



- ! monitoring 3-phase mains:
  - voltage in 2 levels 160-276 V (3x400/230 V) or 280-480 V (3x400 V)
  - phase asymmetry
  - phase sequence
  - phase failure
- ! function "MEMORY" - manual reset, "RESET" button on 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 16 A / 250 V AC1
- ! 3-MODULE, DIN rail mounting

Technical parameters	HRN-43	HRN-43N
<b>Supply</b>		
Supply terminals:	A1 - A2	
Supply voltage:	AC 230 V, AC 400 V, AC/DC 24 V	
Consumption:	max. 4.5 VA	
Supply voltage tolerance:	-15 %; +10 %	
<b>Measuring circuit</b>		
Nominal voltage:	3x400 V	3x400/230 V
Terminals:	L1, L2, L3	L1, L2, L3, N
Upper level Umax:	240 - 480 V	138 - 276 V
Bottom level Umin:	35 - 99 % Umax	
Max. permanent overload:	3x480V	
Hysteresis:	adjustable 5 % or 10 % of set value	
Asymmetry:	5 - 20 %	
Peak overload <1ms:	600 V < 1ms	350 V < 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 dependance:	< 0.1 % / °C	
Limit values tolerance:	5 %	
<b>Output</b>		
Number of contacts:	2x changeover (AgNi)	
Rated current:	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>5</sup>	
<b>Other information</b>		
Operating temperature:	-20 .. +55 °C	
Storage temperature:	-30 .. +70 °C	
Electrical strength:	4 kV (supply - output)	
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP 40 from front panel	
Overvoltage category:	III.	
Pollution degree:	2	
Max. cable size (mm <sup>2</sup> ):	solid wire max. 1x 2.5 or 2x 1.5 / with sleeve max. 1x 1.5	
Dimensions:	90 x 52 x 65 mm, see page 157-159	
Weight:	239 g	
Standards:	EN 60255-6, EN 61010-1	

## Description

Hysteresis from faulty to normal state

Function of 2. relay (1.-parallel, 2.-independent)

Selection of function MEMORY

Supply voltage

Indication overvoltage/  
undervoltage, failure

Sequence indication

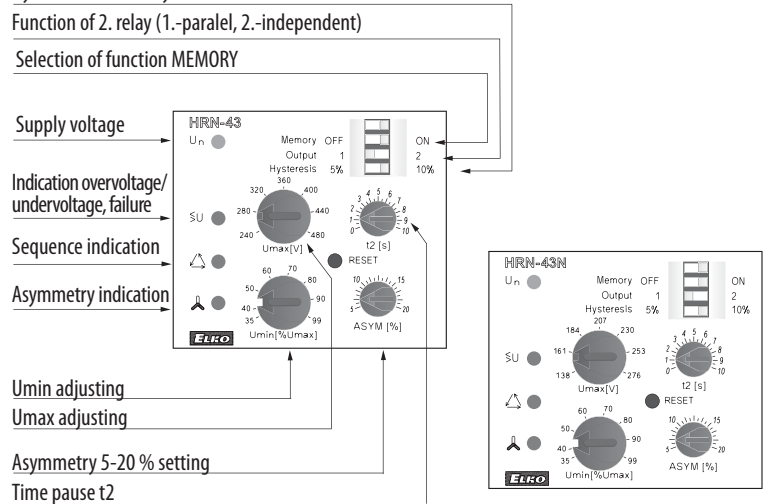
Asymmetry indication

Umin adjusting

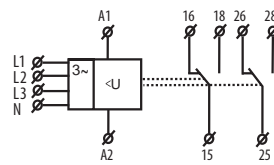
Umax adjusting

Asymmetry 5-20 % setting

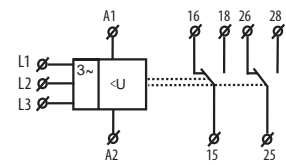
Time pause t2



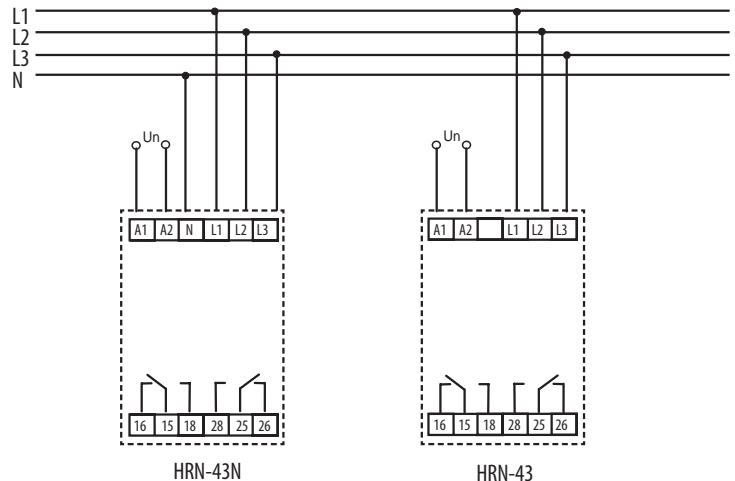
## Symbol HRN-43N

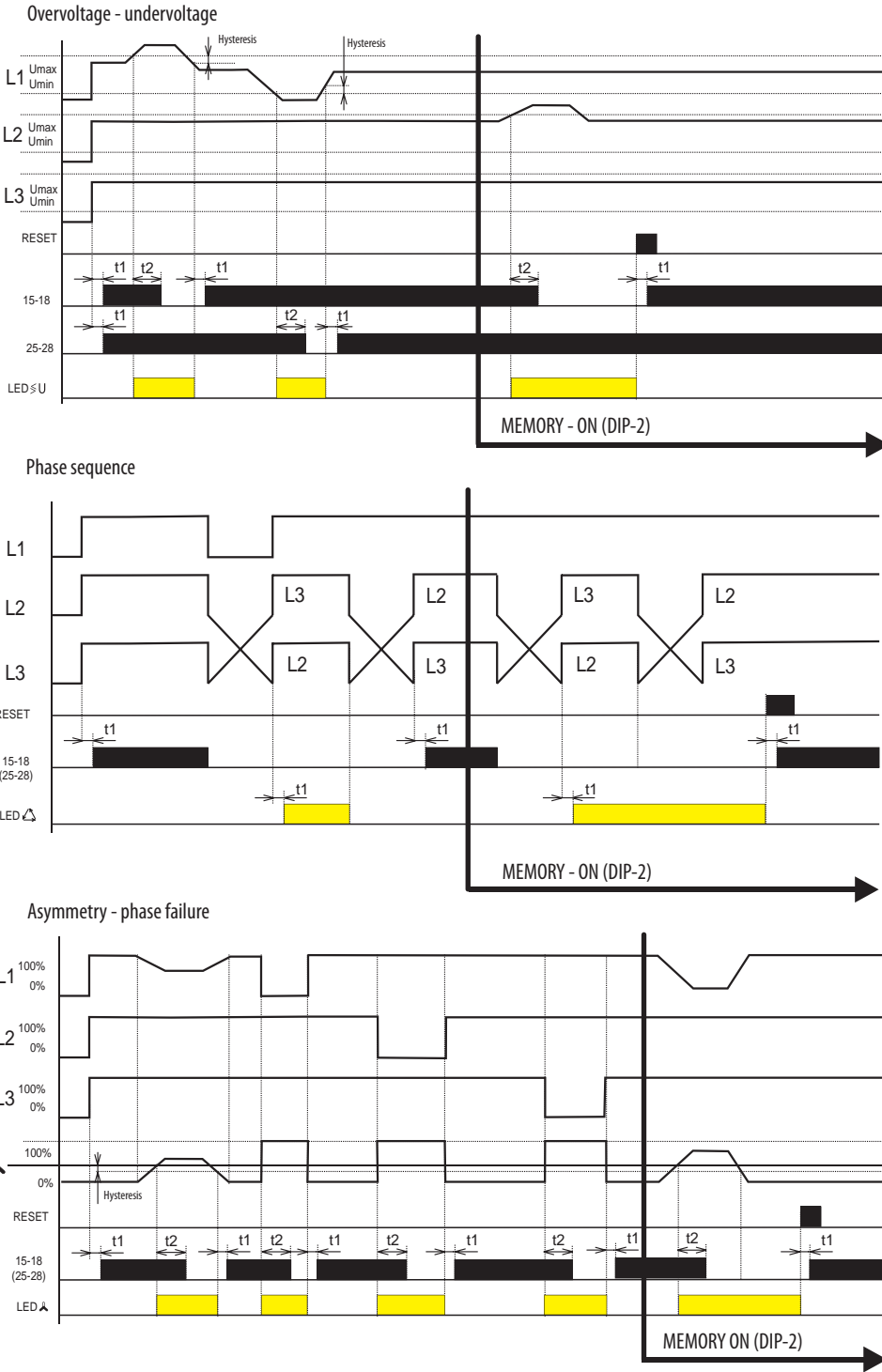


## HRN-43



## Connection





**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 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.

**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 range of phases

**Selection of 2nd relay function:**

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

**Legend:**

- LL1, L2, L3 - 3-phase voltage
- RESET - press of the button on frontal panel
- t1 - time pause, fixed
- t2 - time pause, adjustable 0-10 sec
- Δ - adjustable asymmetry 5-20%
- 15-18 output contact of relay 1
- 25-28 output contact of relay 2
- LED Δ - 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 against 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 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 breaks. 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 open.

**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.