

# Hand-held multi-function calibrator Model CEP6000

WIKA data sheet CT 83.01

## Applications

- Calibration service companies and service industry
- Measurement and control laboratories
- Industry (laboratory, workshop and production)
- Quality assurance

## Special features

- Highest accuracy in class of up to  $\pm 0.015\%$  of reading
- Measuring and simulation of thermocouples (13), resistance thermometers (13), resistance, current, voltage, frequency, pressure and pulse trains
- Isolated mA/V measuring channel enables complete transmitter calibration (measuring and simulation at the same time)
- Entry of customer-specific resistance thermometer coefficients
- Robust design and simple operation

## Description

### General information

The model CEP6000 hand-held multi-function calibrator provides unparalleled features in respect of other high-accuracy calibrators. It offers the functions and accuracy associated with stationary laboratory equipment, and has everything needed for virtually any calibration task.

Measuring and simulation of thermocouple, resistance thermometer, resistance, current, voltage, frequency, pressure and the generation of pulse trains is supported by the CEP6000. External pressure modules can be connected via a port. The built-in isolated mA/V measuring channel enables the complete calibration of transmitters to be carried out.

### Extensive applications

Thanks to its multi-functionality, the CEP6000 offers a wide range of application possibilities. It can be used for calibration in industry (laboratories, production, workshops), in calibration service companies and in quality assurance.



Hand-held multi-function calibrator model CEP6000

### Intuitive operation

Arrow keys, direct keyboard input and three software-driven function keys, plus a large backlit, menu-driven and graphical display have been combined into an intuitive, simple, yet powerful, user interface.

### Additional features

An integrated  $250\ \Omega$  resistor for HART™ compatibility, 24 V voltage supply, compatibility with smart transmitters and PLC's, full fuseless protection and a serial interface for full control with ASCII commands are just some of the additional features that make the CEP6000 an indispensable calibration tool. The CEP6000 is delivered with a robust rubber boot which protects it against shocks.

### Complete service case

For service and maintenance applications, a fully equipped case system is available.

### Certified accuracy

The accuracy of the CEP6000 is certified by a factory calibration certificate which accompanies the instrument. On request, we can provide a DKD/DAkkS calibration certificate for this instrument.

## Specifications Model CEP6000

Basic instrument	
<b>Display</b>	
Display	2-part, each with 10 digits and 8 mm character size
<b>Input and output</b>	
Number and type	6 banana plug inputs for electrical parameters, resistance thermometers and thermocouples
Resistance thermometer (RTD)	Pt100 (385, 3926, 3916), Pt200, Pt500, Pt1000, Ni120, Cu10, Cu50, Cu100, YSI400, Pt10, Pt50
Thermocouples	Type J, K, T, E, R, S, B, L, U, N, C, XK, BP
Voltage signal	Input: DC 30 V output: DC 20 V
Current signal	Input: DC 24 mA Output: DC 24 mA
Resistance	0 ... 4,000 $\Omega$
Frequency/Pulse	2 CPM ... 10 kHz
Pressure	dependent on pressure module
Voltage supply	DC 24 V
<b>Special features</b>	
Resistance thermometer frequency response	5 ms; works with all pulsed transmitters
Customer-specific resistance thermometers	Entry of customer-specific resistance thermometer coefficients
Functions	automatic step function
Resistance	HART® resistor, 250 $\Omega$ (activatable)
<b>Communication</b>	
Interface	RS-232, USB with optional serial adapter
<b>Voltage supply</b>	
Power supply	4 x 1.5 V AA batteries
Battery life	20 hours
Battery status indication	Icon in display for low battery level
<b>Permissible ambient conditions</b>	
Operating temperature	-10 ... +50 °C
Storage temperature	-20 ... +70 °C
Relative humidity	0 ... 90 % r. h. (non-condensing)
Temperature coefficient	0.003 % FS/°C, outside of 23 °C $\pm$ 5 °C

## Case

Material	Plastic (with robust protective rubber boot)
Ingress protection	IP 52
Dimensions	see technical drawing
Weight	approx. 860 g

## CE conformity and certificates

### CE conformity

EMC directive	2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (portable test and measuring equipment)
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### Certificate

Calibration	Standard: 3.1 calibration certificate per DIN EN 10204 Option: DKD/DAkkS calibration certificate
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Approvals and certificates, see website

Input and output signals	Measuring range	Accuracy (of reading)	
<b>Current signal</b>			
Output	DC 0.000 ... 24.000 mA	0.015 % ±2 µA	
Input	DC 0.000 ... 24.000 mA (isolated)	0.015 % ±2 µA	
	DC 0.000 ... 24.000 mA (not isolated)	0.015 % ±2 µA	
<b>Voltage signal</b>			
Output	DC 0.000 ... 20.000 V	0.015 % ±2 mV	
Input	DC 0.000 ... 30.000 V (isolated)	0.015 % ±2 mV	
	DC 0.000 ... 20.000 V (not isolated)	0.015 % ±2 mV	
<b>Resistance</b>			
Output	5.0 ... 400.0 Ω	0.025 % ±0.1 Ω	Stimulus current 0.1 ... 0.5 mA
	5.0 ... 400.0 Ω	0.025 % ±0.05 Ω	0.5 ... 3.0 mA
	401 ... 1,500 Ω	0.025 % ±0.5 Ω	0.05 ... 0.8 mA
	1,501 ... 4,000 Ω	0.025 % ±0.5 Ω	0.05 ... 0.4 mA
Input	0.00 ... 400.00 Ω	0.025 % ±0.05 Ω	
	400.1 ... 4,000.0 Ω	0.025 % ±0.5 Ω	
<b>Frequency <sup>1)</sup></b>			
Output	2.0 ... 600.0 CPM <sup>2)</sup>	0.05 %	
	1.0 ... 1,000.0 Hz	0.05 %	
	1.0 ... 10.0 kHz	0.25 %	
Input	2.0 ... 600.0 CPM <sup>2)</sup>	0.05 % ±0.1 CPM <sup>2)</sup>	
	1.0 ... 1,000.0 Hz	0.05 % ±0.1 Hz	
	1.00 ... 10.00 kHz	0.05 % ±0.01 kHz	
<b>Pulse <sup>1)</sup></b>			
Output	1 ... 30,000 counts		
	2.0 CPM <sup>2)</sup> ... 10.0 kHz		
<b>Pressure</b>			
Input	dependent on pressure module		

1) Selectable amplitude of 1 ... 20 V based on a square wave

2) Counts per minute

Input and output signals	Measuring range	Accuracy (all errors incl.)	
<b>Thermocouple voltage signals</b>	-10.000 ... +75.000 mV	0.02 % of reading ±10 µV	
<b>Thermocouples</b>		Without cold junction compensation	With cold junction compensation <sup>3)</sup>
Type J	-210.0 ... -150.0 °C	0.4 °C	0.6 °C
	-149.9 ... +1,200.0 °C	0.2 °C	0.4 °C
Type K	-200.0 ... -100.0 °C	0.5 °C	0.7 °C
	-99.9 ... +600.0 °C	0.2 °C	0.4 °C
	600.1 ... 1,000.0 °C	0.3 °C	0.5 °C
	1,000.1 ... 1,372.0 °C	0.4 °C	0.6 °C
Type T	-250.0 ... -200.0 °C	1.5 °C	1.7 °C
	-199.9 ... 0.0 °C	0.5 °C	0.7 °C
	0.1 ... 400.0 °C	0.2 °C	0.4 °C
Type E	-250.0 ... -200.0 °C	1.0 °C	1.2 °C
	-199.9 ... -100.0 °C	0.3 °C	0.5 °C
	-99.9 ... +1,000.0 °C	0.2 °C	0.4 °C
Type R	0 ... 200 °C	1.7 °C	1.9 °C
	201 ... 1,767 °C	1.0 °C	1.2 °C
Type S	0 ... 200 °C	1.7 °C	1.9 °C
	201 ... 1,767 °C	1.1 °C	1.3 °C
Type B	600 ... 800 °C	1.5 °C	1.7 °C
	801 ... 1,000 °C	1.2 °C	1.4 °C
	1,001 ... 1,820 °C	1.0 °C	1.2 °C
Type C	0.0 ... 1,000.0 °C	0.5 °C	0.7 °C
	1,000.1 ... 2,316.0 °C	1.5 °C	1.7 °C
Type XK	-200.0 ... +800.0 °C	0.2 °C	0.4 °C
Type BP	0.0 ... 800.0 °C	1.9 °C	2.1 °C
	800.1 ... 2,500.0 °C	0.6 °C	0.8 °C
Type L	-200.0 ... +900.0 °C	0.2 °C	0.4 °C
Type U	-200.0 ... 0.0 °C	0.4 °C	0.6 °C
	0.1 ... 600.0 °C	0.2 °C	0.4 °C
Type N	-200.0 ... -100.0 °C	0.8 °C	1.0 °C
	-99.9 ... +1,300.0 °C	0.3 °C	0.5 °C

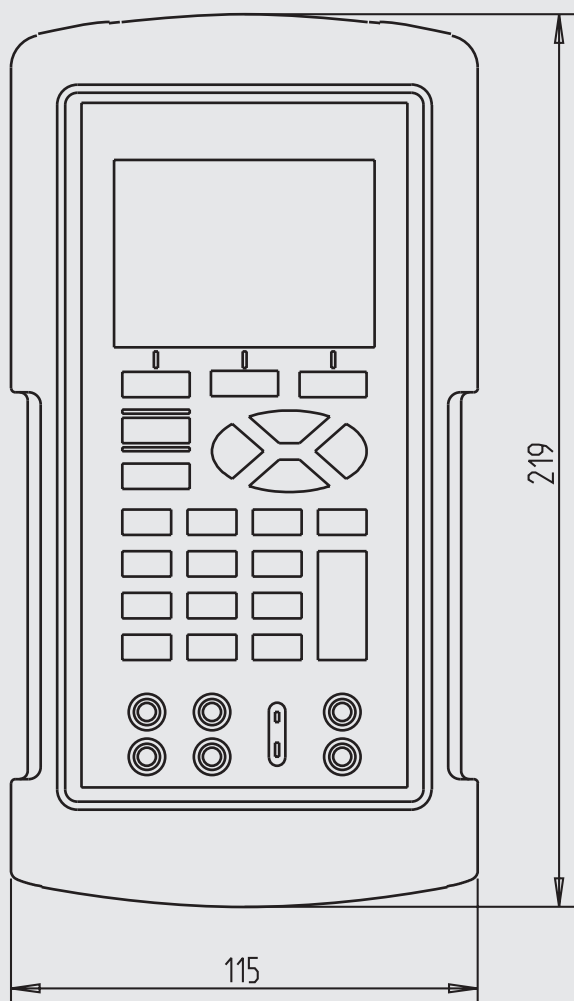
3) Error of cold junction compensation outside of 23 °C ±5 °C is 0.05 °C/°C

Input and output signals	Measuring range	Accuracy (all errors incl.)
<b>Resistance thermometer <sup>4)</sup></b>		
Pt100 (385)	-200.0 ... -80.0 °C	0.1 °C
	-79.9 ... +300.0 °C	0.2 °C
	300.1 ... 630.0 °C	0.3 °C
	630.1 ... 800.0 °C	0.4 °C
Pt100 (3926)	-200.0 ... -80.0 °C	0.1 °C
	-79.9 ... +300.0 °C	0.2 °C
	300.1 ... 630.0 °C	0.3 °C
Pt100 (3916)	-200.0 ... -80.0 °C	0.1 °C
	-79.9 ... +260.0 °C	0.2 °C
	260.1 ... 630.0 °C	0.3 °C
Pt200	-200.0 ... -80.0 °C	0.6 °C
	-79.9 ... +300.0 °C	0.7 °C
	300.1 ... 630.0 °C	0.9 °C
Pt500	-200.0 ... -80.0 °C	0.2 °C
	-79.9 ... +100.0 °C	0.3 °C
	100.1 ... 400.0 °C	0.4 °C
	400.1 ... 630.0 °C	0.5 °C
Pt1000	-200.0 ... +260.0 °C	0.2 °C
	260.1 ... 400.0 °C	0.3 °C
	400.1 ... 630.0 °C	0.4 °C
Pt10	-200.0 ... 0.0 °C	1.3 °C
	0.1 ... 100.0 °C	1.4 °C
	100.1 ... 300.0 °C	1.5 °C
	300.1 ... 400.0 °C	1.6 °C
	400.1 ... 630.0 °C	1.8 °C
	630.1 ... 800.0 °C	1.9 °C
Pt50	-200.0 ... -80.0 °C	0.3 °C
	-79.9 ... +300.0 °C	0.4 °C
	300.1 ... 630.0 °C	0.5 °C
	630.1 ... 800.0 °C	0.6 °C
Ni120	-80.0 ... +260.0 °C	0.1 °C
Cu10	-100.0 ... +260.0 °C	1.3 °C
Cu50	-180.0 ... +200.0 °C	0.3 °C
Cu100	-180.0 ... +200.0 °C	0.1 °C
YSI400	15.0 ... 50.0 °C	0.1 °C

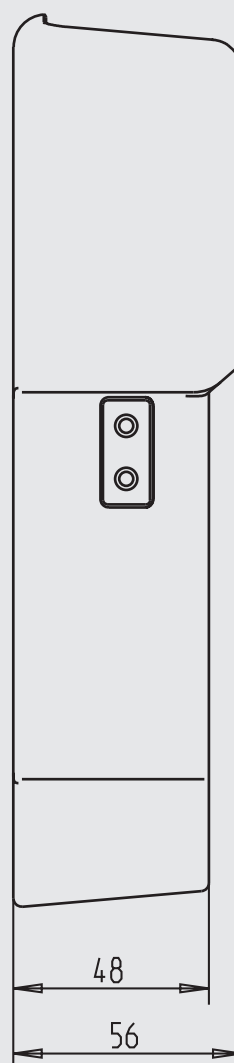
4) Accuracy based on 4-wire connection

## Dimensions in mm

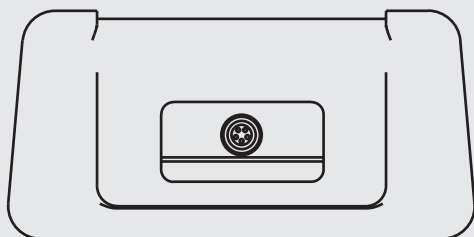
Front view



Side view

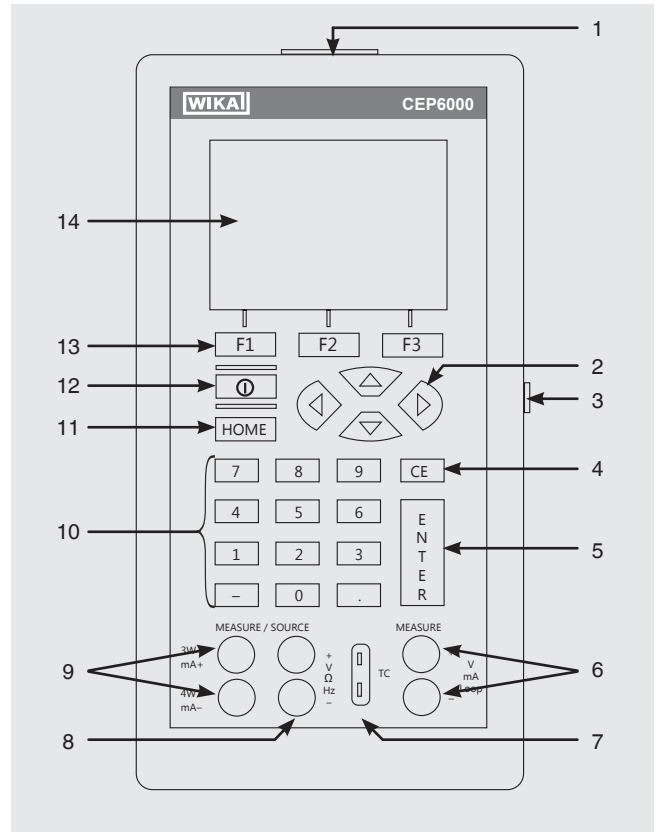


Top view



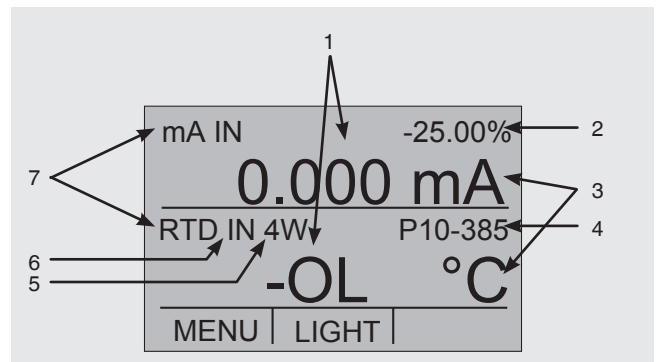
## Front foil

- 1) Connection for external pressure module
- 2) Modification of individual digits of the output value; increase, decrease or ramp output value
- 3) Serial interface
- 4) Clear the input value
- 5) ENTER
- 6) (Isolated) Current and voltage input as well as for output of DC 24 V supply voltage
- 7) Thermocouple input/output
- 8) Voltage, resistance thermometers (2-wire), frequency, pulse, input/output
- 9) Current, resistance thermometers (3-wire, 4-wire), input/output
- 10) Numeric keys
- 11) HOME, returns to main menu
- 12) ON/OFF
- 13) Function keys, used to operate the menu bar at the bottom of the calibrator display
- 14) Display



## Overview of the display

- 1) Numeric display
- 2) Display of the span
- 3) Units
- 4) Sensor type
- 5) Additional settings
- 6) Input/output display
- 7) Primary parameters



## Scope of delivery

- Hand-held multi-function calibrator model CEP6000
- Operating instructions
- Test cables, three sets (red/black)
- 3.1 calibration certificate per DIN EN 10204
- Four AA batteries
- Protective rubber boot
- Quick Start Guide

## Option

- DKD/DAkkS certified accuracy

## Accessories

### Voltage supply

- Battery charger set, including four rechargeable AA batteries, quick charger, power cord, adapters
- Battery set, consisting of four rechargeable AA batteries
- AC mains adapter/charger

### Interface

- RS-232 interface cable
- USB serial adapter

### Test cables

- Thermocouple cable set J, K, T, E with plugs
- Thermocouple cable set R/S, N, B with plugs
- Beryllium copper cable with low thermoelectric voltage (red)
- Beryllium copper cable with low thermoelectric voltage (black)
- Test cables, one pair of cables (red/black)

### Other

- Service case



**Complete service case model CEP6000 and optional accessories**

## Ordering information

Model / Transport case / Calibration / Additional order information

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