

Temperature multi-function calibrator

Model CTM9100-150

WIKA data sheet CT 41.40



Applications

- Testing and calibration of all types of temperature measuring instruments
- Reference instrument for works laboratories for the calibration of thermometers
- Also suitable for on-site calibration

Special features

- Multi-function instrument with four controller parameter sets
- Calibration with an external reference
- Low weight and compact design
- Simple operation

Description

Versatile in application

Nowadays, fast and simple testing of thermometers is a "must" when it comes to the operational safety of machines and plants. The portable calibrators of the CTx9100 family are particularly suited for on-site calibrations and extremely user-friendly. Due to their compact design and their low weight, the instruments can be taken and used almost anywhere.

Using a dry-well calibrator or a micro calibration bath to calibrate either surface thermometers or non-contact thermometers does not reflect the application and can result in false values. In these cases, the model CTM9100-150 temperature multi-function calibrator should be used.

With this temperature multi-function calibrator, in the temperature range from $-20 \dots +150 \text{ }^{\circ}\text{C}$ ($-4 \dots +302 \text{ }^{\circ}\text{F}$), you can cover not only the common functions, but also, with special inserts, this can be used as a surface temperature calibrator and an infrared black body. Like having four instruments in one!



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Easy to use

The temperature multi-function calibrator combines four application possibilities in one instrument. The simple instrument design enables fast and simple switching, back and forth, between individual applications. Changing between the four possibilities can be made very easily using one of the four keys and the toggle switch on the front.

It is possible to calibrate nearly every thermometer with the different inserts, even contact (TC, Pt, surface) or non-contact (infrared) thermometers.

The calibration temperature, adjusted simply using two keys on the controller, can be very quickly controlled. The actual and set temperature can be displayed simultaneously on a large 4-digit, high-contrast LC display. Thus reading errors are virtually eliminated.

Specifications		Model CTM9100-150
Display		
Temperature range	-20 ... +150 °C (-4 ... 302 °F) -35 ... +165 °C (-31 ... 329 °F)	Use as a micro calibration bath
Accuracy ¹⁾	±0.2 K ±0.3 K ±1 K ±1 K	Use as a micro calibration bath Use as a dry-well calibrator Use as an infrared black body Use as a surface temperature calibrator
Stability ²⁾	±0.05 K ±0.05 K ±0.2 K ±0.2 K	Use as a micro calibration bath Use as a dry-well calibrator Use as an infrared black body Use as a surface temperature calibrator
Resolution	0.01 to 100 °C, then 0.1	
Temperature control		
Heating time	depending upon usage and area of application	
Cooling time	depending upon usage and area of application	
Stabilisation time ³⁾	depending upon usage and area of application	
Insert		
Immersion depth	150 mm (5.91 in)	
Insert dimensions	Ø 60 x 170 mm (2.36 x 6.69 in)	
Insert material	Aluminium	
Voltage supply		
Power supply	AC 100 ... 240 V, 50/60 Hz	
Power consumption	400 VA	
Power cord	for Europe, 230 V	
Communication		
Interface	RS-485	
Case		
Dimensions in (W x D x H)	215 x 305 x 425 mm (8.46 x 12.0 x 16.73 in)	
Weight	12 kg (26.5 lbs)	

1) Is defined as the measuring deviation between the measured value and the reference value.

2) Maximum temperature difference at a stable temperature over 30 minutes.

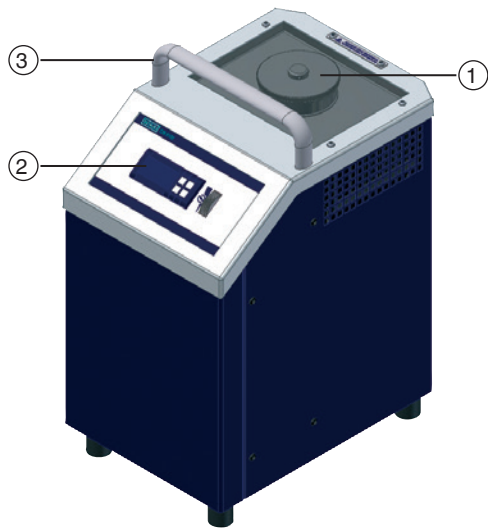
3) Time before reaching a stable value.

The measurement uncertainty is defined as the total measurement uncertainty ($k = 2$), which contains the following shares: accuracy, measurement uncertainty of reference, stability and homogeneity.

CE conformity, approvals, certificates	
CE conformity	
EMC directive	2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (industrial application)
Low voltage directive	2006/95/EC, EN 61010-1 and EN 61010-2-10, safety requirements for electrical equipment for measurement, control and laboratory use
Approvals	
EAC	Import certificate, Eurasian Economic Community
GOST	Metrology/measurement technology, Russia
Certificate	
Calibration	Standard: 3.1 calibration certificate per DIN EN 10204 Option: DKD/DAkkS calibration certificate
Recommended recalibration interval	1 year (dependent on conditions of use)

Approvals and certificates, see website

Isometric views

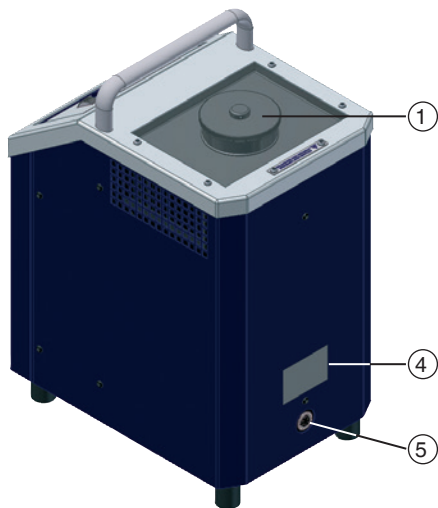


Front and top

On the top of the temperature multi-function calibrator, you will find the dry-well access opening for inserting the different inserts.

The controller, with display and controls, is located on the front of the calibrator.

- ① Block
- ② Controller
- ③ Carrying handle

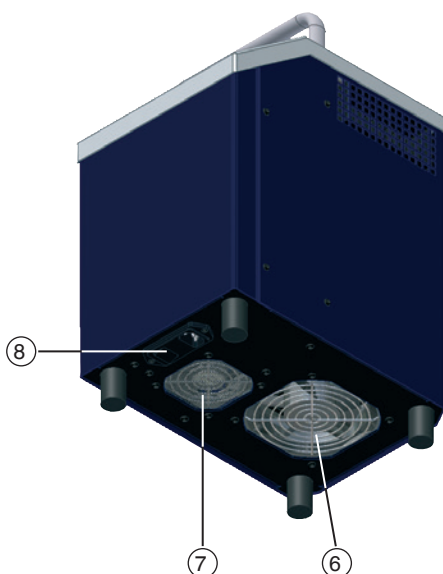


Rear

At the rear, you will find the product label with important information about the model and the suitable mains voltage and frequency, the individual serial number, the instrument's power consumption and the fuse rating.

You will also find the connector for the RS-485 interface here.

- ① Block
- ④ Product label
- ⑤ RS-485 interface



Bottom

On the underside of the instrument are the mains connector socket and the power switch with its fuse holder.

These are located in the centre, at the front. Furthermore, there are two air intakes located on the underside of the instrument.

- ⑥ Fan 1
- ⑦ Fan 2
- ⑧ Mains connector socket with power switch

Inserts and their applications

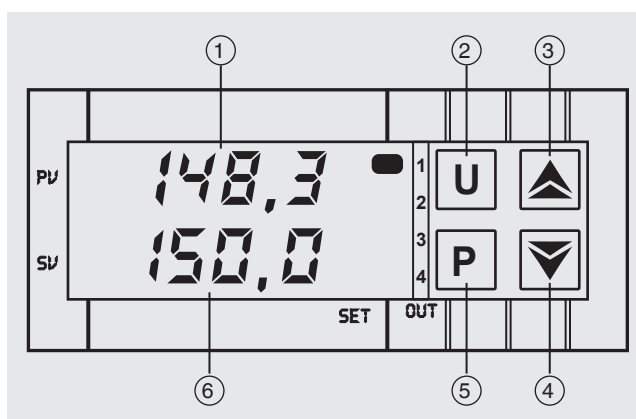


- ① The insert has several bores into which the thermometer being calibrated and one of the additional customer reference thermometers, for comparative calibration, can be inserted. The block is either heated or cooled to the desired calibration temperature. Once a stable temperature has been reached, the temperature probes to be calibrated can be compared with the reference thermometer. The documentation of this comparison represents the calibration.
- ② Angled probes, large-diameter probes or probes with special designs cannot be calibrated with a dry-well calibrator. For this reason the temperature multi-function calibrator also has the possibility to function as a stirred liquid bath. The liquid is circulated by a magnetic stirrer and thus provides very good temperature distribution within the bath. The liquid used is chosen depending upon the desired calibration temperature.
- ③ The measuring spot of the pyrometer being calibrated must be smaller than the diameter of the infrared insert. The sleeve has been specifically manufactured with regard to its design and surface in order to achieve a defined emissivity for the measurement.
- ④ The calibration of surface temperature probes is very difficult and not fully defined. Temperature probes mounted on surfaces dissipate heat from the surface and create a cold zone on the surface being measured. In the temperature multi-function calibrator, the calibration temperature is created in a specially designed surface insert and an external reference thermometer measures the temperature directly under the surface.

Display and control panel

- Set and actual temperature are displayed simultaneously on a 2-line LC display.
- Frequently used set points can be stored in four memory locations.
- The U key is used to recall stored set temperatures.
- The arrow keys are used to change the set temperatures.
- The P key is used to confirm the changes.

- ① Actual temperature
- ② Recall key
- ③ Increase key
- ④ Decrease key
- ⑤ Programming key
- ⑥ Set temperature



Controls

The temperature controller of the multi-function calibrator is located on the front panel:

- The actual and set points can be read from the display simultaneously with a resolution of 0.01 or 0.1 K.
- Frequently used set points can be entered independently into four memory locations and quickly recalled.

- Individual temperatures can be easily entered via the two arrow keys.

Mains connector socket, power switch and fuse holder are located centrally at the front of the underside of the instrument.

Scope of delivery

- Temperature multi-function calibrator model CTM9100-150
- Power cord 1.5 m (5 ft) with safety plug
- Insert with seven bores: \varnothing 1 x 2 mm, 3 x 3.5 mm, 2 x 4.5 mm, 1 x 6 mm
- Surface insert
- Infrared insert
- Calibration liquid and drain pump
- External reference
- Replacement tools
- Operating instructions
- 3.1 calibration certificate per DIN EN 10204



Various inserts and accessories of the CTM9100-150

Options

- Instrument variants with wide-range mains adapter
- Display in Fahrenheit °F
- DKD/DAkkS calibration certificate as a micro calibration bath
- DKD/DAkkS calibration certificate as a dry-well calibrator
- DKD/DAkkS calibration certificate as a micro calibration bath and dry-well calibrator

Accessories

- Inserts, undrilled and drilled to specification
- Screw-on lid for micro calibration bath
- Transport case
- Interface cable with integrated RS-485 to USB 2.0 converter
- Power cord for Switzerland
- Power cord for USA/Canada
- Power cord for UK

Ordering information

Model / Unit / Insert for liquids / Calibration / Transport case / Serial interface converter / Power cord / Additional ordering information

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