JUMO eTRON T
Digital Thermostat
with LC display for mounting on a 35mm DIN rail

Brief description

The JUMO eTRON T is a compact digital thermostat in 90mm x 22.5mm format for simple temperature control (heating or cooling). The measurement input permits the connection of resistance thermometers or thermocouples, or standard current or voltage signals. The measured value is shown on a 3-digit LC display.

The switching status of the relay K1 is indicated by an LED. The instrument is operated from 3 keys on the front panel. The electrical connection is made via screw terminals.

A setup program and a PC interface are available as accessories, for easy configuration and parameterization from a PC.

Key features

- Heating or cooling is configurable
- Limit monitoring
- Available for resistance thermometer, thermocouple, standard current or voltage signals, according to choice
- 10A relay (changeover contact)
- Adjustable switching hysteresis
- Simple, space-saving installation
- Time-delayed switch-on after power-on is selectable, e.g. for staggered starting of several equipment units
- 3-digit LC display with special characters for °C and °F
- Parameter level protected by code
- Setup program for configuration and archiving via PC
- Customized linearization via tabular function in the setup program
- UL approval

Block structure

Measurement input group 1

PT100, PT1000 or KTYX-6
in 5-wire circuit, configurable

Measurement input group 2 or

Thermocouples Fe-Con J, L
or NiCr-Ni K, configurable

Measurement input group 3 or

Current 0(4) – 20 mA

Measurement input group 4 or

Voltage 0 – 10 V

Supply

230 V AC ±10% -15 %, 48 – 63 Hz
115 V AC ±10% -15 %, 48 – 63 Hz
12 – 24 V DC ±15% -15 %
24 V AC ±15% -15 %, 48 – 63 Hz

Keys

3 keys for instrument operation

Displays and controls

LC display

3-digit segment display with symbols for the temperature unit, 8mm high

Status indication

LED K1 lights up when the output relay is energized.

Keys

P programming

increase setpoint or parameter value (dynamically)

decrease setpoint or parameter value (dynamically)

Setup interface

The instrument is linked to a PC via a PC interface with TTL/RS232 converter and adapter (3-pin).
## Technical data

<table>
<thead>
<tr>
<th>Measurement input</th>
<th>Designation</th>
<th>Measuring range</th>
<th>Meas. accuracy¹/ambient temperature error</th>
<th>Recognition of Probe short-circuit</th>
<th>Recognition of Probe break</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance thermometer</td>
<td>Pt100 EN 60 751</td>
<td>-200 to +600°C</td>
<td>0.1%/≤100ppm/°C</td>
<td>is recognized</td>
<td>is recognized</td>
</tr>
<tr>
<td></td>
<td>Pt1000 EN 60 751</td>
<td>-200 to +600°C</td>
<td>0.1%/≤100ppm/°C</td>
<td>is recognized</td>
<td>is recognized</td>
</tr>
<tr>
<td></td>
<td>KTY2X-6 (PTC)</td>
<td>-50 to +150 °C</td>
<td>1%/≤100ppm/°C</td>
<td>is recognized</td>
<td>is recognized</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 — 3000 Ω</td>
<td>0.1%/≤100ppm/°C³</td>
<td>= 0Ω</td>
<td>is recognized</td>
</tr>
</tbody>
</table>

Measuring current for Pt100: 0.2 mA, for Pt1000, KTY2X-6 or resistance: 0.02 mA

Lead compensation is adjustable via the parameter Lead compensation resistance $\Delta R_f$.

The total resistance (sensor+lead) must not exceed 3200 Ω for Pt100 and 32000 Ω for Pt1000, KTY2X-6 or resistance.

### Thermocouple

<table>
<thead>
<tr>
<th>Thermocouple</th>
<th>Measuring range</th>
<th>Meas. accuracy¹/ambient temperature error</th>
<th>Recognition of Probe short-circuit</th>
<th>Recognition of Probe break</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fe-Con J EN 60 584</td>
<td>-200 to +999 °C</td>
<td>0.4%/≤100ppm/°C²</td>
<td>-</td>
<td>is recognized</td>
</tr>
<tr>
<td>Fe-Con L DIN 43 710</td>
<td>-200 to +900 °C</td>
<td>0.4%/≤100ppm/°C²</td>
<td>-</td>
<td>is recognized</td>
</tr>
<tr>
<td>NiCr-Ni K EN 60 584</td>
<td>-200 to +999 °C</td>
<td>0.4%/≤100ppm/°C²</td>
<td>-</td>
<td>is recognized</td>
</tr>
<tr>
<td>-10 to 60 mV</td>
<td>customer table ³</td>
<td>0.1%/≤100ppm/°C³</td>
<td>-</td>
<td>is recognized</td>
</tr>
</tbody>
</table>

For the voltage input (-10 to 60 mV), terminal temperature compensation can be used for thermocouples.

Internal terminal temperature compensation can be switched off via the setup program (0°C).

### Current

<table>
<thead>
<tr>
<th>Current</th>
<th>Measuring range</th>
<th>Meas. accuracy¹/ambient temperature error</th>
<th>Recognition of Probe short-circuit</th>
<th>Recognition of Probe break</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 — 20 mA</td>
<td>-2 to 22 mA scalable with $S_{CL}$ and $S_{CH}$ or customer table</td>
<td>0.1%/≤100ppm/°C³</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4 — 20 mA</td>
<td>2.4 to 21.6 mA scalable with $S_{CL}$ and $S_{CH}$</td>
<td>0.1%/≤100ppm/°C³</td>
<td>is recognized</td>
<td>is recognized</td>
</tr>
</tbody>
</table>

Input resistance $R_{IN}$ ≤ 3Ω

### Voltage

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Measuring range</th>
<th>Meas. accuracy¹/ambient temperature error</th>
<th>Recognition of Probe short-circuit</th>
<th>Recognition of Probe break</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 — 10 V</td>
<td>-1 to 11 V scalable with $S_{CL}$ and $S_{CH}$ or customer table</td>
<td>0.1%/≤100ppm/°C³</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Input resistance $R_{IN}$ ≥ 100kΩ

1.) The accuracies refer to the measuring range span.
2.) valid from -50°C
3.) A valid customer table must be entered via the setup program and switched over to $\xi R_B$ in the instrument.

This may reduce the measuring accuracy.

## Additional data

<table>
<thead>
<tr>
<th>Sampling time</th>
<th>250 msec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input filter</td>
<td>1st order digital filter; filter constant $\Delta F$ adjustable from 0.1 — 99.9sec</td>
</tr>
<tr>
<td>Measurement offset</td>
<td>adjustable from -99.9 to +99.9 via the parameter $\Delta F_{\xi}$</td>
</tr>
<tr>
<td>Special features</td>
<td>display of temperature unit: °C, °F (Fahrenheit) or switched-off</td>
</tr>
<tr>
<td>Customer table</td>
<td>The setup program acquires a maximum of 20 value pairs and uses them for the linear interpolation of 20 new calibration points.</td>
</tr>
</tbody>
</table>

## Ambient conditions

- Ambient temperature range: 0 to +55°C, with side-by-side mounting 0 to +40°C
- Storage temperature range: -40 to +70°C
- Climatic conditions: ≤75% rel. humidity annual mean, no condensation
- Cleaning and care of front panel: The front panel can be cleaned with all the usual cleaning and rinsing agents. Do not use solvents such as methylated spirit, white spirit, P1 or xylene!

## Relay output

| Relay (changeover contact) | 150,000 operations at 10A 250V AC resistive load |

## Supply

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>230V AC +10/-15%, 48 — 63Hz or 115V AC +10/-15%, 48 — 63Hz (isolated from measurement input)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>&lt; 4VA</td>
</tr>
</tbody>
</table>

## Housing

<table>
<thead>
<tr>
<th>Material</th>
<th>polycarbonate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting</td>
<td>35mm x 7.5mm DIN rail to EN 50 022</td>
</tr>
<tr>
<td>Operating position</td>
<td>unrestricted</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 110g</td>
</tr>
<tr>
<td>Protection</td>
<td>IP20</td>
</tr>
<tr>
<td>Flammability class</td>
<td>UL 94 V0</td>
</tr>
</tbody>
</table>
Electrical data

<table>
<thead>
<tr>
<th>Connection diagram Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 701050/XX1-31: Measurement input and supply voltage are not isolated from each other!</td>
</tr>
</tbody>
</table>

**Electrode parameters**
- Supply: 230V AC +10/-15%
- 115V AC +10/-15%
- 12 – 24V DC +15/-15%
- 24V AC +15/-15%
- 48 – 63Hz

**Measurement input**
- Thermocouples: Fe-Con J, L, and NiCr-Ni K
- Standard signals: current 0(4) – 20 mA, voltage 0 – 10 V

**Resistance thermometers:**
- Pt100/ Pt1000/ KTY2X-6

**Relay output**
- Changeover contact (floating) 10A/250V AC

**Dimensions**

**Order details**

- (1) Basic version
  - 701050/
- (2) Basic type extension
  - Version 8 factory-set, configurable within the measurement input group
  - Version 9 configured to customer specifications
  - Measurement input group 1 Pt100 in 2-wire circuit
  - Pt1000 in 2-wire circuit
  - KTY2X-6
- (3) Supply
  - 02 230V AC +10/-15% 48 – 63Hz
  - 05 115V AC +10/-15% 48 – 63Hz
  - 31 12 – 24V DC +15/-15%
  - 24V AC +15/-15%
  - 48 – 63Hz
- (4) Approvals
  - 000 none

**Order code**

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>701050</td>
<td>811</td>
<td>02</td>
<td>000</td>
</tr>
</tbody>
</table>

**Order example**

- 701050 / 811 - 02 - 000

**Accessories**

- Setup program, multilingual
- PC interface with TTL / RS232C converter and adapter (pins)

**Suitable transducers can be found in these data sheets:**
- 90.2050 Push-in resistance thermometers
- 90.2150 Screw-in resistance thermometers
- 90.1020 and subsequent ones for screw-in thermocouples
- 90.1110 and subsequent ones for push-in thermocouples
- 90.1210 Mineral-insulated thermocouples