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EN

HRN3-70
PMR3-70

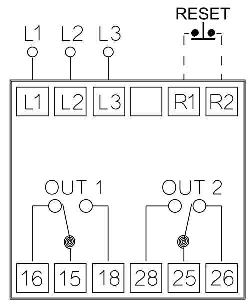
Voltage monitoring relays in 3P with selectable range

Characteristics

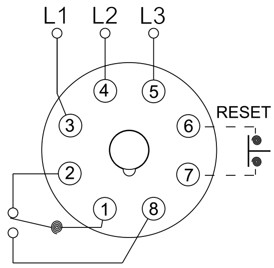
- It is used for monitoring of voltage, phase failure, sequence and asymmetry in 3-phase network.
- Wide range of monitored voltage with automatic selection of an low/high range.
- Fixed overvoltage level (Umax), adjustable undervoltage level (Umin).
- Adjustable time delay t2 (to eliminate short-term voltage drops and peaks).
- Adjustable time delay t3 (to eliminate short-term OK state).
- Adjustable asymmetry level with option to turn it OFF.
- Measures true root mean square value of the voltage - TRUE RMS.
- Fault memory reset can be done by RESET button on the panel or by an external opening contact.

Connection

HRN3-70

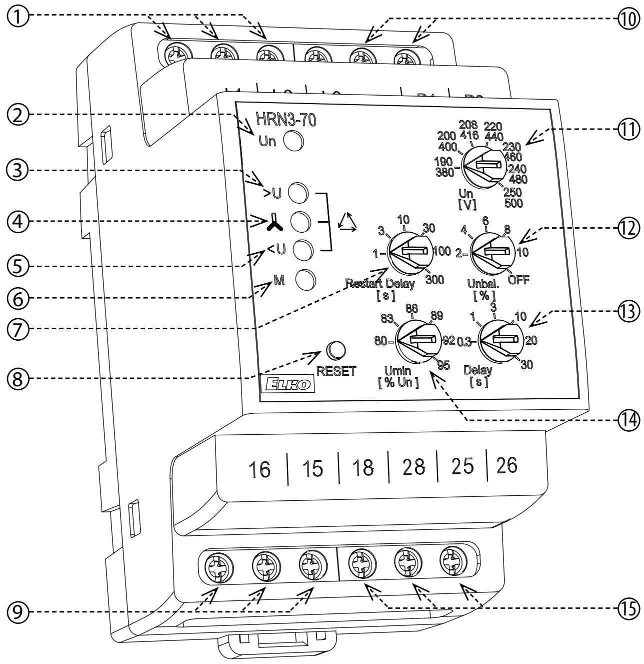


PMR3-70



Description

HRN3-70



1. Supply/monitored terminals (L1-L2-L3)
2. Supply voltage/time delay (t1/t3) indication
3. Overvoltage indication
4. Phase failure/asymmetry indication
5. Undervoltage/phase failure indication
6. Memory function indication
7. Time delay (t3)
8. Memory reset
9. Output contact 1 (16-15-18)
10. External reset terminals of memory (R1-R2)
11. Range setting
12. Asymmetry setting
13. Time delay (t2)
14. Lower level setting (Umin)
15. Output contact 2 (28-25-26)

Range switch (Un)

The range switch has two ranges of phase-to-phase voltage values:
low (190 to 250V) and high (380 to 500V)

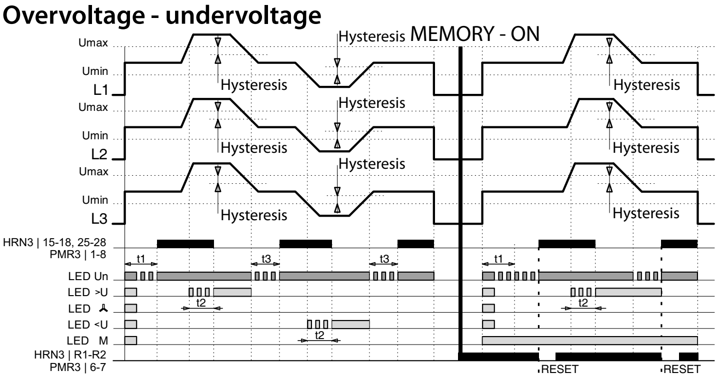
After connecting to the supply/monitored voltage, the device evaluates voltage size and selects the corresponding range of values. When switching between individual positions within the selected range, the green „LED Un“ will flash briefly.

Technical parameters

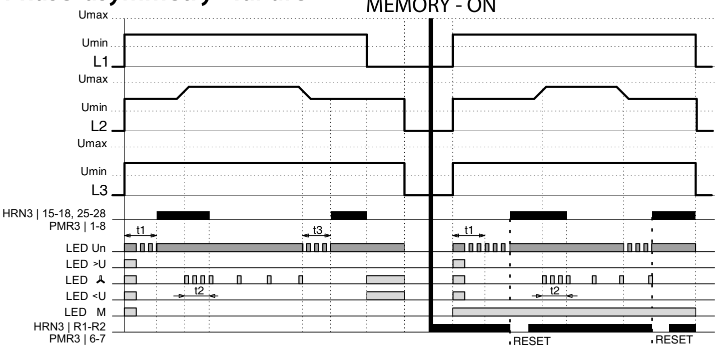
	HRN3-70	PMR3-70
Supply/monitored terminals:	L1-L2-L3	3-4-5
Supply/monitored voltage:	AC 3× 190 – 500 V (50-60 Hz)	
Consumption (max.):	2 VA/1 W	
Upper level (Umax):	110 %Un	
Lower level (Umin):	80 – 95 %Un	
Asymmetry:	adjustable, 2 – 10 %Un + OFF	
Max. permanent voltage:	AC 3× 550 V	
Peak overload (1 s):	AC 3× 600 V	
Time delay (t1):	2 s	
Time delay (t2):	adjustable, 0.3 – 30 s	
Time delay (t3):	adjustable, 1 – 300 s	
Accuracy:		
Hysteresis (fault to OK):	5 %	
Output		
Contact type:	2× changeover (AgNi)	1× changeover (AgNi)
Current rating:	16 A/AC1	
Breaking capacity:	4000 A/AC1, 384 W/DC1	
Switching voltage:	250 V AC/24 V DC	
Power dissipation (max.):	2.4 W	1.2 W
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Other information		
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)	
Dielectric strength:		
supply – output 1	AC 4 kV	AC 2.5 kV
supply – output 2	AC 4 kV	-
output 1 – output 2	AC 4 kV	-
Operating position:	any	
Mounting:	DIN rail EN 60715	into socket (8-pin)
Protection degree:	IP40 front panel / IP20 terminals	IP40
Overvoltage category:	III.	
Pollution degree:	2	
Cross-wire section – solid/ stranded with ferrule (mm²):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)	max. 1× 4, 2× 2.5/ max. 1× 4 (AWG 12)
Dimensions:	90 × 52 × 66 mm	48 × 48 × 79 mm
Weight:	140 g (4.94 oz)	100 g (3.53 oz)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27	

Function

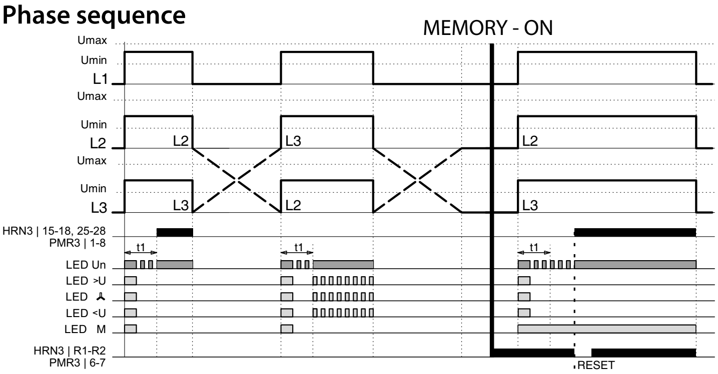
Overvoltage - undervoltage



Phase asymmetry - failure



Phase sequence



Graphs legend:
L1, L2, L3 = 3-phase voltage
RESET = memory reset
t1 = time delay, after connecting to voltage
t2 = time delay into fault state
t3 = time delay to OK state
15-18 = output contact 1(HRN3)
25-28 = output contact 2 (HRN3)

1-8 = output contact (PMR3)
LED >U = overvoltage indication
LED <U = undervoltage/phase failure indication
LED ⅄ = phase failure/asymmetry indication
LED M = memory function indication
LED Un = supply voltage, time delay t1 and t3 indication

After connecting the device to the supply voltage, all the LEDs on the panel will flash briefly.
If a 3-phase voltage is connected to the monitoring relay and all conditions are met (correct voltage magnitude, sequence and phase asymmetry), the output contacts close after the time delay t1 has elapsed. During the time delay, the green „LED Un" flashes, after the end of the delay it lights up permanently (OK state).

- When the voltage exceeds or falls outside the „Umin" and „Umax" levels, after the time delay t2 the green and the corresponding red „LED ≶" light up.
  The output contacts are open (fault state). During the time delay, the red LED flashes.
- If the phase sequence is incorrect when the power is connected, after the time delay t1 the green „LED Un" lights up + all 3 red „LEDs ≶⅄" flash simultaneously.
  The output contact is open (fault state). During the time delay, the green LED flashes.
- When the set phase asymmetry is exceeded, after the time delay t2 the green „LED Un" lights up and the red „LED ⅄" flashes briefly.
  The output contact is open (fault state). During the time delay, the red LED flashes rapidly.
- In the event of a phase failure, the output contacts open without a time delay t2 (fault state), the green „LED Un" and the corresponding red „LED < ⅄" light up.
- To return from the fault state to the OK state, the time delay t3 is always applied. During this time delay, the green „LED Un" flashes.

Reset and fault state memory activation:

By connecting terminals R1-R2 or pins 6-7 in the PLUG-IN version via an external push button with a break contact (RESET), the fault state memory is activated.
After turning on the power, the yellow „LED M" on the device panel lights up. If a fault condition occurs, it is stored in memory. The red LED signalize fault just like in mode with fault state memory turned off. If the voltage values return to the set levels, the corresponding red LED will be permanently lit and at the same time the green „LED Un" will start flashing. It is now possible to reset fault memory state, this closes the output contact and the red LED goes out (OK state). Fault memory reset (RESET) is performed either with an external pushbutton or with the pushbutton on device panel.

Warning

This device is constructed for connection in 3-phase network AC 3× 190–500 V and must be installed according to norms valid in the state of an application. Installation, connection, setting and servicing must be carried out by qualified electrician staff only, which have perfectly understood the instructions and functions of the device. This device contains protection against overvoltage peaks and disturbing impulses in the power supply network. For the correct function of the protection of this device, there must be suitable protections of higher degrees (A,B,C) installed in front of them and according to the standards, interference of switching devices must be securely eliminated (contactors, motors, inductive loads, etc.). Before installation, make sure that the device is de-energized and the main switch is in the "OFF" position. Don't install the device to sources of excessive electromagnetic interference. Ensure correct installation by perfect air circulation so that during continuous operation and a higher ambient temperature, the device does not exceed the maximum allowed operating temperature. For installation and setting use a screwdriver with a width of approx 2 mm. Keep in mind that this is a fully electronic device and approach accordingly with the installation. Non-problematic function of the device is also dependent on the previous method of transportation, storage, and handling. In case of any signs of damage, deformation, malfunction, or missing parts, don't install this device and claim it at the dealer. The product must be treated as electronic waste at the end of its life.

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