PTC165

PTC165i Integrated measuring model

PTC165 & PTC165i

Premium Temperature Calibrators (Multi-Function) -30 to 165°C (-22 to 329°F)

The Druck PTC165 series of Premium Temperature Calibrators are characterised by their unparalleled performance and outstanding ease of operation. By means of the intuitive menu structure, all necessary inputs can be made quickly and easily. The large touch screen has plenty of room to display the reference, target and devices under test temperatures. At the end of a calibration process, the PTC165 series provides the complete calibration certificate.

Features

- Patented control technology - Fastest stabilisation times on the market - Time savings of up to 50 %
- Four functions in one calibrator (dry block / calibration bath / infrared / surface)
- Large calibration volume / large calibration insert for simultaneous calibration of many devices under test
- Patented touch screen function for simple and convenient operation
- Automatic generation of the calibration certificate
- Device under test management with optional barcode scanner (P/N IOPTC-BAR-1)
- Integrated measuring model available (PTC165i)
- Automatic calibration with optional camera P/N IOPTC-CAM-2 and holder P/N IOPTC-CAM-1

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Druck temperature calibrators

Druck temperature calibrators are used for the verification of the functionality and calibration of temperature measuring devices and temperature sensors with a special focus on long-term reliability and utmost accuracy in combination with easy operation.

Every Druck temperature calibrator is meticulously tested for accuracy and stability. This is certified by our traceable factory calibration certificate, which we issue with every temperature calibrator, or an optional Dakks (ISO17025) accredited calibration certificate can be purchased. This is to guarantee that you receive a perfect product which can be traced back to national and international temperature measurement standards.

Features

Four functions in one temperature calibrator

- Covering all calibration tasks with only one model: Dry block, infrared and surface calibration as well as calibration by means of a calibration bath
  - Cost savings due to a reduction in the number of versions required
- Quick and easy change between the calibration functions
- Additional calibration functions for your application
  - Air Shield Insert for the best measurement uncertainties

See accessories

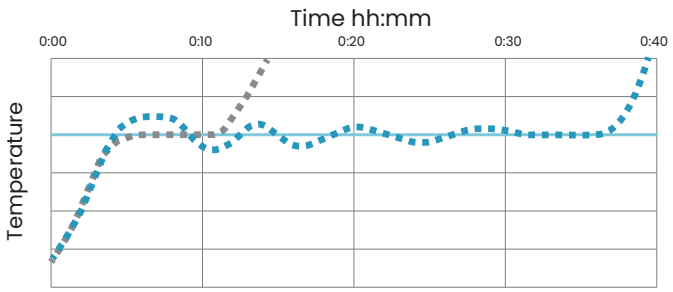
Calibration bath tub
P/N IOPTC-BT-1

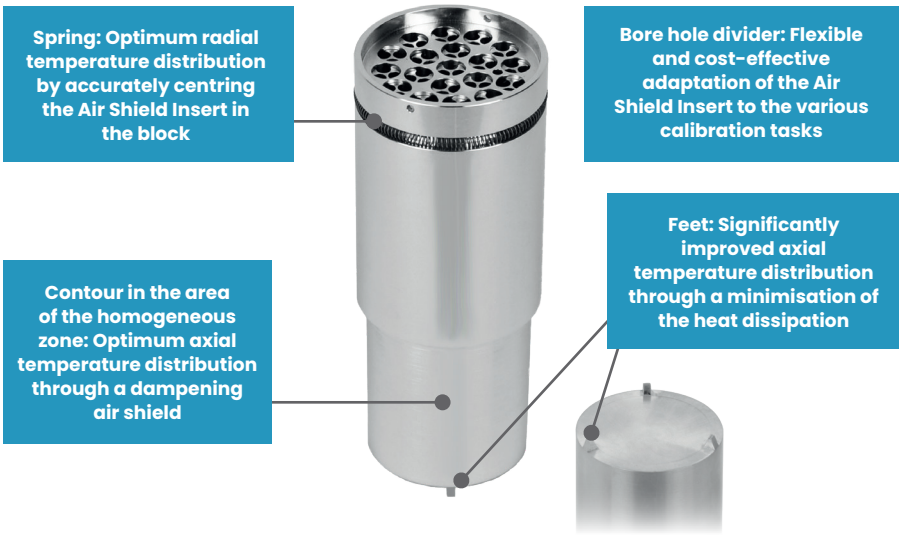
Infrared calibration insert
P/N IOPTC-INF-1

Surface calibration insert
P/N IOPTC-SURF-1

Temperature control with ultra high speed (UHS) controller

- Temperature regulator with model-based state control
- Special regulation algorithm based on knowledge and experience from space travel
- Unique temperature stability of < 0.001 °C / K
- Anticipatory activation of the heating and cooling elements
  - The settling time to the target temperature is reduced by approx. 90% at each calibration point
  - Time savings of up to 50% with each calibration process



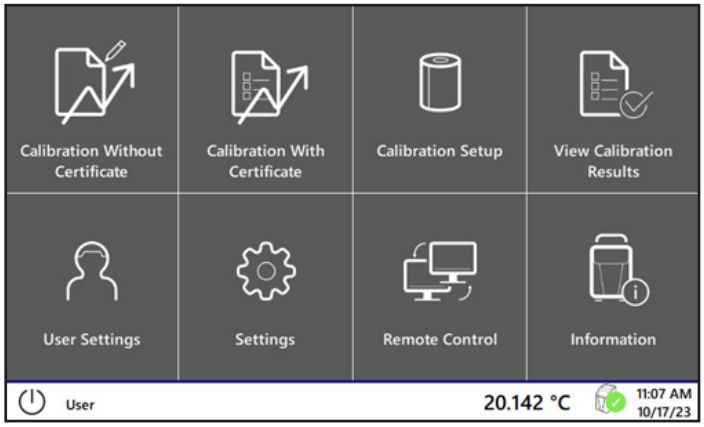


Air Shield Insert P/N IOPTC-DB-23 (supplied as standard)

- Patented dry block version with optimum radial and axial temperature distribution
- Automatic centring of the air shield insert in the block
  - User errors due to jiggling or twisting are excluded

User interface

- Simple operation of the temperature calibrator via the integrated 7" touch screen
  - Intuitive operation of the calibration functions
  - Management of calibration data directly on the calibrator
- Clear display
  - All important information at a glance
- Completely paperless calibration
  - Value calculation and transmission errors are excluded
- Glass surface made of multi-panel safety glass
  - Extremely robust against damage
  - Easy cleaning of the surface
  - Suitable for use in the food industry



Automatic calibration with camera and holder

In calibration processes for devices under test with their own temperature display, the display of the DUT must be read for each calibration point. The read value is transferred by the user to the calibrator or the calibration certificate, and the subsequent calibration point is only approached after a manual acknowledgement. For this purpose, the user must return to the calibrator at each calibration point. In some cases, this can lead to long delays if the user carries out other tasks in between. With our automatic calibration with a camera, these time-intensive intermediate steps are no longer needed:

- The patented camera system automatically creates a recording of the DUT display at each calibration point. The subsequent calibration point is approached directly afterwards
  - No user interaction is required during the calibration process, as it is implemented automatically
  - All test points are approached without waiting times
- Upon completion of the entire calibration process, the user transmits the data of the created display records to the calibrator or calibration certificate
  - During the entire calibration process, the user is free to carry out other tasks
- The visual records of the device under test display at each calibration point are saved and attached to the calibration certificate as verification
- P/N IOPTC-CAM-1 Camera holder for USB camera
- P/N IOPTC-CAM-2 Camera

Technical data

PTC165 / PTC165i Functions		
	-30 to 165 °C at ambient temperature 20 °C	-22...329 °F at ambient temperature 68 °F
Temperature range	See the respective calibration function for details. Lower temperatures can be achieved by reducing the ambient temperature.	
Dimension for the calibration insert	Ø 60 x 170 mm (calibration insert easily exchangeable)	
Dry block Air Shield Insert (Function 1) Temperature range: -30 to 160 °C (-22 to 320 °F)	**External reference temperature sensor**	
Display accuracy	±0.07 °C	±0.126 °F
Temperature stability	±<0.001...0.005 °C	±0.0018...0.009 °F
Temperature distribution		
→ Axial	±0.060 °C	±0.108 °F
→ Radial	±0.010 °C	±0.018 °F
Influence of load	±0.010 °C	±0.018 °F
Infrared calibration (Function 2) Temperature range: -30 to 165°C (-22 to 329 °F)	**Internal reference temperature sensor**	
Display accuracy	±0.5 °C	±0.9 °F
Temperature stability	±0.020 °C	±0.036 °F
Emission factor	0.9994	
Calibration bath (stirred), tub insert (Function 3) Temperature range: -30 to 155 °C (-22 to 311 °F) (Note 1)	**External reference temperature sensor**	
Display accuracy	±0.20 °C	±0.36 °F
Temperature stability	±0.010 °C	±0.018 °F
Temperature distribution		
→ Axial	±0.350 °C	±0.630 °F
→ Radial	±0.080 °C	±0.144 °F
Influence of load	±0.040 °C	±0.072 °F
Surface calibration (Function 4) Temperature range: -25 to 150°C (-13 to 302 °F)	**External reference temperature sensor**	
Display accuracy	±1 °C	±1.8 °F
Temperature stability	±0.150 °C	±0.27 °F

Note 1: Function 3 calibrated with 10cst silicon oil (P/N **TCL10** not included)

PTC165 / PTC165i			
Stabilisation time (with external reference temperature sensor **P/N IOPTC-EXSEN-1**)			
→ to ±0.05°C	→ to ±0.09 °F	From 1 min	
→ to ±0.005°C	→ to ±0.009 °F	From 5 min	
Heating time			
→ 20 °C to 155 °C	→ 68 to 311 °F	27 min	
→ -30 °C to 155 °C	→ -22 to 311 °F	34 min	
Cooling time			
→ 165 °C to 30 °C	→ 329 to 86 °F	17 min	
→ 20 °C to -25 °C	→ 68 to -13 °F	35 min	
Resolution of the temperature display		0.1 / 0.01 / 0.001 °C (selectable)	0.1/0.01/0.001 °F (selectable)
Hysteresis		±0.010 °C	±0.018 °F
Temperature units		°C / °F / K (selectable)	
Reference temperature sensor		internal, fixed installation / external (selectable)	
Interfaces		Ethernet, 3 x USB	
Connectivity		Serial communication and HTTP	
Dimensions			
→ Width		210 mm	
→ Height		380 + 50 mm (Handle)	
→ Depth		300 mm	
Weight		Approx. 13 kg	
Power supply		100...240 V ac, 50/60 Hz	
Power consumption		Approx. 375 W	
Display		Brilliant color touchscreen (7 inches), multi panel safety glass	
Approvals			
Approvals		CE marked, REACH, WEEE, UKCA, RCM, ETL (PTC165 model only), Batteries Regulation (EU) 2023/1542	
RoHS		EU: 2011/65/EU, UK: S.I.2012/3032, UAE, China	
EMC		EU: 2014/30/EU, UK: S.I.2016/1091, Australia: RCM	
Electrical Safety		ETL - (Intertek) marked – (PTC165 model only) LVD - 2014/35/EU, UK: S.I.2016/1101	

Technical data
PTC165i: integrated measuring instrument

Device under test inputs – resistance thermometers		
Number of channels	2	
Connection	4 mm safety socket, 4 per channel	
Connection type	2-, 3-, 4-wire technology	
Resistance range		
→ Pt100	0…400 Ω	
→ Pt1000	0…4000 Ω	
Accuracy		
→ Pt100	±0.03 °C	±0.054 °F
→ Pt500	±0.12 °C	±0.216 °F
→ Pt1000	±0.06 °C	±0.108 °F
→ Ni100	±0.02 °C	±0.036 °F
→ Ni500	±0.08 °C	±0.144 °F
→ Ni1000	±0.04 °C	±0.072 °F
Device under test inputs – thermocouple		
Number of channels	2	
Connection	2x thermocouple socket (mini)	
Measuring range	-10…100 mV	
Accuracy cold junction	±0.3 °C	±0.054 °F
Accuracy		
→ Type K	±0.08 °C	±0.144 °F
→ Type J	±0.07 °C	±0.126 °F
→ Type N	±0.13 °C	±0.234 °F
→ Type E	±0.06 °C	±0.108 °F
→ Type T	±0.09 °C	±0.162 °F
→ Type R	±0.78 °C	±1.404 °F
→ Type S	±0.73 °C	±1.314 °F
→ Type B	±0.5 °C	±0.9 °F
Standard signal input (current)		
Number of channels	1	
Connection	4 mm safety socket	
Measuring range	0…24 mA	
Accuracy	0.01 % of range	
Standard signal input (voltage)		
Number of channels	1	
Connection	4 mm safety socket	
Measuring range	0…12 VDC	
Accuracy	0.01 % of range	
Switch test		
Number of channels	2	
Transmitter supply		
Output current	Max. 24 mA	
Output voltage	24 VDC	

The integrated measuring instrument in detail

Resistance thermometers, thermocouples and signals from temperature transmitters must be operated with an external measuring instrument which measures the output signals and displays them as temperature during the calibration. This temperature can then be compared to the set calibrator temperature.

Our integrated measuring instrument assumes the tasks of an external measuring instrument. It shows the temperature directly on the calibrator display and enables the fully automatic calibration of two devices under test at the same time.

Your benefits of the integrated measuring instrument at a glance:

- Temperature sensor calibration without additional measuring instrument
- Simultaneous calibration of several temperature sensors
- Fully automatic calibration and certification
- Enables the simplification of your work processes
- Offers great time savings compared to a temperature calibrator without integrated measuring instrument

The following DUTs can be connected to the integrated measuring instrument:

- Resistance thermometer (RTD): Pt100, Pt500, Pt1000, Ni100, Ni500 and Ni1000 in 2-,3- or 4-wire circuit
- Thermocouples (TC) of the types K, J, B, E, N, R, S and T. When selecting Dakks (ISO17025) accredited calibration, K,J,N,E,R,T,S are calibrated, all others (type B) will be supplied with a traceable factory calibration.
- 0(4)...20 mA current signals from temperature transmitters (mA), with and without supply voltage
- 0...10 V voltage signals
- Temperature switch (switch) with normally open and normally closed contacts

Ordering information for PTC165 and PTC165i

The PTC165 series are supplied with a safety manual and traceable factory calibration certificate as standard along with the following kit:

Kit included as standard

DRUCK P/N	Description
IOPTC-DB-23	Insert Air shield 1x Ø2.0, 1x Ø3.3, 3x Ø3.5, 2x Ø4.5, 1x Ø6.0 mm (Aluminium)
IOPTC-EXSEN-1	External Reference Sensor (-55 to 255 °C) straight version
IOPTC-BT-1	Tub insert; (bath) Ø60 mm
ISPTC-20	Universal plug and lead set
ISPTC-BN-PLUGS	Banana plugs (only on PTC165i model)
ISPTC-ET-1	Insert exchange tongs
ISPTC-EC-1	Ethernet Cable
ISPTC-BWC-1	Liquid Bath work cover

1. Select the model
2. Select PTC and External reference sensor (ext ref sensor) calibrations
3. Select Integrated measurement calibrations (if selected PTC165i)

Model Type (Mandatory to select one)

PTC165 Premium Temperature Calibrator (Multi-Function)
PTC165i Premium Temperature Calibrator (Multi-Function with Integrated measurement)

PTC and ext ref sensor calibration certificate – select only one
0 Traceable factory calibration on PTC
1 Dakks (ISO17025) accredited calibration on PTC (Functions 1 and 3)

Integrated Measurement Calibration certificate – select only one (only available on PTC165i model)
0 Traceable factory calibration on integrated measurement
1 Dakks (ISO17025) accredited calibration on Integrated measurement –
Traceable factory calibration certificate also included.

Example model numbers: **PTC165-0**
PTC165i-0-1

Accessories

Please state any accessories required as separate items when placing an order.
The PTC165 and PTC165i versions are compatible with the following accessories unless otherwise specified.

DRUCK P/N	Description
IOPTC-DB-8	Insert Air Shield 1x Ø3.5, Ø6.5, Ø8.5, Ø10.5 mm (Aluminium)
IOPTC-DB-9	Insert Air Shield 2x all Ø3.5, Ø4.5, Ø6.5, Ø8.5, Ø10.5 mm (Aluminium)
IOPTC-DB-10	Insert Air Shield 3x all Ø3.5, Ø6.5, Ø8.5, Ø10.5 mm (Aluminium)
IOPTC-DB-11	Insert Air Shield 1x Ø4.5, Ø5, Ø5.5, Ø6.5, Ø8.5, Ø9, Ø9.5, Ø10.5, 2x Ø3.5 mm (Aluminium)
IOPTC-DB-23	Insert Air shield 1x Ø2.0, 1x Ø3.3, 3x Ø3.5, 2x Ø4.5, 1x Ø6.0 mm (Aluminium)
IOPTC-DB-24	Insert Air shield without bore holes Ø60 mm (Aluminium)
IOPTC-BT-1	Tub insert; (bath) Ø60 mm
IOPTC-INF-1	Infrared insert Ø60 mm (Aluminium)
IOPTC-SURF-1	Surface insert Ø60 mm (Aluminium)
IOPTC-CAM-1	Camera holder for USB camera
IOPTC-CAM-2	Camera
IOPTC-BAR-1	Barcode scanner
IOPTC-CASE-1	Transport case with trolley
TCL10	Calibration Liquid (silicon oil 10 CST) BAC-459

The PTC165 is supplied with P/N IOPTC-EXSEN-1 External reference probe of 3mm diameter. When ordering inserts, the recommendation for the ext ref probe drilling should be 3.3mm to 3.5mm.

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