Monitoring Relays
1-Phase True RMS AC/DC Over or Under Voltage
Types DUB01, PUB01

CARLO GAVAZZI

DUB01

PUB01

- TRMS AC/DC over or under voltage monitoring relays
- Selection of measuring range by DIP-switches
- Measuring ranges from 0.1 to 500 V AC/DC
- Adjustable voltage on relative scale
- Adjustable hysteresis on relative scale
- Adjustable delay function (0.1 to 30 s)
- Programmable latching or inhibit at set level
- Output: 8 A SPDT relay N.D. or N.E. selectable
- For mounting on DIN-rail in accordance with DIN/EN 50 022 (DUB01) or plug-in module (PUB01)
- 22.5 mm Euronorm housing (DUB01) or 36 mm plug-in module (PUB01)
- LED indication for relay, alarm and power supply ON

Product Description

DUB01 and PUB01 are precise TRMS AC/DC over or under voltage (selectable by DIP-switch) monitoring relays.
Owing to the built-in latch function, the ON-position of the relay output can be maintained. Inhibit function can be used to avoid relay operation when not desired (maintenance, transitions). The LED's indicate the state of the alarm and the output relay.

Ordering Key

DUB 01 C B23 10V

Housing
Function
Type
Item number
Output
Power supply
Range
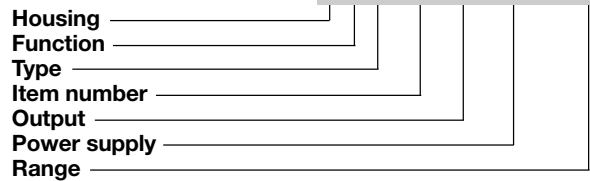
Type Selection

Mounting	Output	Measuring range	Supply: 24 to 48 VAC/DC	Supply: 115/230 VAC
DIN-rail	SPDT	0.1 to 10 V AC/DC 2 to 500 V AC/DC	**DUB 01 C D48 10V** **DUB 01 C D48 500V**	**DUB 01 C B23 10V** **DUB 01 C B23 500V**
Plug-in	SPDT	0.1 to 10 V AC/DC 2 to 500 V AC/DC	**PUB 01 C D48 10V** **PUB 01 C D48 500V**	**PUB 01 C B23 10V** **PUB 01 C B23 500V**

Input Specifications

Input (voltage level)		
DUB01	Terminals Y1, Y2	
PUB01	Terminals 5, 7	

Measuring ranges	Int. resist.	Max. volt.
Direct		
Selectable by DIP-switches		
..10V: 0.1 to 1 V AC/DC	>200 kΩ	100 V
0.2 to 2 V AC/DC	>200 kΩ	100 V
0.5 to 5 V AC/DC	>200 kΩ	100 V
1 to 10 V AC/DC	>200 kΩ	100 V
Max. voltage for 1 s		200 V
..500V: 2 to 20 V AC/DC	>500 kΩ	350 V
5 to 50 V AC/DC	>500 kΩ	350 V
20 to 200 V AC/DC	>500 kΩ	600 V
50 to 500 V AC/DC	>500 kΩ	600 V
Max. voltage for 1 s		1000 V

Note:
The input voltage cannot raise over 300 VAC/DC with respect to ground (PUB01 only)

Contact input		
DUB01	Terminals Z1, Y1	
PUB01	Terminals 8, 9	
Disabled	> 10 kΩ	
Enabled	< 500 Ω	
Latch disable	> 500 ms	

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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	$\geq 30 \times 10^6$ operations
Electrical life	$\geq 10^5$ operations (at 8 A, 250 V, cos φ = 1)
Operating frequency	$\leq$ 7200 operations/h
Dielectric strength	
Dielectric voltage	$\geq$ 2 kVAC (rms)
Rated impulse withstand volt.	4 kV (1.2/50 µs)

Supply Specifications

Power supply	Overvoltage cat. III
Rated operational voltage through terminals:	(IEC 60664, IEC 60038)
A1, A2 or A3, A2 (DUB01)	
2, 10 or 11, 10 (PUB01)	
D48:	24 to 48 VAC/DC ± 15% 45 to 65 Hz, insulated
B23:	115/230 VAC ± 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	3 W	

General Specifications

Power ON delay	1 s ± 0.5 s or 6 s ± 0.5 s
Reaction time	(input signal variation from -20% to +20% or from +20% to -20% of set value)
Alarm ON delay	< 100 ms
Alarm OFF delay	< 100 ms
Accuracy	(15 min warm-up time)
Temperature drift	± 1000 ppm/°C
Delay ON alarm	± 10% on set value ± 50 ms
Repeatability	± 0.5% on full-scale
Indication for	
Power supply ON	LED, green
Alarm ON	LED, red (flashing 2 Hz during delay time)
Output relay ON	LED, yellow
Environment	
Degree of protection	IP 20
Pollution degree	3 (DUB01), 2 (PUB01)
Operating temperature	-20 to 60°C, R.H. < 95%
Storage temperature	-30 to 80°C, R.H. < 95%
Housing	
Dimensions DUB01	22.5 x 80 x 99.5 mm
PUB01	36 x 80 x 94 mm
Weight	Approx. 150 g
Screw terminals	
Tightening torque	Max. 0.5 Nm acc. to IEC 60947
Approvals	UL, CSA
CE Marking	Yes
EMC	Electromagnetic Compatibillity
Immunity	According to EN 61000-6-2
Emission	According to EN 61000-6-3

Mode of Operation

DUB01 and PUB01 monitor both AC and DC over or under voltage.

Example 1
(no connection between terminals Z1, Y1 or 8, 9 - latch function disabled)

The relay operates when the measured value exceeds (or drops below) the set level for more than the set delay time.
It releases when the voltage drops below (or exceeds) the set level (see hysteresis setting), or when power supply is interrupted.

Example 2
(connection between terminals Z1, Y1 or 8, 9 - latch function enabled)

The relay operates and latches in operating position when the measured value exceeds (or drops below) the set level for more than the set delay time.
Provided that the voltage has dropped below (or has exceeded) the set point (see hysteresis setting) the relay releases when the interconnection between terminals Z1, Y1 or 8, 9 is interrupted, or power supply is interrupted as well.
The red LED flashes until the delay time has expired or the measured value has dropped below the set point (see hysteresis setting).

Note
When the inhibit contact is opened, if the input signal is already in alarm position, the delay time needs to elapse before relay activation.

Function/Range/Level and Time Delay Setting

Adjust the input range setting the DIP switches 1 and 2 as shown below.
Select the desired function setting the DIP switches 3 to 6 as shown below.
To access the DIP switches open the grey plastic cover as shown below.
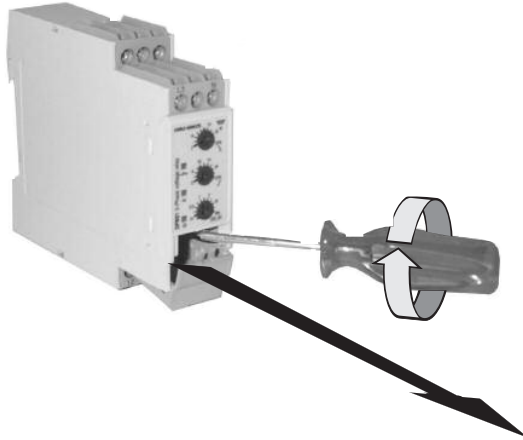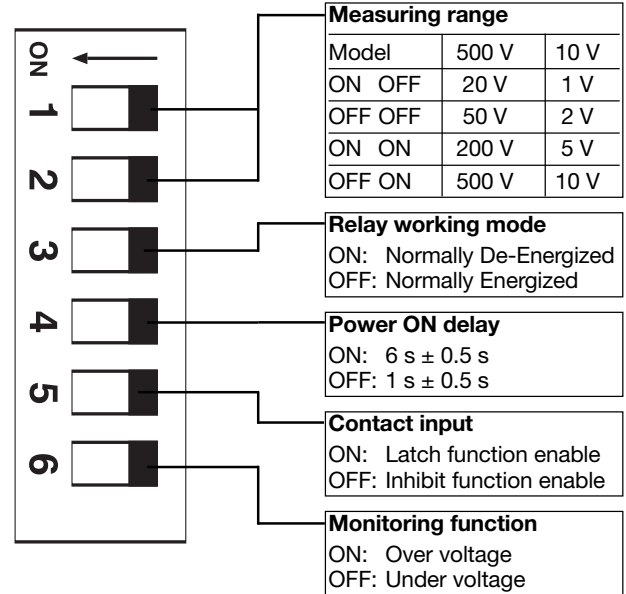
Selection of level and time delay:

Upper knob:
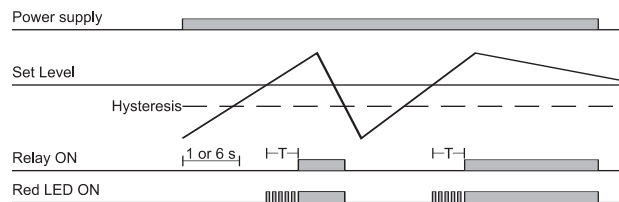Setting of hysteresis on relative scale: 0 to 30% on set value.

Centre knob:
Voltage level setting on relative scale: 10 to 110% on full scale.

Lower knob:
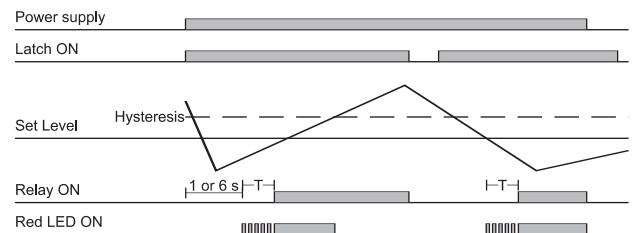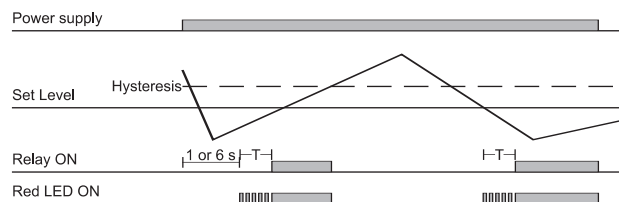Setting of delay on alarm time on absolute scale (0.1 to 30 s).

Measuring range		
Model	500 V	10 V
ON OFF	20 V	1 V
OFF OFF	50 V	2 V
ON ON	200 V	5 V
OFF ON	500 V	10 V

Relay working mode
ON: Normally De-Energized
OFF: Normally Energized

Power ON delay
ON: 6 s ± 0.5 s
OFF: 1 s ± 0.5 s

Contact input
ON: Latch function enable
OFF: Inhibit function enable

Monitoring function
ON: Over voltage
OFF: Under voltage

Operation Diagrams

Over voltage - N.D. relay

Power supply
Set Level
Hysteresis
Relay ON   1 or 6 s   ⊢T⊣
Red LED ON

Under voltage - Latch function - N.D. relay

Power supply
Latch ON
Set Level   Hysteresis
Relay ON   1 or 6 s ⊢T⊣   ⊢T⊣
Red LED ON

Under voltage - N.D. relay

Power supply
Set Level   Hysteresis
Relay ON   1 or 6 s ⊢T⊣   ⊢T⊣
Red LED ON

Over voltage - Inhibit function - N.D. relay

Power supply
Inhibit ON
Set Level
Hysteresis
Relay ON   1 or 6 s   ⊢T⊣   ⊢T⊣   ⊢T⊣
Red LED ON

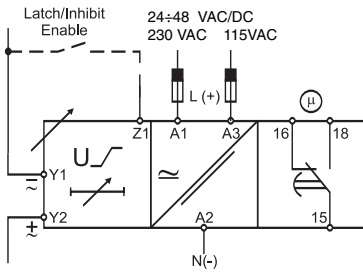Specifications are subject to change without notice (20.05.08)   **3**

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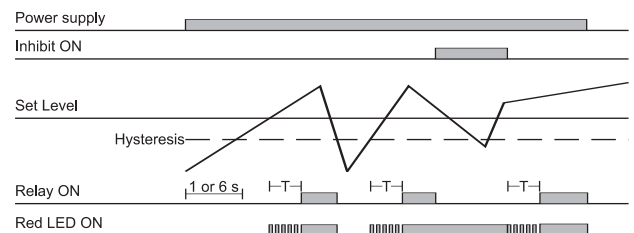
Wiring Diagrams

Example 1
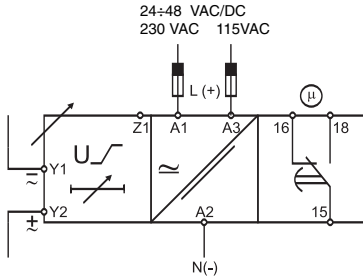
Example 2

DUB01

Example 2
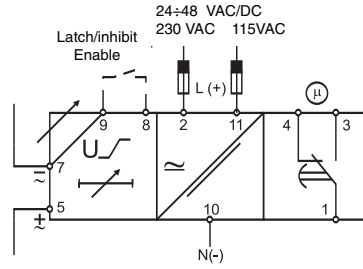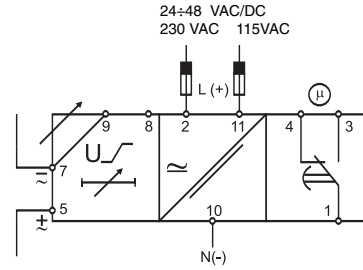
PUB01

Dimensions

DIN-rail

Plug-in

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