



## Temperature Calibrators

Series TP 17...M

Types TP 17165M • TP 17650M



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## 0 About this operating manual

- The operating manual is aimed at specialists and semi-skilled personnel.
- Before each step, read through the relevant advice carefully and keep to the specified order.
- Thoroughly read and understand the information in the section "Safety Instructions".
- For calibrators with a cooling function, the term "Cooling" is also used for temperatures below room temperature, in the meaning of "Heating".

If you have any problems or questions, please contact your supplier or contact us directly at:



Dr. Siebert & Kühn GmbH & Co. KG  
 Struthweg 7-9 • D - 34260 Kaufungen  
 ☎ 05605-803 0 • 📠 05605-803 54  
 info@sika.net • www.sika.net

### Hazard signs and other symbols used:



**CAUTION! Electric current!**  
 This sign indicates dangers which could arise from handling of electric current.



**WARNING! / CAUTION! Risk of injury!**  
 This sign indicates dangers that cause personal injuries that can lead to health defects or cause considerable damage to property.



**CAUTION! High temperature!**  
 This sign indicates dangers resulting from high temperature that can lead to health defects or considerable damage to property.



**CAUTION! Material damage!**  
 This sign indicates actions which could lead to possible damage to material or environmental damage.



**ADHERE TO OPERATING MANUAL!**



**NOTICE!**  
 This symbol indicates important notices, tips or information.



**NO DOMESTIC WASTE!**  
 The device must not be disposed of together with domestic waste.

- ▲ Pay attention to and comply with information that is marked with this symbol.
- ➔ Follow the specified instructions and steps. Adhere to the given order.

- ☐ Check the specified points or notices.
- ➔ Reference to another section, document or source.
- Item.

## 1 Device description

The calibrators of the series TP 17...M serve for testing and calibrating different temperature measuring instruments and temperature sensors, as well as for measurement of temperatures.

The portable instruments are of compact and robust construction and thus allow use directly on-site or in a laboratory.

The TP 17...M series is used for service purposes and for different industrial and laboratory tasks.

Thus, for example, thermometers, temperature switches/thermostats, resistance thermometers and thermo-elements can be directly connected and checked.

### Versions\*:

The series TP 17...M includes the following calibrator types:

TP 17165M



cooling and heating

TP 17650M



heating

### Type plate:

You find the type plate on the rear of the device.

It includes the type designation, the serial number and the key electric specifications.



\* Customised versions available on request.

## 1.1 Delivery, unpacking and accessories

All units have been carefully checked for their operational reliability before shipment.

- Immediately after receipt, please check the outer packaging for damages or any signs of improper handling.
- Report any possible damages to the forwarder and your responsible sales representative. In such a case, state a description of the defect, the type and the serial number of the device.  
Report any in-transit damage immediately. Damage reported at a later date shall not be recognized.


### Unpacking:

-  Carefully unpack the unit to prevent any damage.
-  Check the completeness of the delivery based on the delivery note.



Save the packaging!

Temperature calibrators are delivered in special protective packaging.



-  Save the packaging for returning the instrument safely to the manufacturer for recalibration or repair.

### Scope of delivery and accessories:

<p>Scope of delivery:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Metal block calibrator according to order data.</li> <li><input type="checkbox"/> Mains cable.</li> <li><input type="checkbox"/> Sleeve exchange tools.</li> <li><input type="checkbox"/> Test certificate.</li> <li><input type="checkbox"/> Operating manual.</li> <li><input type="checkbox"/> Protective packaging and transport protection.</li> </ul>	<p>Accessories (optional):</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Transport case.</li> <li><input type="checkbox"/> Transport bag (only TP 17650M).</li> <li><input type="checkbox"/> Adapter sleeves.</li> <li><input type="checkbox"/> DAkkS certificate.</li> <li><input type="checkbox"/> Works certificate.</li> </ul>
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**IMPORTANT!**

-  Use the type plate to check if the delivered unit corresponds to your order.
-  In particular, for devices with electrical components, check to see if the correct power supply voltage is specified.

## 1.2 Intended use

The calibrators of the TP 17...M series may only be used for testing and calibration of suitable temperature measuring instruments, temperature sensors and for measuring temperatures.

The calibrators may not be used for warming up or heating other parts or gases.

The calibrators have been designed for indoor use only.

The operational safety of the device supplied is only guaranteed by intended use. The specified limits (→ § 10 "Technical Data") may under no circumstances be exceeded.

### CAUTION! Risk of burns!

The calibrator can become very hot when in operation. Touching hot parts can result in serious injuries.



⚠ Never touch the metal block, the adapter sleeve or the test specimen at temperatures above 35 °C or below 10 °C.

⚠ Allow the calibrator to cool before you remove the test specimen, change the adapter sleeve or switch off the machine.

### CAUTION! Material damage!

The opening in the metal block of the calibrator is only intended to be used with adapter sleeves.



Using heat transfer media (oil, thermal paste or other media) can lead to incorrect measurements and damage to the calibrator.

⚠ Never fill the metal block opening with a heat transfer medium.

It is your responsibility to select the instrument which is suitable for your specific application, to connect it correctly, to carry out tests and to maintain all the components.

## 1.3 Warranty

The calibrator is under guarantee for 12 months as from the date of delivery for construction errors or material defects. The guarantee is limited to repair or replacing the calibrator.

SIKA also provides an extra 5-year guarantee for calibrators which are calibrated and inspected annually by the SIKA-DAkKS laboratory.

Opening the calibrator, unauthorised repairs or incorrect use or installation of the calibrator automatically result in the warranty being rendered null and void.

## 1.4 Exclusion of liability

We accept no liability for any damage or malfunctions resulting from incorrect installation, in-appropriate use of the device or failure to follow the instructions in this operating manual.

## 2 Safety Instructions



Before you install the TP 17...M, read through this operating manual carefully. If the instructions contained within it are not followed, in particular the safety guidelines, this could result in danger for people, the environment, and the device and the system it is connected to.

The TP 17...M corresponds to the state-of-the-art technology. This concerns the accuracy, the operating mode and the safe operation of the device.

In order to guarantee that the device operates safely, the operator must act competently and be conscious of safety issues.

SIKA provides support for the use of its products either personally or via relevant literature. The customer verifies that our product is fit for purpose based on our technical information. The customer performs customer- and application-specific tests to ensure that the product is suitable for the intended use. With this verification all hazards and risks are transferred to our customers; our warranty is not valid.

### Qualified personnel:

- ⚠ The personnel who are charged for the installation, operation and maintenance of the TP 17...M must hold a relevant qualification. This can be based on training or relevant tuition.

The personnel must be aware of this operating manual and have access to it at all times.

### General safety instructions:

- ⚠ In all work, the existing national regulations for accident prevention and safety in the workplace must be complied with. Any internal regulations of the operator must also be complied with, even if these are not mentioned in this manual.
- ⚠ Ensure that the complete operating instructions are always available in excellent condition at the calibrator installation site.
- ⚠ Degree of protection according to EN 60529:  
Ensure that the ambient conditions at the site of use do not exceed the requirements for the stated protection rating (→ § 10 "Technical Data").
- ⚠ Structural safety in accordance with EN 61010-1:  
The calibrator must be installed in such a way that the requirements for structural safety are met.
- ⚠ Only use the TP 17...M if it is in perfect condition. Damaged or faulty devices must be checked without delay and, if necessary, replaced.  
If problems cannot be cleared, immediately shut down the calibrator and ensure that it cannot be started up accidentally.
- ⚠ Never leave the calibrator unattended when it is in operation or in the cooling phase.
- ⚠ Do not remove or obliterate type plates or other markings on the device, as otherwise the warranty is rendered null and void.

**Special safety instructions:**

- ⚠ Thermal fuse!  
The calibrator is equipped with a temperature fuse that works independently. If there is an over-temperature in the inside of the housing, the power supply to the heating system is cut off. The calibrator cannot then be started any more.
  - ↳ After it has cooled, send the calibrator for inspection to SIKA.
- ⚠ The calibrator may not be used in an explosion-endangered atmosphere (ignitable or explosive atmosphere).
  - ↳ Remove all the easily flammable media from the vicinity of the calibrator.
  - ↳ Ensure that the calibrator cannot come in contact with easily flammable or explosive media.
- ⚠ Operate the calibrator only in the temperature range permissible for the test sample.
- ⚠ Ensure that the test sample is securely fixed in the calibrator.
  - ↳ Use only suitable adapter sleeves.  
When doing so, also ensure that the structural safety of the calibrator is retained.

Further warnings that are specifically relevant to individual operating procedures or activities can be found at the beginning of the relevant sections of this operating manual.



### 3 Construction and function

#### Construction:

The calibrator consists of a robust, black-and-red painted steel housing ② and has a carrying handle at the top ①.

The front part of the housing holds the electronics of the TP 17...M and the controller ③ with display and control elements.

On the front side are the main switch with fuse and mains plug connection ④ as well as the service and data interface ⑦.

The rear part of the housing holds a heat-insulated metal block ⑤ with heating or cooling elements and an integrated sensor for the reference temperature.

The grille ⑥ for the exhaust of the calibrator ventilation ⑥ is located the upper plate of the housing in the range of the opening of the metal block.

In the base, there are grilles for cooling the calibrator. The in-built fans control the inlet air of the housing ⑥ and of the metal block ⑦.

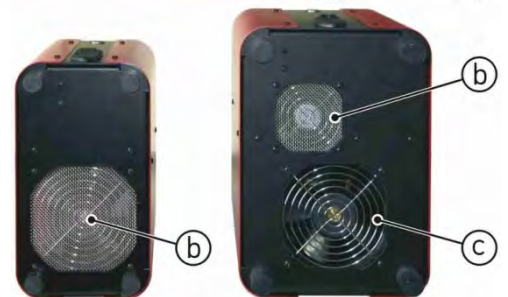
An overview of the most important components of the TP 17...M:

- ① Carrying handle.
- ② Steel housing.
- ③ Controller with display and control elements.
- ④ Main switch with fuse and mains plug socket.
- ⑤ Metal block (Dry block).
- ⑥ Calibrator ventilation:
  - ⑥a Exhaust through upper housing grilles.
- ⑦ Service interface.



Calibrator, bottom view:

- ⑥ Calibrator ventilation
  - ⑥b Inlet air for housing cooling.
  - ⑥c Inlet air for metal block cooling.



#### Function:

Adapter sleeves that are suitable for the temperature sensors or temperature measuring instruments to be tested are inserted in the calibrator (→ § 4.3 "Preparation of the calibrator"). They give the test specimen a secure fit and ensure optimum heat transfer.

Afterwards, the calibrator can be switched on (→ § 4.4).

The calibrator heats or cools the metal block to the set temperature. As soon as this temperature has been reached and is stable, the calibration of the test specimen can be carried out. Then, the next test point is approached or the testing procedure is ended.

## 4 Commissioning and operation

### CAUTION! Risk of injury or material damage!



The calibrator can become very hot during operation. If the machine is operated without supervision, third-party persons in the vicinity could get injured. Moreover, flammable material could get into the machine and cause significant damage to property.

⚠ Never leave the calibrator unattended when it is in operation or in the cooling phase.

For safe operation of the calibrators of the TP 17...M series, a proper commissioning procedure is necessary.

Commissioning includes the installation, the electrical connections, the preparation for the calibration as well as correct switching on and off of the device.

Further, a visual inspection for damage is required before use.

The required steps are described in the following sections.



### IMPORTANT!

Please also follow the instructions for intended use (→ § 1.2), the safety instructions (→ § 2) and the information on the ambient conditions (→ p. 28).

### 4.1 Operating conditions

Select a safe installation site for commissioning the machine.

#### Installation site and operating position:

- Only suitable for indoor use, do not use outdoors.
- Operate only in the vertical position on an even surface. The surface must be stable, clean, and dry.  
If the operation positions do not conform to the above, the structural safety and the specified properties of the calibrator are not guaranteed.
- At higher testing temperatures, please use a sufficiently big, fire-resistant supporting surface.
- Sufficient clearance around the machine  
On the front side > 1 m, behind and to the sides > 0.5 m. Head clearance and sufficient clear space above the machine.
- Sufficient ventilation must be ensured.
- Do not operate in the vicinity of flammable materials.
- Do not install in a cupboard or other similar object.
- The ventilation openings must not be blocked or covered.
- The machine must be so installed that it can be switched off at any time.

#### IMPORTANT! "KILL" switch!



The plug of the mains connecting cable serves as a "KILL" switch.

⚠ Ensure that the plug is always easily accessible and easy to reach.

⚠ In an emergency, pull the plug, so that the machine is isolated from the mains.

## 4.2 Electrical connection

The electrical connections are made with the accompanying mains connecting cable.

### **DANGER! Risk of death due to electric current!**



The TP 17...M is operated at mains voltages up to 240 V<sub>AC</sub>. Contact with the mains voltage can result in serious or fatal injuries.

- ↪ Switch off the TP 17...M and remove the mains connecting cable before you start any work on live parts.

Check the following points before you connect the calibrator:

- Operate the machine only with the approved supply voltage (→ § 10). Ensure that the mains voltage is the same as that specified on the type plate.
- Please follow the local regulations of the energy supplier.
- Connect the calibrator only to a properly installed and earthed 3-pole outlet for Schuko plugs.
- Do not use any extension cables or adapter plugs.

### **IMPORTANT! Mains connecting cable!**



The mains connecting cable may only be replaced by an equivalent cable.

- ↪ Use only original cables from SIKA or approved cables of the same type with the correct design as replacements (→ § 10.1 "Electrical characteristics").

### **Connect TP 17...M:**

- ↪ Connect the mains connecting cable with the connector plug of the TP 17...M.
- ↪ Insert the plug of the mains connecting cable in a suitable outlet.

### 4.3 Preparation of the calibrator

The preparations for the test task must be carried out with the calibrator switched off and cooled to ambient temperature.

#### CAUTION! Risk of burns!

The calibrator can become very hot when in operation. Touching hot parts can result in serious burn injuries.



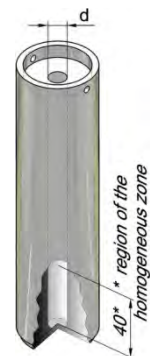
- ✚ Never touch the metal block, the adapter sleeve or the test specimen at temperatures above 35 °C or below 10 °C.
- ✚ Allow the calibrator to cool before you remove the test specimen, change the adapter sleeve or the calibration insert or switch off the machine.

#### Adapter sleeves:

Adapter sleeves with single or multiple holes are used for the calibration of straight temperature sensors.

To achieve the specified accuracy of the calibrators (→ § 10.1) the temperature sensor (test specimen) and the adapter sleeve must be matched to one another:

- ✚ The borehole of the adapter sleeve may be a maximum of 0.5 mm larger than the diameter of the test specimen.
- ✚ The measurement element of the test specimen must be located in the homogeneous temperature zone of the adapter sleeve.
- ✚ Please also note the "Details of the DKD technical committee "Temperature and Humidity" for the operation of temperature block calibrators" (→ § 11).



#### Inserting:

- ✚ The appropriate adapter sleeve is inserted into the metal block with the aid of the sleeve exchange tool.

#### Removing and cleaning:

- ✚ Let the calibrator cool before you remove the adapter sleeve.
- ✚ Pull the adapter sleeve out of the metal block with the help of the sleeve exchange tool.
- ✚ Clean the adapter sleeve and the metal block.



Adapter sleeves and sleeve exchange tool

This prevents the adapter sleeve from getting stuck in the metal block.

## 4.4 Switching on, cool down and switching off



### IMPORTANT!

Follow the instructions and notes of the section (→ § 4.1).

For reasons of safety, upon switching on the calibrator, the fan runs at the fastest speed. As soon as the internal reference has measured a safe block temperature, the fan speed is adjusted.

### Switching on:

- ↪ Turn on the main switch.
  - The controller is initialised.
  - tESt appears in the upper display.
  - The version number e.g. rL 1.6 appears on the lower display.

Initialization is completed after approx. 5 seconds and the **calibration mode** (→ § 5.2) is automatically displayed.

- The installed heating elements automatically adjust the metal block from the room temperature to the set temperature set at the controller.

IMPORTANT! Keep in mind after transport or storage!



After transport, storage or long periods of non-use, moisture can seep into the heating elements (magnesium oxide).

For drying, the calibrator must be slowly heated up. During this process, the calibrator has not yet reached the required insulation voltage for protection class I.

- ↪ For drying the heating elements, heat the calibrator for at least 15 min to 120 °C.

### Cool down the calibrator:

#### CAUTION! Risk of burns!

The calibrator can become very hot when in operation. Touching hot parts can result in serious injuries.



- ↪ Never touch the metal block, the adapter sleeve or the test specimen at temperatures above 35 °C or below 10 °C.
- ↪ In order to cool down the metal block / calibration liquid quickly, set the set temperature to a low temperature, e.g. room temperature.

The installed fan gently and automatically switches to a higher speed for heating instruments, thus providing more cooling air. The LED OUT 2 indicates the status of the output for the fan control. If the LED OUT 2 lights up, the fan is running at high speed. If the LED OUT 2 does not light up, the fan is running at low speed.

The controller switches the active cooling on for heating / cooling instruments. The LED OUT 2 indicates the status of the output for the active cooling. If the LED OUT 2 lights up, the active cooling is running. If the LED OUT 2 does not light up, the cooling is not active.

**IMPORTANT!** Mains failure or separation from the mains!



If there is a mains failure, or if the main switch is turned off, or upon removal of the mains connection ("EMERGENCY STOP"), the built-in fan does not blow any more cooling air.

Sufficient thermal de-coupling between the metal block and the housing is nonetheless guaranteed

### Switching off:

#### **CAUTION! Before switching off, pay attention to the block temperature!**



The calibrator should first reach a low block temperature before switching off. When switching off at high temperatures, the calibrator or the test specimen may be damaged.

↪ Switch off the calibrator only when the metal block has reached room temperature.

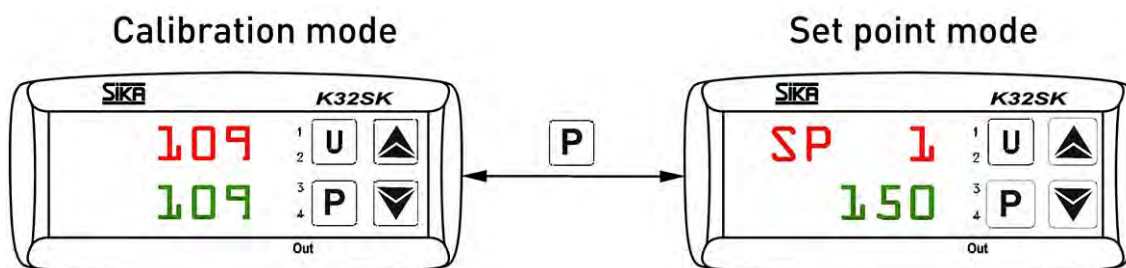
- ↪ Check whether the metal block has cooled down to room temperature.
- ↪ Switch off the calibrator via the main switch.
- ↪ Disconnect the calibrator from AC power if no further testing is required. Unplug the power cord from the wall outlet.
- ↪ Clean the calibrator after use (→ § 8.2).

## 4.5 Operating modes

During operation, there are two operating modes:

- Calibration mode:  
This is the normal operating mode in which the calibration of test specimens is carried out (→ § 5.2).
- Set point mode:  
The set temperatures can be entered in this mode (→ § 5.3).

Press the key **P** to switch between the calibration and set point mode.



## 5 Operation

You operate the calibrator via the controller. Depending on the calibrator type, you operate the calibrator additionally via the thumbwheel of the magnetic stirrer and the switch for the external reference.

The controller is equipped with two 4-digit LED displays for reference and set temperature as well as with indicators and control elements which are described in the following section.

### 5.1 Control elements of the controller (controller type K32SK)

Overview and function of the control elements of the controller:



#### 1 - Upper display (red)

- Calibration mode:  
Display of current reference temperature.
- Set point mode:  
Display of SP1 (Set point 1).

#### 2 - Lower display (green)

- Display of set temperature.
- Display of heating / cooling capacity.
- Display of operating duration.

#### 3 - LED SET

- The function of the LED is not used.

#### 4 - P key

- Switching to set point mode.
- Input confirmation.
- Access "ConF" menu (only for service).

#### 5 - ▼ key

- Reducing values to be set.
- Display of operating hours.

#### 6 - ▲ key

- Increasing values to be set.
- Display of current heating capacity in %.

#### 7 - U key

- The function of the key is not used.

#### 8 - LED OUT 1

Indicates the status of the output for the temperature control:

- ☀ If LED OUT 1 is lit, the calibrator is heating.
- If LED OUT 1 is not lit, the calibrator is not heating.

#### 9a - LED OUT 2

a) Heating instrument

Indicates the status of the output for the fan control:

- ☀ If LED OUT 2 is lit, the fan is running at high speed.
- If LED OUT 2 is not lit, the fan is running at low speed.

#### 9b - LED OUT 2

b) Heating and cooling instrument

Indicates the status of the output for the temperature control:

- ☀ If LED OUT 2 is lit, the calibrator is cooling.
- If LED OUT 2 is not lit, the calibrator is not cooling.

## 5.2 Calibration (calibration mode)

As soon as the calibrator has been switched on, it switches to the **calibration mode** after initialization.

### 5.2.1 Display of reference and set temperature

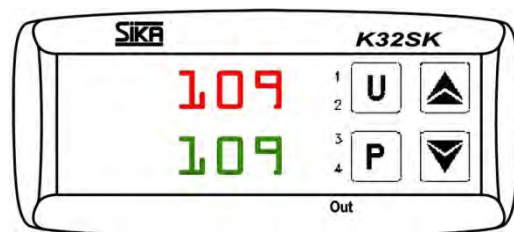
The current reference temperature is displayed in the upper and the set temperature in the lower of the display.

#### Upper display (red):

The red display shows the current temperature of the metal block.

#### Lower display (green):

The green display shows the current set temperature chosen by the user.



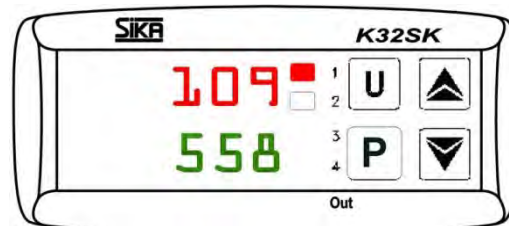
Display of reference and set temperature

### 5.2.2 Display of temperature control

The LED **OUT 1** indicates the status of the temperature control:

- If LED OUT 1 is lit the temperature control is active. The heating or cooling is switched on.
- If LED OUT 1 is not lit the heating or cooling is switched off.

If the LED OUT 1 lights up permanently, the calibrator is heating up. The temperature control is active so that the set point is reached as quickly as possible.



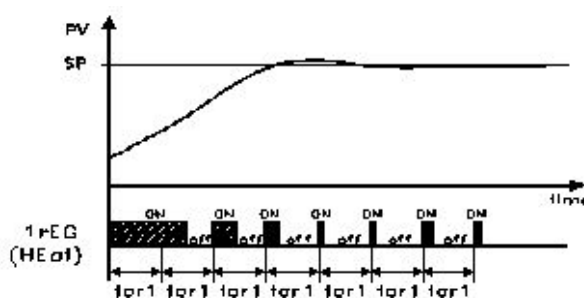
Temperature control active

If the set temperature has almost been reached, the LED OUT 1 begins to flash.

The temperature control is activated at increasingly shorter intervals. Thereby, a too strong overdriving is prevented.

To ensure good temperature stability, the cycle time of the controller is set low.

The temperature control is now often activated but only for a short time.



The control is done by PID algorithm.



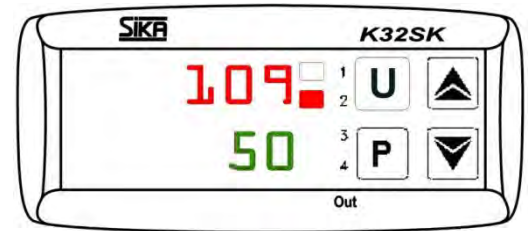
### 5.2.3 Display of fan / cooling control

The LED **OUT 2** indicates the status of the output for the fan / cooling control:

a) Heating instrument (TP 17650M)

The LED **OUT 2** indicates the status of the output for the fan control:

- If the LED OUT 2 is lit the fan is running at high speed.
- If the LED OUT 2 is not lit the fan is running at low speed.



Fan / cooling control active

b) Heating and cooling instrument (TP 17165M)

The LED **OUT 2** indicates the status of the output for the cooling control:

- If LED OUT 2 is lit the temperature is decreased.
- If LED OUT 2 is not lit the cooling is switched off.

### 5.2.4 Display of heating / cooling capacity and operating duration

In calibration mode, you can check the heating or cooling capacity and the operating duration of the calibrator. The current values of the calibrator appear on the lower display (green).

#### Heating or cooling capacity:

☞ Hold down the ▲ key.

- The current heating and cooling capacity is displayed in % of the maximum capacity. "H" indicates the heating capacity and "C" indicates the cooling capacity.

#### Operating duration:

☞ Briefly press the ▼ key.

- The current number of operating hours of the calibrator is displayed for ~5 s.

### 5.2.5 ConF menu

In the **ConF** menu, system parameters of the calibrator can be set. These settings may only be carried out by authorised SIKA personnel.

This menu is protected by a password.

#### CAUTION! Material damage!

The **ConF** menu is protected by a password. Unauthorised access can cause damage to the calibrator.



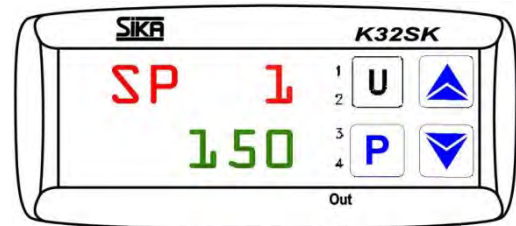
☞ Do not try to guess the password.

☞ Exit the menu by pressing the **P** key twice.

### 5.3 Set a set temperature (set point mode)

In this operating mode it is possible to modify a saved set temperature.

- ↩ Press the **P** key shortly.  
The currently active set point memory, e.g. SP 1 (set point 1), is displayed by the upper display.  
The respective set temperature is displayed by the lower display.
- ↩ Press the **▲** key to increase the set temperature.  
Press the **▼** key to decrease the set temperature.
- ↩ Press the **P** key again to confirm the new set point.
  - The new set point is saved and the controller returns to the calibration mode.



Set temperature setting

#### NOTES:



- Press the **▲** and **▼** key to raise and lower the value by 0.1 respectively. If the keys are held pressed for at least one second, the value increases or decreases quickly and after two seconds even more quickly; this means the desired value can be reached rapidly.
- If no key is pressed in the **set point mode** for approx. 15 seconds, the device automatically returns to the **calibration mode**.

## 6 Testing process / Calibration

### CAUTION! Risk of burns!

The calibrator can become very hot when in operation. Touching hot parts can result in serious injuries.



- ↪ Never touch the metal block, the adapter sleeve or the test specimen at temperatures above 35 °C or below 10 °C.
- ↪ Allow the calibrator to cool before you remove the test specimen, change the adapter sleeve or switch off the machine.

### 6.1 Testing temperature sensors

A separate temperature measuring instrument connected to the test specimen is required to test the temperature sensors

By comparing the temperature displayed at the external measuring instrument with the reference temperature it is possible to assess the status of the test specimen. Remember that the test specimen requires a short period of time until it absorbs the temperature of the metal block.



### CAUTION! Incorrect results!

It is not possible to calibrate earthed thermal elements, because the heating block is earthed and any measurement would produce incorrect results.

### 6.2 Testing process

#### Before the testing process:

Before the start of the testing process, check whether

- the instructions regarding the installation site and the operational position have been complied with (→ § 4.1).
- the electrical connections have been made correctly (→ § 4.2).
- the correct measuring insert has been selected for the testing process (→ § 4.3).
- the test specimen is securely fixed in the calibrator.
- the calibrator has sufficient structural stability.

**Performing testing process:**

During the testing process, one or more test points are approached and the reference temperature of the calibrator is compared with the measured temperature of the specimen.

- ↪ Set the set temperature to the value of the first test point.
  - The temperature control regulates the metal block to the temperature of the test point.
- ↪ Wait until the temperature has been reached and is sufficiently stable for your checking.
  - ⚠ Also note that the temperature of the specimen is stable and transients are finished.
- ↪ Write down the reference temperature and the temperature of the specimen for your test protocol.
- ↪ Set the calibrators gradually to the set values of the further test points and proceed as described above.

**Terminate / cancel testing process:**

If the testing process has to be terminated or cancelled, the calibrator must be brought in a safe operational state.

- ↪ Set the set temperature to a low value e.g. room temperature.
- ↪ Wait until the calibrator has sufficiently cooled down.
  - ⚠ Don't let the calibrator unattended at high temperatures.

**After the testing process:**

- ↪ Allow the calibrator to cool to room temperature.
- ↪ Note the instructions in the section "Switching on, cool down and switching off" (→ § 4.4).
- ↪ Clean the calibrator (→ § 8.2).

## 7 Problems

### CAUTION! Material damage!



The TP 17...M cannot be repaired by the user! In case of a defect, the device must be returned to the manufacturer for repair.

👉 Never open the TP 17...M and perform any repair yourself.

The following table details what problems you can solve yourself and how to solve them.

Problem	Possible cause	Remedy
----	Interruption of the internal reference sensor or the internal reference sensor is defective.	The controller switches off the power supply to the heating cartridge (service call required).
uuuu	Measured temperature under the limit value of the internal reference sensor (under range -200 °C)	
oooo	Measured temperature above the limit value of the internal reference sensor (over range +850 °C)	
ErEP	Possible fault in the EEPROM memory of the controller.	Press the P key
Fan not running.	The fan is defective or blocked.	The temperature switch is possibly triggered, switching off the power supply to the heating cartridge (servicing required)
End temperature is not achieved.	Solid state relay is defective or the heating / cooling element has short circuited or aged.	Service call required.
Sensor break.	External reference sensor not properly connected.	Recheck connection and connect properly.
	Cable break or short circuit.	Service call required.
No display.	Controller defective.	Service call required.
No function.	Network connection not established correctly or fuse defective.	Check the network connection and fuse.

If you are unable to remedy any particular problem, then immediately disconnect the calibrator in order to protect it from unintended operation.

Contact your supplier or directly to SIKA. Please send the device for repair with a brief description of the problem, the environmental conditions and the length of time the device was operational before the problem occurred.

## 7.1 Return shipment to the manufacturer

Contact SIKA's department "Sales" when you have a defective calibrator within or outside the warranty to arrange the shipping of the calibrator.

Due to legal requirements placed on environmental protection and occupational safety and health and to maintain the health and safety of our employees, all units returned to SIKA for repair must be free of toxins and hazardous substances. That also applies to cavities in the devices. If necessary, the customer must neutralise or purge the unit before return to SIKA.

Costs incurred due to inadequate cleaning of the device and possible costs for disposal and/or personal injuries will be billed to the operating company.

### **WARNING! Risk of injury due to insufficient cleaning!**



The operating company is responsible for all damages and harm of any kind, in particular physical injuries (e.g. caustic burns or toxic contaminations), decontamination measures, disposal etc. that can be attributed to insufficient cleaning of the measuring instrument.

☞ Comply with the instructions below before returning the unit.

The following measures must be taken before you send the unit to SIKA for repair:

- ☞ Clean the device thoroughly. This is of extreme importance if the medium is hazardous to health, i.e. caustic, toxic, carcinogenic or radioactive etc.
- ☞ Remove all residues of the media and pay special attention to sealing grooves and slits.
- ☞ Attach a note describing the malfunction, state the application field and the chemical/physical properties of the media.
- ☞ Please follow the instructions on the procedure for sending returns which are on our website ([www.sika.net/en/services/return-of-products-rma.html](http://www.sika.net/en/services/return-of-products-rma.html)) and please specify a point of contact in case our service department has any questions.

The customer must confirm that the measures were taken by filling out the declaration of decontamination. It can be found on our website as a download:

[www.sika.net/images/RMA/Formular\\_Warenruecksendung.pdf](http://www.sika.net/images/RMA/Formular_Warenruecksendung.pdf)

## 8 Maintenance, cleaning and transport

Before maintenance, cleaning and transport, check whether

- the calibrator has cooled sufficiently (→ § 4.4 "Cool down").
- the calibrator has been switched off and disconnected from the mains.

### 8.1 Maintenance

The TP 17...M itself is maintenance-free and cannot be repaired by the user. In case of a defect, the device must be returned to the manufacturer for repair.



#### **CAUTION! Material damage!**

When opening the device, critical parts or components can be damaged.

✘ Never open the device and perform any repair yourself.

For safe operation of the calibrator, the following checks must be carried out at regular intervals:

#### **Before use:**

✘ Check the calibrator for damage.

#### **Annually:**

- ✘ Subject all the parts of the calibrator to a visual inspection for corrosion, wear and damage.
- ✘ Have a trained technical person carry out a safety inspection of all the electrical parts.

#### **Recalibration:**

✘ Send the calibrator for Recalibration(→ § 8.1.1) after 36 months or after a maximum of 500 operating hours to SIKA.

#### **Thermal fuse:**

The thermal fuses of the calibrator are located on the front side and are integrated in the mains connection. If there is a mains voltage present, but the display is dark and the fan is not running, you should check the fuses and replace them if required.

- ✘ Pull the mains connection cable from the calibrator.
- ✘ Prise open the fuse compartment from the bottom with a fingernail or a flat screwdriver.
- ✘ Remove the compartment with the fuses.
- ✘ Check the fuses and replace the faulty fuses.
- ⚠ **IMPORTANT!** Only use fuses of the same type (→ § 10.1 ).  
Always replace both fuses, even if only one is defective.
- ✘ Fit the fuse compartment back in place and connect the mains connecting cable (→ § 4.2 "Electrical connection").

Should the fuses blow repeatedly, there is probably a fault in the calibrator. In this case, send the calibrator to SIKA for repairs (→ § 7+§ 7.1).

### 8.1.1 Recalibration

The calibrator is adjusted and tested with measuring equipment in accordance with recognized national standards prior to delivery.

The calibrator should, depending on the application situation, be inspected at appropriate intervals on the basis of DIN ISO 10012. We recommend you to return the calibrator to SIKA at intervals of max. 36 months or approx. 500 operating hours for recalibration and readjustment.

Recalibration is based on the directive DAkkS-DKD R5-4 of the German Accreditation Body. The measures described here are applied and considered during recalibration.

## 8.2 Cleaning

### External cleaning:

Clean the TP 17...M with a dry or slightly damp lint-free cloth. Do not use sharp objects or aggressive agents for cleaning.

Ensure that your cleaning agent cannot be a source of danger from a reaction with parts of the machine or the materials inside it.

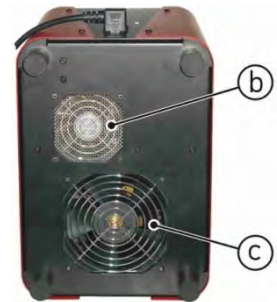
If you have any questions regarding compatibility, please contact our customer service.

### Venting grilles for inlet air:

The grille openings (b) + (c) in the base of the calibrator must be cleaned at regular intervals.

The cleaning intervals depend very closely on the air pollution at the installation site and the daily operating duration.

- ☞ Clean the grille openings by vacuuming or brushing off.
- ☞ Please keep in mind the following instruction regarding the temperature fuse.



**IMPORTANT!** Temperature fuse at over-temperature!



An air flow that is too low can result in the temperature fuse getting triggered. The calibrator is then rendered operationally disabled, and must be sent to SIKA.

- ☞ Ensure that the grille openings are always clear.

### Adapter sleeves:

During operation, small quantities of metal dust get created. It can result in the adapter sleeve getting stuck in the calibration block.

- ☞ Pull the adapter sleeve out of the calibration block with the help of the sleeve exchange tool.
- ☞ Clean the adapter sleeve and the calibration block at regular intervals.



Before a prolonged shutdown of the calibrator, remove the adapter sleeve from the calibration block.



## 8.3 Transport

### CAUTION! Risk of burns!



The calibrator can become very hot when in operation. Touching hot parts can result in serious injuries.

- ↪ Allow the calibrator to cool down before transport.
- ↪ Carry the calibrator only at the handle.

Observe the following instructions for a safe transport of the TP 17...M:

- The calibrator has to cool down to room temperature.
- The calibrator is switched off and was disconnected from AC power.
- All connected sensors and devices have been removed.
  
- ↪ The calibrator must be transported upright.
  - ⚠ Avoid bumps and shocks.
  - ⚠ Let the calibrator neither fall nor tip over.
  
- ↪ Protect the calibrator from inadequate environmental influences.
  - 💡 Use our transport case which is available as accessories.
  
- ↪ ⚠ Carry the calibrator only at the handle.

## 9 Decommissioning and disposal



### CAUTION! Risk of injury!

Never remove the device from a measurement set up in operation.

↳ Make sure that the measurement set up is shut down professionally.

### Before decommissioning:

Prior to decommissioning, ensure that

- the measurement set up is switched off and is in a safe and de-energised state.
- the calibrator and the accessories has completely cooled down (→ § 4.4 "Switching on, cool down and switching off").

### Decommissioning:

- ↳ Remove all connected sensors and devices.
- ↳ Switch off the calibrator and disconnect the mains plug

### Disposal calibrator:

Compliant with the Directives 2011/65/EU (RoHS) and 2012/19/EU (WEEE)\*, the device must be disposed of separately as electrical and electronic waste.

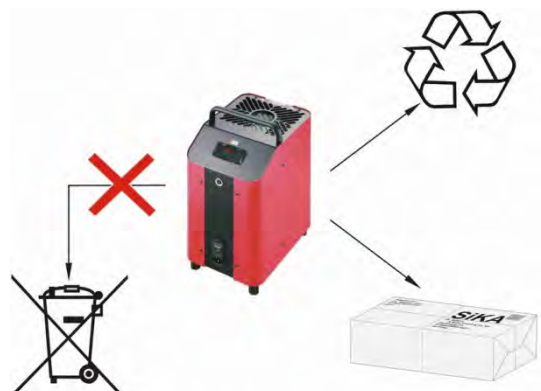


### NO HOUSEHOLD WASTE!

The calibrator of the series TP 17...M consists of various different materials. It must not be disposed of with household waste.

- ↳ Take the TP 17...M to your local recycling plant  
or
- ↳ send the TP 17...M back to your supplier or to SIKA.

\* WEEE reg. no.: DE 25976360



## 10 Technical Data

The technical data of customised versions may differ from the data in these instructions. Please observe the information specified on the type plate.

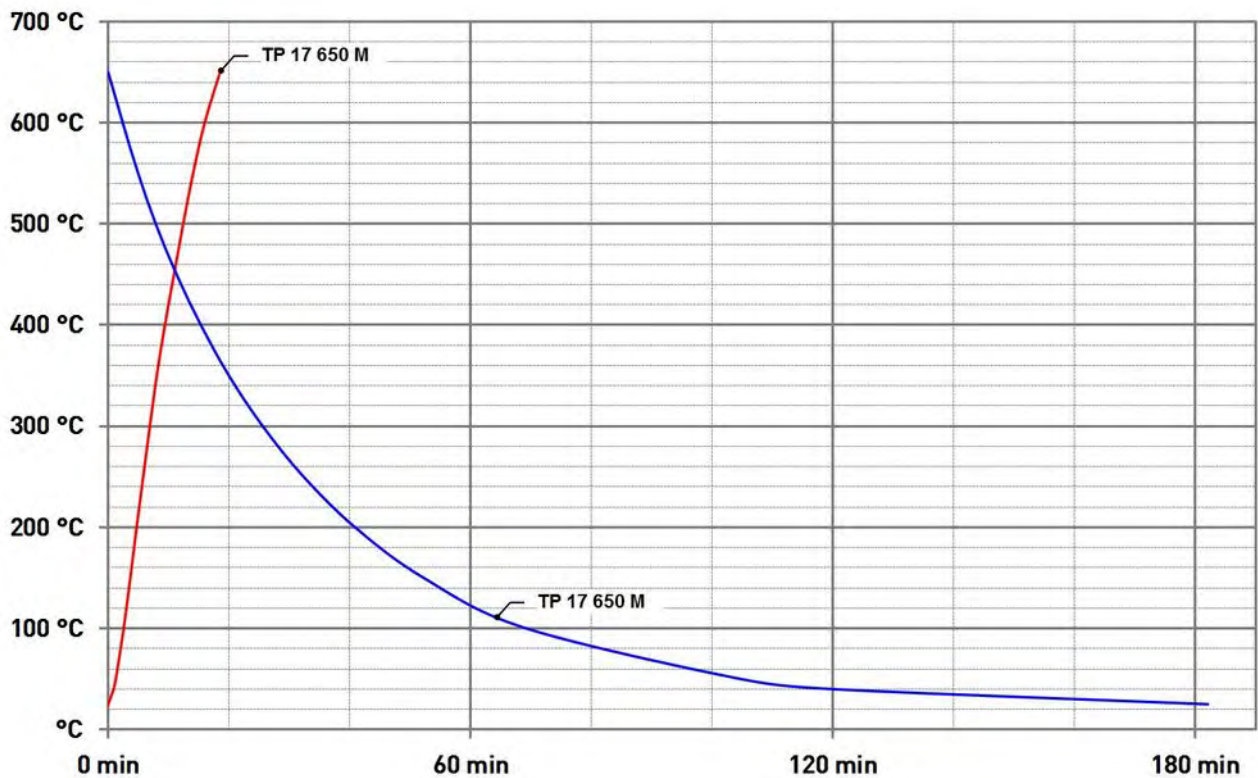
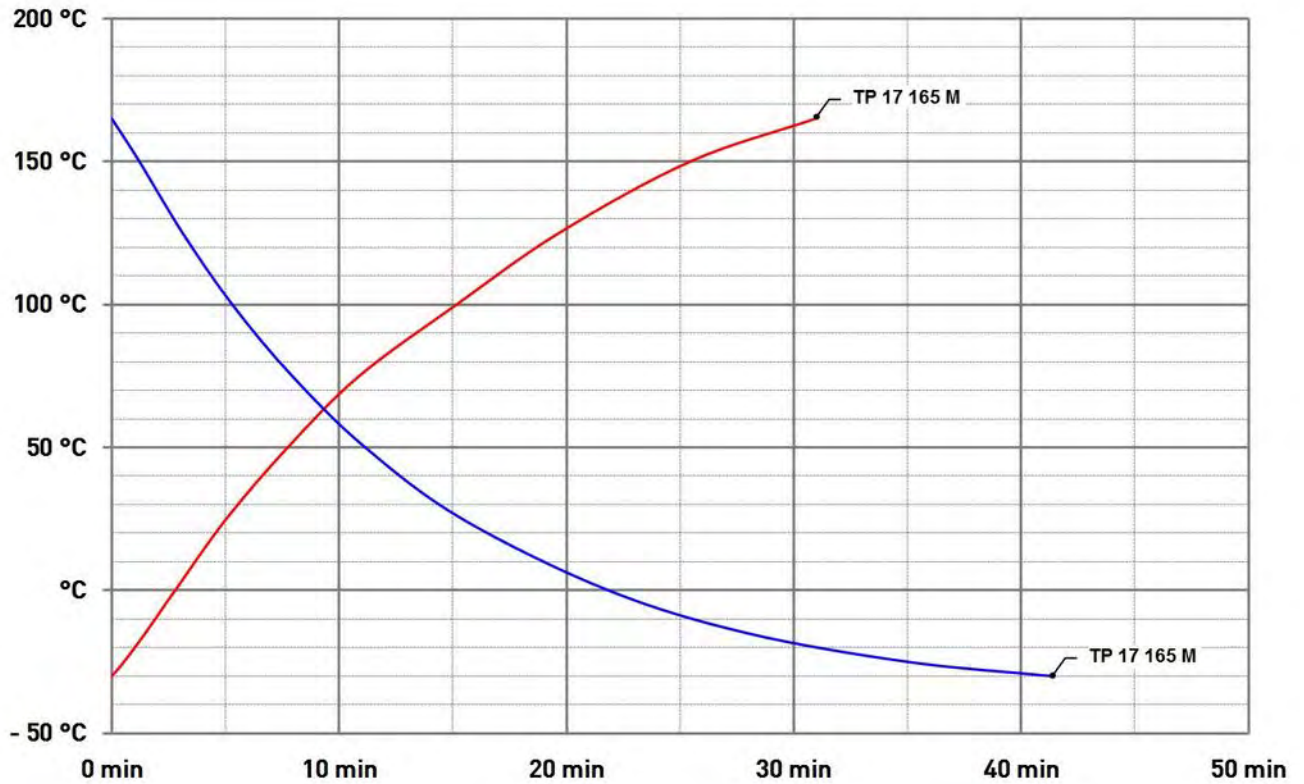
### 10.1 Characteristics series TP 17...M

Series	TP 17165M	TP 17650M
<b>Characteristics</b>		
<b>Kalibrator</b>		
Temperature range	-35...165 °C	T <sub>R</sub> ...650 °C
Accuracy	± 1.0 °C	
Stability	± 0.1 °C	
Influence of the operating temperature (0...50 °C) to the accuracy	+/- 0.02 °C/°C	
Detection speed	130 ms	
Control sensor	Internal	
<b>Display</b>		
Display range	-50...165 °C	0...650 °C
Resolution	1 °C	
Unit	°C or °F (optional)	
Two-line display: - Reference temperature - Set temperature	4-digit 7-segment LED, 7 mm high red = upper display green = lower display	
Display for sensor break	- - - -	
<b>Electrical characteristics</b>		
Supply voltage:	100...240 V <sub>AC</sub> • 50/60 Hz	230/240 V <sub>AC</sub> • 50/60 Hz
- optional	-/-	100...115 V <sub>AC</sub> • 50/60 Hz 100...240 V <sub>AC</sub> • 50/60 Hz
Power consumption	375 W	1000 W
Fuse:	6.3 A slow-blow	6.3 A slow-blow
- optional	-/-	10.0 A slow-blow
Degree of protection	IP 20	
Block temperature control	PID controller	
Controller outputs: - Heater control - Cooler control - Fan control	voltage output for control of the solid state relay (8 mA/ 8 V <sub>DC</sub> ) voltage output for control of the solid state relay (8 mA/ 8 V <sub>DC</sub> ) relay SPDT (8 A-AC1, 3 A-AC3 / 250 V <sub>AC</sub> ) 100,000 switching cycles	
Sensor break behaviour	controller is switched off	
Behaviour when temperature is exceeded in the housing	Temperature fuses switch off the heating when the limit values are exceeded.	

Series	TP 17165M	TP 17650M
<b>Characteristics</b>		
<b>Process variables</b>		
Test specimen holder:		
- Bore	Ø 28 mm	
- Depth	150 mm	
- Measurement zone	110...150 mm	
<b>Housing dimensions:</b>		
- Width	210 mm	150 mm
- Height	380+50 mm	330+70 mm
- Depth	300 mm	270 mm
Weight	~10.0 kg	~7.5 kg
Adapter sleeves for smaller Ø (in 0.5 mm steps)	1.5...25 mm	1.5...25 mm
<b>Ambient conditions</b>		
Operating temperature	0...50 °C	
Transport and storage temperature	-10...60 °C	
Humidity (RH)	30...95 % (non-condensing environment)	
Operating conditions: - Location • Altitude - Operating position	Interiors • up to 2000 m Standing upright/vertically	

## 10.2 Heating and cooling periods

The heating up and cooling times are dependent on the parameters of the test task used and the ambient conditions. The following times are guide values for a room temperature of 23 °C without settling processes.



## 11 Guideline DAkkS-DKD-R 5-4 • Appendix B

### Details of the DKD technical committee "Temperature and Humidity" for the operation of temperature block calibrators.

Having a calibrator certificate from a DAkkS calibration laboratory confirms that the temperature block calibrator meets the high demands of the calibrating ability of such a device, which are outlined in the guideline DAkkS-DKD-R 5-4. Nevertheless, the following points should be noted regarding the use of the calibrator:

The calibration of the temperature block calibrator predominantly relates to the temperature of the solid body block. The temperature of the thermometer in the block to be calibrated can differ from this temperature. If a thermometer of the same model, under the same test conditions as were used in the calibration is used, it can be assumed that the measurement difference in the calibration of ideal thermometers are not larger than the measurement inaccuracy which is stated in the calibrator certificate. If it is the case that nothing else is specified on the calibrator certificate, it must be ensured that

- the measuring element is located in the homogeneous temperature zone.
- the inner diameter of the bore hole used in the calibrator (possibly the casing) in the temperature range of  $-80\text{ °C}$  to  $660\text{ °C}$  is a maximum of 0.5 mm bigger than the outer diameter of the calibrated thermometer, and in the temperature range of  $660\text{ °C}$  to  $1300\text{ °C}$  is a maximum of 1.0 mm bigger.
- the immersion depth of the thermometer to be calibrated amounts to at least 15 times the outer diameter of the thermometer to be calibrated.
- the thermometer to be calibrated has an outer diameter of  $d < 6\text{ mm}$ .

Please take particular care if a heat transfer medium was used during the calibration of the temperature block calibrator. If this is the case the calibration is only effective if the calibrator was used with a corresponding heat transfer medium.

With the calibration of thermometers with an outer diameter  $d > 6\text{ mm}$  allow for an additional error of measurement due to heat conduction. In the case that such measurements are required, the additional heat conduction can be determined by the thermometer model and ascertained from your accredited calibration laboratory. A good test of the possible temperature variations caused by heat conduction consists of testing whether the display of the calibrated thermometer changes when it is lifted 20mm. Contributions to measurement inaccuracy that are conditional on the thermometer to be calibrated (e.g. inhomogeneities from thermal elements), are likewise not covered in the measurement inaccuracy of the calibrator.

In the case that the calibrator is used in load conditions that do not comply with the load condition from the calibration, the influence of the load condition can be determined through replacement or addition of other thermometers on site.

The details on the calibration certificate are important for the calibration, not the manufacturers' instructions. Before the calibration, please make sure you agree upon the operation and calibration conditions with your DAkkS calibration laboratory.

If there is nothing else specified on the calibrator certificate, (independent from the manufacturers' instructions) it must be ensured that

- the calibrator is used in a vertical position.
- no additional thermal isolation is in use.
- the environmental temperature is  $(23 \pm 5)\text{ °C}$ .

In order to check the calibration of the temperature block calibrator it is recommended to take regular measurements with a calibrated thermometer. If control measurements with a calibrated thermometer are not taken annually, recalibration of the temperature block calibrator is strongly recommended.

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**For your notes**



Sensors and Measuring Instruments




Flow Measuring Instruments





Test and Calibration Instruments




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

 +49 (0)5605 803-0

 +49 (0)5605 803-54

 [info@sika.net](mailto:info@sika.net)

 [www.sika.net](http://www.sika.net)