

# Temperature dry-well calibrator

## Models CTD9300-165, CTD9300-650

WIKA data sheet CT 41.38



for further approvals  
see page 3

### Applications

- Bio and pharmaceutical industries
- Food industry
- Demanding on-site calibrations
- Measurement and control laboratories in the chemical industry
- Power plants and plant construction

### Special features

- Easy operation via intuitive, user-friendly menus
- Large, easy-to-read display
- Short response times due to optimised control
- Improved accuracy due to homogeneous block temperature



**Fig. left: without integrated measuring instrument**  
**Fig. right: with integrated measuring instrument**

## Description

### Range of applications

Whether in laboratories, workshops or on site, these temperature dry-well calibrators can meet any calibration requirement. As an option, all instruments are available with an integrated measuring instrument. This enables the measurement of resistances, thermoelectric voltages and also current signals (from thermometers with a 0/4 ... 20 mA transmitter) and their direct display in °C.

Using our calibration software and a laptop computer, fully automatic calibrations of electrical thermometers can be carried out anywhere. It is also possible to retrofit the integrable measuring instrument into existing calibrators.

### Two models from -35 ... +650 °C (-31 ... +1,202 °F)

The temperature dry-well calibrators are available for two temperature ranges. The model CTD9300-165 is for temperatures ranging from -35 ... +165 °C (-31 ... +329 °F) and is primarily suitable for biotechnology, pharmaceutical and food industry applications. Above 40 °C (104 °F), there is the model CTD9300-650 for temperatures up to 650 °C (1,202 °F).

This model is mainly used in power plants, plant construction and also the chemical industry. All instruments are fitted with blocks for large inserts, of 28 mm diameter by 150 mm long (1.1 x 5.91 in).

### Calibration; simple, quick and reliable

We know our customers' requirements well:

Nowadays the main features required are not only high reliability and accuracy, but also safe and simple operation. Our temperature dry-well calibrators work with metal blocks that are cooled and heated electrically. Inserts with different inner diameters enable calibration of test items with a range of diameters.

The calibration instruments of the CTD9300 series achieve the temperature set point extremely quickly, thanks to a controller developed by us specifically for calibration tasks, thus helping to save costs.

Specifications	CTD9300-650	CTD9300-165
<b>Display</b>		
Temperature range	40 ... 650 °C (104 ... 1,202 °F)	-35 ... +165 °C (-31 ... +329 °F)
Accuracy <sup>1)</sup>	±0.3 K at 300 °C (572 °F) ±0.6 K at 650 °C (1,202 °F)	±0.1 K at -30 °C (-22 °F) ±0.16 K at 165 °C (329 °F)
Stability <sup>2)</sup>	±0.03 K at 100 °C (212 °F) ±0.09 K at 650 °C (1,202 °F)	±0.01 to 0.02 at 165 °C (329 °F)
Resolution	0.01 K	
<b>Temperature distribution</b>		
Axial homogeneity <sup>3)</sup>	0.4 K	0.06 K
Radial homogeneity <sup>4)</sup>	dependent on temperature, temperature probes and their quantity	
<b>Temperature control</b>		
Heating time	30 min from 20 °C to 650 °C (from 68 °F to 1,202 °F)	12 min from 20 °C to 165 °C (from 68 °F to 329 °F)
Cooling time	80 min from 650 °C to 100 °C (from 1,202 °F to 212 °F)	7 min from +20 °C to -20 °C (from +68 °F to -4 °F)
Stabilisation time <sup>5)</sup>	dependent on temperature and temperature probe	
<b>Metal block</b>		
Insertion depth	150 mm (5.91 in)	150 mm (5.91 in)
Insert dimensions	Ø 28 x 150 mm (1.1 x 5.91 in)	Ø 28 x 150 mm (1.1 x 5.91 in)
Block material	Brass	Aluminium
<b>Voltage supply</b>		
Power supply <sup>6)</sup>	AC 230 (115) V, 50/60 Hz	AC 100 ... 240 V, 50/60 Hz
Power consumption	1,000 W	400 W
Power cord	for Europe, 230 V	
<b>Communication</b>		
Interface	RS-232	RS-232
<b>Case</b>		
Dimensions (W x D x H)	160 x 320 x 420 mm (6.3 x 12.6 x 16.54 in)	160 x 320 x 420 mm (6.3 x 12.6 x 16.54 in)
Weight	10 kg (22.1 lbs)	10 kg (22.1 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) 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 measuring value.
- 6) AC 115 V power supply must be specified on the order, otherwise an AC 230 V one will be delivered.

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.

Accessories <sup>7)</sup>	CTD9300-650	CTD9300-165
<b>Integrable measuring instrument</b>	✓	✓
<b>Insert</b>		
Dimensions	Ø 28 x 150 mm (1.1 x 5.91 in)	
Standard bores in steps of 0.5 mm	Ø 1.5 ... 25 mm (0.06 x 0.98 in)	
2 bores	1 x Ø 3.2 mm and 1 x Ø 6.3 mm (1 x Ø 0.13 in and 1 x Ø 0.25 in)	
6 bores	2 x Ø 3.2 mm, 1 x Ø 4.2 mm, 1 x Ø 6.3 mm, 1 x Ø 8.4 mm and 1 x Ø 9.9 mm (2 x Ø 0.13 in, 1 x Ø 0.17 in, 1 x Ø 0.25 in, 1 x Ø 0.33 in and 1 x Ø 0.39 in)	
To customer specification <sup>8)</sup>	on request	
<b>Transport case</b>	✓	✓
<b>Calibration</b>		
DKD/DAkkS calibration Measurement uncertainty ±0.2 K or 0.15 % of reading	at 6 temperatures: 100, 200, 300, 400, 500 and 600 °C (212, 392, 572, 752, 932 and 1,112 °F)	at 6 temperatures: -30, 0, 50, 100, 130 and 160 °C (-22, 32, 122, 212, 266 and 320 °F)
Other calibrations	on request	on request

7) The accessories listed here are not included in the standard scope of supply, except for the standard insert with 6.5 mm inner diameter and one insert replacement tool.

8) The number of possible bores in a customised insert depends on the diameters of the bores and the permissible minimum distances between the bores and the edge of the insert.

## Approvals

Logo	Description	Country
	<b>EC declaration of conformity</b> ■ EMC directive 2004/108/EG ■ Low voltage directive 2006/95/EG	European Community
	<b>EAC</b> ■ Electromagnetic compatibility ■ Low voltage directive	Eurasian Economic Community
	<b>GOST</b> Metrology/measurement technology	Russia
	<b>KazInMetr</b> Metrology/measurement technology	Kazakhstan
	<b>MTSchS</b> Commissioning approval	Kazakhstan
	<b>BelGIM</b> Metrology/measurement technology	Belarus
	<b>Uzstandard</b> Metrology/measurement technology	Uzbekistan

## Certificates

Certificate	
<b>Calibration</b>	Standard: 3.1 calibration certificate per DIN EN 10204 Option: DKD/DAkkS calibration certificate
<b>Recommended recalibration interval</b>	1 year (dependent on conditions of use)

Approvals and certificates, see website

### Large, easy-to-read graphical display

All calibrators of the CTD9300 series have a large, easy-to-read graphical display. Brightness and contrast can be individually adjusted in the system menu.

### Easy to work with due to user-friendly menus

The calibrator features two clearly arranged main menus, which are self-explanatory.

- Measurement and calibration menu
- SETUP menu

### Measurement and calibration menu

In this menu, set temperatures are defined, and the control is activated by pressing the CONTROL key. The display shows the actual and the set temperature as well as Min. and Max. temperature; or, as an option, the average temperature. The temperature gradient, in Kelvin per minute, is also displayed.



Measurement and calibration menu

### SETUP menu

In the SETUP menu, settings can be made such as:

- Temperature ramp function
- Configuration of the integrable measuring instrument
- Display parameters
- Temperature units
- RS-232 interface parameters

Further functions include language selection German, English, French, Spanish, settable alarm function, operating hours counter and a real-time clock with date.



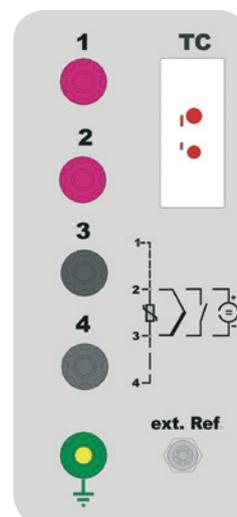
SETUP menu

### Stable, homogeneous block temperature

Due to a controller, which has been specifically developed for temperature calibration, and a special heating block for temperatures up to 650 °C (1,202 °F), a high control accuracy and a homogeneous temperature distribution within the block is achieved. Important features in this context are control algorithms, which have been optimised for the calibration processes, and a heating block with a heating power that increases towards the upper end. The small resulting temperature fluctuations and the good axial temperature distribution lead to a considerably reduced total measurement uncertainty during calibration.

### Integrable measuring instrument (option)

With the measuring instrument, which can also be retrofitted into existing calibrators, Pt100, thermocouples and 0/4 ... 20 mA currents can be measured and converted into temperatures; and also in comparison with a reference thermometer. Automatic calibrations are possible using a PC/laptop and the calibration software.



Integrable measuring instrument

## Scope of delivery

- Temperature dry-well calibrator model CTD9300-165 or CTD9300-650
- Power cord 1.5 m (5 ft) with safety plug
- Insert with 6.5 mm (0.26 in) inner diameter
- Replacement tools
- Operating instructions
- RS-232 interface cable
- Calibration software
- 3.1 calibration certificate per DIN EN 10204

## Options

- Integrable measuring instrument
- Instrument variants for AC 115 V
- DKD/DAkkS calibration certificate

## Accessories

- Additional standard inserts
- Additional inserts with multiple bores
- Robust transport case
- Insert replacement tools
- Integrated measuring instrument for retrofitting
- External reference thermometer up to max. 165 or 650 °C (329 or 1,202 °F)
- Interface adapter from RS-232 to USB
- RS-232 interface cable with 9-pin SUB-D connector
- Power cord for Switzerland
- Power cord for USA/Canada
- Power cord for UK



Temperature dry-well calibrator model CTD9300, without integrated measuring instrument

## Ordering information

Model / Power supply / Protective conductor / Integrated measuring instrument / Reference thermometer / Calibration / Transport case / Power cord / Additional ordering information

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