

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_p 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 VDC	Supply: 48 VDC	Supply: 24/48 VAC	Supply: 115/230 VAC
DIN-rail	SPDT	DUA 01 C 724 500V	DUA 01 C 748 500V	DUA 01 C B48 500V	DUA 01 C B23 500V
Plug-in	SPDT	PUA 01 C 724 500V	PUA 01 C 748 500V	PUA 01 C B48 500V	PUA 01 C B23 500V

Input Specifications

Input (voltage level)	DUA01: Terminals Y1, Y2 PUA01: Terminals 5, 7	
Measuring ranges	Int. resist.	Max. volt.
Direct		
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 _p AC	> 500 kΩ	600 V
MI and MP CT ranges	Max. voltage for 1 s: 1000 V	
1-ph.: 3-ph.:	AAC rms	Max. curr.
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
Note: The input voltage cannot raise over 300 VAC/DC with respect to ground (PUA01 only)		
Contact input	Terminals Z1, Y1 Terminals 8, 9	
DUA01	> 10 kΩ	
PUA01	< 500 Ω	
Disabled	> 500 ms	
Enabled		
Latch disable		

Output Specifications

Output	SPDT relay
Rated insulation voltage	250 VAC
Contact ratings (AgSnO ₂)	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
Mechanical life	≥ 30 x 10 ⁶ operations
Electrical life	≥ 10 ⁵ operations (at 8 A, 250 V, cos φ = 1)
Operating frequency	≤ 7200 operations/h
Dielectric strength	
Dielectric voltage	≥ 2 kVAC (rms)
Rated impulse withstand volt.	4 kV (1.2/50 μs)

Supply Specifications

Power supply	Overvoltage cat. III (IEC 60664, IEC 60038)	
Rated operational voltage through terminals:		
A1, A2 or A3, A2 (DUA01)		
2, 10 or 11, 10 (PUA01)		
724:	24 VDC \pm 20%, insulated	
748:	48 VDC \pm 20%, insulated	
B48:	24/48 VAC \pm 15%	
	45 to 65 Hz, insulated	
B23:	115/230 VAC \pm 15%	
	45 to 65 Hz, insulated	
Dielectric voltage	DC supply	AC supply
Supply to input	2 kV	4 kV
Supply to output	4 kV	4 kV
Input to output	4 kV	4 kV
Rated operational power		
AC	4 VA	
DC	2 W	

General Specifications

Reaction time	
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)
Accuracy	(15 min warm-up time)
Temperature drift	\pm 1000 ppm/°C
Repeatability	\pm 0.5% on full-scale
Indication for	
Power supply ON	LED, green
Output relay ON	LED, red
Environment	(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%
Housing dimensions	
DIN-rail version	22.5 x 80 x 99.5 mm
Plug-in version	36 x 80 x 87 mm
Weight	Approx. 150 g
Screw terminals	
Tightening torque	Max. 0.5 Nm acc. to IEC 60947
Approvals	UL, CSA (except 748)
CE Marking	Yes
EMC	
Immunity	Electromagnetic Compatibility
Emission	According to EN 61000-6-2 According to EN 50081-1

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.

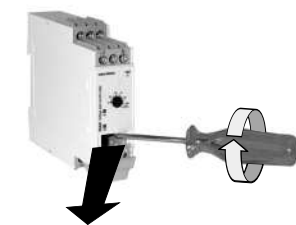
Example 3 (MP CT)

(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.

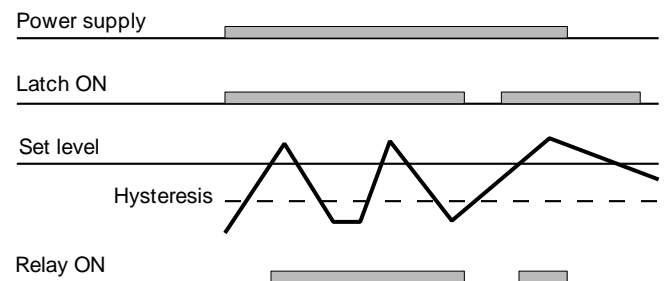
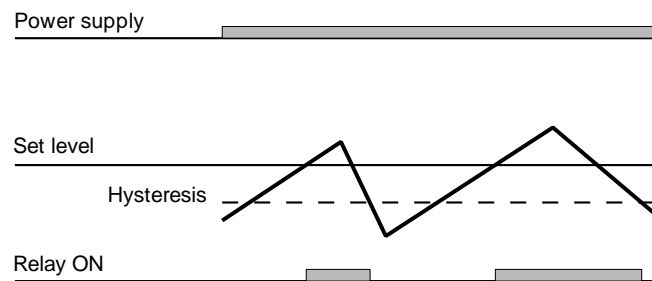
Hysteresis:

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

Approx. resistor values:

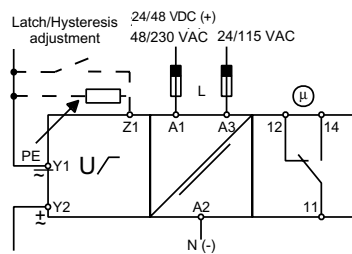
10%:	180 kΩ
25%:	47 kΩ
50%:	22 kΩ
75%:	15 kΩ
Latch:	< 500 Ω

Operation Diagrams

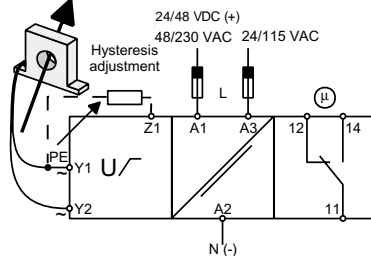


Wiring Diagrams

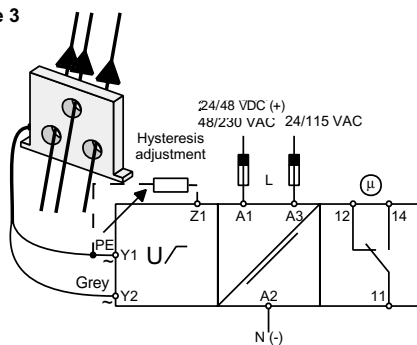
Example 1



Example 2

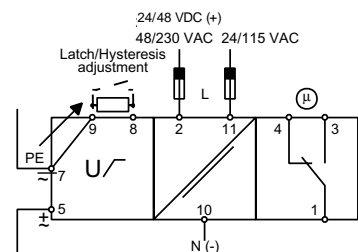


Example 3

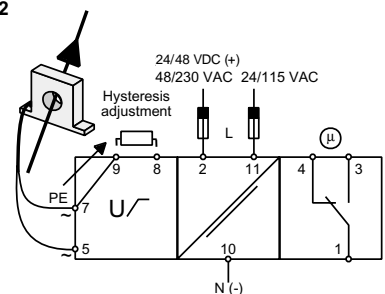


DUA01

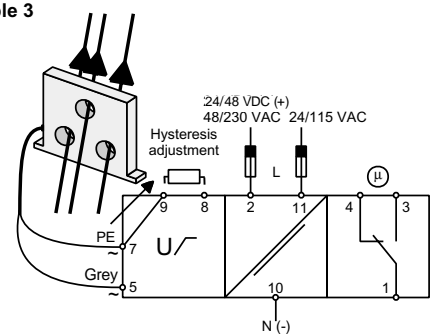
Example 1



Example 2



Example 3



PUA01