesn´t apply when changing from faulty to normal state, but hysteresis (1-6% depends on the voltage setting) apply. Thanks to changeover contacts it is possible to get other configurations and functions according to actual requirements of the application.

Description

HRN-33, HRN-34



HRN-35

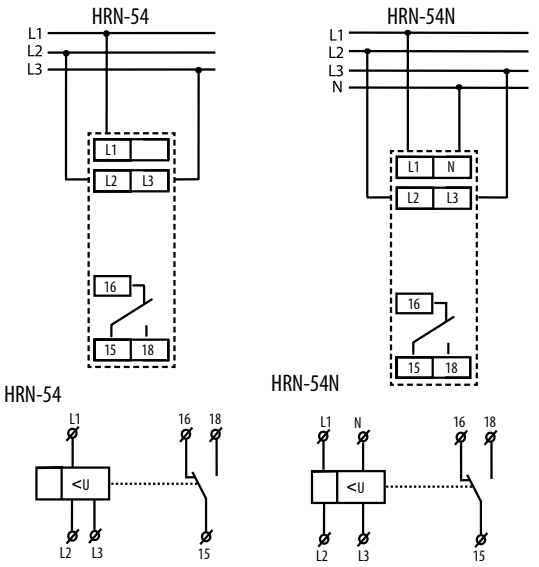


Over/undervoltage monitoring relay HRN-54, HRN-54N

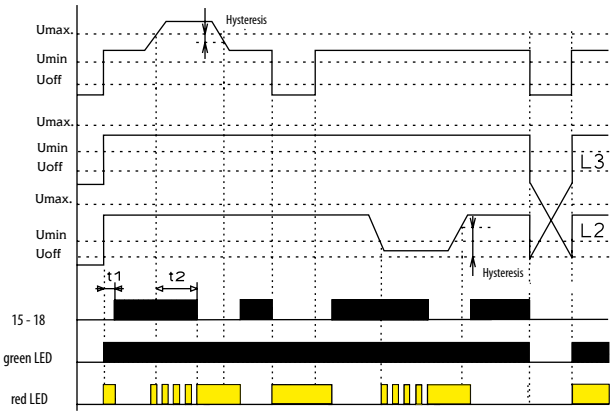
Technical data

	HRN-54	HRN-54N
Supply and measuring	L1,L2,L3	L1,L2,L3,N
Supply	L1,L2,L3	L1,N
Supply/measured voltage	3 x 400 V	3 x 400 V/ 230 V
Level U_{min}	75 - 95% Un	
Level U_{max}	105 - 125% Un	
Consumption	max. 2 VA	
Hysteresis	5 %	
Max. permanent overload	3 x 460V AC	3 x 265V AC
Peak overvoltage <1ms.	3 x 500V AC	3 x 288V AC
Time delayT1	max. 500 ms.	
Time delayT2	0.1 - 10 s.	
Output		
Number of contacts	1 x changeover (AgNi)	
Rated current	8 A / AC1	
Breaking capacity	2500 VA / AC1, 240W / DC	
Inrush current	10 A	
Switching voltage	max. 250 V AC1 / 24 V DC	
Min. breaking capacity DC	500mW	
Output indication	red LED	
Mechanical life	$1x10^7$	
Electrical life	$1x10^5$	
Reset time	max. 150 ms.	
Controlling		
Operating temperature	-20...+55 °C	
Storage temperature	-30...+70 °C	
Electrical strength	4 kV	
Operating position	any	
Mounting	DIN rail EN 60715	
Protection degree	IP 40 from front panel	
Overvoltage category	III	
Pollution degree	2	
Max. cable size	2.5 mm^2	
Dimensions	90 x 17,6 x 64 mm	
Standards	EN 60255-6, EN 61010-1	

Connection



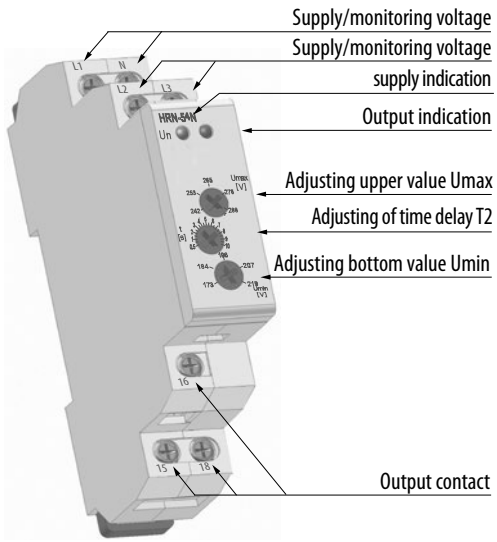
Functions



Function description

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

Description

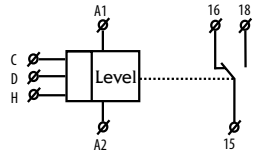


Level switch HRH-5

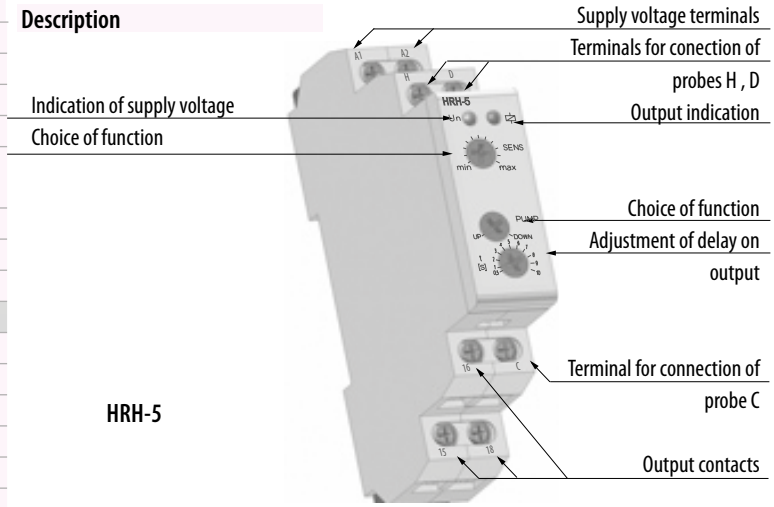
Technical data

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

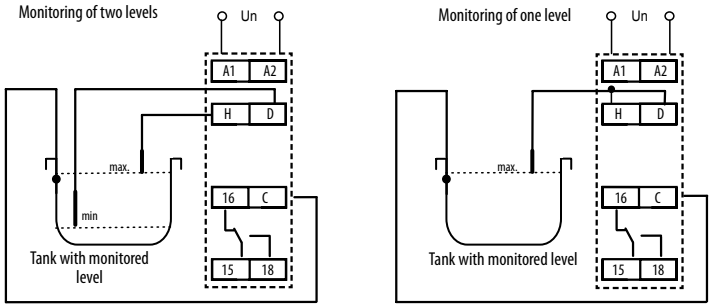
Symbol



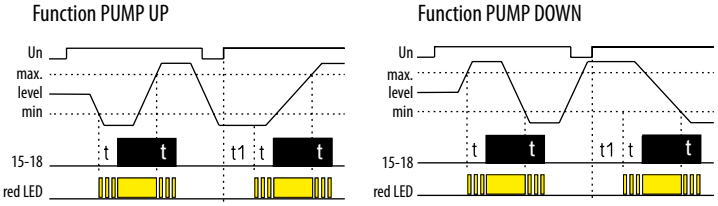
Description



Connection



Functions

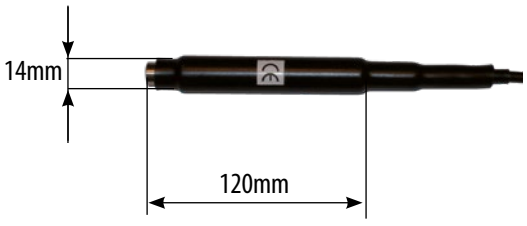


Technical data - Measuring probes HRH

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

* Special probes for aggressive fluids

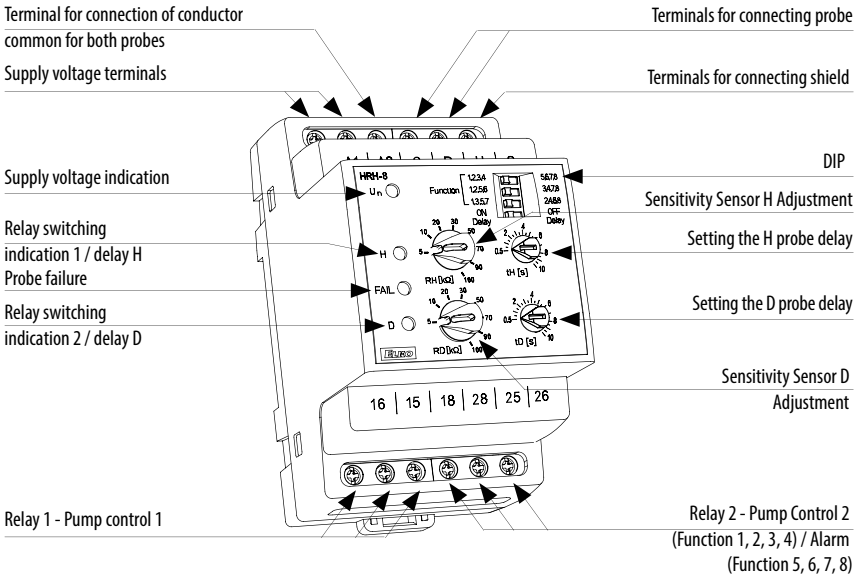
Relay is designated for monitoring of levels of conductive liquids with possibility of functions: PUMP UP or PUMP DOWN. To prevent polarization and liquid electrolysis of liquid, and undesirable oxidation of measuring probes, alternating current is used. For measuring use three measuring probes: H- upper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



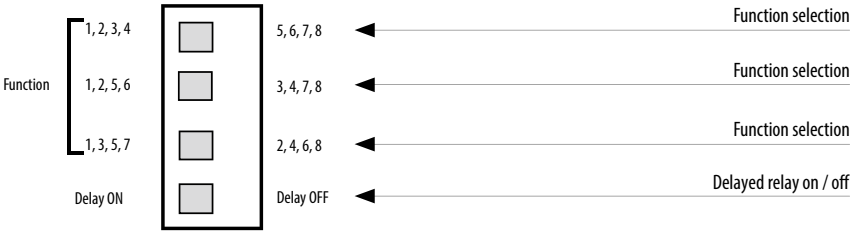
Level switch HRH-8

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

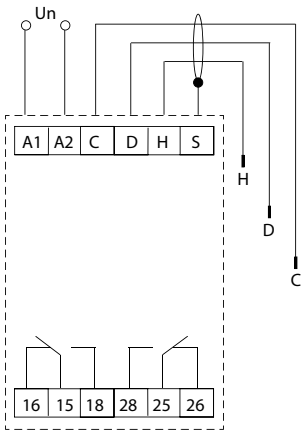
Description



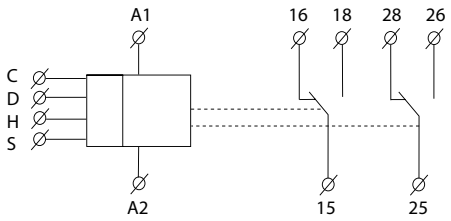
Description and importance of DIP switches



Connection



Symbol

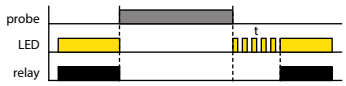


Measuring probes

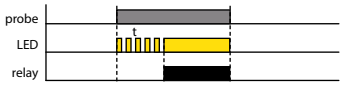
There can be any measuring probe (any conductive contact, it is recommended to use brass or stainless steel).
The probe wire does not need to be shielded, but it is recommended.
When using a shielded wire, the shielding is connected to terminal S.

Functions

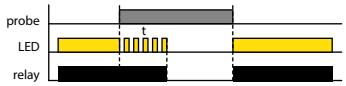
PUMP UP, ON DELAY (Function 1,3,4)



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

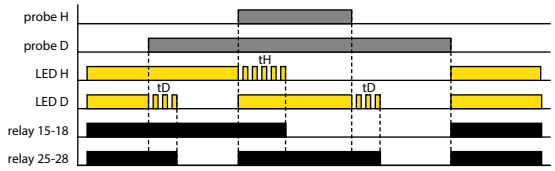


PUMP UP, OFF DELAY (Function 1,3,4)

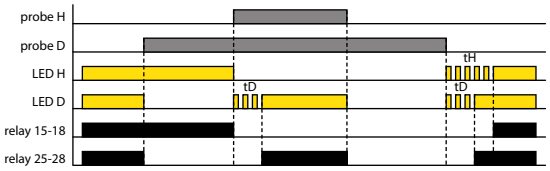


PUMP DOWN, OFF DELAY (Function 2,3,4)

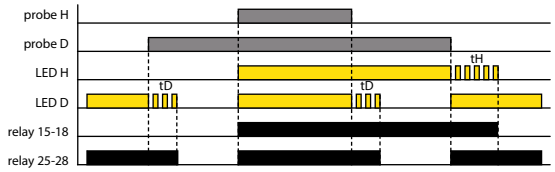
PUMP UP, OFF DELAY (Function 5)



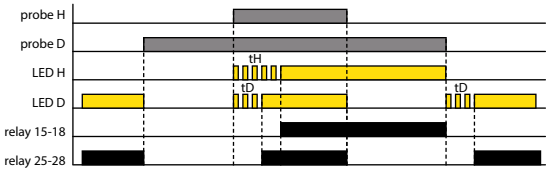
PUMP UP, ON DELAY (Function 5)



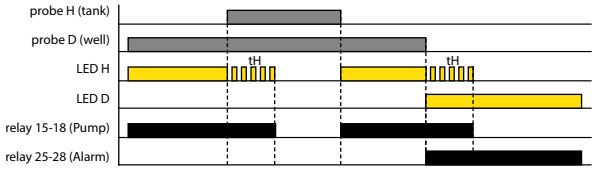
PUMP DOWN, OFF DELAY (Function 6)



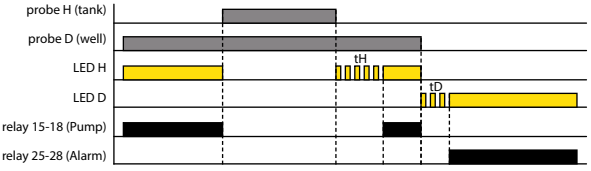
PUMP DOWN, ON DELAY (Function 6)



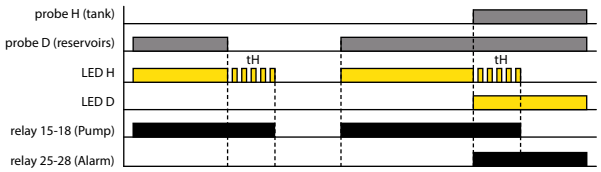
WELL - TANK, OFF DELAY (Function 7)



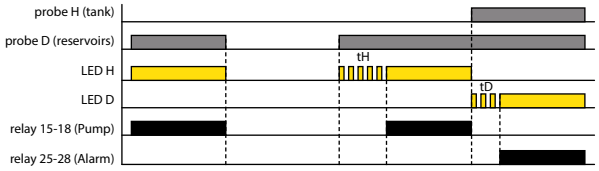
WELL - TANK, ON DELAY (Function 7)



RESERVOIRS - TANK, OFF DELAY (Function 8)



RESERVOIRS - TANK, ON DELAY (Function 8)



Function description

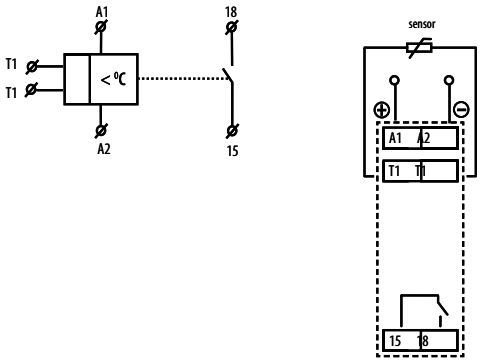
The relay is designed to monitor the level of conductive liquids with a choice of 8 functions:
1) - 2 separate tanks (each with 1 probe) - both PUMP UP (fi lling)
2) - 2 separate tanks (each with 1 probe) - both PUMP DOWN (emptying)
3) - 2 separate tanks (each with 1 probe) - H PUMP DOWN probe, D PUMP UP probe
4) - 2 separate tanks (each with 1 probe) - H PUMP UP probe, probe D PUMP DOWN
5) - both probes in one tank - PUMP UP - maintain level between probes H and D (as HRH-5), relay 1 switches on the pump, relay 2 alarm (level is not between probes H and D)
6) - Both probes in one tank - PUMP DOWN - maintaining the level between probes H and D (as HRH-5), relay 1 switches on the pump, relay 2 alarm (the level is not between probes H and D)
7) - Pumping from the well to the tank - probe D in the well, probe H in the tank. The pump only runs if the probe D is flooded (enough water in the well) and the tank is not full (probe H). The alarm reports a lack of water in the well (probe D is not flooded).
8) - Pumping from the reservoir to the tank - probe D in the reservoir, probe H in the tank. The pump only runs if the probe D is flooded (full reservoir) and the tank is not full (probe H). The alarm reports the status of full tank and reservoir (both probes are flooded).
LED indication:
The red LED lights up - the corresponding relay is switched on
Red LED flashes - delay timing
The yellow LED indicates probe failure - Functions 5, 6 probe H is flooded and probe D is not. At the same time both red LEDs flash.
To prevent polarization and electrolysis of the liquid and undesirable oxidation of the monitoring probes, an AC current of 10 Hz is used for monitoring.
The low frequency has a positive eff ect on suppression of interference by 50 (60) Hz. Three probes are used to monitor the level: H - upper level, D - lower level and C - common probe. In the case of the use of a conductive material tank, it is possible to use the tank itself as a C probe. Probe C can also be connected to the protective conductor of the power supply system (PE). To prevent undesired switching by various infl uences (soiling of dips, moisture ...), the sensitivity of the device can be set according to the conductivity of the liquid being monitored (corresponding to the "resistance" of the liquid) in the range of 5 to 100 kΩ. To limit the eff ect of undesired switching of output contacts by raising the liquid level in the tank, it is possible to set the output response delay 0,5 - 10 s.

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

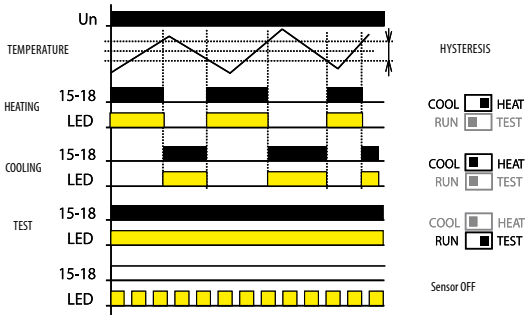
Technical data

	TER-3 (A, B, C)		
Function	single level		
Supply	A1-A2		
Universal supply	AC/DC 24-240 galvanically unseparated		
Consumption	2 VA		
Supply voltage tolerance	-15% - +10%		
Measuring circuit			
Measuring terminals	T1 - T1		
Temperature range	TER-3A	TER-3B	TER-3C
	-30..+10 °C	0..+40 °C	-30..+70 °C
Hysteresis	adjustable in range 0.5...5K		
Sensor	external, termistor NTC		
Sensor fault indication	flashing red LED		
Setting accuracy - mechanical	5%		
Switching difference	0,5°C		
Temperature coefficient	< 0.1 % / °C		
Output			
Number of contacts	1 x changeover (AgNi)		
Rated current	16 A / AC1, 10A/24 V DC		
Breaking capacity	4000 VA / AC1, 300W / DC		
Switching voltage	250V AC1/ 24V DC		
Min. breaking capacity DC	500 mW		
Output indication	red LED		
Mechanical life	$3x10^7$		
Electrical life	$0,7x10^5$		
Controlling			
Operating temperature	-20...+55 °C		
Storage temperature	-30...+70 °C		
Electrical strength	4 kV		
Operating position	any		
Mounting	DIN rail EN 60715		
Protection degree	IP 40 from front panel		
Overvoltage category	III.		
Pollution degree	2		
Max. cable size	2.5 mm^2		
Dimensions	90 x 17,6 x 64 mm		
Standards	EN 60730-2-9, EN 61010-1		

Connection

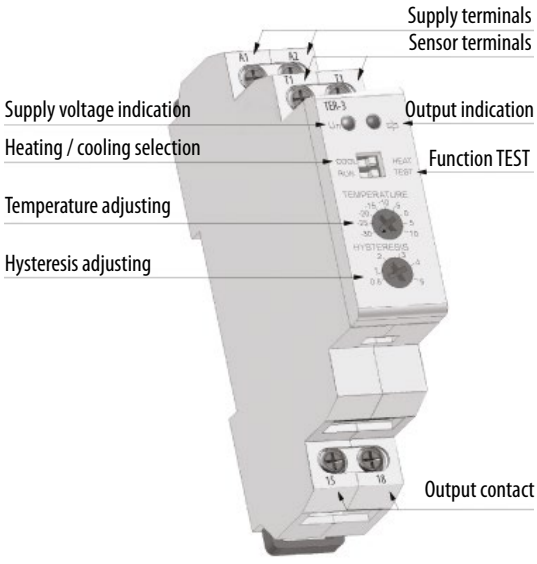


Functions



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

Description



Thermostat for monitoring temperature of motor winding TER-7

Technical data

	TER-7
Function	monitoring temperature of motor winding
Supply terminals	A1-A2
Supply voltage	24 - 240 V AC/DC
Consumption	max. 2 VA
Supply voltage tolerance	-15 %; +10 %
Measuring circuit	
Measuring terminals	Ta-Tb
Cold sensor resistance	50 Ω - 1.5 kΩ
Upper level	3.3 kΩ
Bottom level:	1.8 kΩ
Sensor:	PTC temperature of motor winding
Sensor failure indication	blinking red LED
Accuracy	< 5%
Accuracy in repetition	± 5 %
Temperature dependance	< 0.1 % / °C
Output	
Number of contacts	2x changeover (AgNi)
Rated current	8 A / AC1
Breaking capacity	2000 VA / AC1, 192 W / DC
Inrush current	10 A /< 3 s
Switching voltage	250 V AC1 / 24 V DC
Min. breaking capacity DC	500mW
Mechanical life	$3x10^7$
Electrical life	$0.7x10^5$
Other information	
Operating temperature	- 20 .. +55 °C
Storage temperature	- 30 .. +70 °C
Electrical strength	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40
Overvoltage category	III.
Pollution degree	2
Max. cable size (mm^2)	solid wire max.1x 2.5 or 2x1.5 with sleeve max. 1x2.5
Dimensions	90 x17.6 x 64 mm,
Weight	83 g
Standard	EN 60730-2-9, EN 61010-1

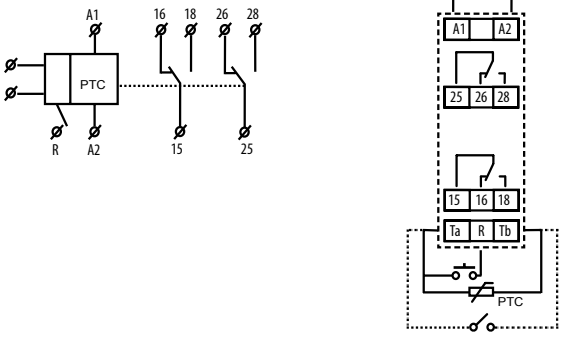
Note:

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

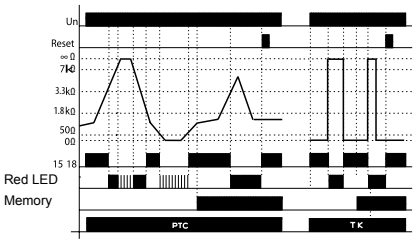
Warning!:

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

Symbol and connection

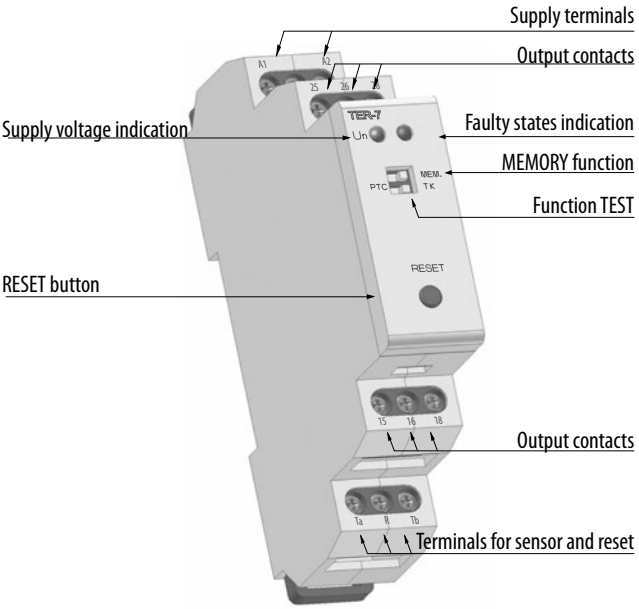


Function



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

Description

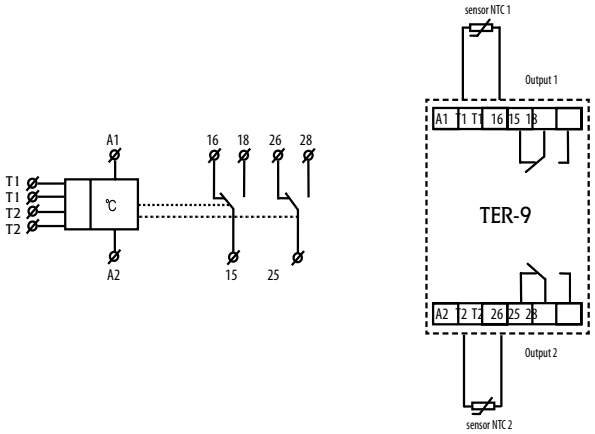


Multifunction digital thermostat TER-9

Technical data

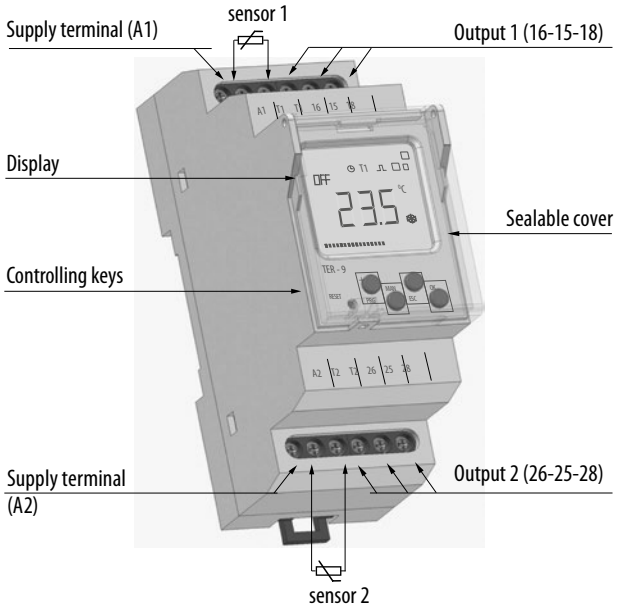
	TER-9
Number of functions	6
Supply	A1-A2
Supply voltage	AC 230V or AC/DC 24V, galvanically separated
Consumption	max. 3,5 VA
Supply voltage tolerance	-15% - +10%
Measuring circuit	
Measuring terminals	T1 - T1 in T2-T2
Temperature range	-40...+110 °C
Hysteresis (sensitivity):)	adjustable in range 0.5...5K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

Connection

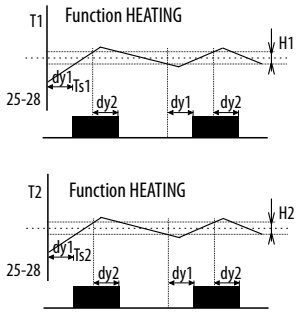


Note: It is possible to operate the device with one sensor. In such case it is necessary to connect resistor10kΩ. This resistor is a part of delivery.

Description



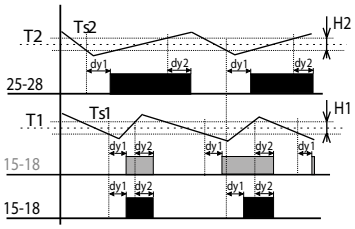
2 independent single-stage thermostat



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

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

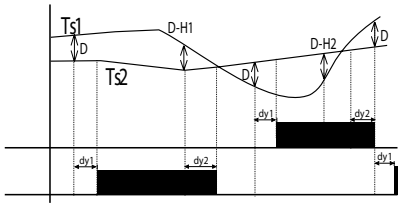
Dependent functions of 2 thermostats



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

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

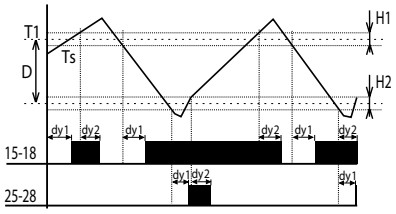
Differential thermostat



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

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

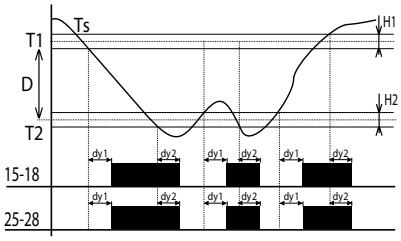
2-stage thermostat



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

Typical example of use for two-stage thermostat is e.g in boiler-room, where there are two boilers from which one is main and the other one is auxiliary. The main boiler is managed according to set temperature and auxiliary boiler is switched in case temperature falls under set difference.
Thus it helps to the main boiler in case outside temperature dramatically falls. In the range of difference (D) output 15-18 functions as normal thermostat to input 1 (type 1). In case temperature falls under set difference, output 2 switches.

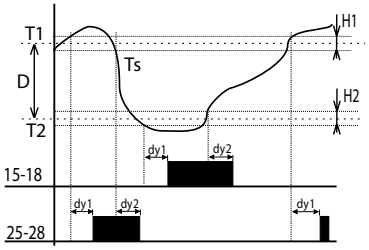
Thermostat with "WINDOW"



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

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

Thermostat with dead zone



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

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

Thermal sensor TZ

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

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

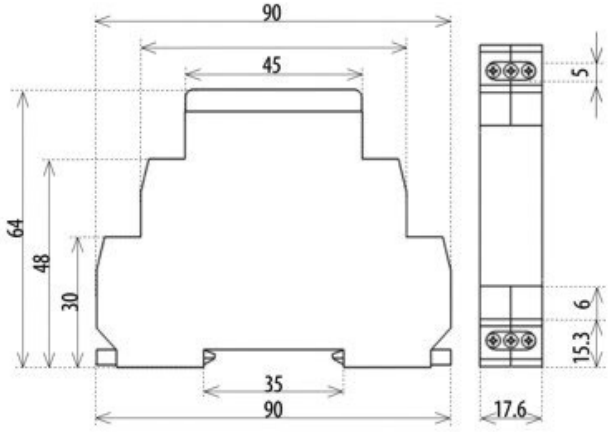
Technical parameters TZ	
Range:	-40...+125°C
Scanning element:	NTC 12K 2%
In air/in water:	(t65) 62s/8s
In air/in water:	(t95) 216s/23s
Cable material:	silicone
Terminal material:	nickel-couted copper
Protection degree:	IP 67
Protection class:	II (double insulation)

Resistive values of sensors in dependance on temperature	
Temperature (°C)	Sensor NTC (kΩ)
20	14,7
30	9,8
40	6,6
50	4,6
60	3,2
70	2,3

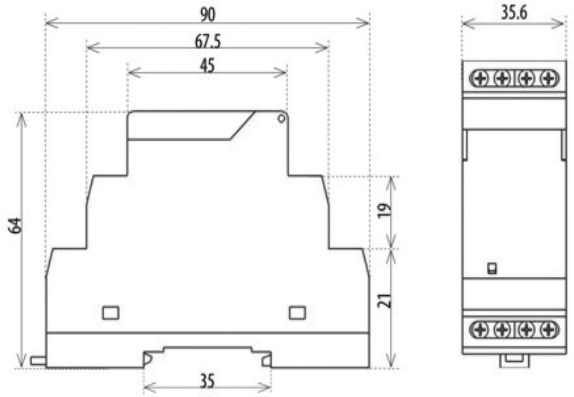
TZ: Thermal sensors for range -40...+125°
TZ-0 - Thermo sensor can be connected directly to terminal block (length of the sensor 110mm)
TZ-3 - Temperature sensor 3m, double isolation silicone
TZ-6 - Temperature sensor 6m, double isolation silicone
TZ-12 - Temperature sensor 12m, double isolation silicone

Dimensions

1-module devices



2-module devices



Product loadability

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

	Load								
relay contact 16 A						AC1	AC3	AC15	DC1 (24/110/220 V)
$AgSNO_2$	2000 W	1000 W	1000 W	750 W	500 W	4000 VA	0,9 kW	750 VA	16A/0,5A/0,35A

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

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

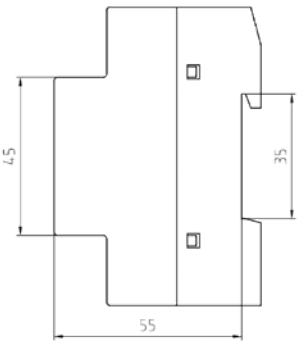
It is valid for following products: CRM-91H, CRM-2H, CRM-2T, HRN-33, HRN-34, HRN-35, TER-3

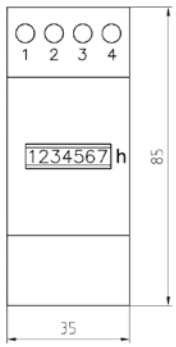
	Load								
relay contact 16 A						AC1	AC3	AC15	DC1 (24/110/220 V)
AgNi	1000 W	x	x	x	x	4000 VA	0,9 kW	750 VA	16A/0,5A/0,35A

Hour meter HM-1

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

Dimensions



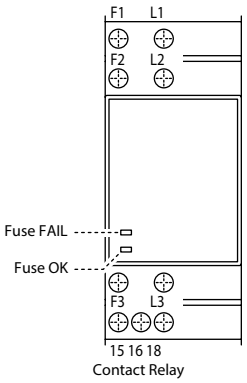


Electronic fuse monitor EFM

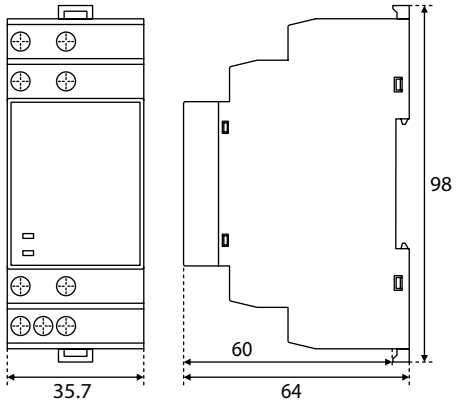
Technical data

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

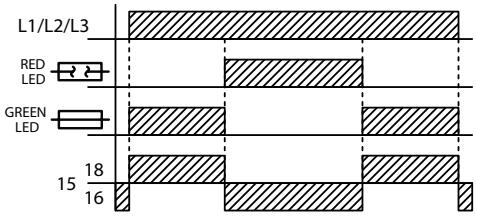
Description



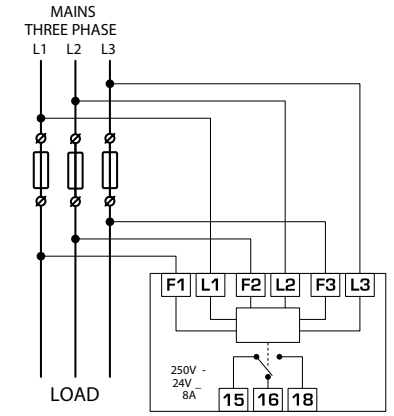
Dimensions

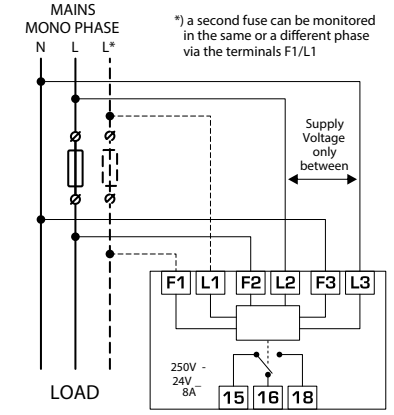


Function



Connection





Power supplies PS-30

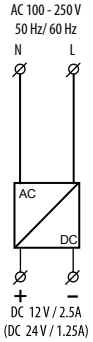
Technical data

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

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

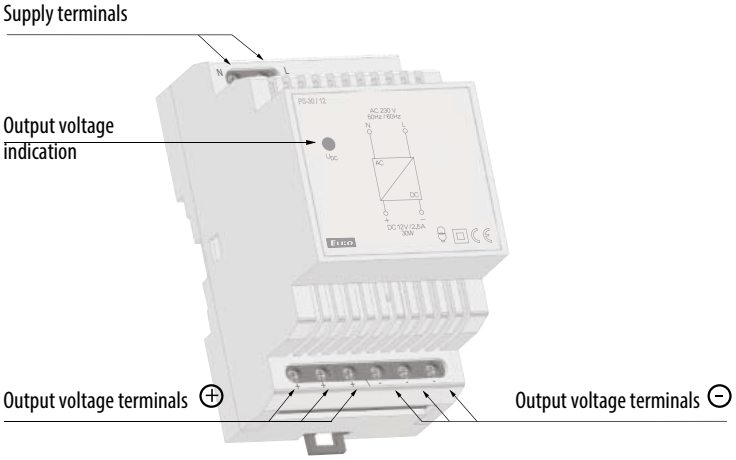
- PS-30-24 - stabilized power supply with fixed output voltage 24 V/30 W

Connection



Description

PS-30-24



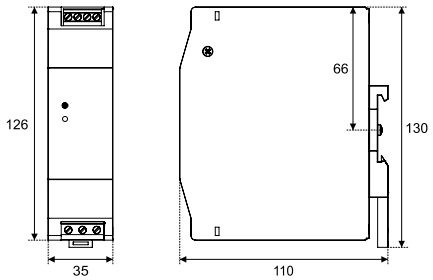
Switching Power Supply

Technical data

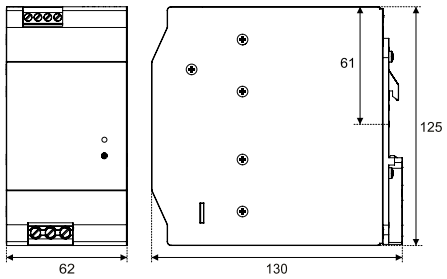
		PS-48-24	PS-72-24	PS-120-24	PS-240-24	PS-480-24
Input						
Supply voltage AC	V AC	100 - 240				
Nominal frequency	Hz	50 - 60 (range: 47 - 63)				
Supply voltage DC	V DC	140 - 340				
Input current at 230VAC	A	0,4	0,97	0,6	1,4	2,4
In-rush current at 230VAC	A	15	20	25	30	50
Input overload protection T-type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

Dimensions

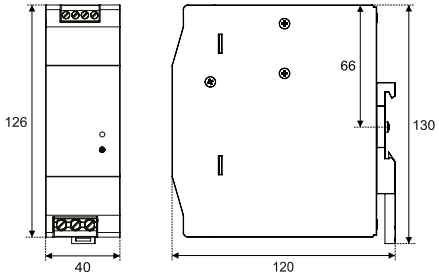
PS-48-24 & PS-72-24



PS-240-24



PS-120-24



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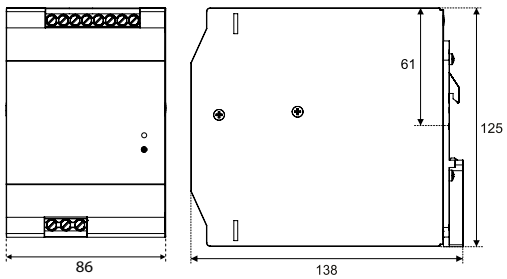
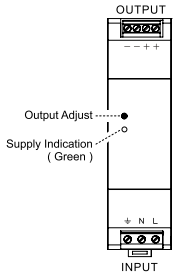
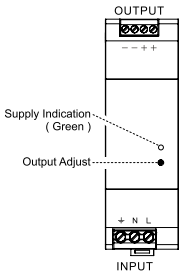


Description

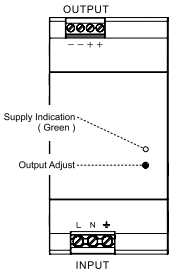
PS-48-24 & PS-72-24



PS-120-24



PS-240-24



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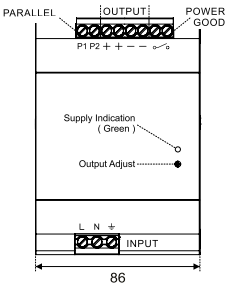
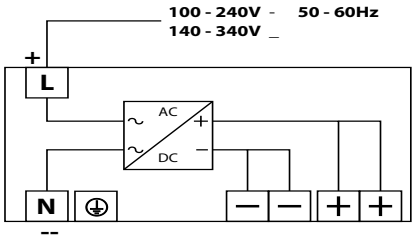


Connection

PS-48-24 & PS-72-24



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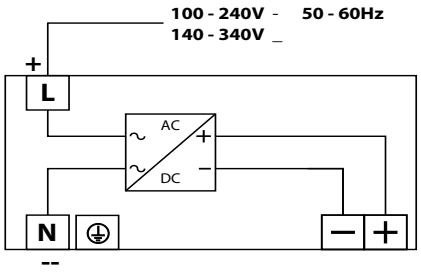

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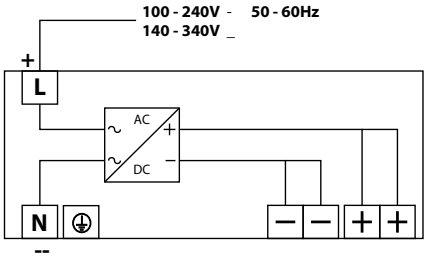

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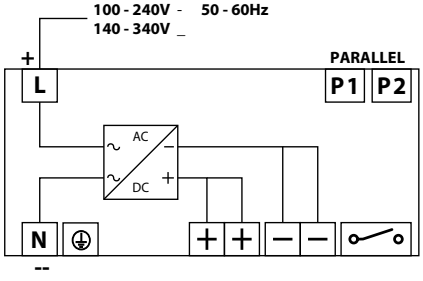
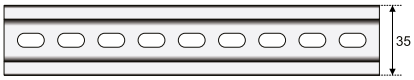




Install rail: TS35/7.5 or TS35/15

POWER GOOD:
Relay closed: power supply (Output) is stable and within the tolerance limits.
Relay opened: power supply (Output) out of tolerance limits. Power cut off – to prevent damages on sensitive loads.

PARALLEL P1 P2:
Parallel connection of up to 10 power supplies. Connect P1s with P1s, P2s with P2s of each power supply wired in parallel (+ and – outputs in parallel). Each power supply unit must have connection to supply (Input)

Electromechanical power relays RERM3

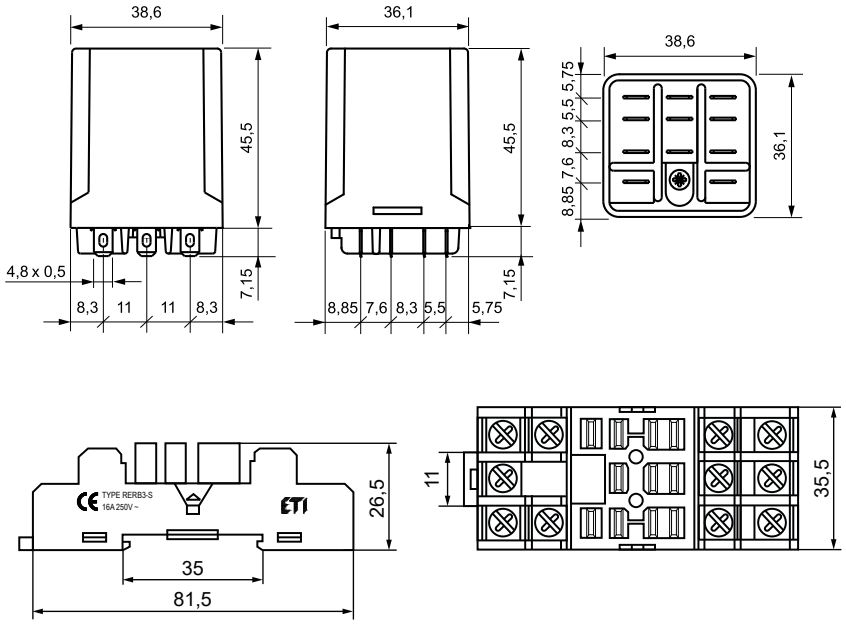
Table 1: Technical data

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

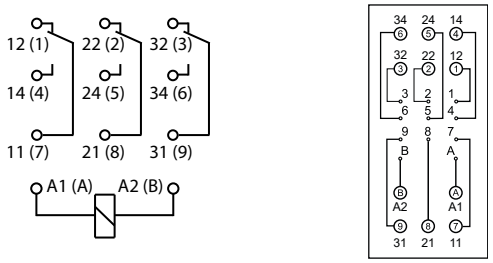
Table 2: Coil data

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

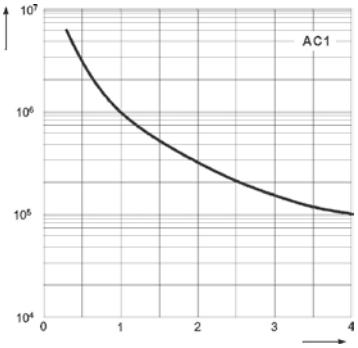
Dimensions



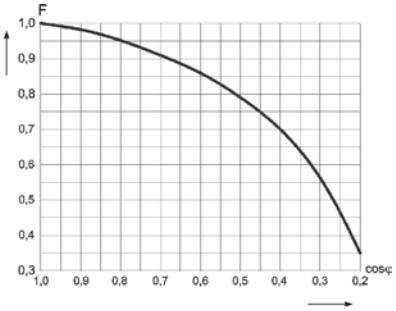
Connection diagram (pin side view)



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



Electrical life reduction factor at AC inductive load



Industrial plugin electromagnetic relays

Relays for general application
For plug-in sockets: 35 mm rail mount acc. to EN 60715; panel mounting
Miniature dimensions
Cadmium - free contacts
AC and DC coils
Recognitions, certifications, directives: RoHS, CE
Standards: EN61810-1:2008 (electromechanical relays); EN61984:2002, EN60998-2-1:2001, EN60664-1:2003 (sockets)

Table 1: Technical data

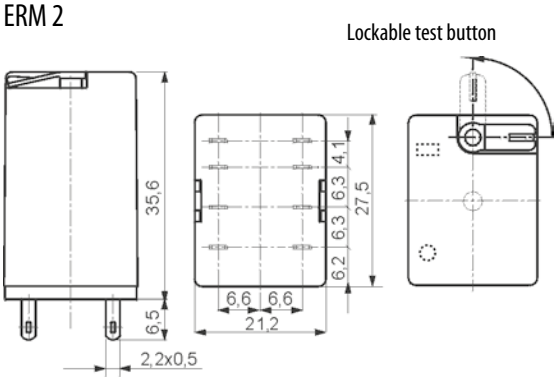
	ERM2	ERM4
Number and type of contacts	2 CO	4 CO
Contact material	AgNi	
Rated / max. switching voltage AC	250 V / 440 V	250 V / 250 V
Min. switching voltage	10 V	10 V AgNi, 10 V AgNi/Au 0,2 µm, 5 V AgNi/Au 5 µm
Rated load (capacity) AC1 AC15 AC3 DC1 DC13	 12 A / 250 V AC 3 A / 120 V 1,5 A / 240 V 370 W (single-phase motor) 12 A / 24 V DC (see Fig. 3) 0,22 A / 120 V 0,1 A / 250 V	 6 A / 250 V AC 1,5 A / 120 V 0,75 A / 240 V (C300) 125 W (single-phase motor) 6 A / 24 V DC (see Fig. 3) 0,22 A / 120 V 0,1 A / 250 V (R300)
Min. switching current	5 mA	
Max. inrush current	24 A	12 A
Rated current	12 A	6 A
Max. breaking capacity AC1	3 000 VA	1 500 VA
Min. breaking capacity	0,3 W	0,3 W AgNi, 0,3 W AgNi/Au 0,2 µm, 0,1 W AgNi/Au 5 µm
Contact resistance	≤ 100 mΩ	
Max. operating frequency (cycles/hour) • at rated load AC1 • no load	 1 200 18 000	
Coil data		
Rated voltage 50/60 Hz AC DC	See table 2	
Must release voltage	AC: ≥ 0,2 Un DC: ≥ 0,1 Un	
Operating range of supply voltage	see Table 2	
Rated power consumption AC DC	1,6 VA 0,9 W	
Insulation according to EN 60664-1		
Insulation rated voltage	250 V AC	
Rated surge voltage	4 000 V 1,2 / 50 µs	2 500 V 1,2 / 50 µs
Overvoltage category	III	II
Insulation pollution degree	3	2
Dielectric strength • between coil and contacts • contact clearance • pole - pole	 2 500 V AC type of insulation: basic 1 500 V AC type of clearance: micro-disconnection 2 500 V AC type of insulation: basic	
Contact - coil distance • clearance • creepage	 ≥ 2,5 mm ≥ 4 mm	 ≥ 1,6 mm ≥ 3,2 mm
General data		
Operating / release time (typical values)	AC: 10 ms / 8 ms DC: 13 ms / 3 ms	
Electrical life • resistive AC1 • cosΦ	 $> 10^5$ 12 A, 250 V AC see Fig. 2	 $> 10^5$ 6 A, 250 V AC see Fig. 2
Mechanical life (cycles)	> 2 x 107	
Dimensions (L x W x H)	27,5 x 21,2 x 35,6 mm	
Weight	35 g	
Ambient temperature • storage • operating	 -40...+85 °C AC: -40...+55 °C DC: -40...+70 °C	
Cover protection category	IP 40 EN 60529	
Environmental protection	RTI EN 116000-3	
Shock resistance (NO/NC)	10 g / 5 g	
Vibration resistance	5 g 10...150 Hz	

Table 2: Coil data

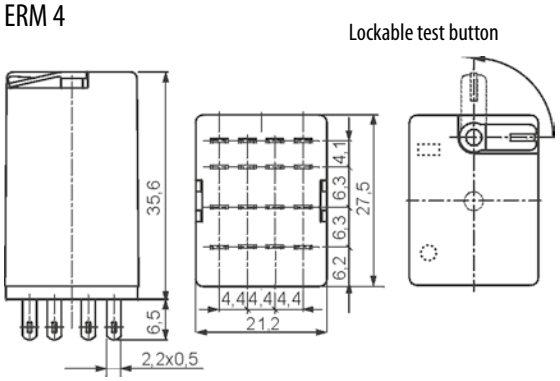
DC voltage version					
Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
012DC	12	160	± 10%	9,6	21,6
024DC	24	640	± 10%	19,2	43,2
048DC	48	2600	± 10%	38,4	86,4
110DC	110	13600	± 10%	88	198
220DC	220	54000	± 10%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

Dimensions

ERM 2

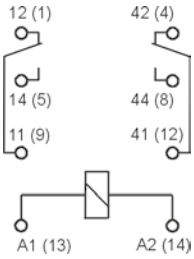


ERM 4

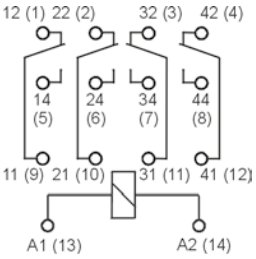


Connection diagram (pin side view)

ERM 2



ERM 4



Ordering designation
ERMX-YYYYYZ

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

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

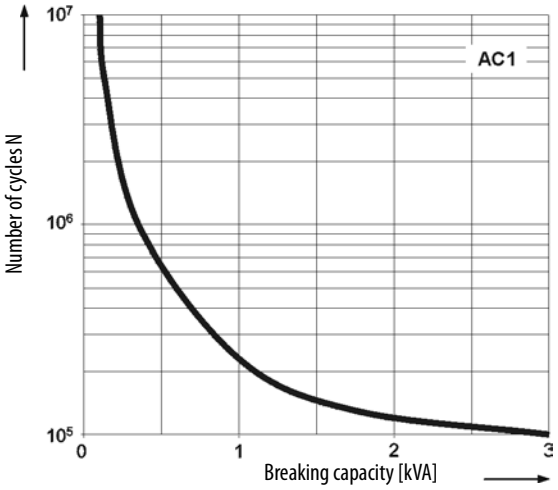
Z – Additional features:
L – Light indicator (smd LED - red)

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

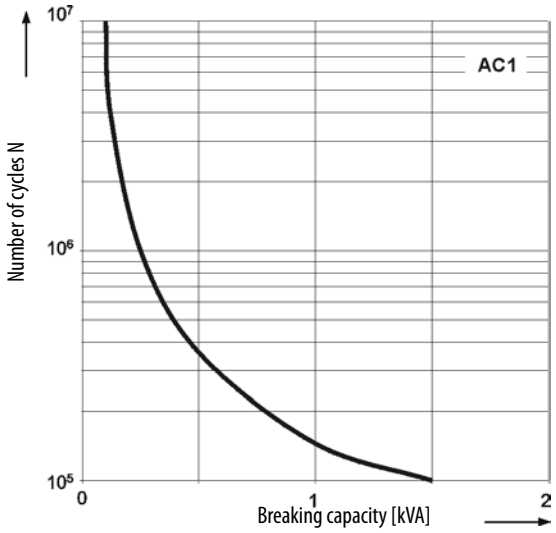
Meaning of color codes:

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

ERM 2

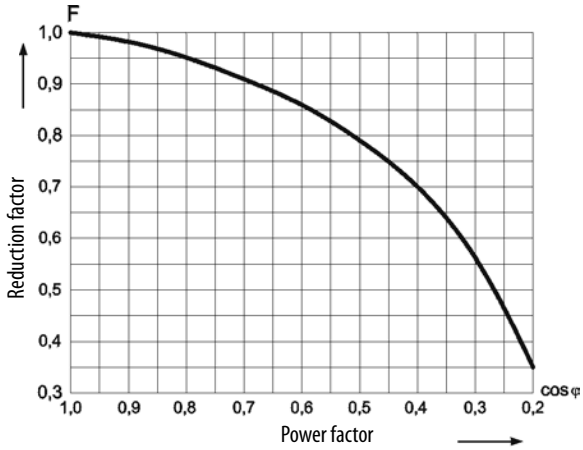


ERM 4



Electrical life reduction factor at AC inductive load Fig. 2

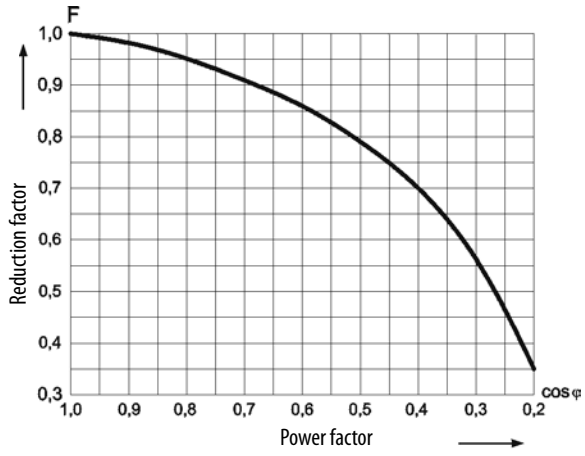
ERM 2



$N_{cos\varphi} = N \times F$

N - electrical life at AC1

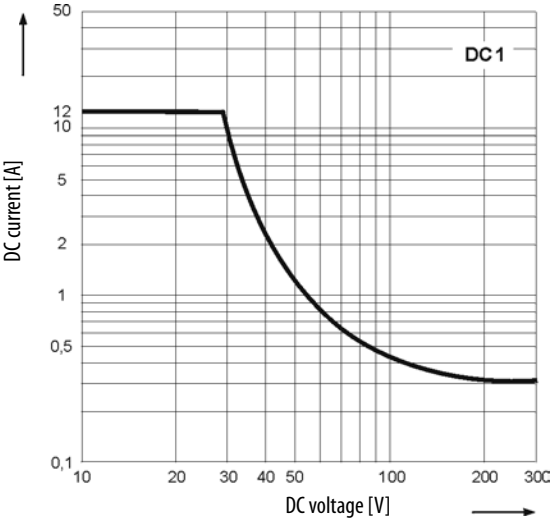
ERM 4



$N_{cos\varphi} = N \times F$

Max. DC resistive load breaking capacity Fig. 3

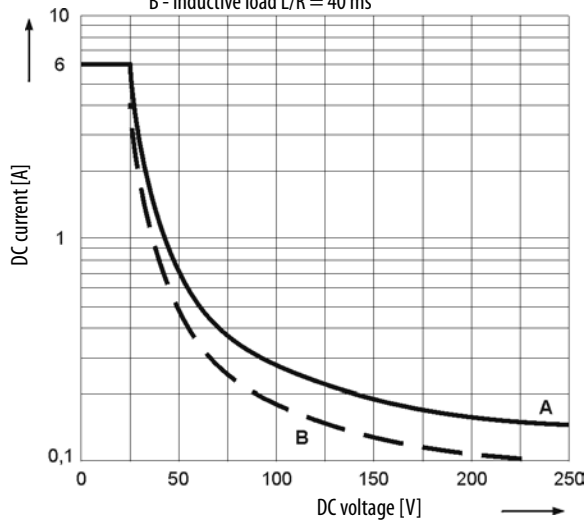
ERM 2



ERM 4

A - resistive load DC1

B - inductive load L/R = 40 ms



Contact material selection for different load types ERM2 and ERM4

AgNi - for resistive or inductive loads,

Mounting

ERM 2

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

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

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

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

ERM 4

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

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

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

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

Plugin Sockets And Accessories

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

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

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

Two poles

12A, 300 V AC

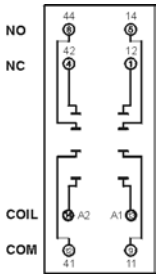
For ERM2

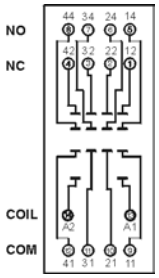
Four poles

6A, 300 V AC

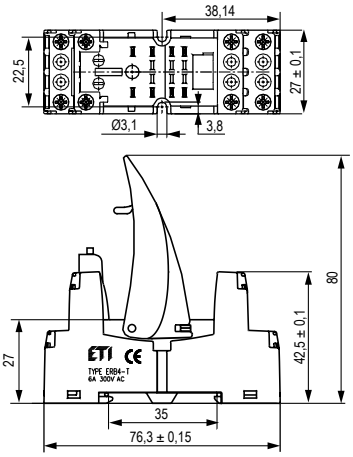
For ERM4

Connection diagram





Dimensions

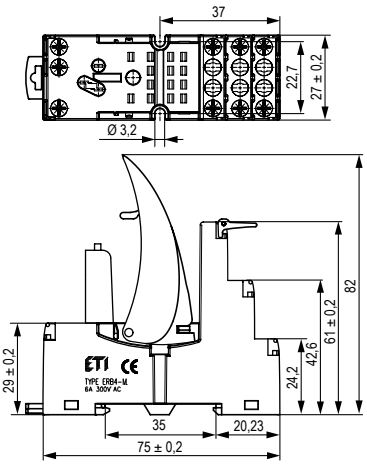


ERB2-M and ERB4-M
Plugin sockets (base) type M

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

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

Dimensions



Two poles

12A, 300 V AC

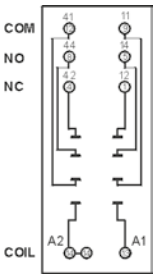
For ERM2

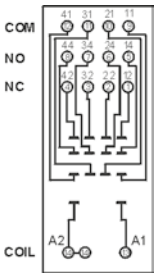
Four poles

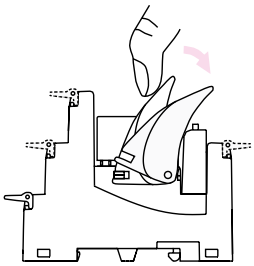
6A, 300 V AC

For ERM4

Connection diagram







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

Protection RC modules type ERC_AC

It protects against EMC disturbance and limits overvoltage.	A2 / A1	6/24 V AC	ERC-024AC
		110/240 V AC	ERC-230AC

Protection RC modules type ERC_ACDCL

It limits overvoltage on AC and DC coils. Coil energizing indication.	≃ A2 / ± A1	6…24 V ACDC	ERC-024ACDCL
		24…60 V AC DC	ERC-060ACDCL
		110…230 V ACDC	ERC-230ACDCL

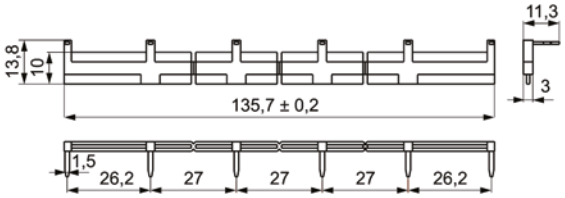
Modules are parallely connected with relay coil

Interconnection strip ER-CLIP

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

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

Dimensions



Miniature Electromagnetic Relays

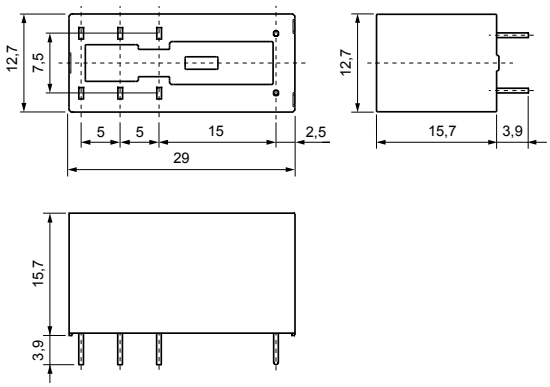
Table 1: Technical data

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

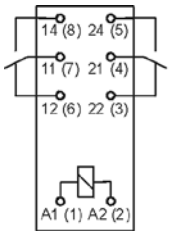
Table 2: Coil data

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
DC voltage version					
005DC	5	60	± 10%	3,5	12,7
012DC	12	360	± 10%	8,4	30,6
024DC	24	1440	± 10%	16,8	61,2
AC 50/60 Hz voltage version					
024AC	24	400	± 10%	19,2	28,8
230AC	230	38 500	± 10%	184,0	276,0

Dimensions



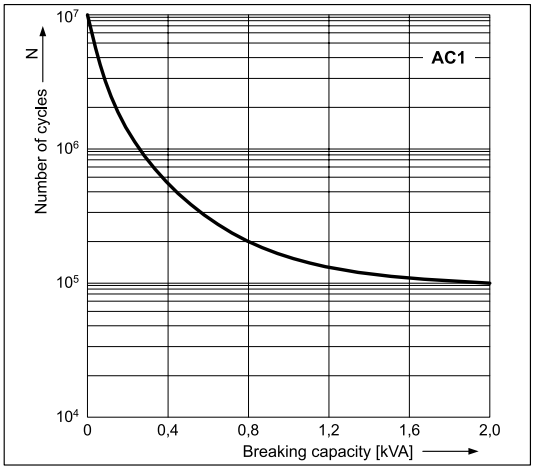
Connection diagram (pin side view)



Terminal (pin)	A1(1); A2(2)	22(3); 21(4); 24(5); 12(6); 11(7); 14(8)
[mm]	Ø 0,6	0,5 x 0,9
Drilling hole: • for relays • for sockets	 Ø 1,3 + 0,1 mm Ø 1,5 + 0,1 mm	

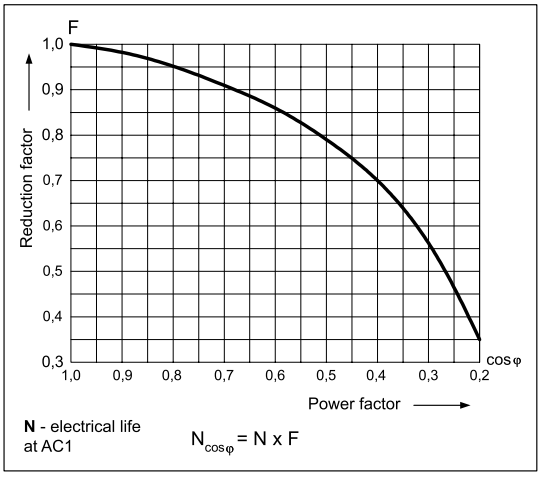
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour

Fig. 1

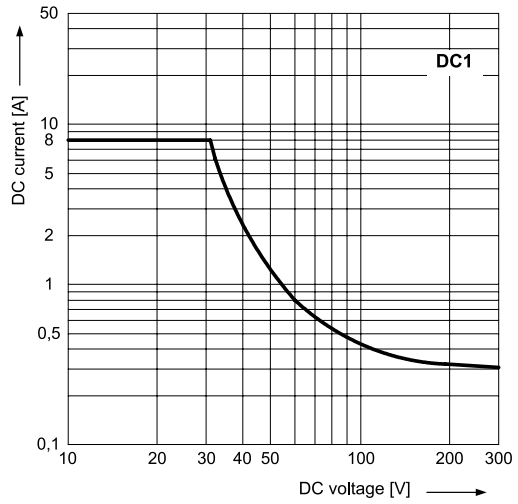


Electrical life reduction factor at AC inductive load

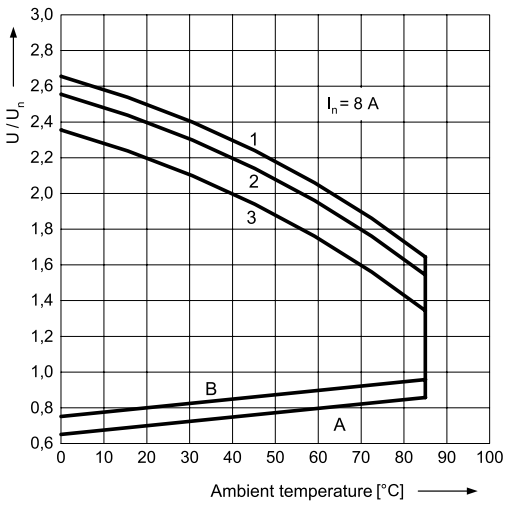
Fig. 2



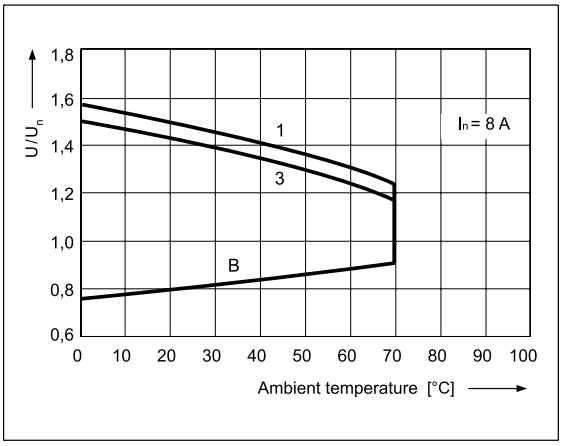
Max. DC resistive load breaking capacity
Fig. 3



Coil operating range = DC
Fig. 4



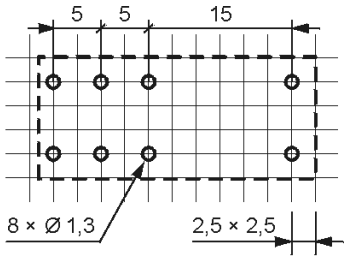
Coil operating range = AC 50 Hz
Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Pinout (soldier side view)



Mounting

Relays MER2 are designed for:

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

Plugin Sockets And Accessories

MERB-T
Plugin sockets (base) type T

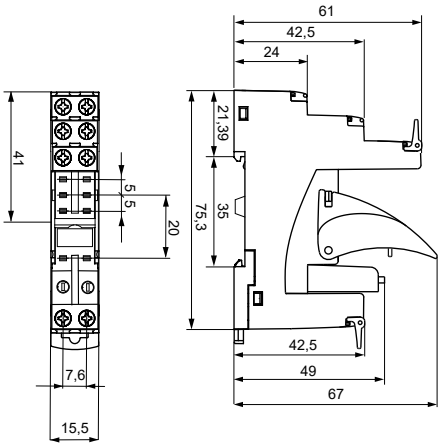
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 75,3 x 15,5 x 61(67) mm*

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

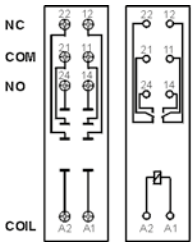
Two poles, 5mm pinout

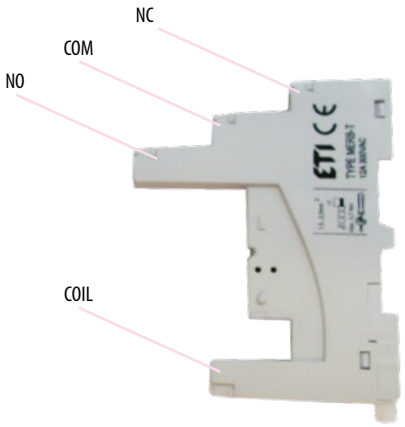
12A, 300 V AC

Dimensions



Connection diagram





MERB-M
Plugin sockets (base) type M

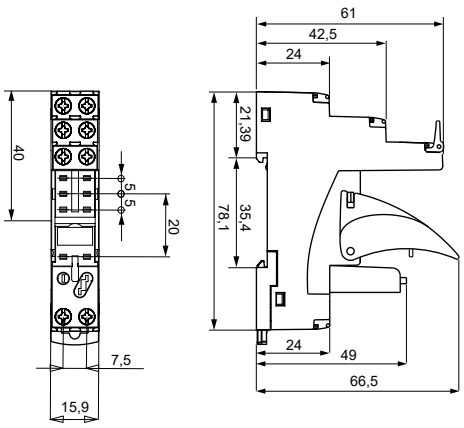
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 78,1 x 15,9 x 61(66,5) mm*

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

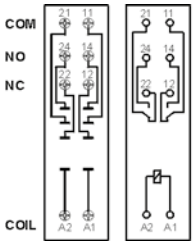
Two poles, 5mm pinout

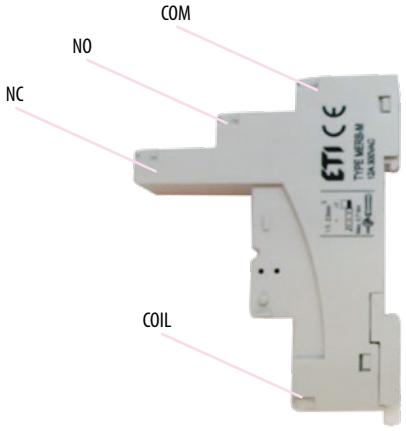
12A, 300 V AC

Dimensions



Connection diagram





SLIM RELAYS SSR & SER, Electromagnetic and solid

Table 1: Technical data

	SER1; Contact data	SSR1; Output circuit - Triac
Number and type of contacts	1 CO	1 NO
Contact material	AgSnO2	-
Rated / max. switching voltage AC	400 V AC / 250 V DC	400 V AC / 440 V AC
Min. switching voltage	10 V AC / DC	20 V AC
Rated load (capacity) AC1 DC1	 6 A / 250 V AC 6 A / 24 V DC; 0,15 A / 250 V DC	 1,2 A / 400 V AC -
Min. switching current	100 mA	10 mA
Max. inrush current / Max. non-repeat surge current	10 A (t=20 ms)	30 A (t=20 ms)
Rated current	6 A	1,2 A
Max. breaking capacity AC1	1 500 VA	-
Min. breaking capacity	1 W	-
Contact resistance	≤100 mΩ 100 mA, 24 V	-
Max. operating frequency (cycles/hour) • at rated load AC1 • no load	 360 72 000	-
I^2t for fusing	-	5,1 A^2s (t=1-10 ms)
dI/dt	-	50 A/µs
dV/dt	-	40 V/µs
Input circuit		
Rated voltage AC: 50/60 Hz AC/DC	24 V; 230 V	
Must release voltage / Turn-off voltage	AC: ≥ 0,2 Un DC: ≥ 0,1 Un	
Must operate voltage	AC & DC: ≤ 0,8 Un	-
Rated power consumption AC/DC AC/DC	0,3 ... 1,6 VA / 0,3 ... 1,6 W -	0,3 VA / 0,3 W 24 V AC/DC 1,6 VA / 1,6 W 230 V AC/DC
Insulation according to PN-EN 60664-1		
Insulation rated voltage	400 V AC	600 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs	-
Overvoltage category	III	-
Insulation pollution degree	3	2
Dielectric strength • input - output • input - output • mass - input, output • contact clearance	 4 000 V AC 50/60 Hz, 1 min. (type of insulation: reinforced) 6 000 V 1,2 / 50 µs 2 500 V AC 50/60 Hz, 1 min. 1 000 V AC 50/60 Hz, 1 min. (type of clearance: micro-disconnection)	 4 000 V AC 50/60 Hz, 1 min. (type of insulation: reinforced) - - -
Input - output distance • clearance • creepage	 ≥ 6 mm ≥ 8 mm	-
General data		
Operating / release time (typical values)	AC: 7 ms DC: 6 ms / AC: 15 ms DC: 10 ms	10 ms max. (zero turn-on) / 10 ms max.
Electrical life • resistive AC1 (cos φ = 0,4) • resistive DC1	 > 0,6 x 105 6 A, 250 V AC; > 2 x 105 2 A, 250 V AC 105 6 A, 30 V DC	-
Mechanical life (cycles)	> 2 x 107	-
Dimensions (L x W x H)	93,8 x 6,2 x 80 mm	
Weight	40 g	
Ambient temperature • storage • operating	 -40...+70 °C -40...+55 °C (-40...+60 °C 24 V DC)	 -40...+70 °C -40...+55 °C
Protection category	IP 20 PN-EN 60529	
Environmental protection	RTI PN-EN 116000-3	
Shock resistance	10 g	
Vibration resistance	5 g 10...500 Hz	

Input data SER1

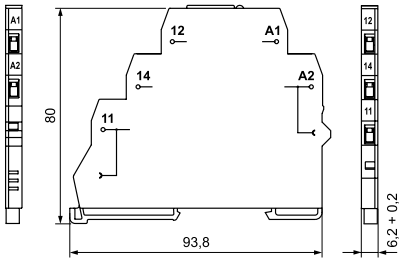
Interface relay code	Rated input voltage, Un	Power of input circuit	Input - voltage range, V	
			min. (20 °C)	max. (55 °C)
SER1-024ACDC	24 V AC/DC	0,5 VA / 0,5 W	19,2	26,4
SER1-230ACDC	230 V AC/DC	0,8 VA / 0,8 W	184,0	253,0

Input data SSR1

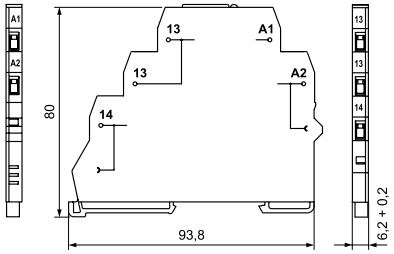
Interface relay code	Rated input voltage Un	Power of input circuit
SSR1-024ACDC	24 V AC/DC	0,3 VA / 0,3 W
SSR1-230ACDC	230 V AC/DC	1,6 VA / 1,6 W

Dimensions

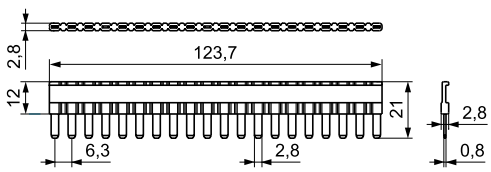
SER1-024ACDC / SER1-230ACDC



SSR1-024ACDC / SSR1-230ACDC

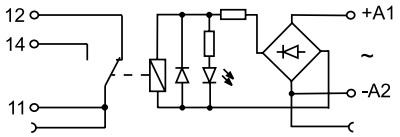


SR-TERMINAL

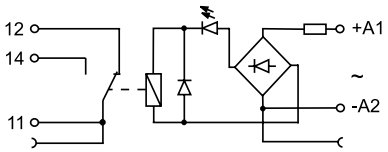


Connection diagram

SER1-024ACDC



SER1-230ACDC



SSR1-024ACDC
SSR1-230ACDC