# OPERATION MANUAL

## Pt100-Simulators
## Model 4506, 4506 S



Valid from: 06.02.2017

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2522-BA4506EN-5170-021519

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# EU-Konformitätserklärung (nach EN ISO/IEC 17050-1:2010)

*EU-Declaration of conformity (in accordance with EN ISO/IEC 17050-1:2010)*

**Name des Ausstellers:** burster präzisionsmesstechnik gmbh & co kg
*Issuer's name:*

**Anschrift des Ausstellers:** Talstr. 1-5
*Issuer's address:* 76593 Gernsbach, Germany

**Gegenstand der Erklärung:** Präzisions-PT100-Simulator
*Object of the declaration:* *Precision PT100 Simulator*

Modellnummer(n) (Typ): 4506
*Model number / type:*

Diese Erklärung beinhaltet obengenannte Produkte mit allen Optionen
*This declaration covers all options of the above product(s)*

**Das oben beschriebene Produkt ist konform mit den Anforderungen der folgenden Dokumente:**
*The object of the declaration described above is in conformity with the requirements of the following documents:*

| **Dokument-Nr.** *Documents No.* | **Titel** *Title* | **Ausgabe** *Edition* |
|---|---|---|
| 2011/65/EU | Richtlinie zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten<br>*Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment* | 2011 |
| *2014/30/EU* | *Richtlinie zur Harmonisierung der Rechtsvorschriften der Mitgliedsstaaten über die Elektromagnetische Verträglichkeit*<br>*Directive on the harmonization of the laws of the Member States relating to electromagnetic compatibility* | *2014* |
| *EN 61326-1* | *Elektrische Mess-, Steuer-, Regel- und Laborgeräte – EMV-Anforderungen – Teil 1: Allgemeine Anforderungen*<br>*Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements* | *2013* |

Gernsbach — Ort / *place*
20.04.2016 — Datum / *date*
i.V. Christian Karius — *Quality Manager*

Dieses Dokument ist entsprechend EN ISO/IEC 17050-1:2010 Abs. 6.1g **ohne Unterschrift** gültig
*According EN ISO/IEC 17050 this document* ***is valid without a signature.***

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# Index

# 1 GENERAL

## 1.1 Application

The precision Pt 100 simulator is used wherever measuring instruments or controlling systems have to be tested or calibrated with great precision.

The standard design, model 4506, simulates 24 set temperature values. Totally different temperature ranges are required in the case of special applications, such as in the food industry, the medical science etc. Model 4506 S is recommended for these applications and can be fitted with 24 temperature values according to customer specifications.

A distinctive feature of these simulators is their easy operation. The resistance values required for simulation are directly set in °C. There is no need to use loof-up tables. In cases a certificate is being demanded more than ever for measurements. It is available under order code 45DKD.

## 1.2. Description

The unit houses a high-quality switch with precision wire-wound resistors made of MANGANIN®. It is installed in a handy and rugged metal casing (with DIN sockets). 24 set temperature values are simulated using the selector switch in accordance with DIN EN 6075 standard values for resistance thermometers (Pt 100). The simulated resistance value, corresponding in its value to the individually set temperature, is picked up at the "$R_{Sim}$"output socket. The four-wire connecting system permits the connection of a separate current and voltage path. Supply lead resistance is therefore eliminated and does not appear in the measurements.

The 24 temperatures are chosen to provide several calibration points suitable for most measuring instruments. The resistors are subject to careful artificial ageing before trimming. This special process and trimming about half the tolerance guarantee a long-term stability of < 0.02 % for years. The material used for the resistors, MANGANIN®, has a temperature coefficient of less than 10 ppm/K. Allowances for ambient temperatures are therefore superfluous.

## 1.3 Technical Data

| | |
|---|---|
| Simulation range: | 24 fixed temperature values |
| Calibration: | according to DIN EN 60751 (ITS 90) |
| Accuracy: | ± (0.082 + 0.0003 · t) in °C for t > – 50 °C<br>± (0.16 + 0.0006 · t) in °C for t – 200 °C to – 50 °C<br>( t = input value in °C) |
| Temperature coefficient: | < 10 ppm/K<br>for each temperature value a wire-wound MANGANIN®-resistor is mounted |
| Long-term stability: | < 0.02 % over years |
| Precision switch: | in very low-ohmic design ≤ 0.8 mΩ,<br>short circuit switching |
| Switch contacts: | electrolytic copper plated with silver |
| Connection: | 4-wire |
| Housing: | aluminium case, beige<br>good shielding against electric interferences |
| Weight: | approx. 800 g |

## 1.4 DKD Calibration Certificate

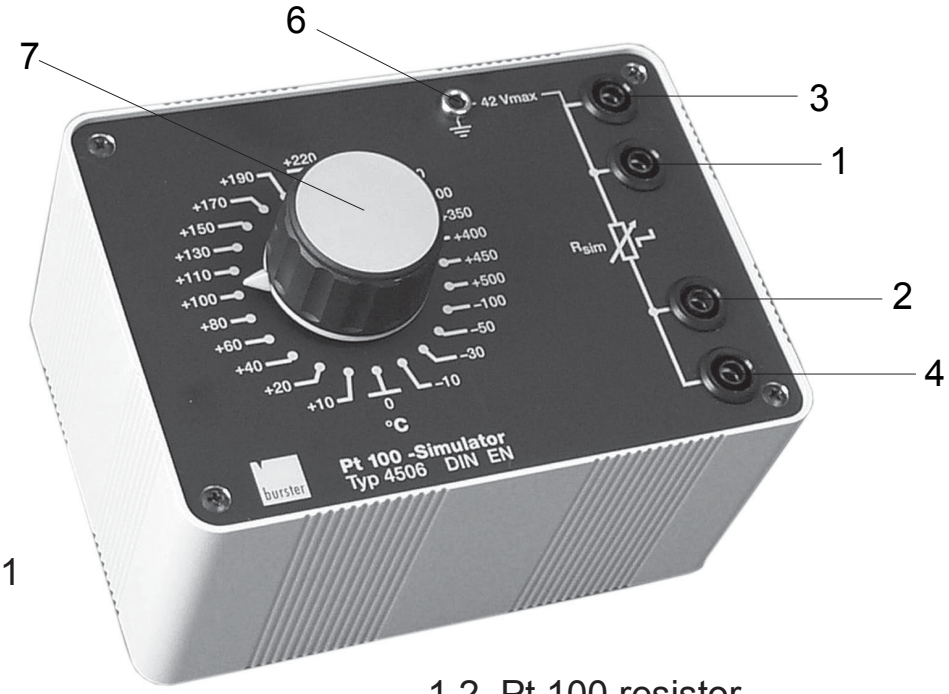
DKD stands for “Deutscher Kalibrierdienst” = German Calibration Service. burster präzisionsmesstechnik maintains a calibration station for determining electric measuring factors, which is affiliated to the Deutsche Kalibrierdienst (DKD). Supervised by the Physikalisch-Technische Bundesanstalt (PTB) of Braunschweig, the calibration station at burster is authorized to issue calibration certificates. The measuring results and uncertainties in measurement as shown in the calibration certificate are determined by standards and measuring instruments which in turn are subject to a periodical check and comparison with the official standard specifications of the Federal Republic of Germany. Proof of the official calibration is the calibration certificate itself and a calibration mark is applied to the test piece.

The calibration certificate shows the resistance referring to the temperature values, according to DIN EN 60751 (ITS 90), as well as the uncertainty of each temperature value in the temperature from -200 °C to + 850 °C the uncertainties for the described Pt 100 simulators are ± 3 mK to ± 45 mK. Thus the calibration certificate of a simulator enables an exact control of the measuring device.

**Order Code: 45 DKD-**.... (please state simulator model to calibrate)

# 2 Operators Manual

## 2.1 Operating, Plugs




Picture 1

1,2 Pt 100 resistor
3,4, Connection in 4-wire
6 PE-connection if required
7 Setting

**Connecting socket (View 1, Index 1, 2)**
Over the connecting sockets the simulated resistance value can be measured.

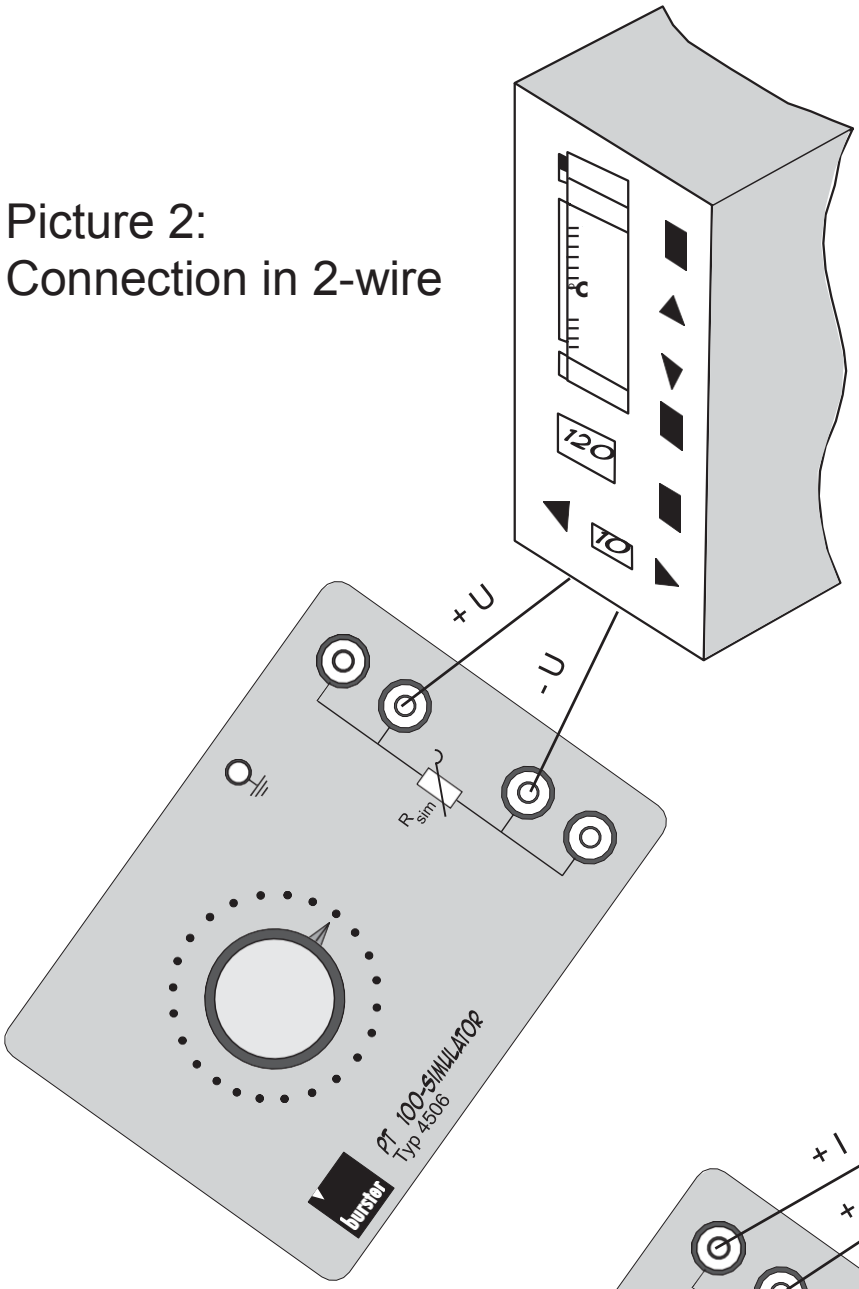
**Connecting socket (View 1, Index 3, 4)**
Over the connecting sockets the simulated resistance value can be measured with 4-wire.

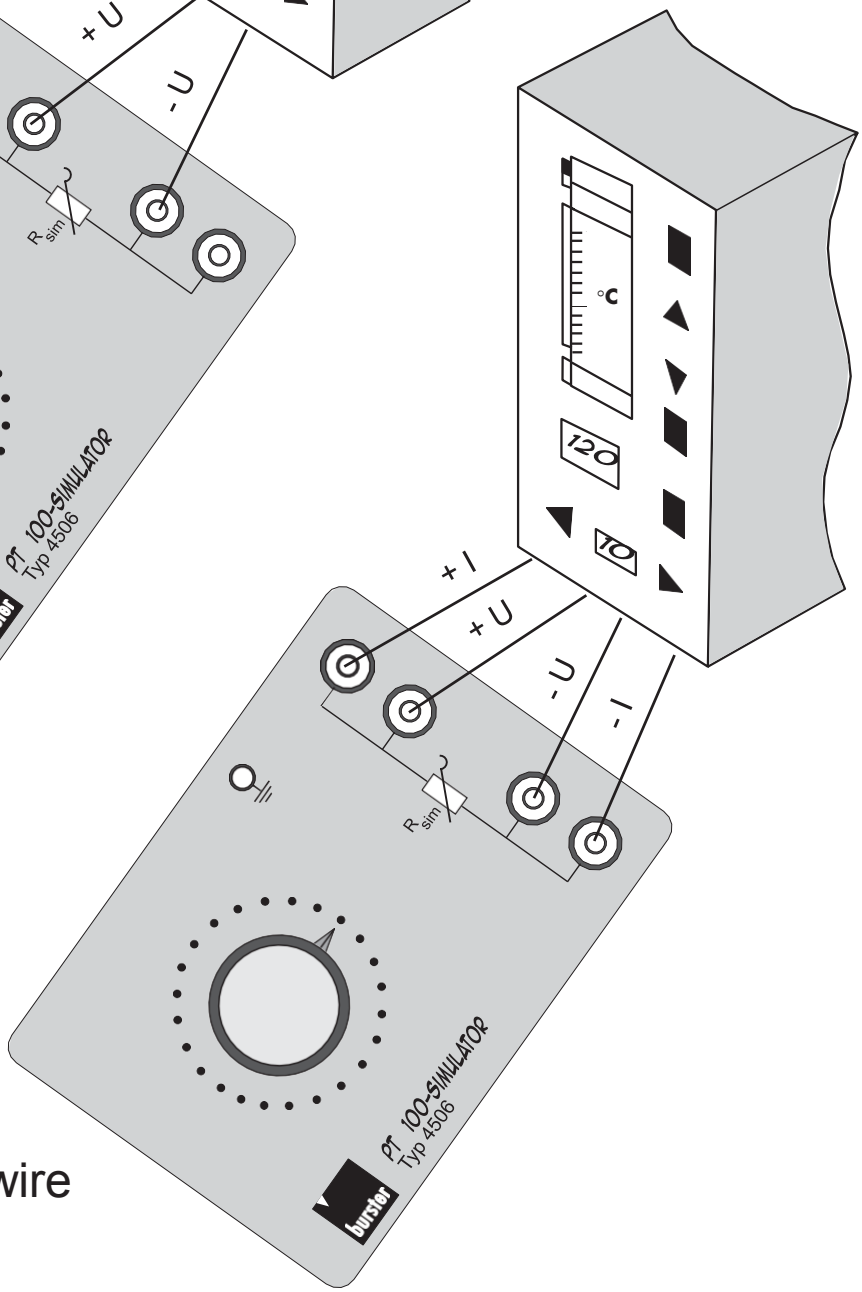
**Connecting socket (View 1, Index 6)**
Over this monitoring socket the metallic parts of the equipment are outward connected.
Here the user has to make the possibility grounding measures.

**Rotary knob (View 1, Index 7)**
The rotary knob used for adjustment the selected temperature range in °C.

## 2.2 Instructions

Picture 2:
Connection in 2-wire




Picture 3:
Connection in 4-wire