



- **Multifunctions monitoring relays (AC voltage monitoring in 1-phase network and 3-phase - 3(N)~ 400/230 V, with adjustable thresholds)**
- Monitoring of phase sequence ❶ and phase failure • Connection of neutral wire (optional) • Timing adjustment of tripping delay
- Supply voltage = monitoring voltage • Output: 1 CO (1 changeover contact)
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data

Number and type of contacts		1 CO
Rated voltage		250 V AC
Max. breaking capacity	AC1	1 250 VA (5 A / 250 V AC)
Max. operating frequency		3 600 cycles/hour
• at resistive load 100 VA		360 cycles/hour
• at resistive load 1 000 VA		
Input circuit		
Supply voltage		= monitoring voltage
Rated voltage	AC	230 V, 3(N)~ 400/230 V
Operating range of supply voltage		0,7...1,3 U _n
Rated power consumption	AC	8,0 VA / 1,0 W
Range of supply frequency	AC	48...63 Hz
Duty cycle		100%
Measuring circuit	<ul style="list-style-type: none"> • measuring variable • measuring inputs • overload capacity • swiching threshold 	3(N)~, sinus, 48...63 Hz = supply voltage AC: 230 V, 3(N)~ 400/230 V terminals (N)-L1-L2-L3 determined by tolerance specified for supply voltage MIN: 0,7...1,2 U _n MAX: 0,8...1,3 U _n
Insulation according to EN 60664-1		
Rated surge voltage		4 000 V 1,2 / 50 μs
Overvoltage category		III
Insulation pollution degree		2 if built-in: 3
General data		
Electrical life	• resistive AC1	> 2 x 10 ⁵ 1 000 VA
Mechanical life (cycles)		> 2 x 10 ⁷
Dimensions (L x W x H)		87 x 17,5 x 65 mm
Weight		72 g
Ambient temperature	• storage	-25...+70 °C
(non-condensation and/or icing)	• operating	-25...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		15...85%
Shock resistance		15 g 11 ms
Vibration resistance		0,35 mm DA 10...55 Hz
Measuring circuit data		
Functions		UNDER, UNDER+SEQ, WIN, WIN+SEQ SEQ - monitoring of phase sequence ❶ and phase failure connection of neutral wire (optional)
Range of delay timing adjustment		tripping delay: 0...10 s
Base accuracy		± 5% (calculated from the final range values)
Setting accuracy		± 5% (calculated from the final range values)
Repeatability		± 2%
Temperature influence		± 0,05% / °C
Recovery time		500 ms
LED indicator		red LEDs MIN and MAX ON/OFF - indication of failure ❷ red LEDs MIN and MAX flashing - indication of tripping delay ❷ red LED SEQ ON - indication of the change of phase sequence yellow LED R ON/OFF - output relay status

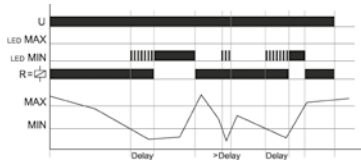
❶ Phase sequence monitoring - selectable.
❷ Indication of relay status - according to the set threshold.

MONITORING

Functions

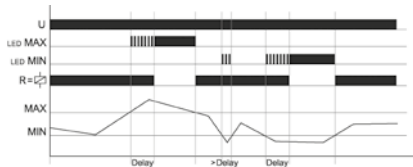
For all functions the LED's MIN and MAX are flashing alternating (the relay is fallen off), when the minimum value for the measured voltage was chosen to be greater than the maximum value. If a failure already exists, when the device is activated, the output relay R remains in off-position and the LED for the corresponding threshold is illuminated. The device includes separately every phase voltage (L-N) and monitors it according to the selected function (UNDER or WINDOW).

UNDER, UNDER+SEQ - Undervoltage monitoring, undervoltage monitoring with monitoring of phase sequence.



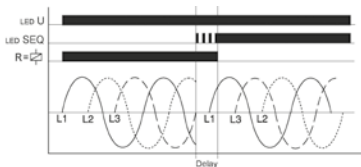
When the measured voltage (one of the phase voltages) falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay (Delay) begins (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R switches into on-position again (yellow LED illuminated), when the measured voltage (all phase voltages) exceeds the value adjusted at the MAX-regulator.

WIN, WIN+SEQ - Voltage monitoring in windowfunction between MIN and MAX values, voltage monitoring in windowfunction between MIN and MAX values with monitoring of phase sequence.



The output relay R switches into on-position (yellow LED illuminated), when the measured voltage (all phase voltages) exceeds the value adjusted at the MIN-regulator. When the measured voltage (one of the phase voltages) exceeds the value adjusted at the MAX-regulator, the set interval of tripping delay (Delay) begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated) the output relay R switches into off-position (yellow LED not illuminated). The output relay R switches into on-position again (yellow LED illuminated) when the measured voltage falls below the value adjusted at the MAX-regulator (red LED MAX not illuminated). When the measured voltage (one of the phase voltage) falls below the value adjusted at the Min-regulator, the set interval of tripping delay (Delay) begins again (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay R switches into off-position (yellow LED not illuminated).

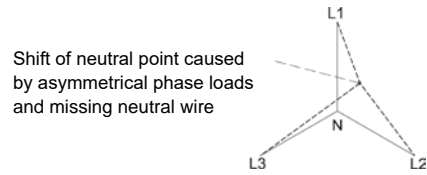
SEQ - Phase sequence monitoring.



Phase sequence monitoring is selectable for all functions. In single phase circuit, the monitoring of phase sequence must be disconnected. If a change in phase sequence is detected (red LED SEQ illuminated), the output relay R switches into off-position after the set interval of tripping delay (Delay) has expired (yellow LED not illuminated).

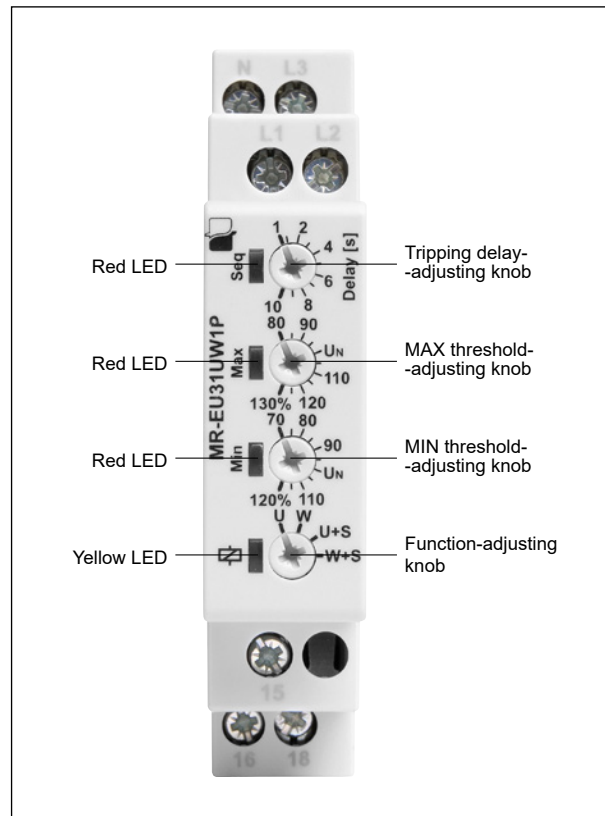
U - supply voltage; **R** - output state of the relay; **MIN, MAX** - relay status; **SEQ** - phase sequence

Loss of neutral wire by means of evaluation of asymmetry.

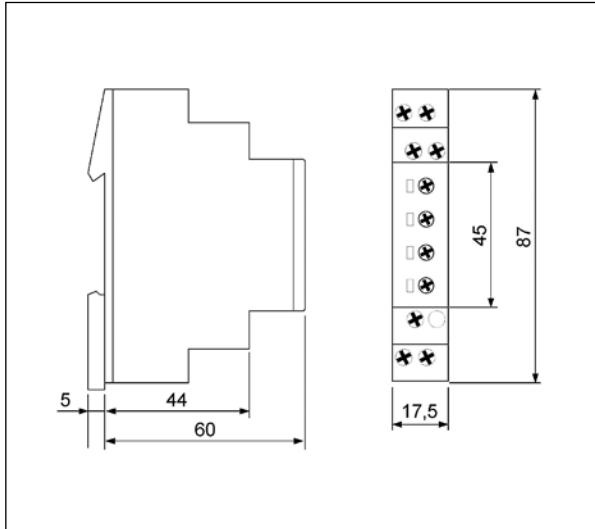


The device monitors every phase (L1, L2 and L3) against the neutral wire N. A shift of neutral point occurs by an asymmetrical phase load if the neutral wire breaks in the power line. If one of the phase voltages exceeds the value adjusted at the trip point, the set interval of tripping delay (Delay) begins (red LED MIN or MAX flashes). After the interval has expired (red LED MIN or MAX illuminated), the output relay R switches into off-position (yellow LED not illuminated).

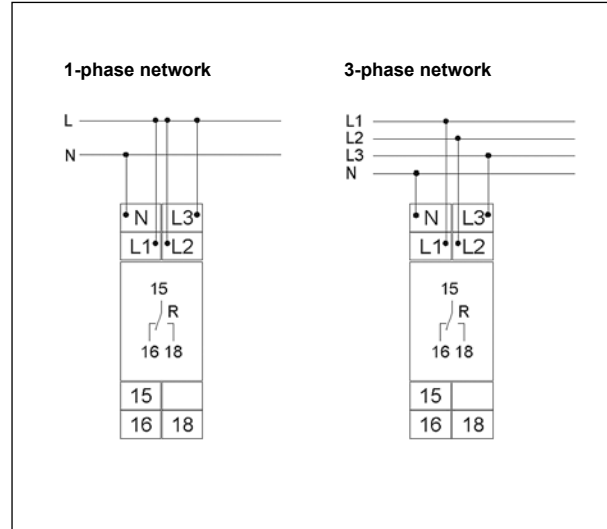
Front panel description



Dimensions



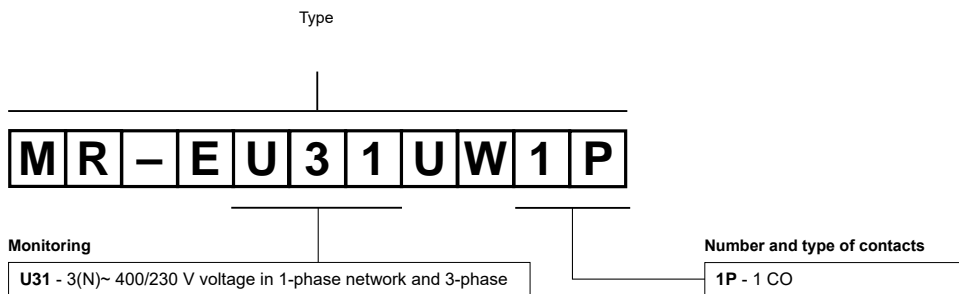
Connection diagrams



Mounting

Relays **MR-EU31UW1P** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm² with/without multicore cable end, 1 x 4 mm² without multicore cable end, 2 x 0,5 ... 1,5 mm² with/without multicore cable end, 2 x 2,5 mm² flexible without multicore cable end.

Ordering codes



Example of ordering code:

MR-EU31UW1P monitoring relay **MR-EU31UW1P**, multifunction (relay perform 5 functions), cover - modular, width 17,5 mm, one changeover contact, rated monitoring voltages: AC - 230 V, 3(N)- 400/230 V