

# Monitoring Relays

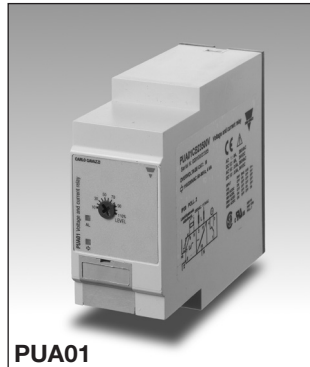
## 1-Phase AC/DC Over Voltage - AC Over Current

### 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**



### 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) DUA01 PUA01	Terminals Y1, Y2 Terminals 5, 7	
<b>Measuring ranges</b> Direct Selectable by DIP-switches 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 Max. voltage for 1 s MI and MP CT ranges 1-ph.: 3-ph.: MI 5 MP 3005 MI 20 MP 3020 MI 100 MP 3100 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> The input voltage cannot raise over 300 VAC/DC with respect to ground (PUA01 only)		
<b>Contact input</b> DUA01 PUA01 Disabled Enabled Latch disable	Terminals Z1, Y1 Terminals 8, 9 > 10 kΩ < 500 Ω > 500 ms	

### Output Specifications

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

## Supply Specifications

<b>Power supply</b> Rated operational voltage through terminals: A1, A2 or A3, A2 (DUA01) 2, 10 or 11, 10 (PUA01)	Overvoltage cat. III (IEC 60664, IEC 60038)	
D48:	24 to 48 VAC/DC $\pm$ 15% 45 to 65 Hz, insulated	
B23:	115/230 VAC $\pm$ 15% 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> Alarm ON delay	< 100 ms (voltage rising from -20% to +20% set value)
Alarm OFF delay	< 300 ms (voltage decreasing from +20% to -20% set value)

## General Specifications (cont.)

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

## 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  $V_p$  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.

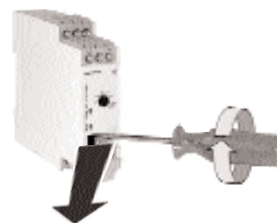
### Example 3 (MP CT)

(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.

## 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.



ON ←									
1	■	■	■	■	■	■	■	■	■
2	■	■	■	■	■	■	■	■	■
3	■	■	■	■	■	■	■	■	■
4	■	■	■	■	■	■	■	■	■

Measuring range	
OFF ON OFF OFF	0.4 to 4 $V_p$
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.

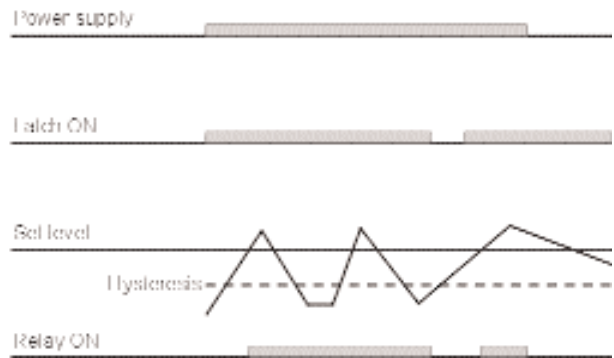
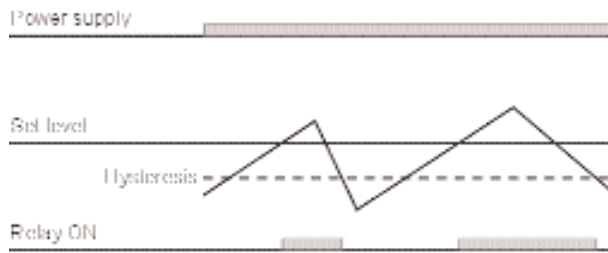
### Hysteresis:

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

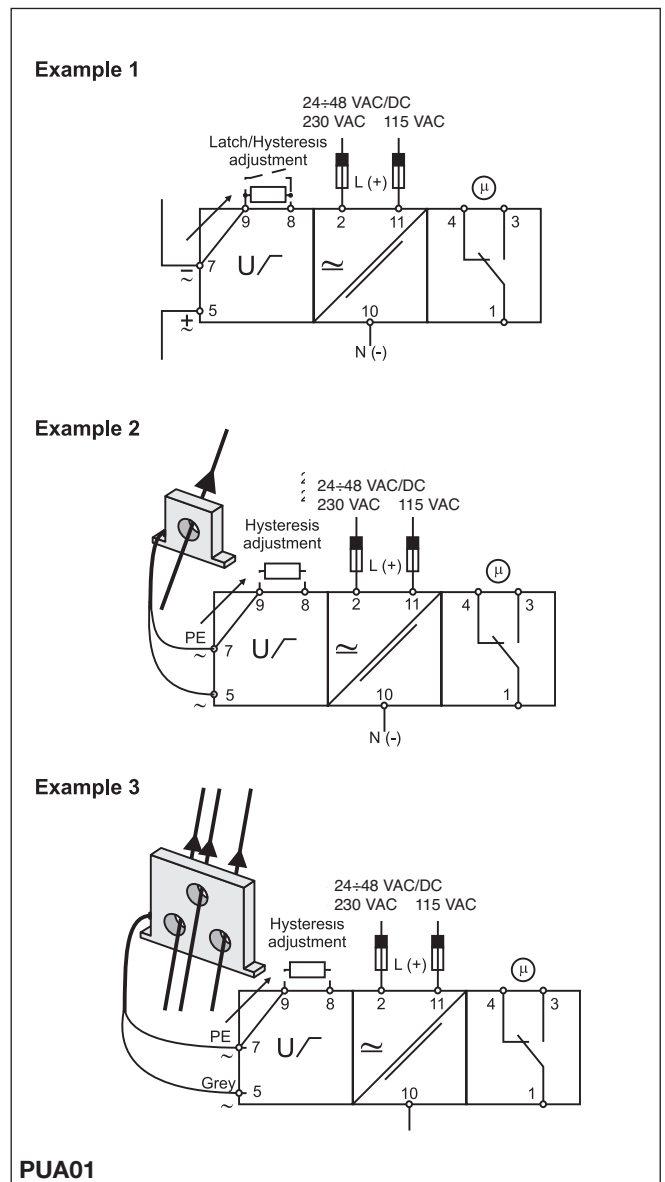
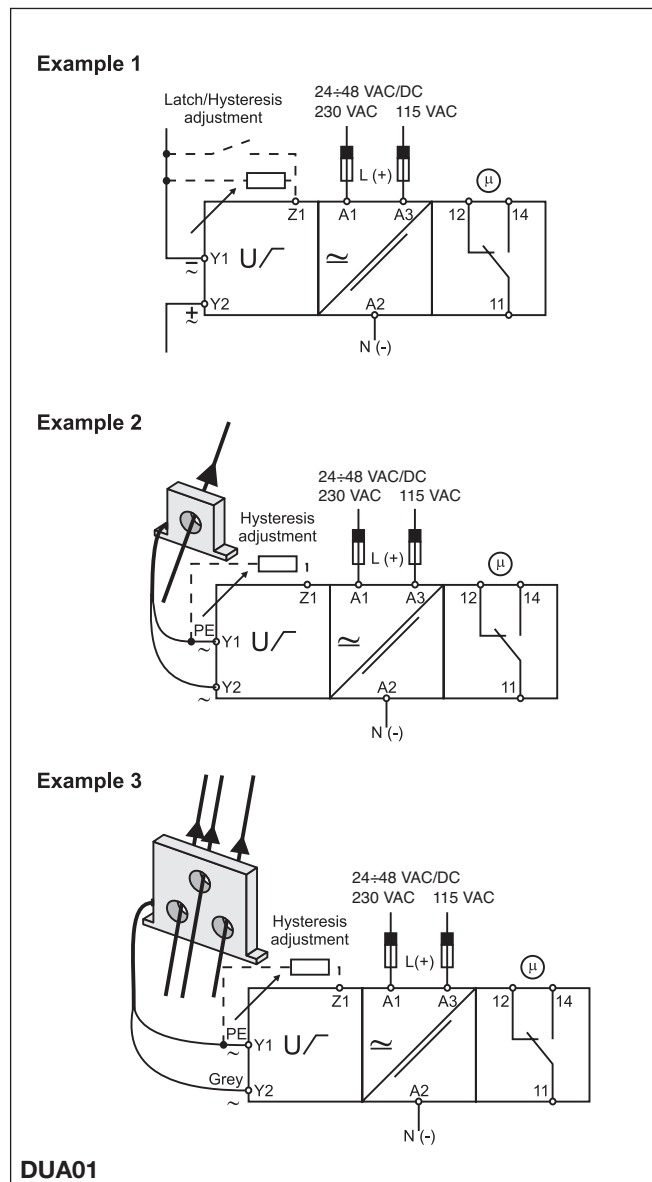
### Approx. resistor values:

10%:	180 k $\Omega$
25%:	47 k $\Omega$
50%:	22 k $\Omega$
75%:	15 k $\Omega$
Latch:	< 500 $\Omega$

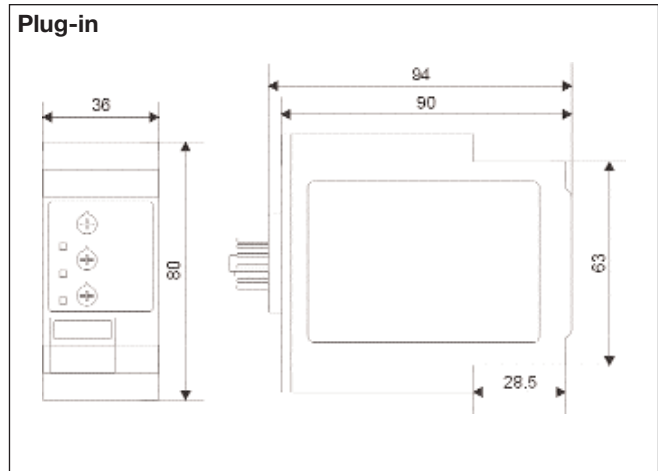
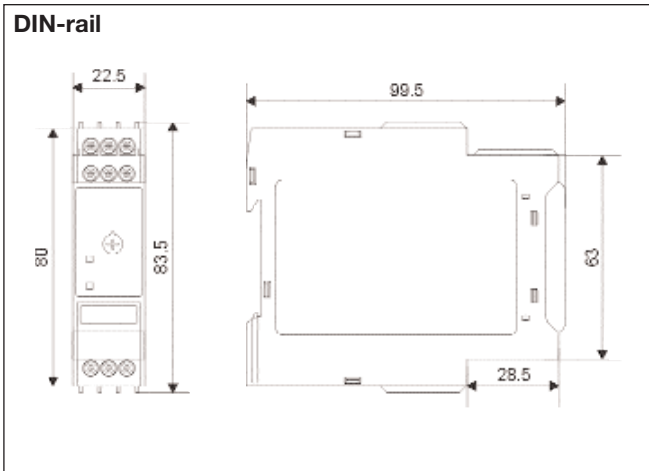
## Operation Diagrams



## Wiring Diagrams



## Dimensions



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