# › Monitoring Relays

## Voltage Control Relays

### Overvoltage or undervoltage control, Selectable latching (memory) function

- Overvoltage or undevoltage control
- Automatic recognition AC/DC
- Control of AC and DC voltages
- 2 Changeover relays to cover 3 ranges of measurement (between 0.2 and 60V or between 15 and 600V)
- 22.5 mm or 35 mm width

HUL

EUL

HUH

EUH

**Selection guide**

| Type | Function | Measuring range | Output | Power Supply | Part-Numbers |
|---|---|---|---|---|---|
| HUL | Overvoltage or undervoltage control<br>Selectable latching (memory) function | 0.2 V → 60 V<br>I1 - G: 0.2 → 2 V<br>I2 - G: 1 → 10 V<br>I3 - G: 6 → 60 V | 2 x 8 A (changeover) | 24 → 240 V≂ | **84872120** |
| EUL | Overvoltage or undervoltage control<br>Selectable latching (memory) function | 0.2 V → 60 V<br>I1 - G: 0.2 → 2 V<br>I2 - G: 1 → 10 V<br>I3 - G: 6 → 60 V | 2 x 8 A (changeover) | 24 → 240 V≂ | **84872025** |
| HUH | Overvoltage or undervoltage control<br>Selectable latching (memory) function | 15 V → 600 V<br>I1 - G: 15 → 150 V<br>I2 - G: 30 → 300 V<br>I3 - G: 60 → 600 V | 2 x 8 A (changeover) | 24 → 240 V≂ | **84872130** |
| EUH | Overvoltage or undervoltage control<br>Selectable latching (memory) function | 15 V → 600 V<br>I1 - G: 15 → 150 V<br>I2 - G: 30 → 300 V<br>I3 - G: 60 → 600 V | 2 x 8 A (changeover) | 24 → 240 V≂ | **84872035** |

| | HUL | EUL | HUH | EUH |
|---|---|---|---|---|
| **Timing** | | | | |
| Delay on threshold crossing (Tt) | 0.1 → 3 s (0, +10%) | | | |
| Repetition accuracy with constant parameters (according to IEC/EN 60255-1) | ± 2% | | | |
| Power ON delay | ≤ 600 ms | | | |
| Reset time max | 1500 ms | | | |
| **Supply** | | | | |
| Voltage type for actuating | AC/DC | | | |
| Rated control supply voltage Un at AC | 24-240 V | | | |
| AC supply voltage frequency 50/60 HZ | ± 10% | | | |
| Voltage supply tolerance | -15% / +10% | | | |
| Operating range | 20.4 → 264 V≂ | | | |
| Polarity with DC voltage | No | | | |
| Galvanic isolation of power supply/Input circuit | No | | | |
| Galvanic isolation of power supply/Output circuit | Yes | | | |
| Galvanic isolation of Input circuit/Output circuit | Yes | | | |
| Immunity from micro power cuts: typical | 10 ms | | | |

| | HUL | EUL | HUH | EUH |
|---|---|---|---|---|
| Maximum Power consumption at Un | AC - 3.7 VA @ 265 V, 50 Hz<br>AC - 4 VA @ 265 V, 60 Hz<br>DC - 1.2 W | | | |
| **Insulation** | | | | |
| Rated Insulation voltage (according to IEC/EN 60664-1) | 250 V | | | |
| Insulation coordination (according to IEC/EN 60664-1) | Overvoltage category III; pollution degree 3 | | | |
| Insulation resistance supply and Output circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27) | > 500 MOhm(s) (500 V⎓) | | | |
| Insulation resistance Input circuit and Output circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27) | > 500 MOhm(s) (500 V⎓) | | | |
| Insulation resistance between supply and Input circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27) | > 1 MOhm(s) (500 V⎓) | | | |
| Dielectric strength (according to IEC/EN 60664-1 and IEC/EN 60255-27) | 2 kV / 1 min / 1 mA / 50 Hz | | | |
| Impulse voltage (according to IEC/EN 60664-1 and IEC/EN 60255-27) | 4 kV<br>wave 1.2 / 50 µs | | | |
| **Input and measuring specifications** | | | | |
| Measurement range | 0.2 V → 60 V<br>I1 - G: 0.2 → 2 V<br>I2 - G: 1 → 10 V<br>I3 - G: 6 → 60 V | | 15 V → 600 V<br>I1 - G: 15 → 150 V<br>I2 - G: 30 → 300 V<br>I3 - G: 60 → 600 V | |
| Number of measuring ranges | 3 | | | |
| Display accuracy (according to IEC/EN 60255-1) | ± 10% of full scale | | | |
| Measuring error with drift temperature | 0.05% / °C | | | |
| Measuring error with drift voltage | < 1% across the whole range | | | |
| Repetition accuracy with constant parameters (according to IEC/EN 60255-1) | ± 0.5% | | | |
| Input resistance | I1 - G: 1.5 KΩ<br>I2 - G: 9 KΩ<br>I3 - G: 56.1 KΩ | | I1 - G: 150 kΩ<br>I2 - G: 300 kΩ<br>I3 - G: 600 kΩ | |
| Permanent overload at 25 °C | I1 - G: 10 V<br>I2 - G: 30 V<br>I3 - G: 150 V | | I1 - G: 250 V<br>I2 - G: 500 V<br>I3 - G: 700 V | |
| Peak overload < 1ms at 25 °C | N/A | | | |
| Voltage threshold adjustment | 10 → 100% of the range | | | |
| Frequency of measured signal | 0 Hz, 40 → 70 Hz | | | |
| Max. measuring cycle time | 20 ms @ 50 Hz | | | |
| Voltage threshold hysteresis | 5 → 50% of threshold | | | |
| **Output specifications** | | | | |
| Maximum switching power (resistive) | 1250 VA | | | |
| Maximum rate (at max switching power) | 360 operations/hour at full load | | | |
| Maximum breaking current | 5 A AC/DC | | | |
| Minimum breaking current | 10 mA / 5 V⎓ | | | |
| Operating categories (according to IEC/EN 60947-5-1 and IEC/EN 60947-5-2) | AC 15 - 1 A @ 250 V, DC 13 - 1 A @ 24 V | | | |
| Nominal rating | 5 A | | | |
| Voltage breaking capacity (according to IEC/EN 60255-1) | 250 V∿/ 24 V⎓ | | | |
| Electrical life (operations) | 1 x $10^5$ | | | |
| Mechanical life (operations) | 30 x $10^6$ | | | |
| 1 or 2 changeover relays, AgNi (cadmium-free) | 2 C/O | 1 C/O | 2 C/O | 1 C/O |

| | HUL | EUL | HUH | EUH |
|---|---|---|---|---|
| **Functions** | | | | |
| Automatic recognition of AC/DC | True | | | |
| Overvoltage and undervoltage control | False | | | |
| Overvoltage or undervoltage control | True | | | |
| Selectable latching (memory) function | | | | |
| Control of AC and DC voltages | True | | | |
| **General characteristics** | | | | |
| Temperature limits use (°C) (according to IEC/EN 60068-2) | 20 → + 50 | | | |
| Temperature limits stored (°C) (according to IEC/EN 60068-2) | 40 → + 70 | | | |
| MTBF in hours (according to IEC/TR 62380) | 1083645.02 | | | |
| MTTF (according to IEC/TR 62380) | 123.70 years | | | |
| Led status indicator | Un: Green LED (power on)<br>R: Yellow LED (relay status ON)<br>OFF LED (under/overvoltage)<br>Flashing LED during time delay<br>Un, R: Flashing LED (Position error)<br>No Tt LED | | | |
| Creepage distance and clearance (according to IEC/EN 60664-1) | 4 kV / 9.4 mm<br>Pollution degree 3 | | | |
| IP degree of protection Terminal block (according to IEC/EN 60529) | IP20 | | | |
| IP degree of protection Housing (according to IEC/EN 60529) | IP30 | | | |
| IP degree of protection Front face (according to IEC/EN 60529) | IP50 | | | |
| Vibration resistance (according to IEC/EN 60255-21-1) | 20 m/s²<br>10 Hz → 150 Hz | | | |
| Relative humidity no condensation (according to IEC/EN 60068-2-30) | 2 x 24 hr cycle 95% RH max. without condensation 55 °C | | | |
| Electromagnetic compatibility - Immunity to electrostatic discharges (according to IEC/EN 61000-4-2) | Level III (Air 8 kV / Contact 6 kV) | | | |
| Immunity to radiated, radio-frequency, electromagnetic field (according to IEC/EN 61000-4-3) | Level I (1 V/m: 2.0 GHz → 2.7 GHz)<br>Level II (3 V/m: 1.4 GHz → 2.0 GHz)<br>Level III (10 V/m: 80 MHz → 1 GHz) | | | |
| Immunity to rapid transient bursts (according to IEC/EN 61000-4-4) | Level III (direct 2 kV / Capacitive coupling clamp 1 kV) | | | |
| Immunity to shock waves on power supply (according to IEC/EN 61000-4-5) | Level III (2 kV / common mode 2 kV/residual current mode 1 kV) | | | |
| Immunity to radio frequency in common mode (according to IEC/EN 61000-4-6) | Level III (10 V rms: 0.15 MHz to 80 MHz) | | | |
| Immunity to voltage dips and breaks (according to IEC/EN 61000-4-11) | 0% residual voltage, 1 cycle<br>70% residual voltage, 25/30 cycles | | | |
| Mains-borne and radiated emissions (according to EN55032 (CISPR22), EN55011 (CISPR11)) | - | Class A | - | Class A |
| Fixing: Symmetrical DIN rail (according to IEC/EN 60715) | 35 mm | | | |
| Mounting position | All positions | | | |
| Drop to concrete floor (according to IEC/EN IEC 60068-2-31) | High: 1m | | | |
| Rigid connecting capacity without ferrule | 1 x 4² - 2 x 2.5² mm²<br>1 x AWG11 - 2 x AWG14 | | | |
| Flexible connecting capacity with ferrule | 1 x 2.5² - 2 x 1.5² mm²<br>1 x AWG14 - 2 x AWG16 | | | |

| | HUL | EUL | HUH | EUH |
|---|---|---|---|---|
| Tightening torque (according to IEC 60947-1) | 0.5…0.6 N.m | | | |
| Housing material (according to IEC/EN 60695-2-11) | Self-extinguishing<br>Incandescent wire test | | | |
| Shock and bump tests (according to IEC/EN 60255-21-2) | 15 g - 11 ms | | | |
| Short interruption on power line (according to IEC/EN 61000-4-11) | 0% residual voltage, 250/300 cycles | | | |
| Delivery: open terminals | True | | | |
| Type of electric connection | Screw connection | | | |
| Packaging | Compact carton recycled and recyclable<br>No plastic | | | |
| **Outline Dimensions** | | | | |
| Depth (mm) | 69 | 104 | 69 | 104 |
| Height (mm) | 90 | 83 | 90 | 83 |
| Weight (g) | 115 | 81 | 115 | 81 |
| Width (mm) according to DIN 43880 | 35 | 22.5 | 35 | 22.5 |
| **International Directives & Conformity Certification** | | | | |
| RoHS 2015/863/UE | Yes | | | |
| REACh regulation N°1907/2006/CE | Yes | | | |
| UK REACh regulation 2023 N°722 | Yes | | | |
| LVD 2014/35/UE | Yes | | | |
| Directive 2012/19/EU | Yes | | | |
| European Directive 2005/20/CE | Yes | | | |
| ISO 14001: 2015 | Yes | | | |
| Certification CE | Yes | | | |
| Certification UL | Yes | | | |
| Certification UKCA | Yes | | | |
| Certification CCC | Yes | | | |

## Principles

HUL,HUH, EUL, EUH monitoring relays are designed to control AC or DC voltages.

They automatically recognise the shape of the DC or AC signal (50 or 60 Hz).

General principle:

The operating mode is set by the user.

A switch is used to select under or overvoltage modes, with or without latching.

The switch position, and hence the operating mode, is read by the product on energisation.

If the switch is set to a non-conforming position, the product goes into fault mode, the output relay stays open, and the LEDs flash to signal the position error.

If the switch position changes while the unit is operating, all the LEDs flash but the product continues to work normally with the function selected on energisation prior to the change of position.

The LEDs return to their normal state if the switch is reset to its initial position defined before the last energisation.

The under or overvoltage threshold value is set by a graduated potentiometer as a percentage of the U scale to be monitored.

The hysteresis is set by a graduated potentiometer from 5 to 50% of the preset threshold. The hysteresis value cannot be higher than the extremes of the measurement range.

## Operating principles

### HUL-EUL-HUH-EUH

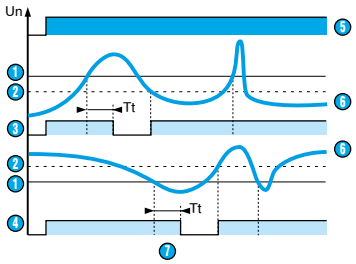
In overvoltage mode, if the controlled voltage exceeds the preset threshold for longer than the time set on the front face (0.1 to 3 s), the output relay opens and LED R is extinguished. During the

time delay, this LED flashes.

Once the voltage falls below the threshold value minus the hysteresis, the relay closes instantaneously.

In undervoltage mode, if the controlled voltage falls below the preset threshold for longer than the time set on the front face (0.1 to 3 s), the output relay opens and LED R is extinguished. During the time delay, this LED flashes.

Once the voltage rises above the threshold value plus the hysteresis, the relay closes instantaneously.

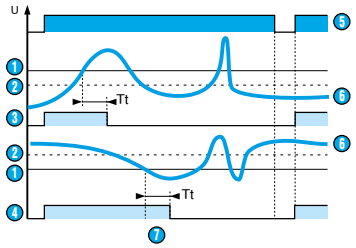



1. Threshold
2. Hysteresis
3. Overvoltage function relay
4. Undervoltage function relay
5. Unit power-up
6. Controlled voltage
7. Delay on threshold crossing (Tt)

### HUL-EUL-HUH-EUH with memory mode

If "with memory" mode has been selected, the relay opens and stays in this position when threshold crossing is detected.

The power supply must be disconnected to reset the product.

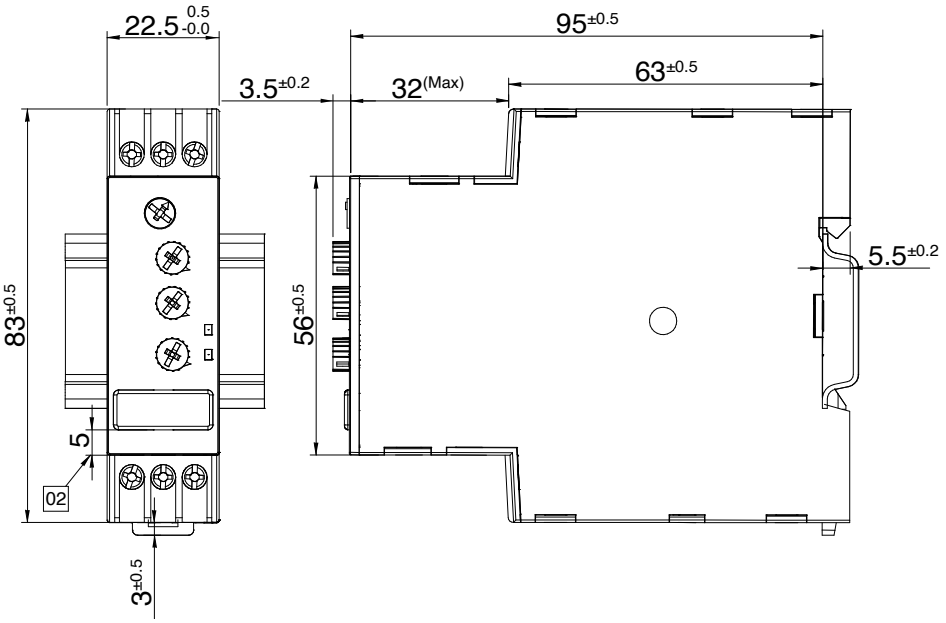



1. Threshold
2. Hysteresis
3. Overvoltage function relay
4. Undervoltage function relay
5. Unit power-up
6. Controlled voltage
7. Delay on threshold crossing (Tt)

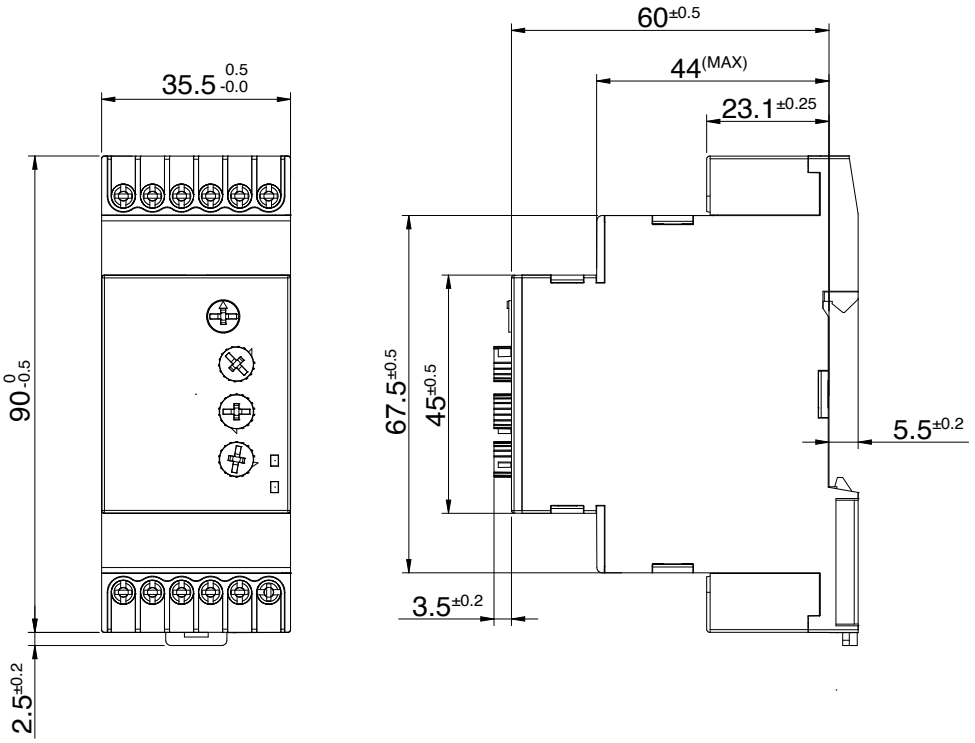
## Product Dimensions

### Front and Side

EUL-EUH



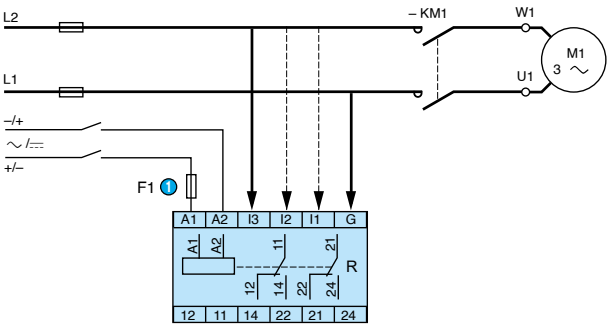

HUL-HUH



## Electronic & Wiring Diagrams

### Connections

HUL-HUH




1 A fast-blow fuse or cut-out

EUL-EUH