Decade Pt100 Simulator
Model 4501

Application
Wherever temperatures are measured, temperatures must also be simulated. The Pt100 simulator is suitable for a wide area of applications. It has a wide range of simulation, which is divided in 0.1 °C steps and makes many assignments in chemistry-, measuring-, controlling-, medicine and household applications, food industry, vehicle construction, air- and space travel and power plants easy to solve. In the past several simulators had often to be used alongside to achieve either resolution or the range of the relevant application. As an extra advantage to the user temperatures can be entered in degrees of celsius. Additional extensive conversions and readings in tabulation sheets are no longer necessary.

Description
There are five precision decade switches in a sturdy metal housing. The desired temperature value is selected in four steps with a 0.1 °C resolution in ranges from -100 °C to max. 500 °C. According to DIN EN 60751 the precision resistors simulate the temperature values for the Pt100 resistor. The simulated temperature value is called on the output plugs "Rsim". If required, the line resistance of 10, 20 and 30 Ω can also be simulated. The celsius scale, displaced by 273.15 K against the absolute temperature requires that an additional switch-over of polarity is performed at negative celsius temperature values. The simulator is high ohmic at wrongly entered + or - signs. An unintentional misuse is practically impossible. The switches are implemented in a short-circuit control manner. The precision resistors in the 100 °C decade will therefore be switched parallely at the moment of switch-over, in all other decade steps there is no effect at switch-over. The used resistor material MANGANIN® has a temperature coefficient smaller ≤ 10 ppm/K. This makes a consideration of the environmental temperature normally superfluous.

- Simulation range -100 °C ... +500 °C
- Resolution 0.1 K
- Calibration in accordance to DIN EN 60751
- Simulation of line resistance 10 Ω, 20 Ω or 30 Ω
- Sturdy aluminium-housing
**Technical Data**

- **Simulation range:** -100 °C ... +500 °C
- **Resolution:** 0.1 K
- **Calibration:** according DIN EN 60751
- **Error limit:** ± 0.5 K
- **Switches:** 5 precision switches in very low-ohmic design, shorting switch mode

**Temperature coefficient:**

\[ \pm(8 \times 10^{-3} + 3 \times 10^{-5} \cdot t) \cdot \Delta \vartheta \]  
\( t = \) simulated temperature in °C,  
\( \Delta \vartheta = \) difference of surrounding temperature to 23 °C

- **Measuring current:** max. 50 mA
- **Operating temperature range:** +5 °C ... +23 °C ... +50 °C, ... 80 % relative humidity, non-condensing
- **Storage temperature:** 0 ... 60 °C
- **Insulation resistance:** > 100 MΩ
- **Connection technology:** 2 wire, with simulation possibility of line resistances (10 Ω + 20 Ω ± 1 %)
- **Long-term stability:** < 0.1 K/year
- **Resistance material:** MANGANIN®,  \( T_a \leq 10 \) ppm/K
- **Housing:** aluminium case; shields well against electric interferences
- **Connections:** counter-sunk safety connectors, ø 4 mm
- **Dimensions (W x H x D):** 150 x 70 x 105 [mm]
- **Weight:** 500 g

**Examples for Application**

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<th>Sign switch</th>
<th>Left-hand digital switch</th>
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**Order Information**

Decade Pt100 simulator  
_Model 4501_

a test certificate with traceability confirmation part of delivery.

**Accessories**

- Functional bag with carrying straps for protection and transport  
_Model 4592_

**DAkkS/WKS Manufacturer Calibration Certificate**

On the Calibration Certificate the desired values for the resistance are indicated and the calculated temperature values indicated too.

- **DAkkS Calibration**  
_Model 45DKD-4501_
- **WKS Calibration**  
_Model 45WKS-4501_

**Operating instructions**

The sign for the temperature must be the same on the sign selection switch +/- and on the left-hand decade switch.

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