

# Temperature dry-well calibrator

## Models CTD9100-COOL, CTD9100-165, CTD9100-450, CTD9100-650

WIKA data sheet CT 41.28



### Applications

- Easy on-site calibration
- Power generation
- Measurement and control laboratories
- Machine building

### Special features

- Various temperature ranges
- Measurement uncertainties from 0.15 ... 0.8 K
- Compact design
- Simple operation



Temperature dry-well calibrator CTD9100-650

## 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 CTD9100 family are particularly suited for on-site calibrations and are extremely user-friendly. Due to their compact design and their low weight, the instruments can be taken and used almost anywhere.

The new instrument concept brings together a stable heat source with precision Pt100 temperature measurement. This enables industrial temperature probes to be calibrated even more efficiently.

Regular monitoring of temperature probes helps to recognise failures promptly and shorten downtimes.

### Easy to use

The temperature dry-well calibrators of the CTD9100 series work with temperature-controlled metal blocks and interchangeable inserts.

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

Thermometers with different diameters can be fitted into the calibrator using inserts, drilled to suit.

A new block design, with improved temperature homogeneity at the calibrator's lower range, leads to smaller measurement uncertainties. The large insertion depth of 150 mm considerably reduces heat dissipation errors.

## Specifications CTD9100 series

	CTD9100-COOL	CTD9100-165
Temperature range	-55 ... +200 °C	-35 ... +165 °C
Accuracy <sup>1)</sup>	0.15 ... 0.3 K	0.15 ... 0.25 K
Stability <sup>2)</sup>	±0.05 K	
Display resolution	0.01 to 100 °C, then 0.1	
Axial homogeneity <sup>3)</sup>	< 0.04 K at 200 °C	< 0.04 K up to 100 °C 0.06 K up to 165 °C
Radial homogeneity <sup>4)</sup>	dependent on temperature, temperature probes and their quantity	
Heating time	approx. 10 min from 20 to 200 °C	approx. 25 min from 20 to 165 °C (X approx. 35 min)
Cooling time	approx. 10 min from +20 to -20 °C	approx. 15 min from +20 to -20 °C (X approx. 35 min)
Stabilisation time <sup>5)</sup>	dependent on temperature and temperature probe	
Immersion depth	150 mm	
Insert dimensions	Ø 28 x 150 mm	Ø 28 x 150 mm or Ø 60 x 150 mm
<b>Voltage supply</b>		
Power supply	AC 100 ... 240 V, 50/60 Hz	
Power consumption	555 VA	375 VA
Power cord	for Europe, 230 V	
<b>Communication</b>		
Interface	RS-485	
<b>Case</b>		
Dimensions	215 x 305 x 425 mm (W x D x H)	
Weight	11 kg	

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) Maximum temperature difference at 40 mm above the bottom.

4) Maximum temperature difference between the bores (all thermometers inserted to the same depth).

5) 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.

	CTD9100-450	CTD9100-650
Temperature range	40 ... 450 °C	40 ... 650 °C
Accuracy <sup>1)</sup>	0.3 ... 0.5 K	0.3 ... 0.8 K
Stability <sup>2)</sup>	±0.05 K at 100 °C ±0.1 K at 450 °C	±0.05 K at 100 °C ±0.1 K at 600 °C
Display resolution	0.01 to 100 °C, then 0.1	0.01 to 100 °C, then 0.1
Axial homogeneity <sup>3)</sup>	0.05 K at 100 °C 0.2 K at 450 °C	< 0.2 K at 100 °C 0.5 K at 600 °C
Radial homogeneity <sup>4)</sup>	dependent on temperature, temperature probes and their quantity	
Heating time	approx. 14 min from 20 to 450 °C	approx. 20 min from 20 to 600 °C
Cooling time	approx. 60 min from 450 to 100 °C	approx. 60 min from 600 to 100 °C
Stabilisation time <sup>5)</sup>	dependent on temperature and temperature probe	
Immersion depth	150 mm	
Insert dimensions	Ø 60 x 150 mm	Ø 28 x 150 mm
<b>Voltage supply</b>		
Power supply	AC 230 V, 50/60 Hz	AC 230 V, 50/60 Hz <sup>6)</sup>
Power consumption	2,000 VA	1,000 VA
Power cord	for Europe, 230 V	
<b>Communication</b>		
Interface	RS-485	
<b>Case</b>		
Dimensions	150 x 270 x 400 mm (W x D x H)	
Weight	7.5 kg	8 kg

- 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) Maximum temperature difference at 40 mm above the bottom.  
4) Maximum temperature difference between the bores (all thermometers inserted to the same depth).  
5) Time before reaching a stable value.  
6) Instrument version available with wide-range mains adapter

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

GOST	Metrology/measurement technology, Russia
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### 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

## Temperature dry-well calibrators models CTD9100

Four instruments for the temperature range from -55 ... +650 °C



Temperature dry-well calibrator model CTD9100-165 or model CTD9100-COOL

### Model CTD9100-COOL

Temperature range from -55 ... +200 °C  
and

### Model CTD9100-165

Temperature range from -35 ... +165 °C

These calibrators operate using Peltier elements and, as a result, can achieve testing temperatures below the ambient temperature. Due to their capacity for active cooling, they are often used in the biotechnology, pharmaceutical and food industries. The CTD9100-165-X features an enlarged insert with Ø 60 mm. Thus, it is possible to calibrate several temperature probes simultaneously without the need of changing the insert.



Temperature dry-well calibrator model CTD9100-450

### Model CTD9100-450

Temperature range from 40 ... 450 °C

The CTD9100-450 is used in the medium temperature range up to 450 °C. It generates its temperature with resistive electrical heating and features an enlarged insert with Ø 60 mm. Thus, it is possible to calibrate several temperature probes simultaneously without the need of changing the insert.



Temperature dry-well calibrator model CTD9100-650

### Model CTD9100-650

Temperature range from 40 ... 650 °C

This is the high-temperature model. This also works with an electrical resistance heating. When it comes to testing at high temperatures, such as for exhaust gases measurements on test benches or in power generation, the model CTD9100-650 is the right choice.

## Operating elements of the temperature dry-well calibrators

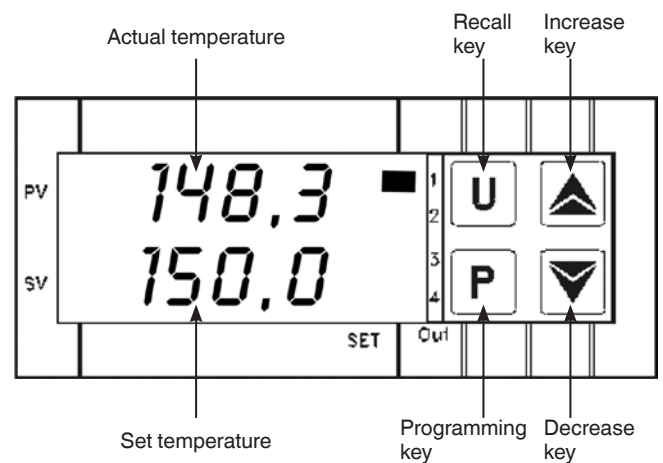
The calibrators' temperature controller is located on the front panel:

- 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.

### The display and control panel

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



## Scope of delivery

- Temperature dry-well calibrator model CTD9100
- Power cord, 1.5 m with safety plug
- Drilled standard insert, depends on instrument version
- Replacement tools
- Operating instructions
- 3.1 calibration certificate per DIN EN 10204

## Options

- Instrument variants with wide-range mains adapter
- Display in Fahrenheit °F
- DKD/DAkkS calibration certificate



Temperature dry-well calibrators model CTD9100

## Accessories

- Inserts, undrilled and drilled to specification
- Software package to operate the calibrator
- Interface cable with integrated RS-485 to USB 2.0 converter
- Transport case
- Power cord for Switzerland
- Power cord for USA/Canada
- Power cord for UK

## Ordering information

### Calibrator CTD9100-COOL

Model / Unit / Software / Calibration / Transport case / Interface converter / Power cord / Additional ordering information

### Calibrator CTD9100-165

Model / Sleeve diameter / Unit / Software / Calibration / Transport case / Interface converter / Power cord / Additional ordering information

### Calibrator CTD9100-450 and CTD9100-650

Model / Power supply / Unit / Protective conductor / Software / Calibration / Transport case / Interface converter / Power cord / Additional ordering information

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**WIKAL**  
**WIKAL Alexander Wiegand SE & Co. KG**  
Alexander-Wiegand-Straße 30  
63911 Klingenberg/Germany  
Tel. +49 9372 132-0  
Fax +49 9372 132-406  
info@wika.de  
www.wika.de