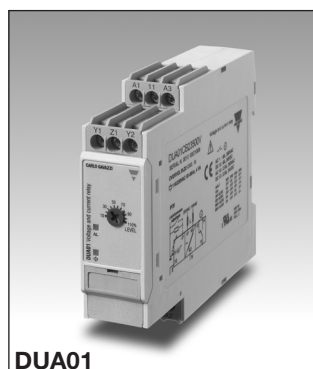


# Monitoring Relays

## 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	DUA 01 C D48 500V	DUA 01 C B23 500V
Plug-in	SPDT	PUA 01 C D48 500V	PUA 01 C B23 500V

## Input Specifications

<b>Input</b> (voltage level)	Terminals Y1, Y2	
DUA01	Terminals 5, 7	
PUA01		
<b>Measuring ranges</b>		
Direct	<b>Int. resist.</b>	<b>Max. volt.</b>
Selectable by DIP-switches		
2 to 20 VAC/DC	> 500 kΩ	600 V
5 to 50 VAC/DC	> 500 kΩ	600 V
20 to 200 VAC/DC	> 500 kΩ	600 V
50 to 500 VAC/DC	> 500 kΩ	600 V
0.4 to 4 V <sub>p</sub> AC	> 500 kΩ	600 V
Max. voltage for 1 s		1000 V
MI and MP CT ranges	<b>AAC rms</b>	<b>Max. curr.</b>
1-ph.: 3-ph.:		
MI 5 MP 3005	0.5 to 5 A	20 AAC
MI 20 MP 3020	2 to 20 A	50 AAC
MI 100 MP 3100	10 to 100 A	250 AAC
MI 500 MP 3500	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>	Terminals Z1, Y1	
DUA01	Terminals 8, 9	
PUA01		
Disabled	> 10 kΩ	
Enabled	< 500 Ω	
Latch disable	> 500 ms	

## Output Specifications

<b>Output</b>	SPDT relay
Rated insulation voltage	250 VAC
<b>Contact ratings</b> (AgSnO <sub>2</sub> )	μ
Resistive loads AC 1	8 A @ 250 VAC
DC 12	5 A @ 24 VDC
Small inductive loads AC 15	2.5 A @ 250 VAC
DC 13	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	≥ 2 kVAC (rms)
Rated impulse withstand volt.	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> Supply to input Supply to output Input to output	<b>DC supply</b>	<b>AC supply</b>
	2 kV 4 kV 4 kV	4 kV 4 kV 4 kV
<b>Rated operational power</b> AC DC	4 VA 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>		(15 min warm-up time)
Temperature drift		± 1000 ppm/°C
Repeatability		± 0.5% on full-scale
<b>Indication for</b>		
Power supply ON		LED, green
Output relay ON		LED, red
<b>Environment</b>		(EN 60529)
Degree of protection		IP 20
Pollution degree		3 (DUA01), 2 (PUA01)
Operating temperature		-20 to 60°C, R.H. < 95%
Storage temperature		-30 to 80°C, R.H. < 95%
<b>Housing</b>		
Dimensions	DUA01	22.5 x 80 x 99.5 mm
	PUA01	36 x 80 x 94 mm
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)

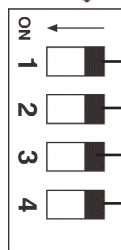
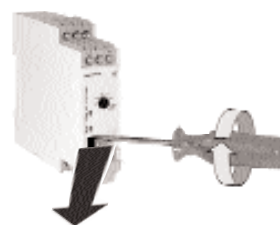
(no connection between terminals Z1, Y1 or 8, 9)  
The relay operates when the current flowing through the CT exceeds the set level. It releases when the current drops min. 4% below the set level (see hysteresis) or when power supply is interrupted.

### 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.



### 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.

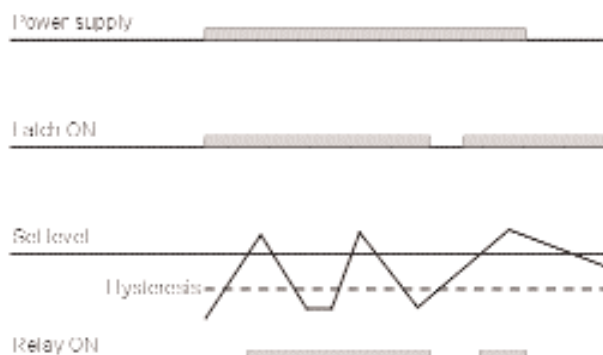
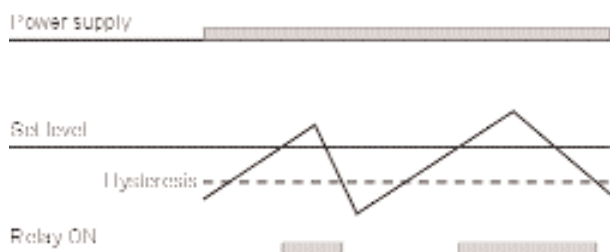
### Hysteresis:

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

### Approx. resistor values:

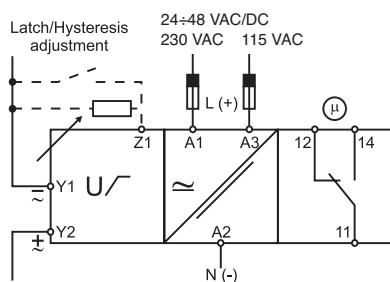
10%:	180 k $\Omega$
25%:	47 k $\Omega$
50%:	22 k $\Omega$
75%:	15 k $\Omega$
Latch:	< 500 $\Omega$

## Operation Diagrams

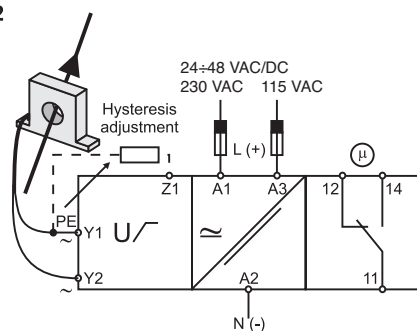


## Wiring Diagrams

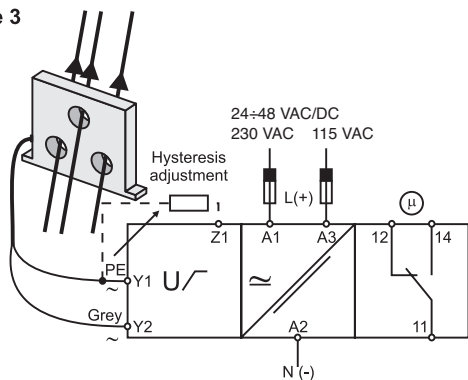
Example 1



Example 2

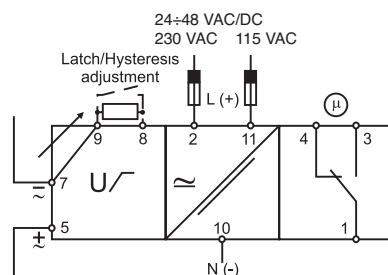


Example 3

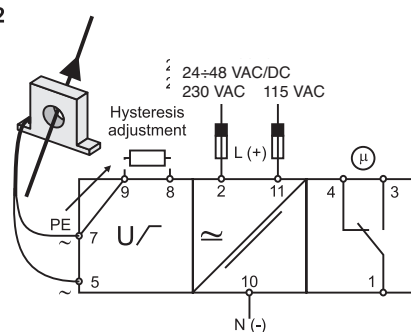


DUA01

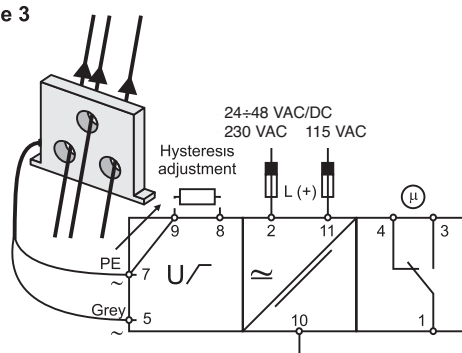
Example 1



Example 2



Example 3



PUA01



Dimensions

