Temperature calibrator TP 37450E.2 | TP 37450E.2i

TP Premium | Multifunction | Room temperature...450 °C | RT...842 °F



TP 37450E.2



TP 37450E.2i
Integrated measuring instrument

Highlights

- Best measurement uncertainties on the market
- Patented control technology - Fastest stabilisation times on the market - Time savings of up to 50 %
- Time and cost savings thanks to patented ventilator concept for fastest cooling times
- Patented touch screen function for simple and convenient operation
- Accessories: device under test management with barcode scanner
- Available with integrated measuring instrument → TP 37450E.2i

TP Premium

The calibrators of the TP Premium series are characterised by their **unparalleled performance** and **outstanding operating comfort**. 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 TP Premium **provides the complete calibration certificate**. The continuously growing bandwidth of supported temperature ranges supports an increasing number of temperature sensors on the market. They can be calibrated with a resolution of 0.001 °C / K and thus meet the highest requirements, e.g. of the **food and pharmaceuticals industry**.

SIKA temperature calibrators

Temperature calibrators are used for the verification of the functionality and calibration of temperature measuring devices and temperature sensors. As the sole German manufacturer of these devices, we develop and produce our “Made in Germany” temperature calibrators with a special focus on **long-term reliability** and **utmost accuracy** in combination with **easy operation**. We can rely on more than 40 years of experience in doing this: SIKA’s **first dry block temperature calibrator** was launched all the way back in 1980.

Every SIKA temperature calibrator is meticulously tested for **accuracy** and **stability**. This is attested by our standard calibration certificate, which we issue with every temperature calibrator, or by means of an optional DAkkS calibration certificate [German accreditation body]. This is to guarantee that you receive a **perfect product** which can be traced back to national and international temperature measurement standards.

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Features

Three functions in one temperature calibrator

- Covering many calibration tasks with only one model: Dry block, infrared and surface calibration
  → 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



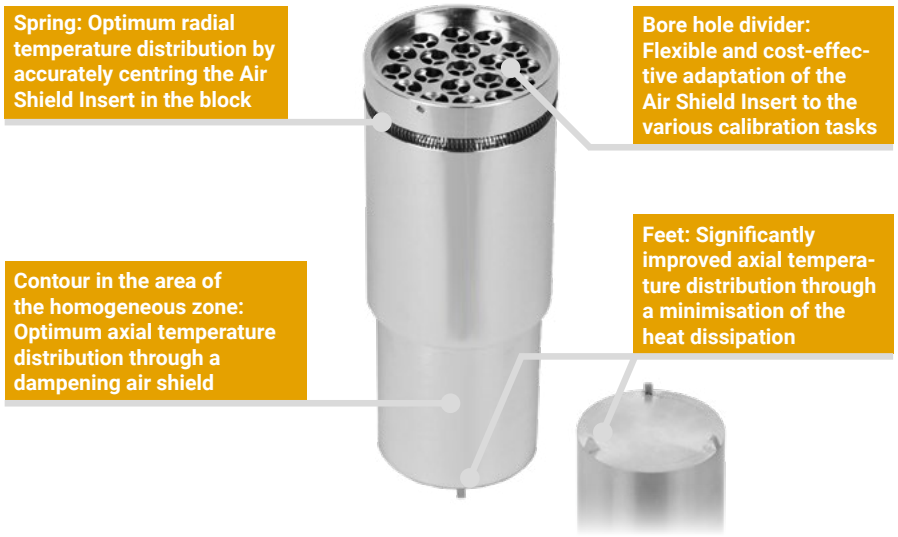
Dry block calibration



Infrared calibration



Surface calibration

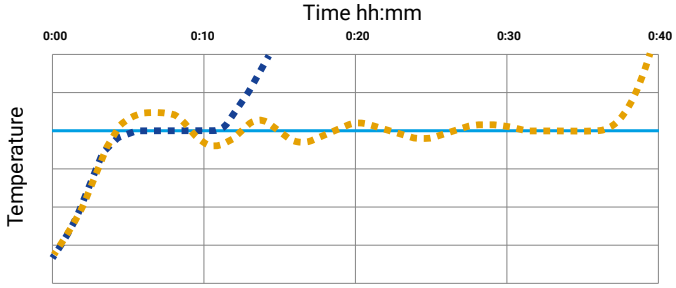


Dry block *Air Shield Insert*

- 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

Temperature control with “rocket 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



Without rocket controller: Long settling time to the target temperature
With rocket controller: Settling time to the target temperature reduced by approx. 90%

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Features



Touch screen with robust glass surface

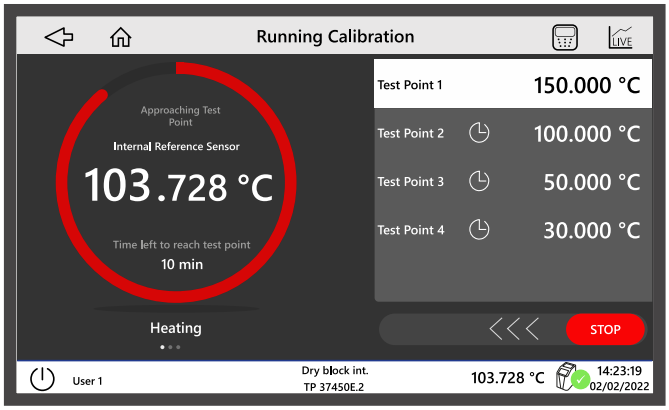
- Simple operation of the temperature calibrator via the integrated 7” touchscreen
  → Intuitive operation of the calibration functions
  → Management of calibration data directly on the calibrator
- Glass surface made of multi-pane safety glass
  → Extremely resistant to damage
  → Easy cleaning of the surface
  → Suitable for use in the food industry

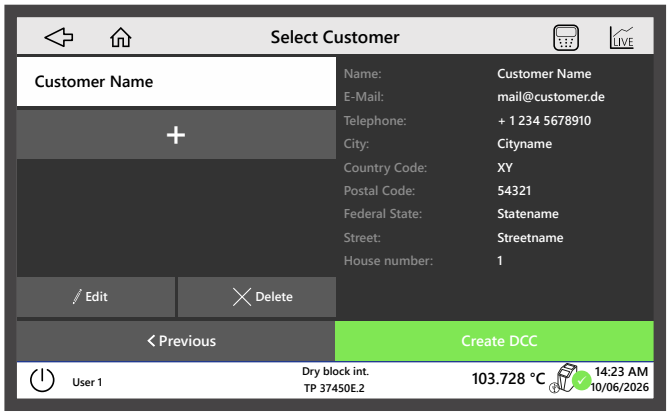
TP OS operating system

Our TP OS operating system with its clear display allows you to see all the important information at a glance.

Our operating system also offers:

- Completely paperless calibration
  → No calculation and transmission errors
- Future-proof through updates
- The option of remote maintenance
- Operating and explanatory videos with sound and text





Digital Calibration Certificate (DCC)

The TP Premium generates calibration data as a standardized, machine-readable XML file based on the DCC schema version 3.3.0, according to the official PTB standard. This allows calibration data to be archived in a structured manner, shared, and integrated into digital quality processes.

- Created directly on the temperature calibrator
- Contains core, laboratory, customer and calibration item data
- Can be further processed in CAQ, ERP or QM systems
- **DCC according to the official PTB standard**

WebApp - Plug and play for your temperature calibrator

- With the WebApp, ongoing or completed calibration processes can be comfortably displayed on a PC or a smart phone
- The connection is made via LAN or WLAN (via router)
- The WebApp is opened via the browser of your PC or mobile phone. Installation of drivers or software is not required
- Compatible with all current operating systems (Windows, Mac OS, Linux, iOS and Android)



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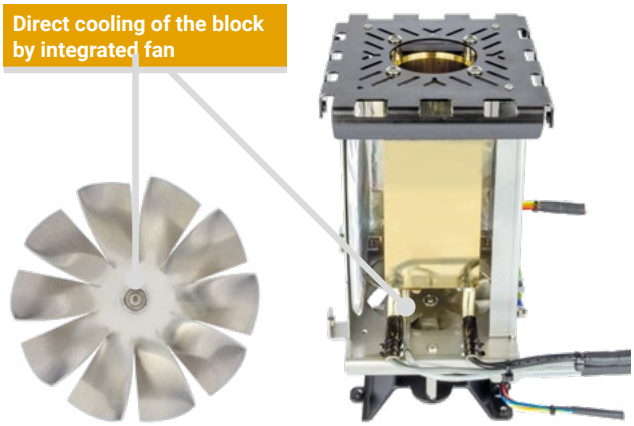
Features

Automatic calibration with camera

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





Innovative ventilator concept

- Temperature calibrators which do not have an active cooling, e.g. due to special Peltier elements, use one or several ventilators for cooling down.
- The innovative SIKA ventilator concept enables a very direct cooling of the block and thus achieves the fastest cooling-down times on the market
  → Time and cost savings with every calibration
  → Reduced standstill times in your company
- The ventilator is exclusively used for cooling down the temperature calibrator
  → Completely silent heating mode
  → Reduced noise emissions for the user

5-Year Warranty:
Low Maintenance, Comprehensive Service!

With regular service and adherence to the SIKA recalibration recommendation, you receive a 5-year warranty.

- Instead of annual recalibration, recalibration is only necessary every 500 operating hours or every three years thanks to long-lasting SIKA technology.
- This results in only 1/3 of the usual maintenance costs.
- Significant reduction in the total cost of ownership.



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Technical data

TP 37450E.2 / TP 37450E.2i				
Temperature range	Room temperature...450 °C		Room temperature...842 °F	
Dimension of the calibration insert	Ø 60 x 150 mm (calibration insert easily exchangeable)			
Dry block Air Shield Insert	**External reference temperature sensor**			
Display accuracy	±0.2 °C		±0.36 °F	
Temperature stability	±0.010 °C		±0.018 °F	
Temperature distribution → Axial → Radial	 ±0.100 °C ±0.015 °C		 ±0.18 °F ±0.027 °F	
Influence of load	±0.010 °C		±0.018 °F	
Dry block	**External reference temperature sensor**		**Internal reference temperature sensor**	
Display accuracy	±0.25 °C	±0.45 °F	±0.3 °C	±0.54 °F
Temperature stability	±0.010 °C	±0.018 °F	±0.030 °C	±0.054 °F
Temperature distribution → Axial → Radial	 ±0.300 °C ±0.060 °C	 ±0.54 °F ±1.08 °F	 ±0.300 °C ±0.060 °C	 ±0.54 °F ±1.08 °F
Influence of load	±0.015 °C	±0.027 °F	±0.015 °C	±0.027 °F
Infrared calibration	**External reference temperature sensor**		**Internal reference temperature sensor**	
Display accuracy	±0.5 °C	±0.9 °F	±0.5 °C	±0.9 °F
Temperature stability	±0.030 °C	±0.054 °F	±0.100 °C	±0.18 °F
Emission factor	0,9994			
Surface calibration	**External reference temperature sensor**			
Display accuracy	±1 °C		±1.8 °F	
Temperature stability	±0.250 °C		±0.45 °F	
General data				
Stabilisation time (with external reference temperature sensor) → to ±0.05°C → to ±0.09 °F → to ±0.005°C → to ±0.009 °F	 From 1 min From 5 min			
Heating time (without calibration insert) → 20 °C...440 °C → 68...824 °F	 17 min			
Cooling time (without calibration insert) → 450 °C...30 °C → 824...86 °F	 36 min			
Resolution of the temperature display	0.001 °C		0.001 °F	
Hysteresis	±0.010 °C		±0.018 °F	
Temperature units	°C / °F / K (selectable)			
Reference temperature sensor	Internal / external (selectable)			
Interfaces	Ethernet, 3 x USB			
Connectivity	OPC UA, HTTP, serial communication. Details and further possibilities on request.			
Dimensions				
→ Width → Height → Depth	210 mm 330 mm + 50 mm (Handle) 300 mm			
Weight	11 kg			
Power supply	90...115 V 60 Hz / 230 V 50 Hz Voltages below 110 V can lead to longer heat-up times or reduced maximum temperature. Protective conductor (PE) required.			
Power consumption	Approx. 1000 W			
Adjustable temperature range	0...450 °C		-76...842 °F	
Display	Brilliant color touchscreen (7 inches), multi panel safety glass			
Approvals				

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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 and Pt1000 in 2-,3- or 4-wire circuit
- Thermocouples (TC) of the types K, J, N, E, R, T, B, S, L and U
- 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



Inputs RTD A and RTD B for the connection of 2-, 3- or 4-wire resistance thermometers

Supply voltage of the DUT via the temperature calibrator

Connection via 4 mm safety sockets. All adapters are included in the scope of delivery.

TC A and TC B for the connection of thermocouple

Standard signal inputs for current and voltage signals

Input for external reference resistance thermometer

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Temperature calibrator TP 37450E.2i | Integrated measuring instrument
Technical data

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	
General technical data		
Annual drift of all measuring inputs	Max. 30% of accuracy	

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Article numbers

To order a complete calibrator, you need three article numbers:

1. Calibrator
2. Linearisation
3. Calibration insert

In addition, depending on your individual calibration requirements, you can order additional calibration inserts, necessary certificates and other accessories.

1. Calibrator

Temperature range		Function	Calibration insert [mm]	Power supply	Integrated measuring instrument	Article number		
Room temperature...450°C	RT...842 °F	Multifunction	Ø 60 x 150	110...240 V	Without	EP3745	0	26015U3
Room temperature...450°C	RT...842 °F	Multifunction	Ø 60 x 150	110...240 V	With	EP3745	I	26015U3

2. Linearisation

Linearisation					
With linearisation	EPLIK				
Function					
Dry block		DB			
Air Shield Insert*		AS			
Infrared		IR			
Surface*		SU			
Reference temperature sensor					
Internal			I		
External			E		
Alignment to medium					
No Medium				00	
Test points					
Standard					0
Customer-specific					K
Example article number	**EPLIK**	**DB**	**I**	**00**	**0**

* Only with external reference temperature sensor

3. Calibration insert

Bore holes [mm]	Function	Calibration insert [mm]	Material	Article number
1x Ø 3.5, 1x Ø 6.5, 1x Ø 8.5, 1x Ø 10.5	Dry block	Ø 60 x 150	Aluminium	EZ15060D04AL78
2x Ø 3.5, 2x Ø 4.5, 2x Ø 6.5, 2x Ø 8.5, 2x 10.5	Dry block	Ø 60 x 150	Aluminium	EZ15060D10AL79
2x Ø 3.5, 1x Ø 4.5, 1x Ø 5.0, 1x Ø 5.5, 1x Ø 6.5, 1x Ø 8.5, 1x Ø 9.0, 1x Ø 9.5, 1x Ø 10.5	Dry block	Ø 60 x 150	Aluminium	EZ15060D10AL83
3x Ø 3.5, 3x Ø 6.5, 3x Ø 8.5, 3x Ø 10.5	Dry block	Ø 60 x 150	Aluminium	EZ15060D12AL81
Calibration insert for infrared calibration	Infrarot	Ø 60 x 150	Aluminium	EZ15060B03AL41IR
Calibration insert for surface calibration	Surface	Ø 60 x 150	Aluminium	EZ17260B02AL06OF
Without bore holes (Air Shield Insert)	Dry block	Ø 60 x 150	Aluminium	EZ15260B00AL23F
Air Shield Insert incl. 1 bore hole of choice	Air Shield Insert	Ø 60 x 150	Aluminium	Please indicate bore holes in the order

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4. Calibration certificate - Select your calibration certificates as needed Each calibrator is already delivered with a standard calibration certificate (6 test points).	**Article number**
SIKA works calibration certificate (Air Shield Insert with external reference temperature sensor)	EKWPEPLIKASE
SIKA works calibration certificate (Dry block with internal reference temperature sensor)	EKWPEPLIKDBI
SIKA works calibration certificate (Dry block with external reference temperature sensor)	EKWPEPLIKDBE
SIKA works calibration certificate (Calibration bath, direct filling, with internal reference temperature sensor)	EKWPEPLIKLII
SIKA works calibration certificate (Calibration bath, direct filling, with external reference temperature sensor)	EKWPEPLIKLIE
SIKA works calibration certificate (Calibration bath, tub insert, with internal reference temperature sensor)	EKWPEPLIKTII
SIKA works calibration certificate (Calibration bath, tub insert, with external reference temperature sensor)	EKWPEPLIKTIE
SIKA works calibration certificate (Infrared calibration insert with internal reference temperature sensor)	EKWPEPLIKIRI
SIKA works calibration certificate (Infrared calibration insert with external reference temperature sensor)	EKWPEPLIKIRE
SIKA works calibration certificate (Surface calibration insert with external reference temperature sensor)	EKWPEPLIKSUE
DAkkS calibration certificate (Air Shield Insert with external reference temperature sensor)	EKDAKKSEPLIKASE
DAkkS calibration certificate (Dry block with internal reference temperature sensor)	EKDAKKSEPLIKDBI
DAkkS calibration certificate (Dry block with external reference temperature sensor)	EKDAKKSEPLIKDBE
DAkkS calibration certificate (Calibration bath, direct filling, with internal reference temperature sensor)	EKDAKKSEPLIKLII
DAkkS calibration certificate (Calibration bath, direct filling, with external reference temperature sensor)	EKDAKKSEPLIKLIE
DAkkS calibration certificate (Calibration bath, tub insert, with internal reference temperature sensor)	EKDAKKSEPLIKTII
DAkkS calibration certificate (Calibration bath, tub insert, with external reference temperature sensor)	EKDAKKSEPLIKTIE
Each additional test point DAkkS calibration certificate	EKTPDAKKSZUSP
SIKA works calibration certificate integrated measuring instrument (Pt100, type K)	EKTPWPMI1
SIKA works calibration certificate integrated measuring instrument (Pt100, Pt1000 type K, type J)	EKTPWPMI2
SIKA works calibration certificate integrated measuring instrument (Pt100, type K, mA, V)	EKTPWPMI3
SIKA works calibration certificate integrated measuring instrument (Pt100, Pt1000 type K, type J, mA, V)	EKTPWPMI4
SIKA works calibration certificate for each additional measurement input of your choice (Pt500, Pt1000, type J/N/E/T/R/S, mA, V)	EKTPWPMIZUS
SIKA works calibration certificate complete (Pt100, Pt500, Pt1000, type K/J/N/E/T/R/S, mA, V)	EKTPWPMIKOMPL
DAkkS calibration certificate integrated measuring instrument (Pt100, type K)	EKTPDAKKSMI1
DAkkS calibration certificate integrated measuring instrument (Pt100, Pt1000 type K, type J)	EKTPDAKKSMI2
DAkkS calibration certificate integrated measuring instrument (Pt100, type K, mA, V)	EKTPDAKKSMI3
DAkkS calibration certificate integrated measuring instrument (Pt100, Pt1000 type K, type J, mA, V)	EKTPDAKKSMI4
DAkkS calibration certificate for each additional measurement input of your choice (Pt500, Pt1000, type J/N/E/T/R/S, mA, V)	EKTPDAKKSMIZUS
DAkkS calibration certificate complete (Pt100, Pt500, Pt1000, type K/J/N/E/T/R/S, mA, V)	EKTPDAKKSKOMPL

5. Accessories	**Article number**
Transport case without trolley	EZTPKOFFER20
Transport case with trolley	EZTPKOFFER20TG
External reference temperature sensor TF 700-4.5-300 (5…700 °C / 41…1292 °F), straight	W454P413000GX0R2
Network switch	XE2103
Barcode scanner	XE2102
W-LAN router	XE2101
USB Camera for DUT monitoring	XE2375
Camera holder for USB Camera	XE2370
DUT temperature sensor for demo purposes (Pt100 3-phase) for integrated measuring instrument	WMQMP31020050003
Bore hole divider for Air Shield Insert 3 x Ø 3 mm sensors from Ø 9 mm bore hole	XE2194
Spare part extension spring for Air Shield Insert	XE2267
Instruction in the temperature calibrator by SIKA field service	EKTPEINWEISUNG
Frame packaging for return of calibrator (e.g. for recalibration) Please indicate the calibrator model when ordering.	098V

Overview of SIKA temperature calibrators

Our series: Basic. Solid. Premium.

- **Dry block calibrators** of the **TP Basic** series impress with their **uncomplicated operation** and **high cost-effectiveness**. They are particularly suitable for use on ships or in industrial applications.
- Equipped with a **PC interface**, the **dry block calibrators** and **calibration baths** of the **TP Solid** series cover a wide temperature range with high accuracy.
- For the highest demands on accuracy and flexibility: The dry-block and multi-function temperature calibrators of the **TP Premium** series represent the pinnacle of our technical development. Equipped with an **integrated touch screen**, a **PC interface**, an **external reference sensor** and **integrated measuring instrument**, this series offers **extreme accuracies** for **all calibration tasks**.

Temperature range (RT=Room temperature)	Function	Accuracy		Features	Block dimensions [Ø mm x depth mm]	Type
-50 °C ... 200 °C -58 °F ... 392 °F	Dry block	±0.4 °C	±0.72 °F	TP Basic	28 x 150	TP 17200
	Dry block	±0.2 °C	±0.36 °F	TP Solid	28 x 150	TP 17200S
	Dry block	±0.1 °C	±0.18 °F	TP Premium	28 x 150	TP 37200E.2
-35 °C ... 165 °C -31 °F ... 329 °F	Dry block	±1 °C	±1.8 °F	TP Basic	28 x 150	TP 17165M
	Dry block	±0.4 °C	±0.72 °F	TP Basic	28 x 150	TP 17165
	Dry block	±0.2 °C	±0.36 °F	TP Solid	28 x 150	TP 17165S
	Dry block	±0.1 °C	±0.18 °F	TP Premium	28 x 150	TP 37165E.2
-30 °C ... 155 °C -22 °F ... 311 °F	Calibration bath	±0.1 °C	±0.18 °F	TP Solid	60 x 170	TP M165S
-30 °C ... 165 °C -22 °F ... 329 °F	Dry block	±0.4 °C	±0.72 °F	TP Basic	60 x 150	TP 17166
	Dry block	±0.2 °C	±0.36 °F	TP Solid	60 x 150	TP 17166S
	Dry block Air Shield Insert Calibration bath Infrared Surface	±0.1 °C ±0.07 °C ±0.19 °C ±0.5 °C ±1 °C	±0.18 °F ±0.126 °F ±0.342 °F ±0.9 °F ±1.8 °F	TP Premium	60 x 170	TP 3M165E.2
-10 °C ... 100 °C 14 °F ... 212 °F	Dry block	±0.05 °C	±0.09 °F	TP Solid	7 x 6.5 x 150	TP 17Zero
RT ... 200 °C RT ... 392 °F	Dry block	±0.3 °C	±0.54 °F	TP Basic	18 x 150	TP 18200ES
RT ... 255 °C RT ... 491 °F	Calibration bath	±0.2 °C	±0.36 °F	TP Solid	60 x 170	TP M255S
	Dry block Air Shield Insert Calibration bath Infrared Surface	±0.25 °C ±0.08 °C ±0.18 °C ±0.5 °C ±1°C	±0.45 °F ±0.144 °F ±0.324 °F ±0.9 °F ±1.8 °F	TP Premium	60 x 170	TP 3M255E.2
RT ... 450 °C RT ... 842 °F	Dry block	±0.6 °C	±1.08 °F	TP Basic	60 x 150	TP 17450
	Dry block	±0.3 °C	±0.54 °F	TP Solid	60 x 150	TP 17450S
	Dry block Air Shield Insert Infrared Surface	±0.25 °C ±0.2 °C ±0.5 °C ±1 °C	±0.45 °F ±0.36 °F ±0.9 °F ±1.8 °F	TP Premium	60 x 150	TP 37450E.2
RT ... 650 °C RT ... 1202 °F	Dry block	±1 °C	±1.8 °F	TP Basic	28 x 150	TP 17650M
	Dry block	±0.8 °C	±1.44 °F	TP Basic	28 x 150	TP 17650
	Dry block	±1.2 °C	±2.16 °F	TP Basic	13.5 x 110	TP Basic Marine
	Dry block	±0.4 °C	±0.72 °F	TP Solid	28 x 150	TP 17650S
RT ... 700 °C RT ... 1292 °F	Dry block Air Shield Insert	±0.43 °C ±0.27 °C	±0.744 °F ±0.486 °F	TP Premium	29 x 150	TP 37700E.2
RT ... 850 °C RT ... 1562 °F	Dry block	±1 °C	±1.8 °F	TP Basic	18 x 100	TP 18850E

Subject to technical modifications and errors

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