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

**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.

### Product Description

- 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

### Ordering Key

<table>
<thead>
<tr>
<th>Housing</th>
<th>Function</th>
<th>Type</th>
<th>Item number</th>
<th>Output</th>
<th>Power supply</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>DUB01</td>
<td></td>
<td></td>
<td>DUB01</td>
<td></td>
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<tr>
<td>PUB01</td>
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<td>PUB01</td>
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</tbody>
</table>

### Type Selection

<table>
<thead>
<tr>
<th>Mounting</th>
<th>Output</th>
<th>Measuring range</th>
<th>Supply: 24 to 48 VAC/DC</th>
<th>Supply: 115/230 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN-rail</td>
<td>SPDT</td>
<td>0.1 to 10 V AC/DC</td>
<td>DUB 01 C D48 10V</td>
<td>DUB 01 C B23 10V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 to 500 V AC/DC</td>
<td>PUB 01 C D48 10V</td>
<td>PUB 01 C B23 10V</td>
</tr>
<tr>
<td>Plug-in</td>
<td>SPDT</td>
<td>0.1 to 10 V AC/DC</td>
<td>DUB 01 C D48 500V</td>
<td>DUB 01 C B23 500V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 to 500 V AC/DC</td>
<td>PUB 01 C D48 500V</td>
<td>PUB 01 C B23 500V</td>
</tr>
</tbody>
</table>

### Input Specifications

**Input (voltage level)**
- DUB01
- PUB01

<table>
<thead>
<tr>
<th>Measuring ranges</th>
<th>Int. resist.</th>
<th>Max. volt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Selectable by DIP-switches</td>
<td>&gt;200 kΩ</td>
<td>100 V</td>
</tr>
<tr>
<td>0.1 to 1 V AC/DC</td>
<td>&gt;200 kΩ</td>
<td>100 V</td>
</tr>
<tr>
<td>0.2 to 2 V AC/DC</td>
<td>&gt;200 kΩ</td>
<td>100 V</td>
</tr>
<tr>
<td>0.5 to 5 V AC/DC</td>
<td>&gt;200 kΩ</td>
<td>100 V</td>
</tr>
<tr>
<td>1 to 10 V AC/DC</td>
<td>&gt;200 kΩ</td>
<td>200 V</td>
</tr>
<tr>
<td>2 to 20 V AC/DC</td>
<td>&gt;500 kΩ</td>
<td>350 V</td>
</tr>
<tr>
<td>5 to 50 V AC/DC</td>
<td>&gt;500 kΩ</td>
<td>350 V</td>
</tr>
<tr>
<td>10 to 200 V AC/DC</td>
<td>&gt;500 kΩ</td>
<td>600 V</td>
</tr>
<tr>
<td>20 to 500 V AC/DC</td>
<td>&gt;500 kΩ</td>
<td>600 V</td>
</tr>
<tr>
<td>50 to 500 V AC/DC</td>
<td>&gt;500 kΩ</td>
<td>1000 V</td>
</tr>
<tr>
<td>Max. voltage for 1 s</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Contact input**
- DUB01
- PUB01

<table>
<thead>
<tr>
<th>Disable</th>
<th>Enabled</th>
<th>Latch disable</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 10 kΩ</td>
<td>&lt; 500 Ω</td>
<td>&gt; 500 ms</td>
</tr>
</tbody>
</table>

Specifications are subject to change without notice (08.06.10)
### Output Specifications

**Output**
- Rated insulation voltage: 250 VAC

**Contact ratings (AgSnO₂)**
- Resistive loads: AC 1 (8 A @ 250 VAC), DC 12 (5 A @ 24 VDC), AC 15 (2.5 A @ 250 VAC), DC 13 (2.5 A @ 24 VDC)

**Mechanical life**: ≥ 30 x 10⁶ operations

**Electrical life**: ≥ 10⁸ operations (at 8 A, 250 V, cos ϕ = 1)

**Operating frequency**: ≤ 7200 operations/h

**Dielectric strength**
- Dielectric voltage: 2 kVAC (rms)
- Rated impulse withstand voltage: 4 kV (1.2/50 μs)

### 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**
- 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
- Material: PA66 or Noryl

**Weight**: Approx. 150 g

**Screw terminals**
- Tightening torque: Max. 0.5 Nm acc. to IEC 60947

**Product standard**: EN 60255-6

**Approvals**: UL, CSA

**CE Marking**
- L.V. Directive 2006/95/EC
- EMC Directive 2004/108/EC
- EM Immunity
- Emissions

### Power Supply Specifications

**Power supply**
- Rated operational voltage through terminals: A1, A2 or A3, A2 (DUB01), 2, 10 or 11, 10 (PUB01)
  - D48: 24 to 48 VAC/DC ± 15%
  - 45 to 65 Hz, insulated
  - 115/230 VAC ± 15%
  - 45 to 65 Hz, insulated
- B23: 24 to 48 VAC/DC ± 15%

**Dielectric voltage**
- Supply to input: 2 kV
- Supply to output: 4 kV
- Input to output: 4 kV

**Rated operational power**
- AC: 4 VA
- DC: 3 W

### 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. 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).

**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).

Operation Diagrams

Over voltage - N.D. relay

Under voltage - Latch function - N.D. relay

Power supply
Set Level
Hysteresis
Relay ON: 1 or 5 s
Red LED ON
Power supply
Latch ON
Set Level
Hysteresis
Relay ON: 1 or 5 s
Red LED ON

Under voltage - N.D. relay

Over voltage - Inhibit function - N.D. relay

Power supply
Inhibit ON
Set Level
Hysteresis
Relay ON: 1 or 5 s
Red LED ON
Power supply
Latch ON
Set Level
Hysteresis
Relay ON: 1 or 5 s
Red LED ON
Wiring Diagrams

Example 1

Example 2

Dimensions

DIN-rail

Plug-in

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