

ELKO_{ep}
HRN-43 Voltage
MonitoringRelay



ELKO HRN-43 Voltage Monitoring Relay Instructions

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ELKO HRN-43 Voltage Monitoring Relay



Specifications

Manufacturer: ELKO EP, s.r.o.

Country of Origin: Czech Republic

Model: HRN-43 HRN-43N

Function: Voltage monitoring relay for complete control in 3P incl. asymmetry

Product Description

The HRN-43N voltage monitoring relay is designed to provide comprehensive control in 3-phase systems, including asymmetry detection. It offers various features such as overvoltage/Undervoltage, phase failure indication, phase sequence indication, phase asymmetry indication, and more.

Usage Instructions

Connection

Connect the voltage monitoring terminals (N-L1-L2-L3) according to the provided symbol for HRN-43 or HRN-43N model. Make sure to follow the correct wiring for L1, L2, L3, and N connections.

Function Settings

1. **Supply voltage terminals (A1-A2):** Connect the supply voltage to these terminals.
2. **Overvoltage/undervoltage, phase failure indication:** Monitor these indications for system anomalies.
3. **Phase sequence indication:** Ensure correct phase sequence for proper operation.
4. **Phase asymmetry indication:** Detect any phase imbalances for system reliability.
5. **Memory function:** Use the memory function for storing critical data.

6. **Output function setting:** Configure the output functions as needed.
7. **Hysteresis setting:** Adjust hysteresis settings for optimal performance.
8. **Time delay Umax/Umin:** Set the time delays for voltage thresholds.
9. **Asymmetry setting:** Configure asymmetry settings for the system.

Output Connections

Utilize the output contact terminals (16-15-18 and 28-25-26) for connecting external devices based on relay output operations.

FAQ

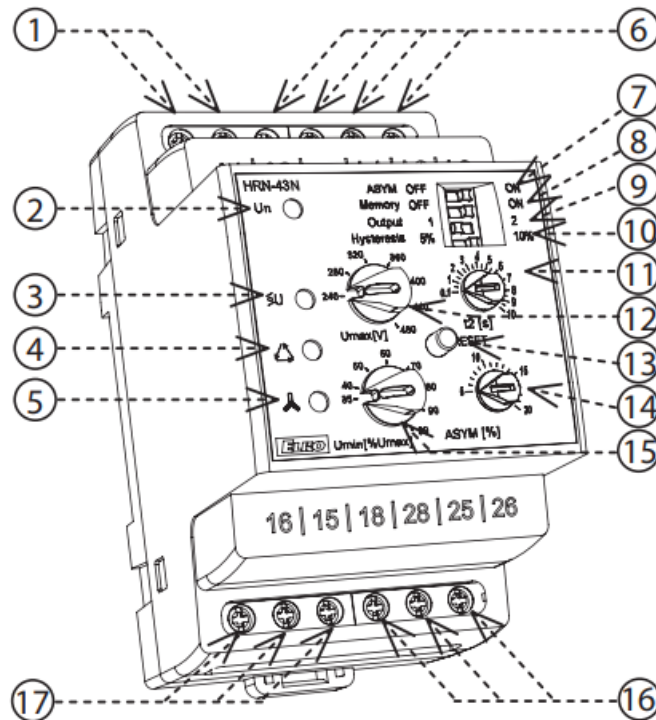
- **Q: What is the purpose of the phase asymmetry monitoring feature?**
 - **A:** The phase asymmetry monitoring feature helps in detecting any imbalances in the voltage phases, ensuring stable and safe operation of the system.
- **Q: How to reset the memory function on the HRN-43N model?**
 - **A:** To reset the memory function on the HRN-43N model, use the designated memory reset button as indicated in the user manual.

Characteristics

- 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 isolated supply voltage AC/DC 24 – 240 V, AC 400 V.
- Output contact for each monitored voltage level.

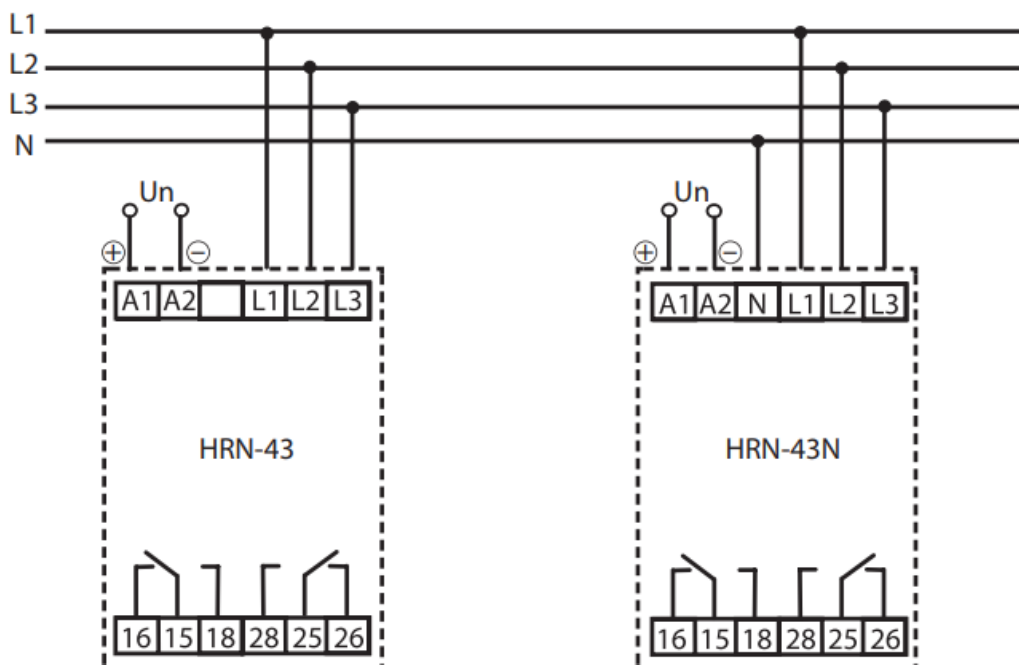
Description

HRN-43N



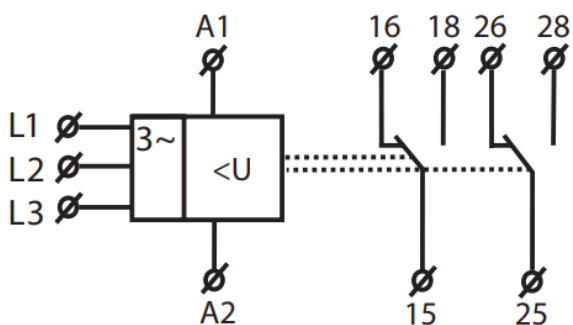
1. Supply voltage terminals (A1-A2)
2. Supply voltage indication
3. Overvoltage/Undervoltage, phase failure indication
4. Phase sequence indication
5. Phase asymmetry indication
6. Voltage monitoring terminals (N-L1-L2-L3)
7. Phase asymmetry monitoring (YES/NO)
8. Memory function
9. Output function setting
10. Hysteresis setting
11. Time delay U_{max}/U_{min}
12. Upper-level setting (U_{max})
13. Memory reset
14. Asymmetry setting
15. Lower level setting (U_{min})
16. Output contact 2 (28-25-26)
17. Output contact 1 (16-15-18)

Connection

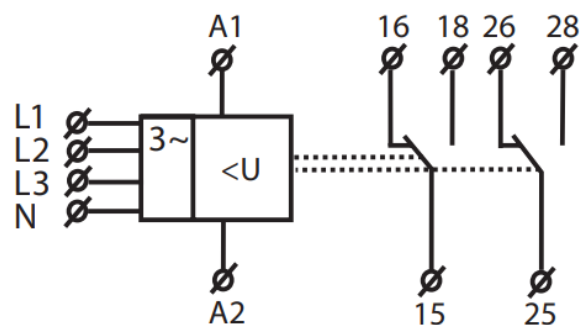


Symbol

HRN-43



HRN-43N



Technical parameters

Supply/HRN-43 /HRN-43N

Supply terminals:		A1-A2
Supply voltage:	UNI	AC/DC 24 – 240 V (AC 50-60 Hz)
Consumption (max.):		3 VA/1 W
Supply voltage:	400V	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 (U _{max}):	240 – 480 V	138 – 276 V
Lower level setting (U _{min}):	35 – 99 %U _{max}	
Max. permanent voltage:	3× 480 V	
Asymmetry:	adjustable, 5 – 20 % + OFF	
Peak overload (1 s):	600 V	350 V
Time delay (t ₁):	fixed, max. 200 ms	
Time delay U _{max} /U _{min} (t ₂):	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

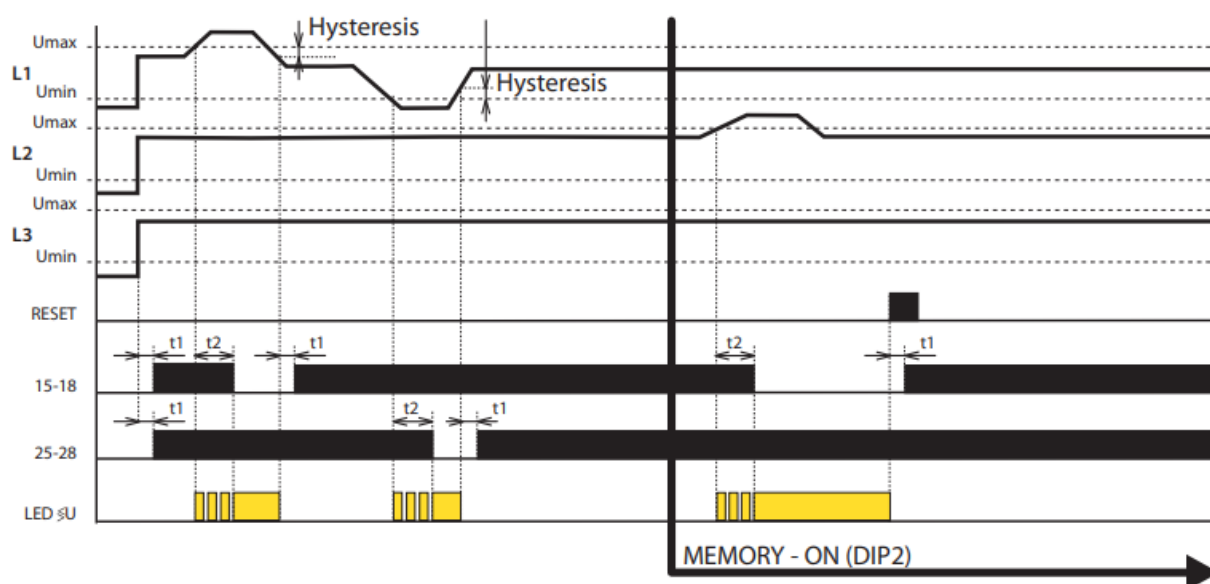
Contact type:	2× changeover/SPDT (AgNi)
Current rating:	16 A/AC1
Breaking capacity:	4000 VA/AC1, 384 W/DC1
Inrush current:	30 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Power dissipation (max.):	2.4 W
Mechanical life:	10.000.000 ops.
Electrical life (AC1):	100.000 ops.

Other information

Operating temperature:	–20 .. 55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. 70 °C (–22 .. 158 °F)
Dielectric strength: supply – output output 1 – output 2	AC 4 kV 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 (mm ²):	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

Function

Overvoltage – undervoltage



The function of output contacts:

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

Graphs legend:

L1, L2, L3 = 3-phase voltage

RESET = memory reset

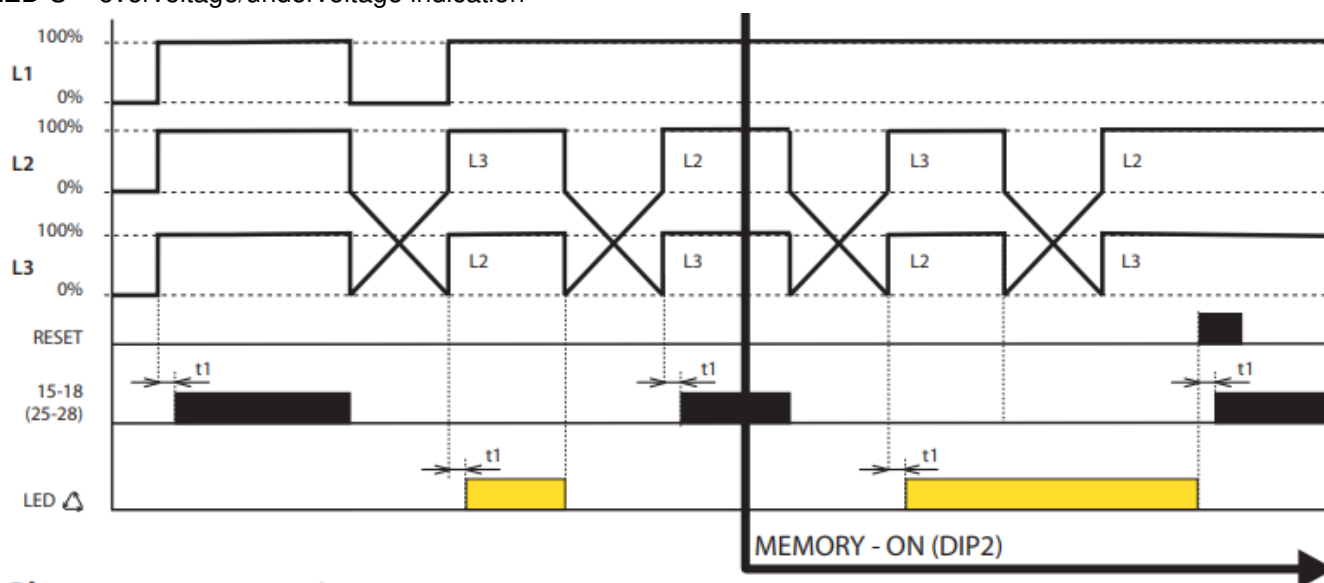
t1 = time delay, fixed

t2 = time delay U_{max}/U_{min}, adjustable

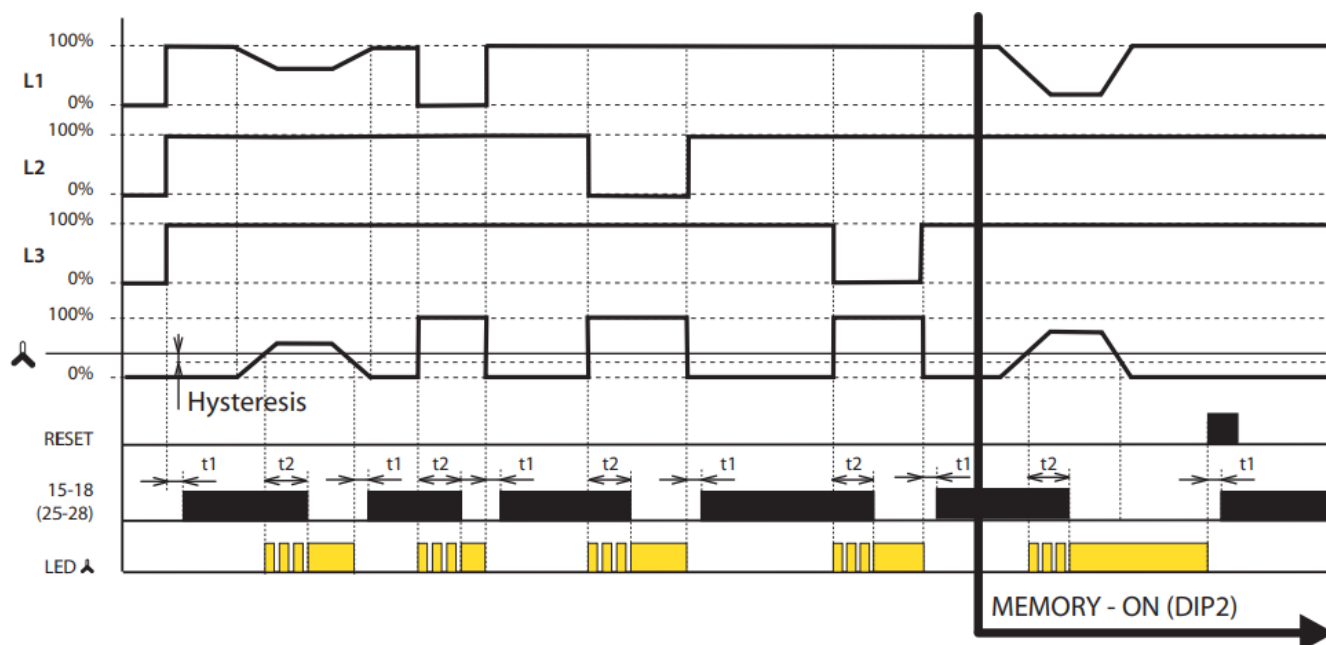
15-18 = output contact 1

25-28 = output contact 2

LED U = overvoltage/undervoltage indication



Phase sequence



The 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.

Graphs legend:

L1, L2, L3 = 3-phase voltage


RESET = memory reset

t1 = time delay, fixed

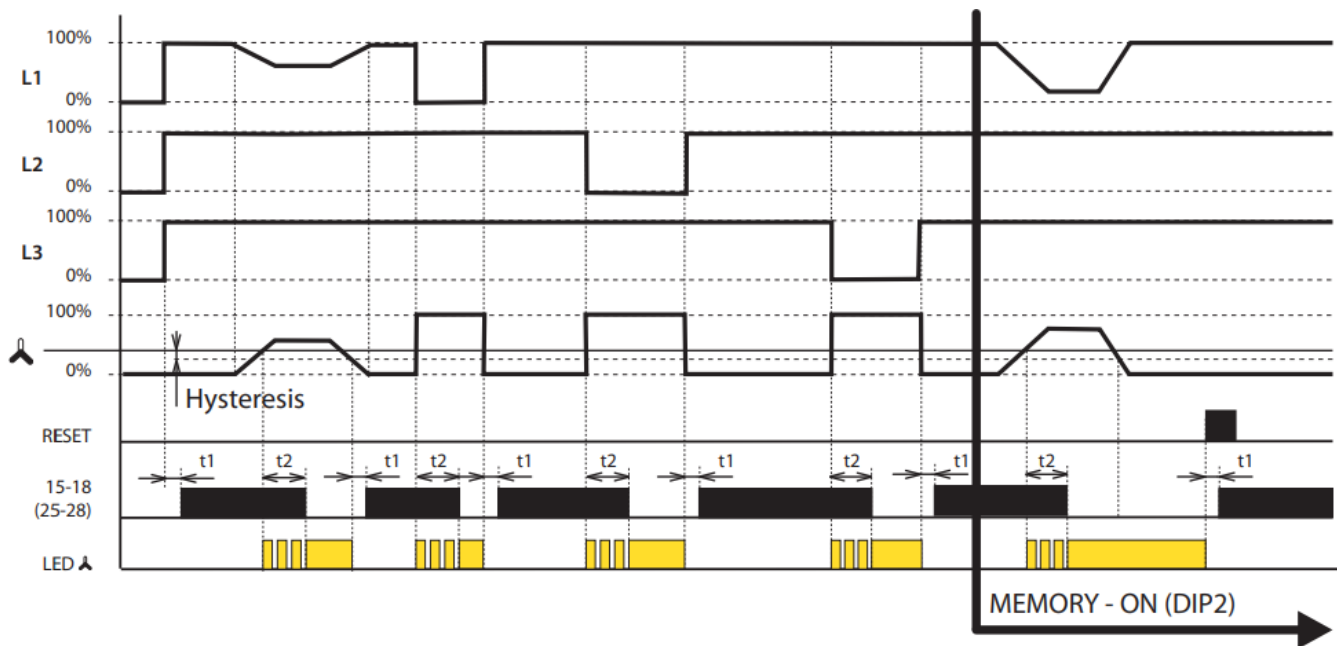
t2 = time delay U_{max}/U_{min}, adjustable

15-18 = output contact 1

25-28 = output contact 2

LED  = phase sequence indication

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

 – adjustable asymmetry level

15-18 = output contact 1

25-28 = output contact 2

LED  = asymmetry indication

Relay is designated to monitor 3-phase circuits. Type HRN-43 controls the interphase voltage, type HRN-43N controls the voltage towards the neutral wire. Relay can monitor the 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 (1× for overvoltage, 1× 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 t_2 .

Phase sequence

Monitors correctness of phase sequence. In case of unwanted change, output contacts open. In case of energization of a relay with an 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 t_1 , t_2 , and hysteresis are applied when returning to OK state. Monitoring asymmetry can be switched off by the DIP switch „ASYM“.

The function of output contacts:

The function is not applicable in the phase asymmetry and failure monitoring, the contacts are switched in a parallel way. DIP switch „Output“ is ignored.

Warning

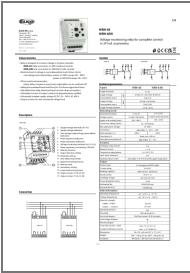
This device is constructed for connection in a 3-phase network AC 3× 400 V or AC 3×400/230 V (according to the type) and must be installed according to norms valid in the state of an application. Installation, connection, setting, and servicing must be carried out by qualified electrician staff only, who have perfectly understood the instructions and functions of the device. This device contains protection against overvoltage peaks and disturbing impulses in the power supply network. For the correct function of the protection of this device, there must be suitable protections of higher degrees (A,B, C) installed in front of them and according to the standards, interference of switching devices must be securely eliminated (contactors, motors, inductive loads, etc.). Before installation, make sure that the device is de-energized and the main switch is in the “OFF” position. Don't install the device to sources of excessive electromagnetic interference. Ensure correct installation by perfect air circulation so that during continuous operation and a higher ambient temperature, the device does not exceed the maximum allowed operating temperature. For installation and setting use a screwdriver with a width of approx 2 mm. Keep in mind that this is a fully electronic device and approach accordingly with the installation. The non-problematic function of the device is also dependent on the previous method of transportation, storage, and handling. In case of any signs of damage, deformation, malfunction, or missing parts, don't install this device and claim it at the dealer. The product must be treated as electronic waste at the end of its life.

Type of load	 $\cos \varphi \geq 0.95$	 M	 M						
	AC1	AC2	AC3	AC5a uncompensated	AC5a compensated	AC5b	AC6a	AC7b	AC12
Contact material AgNi, 16A	250V / 16A	250V / 5A	250V / 3A	230V / 3A (690VA)	x	800W	x	250V / 3A	250V / 10A
Type of load					 M	 M			
	AC13	AC14	AC15	DC1	DC3	DC5	DC12	DC13	DC14
Contact material AgNi, 16A	250V / 6A	250V / 6A	250V / 6A	24V / 16A	24V / 6A	24V / 4A	24V / 16A	24V / 2A	24V / 2A

ELKO EP, s.r.o.

Palackého 493
769 01 Holešov, Všetuly Czech Republic
Tel.: +420 573 514 211
e-mail: elko@elkoep.com
www.elkoep.com

Documents / Resources



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HRN-43 Voltage Monitoring Relay, HRN-43, Voltage Monitoring Relay, Monitoring Relay, Relay

References

- [User Manual](#)

[Manuals+](#). [Privacy Policy](#)

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