



**THE DATASHEET OF
HRN-43N/UNI**



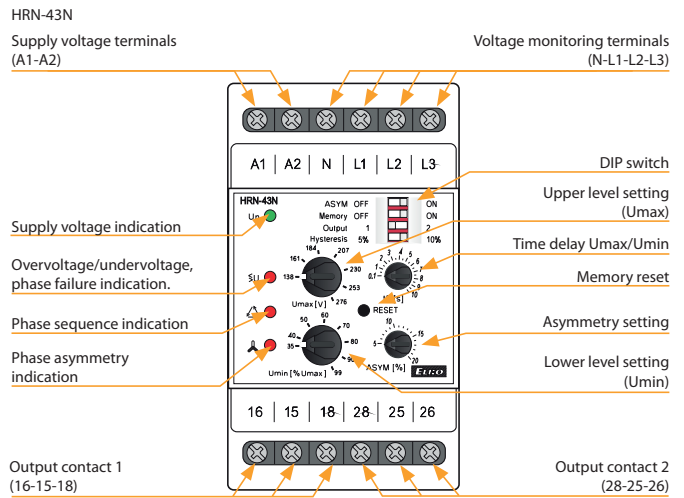


EAN code
 HRN-43/UNI: 8595188185318
 HRN-43/400V: 8595188121316
 HRN-43N/UNI: 8595188185325
 HRN-43N/400V: 8595188120258

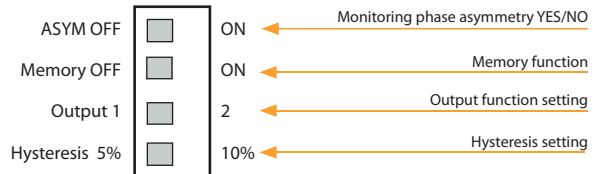
Technical parameters	HRN-43	HRN-43N
Supply		
Supply terminals:	A1-A2	
Supply voltage:	AC/DC 24 – 240 V (AC 50-60 Hz)	
Consumption (max.):	3 VA/1 W	
Supply voltage:	AC 400 V (50-60 Hz)	
Consumption (max.):	5 VA/2.5 W	
Supply voltage tolerance:	–15 %; +10 %	
Measuring circuit		
Monitored terminals:	L1-L2-L3	L1-L2-L3-N
Voltage system:	3× 400 V (50-60 Hz)	3× 400 V/230 V (50-60 Hz)
Upper level setting (Umax):	240 – 480 V	138 – 276 V
Lower level setting (Umin):	35 – 99 %Umax	
Max. permanent voltage:	3× 480 V	
Asymmetry:	adjustable, 5 – 20 % + OFF	
Peak overload (1 s):	600 V	350 V
Time delay (t1):	fixed, max. 200 ms	
Time delay Umax/Umin (t2):	adjustable, 0.1 – 10 s	
Accuracy		
Setting accuracy (mech.):	5 %	
Repeat accuracy:	< 1 %	
Temperature dependence:	< 0.1 %/°C (°F)	
Limit values tolerance:	5 %	
Hysteresis (fault to OK):	selectable, 5 %/10 % from the upper range value	
Output		
Contact type:	2× changeover/SPDT (AgNi)	
Current rating:	16 A/AC1; 1 HP 240 Vac, 1/2 HP 120 Vac; PD. B300	
Breaking capacity:	4000 VA/AC1, 384 W/DC1	
Inrush current:	30 A/< 3 s	
Switching voltage:	250 V AC/24 V DC	
Power dissipation (max.):	2.4 W	
Mechanical life:	10.000.000 ops.	
Electrical life (AC1):	100.000 ops.	
Other information		
Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)	
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)	
Dielectric strength:		
supply – output	AC 4 kV	
output 1 – output 2	AC 4 kV	
Operating position:	any	
Mounting:	DIN rail EN 60715	
Protection degree:	IP40 front panel / IP20 terminals	
Overvoltage category:	III.	
Pollution degree:	2	
Cross-wire section – solid/ stranded with ferrule (mm2):	max. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)	
Dimensions:	90 × 52 × 65 mm (3.5" × 2" × 2.6")	
Weight:	UNI – 148 g (5.2 oz), 400V – 248 g (8.7 oz)	
Standards:	EN 60255-1, EN 60255-26, EN 60255-27	

- Relay is designed to monitor voltage in 3-phase networks:
 - HRN-43:** delta connection 3× 400 V (without neutral)
 - HRN-43N:** star connection 3× 400/230 V (with neutral)
- Monitors level of voltage in two independent levels (Umax, Umin) overvoltage and undervoltage:
 - system 3× 400 V: range 240 – 480 V
 - system 3× 400/230 V: range 138 – 276 V
- Other monitored parameters:
 - phase failure, sequence, asymmetry (adjustable, can be switched off)
- Setting the monitored lower level (Umin) in % of the set upper level Umax.
- Adjustable time delay (eliminating short-term drops and spikes).
- Selectable function of output contacts (independently/in parallel).
- Galvanically separated supply voltage AC/DC 24 – 240 V, AC 400 V.
- Output contact for each monitored voltage level.

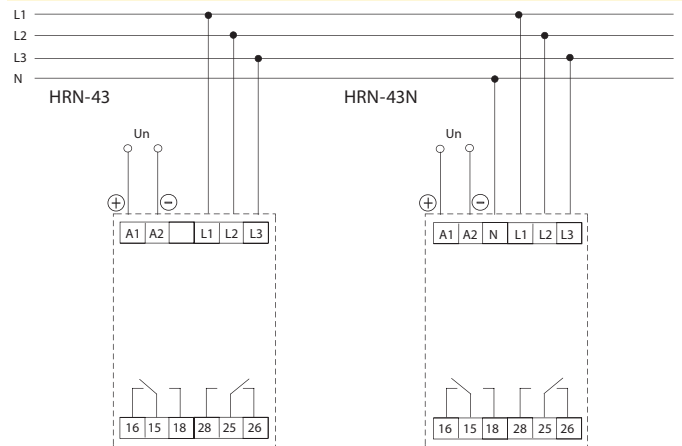
Description



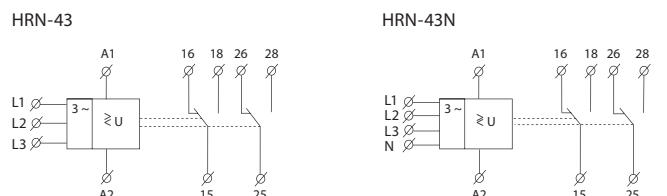
Description of DIP switch



Connection

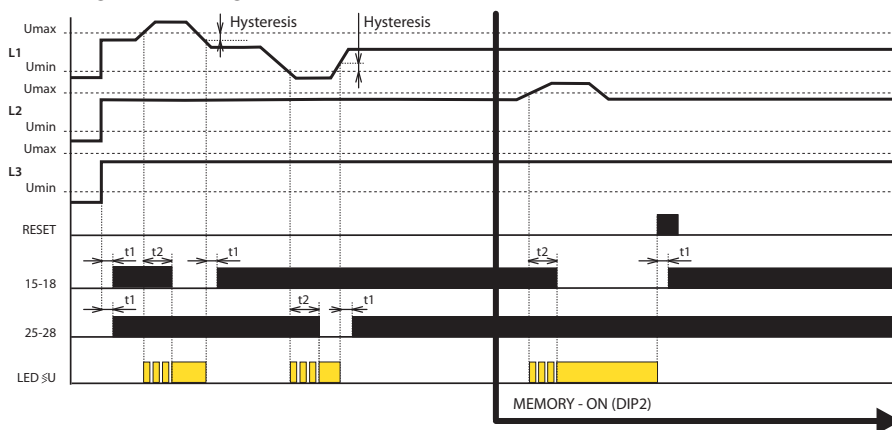


Symbol



Function

Overvoltage - undervoltage



Graphs legend:

L1, L2, L3 = 3-phase voltage
 RESET = memory reset
 t1 = time delay, fixed
 t2 = time delay U_{max}/U_{min} , adjustable
 15-18 = output contact 1
 25-28 = output contact 2
 LED \leq U = overvoltage/undervoltage indication

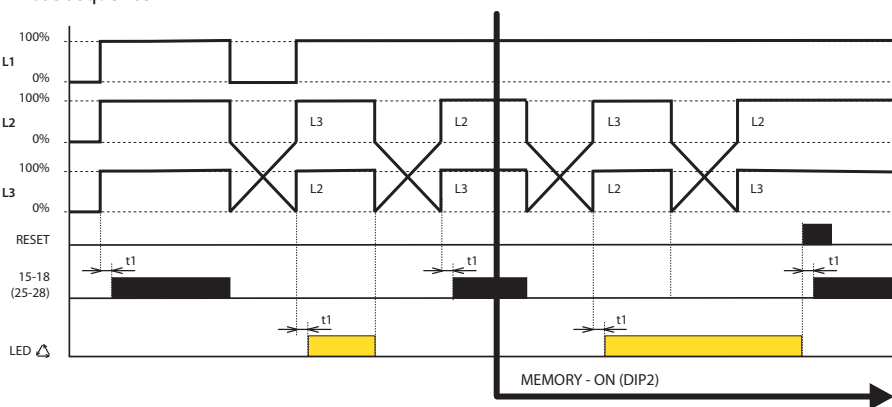
Function of output contacts:

In order to monitor two levels of voltage, it is possible to select if output contact will respond to each level individually (see the diagram) or both contacts will switch in parallel (see diagram "phase sequence").

Selection via DIP switch „Output“.

Output 1 = output contacts are switched in parallel
 Output 2 = output contacts are switched separately for each level

Phase sequence



Graphs legend:

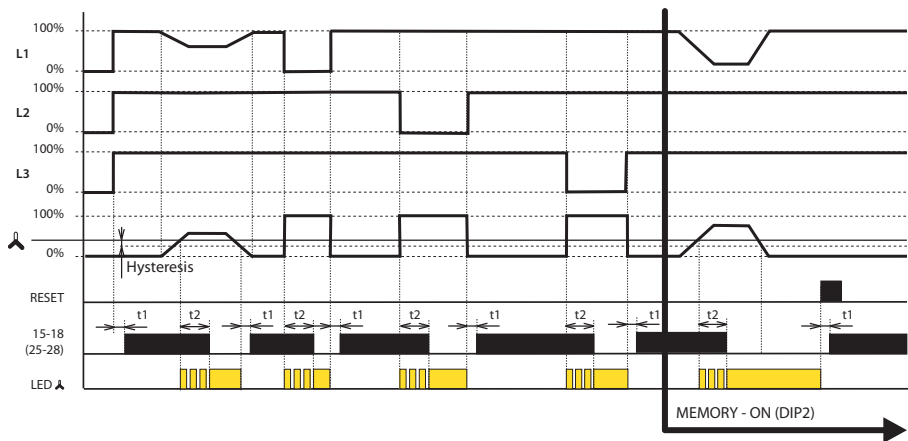
L1, L2, L3 = 3-phase voltage
 RESET = memory reset
 t1 = time delay, fixed
 t2 = time delay U_{max}/U_{min} , adjustable
 15-18 = output contact 1
 25-28 = output contact 2
 LED Δ = phase sequence indication

Function of output contacts:

The function is not applicable in the phase sequence monitoring, the contacts are switched in parallel.

DIP switch „Output“ is ignored.

Phase asymmetry - failure



Graphs legend:

L1, L2, L3 = 3-phase voltage
 RESET = memory reset
 t1 = time delay, fixed
 t2 = time delay U_{max}/U_{min} , adjustable
 Δ - adjustable asymmetry level
 15-18 = output contact 1
 25-28 = output contact 2
 LED Δ - asymmetry indication

Function of output contacts:

The function is not applicable in the phase asymmetry and failure monitoring, the contacts are switched in parallel way.

DIP switch „Output“ is ignored.

Relay is designated to monitor 3-phase circuits. Type HRN-43 controls the interphase voltage, type HRN-43N controls voltage towards the neutral wire. Relay can monitor: voltage in two levels (overvoltage/undervoltage), phase sequence/failure and asymmetry. Each fault state is indicated by an individual LED. By DIP switch „Output“ it is possible to select the function of output contacts: independent function (1x for overvoltage, 1x for undervoltage) or in parallel. Fixed time delay (t1) is applied when changing from fault to OK state or when de-energized. Adjustable time delay (t2) is applied, when changing from OK to fault state. This delay prevents incorrect behavior and oscillation of the output device during short-term voltage drops and peaks.

Voltage monitoring

The upper level U_{max} is set in the range 138 – 276 V (resp. 240 – 480 V for HRN-43) and the lower level U_{min} in the range of 35 – 99% U_{max} . In case any phase deviates from this set band, after a set delay, output contact opens. Output contact again closes after returning back into the monitored band and exceeding fixed hysteresis (selectable by DIP switch „Hysteresis“). In the event of an outage in two or three phases, the output contacts will open immediately, regardless of the set delay t2.

Phase sequence

Monitors correctness of phase sequence. In case of unwanted change, output contacts open. In case of energization of a relay with incorrect phase sequence, contacts stay open.

Asymmetry

The level of asymmetry between individual phases is set in the range of 5 – 20 %. In case set asymmetry is exceeded, output contacts open and LED indicating asymmetry shines. Time delays t1, t2 and hysteresis are applied when returning to OK state. Monitoring asymmetry can be switched off by the DIP switch „ASYM“.

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