

# Relay for complete monitoring 3-phase mains HRN-43, HRN-43N

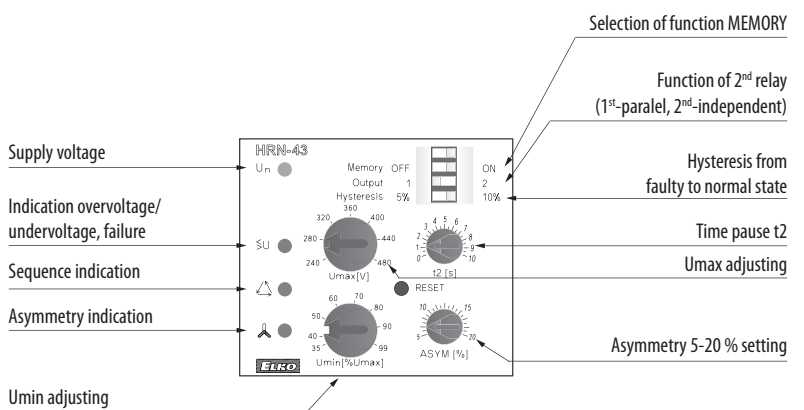


**EAN code**  
 HRN-43 /230V: 8594030337660  
 HRN-43 /400V: 8595188121316  
 HRN-43 /24V: 8594030338087  
 HRN-43N /230V: 8594030338216  
 HRN-43N /400V: 8595188120258  
 HRN-43N /24V: 8594030338094

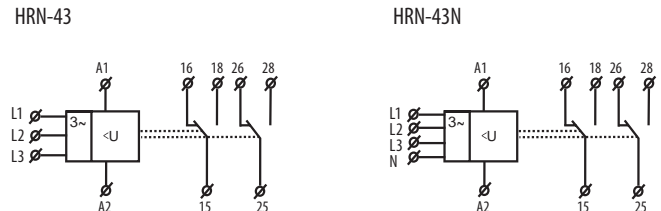
- Monitoring 3-phase mains:
  - voltage in 2 levels (undervoltage and overvoltage) in range 138-276V or 280-480 V (3x400 V)
  - phase asymmetry
  - phase sequence
  - phase failure
- Function "MEMORY" - for return from the faulty into normal state press button „RESET“ located on the front panel
- **HRN-43** - for circuits 3x400 V (without neutral)
- **HRN-43N** - for circuits 3x400/230 V (with neutral)
- 2 output relays, selectable function of 2nd relay (independent / parallel)
- Fixed (t1) and adjustable (t2) delay to eliminate short voltage drops and peaks
- Galvanically separated supply voltage AC 400 V, AC 230 V, AC/DC 24 V
- Output contact: 2x changeover/ DPDT 16 A / 250 V AC1
- 3-MODULE, DIN rail mounting

Technical parameters	HRN-43	HRN-43N
<b>Supply</b>		
Supply terminals:	A1 - A2	
Voltage range:	AC 230 V, AC 400 V, AC/DC 24 V / (AC 50-60Hz)	
Burden:	max. 4.5 VA	
Supply voltage tolerance:	-15%; +10 %	
<b>Measuring circuit</b>		
Nominal voltage:	3x400V / 50Hz	3x400V / 230V / 50Hz
Terminals:	L1, L2, L3	L1, L2, L3, N
Upper level Umax:	240-480V	138-276V
Bottom level Umin:	35 - 99 % Umax	
Max. permanent overload:	3x480 V	
Hysteresis:	adjustable 5 % or 10 % of set value	
Asymmetry:	5 - 20 %	
Peak overload <1ms:	600 < 1ms	350V < 1ms
Time delay t1:	fixed, max. 200 ms	
Time delay t2:	adjustable 0-10 s	
<b>Accuracy</b>		
Set. accuracy (mechanical):	5 %	
Repeat accuracy:	<1 %	
Temperature dependence:	< 0.1 % / °C	
Limit values tolerance:	5 %	
<b>Output</b>		
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	
Min. breaking capacity DC:	500 mW	
Mechanical life:	3x10 <sup>7</sup>	
Electrical life (AC1):	0.7x10 <sup>9</sup>	
<b>Other information</b>		
Operating temperature:	-20 °C to +55 °C (-4 °F to 131 °F)	
Storage temperature:	-30 °C to +70 °C (-22 °F to 158 °F)	
Electrical strength:	4 kV (supply - output)	
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP 40 from front panel / IP 20 terminals	
Overtoltage category:	III.	
Pollution degree:	2	
Max. cable size (mm <sup>2</sup> ):	solid wire max. 1x 2.5 or 2x1.5/ with sleeve max. 1x1.5 (AWG 12)	
Dimensions:	90 x 52 x 65 mm (3.5" x 2" x 2.6")	
Weight:	239 g (8.4 oz.)	
Standards:	EN 60255-6, EN 61010-1	

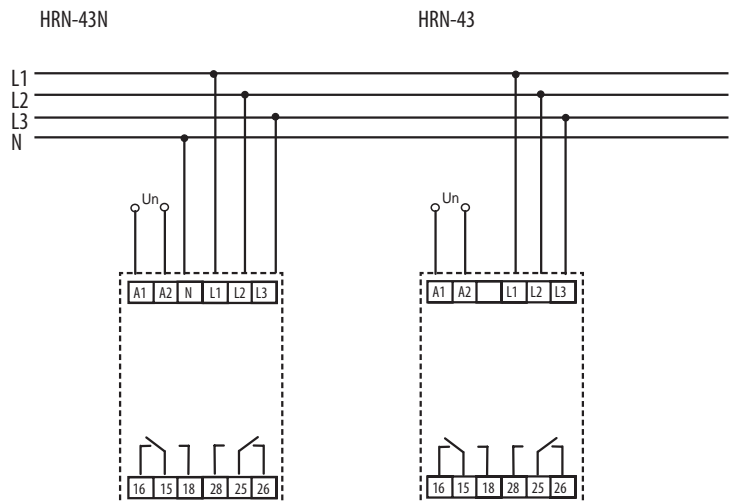
## Description



## Symbol

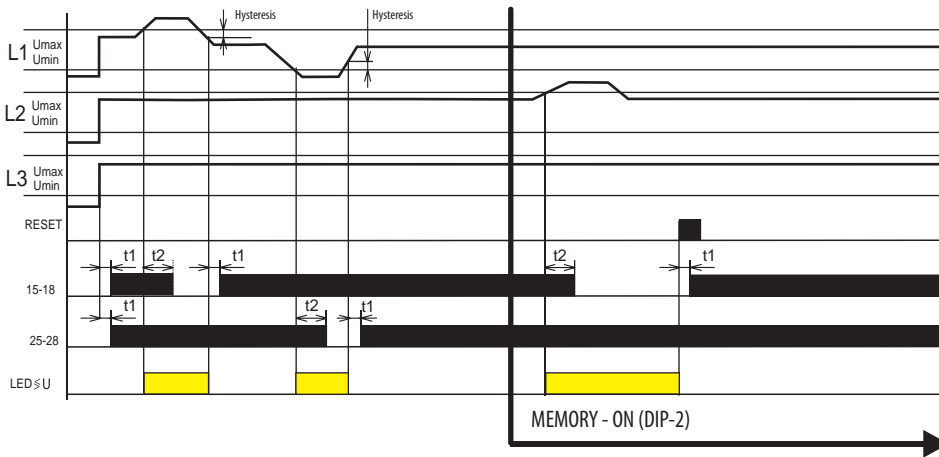


## Connection



**Function**

**Overvoltage - undervoltage**



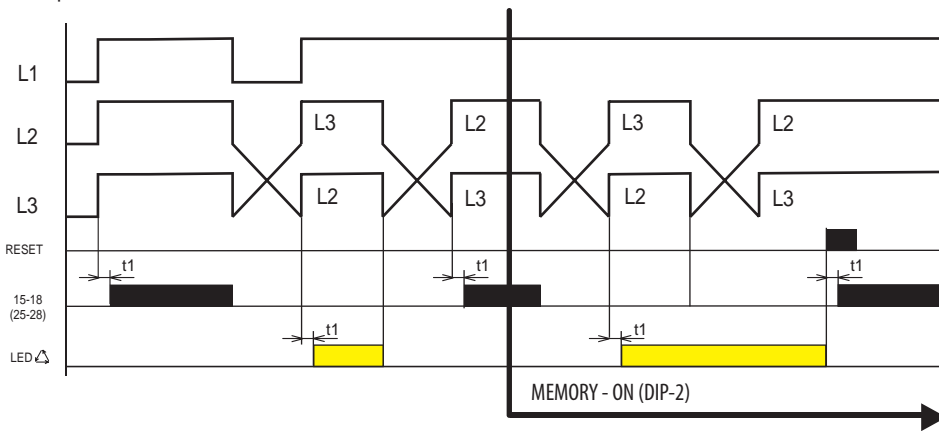
**Legend:**

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

**Selection of 2<sup>nd</sup> the relay function:**

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

**Phase sequence**



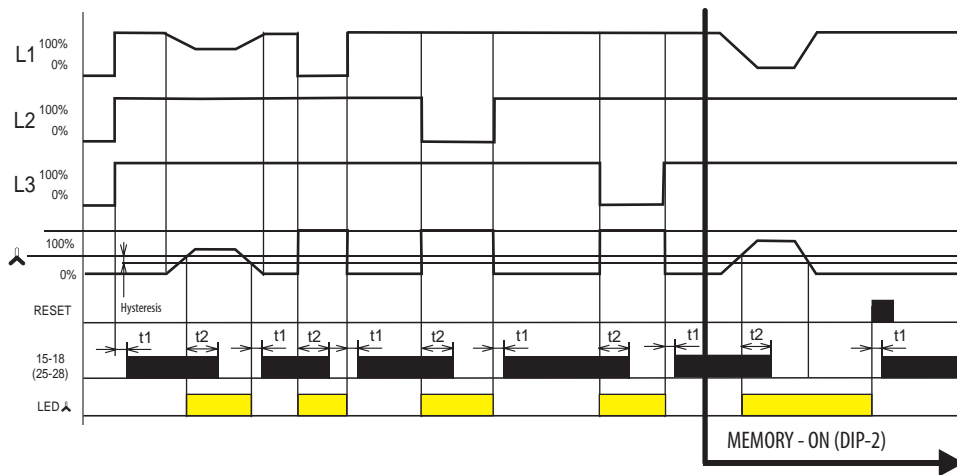
**Legend:**

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

**Selection of 2<sup>nd</sup> relay function:**

The function is not implied in the monitoring phase sequence, the relays are switched in parallel way.  
DIP switch no. 3 is ignored.

**Asymmetry - phase failure**



**Legend:**

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

**Selection of 2<sup>nd</sup> relay function:**

The function is not implied in the monitoring phase sequence, the relays are switched in parallel way.  
DIP switch no. 3 is ignored.

**Function description**

Relay is designated to monitor 3-phase circuits. Type HRN-43N controls voltage towards neutral wire, type HRN-43 controls interphase voltage. Relay can monitor voltage in two levels (overvoltage/undervoltage), phase asymmetry, sequence and failure. Each faulty state is indicated by individual LED. By DIP switch (No.3) it is possible to define function of the other relay – independent function (1x for overvoltage, 1x for undervoltage) or in parallel. Time delays t1 (fixed) – 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 Umax in range 138-276 V (or 240 - 480 V for HRN-43) and lower level Umin in range 35-99% Umax. 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 fixed hysteresis (which is adjustable in two values by DIP switch).

**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 asymmetry 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 hysteric are applicable when returning to normal state.