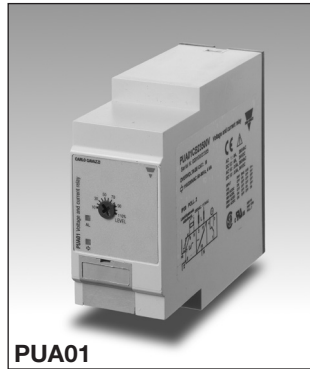


# Monitoring Relays 1-Phase AC/DC Over Voltage - AC Over Current Types DUA01, PUA01

CARLO GAVAZZI



DUA01



PUA01

- AC/DC over voltage monitoring relay
- Selection of measuring range by DIP-switches
- Measuring ranges: 2 to 20 VAC/DC, 5 to 50 VAC/DC, 20 to 200 VAC/DC, 50 to 500 VAC/DC, 0.4 to 4 V<sub>p</sub> AC
- Adjustable voltage limit on relative scale
- Adjustable hysteresis
- Programmable latching at set level
- Output: 8 A SPDT relay normally de-energized
- For mounting on DIN-rail in accordance with DIN/EN 50 022 (DUA01) or plug-in module (PUA01)
- 22.5 mm Euronorm housing (DUA01) or 36 mm plug-in module (PUA01)
- LED indication for relay and power supply ON
- Galvanically separated power supply

## Product Description

DUA01 and PUA01 are precise AC/DC over voltage monitoring relays. They can also be used as 1-phase or 3-phase over current monitoring relays when connected with MI or MP current

transformers. Owing to the built-in latch function, the ON-position of the relay output can be maintained. The red LED indicates the alarm status.

## Ordering Key **DUA 01 C B23 500V**

|              |       |
|--------------|-------|
| Housing      | _____ |
| Function     | _____ |
| Type         | _____ |
| Item number  | _____ |
| Output       | _____ |
| Power supply | _____ |
| Range        | _____ |

## Type Selection

| Mounting | Output | Supply: 24 to 48 VAC/DC  | Supply: 115/230 VAC      |
|----------|--------|--------------------------|--------------------------|
| DIN-rail | SPDT   | <b>DUA 01 C D48 500V</b> | <b>DUA 01 C B23 500V</b> |
| Plug-in  | SPDT   | <b>PUA 01 C D48 500V</b> | <b>PUA 01 C B23 500V</b> |

## Input Specifications

|  |  |                   |
|--|--|-------------------|
| <b>Input</b> (voltage level)<br>DUA01<br>PUA01   | Terminals Y1, Y2<br>Terminals 5, 7                                   |                   |
| <b>Measuring ranges</b><br>Direct<br>Selectable by DIP-switches<br>2 to 20 VAC/DC<br>5 to 50 VAC/DC<br>20 to 200 VAC/DC<br>50 to 500 VAC/DC<br>0.4 to 4 V <sub>p</sub> AC<br>Max. voltage for 1 s<br>MI and MP CT ranges<br>1-ph.: 3-ph.:<br>MI 5 MP 3005<br>MI 20 MP 3020<br>MI 100 MP 3100<br>MI 500 MP 3500 | <b>Int. resist.</b>  | <b>Max. volt.</b> |
|  | > 500 kΩ   | 600 V             |
|  | > 500 kΩ   | 600 V             |
|  | > 500 kΩ   | 600 V             |
|  | > 500 kΩ   | 600 V             |
|  | > 500 kΩ   | 600 V             |
|  | > 500 kΩ   | 1000 V            |
|  | <b>AAC rms</b>   | <b>Max. curr.</b> |
|  | 0.5 to 5 A   | 20 AAC            |
|  | 2 to 20 A  | 50 AAC            |
|  | 10 to 100 A  | 250 AAC           |
|  | 50 to 500 A  | 750 AAC           |
| <b>Note:</b><br>The input voltage cannot raise over 300 VAC/DC with respect to ground (PUA01 only)   |  |                   |
| <b>Contact input</b><br>DUA01<br>PUA01<br>Disabled<br>Enabled<br>Latch disable   | Terminals Z1, Y1<br>Terminals 8, 9<br>> 10 kΩ<br>< 500 Ω<br>> 500 ms |                   |

## Output Specifications

|   |   |
|---|---|
| <b>Output</b><br>Rated insulation voltage   | SPDT relay<br>250 VAC   |
| <b>Contact ratings</b> (AgSnO <sub>2</sub> )<br>Resistive loads AC 1<br>DC 12<br>Small inductive loads AC 15<br>DC 13 | μ<br>8 A @ 250 VAC<br>5 A @ 24 VDC<br>2.5 A @ 250 VAC<br>2.5 A @ 24 VDC |
| <b>Mechanical life</b>  | ≥ 30 x 10 <sup>6</sup> operations                                       |
| <b>Electrical life</b>  | ≥ 10 <sup>5</sup> operations<br>(at 8 A, 250 V, cos φ = 1)              |
| <b>Operating frequency</b>  | ≤ 7200 operations/h   |
| <b>Dielectric strength</b><br>Dielectric voltage<br>Rated impulse withstand volt.                                     | ≥ 2 kVAC (rms)<br>4 kV (1.2/50 μs)                                      |



## Supply Specifications

|  |   |                  |
|--|---|------------------|
| <b>Power supply</b><br>Rated operational voltage through terminals:<br>A1, A2 or A3, A2 (DUA01)<br>2, 10 or 11, 10 (PUA01) | Overvoltage cat. III<br>(IEC 60664, IEC 60038)  |                  |
| D48:   | 24 to 48 VAC/DC ± 15%<br>45 to 65 Hz, insulated |                  |
| B23:   | 115/230 VAC ± 15%<br>45 to 65 Hz, insulated     |                  |
| <b>Dielectric voltage</b>  | <b>DC supply</b>                                | <b>AC supply</b> |
| Supply to input  | 2 kV  | 4 kV             |
| Supply to output   | 4 kV  | 4 kV             |
| Input to output  | 4 kV  | 4 kV             |
| <b>Rated operational power</b>   |   |                  |
| AC   | 4 VA  |                  |
| DC   | 2 W   |                  |

## General Specifications

|  |   |
|--|---|
| <b>Reaction time</b><br>Alarm ON delay | < 100 ms<br>(voltage rising from<br>-20% to +20% set value)     |
| Alarm OFF delay                        | < 300 ms<br>(voltage decreasing from<br>+20% to -20% set value) |

## Mode of Operation

DUA01 and PUA01 monitor both AC and DC over voltage. When connected with MI or MP current transformer (using the 0.4 - 4 V<sub>p</sub> range) they can monitor 1-phase or 3-phase AC currents up to 500 A.

### Example 1

(connection between terminals Z1, Y1 or 8, 9 - latch function enabled)

The relay operates and latches in operating position when the measured value exceeds the set level. Provided that the voltage has dropped min. 4% below the set point (see hysteresis), the relay releases when the interconnection between terminals Z1, Y1 or 8, 9 is interrupted or the power supply is interrupted as well.

### Example 2 (MI CT)

(no connection between terminals Z1, Y1 or 8, 9)

The relay operates when the current flowing through the CT exceeds the set level. It releases when the current drops min. 4% below the set level (see hysteresis) or when power supply is interrupted.

### Example 3 (MP CT)

(no connection between terminals Z1, Y1 or 8, 9 - latch function disabled)

The relay operates when the maximum current flowing through the CT exceeds the set level. It releases when the maximum current drops min. 4% below the set level (see hysteresis) or when power supply is interrupted.

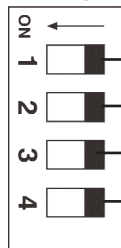
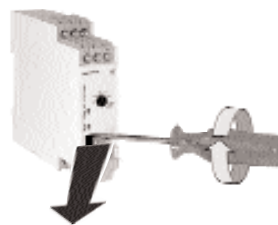
## General Specifications (cont.)

|  |  |   |
|--|--|---|
| <b>Accuracy</b><br>Temperature drift<br>Repeatability  | (15 min warm-up time)<br>± 1000 ppm/°C<br>± 0.5% on full-scale   |   |
| <b>Indication for</b><br>Power supply ON<br>Output relay ON  | LED, green<br>LED, red   |   |
| <b>Environment</b><br>Degree of protection<br>Pollution degree<br>Operating temperature<br>Storage temperature | (EN 60529)<br>IP 20<br>3 (DUA01), 2 (PUA01)<br>-20 to 60°C, R.H. < 95%<br>-30 to 80°C, R.H. < 95%  |   |
| <b>Housing</b><br>Dimensions   | DUA01<br>PUA01   | 22.5 x 80 x 99.5 mm<br>36 x 80 x 94 mm<br>PA66 or Noryl |
| Material   | PA66 or Noryl  |   |
| <b>Weight</b>  | Approx. 150 g  |   |
| <b>Screw terminals</b><br>Tightening torque  | Max. 0.5 Nm<br>acc. to IEC 60947   |   |
| <b>Product standard</b>  | EN 60255-6   |   |
| <b>Approvals</b>   | UL, CSA  |   |
| <b>CE Marking</b><br><br>EMC<br>Immunity<br><br>Emissions  | L.V. Directive 2006/95/EC<br>EMC Directive 2004/108/EC<br><br>According to EN 60255-26<br>According to EN 61000-6-2<br>According to EN 60255-26<br>According to EN 61000-6-3 |   |

## Range - Level Setting

Adjust the measuring range setting the DIP switches 1 to 4 as shown below.

To access the DIP switches open the grey plastic cover using a screwdriver as shown below.



### Measuring range

|                 |                         |
|-----------------|-------------------------|
| OFF ON OFF OFF  | 0.4 to 4 V <sub>p</sub> |
| ON OFF OFF OFF  | 2 to 20 VAC/DC          |
| OFF OFF OFF OFF | 5 to 50 VAC/DC          |
| ON OFF ON OFF   | 20 to 200 VAC/DC        |
| ON OFF OFF ON   | 50 to 500 VAC/DC        |

### Centre knob:

Setting of voltage on relative scale: from 10 to 110% of the full-scale value.

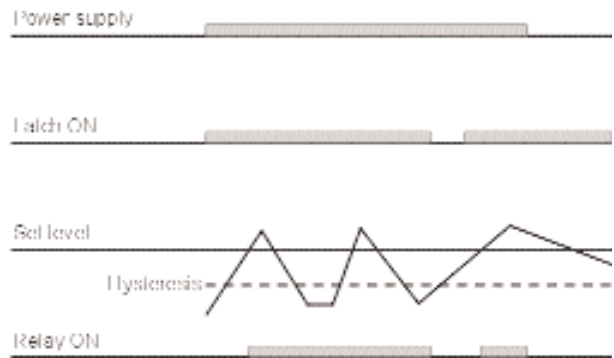
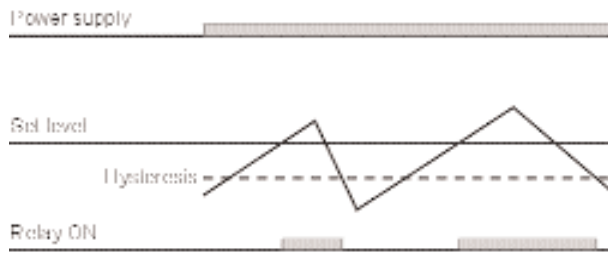
### Hysteresis:

Approx. 4% of set value, it can be extended by inserting a resistor between terminals Z1, Y1 or 8, 9.

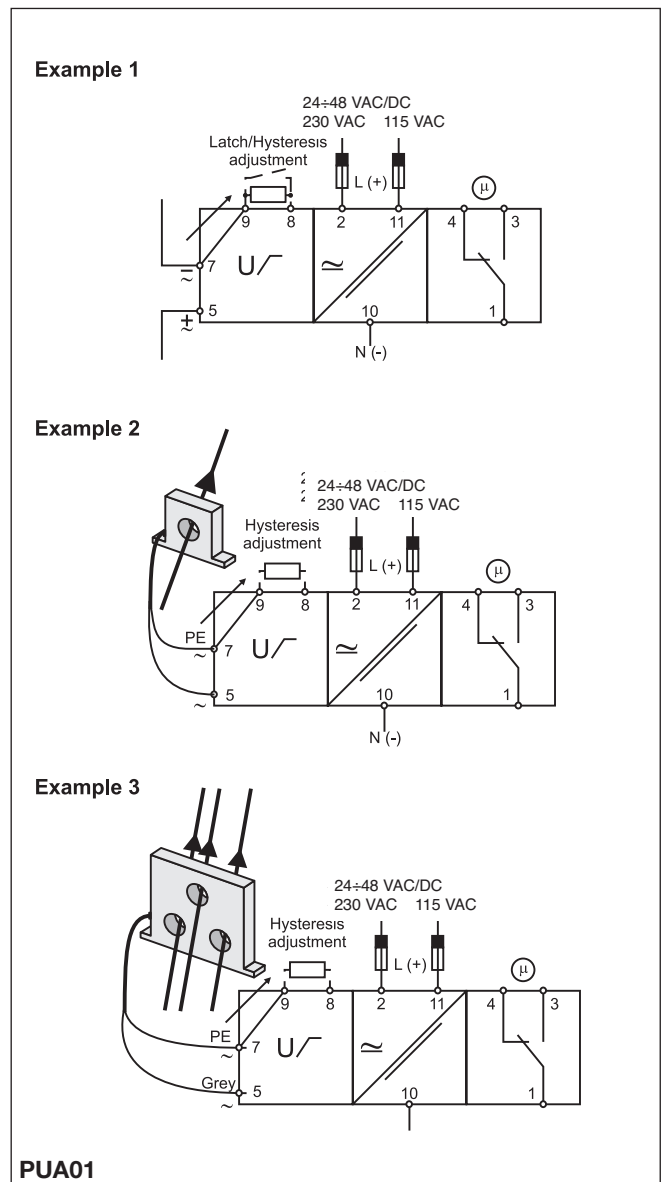
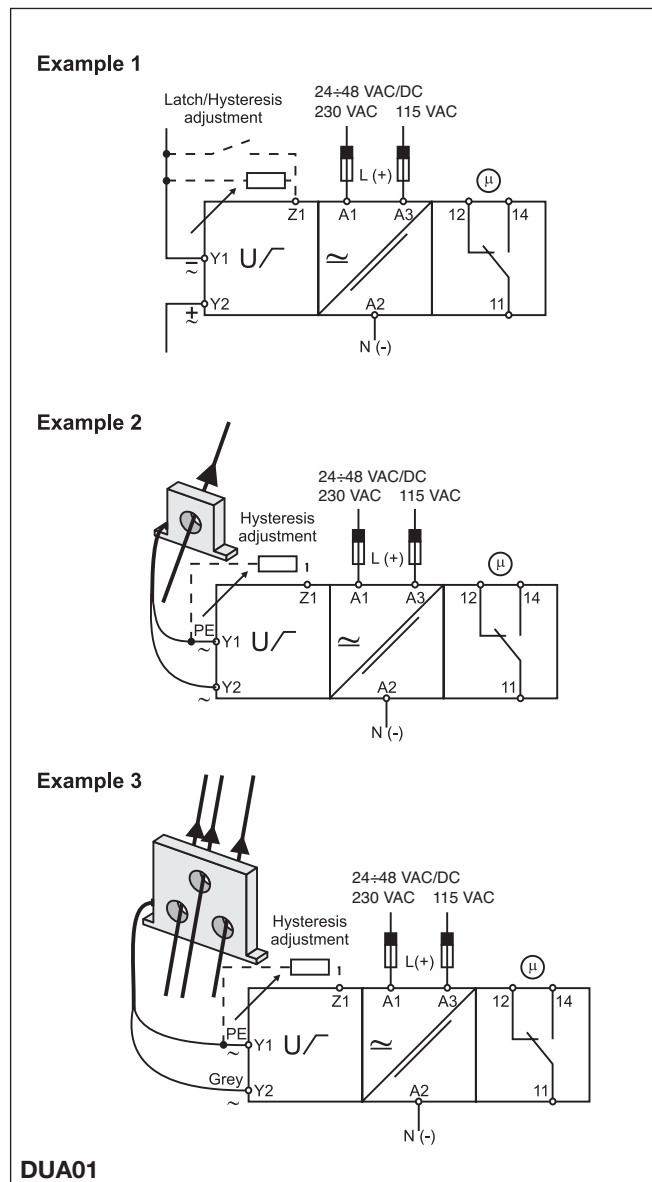
### Approx. resistor values:

|        |         |
|--------|---------|
| 10%:   | 180 kΩ  |
| 25%:   | 47 kΩ   |
| 50%:   | 22 kΩ   |
| 75%:   | 15 kΩ   |
| Latch: | < 500 Ω |

## Operation Diagrams



## Wiring Diagrams



## Dimensions

