

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



- 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

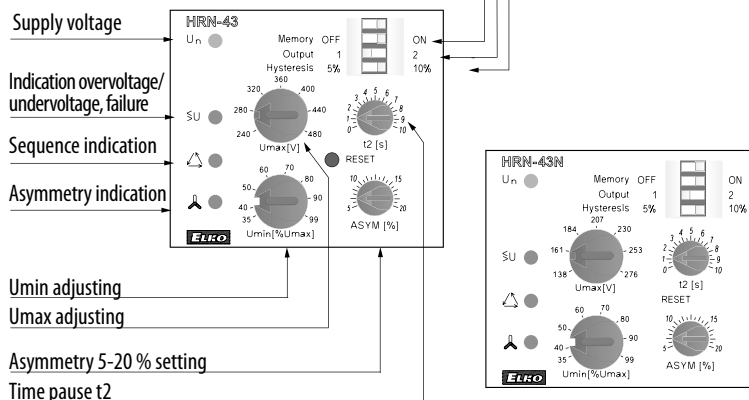
| Technical parameters | HRN-43 | HRN-43N |
|-------------------------------------|---|---------------|
| Supply | | |
| Supply terminals: | A1 - A2 | |
| Supply voltage: | AC 230 V, AC 400 V, AC/DC 24 V | |
| Consumption: | max. 4.5 VA | |
| Supply voltage tolerance: | -15 %; +10 % | |
| Measuring circuit | | |
| 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 | |
| Accuracy | | |
| Set. accuracy (mechanical): | 5 % | |
| Repeat accuracy: | <1 % | |
| Temperature dependence: | < 0.1 % / °C | |
| Limit values tolerance: | 5 % | |
| Output | | |
| 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 ⁷ | |
| Electrical life (AC1): | 0.7x10 ⁵ | |
| Other information | | |
| 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 | |
| Overtoltage category: | III. | |
| Pollution degree: | 2 | |
| Max. cable size (mm ²): | solid wire max. 1x 2.5 or 2x1.5/ with sleeve max. 1x1.5 | |
| Dimensions: | 90 x 52 x 65 mm, see page 90-92 | |
| Weight: | 239 g | |
| Standards: | EN 60255-6, EN 61010-1 | |

Description

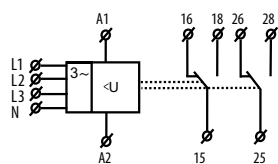
Hysteresis from faulty to normal state

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

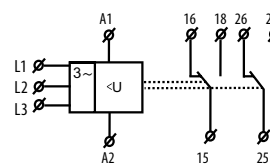
Selection of function MEMORY



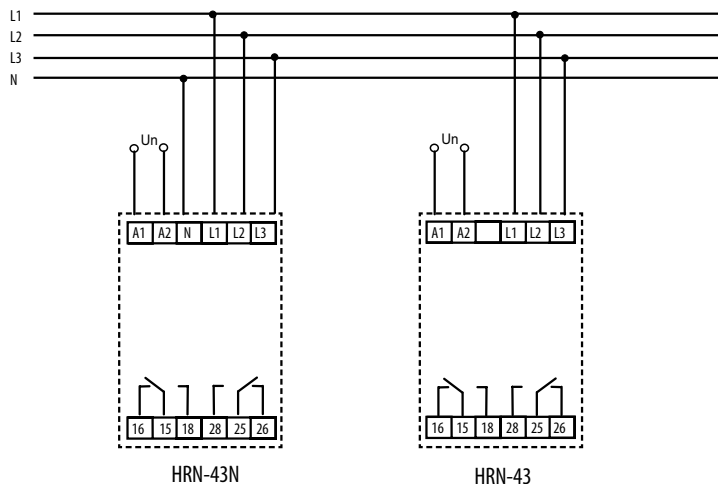
Symbol HRN-43N

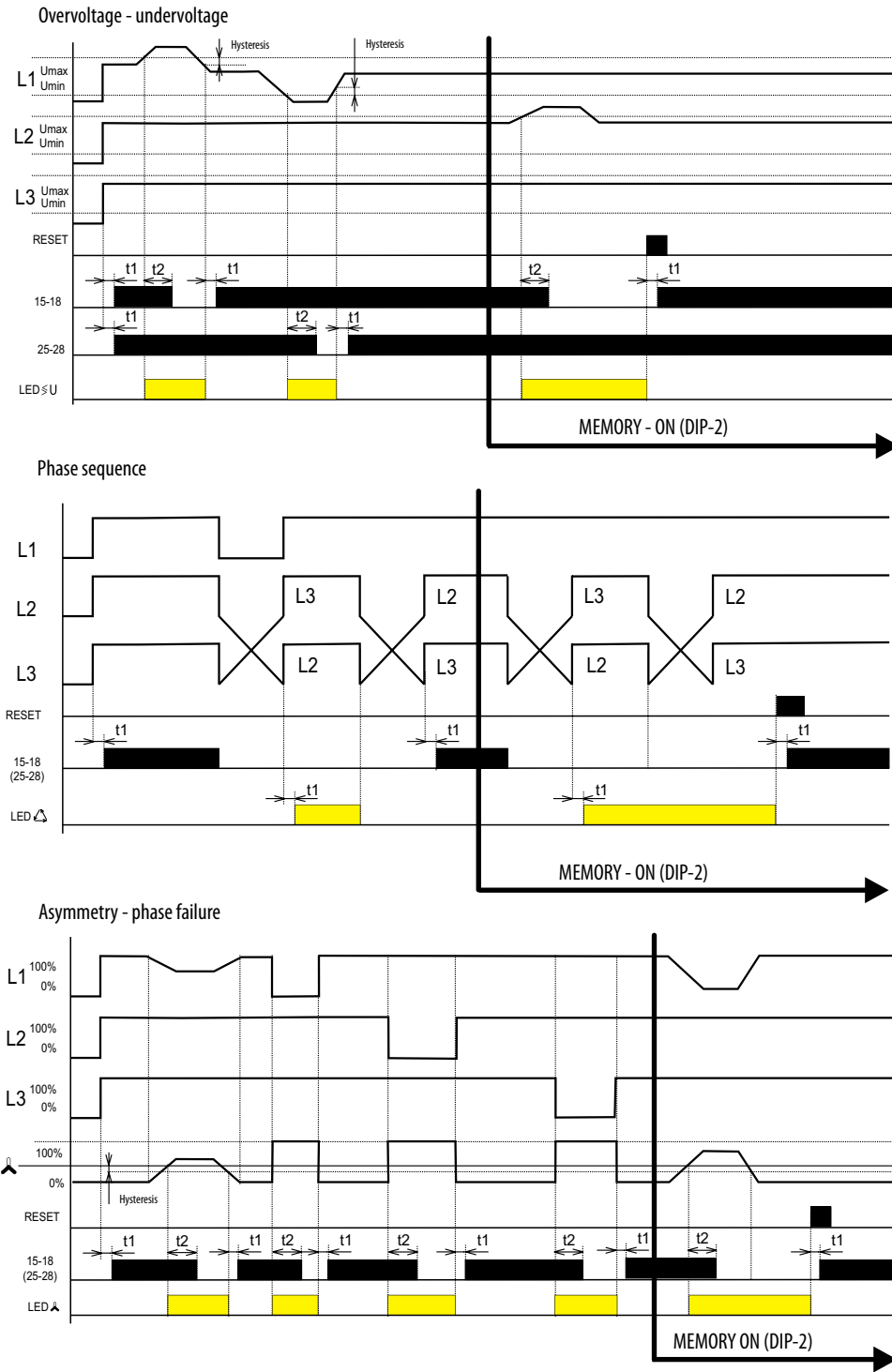


Symbol HRN-43



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
- Λ - adjustable asymmetry 5-20%
- 15-18 output contact of relay 1
- 25-28 output contact of relay 2
- LED Λ - 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 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 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.