



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

Technical parameters

Supply

Technical parameters	HRN-43	HRN-43N
Supply terminals:	A1 - A2	
Supply voltage:	AC 230 V, AC 400 V, AC/DC 24 V (AC 50-60 Hz)	
Consumption max.:	5 VA/2.5 W (AC 230 V, AC 400 V), 2 VA/1.4 W (AC/DC 24 V)	
Max. dissipated power (Un + terminals):	6.5 W (230 V, 400 V), 5.5 W (24 V)	
Supply voltage tolerance:	-15 %; +10 %	

Measuring circuit

Measuring circuit	HRN-43	HRN-43N
Voltage set:	3x 400 V (50-60 Hz)	3x 400 V/230 V (50-60 Hz)
Monitored terminals:	L1, L2, L3	L1, L2, L3, N
Upper voltage level:	240 - 480 V	138 - 276 V
Bottom voltage level:	35 - 99 % Umax	
Max. permanent overload:	3x 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

Set. accuracy (mechanical):	5 %
Repeat accuracy:	< 1 %
Temperature dependence:	< 0.1 %/°C (°F)
Limit values tolerance:	5 %

Output

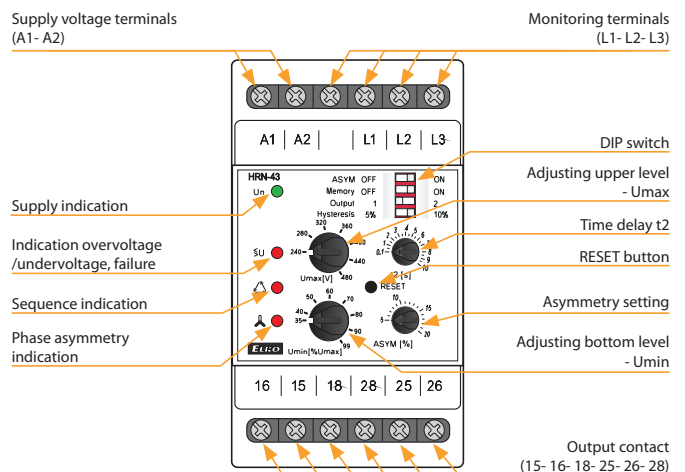
Number of contacts:	2x changeover/SPDT (AgNi/Silver Alloy)
Rated current:	16 A/AC1
Switching capacity:	4000 VA/AC1, 384 W/DC
Inrush current:	30 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.

Other information

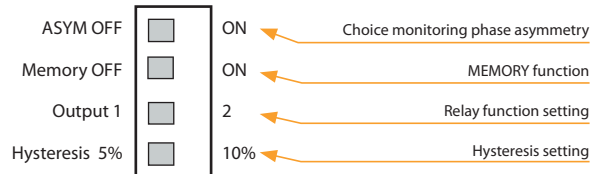
Operating temperature:	-20 °C to 55 °C (-4 °F to 131 °F)
Storage temperature:	-30 °C to 70 °C (-22 °F to 158 °F)
Dielectrical strength:	4 kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel/IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm ²):	solid wire max. 1x 2.5 or 2x 1.5/ with sleeve max. 1x 1.5 (AWG 12)
Dimensions:	90 x 52 x 65 mm (3.5" x 2" x 2.6")
Weight:	248 g (110 V, 230 V, 400 V) (8.7 oz.), 146 g (24 V) (5.1 oz.)
Standards:	EN 60255-1, EN 60255-26, EN 60255-27

- 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.
- Function of second relay (independent/parallel).
- HRN-43:** for circuits 3x 400 V (without neutral).
- HRN-43N:** for circuits 3x 400/230 V (with neutral).
- Galvanically separated supply voltage AC 400 V, AC 230 V, AC/DC 24 V.

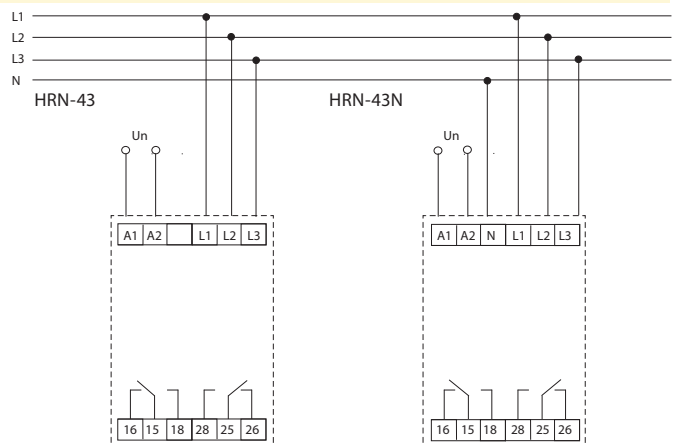
Description



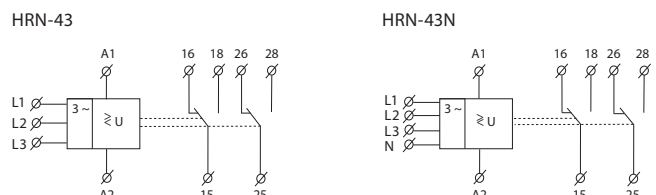
Description and importance of DIP switches



Connection

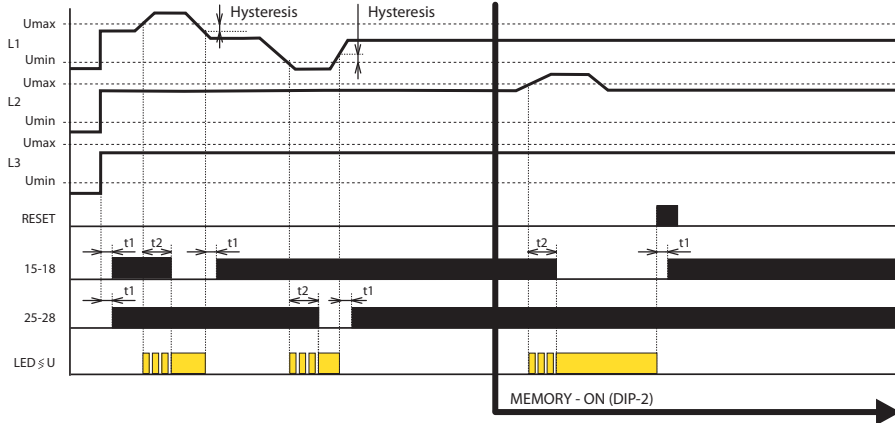


Symbol



Function

Overvoltage - undervoltage

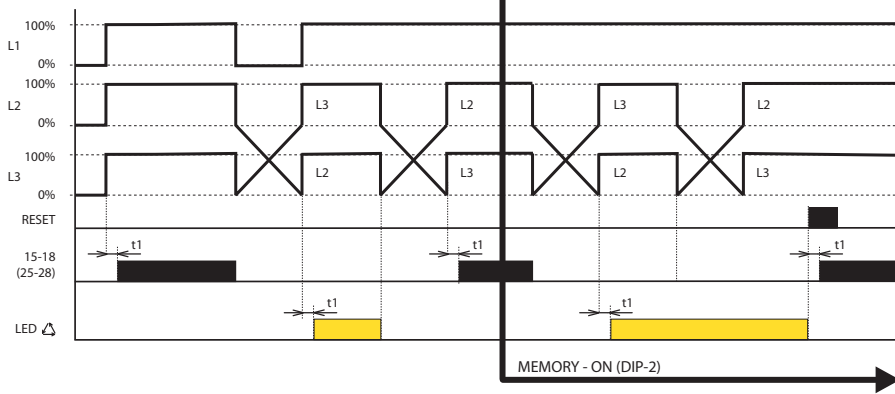


Legend:
 L1, L2, L3 - 3-phase voltage
 RESET - press of the button on frontal panel
 t1 - time delay, fixed
 t2 - time delay, adjustable
 15-18 output relay 1
 25-28 output relay 2
 LED $\geq U$ - indication overvoltage/undervoltage

Selection of 2nd 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 "phase sequence") or both relays will switch in parallel way (see diagram "phase sequence"). Selection via DIP switch Output.

Phase sequence

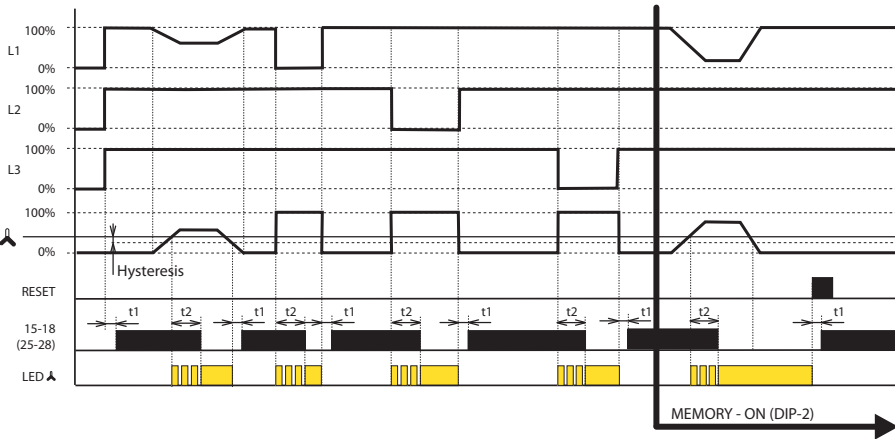


Legend:
 L1, L2, L3 - 3-phase voltage
 RESET - press of the button on frontal panel
 t1 - time delay, fixed
 t2 - time delay, adjustable
 15-18 output relay 1
 25-28 output relay 2
 LED Δ - indication of phase sequence

Selection of 2nd relay function:

The function is not implied 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 panel
 t1 - time pause, fixed
 t2 - time pause, adjustable
 \blacktriangle - adjustable asymmetry
 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 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 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 (Output) 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). 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 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. Monitoring asymmetry can be switched off by DIP switch ASYM.