

# Precision RTD Simulator

## Model 4530

Code:	4530 EN
Delivery:	6 weeks
Warranty:	24 months



- Simulation of Pt100, Pt200, Pt500, Pt1000, Ni100 and Ni1000 sensors
- Accuracy 0.02 °C
- Temperature scales ITS 90, IPTS 68
- Real Ohm simulation
- Control manually or remotely via RS232/IEEE488/USB Converter

### Application

The precision RTD simulator is used where measuring instruments or controlling means have to be examined or calibrated with high precision.

The simulator is suitable for calibration laboratory and service-centers which need a computer-controlled resistance decade for the automation of calibration procedures.

All standard platinum and nickel RTD can be simulated with very high accuracy according to scales ITS 90 or IPTS 68.

Temperature regulators, transducers etc. often supply a pulsed signal current in order to reduce the self-heating of the RTD. Devices with electronic simulation of RTD are therefore inclined to swinging and do not operate with this application. Here, the advantage of the RTD simulator model 4530 becomes obvious as it can simulate the resistance sensor by real Ohm simulation without problems.

Of course the RTD simulator can be used also as classical resistance decade.

### Description

The equipment comes in a sturdy aluminium housing. The keyboard and display are located at the front panel. 2-, 3- and 4-wire connections are possible at the back side.

Pt100, Pt200, Pt500, Pt1000, Ni100 or Ni1000 can be selected by simple menu navigation. In addition, the selection of temperature scales ITS 90 (DIN EN 60751) or IPTS 68 (DIN 43760) and two coefficients  $\alpha = 0.385$  (European) or  $\alpha = 0.392$  (US) is possible. After entry of the characteristic values the input of the temperature levels can be made very simple by the numeric keyboard. Presently set values are indicated in the display.

Relays with low thermovoltage and stable foil resistances with very small temperature coefficients are the heart of the simulator.

**Technical Data**

Range of temperature simulation: - 200 °C ... 850 °C  
 Type of sensors: Pt100, Pt200, Pt500, Pt1000, Ni100 and Ni1000  
 Temperature scales: ITS 90, IPTS 68  
 Pt sensors coefficient:  $\alpha = 0.385$  (DIN) or  $\alpha = 0.392$  (US)  
 Pt sensors standards: DIN EN 60751  
 Ni sensors standards: DIN 43760  
 Range of resistance simulation: 16  $\Omega$  ... 10000  $\Omega$   
 Temperature coefficient: < 1 ppm/°C (16  $\Omega$  ... 2000  $\Omega$ ) or < 5 ppm/°C (2 k $\Omega$  ... 10 k $\Omega$ )  
 Maximum power dissipation: 0.3 W  
 Maximum current: 100 mA (16 ..... 30  $\Omega$ ), 50 mA (30 ..... 100  $\Omega$ ), 20 mA (100 ..... 500  $\Omega$ ), 10 mA (500 ..... 3000  $\Omega$ ), 5 mA (3000 ..... 10000  $\Omega$ )  
 Connection: 2-, 3- and 4-wire  
 Terminals: 4 mm, gold plated terminals  
 Remote control: RS232 interface, galvanically isolated or IEEE488  
 Reaction time in remote mode: < 3 ms  
 Power supply: 100-240 VAC / 50/60 Hz  
 Operating temperature range: + 5 °C ... + 40 °C  
 - within the specifications 23 °C  $\pm$  5 °C  
 Storage temperature range: - 10 °C ... + 50 °C  
 Protection class: IP20  
 Dimensions (W x H x D): 250 x 100 x 390 [mm]  
 Weight: 4.0 kg

**Accuracy**

Specified accuracy is valid after 10 minutes warm-up in temperature range 23 °C  $\pm$  5 °C. Uncertainties include long-term stability, temperature coefficient, linearity, load and line regulation they are traceable to national calibration standards. Accuracy assigned in % is related to the set value. Specified accuracy is valid for one year.

**Resistance simulation**

Range	Accuracy
16.0000 ... 400.00 $\Omega$	0.003 % + 3 m $\Omega$
400.00 ... 2000.0 $\Omega$	0.005 %
2000.0 ... 10000 $\Omega$	0.015 %

**Pt sensor simulation**

Temperature Range	Accuracy			
	Pt100	Pt200	Pt500	Pt1000
- 200.000 ... 200.000 °C	0.02 °C	0.02 °C	0.02 °C	0.03 °C
200.000 ... 500.000 °C	0.03 °C	0.04 °C	0.06 °C	0.15 °C
500.000 ... 850.000 °C	0.04 °C	0.06 °C	0.15 °C	0.2 °C

**Ni sensor simulation**

Temperature Range	Accuracy	
	Ni100	Ni1000
- 60.000 ... 250.000 °C	0.02 °C	0.1 °C

It is possible to simulate feed line resistances of 10  $\Omega$  and 20  $\Omega$ . The accuracy of the resistances is 0.1 %.

**Order Information**

- RTD simulator with RS232, desktop housing including power cable, manual, data cable, Demo CD and test certificate **Model 4530-V300**
- RTD simulator with IEEE488, desktop housing including power cable, manual, Demo CD and test certificate **Model 4530-V400**
- 19"-Rack mount kit (3HU) **Model 2316-Z001**
- USB/RS232 converter **Model 9900-K361**

**DAkKS Calibration Certificate**

DAkKS calibration of the RTD simulator is made by simulation of 9 resistance values at 20  $\Omega$ , 50  $\Omega$ , 100  $\Omega$ , 200  $\Omega$ , 1 k $\Omega$ , 2 k $\Omega$ , 5 k $\Omega$  und 10 k $\Omega$ . **Typ 45DKD-4530**

**Application**

Temperature measurement device      Recording device      4 wire adaption

Temperature transmitter

Precision RTD simulator 4530 back side

**Calibration of temperature measurement, temperature regulators, head transmitters etc. in production**  
 In production the temperature measurement, temperature regulators, transmitters are calibrated in compliance with the data and/or for the building of a test certificate with the RTD simulator model 4530.  
 Precise temperature values are simulated via PC control or manual input.  
 The real Ohm simulation takes place in 2-, 3- or 4-wire connection.