

Electronic Measuring and Calibration Instruments



Electronic Measuring and Calibration Instruments

Our electronic instruments and calibration equipment product area features instruments with long-term reliability, innovative calibration technology, and a comprehensive range of services from our own DKD laboratory for temperature, pressure and standardised electrical signals.

Tried and tested components for instrumentation and control equipment and systems help our customers ensure the consistent long-term quality of their products and the efficiency of their production processes. Our strength is our flexibility in developing customised solutions, based on our wealth of experience.

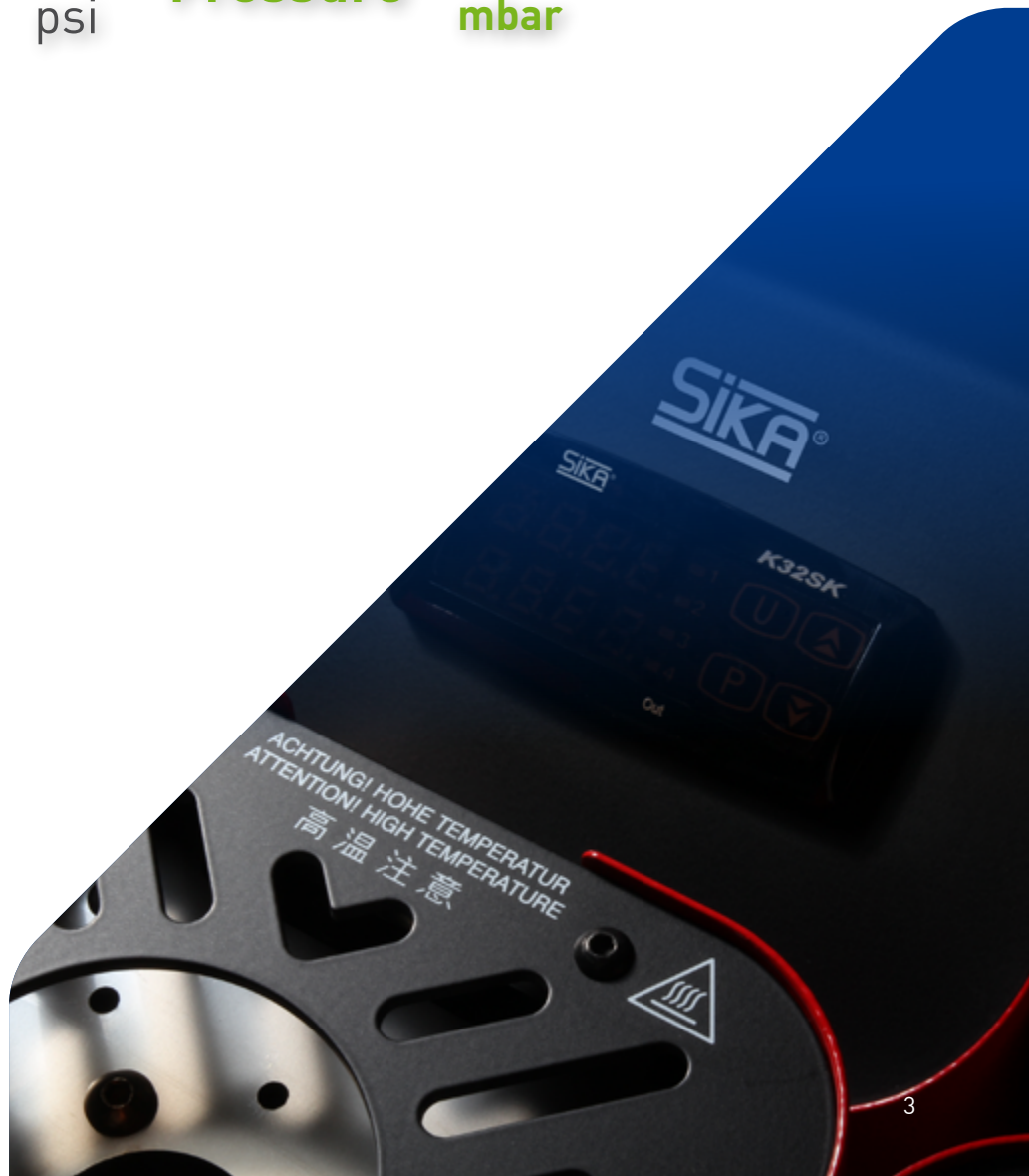
Standard Signals

Temperature

Pressure

% r.F. **bar** **Ω**

mA **°C** **psi** **°F** **mbar**



- TP Basic
- TP Solid
- TP Premium
- Accessories
- TT-Scan



Including products with:



TEMPERATURE CALIBRATORS





For industry and service

Good reasons for a calibration

- Maintain consistently high product quality
- Meet industry standards and legal regulations
- Optimize processes and boost productivity
- Avoid unscheduled downtime

Temperature sensors are subject to mechanical, thermal and chemical stress. This results in a drift the longer the sensors are in use. Only the regular calibration of the sensors provides information on the difference between the actual temperature and the measured temperature and makes the specific drift visible. In measuring tasks, readings are often taken without regard to the fact that every display value contains an error. These measured errors are probably still negligible in private applications, but in industrial applications even the smallest inaccuracy can lead to production errors, for instance.

Calibration with SIKA

Dry block calibrators and micro calibration baths are used to check and calibrate a wide range of temperature measuring instruments and temperature sensors. Mechanical, electro-mechanical or electronic measurement equipment can be checked with ease. The following can be tested directly:

- Contact-based immersion or surface temperature sensors
- Sensors with special shapes and sizes
- Non-contact infrared instruments and thermal imaging cameras

The compact and robust SIKA instruments are easy to transport, simple to use and offer all the features required for the specific test. Our instruments are already standard in many development, research and testing labs, testing and inspection departments and in the production and manufacturing sector.

DEUTSCHER KALIBRIERDIENST **DKD**

Kalibrierlaboratorium für thermodynamische und elektrische Messgrößen/
Calibration laboratory for pressure and electrical measuring instruments

Akkreditiert durch die / accredited by the
Akkreditierungsstelle des Deutschen Kalibrierdienstes

SIKA Labor Messtechnik
Dr. Siebert & Kühn GmbH & Co. KG
Struthweg 7-9
D-34260 Kaufungen

Kalibrierschein
Calibration certificate

Gegenstand
Objekt: Multifunktions-Temperaturkalibrator
- Trockenblockfunktion (DB) -

Hersteller
Hersteller: Dr. Siebert & Kühn GmbH & Co. KG
D-34260 Kaufungen

Typ
Typ: TPM165S-U

Fabrikat/Serien-Nr.
Serial number: 9904245

Auftraggeber
Customer: [Redacted]

Auftragsnummer
Order No.: 655 578

Anzahl der Seiten des Kalibrierscheines
Number of pages of the certificate: 3

Datum der Kalibrierung
Date of calibration: 2011-04-21

Dieser Kalibrierschein darf nur vollständig und unverändert weiterverleitet werden.
Der Genehmigungsvermerk der Akkreditierungsstelle des DKD ist auch die
Kalibrierscheine ohne Unterschrift und Stempel haben keine Gültigkeit.
This calibration certificate may not be reproduced other than in full except with
Body of the DKD and the issuing laboratory. Calibration certificates without signature.

Stempel Seal	Datum Date	Stellv. Leiter des Kalibrierlaboratoriums Occup. Head of the calibration laboratory

Dr. Siebert & Kühn GmbH & Co. KG · Struthweg 7-9 · D-34260 Kaufungen · Telefon: 0

Works Calibration Certificate

SAMPLE
SIKA
2009-08

Instrument: Precision-Temperature-Calibrator

Type: TP17650M

Range: RT to 650 °C

Serial-No.: 5908022

Order-No.:

Customer:

Used standards and devices:
Reference: P1100, SN ASL-18, 2328 DKD-K-097
DMM Keithley, SN 687117, 0003 DKD-K-150011

Results:

Reading [C]	Set value [C]	Deviation [C]
110	29,998	0,10
200	199,906	0,19
300	299,984	0,19
400	399,992	0,10
500	500,088	-0,08
600	600,035	-0,05
650	649,999	0,00

The deviations are within the specified tolerances of 1

SIKA electronic
Dr. Siebert & Kühn GmbH & Co. KG · Struthweg 7-9
Telefon: (05605) 803-0 · Telefax: (05605) 803-54 / 60

Deutscher Kalibrierdienst (DKD)
Akkreditierungsstelle

verleitet im

Deutschen Akkreditierungsrat

Akkreditierung

Die Akkreditierungsstelle des Deutschen Kalibrierdienstes akkreditiert hiermit
SIKA
Dr. Siebert & Kühn GmbH & Co. KG
Struthweg 7-9
34260 Kaufungen

nach DIN EN ISO/IEC 17025: 2005 für Kalibrierungen im Bereich / in den Bereichen
elektrische Gleichstrom- und NF-Größen, Druck, Temper

Bestandteil der Urkunde ist: Anlage 04 (2 Seiten), 2007-05-25

DAR-Registrierungsnummer: DKD-K-13901
Akkreditiert im DKD seit: 1995-10-23

Bewertungszeitpunkt: 2007-05-25



Temperature calibrator requirements

Calibration task and operation locations

A temperature calibrator needs to meet a wide range of requirements: as a portable device, it has to cope with frequently changing operation locations in the test bay or in production, while being equally suitable for stationary use in the measuring workshop and testing and inspection laboratory. For this reason, the instruments must be lightweight and handy for quick and easy use on site. The weight and size are determining factors here. Furthermore, instrument durability also plays an important role.

Temperature range

Temperature sensors should be calibrated at the temperature point at which they are used. This means that the temperature calibrator must be able to cover the process temperatures of the temperature sensor under calibration and, in particular, generate the main test points. SIKA offers several temperature calibrators to cover the range from -55 °C to 1300 °C.

Efficiency and flexibility

The time and personnel required to perform the calibration task is a key index for gauging efficiency. The more efficiently things are done, the faster the return on investment in a temperature calibrator. Intuitive operation with clear displays that provide all the necessary information at a glance, along with the calibration volume and the associated re-cooling and cooling times, primarily determine the speed of the calibration. Another time-saver: a large-diameter test item holder that enables several temperature sensors to be calibrated simultaneously.

Reliable system accuracy

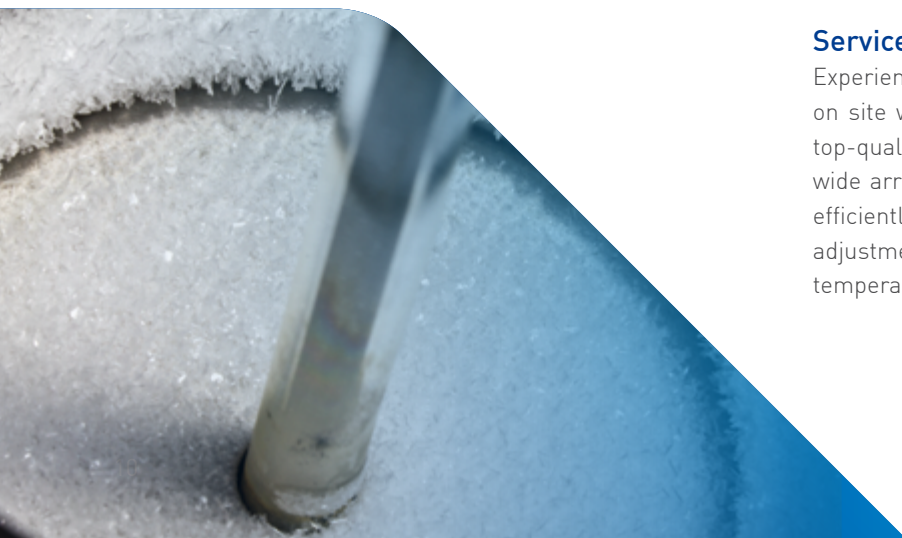
Various tests and measurement uncertainty appraisals as defined in the guidelines of the German Calibration Service (DKD) are performed during the production of SIKA calibrators. The measurement results are documented in comprehensive examination reports, thereby ensuring a reliable, high degree of system accuracy.

Traceability

Instruments and measuring equipment become worn from constant use. It is unavoidable that equipment ages and measured values drift as a result. Regular inspection with a factory calibration standard is absolutely essential and can be performed easily with a SIKA temperature calibrator as the calibration standard.

Services

Experienced and professional consultants visit you directly on site with demo instruments, thereby ensuring you receive top-quality customer care. Furthermore, SIKA also offers a wide array of services which can generally only be performed efficiently by the manufacturer, such as recalibration, adjustments and repairs. This increases the availability of the temperature calibrators and cuts cost.



TP Premium series

The TP Premium series stands for optimum performance and outstanding ease of use. With the help of the self-explanatory menu structure, all the necessary entries can be made quickly and easily. The block and set temperature, as well as the difference and the variance of the stability, are displayed on the touch display. The block temperature can be set to precisely 0.001 °C.

Dry block function



The optimum thermal coupling from the block to test item is achieved with the correct adapter sleeve. With the aid of the adapter sleeve, straight temperature sensors of virtually any length and diameter can be calibrated. The dry block covers the entire temperature range without the need to change the calibration medium. Viscosity, flash points or outgassing are of no concern.

Micro bath function



The use of calibration liquids offers certain advantages if temperature sensors with an unusual shape and size are to be tested. The test item is immersed directly into the liquid without an insulating air gap, resulting in direct temperature contact between the calibrator and the test item. The liquid, such as silicone oil, is chosen depending on the calibration temperature required. The continuous adjustment of the magnetic stirrer together with the removable sensor basket agitates the calibration liquid to create a large measuring zone. Furthermore, the sensor basket guarantees unhindered stirring and helps protect the tank floor.

Black body function



A patented infrared calibration sleeve is used to calibrate IR pyrometers or thermal imaging cameras. The special surface structure and the asymmetrical shapes create a „cavity radiator“ with an emission factor of 0.9994, prevent the reflection of interference radiation and emit the required temperature in an ideal form. The pyrometer is simply held at the specified distance above the measurement opening, thereby forming the desired measurement area on the bottom for the calibration to be performed. A support base can be fitted directly on the unit.

Surface temperature function



Surface temperature sensors are calibrated using special sleeves that are fitted vertically with the required contact force. Switching calibration control to the external reference sensor creates the best possible temperature reference point on the surface of the sleeve. The reference sensor is located directly beneath the abutting face of the sleeve. The sleeve is designed in such a way that the best temperature homogeneity is achieved in the centre of the abutting face. The special design of the abutting face enables good thermal contact. There is no need to use a thermally conductive paste or other thermal conduction aids.



TP 38 165 E



Type TP 38 165 E

Scope of delivery

- Test certificate
- Mains cable
- Insert exchange tool
- Operating manual

Optional accessories

- Transport case
- Adapter sleeve
- PC software
- PC cable
- Precision measuring instrument
- DKD certificate
- Works certificate

Technical data	
Type	TP 38 165 E
Control sensor	Internal
Micro Bath	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Dry block	
Temperature range	-35...165 °C
Tolerance	±0.1 °C
Stability	0.01...0.05 °C
Measurement zone	110...150 mm
Infrared	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Surface	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Block	
	∅ 28 mm / depth 150 mm
Display	
Display	Monochrome, graphic display Units °C / °F / K
Display range	-50...165 °C
Resolution	0.01 °C
General data	
Dimensions	
→ Width	153 mm
→ Height	347 mm
→ Depth	348 mm
Weight	Approx. 12 kg
Power supply	100...240 VAC, 50 / 60 Hz
Power consumption	Approx. 400 VA

TP 38 165



Technical data	
Type	TP 38 165
Control sensor	switchable internal / external
Micro Bath	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Dry block	
Temperature range	-35...165 °C
Tolerance	±0.1 °C
Stability	0.01...0.05 °C
Measurement zone	110...150 mm
Infrared	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Surface	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Block	
	∅ 28 mm / depth 150 mm
Display	
Display	Monochrome, graphic display Units °C / °F / K / Q / mV / mA
Display range	-50...165 °C
Resolution	0.01 °C
General data	
Dimensions	
→ Width	153 mm
→ Height	347 mm
→ Depth	348 mm
Weight	Approx. 12 kg
Power supply	100...240 VAC, 50 / 60 Hz
Power consumption	Approx. 400 VA

Scope of delivery

- Test certificate
- Mains cable
- Insert exchange tool
- Operating manual

Optional accessories

- Transport case
- Adapter sleeve
- PC software
- PC cable
- External calibration reference sensor
- DKD certificate
- Works certificate

TP 38 650 E

Technical data	
Type	TP 38 650 E
Control sensor	Internal
Micro Bath	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Dry block	
Temperature range	RT...650 °C
Tolerance	±0.2 °C
Stability	0.03...0.1 °C
Measurement zone	110...150 mm
Infrared	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Surface	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Block	
	∅ 28 mm / depth 150 mm
Display	
Display	Monochrome, graphic display Units °C / °F / K
Display range	0...650 °C
Resolution	0.01 °C
General data	
Dimensions	
→ Width	153 mm
→ Height	347 mm
→ Depth	348 mm
Weight	Approx. 10 kg
Power supply	230 VAC, ±10 %, 50 / 60 Hz, optional 115 VAC, ±10 %, 50 / 60 Hz
Power consumption	Approx. 1000 VA

Type TP 38 650 E



Scope of delivery

- Test certificate
- Mains cable
- Insert exchange tool
- Operating manual

Optional accessories

- Transport case
- Adapter sleeve
- PC software
- PC cable
- Precision measuring instrument
- DKD certificate
- Works certificate

TP 38 650

Technical data	
Type	TP 38 650
Control sensor	Switchable internal / external
Micro Bath	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Dry block	
Temperature range	RT...650 °C
Tolerance	±0.2 °C
Stability	0.03...0.1 °C
Measurement zone	110...150 mm
Infrared	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Surface	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Block	
	∅ 28 mm / depth 150 mm
Display	
Display	Monochrome, graphic display Units °C / °F / K / Ω / mV / mA
Display range	0...650 °C
Resolution	0.01 °C
General data	
Dimensions	
→ Width	153 mm
→ Height	347 mm
→ Depth	348 mm
Weight	Approx. 10 kg
Power supply	230 VAC, ±10 %, 50 / 60 Hz, optional 115 VAC, ±10 %, 50 / 60 Hz
Power consumption	Approx. 1000 VA

Type TP 38 650



Scope of delivery

- Test certificate
- Mains cable
- Insert exchange tool
- Operating manual

Optional accessories

- Transport case
- Adapter sleeve
- PC software
- PC cable
- External calibration reference sensor
- DKD certificate
- Works certificate

TP 37 200 E

Type TP 37 200 E



Scope of delivery

- Test certificate
- Mains cable
- Insert exchange tool
- PC- and network cable
- Operating manual

Optional accessories

- Transport case
- Adapter sleeve
- External reference sensor TF 255-3-300
- PC software
- Network-switch, barcode-reader, WLAN-router
- DKD certificate
- Works certificate

Technical data

Type	TP 37 200 E
Control sensor	Switchable internal / external
Micro Bath	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Dry block	
Temperature range	-55...200 °C
Tolerance	±0.2 °C
Stability	±0.05 °C
Measurement zone	110...150 mm
Infrared	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Surface	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Block	
	Ø 28 mm / depth 150 mm
Display	
Display	Brilliant Color-Touchscreen (7") Viewing angle 120...140° Brightness 400 cd / m ² Unit °C / °F
Display range	-60...200 °C
Resolution	0.1 / 0.01 / 0.001 °C
General data	
Dimensions	
→ Width	210 mm
→ Height	380 + 50 mm
→ Depth	300 mm
Weight	Approx. 12.5 kg
Power supply	100...240 VAC, 50 / 60 Hz
Power consumption	Approx. 600 VA

TP 37 165 E

Technical data	
Type	TP 37 165 E
Control sensor	Switchable internal / external
Micro Bath	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Dry block	
Temperature range	-35...165°C
Tolerance	±0.2 °C
Stability	±0.05 °C
Measurement zone	110...150 mm
Infrared	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Surface	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Block	
	Ø 28 mm / depth 150 mm
Display	
Display	Brilliant Color-Touchscreen (7") Viewing angle 120...140° Brightness 400 cd / m ² Unit °C / °F
Display range	-50...165 °C
Resolution	0.1 / 0.01 / 0.001 °C
General data	
Dimensions	
→ Width	210 mm
→ Height	380 + 50 mm
→ Depth	300 mm
Weight	Approx. 10 kg
Power supply	100...240 VAC, 50 / 60 Hz
Power consumption	Approx. 400 VA

Type TP 37 165 E



Scope of delivery

- Test certificate
- Mains cable
- Insert exchange tool
- PC- and network cable
- Operating manual

Optional accessories

- Transport case
- Adapter sleeve
- External reference sensor TF 255-3-300
- PC software
- Network-switch, barcode-reader, WLAN-router
- DKD certificate
- Works certificate

TP 37 166 E

Typ TP 37 166 E



Scope of delivery

- Test certificate
- Mains cable
- Insert exchange tool
- PC- and network cable
- Operating manual

Optional accessories

- Transport case
- Adapter sleeve
- Infrared calibration sleeve
- Surface calibration sleeve
- External reference sensor TF 255-3-300
- PC software
- Network-switch, barcode-reader, WLAN-router
- DKD certificate
- Works certificate

Technical data

Type	TP 37 166 E
Control sensor	Switchable internal / external
Micro Bath	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Dry block	
Temperature range	-35...165 °C
Tolerance	±0.2 °C
Stability	±0.05 °C
Measurement zone	110...150 mm
Infrared	
Temperature range	-35...165 °C
Tolerance	±0.5 °C
Stability	±0.05 °C
Measurement zone	110 mm
Surface	
Temperature range	-25...150 °C
Tolerance	±1 °C
Stability	±0.2 °C
Measurement zone	
Block	
	∅ 60 mm / depth 150 mm
Display	
Display	Brilliant Color-Touchscreen (7") Viewing angle 120...140° Brightness 400 cd / m ² Unit °C / °F
Display range	-50...165 °C
Resolution	0.1 / 0.01 / 0.001 °C
General data	
Dimensions	
→ Width	210 mm
→ Height	380 + 50 mm
→ Depth	300 mm
Weight	Approx. 13 kg
Power supply	100...240 VAC, 50 / 60 Hz
Power consumption	Approx. 400 VA



The Typ TP 37 166 E temperature calibrator model has a very large calibration volume.

TP 3M 165 E

Type TP 3M 165 E



Scope of delivery

- Test certificate
- Mains cable
- Insert exchange tool
- PC- and network cable
- Operating manual
- Sensor basket, suction pump, transport cover
- Magnetic stirrer with magnet lifter
- Sensor lid with 5 silicone plugs

Optional accessories

- Transport case
- Adapter sleeve
- Tube insert
- Infrared calibration sleeve
- Surface calibration sleeve
- External reference sensor TF 255-3-300
- PC software
- Network-switch, barcode-reader, WLAN-router
- DKD certificate
- Works certificate

Technical data	
Type	TP 3M 165 E
Control sensor	Switchable internal / external
Micro Bath	
Temperature range	-35...165 °C
Tolerance	±0.1 °C
Stability	±0.05 °C
Measurement zone	110...150 mm
Dry block	
Temperature range	-35...165 °C
Tolerance	±0.3 °C
Stability	±0.05 °C
Measurement zone	123...163 mm
Infrared	
Temperature range	-35...165 °C
Tolerance	±0.5 °C
Stability	±0.05 °C
Measurement zone	110 mm
Surface	
Temperature range	-25...150 °C
Tolerance	±1 °C
Stability	±0.2 °C
Measurement zone	
Block	
	Ø 60 mm / depth 170 mm
Display	
Display	Brilliant Color-Touchscreen (7") Viewing angle 120...140° Brightness 400 cd / m ² Unit °C / °F
Display range	-50...165 °C
Resolution	0.1 / 0.01 / 0.001 °C
General data	
Dimensions	
→ Width	210 mm
→ Height	380 + 50 mm
→ Depth	300 mm
Weight	Approx. 13 kg
Power supply	100...240 VAC, 50 / 60 Hz
Power consumption	Approx. 400 VA

TP 28 1300

Type TP 28 1300



Scope of delivery

- Test certificate
- Mains cable
- Insert exchange tool
- Operating manual

Optional accessories

- Transport case
- Adapter sleeve
- PC software
- PC cable
- DKD certificate
- Works certificate

Technical data	
Type	TP 28 1300
Control sensor	Internal
Micro Bath	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Dry block	
Temperature range	400...1300 °C
Tolerance	±2 °C
Stability	±0.5 °C
Measurement zone	at 200 mm
Infrared	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Surface	
Temperature range	
Tolerance	
Stability	
Measurement zone	
Block	
	∅ 28 mm / depth 200 mm
Display	
Display	1-line, 4½-digit display Red, unit °C (°F optional)
Display range	0...1300 °C
Resolution	0.5 °C
General data	
Dimensions	
→ Width	510 mm
→ Height	290 mm
→ Depth	415 + 100 mm
Weight	Approx. 25 kg
Power supply	230 VAC, 50 / 60 Hz
Power consumption	Approx. 1000 VA

Overview temperature calibrators

	TP Basic				TP Solid			
-55...200 °C			TP 17 200		TP 17 200 S			
-35...165 °C		TP 17165 M	TP 17 165	TP 17 166	TP 17 165 S		TP 17 166 S	
-10...100 °C					TP 17 Zero			
RT...200 °C	TP 18 200 E							
RT...225 °C								
RT...255 °C								
RT...450 °C				TP 17 450			TP 17 450 S	
RT...650 °C		TP 17 650 M	TP 17650		TP 17 650 S			
RT...850 °C	TP 18 850 E					TP 28 850 E		
400...1300 °C								
Metrology*								
Best Resolution	1 °C	1 °C	0.1 °C	0.1 °C	0.01 °C	0.01 °C	0.01 °C	
Stability	0.1 °C	0.1 °C	0.1 °C	0.1 °C	0.05 °C	0.05 °C	0.05 °C	
Tolerance	1 °C	1 °C	< 0.8 °C	< 0.6 °C	< 0.4 °C	< 0.5 °C	< 0.3 °C	
Testholder								
Block Ø	18 / 28 mm	28 mm	28 mm	60 mm	6.5 / 28 mm	18 / 28 mm	60 mm	
Dry block	✓	✓	✓	✓	✓	✓	✓	
Infrared							✓	
Microbath								
Surface								
Scope of delivery								
PC connection					✓	✓	✓	
External reference connection								
Internal precision measuring instrument								
Data logger function								
Controller OFF			✓	✓	✓		✓	
Manual control			✓	✓	✓		✓	
Set-value memory					✓		✓	
Temperature levels					✓		✓	
Gradient control					✓		✓	
Periodic counter	✓	✓	✓	✓	✓		✓	
Optional accessories								
Transport case	✓	✓	✓	✓	✓	✓	✓	
Service transport bag**		✓	✓	✓	✓		✓	
PC software					✓	✓	✓	
PC cable					✓	✓	✓	
Precision measuring instrument								
External calibration reference sensor								

* The specifications listed are for guidance.

Detailed information can be found on the individual product pages.

** For calibrators with slim body only

				TP Premium					
						TP 37 200 E			
	TP M 165 S	TP 17 166 S-U	TP M 165 S-U	TP 38 165 E		TP 38 165	TP 37165 E	TP 37 166 E	TP 3M 165 E
	TP M 225 S		TP M 225 S-U						
	TP M 255 S								
		TP 17 450 S-U							
				TP 38 650 E		TP 38 650			
					TP 28 1300				
	0.01 °C	0.01 °C	0.01 °C	0.01 °C	0.5 °C	0.01 °C	0.001 °C	0.001 °C	0.001 °C
	0.05 °C	0.05 °C	0.05 °C	-0.03 °C	0.5 °C	-0.03 °C	0.05 °C	0.05 °C	0.05 °C
	< 0.2 °C	< 0.3 °C	< 0.2 °C	< 0.2 °C	2 °C	< 0.2 °C	< 0.2 °C	< 0.3 °C	< 0.2 °C
	60 mm	60 mm	60 mm	28 mm	28 mm	28 mm	60 mm	60 mm	60 mm
	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓				✓	✓	✓
	✓		✓						✓
		✓	✓				✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓
		✓	✓			✓	✓	✓	✓
					✓	✓			
	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓	✓			✓	✓	✓	✓
	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓						
	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓
						✓			
						✓	✓	✓	✓

Accessories

Adapter sleeves

Dry-block calibrators are designed to simplify temperature calibration in the lab and in the field. With the help of adapter sleeves, straight temperature sensors with almost any length and diameter can be calibrated. The dry block covers the entire temperature range of the calibrator with no need for changing the calibration medium. Viscosity, flash point and outgassing are of no concern. Every adapter sleeve can be equipped with a single or several multi bores. Bores with diameters ranging from 1.5 to 25.5 mm can be realised in 0.5 mm steps. Ideally, the internal diameter of the sleeve is 0.5 mm larger than the outer diameter of the test item.

Calibration liquids

Using a liquid calibration medium is advantageous for checking temperature sensors with unusual shapes or dimensions. The test item is immersed in the liquid without an insulating air gap, resulting in direct contact between the calibrator and the test item. The calibration liquid is chosen according to the desired calibration temperature. The sensor lid with 5 silicone plugs and / or a support base ensures the stable positioning of the test items in the calibration bath. The lid reduces heat emission over the surface of the liquid, thereby ensuring optimum measurement results.

	Demineralised water	Silicone oil 10 CS	Silicone oil 20 CS	Silicone oil 50 CS
Limits	2...95 °C	-35...155 °C	7...220 °C	50...270 °C
Flash point		165 °C	230 °C	280 °C



Tub insert

Our tub insert is the ideal solution for applications in which a variety of liquids are used. It eliminates the time-consuming task of exchanging the liquids and cleaning the bath. The separate tub insert is just as leak-proof as the bath itself.

Calibration and testing software

The in-house calibration software application is used for temperature calibrators that are equipped with an external interface for programming and evaluating the calibration values. It can be operated easily from an external PC. The following calibration tasks can be performed:

- Programmable ramp functions
- Programmable temperature cycles
- Series tests (e.g. for incoming goods inspection)
- Preparing the test data in graphical and in tabular form
- Incorporating customer data in the certificates
- Programmable temperature gradients

For your test equipment monitoring

TT-Scan

Resistance thermometers, thermocouples, temperature transmitters and switches must be calibrated using an instrument that measures the output signal and displays it as a temperature.

Checking groups of temperature sensors can be automated by extending your SIKA calibrator with a TT-Scan unit and calibration software. Up to eight test items can be checked at the same time with this arrangement. The configuration of the test item type is free programmable. A reference sensor can be connected. The TT-Scan unit has a USB port for connection to a PC. SIKA calibration software analyses the measurement data and presents the results in graphic or tabular form. At the same time it automatically generates up to 8 certificates, which may also include customer data.



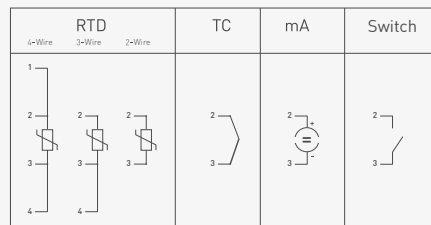
TT-Scan

Type TT-Scan



Properties

Possibilities to connect



Version

Scanner device with precision measuring instrument

Measuring inputs

Switchable
For up to 8 sensors
Sensor type free configurable

General data

Power supply

230 VAC $\pm 10\%$, 50/60 Hz over adapter

Power consumption

Approx. 100 W

Dimensions (D x W x H)

200 x 140 + 40 x 380 mm

Weight

Approx. 2.5 kg

Equipment features

32 x 4 mm connections free of thermal voltage
Connection for external calibration reference sensor
External cold junction available
Serial USB data interface, incl. USB data cable

Options

Aluminium transport case, test & calibration software, DKD certificate, SIKA works certificate, external calibration reference sensors

Measuring inputs

	Version	Measuring range	Tolerance
Resistance thermometer EN 60751			
Pt100 Pt500 Pt1000	2-, 3-, 4-wire	-90.00 °C...850.00 °C	±0.005 % full scale ±0.01 °C
Connection possibility through 4 mm connections free of thermal voltage			
Thermocouples according to DIN EN 60584 / DIN 43710			
Type K	NiCr-NiAl	-90.00...999.99 °C 1000.0...1370.0 °C	±0,007 % full scale ±0.01 °C ±0,005 % full scale ±0.1 °C
Type J	FeCu-Ni	-90.00...900.00 °C	±0,005 % full scale ±0.01 °C
Type N	NiCrSi - NiSiMg	-90.00...999.99 °C 1000.0...1370,0 °C	±0,007 % full scale ±0.01 °C ±0,005 % full scale ±0.1 °C
Type E	NiCr-CuNi	-90,00...700.00 °C	±0,005 % full scale ±0.01 °C
Type R	Pt13Rh - Pt	0.00...999.99 °C 1000.0...1760.0 °C	±0,05 % full scale ±0.01 °C ±0,03 % full scale ±0.1 °C
Type T	Cu-CuNi	-90.00...400.00 °C	±0,01 % full scale ±0.01 °C
Type B	Pt30Rh-Pt6Rh	0.00...999.99 °C 1000.0...1820.0 °C	±0,05 % full scale ±0.01 °C ±0,03 % full scale ±0.1 °C
Type S	Pt10Rh-Pt	0.00...999.99 °C 1000.0...1760.0 °C	±0,05 % full scale ±0.01 °C ±0,03 % full scale ±0.1 °C
Type L	Fe-CuNi	-90.00...900.00 °C	±0,005 % full scale ±0.01 °C
Type U	Cu-CuNi	90.00...600.00 °C	±0,01 % full scale ±0.01 °C
Automatic comparison point compensation between 0 °C and 60 °C Accuracy of the comparison point Pt100 DIN class A Possibility of connection through 4 mm connections free of thermal voltage			
Standard signal input			
Current (switchable)	mA	0(4)...20 mA	±0.015 % full scale ±0.01 mA
Transmitter supply 24 VDC, I _{max} = 30 mA, Possibility of connection through 4 mm connections free of thermal voltage			
Temperature switch			
Automatic detection of an edge change, determining the hysteresis, Independent detection normally closed / normally open Potential-free input contacts (U _{max} = 5 V, I _{max} = 1 mA) Possibility of connection through 4 mm connections free of thermal voltage			
Calibration reference sensor connection			
Pt100	4-wire	-90.00...850.00 °C	±0.005 % full scale ±0.01 °C
Polynomial correctable through internal parameters or through external EEPROM inside the sensor Possibility of connection through 7-pin built-in socket			

Calibration reference sensors

Type TF 650-3-300



If the sensor to be calibrated is too short to be inserted into the homogeneous temperature zone of the metal block, an external reference sensor can be used without any problems. This results in a small, flexible measurement zone.

Calibration reference sensor - Type TF

Pt100 without probe specific linearization in the controller for Series TP...S-U, TP 3...

Technical data	
Measuring range	
TF 255-3-300	-50...255 °C / sensitive area 2 mm
TF 650-3-300	-50...650 °C / sensitive area 5 mm
Tolerance	
±0.05 °C in the range of -9.99...99.99 °C, else ±0.1 °C	
Version	
Material	Rust and acid-proof Stainless steel 1.4571 Robust plastic handle
Immersion tube	Ø 3 mm, L = 300 mm
Electrical connection	Silicon cable with 4-pin mini DIN-plug

An ace of calibration

Particular attention is given to the physical construction to ensure that shocks have minimal effect on the reference sensor.

The use of robust measuring elements in thinfilm technology ensure standardised and reliable performance.

Intensive ageing tests are carried out at the maximum operating temperature to examine longterm temperature stability. In order to detect longterm effects through thermal stress, a defined tempering process is carried out with a special selection of reference sensors over 300 hours. In the case of stress caused by thermocycling, no significant hysteresis effects were found.

The physical structure of the reference sensors requires that different materials be joined together. The special design of the joint areas prevents the occurrence of parasitic thermoelectric voltages. Thus the measurement reading is not affected by the temperature gradients from the measurement point to the handle.

In examining the self-heating characteristics it was seen that measurement currents ≤ 1 mA are ideally suited, since no distortion of the measurement result occurs. Here the self-heating effect can be neglected.

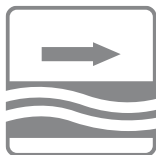
Calibration reference sensor - Type TFEE

Pt100 with probe specific linearization through EEPROM in the handle for TT-Scan and Series TP 38...

Technical data	
Measuring range	
TFEE 255-3-300	-50...255 °C / sensitive area 2 mm
TFEE 650-3-300	-50...650 °C / sensitive area 5 mm
Tolerance	
±0.05 °C in the range of -35.00...199.99 °C, else ±0.1 °C	
Version	
Material	Rust and acid-proof Stainless steel 1.4571 Robust plastic handle
Immersion tube	Ø 3 mm, L = 300 mm
Electrical connection	Silicon cable with 7-pin mini DIN-plug



Mechanical Measuring Instruments



Flow Measuring Instruments



Electronic Measuring and Calibration Instruments



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