Temperature dry-well calibrator
Models CTD9100-COOL, CTD9100-165, CTD9100-450, CTD9100-650

for further approvals
see page 4

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 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 LC 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.

Data sheets showing similar products:
Temperature dry-well calibrator; model CTD9100-1100; see data sheet CT 41.29
Temperature dry-well calibrator; model CTD9100-ZERO; see data sheet CT 41.30
Temperature dry-well calibrator; model CTD9100-375; see data sheet CT 41.32
Temperature dry-well calibrator; models CTD9300-165 and CTD9300-650; see data sheet CT 41.38
Multi-function temperature calibrator; model CTM9100-150; see data sheet CT 41.40

Specifications
CTD9100 series

	Model CTD9100-COOL	Model CTD9100-165
Display		
Temperature range	-55 ... +200 °C (-67 ... +392 °F)	-35 ... +165 °C (-31 ... +329 °F)
Accuracy [1]	0.15 ... 0.3 K	0.15 ... 0.25 K
Stability [2]	±0.05 K	
Resolution	0.01 up to 100 °C, then 0.1 (0.01 up to 212 °F, then 0.1)	
Temperature distribution		
Axial homogeneity [3]	dependent on temperature, temperature probes and their quantity	
Radial homogeneity [4]	dependent on temperature, temperature probes and their quantity	
Temperature control		
Heating time	approx. 10 min from 20 to 200 °C (from 68 °F to 392 °F)	approx. 25 min from 20 to 165 °C (X approx. 35 min) (from 68 °F to 329 °F)
Cooling time	approx. 10 min from +20 to -20 °C (from 68 °F to -4 °F)	approx. 15 min from +20 to -20 °C (X approx. 35 min) (from 68 °F to -4 °F)
Stabilisation time [5]	dependent on temperature and temperature probe	
Insert		
Immersion depth	150 mm (5.91 in)	
Insert dimensions	Ø 28 x 150 mm (Ø 1.1 x 5.91 in)	Ø 28 x 150 mm or Ø 60 x 150 mm (Ø 1.1 x 5.91 in or Ø 2.36 x 5.91 in)
Insert material	Aluminium	
Voltage supply		
Power supply	AC 100 ... 240 V, 50/60 Hz	
Power consumption	555 VA	375 VA
Fuse	6.3 A slow blow fuse	
Power cord	AC 230 V; for Europe	
Communication		
Interface	RS-485	
Case		
Dimensions (W x D x H)	215 x 305 x 425 mm (8.46 x 12.00 x 16.73 in)	
Weight	11 kg (24.3 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 (1.57 in) 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.

	Model CTD9100-450	Model CTD9100-650
Display		
Temperature range	40 ... 450 °C (104 ... 842 °F)	40 ... 650 °C (104 ... 1,202 °F)
Accuracy [1]	0.3 ... 0.5 K	0.3 ... 0.8 K
Stability [2]	±0.05 K up to 100 °C (212 °F) ±0.1 K up to 450 °C (842 °F)	±0.05 K up to 100 °C (212 °F) ±0.1 K up to 600 °C (1,112 °F)
Resolution	0.01 up to 100 °C, then 0.1 (0.01 up to 212 °F, then 0.1)	
Temperature distribution		
Axial homogeneity [3]	dependent on temperature, temperature probes and their quantity	
Radial homogeneity [4]	dependent on temperature, temperature probes and their quantity	
Temperature control		
Heating time	approx. 14 min from 20 to 450 °C (from 68 °F to 842 °F)	approx. 20 min from 20 to 600 °C (from 68 °F to 1,112 °F)
Cooling time	approx. 60 min from 450 to 100 °C (from 842 °F to 212 °F)	approx. 60 min from 600 to 100 °C (from 1.112 °F to 212 °F)
Stabilisation time [5]	dependent on temperature and temperature probe	
Insert		
Immersion depth	150 mm (5.91 in)	
Insert dimensions	Ø 60 x 150 mm (2.36 x 5.91 in)	Ø 28 x 150 mm (1.1 x 5.91 in)
Insert material	Aluminium	Brass
Voltage supply		
Power supply	AC 230/240 V, 50/60 Hz	AC 230/240 V, 50/60 Hz [6] (AC 100 ... 240 V, 50/60 Hz) [7]
Power consumption	2.000 VA	1.000 VA
Fuse	10 A slow blow fuse	10 A slow blow fuse (at AC 110 V) 6.3 A slow blow fuse (at AC 230 V)
Power cord	AC 230 V; for Europe	
Communication		
Interface	RS-485	
Case		
Dimensions (W x D x H)	150 x 270 x 400 mm (5.91 x 10.63 x 15.75 in)	
Weight	7,5 kg (16.5 lbs)	8 kg (17.6 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 (1.57 in) 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 design available with multi-voltage power supply
7) 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.

Approvals

Logo	Description	Country
CE	**EU declaration of conformity** ■ EMC directive EN 61326, emission (group 1, class B) and interference immunity (industrial application) ■ Low voltage directive EN 61010, safety requirements for electrical equipment for measurement, control and laboratory use ■ RoHS directive	European Union
EAC	**EAC** ■ EMC directive ■ Low voltage directive	Eurasian Economic Community
	GOST Metrology, measurement technology	Russia
	KazInMetr Metrology, measurement technology	Kazakhstan
-	**MTSCHS** Permission for commissioning	Kazakhstan
	BelGIM Metrology, measurement technology	Belarus

Certificates

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 (-67 ... +1.202 °F)

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

Model CTD9100-COOL
Temperature range from -55 ... +200 °C (-67 ... +392 °F)
and
Model CTD9100-165
Temperature range from -35 ... +165 °C (-31 ... +329 °F)
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 (2.4 in). 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 (104 ... 842 °F)
The CTD9100-450 is used in the medium temperature range up to 450 °C (842 °F). It generates its temperature with resistive electrical heating and features an enlarged insert with Ø 60 mm (2.4 in). 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 (104 ... 1.202 °F)
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.

Controls

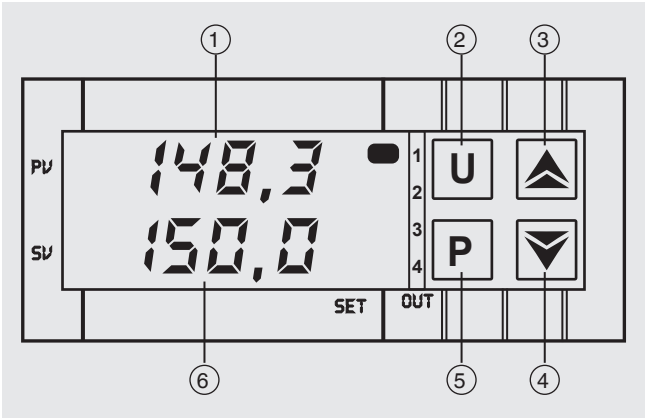
The temperature controller of the temperature dry-well calibrator is located on the front panel:

- 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.

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

Scope of delivery

- Temperature dry-well calibrator model CTD9100
- Power cord, 1.5 m (5 ft) 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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