

# Monitoring Relays

## 1-Phase True RMS AC Over/Under Voltage

### Types DUB02, PUB02



DUB02



PUB02

- TRMS AC over/under voltage monitoring relays
- Measuring if power supply is within set limits
- Measure on own power supply
- Measuring ranges: 24, 115, 230 VAC
- Power ON delay 1 or 6 s selectable by DIP-switch
- Separately adjustable upper/lower level on relative scale
- Adjustable delay on alarm or on recovery (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 (DUB02) or plug-in module (PUB02)
- 22.5 mm Euronorm housing (DUB02) or 36 mm plug-in module (PUB02)
- LED indication for relay, alarm and power supply ON

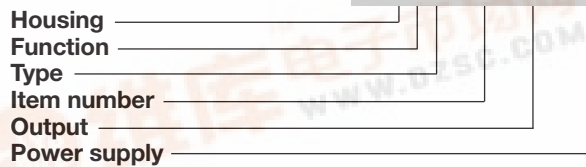
### Product Description

DUB02 and PUB02 are precise TRMS AC window voltage monitoring relays. The relays monitor their own power supply which is selectable by DIP-switch (24, 115 or 230 VAC). The advantage of using the latch function is that the relay can be kept energized

even after the end of the alarm condition. 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 02 C T23**



### Type Selection

Mounting	Output	Supply: 24, 115, 230 VAC
DIN-rail	SPDT	<b>DUB 02 C T23</b>
Plug-in	SPDT	<b>PUB 02 C T23</b>

### Input Specifications

Input		Upper level		Lower level
Own power supply	DUB02: A1, A2 (24, 115, 230 VAC) PUB02: 2, 10 (24, 115, 230 VAC)	-5% to +20%	22.8 to 28.8 V	-20% to +5% 19.2 to 25.2 V
Measuring ranges		109 to 138 V		92 to 121 V
Selectable by DIP-switch		218 to 275 V		184 to 242 V
24 VAC				
115 VAC				
230 VAC				
Contact input		Terminals Z1, Z2		
DUB02		Terminals 8, 9		
PUB02		> 10 kΩ		
Disabled		< 500 Ω		
Enabled		> 500 ms		
Pulse width				
Hysteresis		~ 2% of set value - fixed		

### Output Specifications

Output	SPDT relay
Rated insulation voltage	250 VAC
Contact ratings (AgSnO <sub>2</sub> )	
Resistive loads	μ
AC 1	8 A @ 250 VAC
DC 12	5 A @ 24 VDC
Small inductive loads	2.5 A @ 250 VAC
DC 13	2.5 A @ 24 VDC
Mechanical life	
	≥ 30 x 10 <sup>6</sup> operations
Electrical life	
	≥ 10 <sup>5</sup> 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

<b>Power supply</b> Rated operational voltage through terminals: A1 and A2 (DUB02) or 2 and 10 (PUB02)	Overvoltage cat. III (IEC 60664, IEC 60038)  24 VAC $\pm$ 20%, 115 VAC $\pm$ 20% or 230 VAC $\pm$ 20%
Dielectric voltage	None
<b>Dielectric voltage</b> Supply to output	4 kV
<b>Rated operational power</b>	4 VA

## General Specifications

<b>Power ON delay</b>	1 s $\pm$ 0.5 s or 6 s $\pm$ 0.5 s
<b>Reaction time</b>	(input signal variation from -20% to +20% or from +20% to -20% of set value) Alarm ON delay < 200 ms Alarm OFF delay < 200 ms

## General Specifications (cont.)

<b>Accuracy</b> Temperature drift Delay ON alarm Repeatability	(15 min warm-up time) $\pm$ 1000 ppm/ $^{\circ}$ C $\pm$ 10% on set value $\pm$ 50 ms $\pm$ 0.5% on full-scale
<b>Indication for</b> Power supply ON Alarm ON	LED, green LED, red (flashing 2 Hz during delay time)
Output relay ON	LED, yellow
<b>Environment</b> Degree of protection Pollution degree Operating temperature Storage temperature	IP 20 3 (DUB02), 2 (PUB02) -20 to 60 $^{\circ}$ C, R.H. < 95% -30 to 80 $^{\circ}$ C, R.H. < 95%
<b>Housing dimensions</b> DIN-rail version Plug-in version	22.5 x 80 x 99.5 mm 36 x 80 x 87 mm
<b>Weight</b>	Approx. 150 g
<b>Screw terminals</b> Tightening torque	Max. 0.5 Nm acc. to IEC 60947
<b>CE-Marking</b>	Yes

## Mode of Operation

DUB02 and PUB02 monitor the TRMS value of their own power supply.

### Example 1

(no connection between terminals Z1, Z2 or 8, 9 - Delay ON alarm - N.E. relay)

The relay operates and the yellow LED is ON as long as the measured value is within the upper and lower limits.

The relay releases after the adjustable time delay when

the measured voltage exceeds the upper set level or drops below the lower set level. The red LED flashes until the delay time has expired or the measured value falls off the limits.

### Example 2

(connection between terminals Z1, Z2 or 8, 9 - latching function enabled - delay on recovery - N.E. relay)

The relay operates and the

yellow LED is ON as long as the measured value is within the upper and lower limits.

The relay releases and latches in alarm position as soon as the measured voltage exceeds the upper set level or drops below the lower set level. Provided that the voltage has dropped below the upper set level (minus hysteresis) or exceeded the lower set level (plus hysteresis) for more than the set delay time, the relay operates

when the interconnections between terminals Z1, Z2 or 8, 9 are interrupted. The red LED flashes until the delay time has expired or the measured value falls off the limits.

## Function/Range/Level and Time Delay Setting

### Selection of function:

DIP-switch selector (1 to 4)

1  
ON  Delay ON recovery  
 Delay ON alarm

2  
 Relay de-energized in normal condition.

Relay energized in normal condition.

3

Power ON delay 6  $\pm$  0.5 s  
 Power ON delay 1  $\pm$  0.5 s

4

Contact input as latch function enable. When the contact is closed, the latch function is activated. Reset of the latch condition occurs when the contact is open or by power down.

Contact input as inhibit of alarm enable. When the contact is closed the relay remains in normal position even if the alarm condition occurs.

### Selection of ranges:

DIP-switch selector (5 to 6)

56  
 24 VAC  $\pm$  20%,  
45 to 65 Hz  
 115 VAC  $\pm$  20%  
45 to 65 Hz  
 230 VAC  
45 to 65 Hz

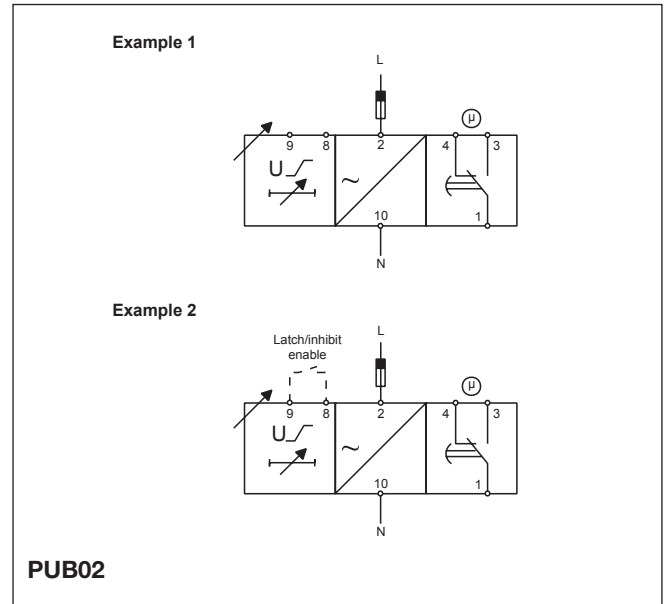
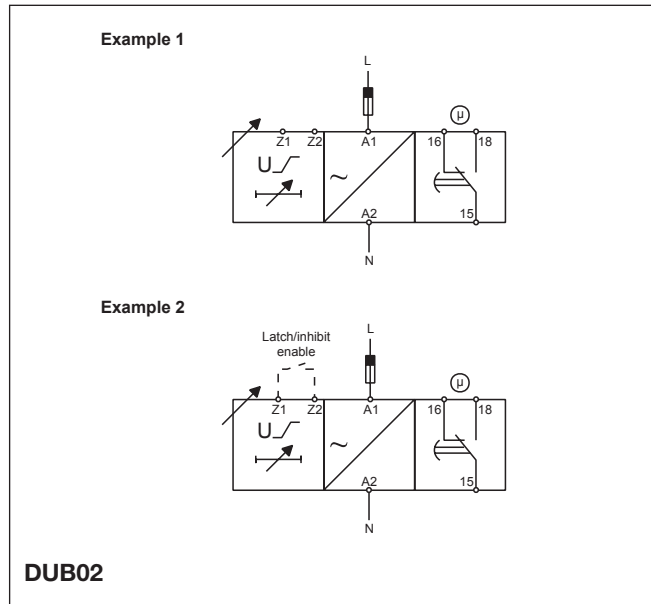
### Selection of level and time delay:

Upper knob:  
Setting of upper level on relative scale: -5% to +20% of set power supply voltage.

Centre knob:  
Setting of lower level on relative scale: -20% to +5% of set power supply voltage.

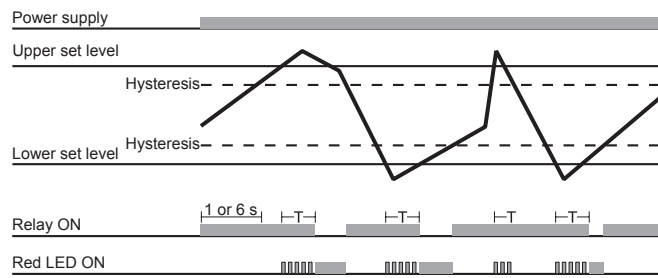
Lower knob:  
Setting of delay on alarm time on absolute scale (0.1 to 30 s).

## Wiring Diagrams

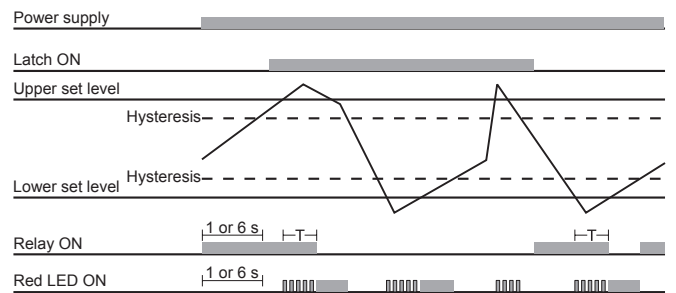


## Operation Diagrams

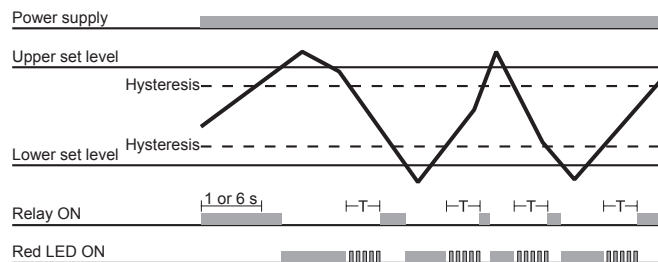
### Delay ON alarm



### Delay ON alarm - Latch function



### Delay ON recovery



### Delay ON recovery - Inhibit function

