

# Zelio Control - measurement and control relays

Voltage-current control relays with display, models RM 84 872 and RM 84 871

- Displays the actual value and the preset value on the LCD display.
- Controls a.c. and d.c. signals (automatic detection).
- Overload or underload modes can be selected.
- Threshold and hysteresis can be adjusted separately.
- Memory function in the event of a fault.
- Delay on crossing the threshold.

## Operating principle

These devices are designed to control an a.c. or d.c. electric signal. The threshold and hysteresis can be adjusted separately via two potentiometers on the front panel of the device. Before powering up the device, the operating mode must be selected by means of two dip-switches on the underside of the device (with/without memory, over/under value). The mode is validated when power is applied to terminals A1 - A2. The signal to be monitored is connected between terminals E1, E2 or E3 (depending on the range) and terminal M.

## Voltage or current control, without memory

When the value of the controlled signal, a.c. or d.c., reaches the threshold set on the front panel, the output relay opens (failsafe) at the end of time delay T. It closes immediately when the signal goes below (or above in under value mode) the threshold minus hysteresis (plus hysteresis in under value mode).

## Voltage or current control, with memory

When the threshold is reached, the output relay opens at the end of time delay T and remains in that position. To reset the relay, the power supply must be switched off. This operating mode enables the detection of over or under values of short duration.

### Notes

The threshold crossing time delay T, which can be adjusted on the front panel from 0.1 to 3 seconds, ensures immunity to transients and other interference, thus preventing spurious triggering of the output relay.

In "under value" mode, the absolute value of the hysteresis cannot be more than the maximum of the measurement range.

## Programming - display

### Normal mode

In this mode, the device displays the value of the measured signal, its form (~ or ---), the mode selected (OVER or UNDER), the memory function (ON or OFF), and the state of the output relay. In the event of measurement overflow, the display indicates OVERFLOW (by three dashes on the screen and the flashing symbol OVER).

### Parameter entry mode

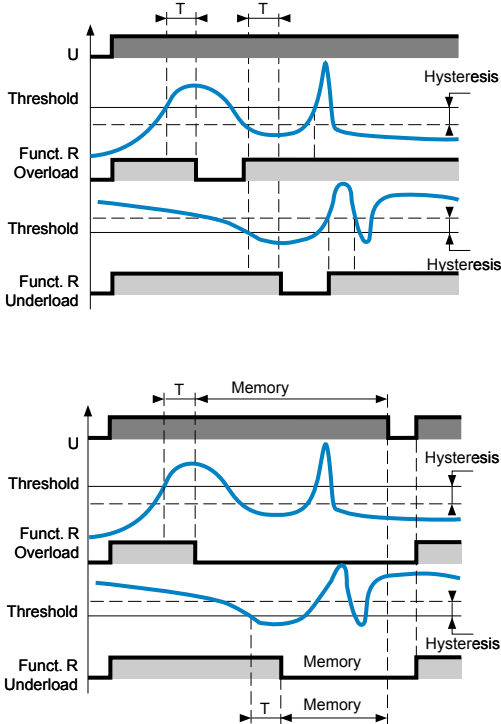
If the user wishes to modify one of the three parameters (Threshold, Hysteresis or Threshold delay), he simply needs to set the corresponding potentiometer and the value of the modified parameter automatically appears. After 2 seconds, the current value of the measured signal reappears in the display : return to NORMAL mode.

### Exception

In UNDER mode (underload), since the hysteresis is always greater than the threshold, it is possible that it will exceed the maximum measurement range according to the settings (Threshold + Hysteresis > Max. Threshold). To remedy this problem, when the user sets the hysteresis or threshold in proportions which exceed the management capacity, the value of the hysteresis is automatically corrected so that it does not exceed the range maximum. In addition, the user is warned by flashing of the symbol UNDER.

### Parameter display mode

To review the parameters, press the pushbutton (VISU) several times in succession, to cycle through the settings. Keep the pushbutton depressed to scroll through the values.



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## References



RM 84 872 305

### Control relay with LCD display - Voltage-Current

| Measurement range | Supply voltage | Reference            | Weight kg |
|-------------------|----------------|----------------------|-----------|
| 0.2 ...60 V       | --- 24 V       | <b>RM 84 872 301</b> | 0.160     |
|                   | ~ 230 V        | <b>RM 84 872 305</b> | 0.160     |
| 15 ...600 V       | ~ 230 V        | <b>RM 84 872 310</b> | 0.160     |
| 2...500 mA        | ~ 230 V        | <b>RM 84 871 305</b> | 0.160     |
| 0.1...10 A        | ~ 230 V        | <b>RM 84 871 310</b> | 0.160     |

## Supply characteristics

| Relay type                      |                           | RM 84 872 301    | RM 84 87● 305/RM 84 87● 310 |
|---------------------------------|---------------------------|------------------|-----------------------------|
| Supply voltage                  | V                         | --- 24           | ~ 230 (50/60 Hz)            |
| Operating range                 |                           | 0.85...1.10 x Un | 0.85...1.10 x Un            |
| Maximum power consumption       |                           | 1 W              | 3 VA                        |
| Immunity to microbreaks         | ms                        | 10               | 10                          |
| Delay on pick-up                | ms                        | 500              | 500                         |
| Creepage distance and clearance | Conforming to IEC 60664-1 | kV               | 4 kV/3                      |

## Output characteristics

|                                 |       |   |
|---------------------------------|-------|---|
| Relay type                      |       | 1 C/O contact, AgCdO, 5 A, 250 V  |
| Minimum current                 | mA    | 100   |
| Mechanical life                 |       | 5...10 <sup>6</sup> operating cycles  |
| Electrical life                 | AC-12 | 1250, 10 <sup>5</sup> operating cycles  |
|                                 | AC-15 | Cos φ = 0.3, 6000 operating cycles  |
|                                 | DC-13 | L/R = 300 ms, 6000 operating cycles   |
| Delay on crossing the threshold |       | 0.1...3 seconds ± 10 %  |
| LCD display                     |       | Relay state. OVER or UNDER Mode. Memory function. Type of signal (~ or ---)<br>Measurement overflow |

## Other characteristics

|                        |                         |                 |   |
|------------------------|-------------------------|-----------------|---|
| Protection class       | Conforming to IEC 529   |                 | Terminal block: IP 20, front panel: IP 40, enclosure: IP 50 |
| Enclosure              |                         |                 | Self-extinguishing Pc                                       |
| Terminal capacity      | With cable end          | mm <sup>2</sup> | 2 x 1.5   |
|                        | Without cable end       | mm <sup>2</sup> | 2 x 2.5   |
| Tightening torque      |                         | Nm              | 0.6 max   |
| Temperature limits     |                         | °C              | Operation: - 20...+ 60, storage: - 30...+ 70                |
| Relative humidity      |                         |                 | 93 % without condensation                                   |
| Dielectric strength    | Conforming to IEC 255-5 | kV              | 2.5/1 min/1 mA/50 Hz  |
| Product certifications |                         |                 | c UL us, CSA  |

## Voltage control relay input characteristics

| Relay type                          |                  | RM 84 872 301/RM 84 872 305 |        |        | RM 84 872 310 |          |          |
|-------------------------------------|------------------|-----------------------------|--------|--------|---------------|----------|----------|
| Input circuits                      |                  | E1-M                        | E2-M   | E3-M   | E1-M          | E2-M     | E3-M     |
| Measurement ranges                  | V                | 0.2...2                     | 1...10 | 6...60 | 15...150      | 30...300 | 60...600 |
| Input resistance                    | kΩ               | 2                           | 10     | 60     | 100           | 300      | 650      |
| Maximum continuous voltage at 20 °C | V                | 4                           | 20     | 120    | 200           | 350      | 650      |
| Peak overload                       | < 1 ms at 20 °C  | V                           | 50     | 100    | 300           | —        | —        |
|                                     | < 50 ms at 20 °C | kV                          | —      | —      | —             | 2        | 2        |

## Current control relay input characteristics

| Relay type                          |                 | RM 84 871 305 |             |             | RM 84 871 310 |           |          |
|-------------------------------------|-----------------|---------------|-------------|-------------|---------------|-----------|----------|
| Input circuits                      |                 | E1-M          | E2-M        | E3-M        | E1-M          | E2-M      | E3-M     |
| Measurement ranges                  |                 | 2...20 mA     | 10...100 mA | 50...500 mA | 0.1...1 A     | 0.5...5 A | 1...10 A |
| Input resistance                    | Ω               | 5             | 1           | 0.2         | 0.1           | 0.02      | 0.01     |
| Maximum continuous voltage at 20 °C |                 | 40 mA         | 200 mA      | 1 A         | 2 A           | 10 A      | 14 A     |
| Peak overload                       | < 1 ms at 20 °C | A             | 1           | 5           | 8             | 17        | 20       |

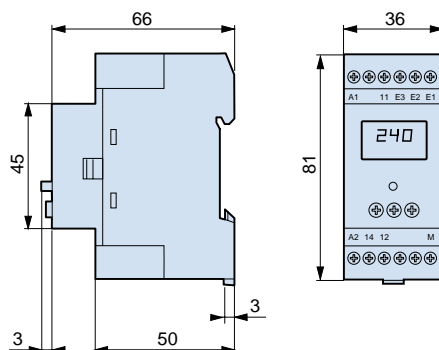
## General input characteristics

|                                   |    |  |
|-----------------------------------|----|--|
| Maximum line voltage              |    | Mains 277/ ~ 480 V                     |
| Hysteresis                        |    | Adjustable from 5 to 50 % of threshold |
| Frequency of a.c. signal measured | Hz | 40...500                               |
| Threshold setting accuracy        |    | ± 10 %                                 |
| Repeat accuracy                   |    | ± 0.1 % with constant parameters       |
| Temperature drift                 |    | ± 0.05 %/°C                            |
| Voltage drift                     |    | ≤ 0.5 %                                |

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RM 84 871 305, RM 84 871 310, RM 84 872 301, RM 84 872 305, RM 84 872 310



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## Connection and application schemes

