



### 3-phase voltage control relay - 17.5 mm / 35 mm M3US Part number 84873222



- H3US and M3US relays control, on 3-phase networks :
  - overvoltage between phases,
  - undervoltage between phases
- The H3USN relay controls, on 3-phase networks :
  - overvoltage between phases and neutral,
  - undervoltage between phases and neutral,
  - loss of neutral
- Multi-voltage Products
- Controls its own supply voltage
- True RMS measurement
- LED status indication

#### Part numbers

|          | Type | Function                         | Nominal voltage (V)    | Output                         |
|----------|------|----------------------------------|------------------------|--------------------------------|
| 84873222 | M3US | Under/overvoltage between phases | 3 x 208 → 3 x 480 V AC | 1 single pole changeover relay |

#### Specifications

##### Supply

|                                                |                  |
|------------------------------------------------|------------------|
| AC supply voltage frequency                    | 50 / 60 Hz ±10 % |
| Galvanic isolation of power supply/measurement | No               |

##### Inputs and measuring circuit

|                                              |                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency of measured signal                 | 50 → 60 Hz ± 10 %                                                                                                                                                                                                                                                                                                   |
| Max. measuring cycle time                    | 150 ms/True RMS measurement                                                                                                                                                                                                                                                                                         |
| Voltage threshold adjustment                 | Undervoltage -2 to -20 % of selected Un<br>for M3US :<br>(-2 to -12 % across the 3 x 208 V range)<br>(-2 to -17 % across the 3 x 220 V range)<br>for H3US :<br>(-2 to -12 % across the 3 x 220 V range)<br>Overvoltage 2 → 20 % of selected Un<br>For M3US and H3US :<br>(+2 → +10 % across the 3 x 480 V AC range) |
| Fixed hysteresis                             | 2 % of Un (M3US, H3US)                                                                                                                                                                                                                                                                                              |
| Display precision                            | ± 3 % of the displayed value                                                                                                                                                                                                                                                                                        |
| Repetition accuracy with constant parameters | ± 0,5 %                                                                                                                                                                                                                                                                                                             |
| Measuring error with voltage drift           | < 1 % across the whole range                                                                                                                                                                                                                                                                                        |
| Measuring error with temperature drift       | 0,05 % / °C                                                                                                                                                                                                                                                                                                         |

##### Timing

|                                              |                       |
|----------------------------------------------|-----------------------|
| Delay on threshold crossing Tt               | 0,3 → 30 s (0, +10 %) |
| Repetition accuracy with constant parameters | ± 3 %                 |
| Reset time                                   | 1500 ms               |
| Alarm on delay time max.                     | 200 ms                |

##### Output

|                                               |                                                 |
|-----------------------------------------------|-------------------------------------------------|
| Type of contacts                              | No cadmium                                      |
| Maximum breaking voltage                      | 250 V AC/DC                                     |
| Max. breaking current                         | 5 A AC/DC                                       |
| Min. breaking current                         | 10 mA / 5 V DC                                  |
| Breaking capacity (resistive)                 | 1250 VA AC                                      |
| Maximum rate                                  | 360 operations/hour at full load                |
| Operating categories acc. to IEC/EN 60947-5-1 | AC 12, AC 13, AC 14, AC 15, DC 12, DC 13, DC 14 |
| Mechanical life (operations)                  | 30 x 10 <sup>6</sup>                            |

##### Insulation

|                                                  |                                                  |
|--------------------------------------------------|--------------------------------------------------|
| Nominal insulation voltage IEC/EN 60664-1        | 400 V                                            |
| Insulation coordination (IEC/EN 60664-1)         | Overvoltage category III : degree of pollution 3 |
| Rated impulse withstand voltage (IEC/EN 60664-1) | 4 kV (1,2 / 50 µs)                               |
| Dielectric strength (IEC/EN 60664-1)             | 2 kV AC 50 Hz 1 min                              |
| Insulation resistance (IEC/EN 60664-1)           | > 500 MΩ / 500 VDC                               |

##### General characteristics

|                                                       |                                                       |
|-------------------------------------------------------|-------------------------------------------------------|
| Display power supply                                  | Green LED                                             |
| Display relay                                         | Yellow LED (1 for M3US, 2 for H3US and H3USN)         |
| Mounting                                              | On 35 mm symmetrical DIN rail, IEC/EN 60715           |
| Mounting position                                     | All positions                                         |
| Material : enclosure plastic type VO to UL94 standard | Incandescent wire test according to IEC/EN 60695-2-11 |
| Protection (IEC/EN 60529)                             | Terminal block : IP 20<br>Casing : IP30               |

|                                         |                                                                                                                                                                                                                 |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connecting capacity IEC/EN 60947-1      | Rigid : 1 x 4 <sup>2</sup> - 2 x 2.5 <sup>2</sup> mm <sup>2</sup><br>1 x 11 AWG - 2 x 14 AWG<br>Flexible with ferrules : 1 x 2.5 <sup>2</sup> - 2 x 1.5 <sup>2</sup> mm <sup>2</sup><br>1 x 14 AWG - 2 x 16 AWG |
| Max. tightening torques IEC/EN 60947-1  | 0,6 →1 Nm / 5,3 →8,8 Lbf.Ft                                                                                                                                                                                     |
| Operating temperature IEC/EN 60068-2    | -20 →+50 °C                                                                                                                                                                                                     |
| Storage temperature IEC/EN 60068-2      | -40 →+70 °C                                                                                                                                                                                                     |
| Humidity IEC/EN 60068-2-30              | 2 x 24 hr cycle 95 % RH max. without condensation 55 °C                                                                                                                                                         |
| Vibrations according to IEC/EN60068-2-6 | 10 →150 Hz, A = 0.035 mm                                                                                                                                                                                        |
| Shocks IEC/EN 60068-2-6                 | 5 g                                                                                                                                                                                                             |

|                                          |                                                  |
|------------------------------------------|--------------------------------------------------|
| <b>Standards</b>                         |                                                  |
| Standards                                | IEC/EN 50178, IEC/EN 61000-6-2, IEC/EN 61000-6-3 |
| Certifications                           | CE, UL, CSA, GL                                  |
| Conformity with environmental directives | RoHS, WEEE                                       |

|                          |                         |
|--------------------------|-------------------------|
| <b>Supply</b>            |                         |
| Supply voltage Un        | 3 x 208 →3 x 480 V AC * |
| Voltage supply tolerance | -12 % / +10 %           |
| Operating range          | 183 →528 V AC           |
| Power consumption at Un  | 22 VA in 400 VAC, 50 Hz |

|                                             |                                  |
|---------------------------------------------|----------------------------------|
| <b>Inputs and measuring circuit</b>         |                                  |
| Selection of phase-phase nominal voltage Un | 208-220-380-400-415-440-480 V AC |
| Selection of phase-neutral voltage          | -                                |

|                  |          |
|------------------|----------|
| <b>Timing</b>    |          |
| Delay on pick-up | ≤ 650 ms |

|                                        |                     |
|----------------------------------------|---------------------|
| <b>Output</b>                          |                     |
| Electrical life (number of operations) | 1 x 10 <sup>5</sup> |

|                                |         |
|--------------------------------|---------|
| <b>General characteristics</b> |         |
| Casing                         | 17,5 mm |
| Weight                         | 80 g    |

|                 |  |
|-----------------|--|
| <b>Comments</b> |  |
|-----------------|--|

Accessories

| Description                                 | Code     |
|---------------------------------------------|----------|
| Removable sealable cover for 17.5 mm casing | 84800000 |

Principles



Overview

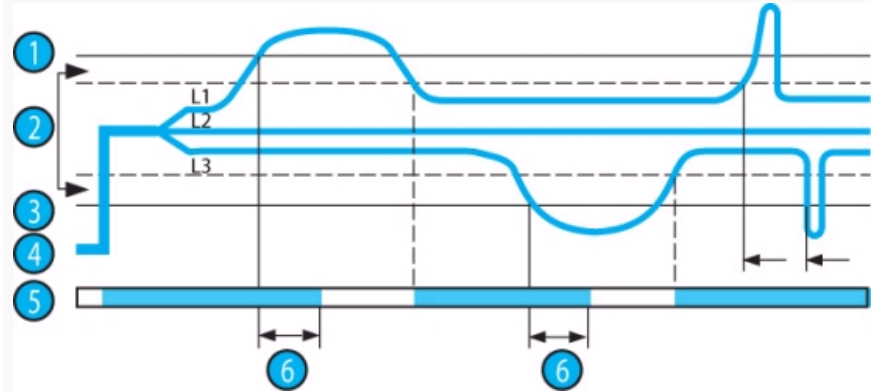
3-phase voltage controllers which monitor :

- Undervoltage, adjustable from -20 to -2 % of Un
- Overvoltage, adjustable from 2 to 20 % of Un
- Presence of the neutral (H3USN only)

Measurements are taken between Phases for the H3US - M3US and between Phases and Neutral for the H3USN  
Faults are signalled via LEDs, distinguishing the origin of the fault (one LED for the upper threshold, one LED for the lower threshold).

**Voltage selector switch :** Set the selector switch to the 3-phase network voltage Un.  
The position of this selector switch is only taken into account when the unit is powered up.  
If the switch position changes while the unit is operating, all the LEDs flash but the product continues to work normally with the voltage 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.

Principles



Operating principle  
M3US

The relay monitors its own supply voltage. It controls :

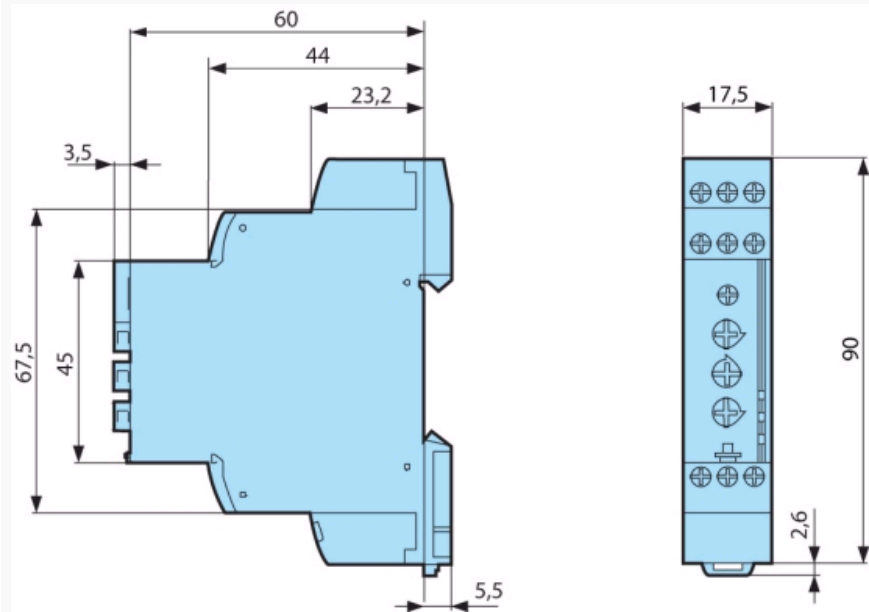
- Undervoltage, adjustable from -20 to -2 % of Un (-12 to -2 % over the 3 x 208 V AC range and -17 % to -2 % for the 3 x 220 V AC range due to the minimum voltage 183 V AC)
- Overvoltage, adjustable from +2 →+20 % (+2 →+10 % over the 3 x 480 V AC range due to the maximum voltage 528 V AC).

An adjustable time delay from 0.3 to 30s can be used to disable the output relay during a transient fault.  
In the event of a voltage fault, the relay opens at the end of the time delay set by the user.  
In the event of phase failure, the relay opens instantaneously, without waiting for the end of the time delay.  
When the unit is powered up with a measured fault, the relay stays open.

| N° | Legend                                |
|----|---------------------------------------|
| 1  | Overvoltage                           |
| 2  | Hysteresis                            |
| 3  | Undervoltage                          |
| 4  | Phases L1, L2, L3                     |
| 5  | Relay                                 |
| 6  | Over and undervoltage threshold delay |

Dimensions (mm)

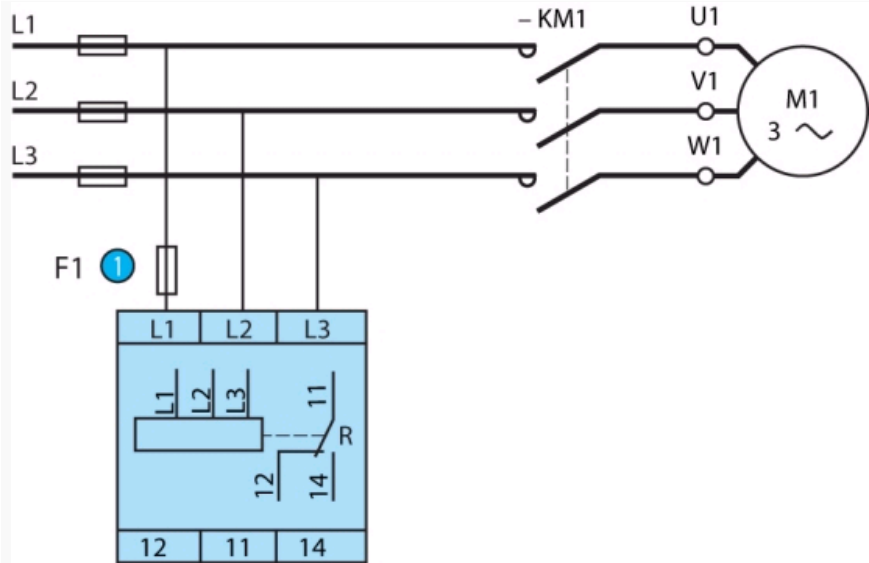
M3US



mm

Connections

M3US



| N° | Legend                           |
|----|----------------------------------|
| 1  | 100 mA fast-blow fuse or cut-out |

Product adaptations



- Customisable colours and labels
  - Single voltage in the generic range
  - Fixed or adjustable time delay
  - Adjustable fixed hysteresis
- Adaptations dedicated to M3US :
- Fixed threshold in the generic range
- Adaptations dedicated to H3US :
- Fixed threshold in the generic range
- Adaptations dedicated to H3USN :
- Fixed overvoltage threshold in the generic range
  - Fixed undervoltage threshold in the generic range