Full Installation Instructions
Multi-Function Protector

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

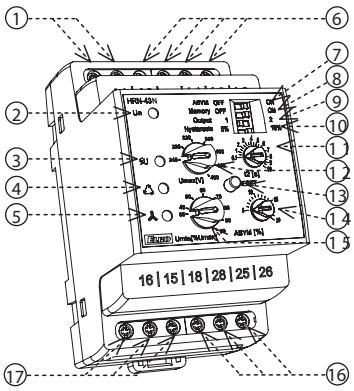


Characteristics

- The relay is designed to monitor voltage in three-phase networks
  PSV-3: delta connection 3× 400 V (without neutral)
  PSV-4: star connection 3× 400/230 V (with neutral)
- Monitors two independent voltage levels (Umax and Umin) for overvoltage and undervoltage conditions:
  System 3× 400 V: range 240 – 480 V
  System 3× 400/230 V: range 138 – 276 V
- Also monitors phase failure, phase sequence and phase asymmetry. Asymmetry monitoring is adjustable and can be disabled.
- The lower voltage threshold (Umin) is set as a percentage of the upper voltage threshold (Umax).
- Adjustable time delay to prevent operation during short-term voltage drops and spikes.
- Selectable output contact operation: independent or parallel.
- Galvanically isolated supply voltage AC/DC 24 – 240 V, AC 400 V.
- Output contact for each monitored voltage level.

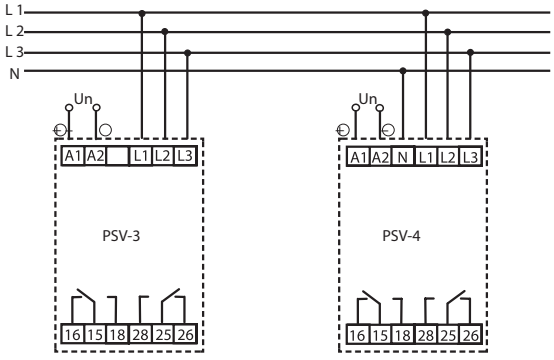
Description

PSV

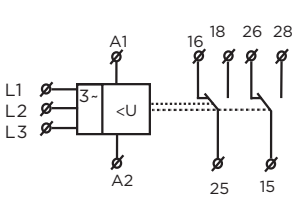


1. Supply voltage terminals (A1-A2)
2. Supply voltage indication
3. Overvoltage/undervoltage, phase failure indication
4. Phase sequence indication
5. Phase asymmetry indication
6. Voltage monitoring terminals (N-L1-L2-L3)
7. Phase asymmetry monitoring (YES/NO)
8. Memory function
9. Output function setting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

Connection

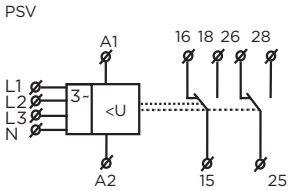


Symbol



PSV-3: delta connection
3× 400 V (without neutral)

PSV



PSV-4: star connection
3× 400/230 V (with neutral)

Technical parameters

Supply

		PSV-3: delta connection 3× 400 V (without neutral)	PSV-4: star connection 3× 400/230 V (with neutral)
Supply terminals:	UNI	A1-A2	
Supply voltage:	UNI	AC/DC 24 – 240 V (AC 50-60 Hz)	
Consumption (max.):	UNI	3 VA/1 W	
Supply voltage:	400V	AC 400 V (50-60 Hz)	
Consumption (max.):	400V	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. continuous 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	
Setting accuracy (mech.):	5 %	
Repeat accuracy:	< 1 %	
Temperature dependence:	< 0.1 %/°C (°F)	
Limit value tolerance:	5 %	
Hysteresis (fault to OK):	selectable, 5 %/10 % from the upper range value	

Output

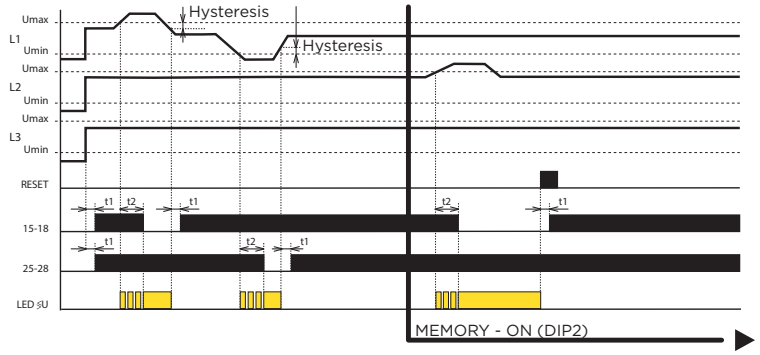
Contact type:	2× changeover/SPDT (AgNi)
Current rating:	16 A/AC1
Breaking capacity:	4000 VA/AC1, 384 W/DC1
Inrush current:	30 A/< 3 s
Switching voltage:	250 V AC/24 V DC
Power dissipation (max.):	2.4 W
Mechanical life:	10,000,000 ops.
Electrical life (AC1):	100,000 ops.

Other information

Operating temperature:	–20 to 55 °C (–4 to 131 °F)
Storage temperature:	–30 to 70 °C (–22 to 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
Conductor cross-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)
Applicable Standards	EN 60255-1, EN 60255-26, EN 60255-27

Function

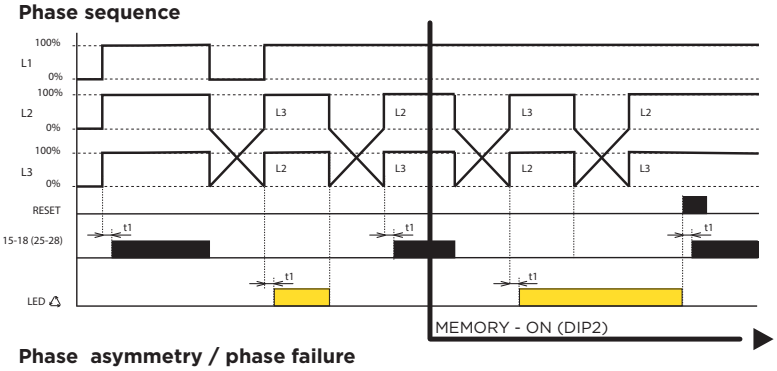
Overvoltage - undervoltage



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.

Graph legend:
L1, L2, L3 = three-phase voltage
RESET = memory reset t1 = time delay,
fixed t2 = time delay Umax/Umin,
adjustable
15-18 = output contact 1
25-28 = output contact 2
LED = overvoltage/undervoltage indication

Phase sequence

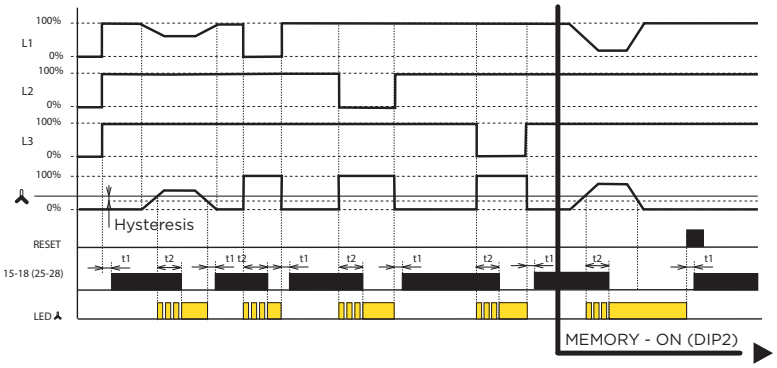


Function of output contacts: This function does not apply to phase asymmetry or phase failure monitoring. The output contacts operate in parallel and the ‘Output’ DIP switch setting is ignored.

Graph legend:
L1, L2, L3 = three-phase voltage
RESET = memory reset t1 = time delay,
fixed t2 = time delay Umax/Umin, adjustable 15-18 = output contact 1 25-28 = output contact 2

LED phase sequence indication

Phase asymmetry / phase failure



Function of output contacts: This function does not apply to phase sequence monitoring. The output contacts operate in parallel and the ‘Output’ DIP switch setting is ignored.

Graph legend:
L1, L2, L3 = three -phase voltage
RESET = memory reset t1 = time delay,
fixed t2 = time delay Umax/Umin,
adjustable
- adjustable asymmetry level
15-18 = output contact 1
25-28 = output contact 2
LED asymmetry indication

The relay is designed to monitor voltage in three-phase circuits. The 3-wire version monitors phase-to-phase voltage, while the 4-wire version monitors phase-to-neutral voltage The relay monitors overvoltage, undervoltage, phase sequence, phase failure and phase asymmetry Each fault condition is indicated by an individual LED. The ‘Output’ DIP switch selects the operating mode of the output contacts: independent operation (one contact for overvoltage and one for undervoltage) or parallel operation The fixed time delay (t1) applies when transitioning from a fault condition to the OK state and when the relay is de-energised. The adjustable time delay (t2) applies when transitioning from the OK state to a fault condition. This delay prevents unnecessary output operation in response to short-term voltage drops and spikes.

Voltage monitoring

The upper level Umax is set in the range 138 – 276 V (resp. 240 – 480 V for PSV-3) and the lower level Umin in the range of 35 – 99 %Umax. If any phase moves outside the set voltage range, the output contact opens after the configured time delay. The output contact closes again when the voltage returns within the monitored range, taking the selected hysteresis into account(selectable by DIP switch). In the event of failure of two or three-phases, the output contacts open immediately, regardless of the configured t2 delay

Phase sequence

The relay monitors the phase sequence. If an incorrect phase sequence is detected, the output contacts open. If the relay is energised with an incorrect phase sequence, the output contacts remain open

Asymmetry

The phase asymmetry threshold can be set between 5% and 20%. If the configured threshold is exceeded, the output contacts open and the asymmetry LED illuminates. Time delays t1, t2 and hysteresis are applied when returning to OK state. Asymmetry monitoring can be disabled using the ‘ASYM’ DIP switch.

Warning

This device is designed for connection to a three-phase AC network (3 × 400 V or 3 × 400/230 V, depending on the version) and must be installed in accordance with the applicable regulations and standards in the country of use. Installation, connection, configuration and servicing must be carried out only by a qualified electrician who has read and understood these instructions and is familiar with the operation of the device.

The device incorporates protection against overvoltage peaks and disturbances in the power supply. To ensure this protection operates correctly, suitable upstream surge protection must be provided in accordance with the applicable standards. Appropriate measures must also be taken to minimise interference generated by switching devices, contactors, motors and other inductive loads.

Before installation, ensure that the mains supply is switched OFF and that the device is de-energised. Do not install the device near sources of excessive electromagnetic interference.

Ensure adequate ventilation around the device. During continuous operation, particularly at higher ambient temperatures, the maximum specified operating temperature must not be exceeded.

Use a screwdriver of approximately 2 mm for installation and adjustment. This is a fully electronic device and must be installed and handled accordingly. Reliable operation also depends on appropriate transportation, storage and handling.

Do not install or use the device if there are any signs of damage, deformation, malfunction or missing parts. In such cases, contact your supplier.

At the end of its service life, the product must be disposed of as electronic waste in accordance with applicable local regulations

Type of load	cos φ ≥ 0.95 AC1	M AC2	M 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	AC13	AC14	AC15	DC1	M DC3	M 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

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