DTS 1, DTS 2, DTS 3, DTS 5 - Digital time switch clock Page 10-3

- Automatic conversion summer/ winter time
- 100 memory places
- 4 types of settings - auto/constantly manually/ random/holiday mode.
- Universal power voltage AC/DC 12 - 240 V or AC 230 V
- CE

DTS 4 - Digital time switch with an astronomical program Page 10-5

- Two-channel design, where each channel is programmable independently of the other
- By entering the geographic coordinates, the lighting can be switched on/off by sunrise and sunset
- Power voltage AC 230 V
- CE

TSD 1 - Twilight switch Page 10-7

- Level of ambient intensity is monitored by an external sensor and output is switched according to set level on the device
- Level of illumination adjustable in two ranges
- Universal power voltage AC/DC 12 – 240V nebo AC 230 V
- CE

TSD 2 - Twilight switch with digital time switch clock Page 10-10

- The advantage of a digital switch is the possibility of blocking the twilight switch function when lighting seems as uneconomical
- Switching: according to programme - AUTO/constantly manually/random
- Power voltage AC 230 V
- CE

MVR 33, MVE 63 - Monitoring voltage relay Page 10-12

- Serves to control supply voltage for appliances sensitive to supply tolerance
- U max and U min can be monitored independently
- Adjustable time delay for all types is 0 - 10 s
- Power (and monitored) voltage AC 48-276 V
- CE

MVR 43N - Relay for complete monitoring 3-phase mains Page 10-15

- Monitoring 3-phase mains:
  - Voltage in 2 levels: overvoltage and undervoltage
  - phase asymmetry
  - phase sequence
  - phase failure
- Monitoring relays for circuits 3x400/230 V (with neutral)
- Power voltage AC 230 V, AC 400 V, AC/DC 24 V, galvanically separated
- CE

MVR 42 - Monitoring voltage relay Page 10-18

- Monitoring voltage with 2 independent levels (overvoltage/ undervoltage)
- MEMORY function – manual reset key on frontal panel
- Function of second relay (independent/parallel)
- Power voltage AC 230 V, AC 400 V or AC/DC 24 V
- CE

MVR 54N - Relay for monitoring over/ under voltage, phase sequence and failure Page 10-21

- Serves to monitor voltage , phase failure and sequence in switchboards
- Supply is done from monitored voltage
- Monitoring voltage relay supply L1-N, means that relay monitors also failure of neutral wire
- Monitored power voltage: 3 x 400 V/ 230 V
- CE

MVR 55 - Relay for monitoring phase sequence and failure Page 10-23

- Monitoring of correct motor winding etc..
- Fixed delay T1 (500 ms) and adjustable delay T2 (0.5-10 s)
- Monitoring voltage relay supply from all phases, which means that function of relay is applicable also if one phase fails.
- Monitored power voltage: 3 x 400 V
- CE

MVR 56 - Relay for monitoring phase sequence and failure Page 10-25

- Supply is done from monitored voltage
- Supply from all phases which means that relay is functional also in case of one phase faillure
- Faulty state is indicated by LED and by opening of output relay contact
- 7 types according to supply
- CE

MCR 515 - Current monitoring relay

Page 10-27

- Supply from monitored voltage
- In conjunction with the supplied current transformers, the basic current ranges can be expanded up to 600 A, increasing the range of use.
- Power voltage
  AC 24 – 240 V, DC 24 V
- CE

MCR 32 - Current monitoring relay

Page 10-29

- The design reduces the thermal stress of the product compared to the conventional solution with the built-in shunt, increases the current range up to 20A and galvanically separates the measured circuit
- Supply from monitored voltage
- Power voltage
  AC 24 – 240 V, DC 24 V
- CE

MCR 413 - Monitoring current relay

Page 10-31

- Monitoring adjusted current in 2 independent levels (overvoltage/ undervoltage)
- MEMORY – function, "RESET" button on the frontal panel
- Function of 2nd relay (independent/parallel)
- Power voltage
  AC 230 V or AC/DC 24 V
- CE

NWT 5 - Level switch

Page 10-34

- One-level switch of conductive liquids
- Two-level switch of conductive liquids
- Choice of function Pump up, Pump down
- Adjustable time delay on the output (0.5 - 10 s)
- Supply AC/DC 24 - 240 V
- CE

LS 2 - Level sensors

Page 10-36

- Intended for tank wall mounting or mounting by socket
- To be used in electric conductive fluids and mechanically polluted fluids with temperature +1...+80°C
- Max. wire profile: 2.5 mm^2.
- CE

TZ 220 - Thermostat for monitoring temperature of motor winding

Page 10-37

- Function of short-circuit or sensor disconnection monitoring
- MEMORY function - active by DIP switch
- PTC sensor is used for sensing, It is in-built in motor winding by its manufacturer
- Multivoltage supply
  AC/DC 24-240 V
- CE

MRM 116UW - Power relays

Page 10-39

- Auxiliary control of lighting, signaling, relays, boilers, HDO, heaters etc.
- Supply voltage:
  AC/DC 12-240 V or AC 230 V
- CE

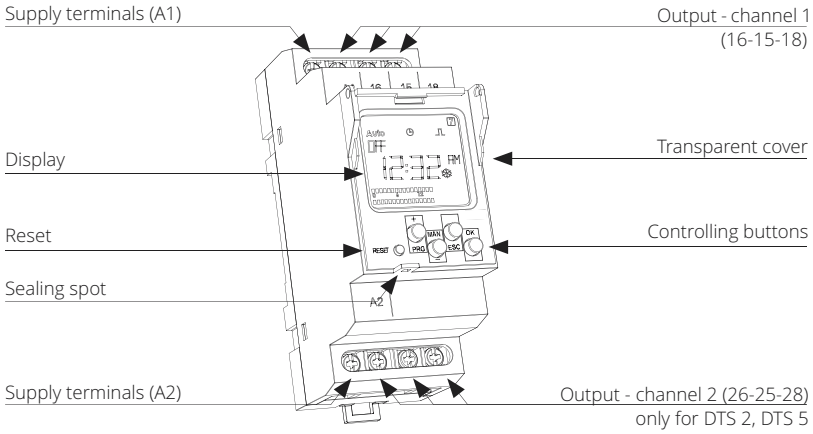
THE RELAY BOASTS A LOWER POWER OUTPUT OF ONLY 2.5 WATTS AND THE ABILITY TO MONITOR BOTH ALTERNATING VOLTAGE AND NON-SINUSOIDAL WAVEFORMS. THEY ARE SUITABLE FOR 50 HZ AND 60 HZ, WHICH IS ESPECIALLY APPRECIATED BY CUSTOMERS, WHOSE PRODUCTS TRAVELS OVERSEAS.

DTS 1, DTS 3 – 1-CHANNEL DIGITAL SWITCH CLOCK CONTROLS VARIOUS APPLIANCES IN REAL TIME; DAILY, WEEKLY, MONTHLY AND YEARLY.
DTS 2, DTS 5 – 2-CHANNEL DIGITAL SWITCH CLOCK CONTROLS VARIOUS APPLIANCES IN REAL TIME; DAILY, WEEKLY, MONTHLY AND YEARLY

Type	OUTPUT		TIME PROGRAMM			
	1 channel	2 channel	day	week	month	year
DTS 1	●		●	●		
DTS 2		●	●	●		
DTS 3	●		●	●	●	●
DTS 5		●	●	●	●	●

FUNCTION DESCRIPTION

- This time switch clock DTS is used to control various appliances in real time; daily, weekly, monthly and yearly mode.
- Switching: according the program (AUTO)/constantly manually, manually to next program change/random (CUBE)
- „Holiday program" option to choose an interval when the device doesn´t switch according to the standard program, but will be block during that time.
- Automatic conversion summer / winter time
- Sealable cover of front panel, easy controlling via 4 buttons
- 100 memory places, clear LCD display, min. interval 1 s
- Voltage range: AC 230 V or AC/DC 12-240 V
- Cyclic output
- Pulse output
- **DTS 1, DTS 3**: one channel version, 2-MODULE, DIN rail mounting, clamp terminals
- **DTS 2, DTS 5**: two channel version, 2-MODULE, an individual program can be run on each channel

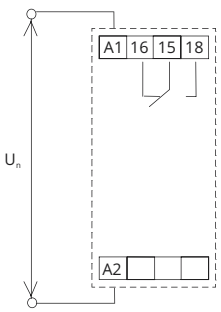


Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
DTS 1 1 230 V AC	230	1	786.053.010	110	1
DTS 2 2 UNI AC/DC	12 -240	2	786.053.001	143	1
DTS 3 1 UNI	12 -240	1	786.053.007	130	1
DTS 5 2 UNI	12 -240	2	786.053.005	143	1

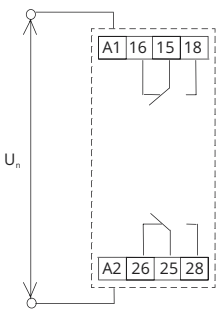
Type		DTS 1 DTS 3	DTS 2 DTS 5
Supply terminals		A1 - A2	
Voltage range	UNI	AC/DC 12 - 240 V (50 - 60 Hz)	
Burden	UNI	AC 0.5 2 VA / DC 0.4 - 2 W	
Voltage range	230	AC 230 V / 50 -60 Hz	
Burden	230	AC max. 14 VA / 2 W	
Supply voltage tolerance		-15 %; +10 %	
Back-up supply		yes	
Summer/winter time		automatic	
OUTPUT			
Number of contacts		1x changeover/SPDT ($AgNiSnO_2$)	2x changeover/SPDT ($AgNiSnO_2$)
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	
Mechanical life		3 x 10^7	
Electrical life (AC1)		<0.7 x 10^5	
TIME CIRCUIT			
Power back-up		up to 3 years	
Accuracy		max. ±1 s / day at 23 °C	
Minimum interval		1 min	
Data stored for		min. 10 years	
Cyclic output		1 - 99 s	
Pulse output		1 - 99 s	
PROGRAM CIRCUIT			
Number of memory places		100	
Program (DTS 1, DTS 2)		daily, weekly	
Program (DTS 3, DTS 5)		daily, weekly, monthly, yearly (up to year 2095)	
Data display		LCD display, backlight	
OTHER INFORMATION			
Operating temperature		-20 ... +55 °C	
Storage temperature		-30 ... +70 °C	
Electrical strenght		4 kV (supply - output)	
Operating position		any	
Mounting		DIN rail EN 60715	
Protection degree		IP 10 clips / IP 40 from front panel	
Overvoltage category		III.	
Pollution degree		2	
Terminal wire capacity		solid wire max. 2x 2.5 mm^2 or 1x4 mm^2 / with sleeve max. 1x2.5 mm^2 or 2x1.5 mm^2	
Standards		EN 61812-1, EN 61010-1	

Connection diagram

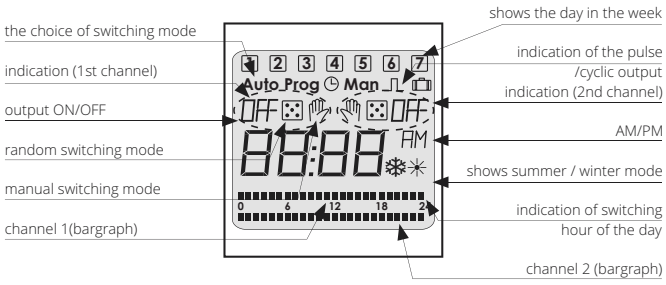
DTS 1, DTS 3



DTS 2, DTS 5

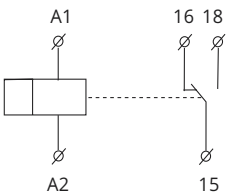


Description of displayed elements on the screen

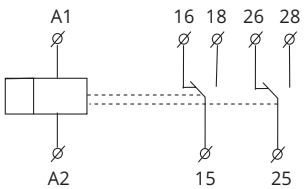


Symbol

DTS 1, DTS 3



DTS 2, DTS 5

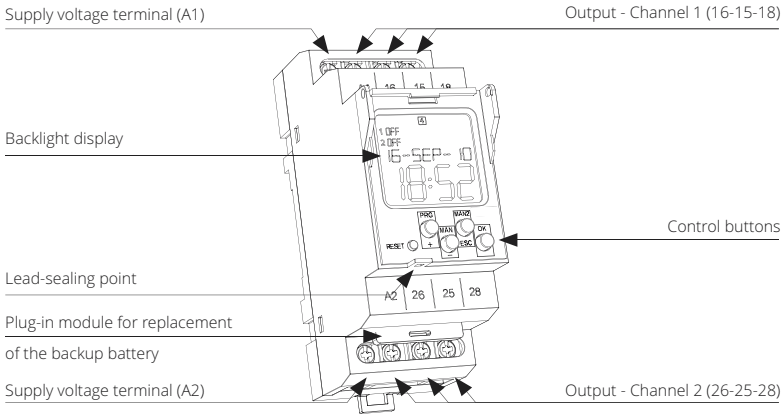


DTS 4 – THIS RELAY REPLACES TWILIGHT SWITCHES AND IS USED PRIMARILY TO CONTROL THE SWITCHING OF OUTDOOR LIGHTING - FOR EXAMPLE, IN SHOP WINDOWS, BILLBOARDS AND OTHER ADVERTISING AREAS, FOR GARDEN OR PUBLIC LIGHTING.

THE DTS 4 DOES NOT NEED ANY ADDITIONAL LIGHT SENSORS, OR SENSORS THAT CAN LOSE SENSITIVITY WITH TIME, BECOME A TARGET OF VANDALISM, NEED TO BE ALTERED AND CAN BE COMPLICATED TO INSTALL. THANKS TO THE ASTROPROGRAM, THE SHT-4 CONTROLS UTILISING THE SUNRISE AND SUNSET AT THE GIVEN LOCATION, BY THE SPECIFIED COORDINATES.

FUNCTION DESCRIPTION

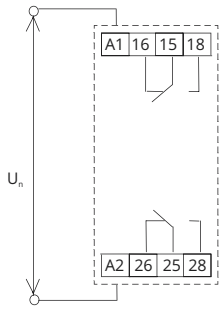
- Function:
  - by entering the geographic coordinates, the lighting can be switched on/off by sunrise and sunset
  - astro-clock with adjustable interruption
  - operating hours counter for each channel
  - timer - switching on the basis of real-time
- Two-channel design, where each channel is programmable independently of the other
- Automatic switching between winter and summer time
- Sealable transparent cover on the front panel
- Data and time backup using the battery
- Battery life - up to 3 yearseasy replacement of the backup battery through the plug-in module, no disassembling is required
- Supply voltage: AC 230 V
- 2-MODULE, DIN rail mounting



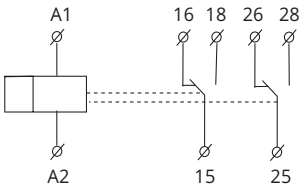
Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
DTS 4 2 230 V AC	230	2	786.053.004	126	1

Type	DTS 4
Supply terminals	A1 - A2
Supply voltage	AC 230 V / 50 - 60 Hz
Input power	AC max. 14 VA / 2 W
Supply voltage tolerance	-15 %; +10 %
Back-up supply	yes
Summer/winter time	automatic
OUTPUT	
Number of contacts	2x changeover/SPDT ($AgNiSnO_2$)
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
Mechanical life	3×10^7
Electrical life (AC1)	$<0.7 \times 10^5$
TIME CIRCUIT	
Power back-up	up to 3 years
Accuracy	max. ±1 s / day at 23 °C
Minimum interval	1 min
Data stored for	10 years
PROGRAM CIRCUIT	
Number of memory places	100
Program	daily, weekly (until 2099)
Data display	LCD display, backlight
OTHER INFORMATION	
Operating temperature	-20 ... +55 °C
Storage temperature	-30 ... +70 °C
Electrical strenght	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 10 terminals / IP 40 from front panel
Overvoltage category	III.
Pollution degree	2
Terminal wire capacity	solid wire max. 2x 2.5 mm^2 or 1x4 mm^2 / with sleeve max. 1x2.5 mm^2 or 2x1.5 mm^2
Standards	EN 61812-1, EN 61010-1

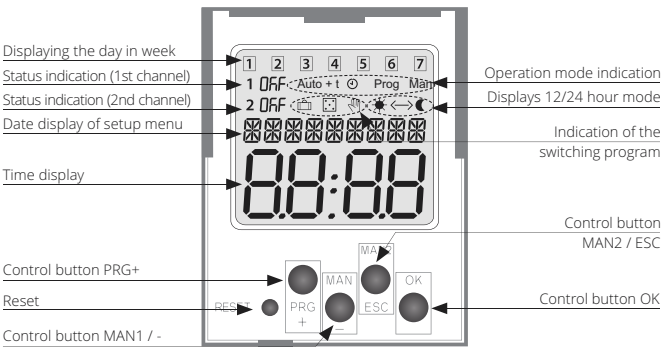
Connection diagram



Symbol



Description of displayed elements on the screen

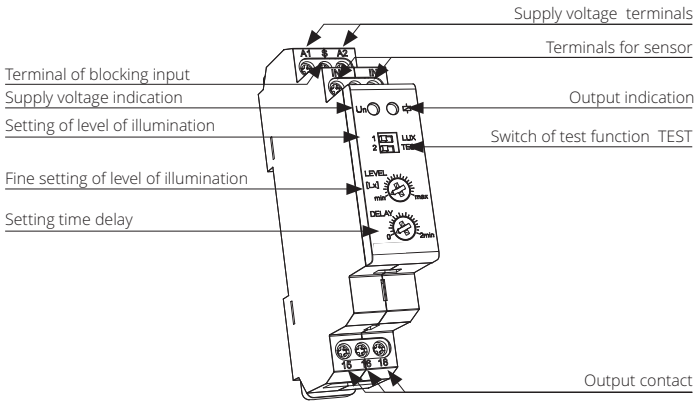


TSD 1 – TWILIGHT SWITCH WITH EXTERNAL FOTOSENSOR USED FOR SWITCHING STREET ILLUMINATION AND GARDEN LIGHTS, ILLUMINATION OF ADVERTISEMENTS, SHOP WINDOWS, ETC.

CE

FUNCTION DESCRIPTION

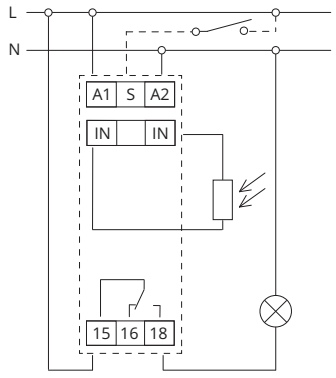
- Used to control lights on the basis of ambient light intensity
- Level of ambient intensity is monitored by an external sensor and output is switched according to set level on the device
- Control input for additional control, e.g. time switch, preswitch etc.
- Level of illumination adjustable in two ranges: 1 - 100 lx and 100 - 50000 lx
- Adjustable time delay to eliminate short term fl uctuation in illumination
- External sensor IP44 suitable for mounting on the wall (cover and holder of a sensor are a part of the package)
- Supply voltage AC 230 V or AC/DC 12 - 240 V
- Output contact: 1x changeover/ SPDT 16 A
- Red LED output indication
- 1-MODULE, DIN rail mounting



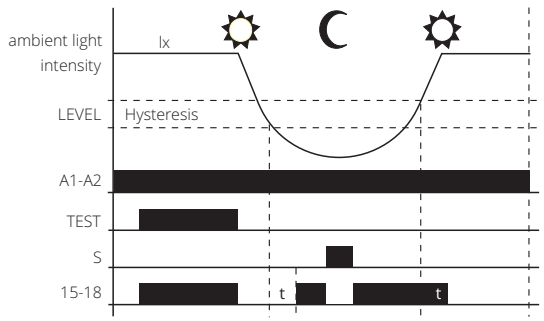
Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
TSD 1 1 230 V AC	230	1	786.053.016	65	1

Type	TSD 1
Supply terminals	A1 - A2
Supply voltage	AC 230 V / 50 - 60 Hz
Power input (apparent/loss)	AC max. 12 VA / 1.8 W
Supply voltage tolerance	-15 %; +10 %
Supply indication	green LED
Time delay	0 - 2 min
Time delay setting	potentiometer
Illumination rang 1)	1 - 100 lx
Illumination rang 2)	100 - 50000 lx
OUTPUT	
Number of contacts	1x changeover/SPDT ($AgNiSnO_2$)
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	3 x 10^7
Electrical life (AC1)	<0.7 x 10^5
CONTROL	
Power the control input	0.8 - 530 mVA
Load between S - A2	yes
Control terminals	A1 - S
Glow tubes connections	yes
Max. amount of flow lamps connected to controling input	max. amount 20 pcs
Impulse lenght	min. 25 ms / max. unlimited
Reset time	150 ms
OTHER INFORMATION	
Operating temperature	-20 ... +55 °C
Storage temperature	-30 ... +70 °C
Electrical strenght	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 20 terminals / IP 40 from front panel
Overvoltage category	III.
Pollution degree	2
Terminal wire capacity	solid wire max. 1x 2.5 mm^2 or 2x1.5 mm^2 / with sleeve max. 1x2.5 mm^2
Standards	EN 60255-6, EN 61010-1

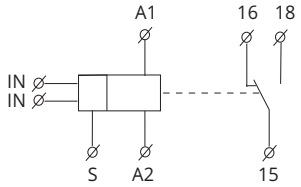
Connection diagram



Function

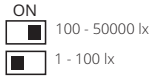


Symbol



Description of DIP switch

DIP 1 - LUX



DIP 2 - TEST

SKS – SENSOR IS INSTALLABLE TO PANEL (BY SCREW-ABLE TRANSPARENT COVER) TO OPENING WITH DIAMETER 6 mm. A PART OF THE SENSOR IS A PLASTIC HOLDER FOR PLACING INTO THE WALL OR TO ANOTHER PLACE. LENGTH OF A LINE CONNECTOR TO THE SENSOR CANNOT BE MORE THAN 50 m. DOUBLECURE CABLE CAN BE USED AS WIRE DIAMETER MIN. 2X 0.35 mm^2 AND MAX. 2X 2.5 mm^2.

CE

FUNCTION DESCRIPTION

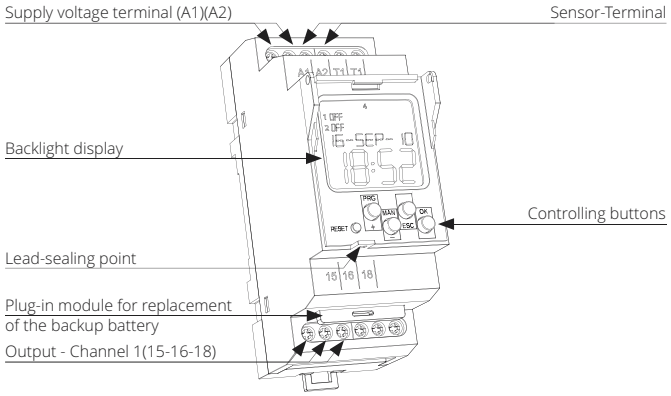
- Protection degree is IP44. To keep this protection:
  - photoresistor cover must be sealed by a rubber circle (part of the sensor)
  - cable must be of round cross-selection
  - the opening must be tight to the used cable
- It is possible to use photoresistor, which changes resistance in accordance with ambient illumination, as a sensor. Tolerance sensor ± 33 %
- Light sensor can not be used alone

Type	SKS
Operating temperature	-20 °C to +55 °C
Storage temperature	-30 °C to +70 °C
Protection degree	IP 44
Sensor cable length	max. 50 m (standard wire)
Weight	20 g

TSD 2 – IS USED FOR CONTROL OF LIGHTS ON THE BASIS OF AMBIENT LIGHT INTENSITY AND REAL TIME. TIME CLOCK CAN OVERRIDE THE LIGHT SENSOR FOR APPLICATIONS WHEN LIGHTS ARE NOT REQUIRED.

FUNCTION DESCRIPTION

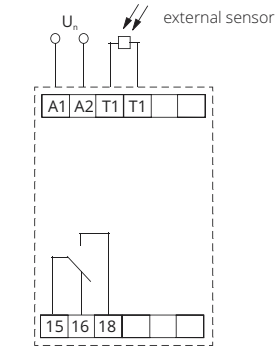
- Adjustable light intensity 10-50000 lx
- Function „random switching“ enables simulation of presence in a house when nobody is at home
- Switching: according to a program (AUTO) / permanently manual / random (CUBE)
- External sensor IP44 issuitable for mounting on the wall / in panel (cover and sensors are part of delivery)
- Sealable transparent cover of front panel
- Backup of data and time by battery (reserve battery up to 3 years)
- Easy replacement of backup battery with plug-in module located on front panelof device (no disassembly required)
- 2-MODULE, DIN rail mounting



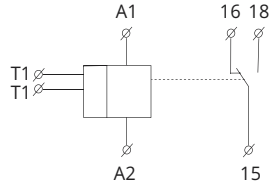
Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
TSD 2 1 230 V AC	230	1	786.050.845	127	1

Type	TSD 2
Supply terminals	A1 - A2
Supply voltage	AC 230 V / 50 - 60 Hz
Burden	max. 4 VA
Supply voltage tolerance	-15 %; +10 %
Back-up supply	yes
Summer/winter time	automatic
Type of backup battery	CR 2032 (3 V)
OUTPUT	
Number of contacts	1x changeover/SPDT ($AgNiSnO_2$)
Current rating	8 A / AC1
Breaking capacity	2000 VA / AC1,240 W / DC
Switching voltage	250 V AC1 / 30 V DC
Mechanical life	1×10^7
Electrical life (AC1)	1×10^5
TIME CIRCUIT	
Power back-up	up to 3 years
Accuracy	max. ±1 s / day at 23 °C
Minimum interval	1 min
Data stored for	10 years
PROGRAM CIRCUIT	
Illumination range	10 - 50000 lx
Program place number	100
Program period	daily, weekly, yearly
Data readout	LCD display, illuminated by back up
OTHER INFORMATION	
Operating temperature	-10 ... +55 °C
Storage temperature	-30 ... +70 °C
Electrical strenght	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 20 terminals / IP 40 from front panel
Overvoltage category	III.
Pollution degree	2
Terminal wire capacity	solid wire max. 1x 2.5 mm^2 or 2x1.5 mm^2 / with sleeve max. 1x1.5 mm^2
Standards	EN 61812-1, EN 61010-1, EN 60255-6, EN 60730-1, EN 60730-2-7

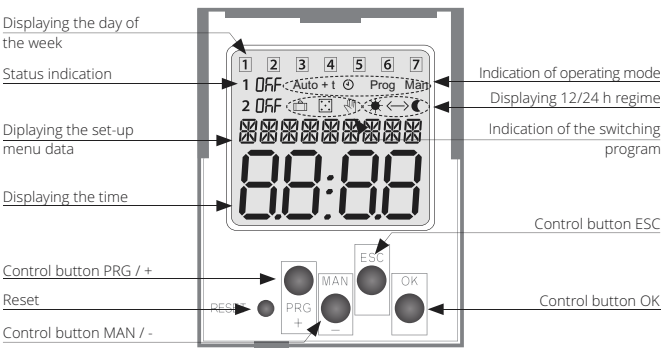
Connection diagram



Symbol



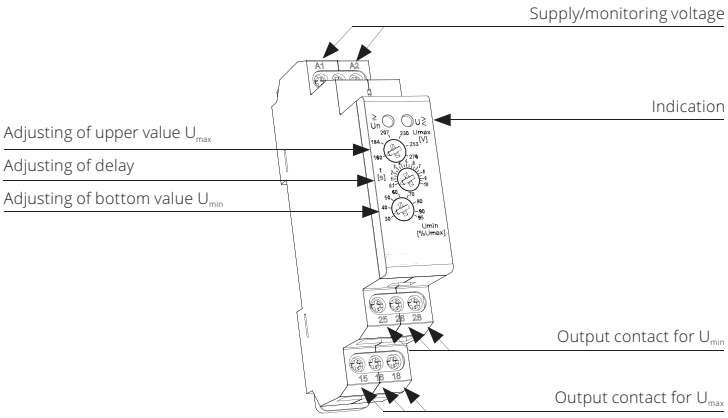
Description of displayed elements on the screen



MVE 33, MVR 63 – IT SERVES TO CONTROL SUPPLY VOLTAGE FOR APPLIANCES SENSITIVE TO SUPPLY TOLERANCE, PROTECTION OF THE DEVICE AGAINST UNDER/OVER VOLTAGE.

FUNCTION DESCRIPTION

- MVR-33 and MVR 63 are band voltage relay
- Monitors voltage in range AC 48 - 276 V
- U_{max} and U_{min} can be monitored independently
- Adjustable time delay for all types is 0 - 10 s (to eliminate short voltage drops or peaks).
- Voltage U_{min} adjusted as % of U_{max}.
- 3-state indication - LEDs indicating normal state and 2 fault states
- Supply from monitored voltage (monitors level of its own supply)
- 1-MODULE, DIN rail mounting

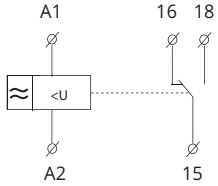


Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
MVR 33 1 48 - 276 V AC	48 - 276	1	786.050.795	61	1
MVR 63 1 48 - 276 V AC	48 - 276	1	786.053.031	61	1

Type	MVR 33	MVR 63
Supply terminals	A1 - A2	
Voltage range	AC 48 - 276 V / 50 - 60 Hz	
Burden	AC max. 1.2 VA	
Upper level (U_{max})	AC 160 - 276 V	
Bottom level (U_{min})	30 - 95 % U_{max}	
Max. permanent	AC 276 V	
Peak overload <1 ms	AC 290 V	
Time delay	adjustable 0 - 10 s	
ACCURACY		
Setting accuracy (mechanical)	5 %	
Repeat accuracy	1 %	
Dependance on temperature	<0.1 % / °C	
Tolerance of limit values	5 %	
Hysteresis	2 - 6 % adjusted value	–
OUTPUT		
Number of contacts	1x changeover/SPDT ($AgNiSnO_2$)	
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 / green LED	
Mechanical life	3×10^7	
Electrical life (AC1)	$<0.7 \times 10^5$	
OTHER INFORMATION		
Operating temperature	-20 ... +55 °C	
Storage temperature	-30 ... +70 °C	
Electrical strenght	4 kV (supply - output)	
Operating position	any	
Mounting	DIN rail EN 60715	
Protection degree	IP 20 terminals / IP 40 from front panel	
Overvoltage category	III.	
Pollution degree	2	
Terminal wire capacity	solid wire max. 1x 2.5 mm^2 or 2x1.5 mm^2 / with sleeve max. 1x2.5 mm^2	
Standards	EN 60255-6, EN 61010-1	

Connection diagram

Symbol



Indication LED

MVR 33

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

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

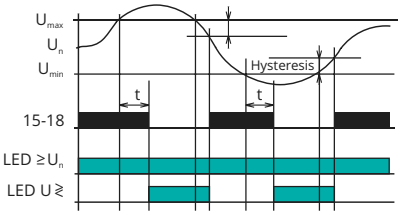
MVR 63

Exceeded U_{max} (overvoltage)
$U_n > U_{max}$
Green LED = ON
Red LED = OFF

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

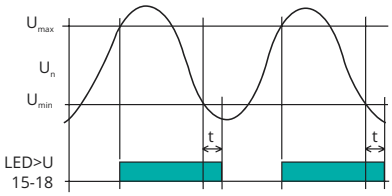
Functions

MVR 33



Monitoring relay series MVR 33 monitors level of voltage in single - phase circuits. Monitored voltage serves also as supply voltage. It is possible to set two indipendent (all occurrences) levels of voltage, when exceeded the output is activated. MRV 33 - in normal state the output relay is permanently switched. It switches off when there is a limit settings. 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 .

MVR 63



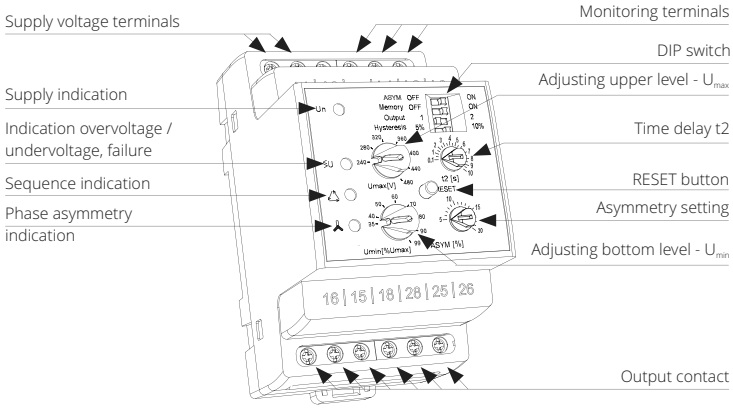
Monitoring relay line MRV 63 serves to monitor levels of voltage in single-phase or DC circuits. Monitored voltage is in the same time also supply voltage. It is possible to set two indipendent levels of voltage. When U_{max} is exceeded, output is activated. In case voltage level falls below U_{minr} output is deactivated. This combination is advantageous when full absence of supply voltage is understood as faulty state, as well as voltage drop within the set level. To eliminate short voltage peaks in the main there is time delay which can be set in a range of 0-10 sec. Such delay applies in case of going from overvoltage to undervoltage. In case of returning from undervoltage to overvoltage this delay doesn't apply. Thanks to changeover output contacts it is possible to reach various configurations and functions according to requirements or an application.

LEGEND:
U_{max} - upper adjustable level of voltage
U_n - measured voltage
U_{min} - bottom adjustable level of voltage
15-18 - switching contact of output relay No.1
LED ≥ U_n - green indicator light
LED U≷ - red indicator light
LED U> - red indicator light

MVR 43, MVR 43N – THE FULL-FEATURED MONITORING RELAY IS USED FOR 3-PHASE NETWORK CONTROL, NETWORK MONITORING AND PROTECTION, VOLTAGE REGULATION FROM A GENERATOR OR HYDROPOWER PLANT.

FUNCTION DESCRIPTION

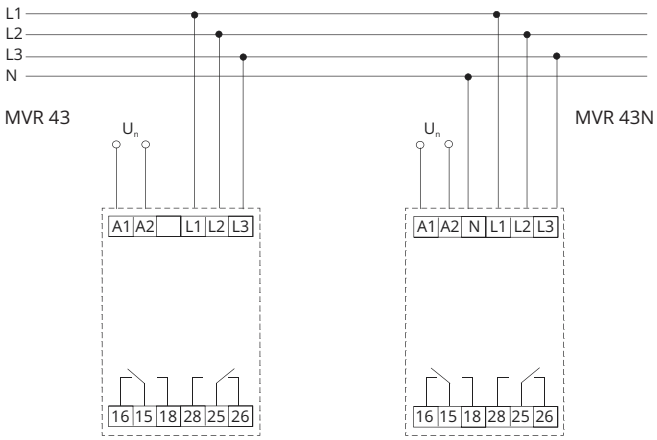
- Monitoring of 3-phase mains:
  - voltage in 2 levels (undervoltage and overvoltage) in range 138-276 V (3x 400 V / 230 V) or 280-480 V (3x 400 V)
  - phase asymmetry (can be switched off)
  - phase sequence
  - phase failure
- Adjustable function „MEMORY“
- Function of second relay (independent / parallel)
- MVR 43: for circuits 3x 400 V (without neutral)
- MVR 43N: for circuits 3x 400 / 230 V (with neutral)
- Galvanically separated supply voltage AC 400 V, AC 110 V, AC 230 V, AC/DC 24 V
- Output contact: 2x changeover 16 A / 250 V AC1
- 3-MODULE, DIN rail mounting



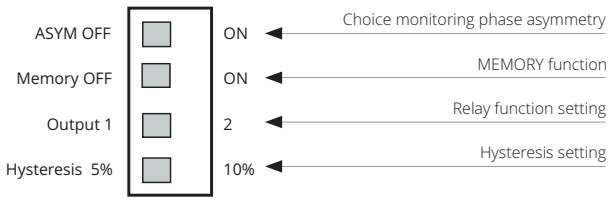
Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
MVR 43 2 400 V AC	400	2	786.053.030	246	1
MVR 43N 2 110 V AC	400	2	786.053.065	246	1
MVR 43N 2 400 V AC	400	2	786.053.037	246	1

Type	MVR 43	MVR 43N
Supply terminals	A1 - A2	
Supply voltage	AC 110 V, AC 230 V, AC 400 V, AC/DC 24 C / 50 - 60 Hz	
Consumption max.	2.5 W / 5 VA (AC 110 V, AC 230 V, AC 400 V) ; 1.4 W / 2 VA (AC/DC 24 V)	
Supply voltage tolerance	-15 %; +10 %	
MEASURING CIRCUIT		
Voltage set	3 x 400 V / 50 Hz	3 x 400 V / 230 V / 50 Hz
Monitored terminals	L1, L2, L3	L1, L2, L3, N
Upper voltage level	240 - 480 V	138 - 276 V
Bottom voltage level	35 - 99 % U_{max}	
Max. permanent overload	3 x 480 V	
Hysteresis	adjustable 5 % or 10 % of set value	
Asymmetry	5 - 20 %	
Peak overload <1 ms	600 V <1 ms	350 V <1 ms
Time delay t1	fixed, max. 200 ms	
Time delay t2	adjustable 0.1 - 10 s	
ACCURACY		
Setting accuracy (mechanical)	5 %	
Repeat accuracy	1 %	
Dependance on temperature	<0.1 % / °C	
Tolerance of limit values	5 %	
OUTPUT		
Number of contacts	2x changeover/SPDT ($AgNiSnO_2$)	
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	
Mechanical life	3 x 10^7	
Electrical life (AC1)	<0.7 x 10^5	
OTHER INFORMATION		
Operating temperature	-20 ... +55 °C	
Storage temperature	-30 ... +70 °C	
Electrical strenght	4 kV (supply - output)	
Operating position	any	
Mounting	DIN rail EN 60715	
Protection degree	IP 20 terminals / IP 40 from front panel	
Overvoltage category	III.	
Pollution degree	2	
Terminal wire capacity	solid wire max. 1x 2.5 mm^2 or 2x1.5 mm^2 / with sleeve max. 1x1.5 mm^2	
Standards	EN 60255-6, EN 61010-1	

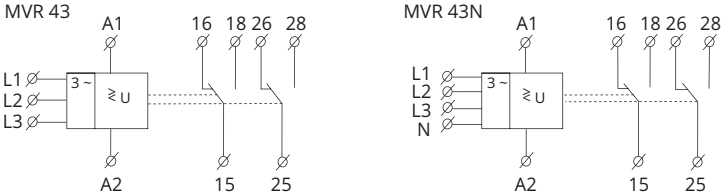
Connection diagram



Description and importance of DIP switches

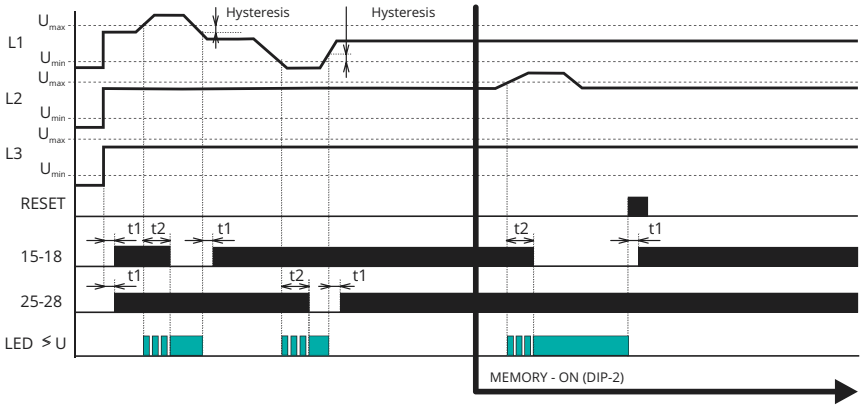


Symbol



Functions

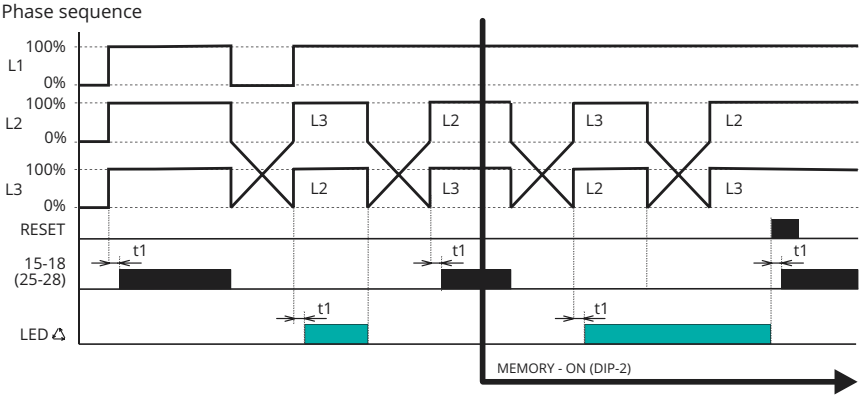
Phase sequence



LEGEND:
L1, L2, L3 - 3-phase voltage
RESET - press of the button on frontal pane
t1 - time delay, fixed
t2 - time delay, adjustble
15-18 - output relay 1
25-28 - output relay 2
LED - indication overvoltage / undervoltage

Selection of 2nd relay function:
In order to monitor 2 levels of voltage, it is pos-sible to select if output relay will respond to each level individually (see the diagram) or both relays will switch in parallel way (see diagram "phase se-quence").
Selection via DIP switch Output.

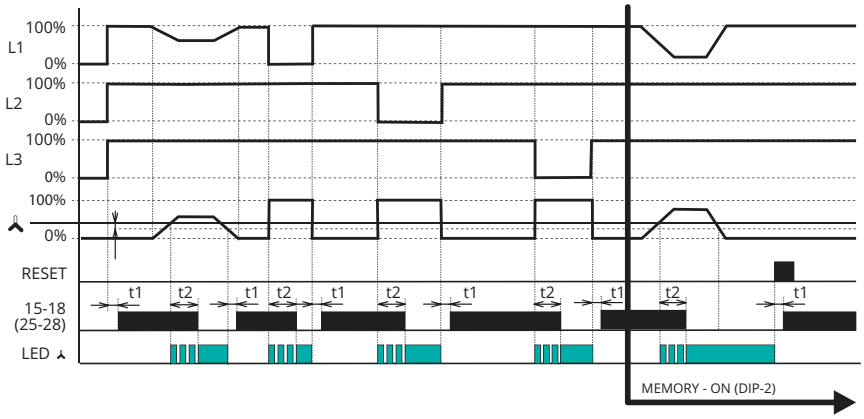
Phase sequence



LEGEND:
L1, L2, L3 - 3-phase voltage
RESET - press of the button on frontal pane
t1 - time delay, fixed
t2 - time delay, adjustble
15-18 - output relay 1
25-28 - output relay 2
LED - indication of phase sequence

Selection of 2nd relay function:
The function is not implied in the monitoring phase sequence, the relays are switched in parallel way.
DIP switch Output is ignored.

Asymmetry - phase failure



LEGEND:
L1, L2, L3 - 3-phase voltage
RESET - press of the button on frontal pane
t1 - time delay, fixed
t2 - time delay, adjustble
- adjustable asymmetry
15-18 - output relay 1
25-28 - output relay 2
LED - asymmetry indicator

Selection of 2nd relay function:
The function is not implied in the monitoring phase sequence, the relays are switched in parallel way.
DIP switch Output is ignored.

Relay is designated to monitor 3-phase circuits. Type MVR 43N controls voltage towards neutral wire, type MVR 43 controls interphase voltage. Relay can moni-tor voltage in two levels (overvoltage / undervoltage), phase assymetry, sequence and failure. Each faulty state is indicated by individual LED. By DIP switch (Output) it is possible to defi ne function of the other relay - independent function (1x for overvoltage, 1x for undervoltage) or in parallel. Time delays t1(fi xed) - when changing from faulty to normal state or when de-energized and t2 (adjustable) when changing from normal to faulty state. These delays prevent incorrect conduct and oscillation of output device during short voltage peaks in the main or during gradual voltage decline into normal.

Voltage control
Set upper level U_{max} in range 138 - 276 V (or 240 - 480 V for MVR 43N) and lower level U_{min} in range 35-99 % U_{max}. In case any phase passes this range, after a delay which eliminated short voltage peaks, contact opens. Output contact again switches after returning back into monitored voltage range and exceeding fi xed hysteresis (which is adjustable in two values by DIP switch). In case of failure of two or three phases, the relay is deactivated immediately regardless of the set delay t2.

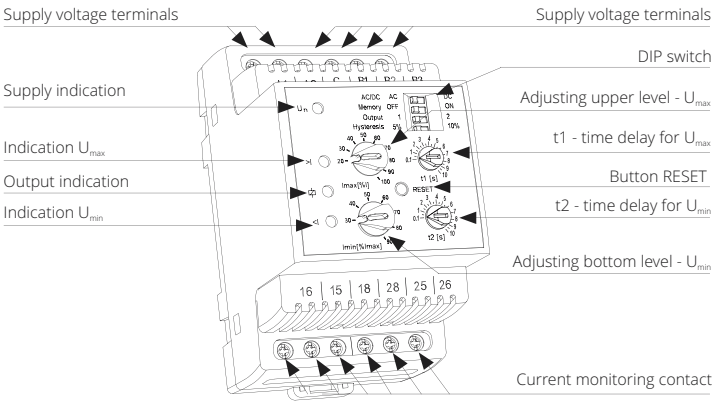
Phase sequence
Monitors correctness of phase sequence. In case of unwanted change output contact breaks. In case of energization of a device with incorrect phase sequence, contact stays opened.

Asymmetry
Rate of assymetry between individual phases is set in a range of 5-20 %. In case set asymmetry is exceeded, output relay breaks and LED indicating asymmetry shines. Delays t1, t2 and hysteretic are applicable when returning to normal state. Monitoring asymmetry can be switched off by DIP switch ASYM.

MVR 42 – RELAY DESIGNED FOR MONITORING DC AND AC VOLTAGE IN THREE RANGES.

FUNCTION DESCRIPTION

- The relay controls the size of the voltage in two independent levels (U_{min}, U_{max})
- Setting the monitored level Umax (in % of range)
- Setting the monitored level U_{min} (in % of range - function WINDOW),
- Adjustable function „MEMORY“
- Function of second relay (independently / in parallel)
- Adjustable delay for eliminating short-term outages and surges for every level independently
- Galvanically separated power supply from monitoring inputs
- Output contact 2x switching 16 A / 250 V AC1 for each monitored voltage level.
- Output contact: 2x changeover 16 A / 250 V AC1
- 3-MODULE design, fi xing to DIN rail

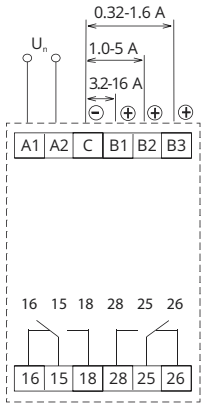


Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
MVR 42 2 400 V AC	400	2	786.053.066	246	1

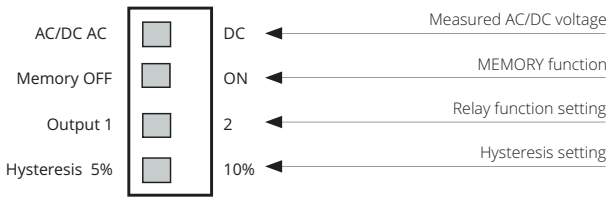
Type	MVR 42		
Supply terminals	A1 - A2		
Supply voltage	AC 110 V, AC 230 V, AC 400 V, AC/DC 24 C (AC 50 - 60 Hz)		
Consumption max.	2.5 W / 5 VA (AC 110 V, AC 230 V, AC 400 V) ; 1.4 W / 2 VA (AC/DC 24 V)		
Supply voltage tolerance	-15 %; +10 %		
MEASURING CIRCUIT			
Voltage ranges *	AC/DC 10-50 V (AC 50-60 Hz)	AC/DC 32-160 V (AC 50-60 Hz)	AC/DC 100-500 V (AC 50-60 Hz)
Terminals	C - B1	C - B2	C - B3
Input resistance	212 kΩ	676 kΩ	2.12 MΩ
Max. permanent overload	100 V	300 V	600 V
Max. permanent overload	250 V	700 V	1 kV
Time delay for U_{max}	adjustable 0.1 - 10 s		
Time delay for U_{min}	adjustable 0.1 - 10 s		
ACCURACY			
Setting accuracy (mechanical)	5 %		
Repeat accuracy	<1 %		
Dependance on temperature	<0.1 % / °C		
Tolerance of limit values	5 %		
Hysteresis (from fault to normal)	selectable 5 % / 10 % from range		
OUTPUT			
Number of contacts	2x changeover/SPDT ($AgNiSnO_2$)		
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	yellow LED		
Mechanical life	3×10^7		
Electrical life (AC1)	$<0.7 \times 10^5$		
OTHER INFORMATION			
Operating temperature	-20 ... +55 °C		
Storage temperature	-30 ... +70 °C		
Electrical strenght	4 kV (supply - output)		
Operating position	any		
Mounting	DIN rail EN 60715		
Protection degree	IP 20 terminals / IP 40 from front panel		
Overvoltage category	III.		
Pollution degree	2		
Terminal wire capacity	solid wire max. 1x 2.5 mm^2 or 2x1.5 mm^2 / with sleeve max. 1x1.5 mm^2		
Standards	EN 60255-6, EN 61010-1		

* - Only one of the inputs can be connected

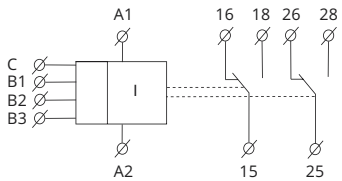
Connection diagram



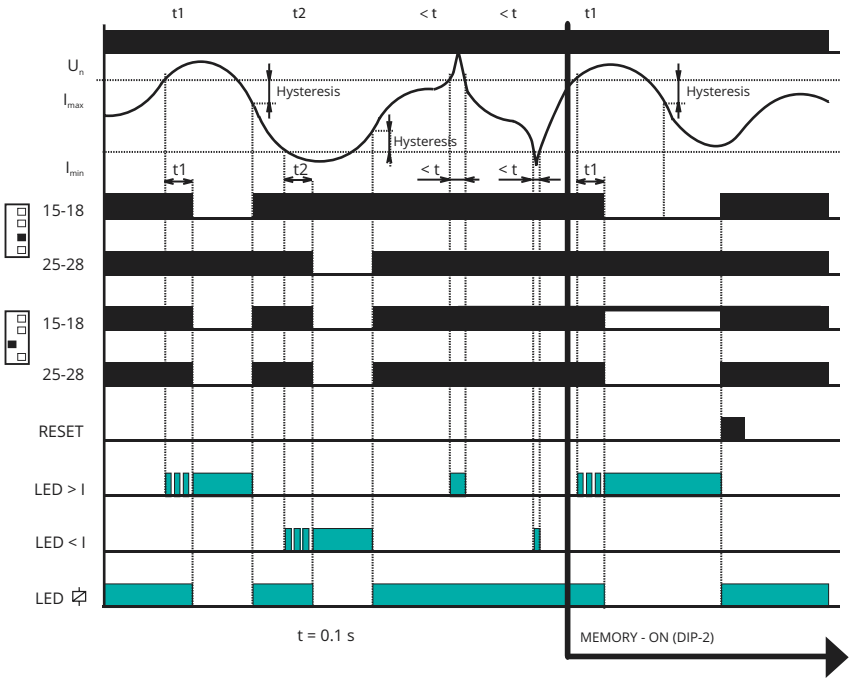
Description and importance of DIP switches



Symbol



Functions



LEGEND:
L1, L2, L3 - 3-phase voltage
RESET - press of the button on frontal pane
t1 - time delay, fixed
t2 - time delay, adjustble
15-18 - output relay 1
25-28 - output relay 2
LED ≷ - indication overvoltage / undervoltage

Selection of 2nd relay function:
In order to monitor 2 levels of voltage, it is pos-sible to select if output relay will respond to each level individually (see the diagram) or both relays will switch in parallel way (see diagram "phase se-quence").
Selection via DIP switch Output.

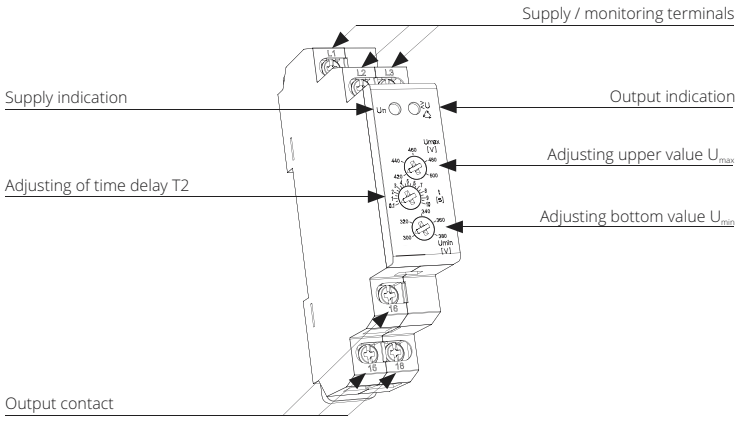
- If the value of the monitored voltage is in the zone between the set upper and lower levels, the status OK occurs - both relays are closed and the yellow LED illuminates. If the value of the monitored voltage is outside the set limits (> U_{max} or < U_{min}), an error state occurs.
- When moving to an error state U > U_{max}, it times the delay t1 and a red LED > U simultaneously flashes. After the t1 time elapses, the red LED > U illuminates and the relevant relay opens.
- When moving to an error state U < U_{min}, it times the delay t2 and a red LED < U simultaneously fl ashes. After the time t2 elapses, the red LED < U illuminates and the relevant relay opens.
- When moving from the error status to the OK status, the relevant red LED immediately goes out, and the corresponding relay closes.

MVR 54N – IT SERVES TO MONITOR VOLTAGE, PHASE FAILURE AND SEQUENCE IN SWITCH-BOARDS, PROTECTION OF DEVICES IN 3-PHASE MAINS.

FUNCTION DESCRIPTION

- It is possible to set upper and lower level of monitoring voltage
- Adjustable time delay eliminates short voltage peaks and failures in the main
- Setting the monitored level U_{min} (in % of range - function WINDOW),
- Supplied from monitored voltage
- Faulty state is indicated by red LED and by opening of output relay contact
- Output contact 1x changeover / SPDT 8 A / 250 V AC1
- In case supply voltage falls below 60 % U_n (U_{OFF} lower level) relay immediately opens without delay
- Supply L1-N, means that relay monitors also failure of neutral wire
- 1-MODULE, DIN rail mounting

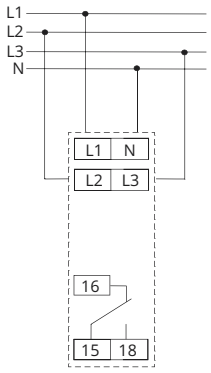
Relay in 3-phase main monitors size of phase voltage. It is possible to set two independent voltage levels and thus it is possible to set two independent voltage levels and monitor e.g. undervoltage and overvoltage independently. In normal state when voltage is within set levels, output relay is closed and red LED shines. In case voltage exceeds or falls below the set levels, output relay opens and red LED shines (LED indicates faulty state - flashes when timing). In case supply voltage falls below 60 % U_n (U_{OFF} lower level) relay immediately opens 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.



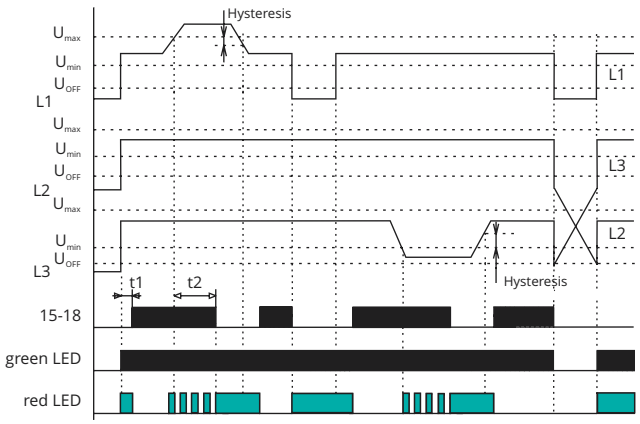
Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
MVR 54N 1 230/400 V AC	230/400	1	786.053.039	67	1

Type	MVR 54N
Supply and measuring	L1, L2, L3, N
Supply terminals	L1, N
Supply / measured voltage	3 x 400 V / 230 V / 50 Hz
Level (U_{max})	105 - 125 % U_n
Level (U_{min})	75 - 95 % U_n
Burden	max. 2 VA
Hysteresis	2 %
Max. permanent overload	AC 3 x 265 V
Peak overload <1 ms	AC 3 x 288 V
Time delay T1	max. 500 ms
Time delay T2	adjustable 0.1 - 10 s
OUTPUT	
Number of contacts	1x changeover/SPDT (AgNi / Silver Alloy)
Current rating	8 A / AC1
Breaking capacity	2000 VA / AC1, 240 W / DC
Inrush current	10 A
Switching voltage	250 V AC1 / 24 V DC
Output indication	red LED
Mechanical life	1 x 10^7
Electrical life (AC1)	1 x 10^5
OTHER INFORMATION	
Operating temperature	-20 ... +55 °C
Storage temperature	-30 ... +70 °C
Electrical strenght	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 20 terminals / IP 40 from front panel
Overvoltage category	III.
Pollution degree	2
Terminal wire capacity	solid wire max. 2x 2.5 mm^2 or 1x4 mm^2 / with sleeve max. 1x2.5 mm^2 or 2x1.5 mm^2
Standards	EN 60255-6, EN 61010-1

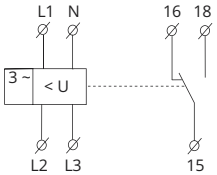
Connection diagram



Function

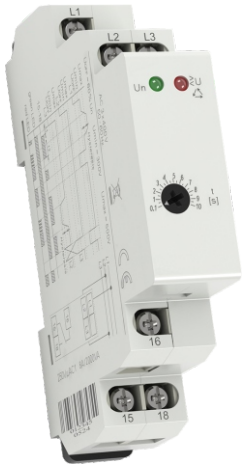


Symbol



10

TECHNICAL DATA

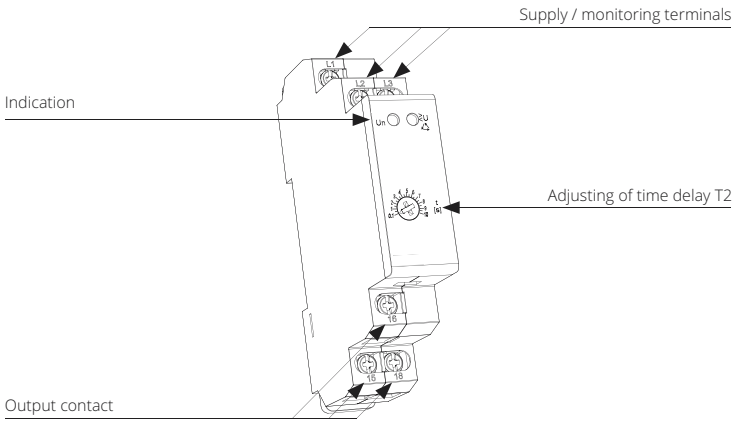


MVR 55 – RELAY MONITORS PHASE SEQUENCE AND FAILURE, EXCEEDING OF MONITORED VOLTAGE IN 3 PHASE MAIN.

FUNCTION DESCRIPTION

- Supply from all phases, which means that function of relay is applicable also if one phase fails
- Fixed delay T1 (500 ms) and adjustable delay T2 (0.1 - 10 s)
- Faulty state is indicated by LED and output contact of relay is OFF
- Output contact: 1x changeover / SPDT 16 A / 250 V AC1
- 1-MODULE, DIN rail mounting

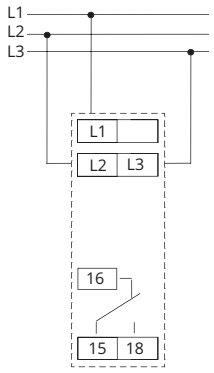
Relay in 3-phase main monitors correct phase sequence and failure of any phase. Green LED is permanently ON and indicates presence of power supply voltage. In case of phase failure or exceeding voltage level red LED fl ashes and relay breaks. When changing to faulty state, time delay applies. Time delay setting is set by a potentiometer on front panel of the device. In case of incorrect phase sequence red LED shines permanently and relay is open. In case supply voltage falls below 60 % U_n (OFF lower level) relay immediately opens with no delay and faulty state is indicated by red LED. MRV 55 - thanks to supply form all phases, this relay is able to stay operational also if one phase is out.



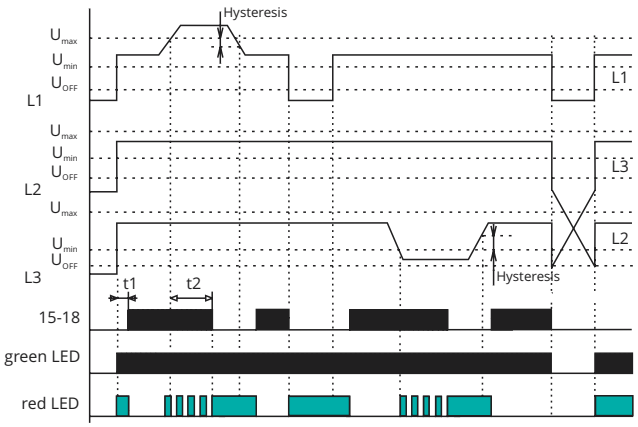
Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
MVR 55 1 400 V AC	400	1	786.050.798	67	1

Type	MVR 55
Supply and measuring	L1, L2, L3
Supply terminals	L1, L2, L3
Supply / measured voltage	3 x 400 V / 50 Hz
Level (U_{max})	125 % U_n
Level (U_{min})	75 % U_n
Burden	max. 2 VA
Hysteresis	2 %
Max. permanent overload	AC 3 x 460 V
Peak overload <1 ms	AC 3 x 500 V
Time delay T1	max. 500 ms
Time delay T2	adjustable 0.1 - 10 s
OUTPUT	
Number of contacts	1x changeover/SPDT (AgNi / Silver Alloy)
Current rating	8 A / AC1
Breaking capacity	2000 VA / AC1, 240 W / DC
Inrush current	10 A
Switching voltage	250 V AC1 / 24 V DC
Output indication	red LED
Mechanical life	1 x 10^7
Electrical life (AC1)	1 x 10^5
OTHER INFORMATION	
Operating temperature	-20 ... +55 °C
Storage temperature	-30 ... +70 °C
Electrical strenght	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 10 terminals / IP 40 from front panel
Overvoltage category	III.
Pollution degree	2
Terminal wire capacity	solid wire max. 2x 2.5 mm^2 or 1x4 mm^2 / with sleeve max. 1x2.5 mm^2 or 2x1.5 mm^2
Standards	EN 60255-6, EN 61010-1

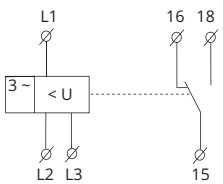
Connection diagram



Function



Symbol



10

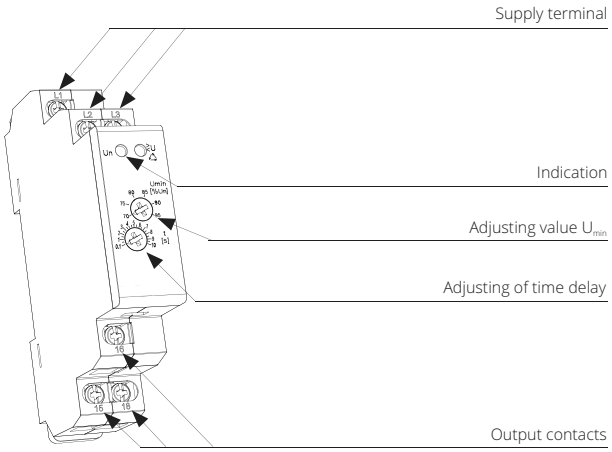
TECHNICAL DATA

MVR 56 – RELAY MONITORS PHASE SEQUENCE AND FAILURE (E.G. CONTROL OF CORRECT MO-TOR WINDING ETC.).

FUNCTION DESCRIPTION

- Relay is designated for monitoring of 3-phase networks
- Supply from all phases which means that relay is functional also in case of one phase failure
- Supply and monitored supply U_n - 3x 400 V
- Fixed time delay T1 (500 ms) and adjustable time delay T2 (0 -10s)
- Faulty state is indicated by LED and by opening of output relay contact
- Output contact 1x changeover / SPDT 8 A / 250V AC1
- 1-MODULE, DIN rail mounting

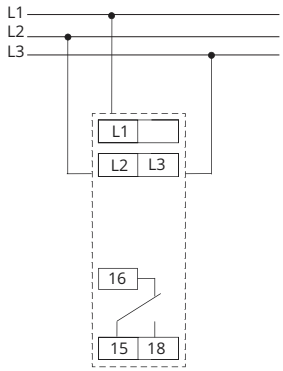
Relay in 3-phase main monitors correct phase sequence and phase failure. Green LED illuminates permanently and indicates energization. In case of phase failure red LED flashes and relay turns off . When changing to faulty state, time delay applies - delay setting is done by potentiometer on the front panel of the device. In case of incorrect phase sequence, red LED shines permanently and relay is open. In case supply voltage falls below 60% U_n (U_{OFF} lower level) relay immediately opens with no delay and faulty state is indicate by red LED.
MVR 56: Thanks to supply from all phases, relay is functional also in case of one phase failure.



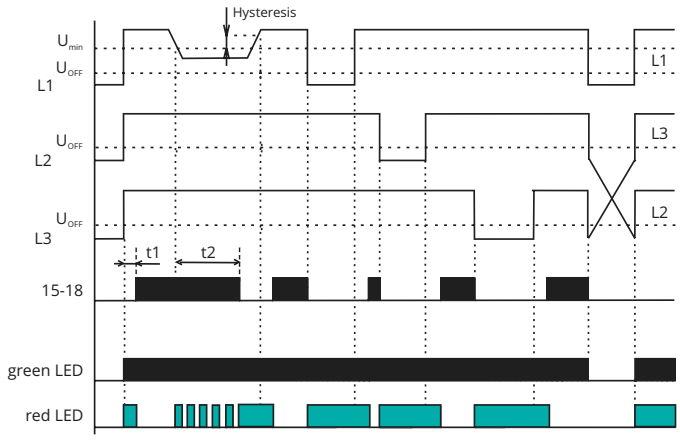
Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
MVR 56 1 400 V AC	400	1	786.053.064	66	1

Type	MVR 56
Supply and measuring	L1, L2, L3
Supply terminals	L1, L2, L3
Supply / measured voltage	3 x 400 V L-L (3 x 230 V L-N) / 50 Hz
Level (U_{min})	adjustable 70 - 95 % U_n
Level (U_{OFF})	60 % U_n
Burden	max. 2 VA
Hysteresis	2 %
Max. permanent overload	AC 3 x 460 V
Peak overload <1 s	AC 3 x 500 V
Time delay T1	max. 500 ms
Time delay T2	adjustable 0.1 - 10 s
OUTPUT	
Number of contacts	1x changeover/SPDT (AgNi / Silver Alloy)
Current rating	8 A / AC1
Breaking capacity	2000 VA / AC1, 240 W / DC
Inrush current	10 A
Switching voltage	250 V AC1 / 24 V DC
Output indication	red LED
Mechanical life	1 x 10^7
Electrical life (AC1)	1 x 10^5
OTHER INFORMATION	
Operating temperature	-20 ... +55 °C
Storage temperature	-30 ... +70 °C
Electrical strenght	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 10 terminals / IP 40 from front panel
Overvoltage category	III.
Pollution degree	2
Terminal wire capacity	solid wire max. 2x 2.5 mm^2 or 1x4 mm^2 / with sleeve max. 1x2.5 mm^2 or 2x1.5 mm^2
Standards	EN 60255-6, EN 61010-1

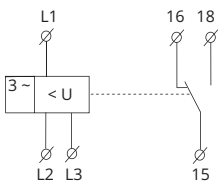
Connection diagram



Function



Symbol



10

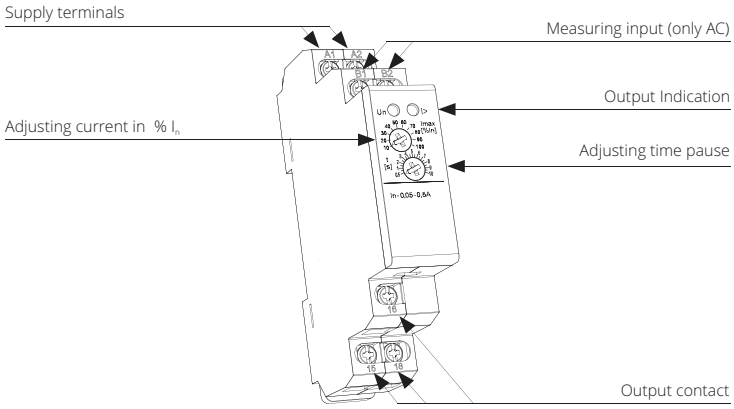
TECHNICAL DATA

MCR 515 – IT SERVES FOR MONITORING OF HEATING IN RAIL-SWITCHES, HEATING CABLES, CONSUMPTION OF ONE-PHASE MOTORS, INDICATES CURRENT FLOW.

FUNCTION DESCRIPTION

- Flexible adjustment by potentiometer, choice of 7 ranges:
  AC 0.05 - 0.5 A; AC 0.1 - 1 A; AC 0.2 - 2 A; AC 0.5 - 5 A; AC 0.8 - 8 A; AC 1 - 10 A; AC 1.6 - 16 A
- Adjustable delay 0.5 - 10 s to eliminate short current peaks
- It is possible to use for current scanning from current transformer - up to 600 A
- Universal supply AC 24 - 240 V and DC 24 V
- Supply is galvanically separated from measured current, it must be in the same phase
- Output contact: 1x changeover / SPDT 8 A
- 1-phase, 1-MODULE, DIN rail mounting

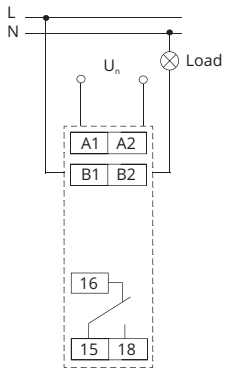
Monitoring relay MCR 515 serves to monitor current level in one-phase AC circuits. Gradual setting of actuating current of monitoring relay enables many different applications. Output relay is in normal state opened. After the set current level is reached, relay closes after the set delay (0.5 - 10s). When returning from faulty to normal state there is a hystersis (5 %). Multi-voltage of this relay is an advantage. It is possible to monitor load which doesn´t have the same supply as monitoring relay MCR 515.
Range of MCR 515 can be increased by an external current transformer.

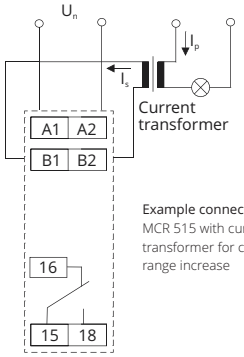


Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
MCR 515/8 1 24-400 V AC	24 - 400	1	786.053.045	72	1

Type	MCR 515
Supply terminals	A1 - A2
Voltage range	AC 24 - 240 V and DC 24 V (AC 50 - 60 Hz)
Burden	max. 1.5 VA
Supply voltage tolerance	15 %; +10 %
MEASURING CIRCUIT	
Load	between B1 - B2
Current range	AC 0.5 - 8 A (AC 50 Hz) - applicable also for current transformer
Max. permanent current	17 A
Inrush overload <1 ms	100 A
Current adjustment	potentiometer
Time delay	adjuastable 0.5 - 10 s
ACCURACY	
Setting accuracy (mechanical)	5 %
Repeat accuracy	<1 %
Temperature dependancy	<0.1 % / °C
Limit values tolerance	5 % (10 % for 0.05 - 0.5 A range)
Hysteresis (fault to OK)	5 %
OUTPUT	
Number of contacts	1x changeover/SPDT (AgNi / Silver Alloy)
Current rating	8 A / AC1
Breaking capacity	2000 VA / AC1, 240 W / DC
Output indication	green / red LED
OTHER INFORMATION	
Operating temperature	-20 ... +55 °C
Storage temperature	-30 ... +70 °C
Electrical strenght	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 10 terminals / IP 40 from front panel
Overvoltage category	III.
Pollution degree	2
Terminal wire capacity	solid wire max. 2x 2.5 mm^2 or 1x4 mm^2 / with sleeve max. 1x2.5 mm^2 or 2x1.5 mm^2
Standards	EN 60255-6, EN 61010-1

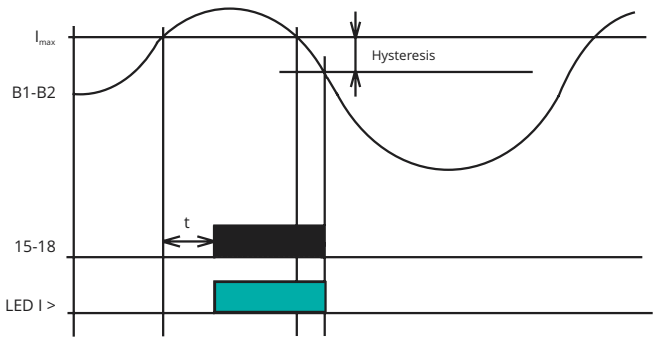
Connection diagram



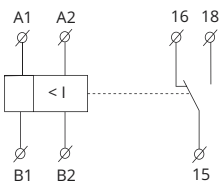


Example connection
MCR 515 with current transformer for current range increase

Function



Symbol



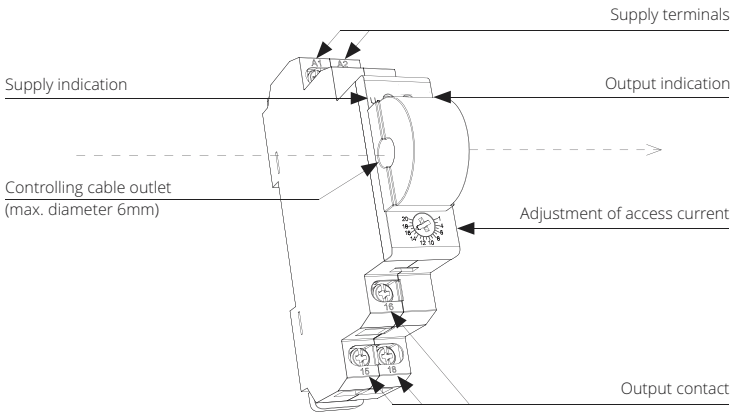
Always specify all reference name of current relay according to required range, for example MCR 515.

MCR 32 – THE CURRENT TRANSFORMER RELAY, WHICH SENSES THE CURRENT THROUGH THE PASSING WIRE, IS USED TO MONITOR THE HEATING RODS IN THE SWITCHES, THE HEATING CABLES, THE CURRENT FLOW INDICATION, AND THE MONITORING OF SINGLE-PHASE MOTORS.

FUNCTION DESCRIPTION

- Current transformer is a part of the product. Inside this transformer there is a wire which senses the volume of fl owing current
- This construction reduces thermal stress of product when compared with conventional solutions with inbuilt shunt, and increases current range up to 20 A, and galvanically separates monitored circuit
- Universal supply AC 24 - 240 V and DC 24 V
- Supply is galvanically separated from measuring current
- Current exceeding - current fl owing through monitored wire must not exceed 100 A
- Output contact: 1x changeover / SPDT 8 A
- Clamp terminals
- 1-phase, 1-MODULE, DIN rail mounting

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

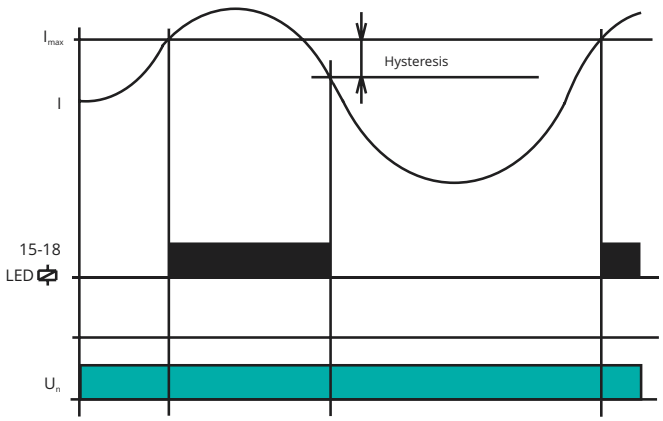


Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
MCR 32 1 UNI	UNI	1	786.053.072	68	1

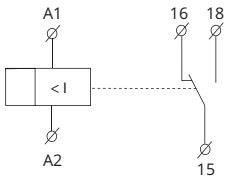
Type	MCR 32
Supply terminals	A1 - A2
Voltage range	AC 24 - 240 V and DC 24 V (AC 50 - 60 Hz)
Burden	max. 1.5 VA
Supply voltage tolerance	15 %; +10 %
MEASURING CIRCUIT	
Current range	1 - 20 A (AC 50 Hz)
Current adjustment	potentiometer
ACCURACY	
Setting accuracy (mechanical)	5 %
Repeat accuracy	<1 %
Temperature dependancy	<0.1 % / °C
Limit values tolerance	5 %
Overload capacity	max. 100 A / 10 s
OUTPUT	
Number of contacts	1x changeover/SPDT (AgNi / Silver Alloy)
Current rating	8 A / AC1
Breaking capacity	2000 VA / AC1, 240 W / DC
Output indication	red LED
OTHER INFORMATION	
Operating temperature	-20 ... +55 °C
Storage temperature	-30 ... +70 °C
Electrical strenght	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 10 terminals / IP 40 from front panel
Overvoltage category	III.
Pollution degree	2
Terminal wire capacity	solid wire max. 2x 2.5 mm^2 or 1x4 mm^2 / with sleeve max. 1x2.5 mm^2 or 2x1.5 mm^2
Standards	EN 60255-6, EN 61010-1

Connection diagram

Function



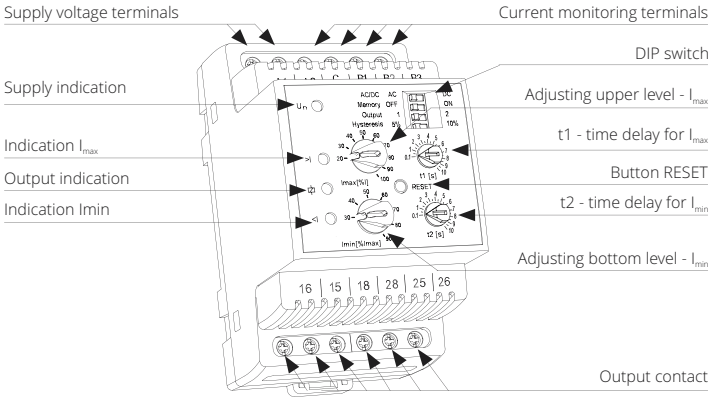
Symbol



MCR 413 – USED TO MONITOR OVERLOADING / RELIEF (MACHINE, MOTOR, ETC.), CHECK CONSUMPTION, DIAGNOSTICS ON A REMOTE DEVICE (BURNING, SHORT CIRCUIT, IN-CREASED CURRENT DRAW, ETC.)

FUNCTION DESCRIPTION

- Relay designed for monitoring DC and AC currents in three ranges
- The relay controls the current size in two independent levels (I_{max}, I_{min})
- Setting the monitored level I_{max} (in % of range)
- Setting the monitored level I_{min} - (in % of the set upper limit - function HYSTERESIS)
- Adjustable function "MEMORY"
- Function of second relay (independently / in parallel)
- Adjustable delay for eliminating short-term outages and surges for every level independently
- Galvanically separated power supply from monitoring inputs
- Output contact: 2x changeover 16 A / 250 V AC1 for each current level
- 3-MODULE, DIN rail mounting

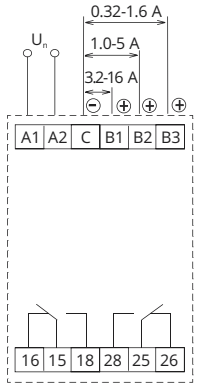


Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
MCR 413 2 230 V	230	2	786.053.078	250	1

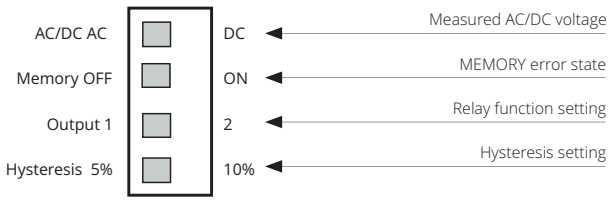
Type	MCR 413		
Supply terminals	A1 - A2		
Voltage range	AC 110 V, AC 230 V, AC 400 V or AC/DC 24 V (AC 50 - 60 Hz)		
Burden max.	2.5 W / 5 VA (AC 110 V, AC 230 V, AC 400 V) ; 1.4 W / 2 VA (AC/DC 24 V)		
Operating range	15 %; +10 %		
MEASURING CIRCUIT			
Ranges *	AC/DC 3.2 - 16 A (AC 50-60 Hz)	AC/DC 1 - 5 A (AC 50-60 Hz)	AC/DC 0.32 - 1.6 A (AC 50-60 Hz)
Terminals	C - B1	C - B2	C - B3
Input resistance	2.3 mΩ	11 mΩ	23 mΩ
Max. permanent current	16 A	8 A	3 A
Inrush overload <1 ms	20 A	16 A	6 A
Time delay for I_{max}	adjustable 0.1 - 10 s		
Time delay for I_{min}	adjustable 0.1 - 10 s		
ACCURACY			
Measuring accuracy	5 %		
Repeat accuracy	<1 %		
Temperature dependancy	<0.1 % / °C		
Limit values tolerance	5 %		
Hysteresis (fault to OK)	max. 100 A / 10 sselectable 5 % / 10 % from range		
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		
Mechanical life	3×10^7		
Electrical life (AC1)	0.7×10^5		
OTHER INFORMATION			
Operating temperature	-20 ... +55 °C		
Storage temperature	-30 ... +70 °C		
Electrical strenght	4 kV (supply - output)		
Operating position	any		
Mounting	DIN rail EN 60715		
Protection degree	IP 20 terminals / IP 40 from front panel		
Overvoltage category	III.		
Pollution degree	2		
Terminal wire capacity	solid wire max. 1x 2.5 mm^2 or 2x1.5 mm^2 / with sleeve max. 1x1.5 mm^2		
Standards	EN 60255-6, EN 61010-1		

* Only one of the inputs can be connected.

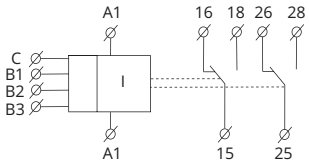
Connection diagram



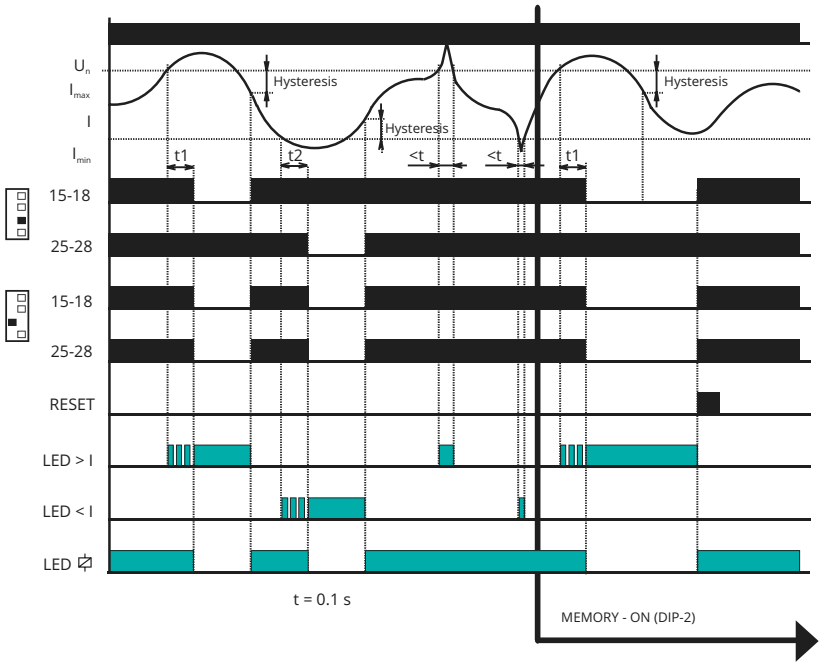
Description and importance of DIP switches



Symbol



Functions



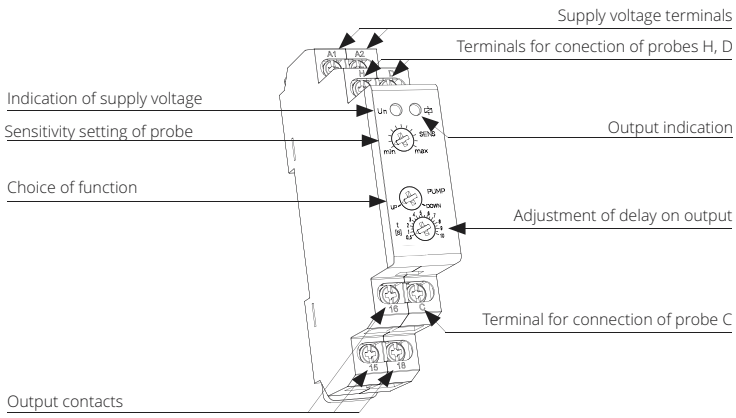
- If the value of the monitored current is in the zone between the set upper and lower levels, the status OK occurs - both relays are closed and the yellow LED illuminates. If the value of the monitored current is outside the set limits (> I_{max} or < I_{min}), an error state occurs.
- When moving to an error state I > I_{max}, it times the delay t1 and a red LED > I simultaneously flashes. After the t1 time elapses, the red LED > I illuminates and the relevant relay opens.
- When moving to an error state I < I_{min}, it times the delay t2 and a red LED < I simultaneously flashes. After the time t2 elapses, the red LED < I illuminates and the relevant relay opens.
- When moving from the error status to the OK status, the relevant red LED immediately goes out, and the corresponding relay closes.

NWT 5 – RELAY IS DESIGNED FOR MONITORING LEVELS IN WELLS, BASINS, RESERVOIRS, TANKS...

FUNCTION DESCRIPTION

- In one device you can choose the following confi gurations:
  - one-level switch of conductive liquids (by connecting H and D)
  - two-level switch of conductive liquids
- One-state device monitors one level, two-state device monitors two levels (switches on one level and switches off on another level)
- Choice of function PUMP UP, PUMP DOWN
- Adjustable time delay on the output (0.5 - 10s)
- Sensitivity adjustable by a potentiometer (5 - 100 kΩ)
- Measuring frequency 10 Hz prevents polarization of liquid and raising oxidation of measuring probes
- Galvanically separated supply voltage UNI 24.. 240 V AC/DC
- Output contact 1x changeover/SPDT 8A/250V AC1
- 1-MODULE, mounting onto DIN rail

Relay is designated for monitoring of levels of conductive liquids with possibility of functions: PUMP UP or PUMP DOWN. To prevent polarization and liquid electrolysis of liquid, and undesirable oxidation of measuring probes, alternating current is used. For measuring use three measuring probes: H- upper level, D- lower level, C - common probe. In case you use a tank made of a conductive material, you can use it as probe C. In case you require monitoring of one level only, it is neccessary to connect inputs H and D and connect them to one probe - in this case sensitivity is lowered by half (2.5 ... 50 kΩ). Probe C can be connected with a protective wire of supply system (PE). To prevent undesirable switching out output contacts by various infl u-ences (sediment on probes, humidity...) it is possible to set sensitivity of the device according to conductivity of monitored liguid (corresponding to "re-sistance" of liquid) range 5 up to 100 kΩ.To reduce infuences of undesirable switching of output contacts by liquid gorgle in tanks, it is possible to set delay of output reaction 0.5 - 10s.

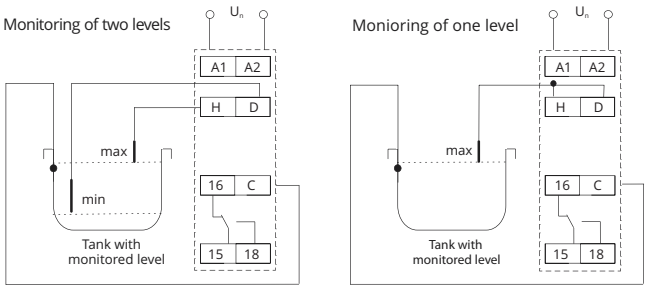


Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
NWT 5 1 UNI	UNI	1	786.053.062	72	1

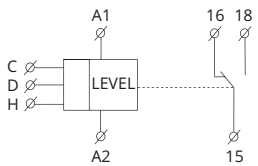
Type	MCR 413		
Supply terminals	A1 - A2		
Voltage range	AC 110 V, AC 230 V, AC 400 V or AC/DC 24 V (AC 50 - 60 Hz)		
Burden max.	2.5 W / 5 VA (AC 110 V, AC 230 V, AC 400 V) ; 1.4 W / 2 VA (AC/DC 24 V)		
Operating range	15 %; +10 %		
MEASURING CIRCUIT			
Ranges *	AC/DC 3.2 - 16 A (AC 50-60 Hz)	AC/DC 1 - 5 A (AC 50-60 Hz)	AC/DC 0.32 - 1.6 A (AC 50-60 Hz)
Terminals	C - B1	C - B2	C - B3
Input resistance	2.3 mΩ	11 mΩ	23 mΩ
Max. permanent current	16 A	8 A	3 A
Inrush overload <1 ms	20 A	16 A	6 A
Time delay for I_{max}	adjustable 0.1 - 10 s		
Time delay for I_{min}	adjustable 0.1 - 10 s		
ACCURACY			
Measuring accuracy	5 %		
Repeat accuracy	<1 %		
Temperature dependancy	<0.1 % / °C		
Limit values tolerance	5 %		
Hysteresis (fault to OK)	max. 100 A / 10 sselectable 5 % / 10 % from range		
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		
Mechanical life	3 x 10^7		
Electrical life (AC1)	0.7 x 10^5		
OTHER INFORMATION			
Operating temperature	-20 ... +55 °C		
Storage temperature	-30 ... +70 °C		
Electrical strenght	4 kV (supply - output)		
Operating position	any		
Mounting	DIN rail EN 60715		
Protection degree	IP 20 terminals / IP 40 from front panel		
Overvoltage category	III.		
Pollution degree	2		
Terminal wire capacity	solid wire max. 1x 2.5 mm^2 or 2x1.5 mm^2 / with sleeve max. 1x1.5 mm^2		
Standards	EN 60255-6, EN 61010-1		

* Only one of the inputs can be connected.

Connection diagram

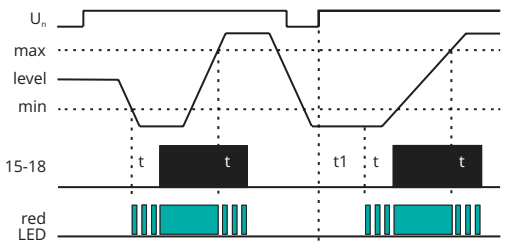


Symbol

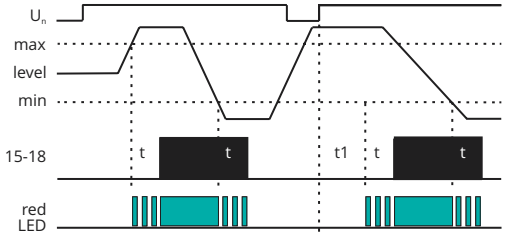


Function

Function PUMP UP



Function PUMP DOWN



LS 2 – DETECTION SENSOR IS ELECTRODE, WHICH IN CONNECTION WITH SWITCHABLE DEVICE IS USED FOR LEVEL DETECTION FOR EXAMPLE IN WELLS, TANKS,...

FUNCTION DESCRIPTION

- To be ued in electric conductive fl uids and mechanically polluted fl uids with temperature - 1°C to 80°C
- Suitable for use in drinking water
- Stainless steel one-pole electrode reside in PVC cover, intended for tank wall mounting or mounting by socket
- To ensure corret function of the sensor, it is necessary to have the electrode without dirt which could disable the connection of the electrode and fluid and thus lead to malfunction
- Max. wire profi le: 2.5 mm^2
- Installation:
  - conductor wire is connected by feazing of two brass screws to stainless steel electrode
  - conductor is caulked by bushing Pg7 with protection degree IP68
- Dimensions: max. diameter 21 mm, lenght 96 mm

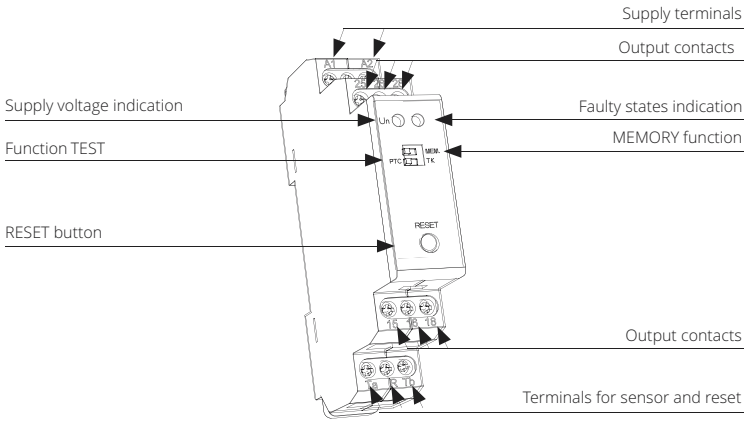
Type	Ordering No.	Weight (g)	Packaging (pcs)
LS 2	786.201.417	48	1

TZ 220 – MONITORING HEATING OF MOTOR WINDING IN RANGE GIVEN BY RESISTANCE OF IN-BUILT PTC THERMISTOR(1.8-3.3 KΩ)

FUNCTION DESCRIPTION

- It monitors motor coil temperature
- Fixed levels of switching
- PTC sensor is used for sensing, it is in-built in motor winding by its manufacturer or there is used an external PTC sensor
- MEMORY function - relay is blocked in an error state until until operator intervention (press RESET button)
- RESET of faulty state:
  - button on the front panel
  - by external contact (remote by two wires)
- Function of short-circuit or sensor disconnection monitoring, red LED flashing indicates faulty sensor
- Output contact: 2x changeover / DPDT 8 A / 250 V AC1
- Red LED shines and indicates exceeded temperature
- Terminals of sensor are galvanically separated, they can be shorted out by terminal PE without damaging the device
- Multivoltage supply AC/DC 24 - 240 V
- 1-MODULE, mounting onto DIN rail

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 ther-mistor 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 de-crease and thereby decrease of thermistor resistance under 1.8 kΩ the output contact of relay again switches on. The relay has function “Control of sensor fault“. This controls interruption or disconnection of sensor. When switch is in position “TK” monitoring of faulty sensor is not functional - it is possibel to connect bimetal sensor with only 2 states: ON or OFF. The device can work with bimetal 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).



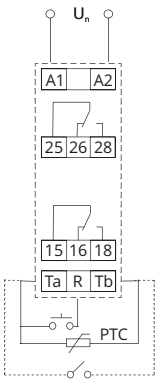
Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
TZ 220E 2 UNI	UNI	2	786.050.805	83	1

Type	TZ 220
Function	monitoring temperature of motor winding
Supply terminals	A1 - A2
Voltage range	AC/DC 24 - 240 V (AC 50 - 60 Hz)
Burden	max. 2 VA
Operating range	15 %; +10 %
MEASURING CIRCUIT	
Measuring terminals	Ta - Tb
Cold sensor resistance	50 kΩ - 1.5 kΩ
Upper level	3.3 kΩ
Botton level	1.8 kΩ
Sensor	PTC temperature of motor winding
Sensor failure indication	blinking red LED
ACCURACY	
Accuracy in repetition	<5 %
Switching difference	±5 %
Temperature dependance	<0.1 % / °C
OUTPUT	
Number of contacts	2x changeover/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
Mechanical life	3×10^7
Electrical life (AC1)	0.7×10^5
OTHER INFORMATION	
Operating temperature	-20 ... +55 °C
Storage temperature	-30 ... +70 °C
Electrical strenght	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 20 terminals / IP 40 from front panel
Overvoltage category	III.
Pollution degree	2
Terminal wire capacity	solid wire max. 1x 2.5 mm^2 or 2x1.5 mm^2 / with sleeve max. 1x2.5 mm^2
Standards	EN 60730-2-9, EN 61010-1

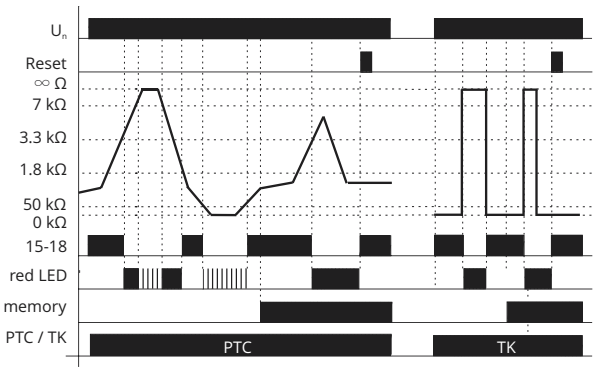
NOTE:
Sensors could be in series in abide with conditions in technical specifi cation - switching limits.

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

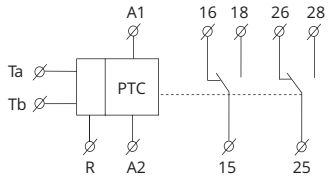
Connection diagram



Function



Symbol

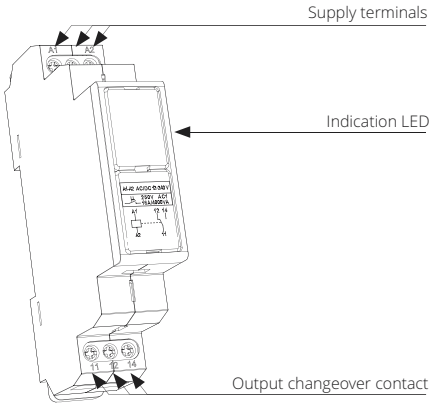


MRM 116UW – POWER RELAY USED FOR SWITCHING LARGER LOAD OUTPUT, STRENGTHEN OR „MULTIPLYING“ CONTACTS OF THE EXISTING DEVICE.

FUNCTION DESCRIPTION

- In the design 1-MODULE , DIN rail mounting, output status indicated by high intensity LED with choice of LED color (red, green, yellow, blue or white LED*).

* Possibility to choose blue, red, green and yellow color of LED for power relays line VS in case of minimal order quantity 100 pcs.



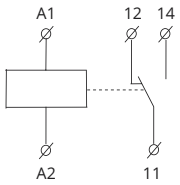
Type	Control supply (V)	Number of optput contacts	Ordering No.	Weight (g)	Packaging (pcs)
MRM 116UW 12-240	12 - 240	2	786.053.068	58	1

Type	MRM 116UW
Supply terminals	A1 - A2
Voltage range	AC/DC 24 - 240 V (AC 50 - 60 Hz)
Burden	AC 0.7 - 36 VA / DC 0.5 - 1.7 W
Supply voltage tolerance	15 %; +10 %
OUTPUT	
Number of contacts	1x 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	high intensity of LED
Mechanical life	3×10^7
Electrical life (AC1)	0.7×10^5
Time between switching	min. 2 s
OTHER INFORMATION	
Operating temperature	-20 ... +55 °C
Storage temperature	-30 ... +70 °C
Electrical strenght	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
Terminal wire capacity	solid wire max. 1x 2.5 mm^2 or 2x1.5 mm^2 / with sleeve max. 1x2.5 mm^2
Standards	EN 61810-1, EN 61010-1

NOTE:
Max. time of changeover of contact is 10 ms.

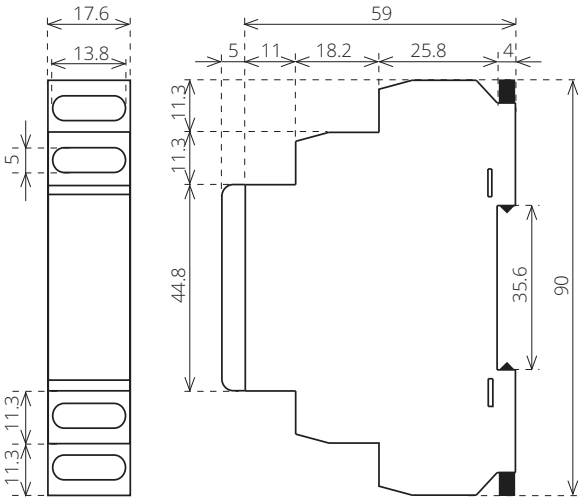
10

Symbol

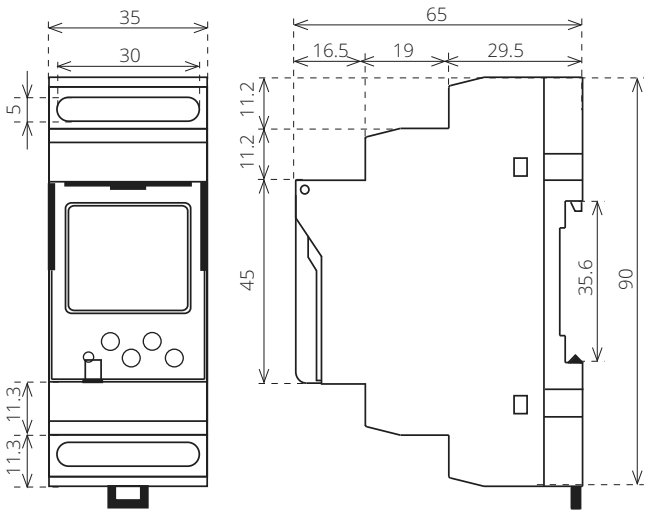


TECHNICAL DATA

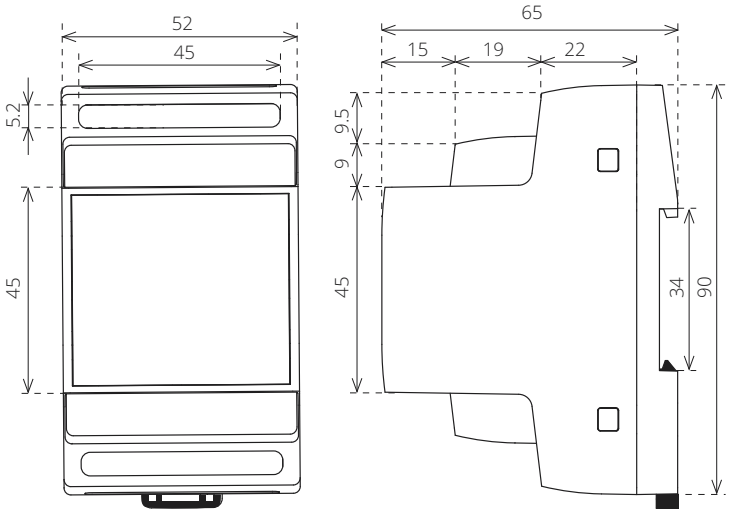
1-MODULE DESIGN



2-MODULE DESIGN



3-MODULE DESIGN



PHOTOSENSOR - SKS