

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

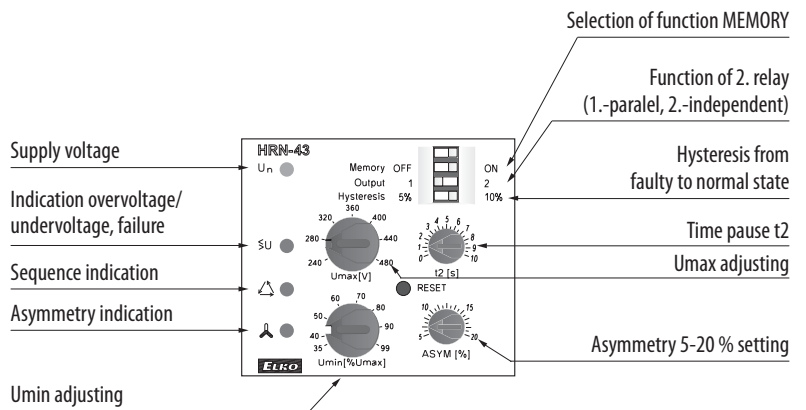


EAN code

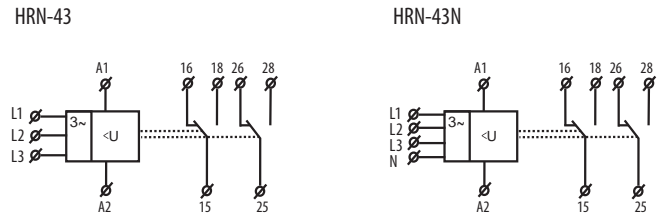
HRN-43 /230V	8594030337660
HRN-43 /400V **	8595188121316
HRN-43 /24V **	8594030338087
HRN-43N /230V	8594030338216
HRN-43N /400V	8595188120258
HRN-43N /24V	8594030338094

- 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
- Galvanic isolated 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

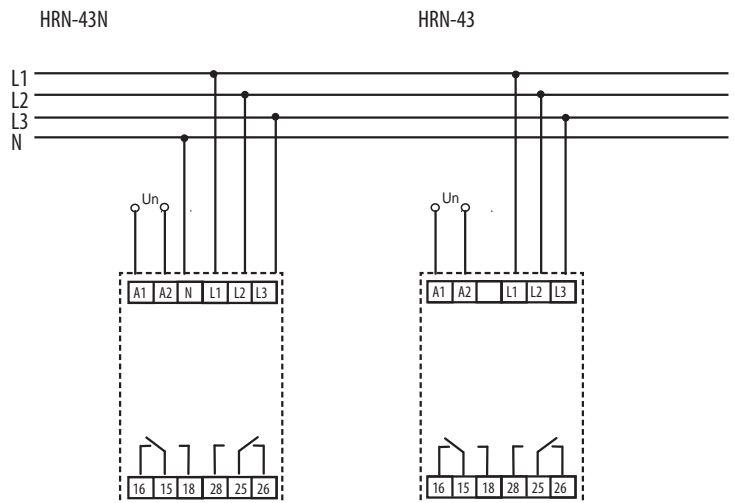
Technical parameters	HRN-43	HRN-43N	Description
Supply			
Supply terminals:	A1 - A2		
Voltage range:	AC 230 V, AC 400 V, AC/DC 24 V / (AC 50-60Hz)		
Burden:	max. 4.5 VA		
Supply voltage tolerance:	-15 %; +10 %		
Measuring circuit			
Nominal voltage:	3x400V / 50Hz	3x400V / 230V / 50Hz	
Terminals:	L1, 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		
Accuracy			
Set. accuracy (mechanical):	5 %		
Repeat accuracy:	<1 %		
Temperature dependence:	< 0.1 % / °C		
Limit values tolerance:	5 %		
Output			
Number of contacts:	2x changeover/ SPDT (AgNi / Silver Alloy)		
Current rating:	16 A / AC1		
Breaking capacity:	4000 VA / AC1, 384 W / DC		
Inrush current:	30 A / < 3 s		
Switching voltage:	250 V AC1 / 24 V DC		
Min. breaking capacity DC:	500 mW		
Mechanical life:	3x10 ⁷		
Electrical life (AC1):	0.7x10 ⁵		
Other information			
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		
Overvoltage category:	III.		
Pollution degree:	2		
Max. cable size (mm ²):	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		



Symbol



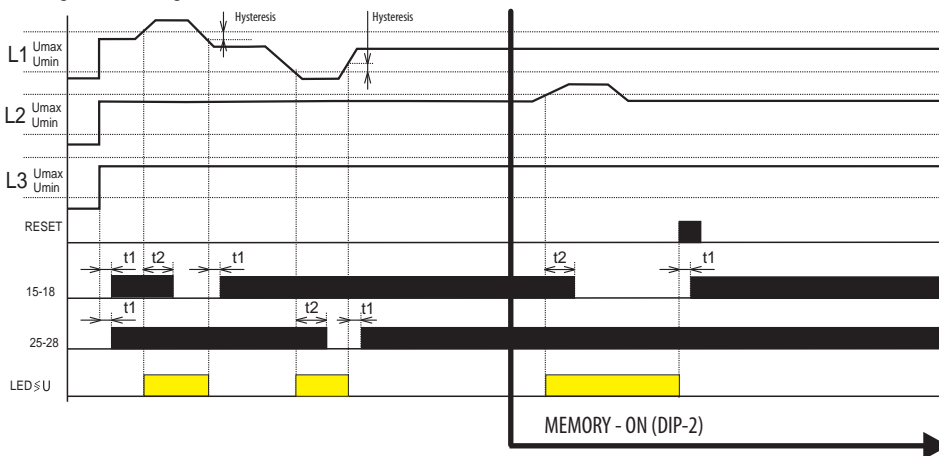
Connection





Function

Overvoltage - undervoltage



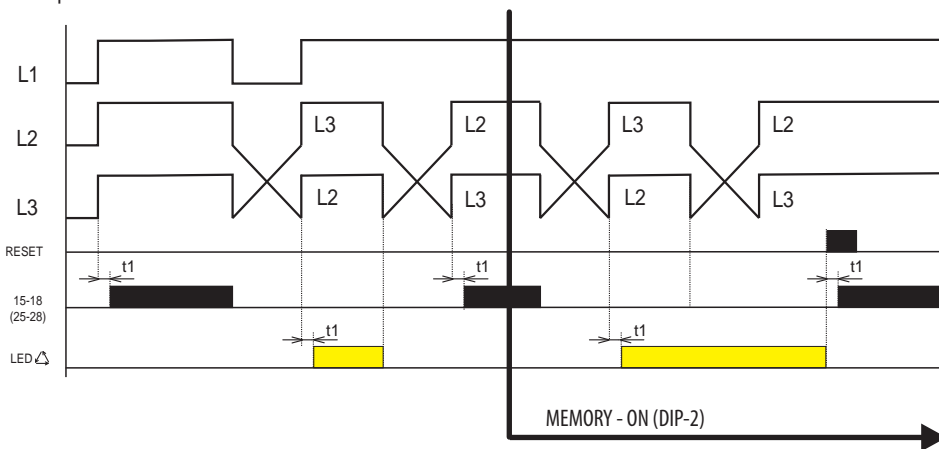
Legend:

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 $\leq U$ - indication overvoltage / undervoltage

Selection of 2nd 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



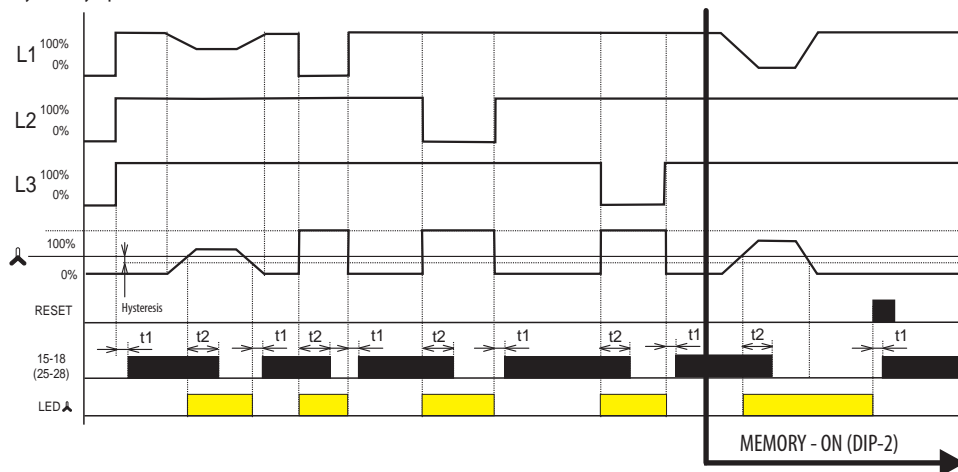
Legend:

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 Δ indication of phase sequence

Selection of 2nd relay function:

The function is not implied when monitoring phase sequence, the relays are switched in parallel way.

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 2nd relay function:

The function is not implied when monitoring phase sequence, the relays are switched in parallel way.
 DIP switch 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 – independant 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 U_{max} in range 138-276 V (or 240 - 480 V for HRN-43) 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 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.