Sika TP 17165 Temperature Calibrators Instruction Manual

Contents

Sika TP 17165 Temperature Calibrators

Specifications

- Product Model: TP17 / TPM
- Calibration Range: Not applicable
- Product Types: TP 17165, TP 17165M, TP 17165S, TP 17166, TP 17166S, TP 17200, TP 17200S, TP 17450, TP 17450S, TP 17650, TP17650M(.2), TP 17650S, TP M165S, TP M255S

Product Information

The TP17 / TPM is a temperature calibrator used for calibration purposes. It comes with various accessories including a temperature calibrator, transport case, test certificate, calibration insert, power cable, operating manual, PC software, safety packaging, sensor basket, DAkkS certificate, drainage pump, transport cover, and work cover with silicone stoppers.

Product Usage Instructions

Setup

The calibrator consists of a service and data interface, main switch with fuse and power plug connection, metal block (dry block), and tank (calibration bath).

Data Interface (S-Version)

There is an embedded socket for the data interface in the S-Version of the calibrator.

Operation

Powering On

Ensure proper network setup. If the calibrator is busy communicating with the data interface, the display will show a “busy” message indicating an occupied state.

Operating Conditions

The operating temperature, transport and storage temperature, and relative humidity must meet specified conditions for optimal performance.

Electrical Connection

Follow the electrical connection guidelines provided in the manual for safe operation.

Preparing the Calibrator

Dry Block Calibration

Select the appropriate dry block type and ensure correct positioning within the calibration insert.

Calibration Bath

For calibration bath calibration types, handle with caution and securely fasten all components during operation.

Frequently Asked Questions

- **Q: What is included in the product package?**
  - A: The product package includes a temperature calibrator, transport case, test certificate, calibration insert, power cable, operating manual, PC software, safety packaging, sensor basket, DAkkS certificate, drainage pump, transport cover, and work cover with silicone stoppers. Some accessories are specific to certain models.

About This Operating Manual

- Read carefully before use!
- Keep for future reference!
- For calibrators with a cooling function, the term “cooling” is also used for temperatures below room temperature, in the sense of “heating”. If you have any problems or questions, please contact your supplier or contact us directly:

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Safety Instructions

Read the operating manual carefully. Follow all instructions to avoid personal injury and damage to property.

Intended use

The calibrators of the TP17 / TPM series may only be used for the calibration of suitable temperature measuring devices and temperature sensors. The calibrators must not be used to heat or warm other parts or gases. The calibration baths may only be used with suitable media. Permitted liquids are silicone oils, mineral oils and water. Dangerous media (flammable or explosive liquids or gases) must not be used.

WARNING

Touching hot parts can cause serious burns.

- Never touch the metal block, the calibration insert or the device under test at temperatures above 35°C or below 10°C.
- Allow the calibrator to cool down (≥ 10°C and ≤ 35°C) before removing the device under test, changing the calibration insert, or switching off the device.
- Never leave the calibrator unattended during operation or the cool-down phase.

IMPORTANT

The opening in the metal block of the calibrator is only suitable for operation with calibration inserts.

- Never pour heat transfer agents (oil, heat-conducting paste or other agents) into the metal block.
- Only use calibration baths with calibration liquids.

Qualified personnel

- The personnel responsible for the operation and maintenance of the device must be appropriately qualified. This can be done through training or instruction.

General safety instructions

- Stability in accordance with DIN EN 61010-1:
  The calibrator must be set up in such a way that the requirements for stability are met.
- Do not use in potentially explosive atmospheres (flammable or explosive atmospheres).
- Do not operate in the vicinity of flammable substances.
- The calibrator may only be operated within the temperature range permitted for the device under test.
- Only operate the device if it is in perfect working order. Check damaged or defective devices immediately and replace if necessary. If faults cannot be rectified, switch off the device immediately and secure it against

unintentional operation.

- Do not remove or obliterate type plates or other notices on the device, as this will invalidate the warranty and manufacturer's liability.

Safety Instructions for the Use of Calibration Liquids

- Read the safety data sheet carefully before using calibration liquids. Observe the information on the physical and chemical properties.
- Only use calibration liquids that are suitable for the required temperature range and cannot burn.
- Always wear safety goggles when handling calibration liquids.

We recommend the following calibration liquids for the various temperature ranges:

Calibration liquid	Calibration range		Flash point
Distilled water	2...95°C		none
Silicone oils from XIAMETER®:			
PMX-200 SILICONE FLUID 5 CS	-40°C	123°C	133°C
PMX-200 SILICONE FLUID 10 CS	-35°C	155°C	165°C
PMX-200 SILICONE FLUID 20 CS	7°C	220°C	230°C
PMX-200 SILICONE FLUID 50 CS	50°C	270°C	280°C

Water

- Only use distilled water, otherwise the tank will become heavily calcified and contaminated.

Silicone oil

- Only use the silicone oil recommended here.
- Read the safety data sheet of the silicone oil.
- Ensure good room ventilation when working with silicone oil, as harmful substances may escape.
- Avoid contact of silicone oil with the eyes.
- Leaking silicone oil poses an extreme risk of slipping. Remove affected areas with suitable agents.
- Always close the calibration bath with the transportation lid after use, as silicone oil is hygroscopic.

Mineral oil

- Calibrators are supplied exclusively with silicone oil.
- The use of mineral oil is possible, but is at the customer's own risk. The risk is transferred to the customer. Our warranty is void.
- Read the safety data sheet of the mineral oil.
- The safety instructions for silicone oil also apply analogously to mineral oil. The same applies to the corresponding sections on silicone oil in this operating manual.

Device Description

Versions

Dry block calibrators				Calibration bath calibrators	
TP 17165 TP 17165M TP 17165S	(c+h) (c+h) (c+h)	TP 17450 TP 17450S	(h) (h)	TP M165S	(c+h)
TP 17166 TP 17166S	(c+h) (c+h)				
TP 17200 TP 17200S	(c+h) (c+h)	TP 17650 TP 17650M(.2) TP 17650S	(h) (h) (h)	TP M255S	(h)
c+h: cooling and heating		h: heating			

Dry block calibrators

TP 17165...
TP 17166...
TP 17200...

TP 17450...
TP 17650...

Calibration bath calibrators

TP M165S

TP M255S

Scope of delivery and accessories

IMPORTANT

Keep the packaging so that the calibrator can be safely returned to the manufacturer for recalibration or repair.

Scope of delivery

- Temperature calibrator
- Test certificate
- Mains cable
- Exchange tool*
- Operating manual
- Safety packaging/transport protection
- Sensor cage**
- Drain syringe**
- Transportation lid**
- Magnetic stirrer with magnet lifter**
- Working lid with 5 silicone plugs

Accessories (optional)

- Transport case

- Calibration insert*
- Holding device for sensors**
- Calibration liquid (silicone oil)**
- PC software
- PC connection cable (RS485 to USB)
- DAkkS certificate
- Works calibration certificate

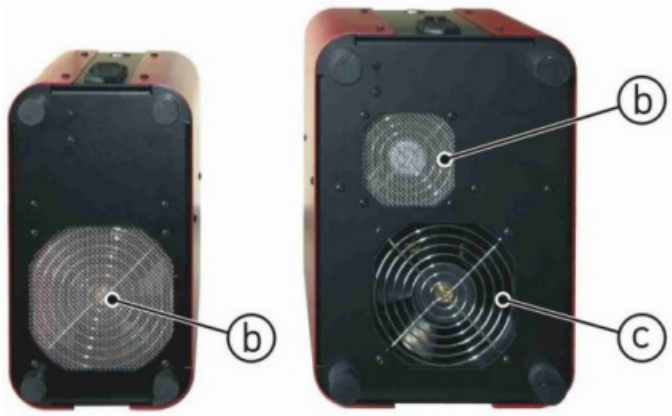
Only for dry block temperature calibrators
** TP M165S and TP M255S only

Structure

1. Carrying handle
2. Steel casing
3. Controller with display and controls
4. Service and data interface
5. The main switch with fuse and mains plug connection
6. Metal block (dry block)
    - a Calibrator ventilation: exhaust air via upper housing grille
7. Tank (calibration bath)
    - a Calibrator ventilation: exhaust air via side housing grilles
8. Magnetic stirrer setting wheel

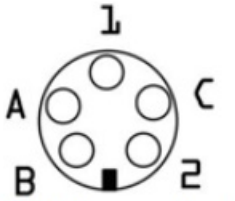
   Calibrator from below:
9. Calibrator ventilation
    - b Supply air for housing cooling

      c Supply air for tank/metal block cooling



Data Interface (S version)

The S version is equipped with an RS485 serial communication interface. A PC, a level converter or a network can be connected via this interface. The software protocol used is a MODBUS RTU protocol that is used by many monitoring programmes available on the market. It can be supplied as a separate document on request. The transmission speed (baud rate) is set to 9600 baud at the factory. Other transmission speeds are possible on request. The 5-pin panel jack has two connections, A and B, which must be connected to the corresponding connections of the PC, level converter or network. For connection to a PC, the RS 485 signals must be converted externally into RS 232 or USB signals. Corresponding converters including drivers are optionally available. The PC records all operating data and enables all configuration parameters of the calibrator to be programmed.

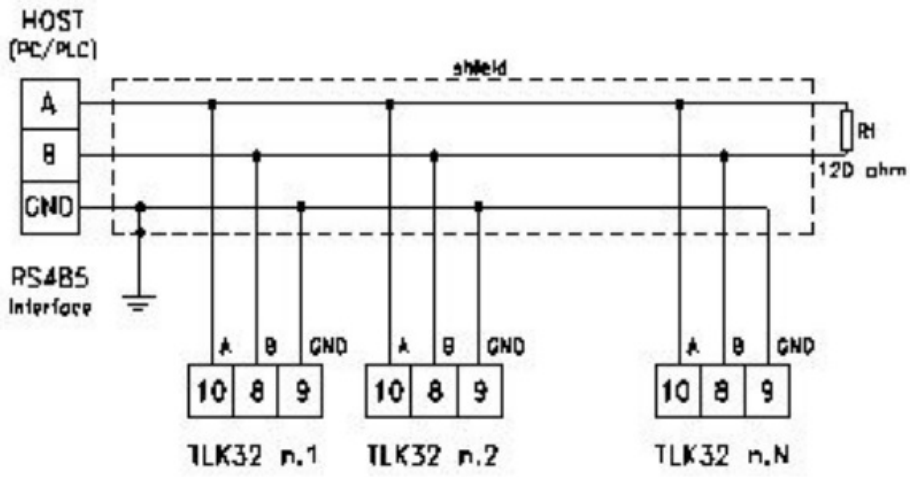


Built-in socket

The minimum requirements for operation with USB converter are

- IBM-compatible PC
- Windows 7, Windows 8 or Windows 10 operating system
- a free USB interface (USB 1.1 or USB 2.0)

A network setup allows up to 32 calibrators/calibration baths to be connected to the same network. To set up a network, some settings must be made at the factory. Please contact your supplier or SIKA directly



Network development

Notice

If programming is called up via the keypad while communication is taking place via the serial interface, the message “buSy” appears on the display, indicating the “connected” status.

Commissioning and Operation

Operating Conditions

Installation site and operating position

- Only suitable for indoor use, do not use outdoors.
- Only operate vertically on a level surface. The surface must be firm, clean and dry. Stability and the specified properties of the calibrator are not guaranteed if it is set up in any other way.
- For higher test temperatures, use a sufficiently large, fireproof base.
- Sufficient distance around the device: > 1 m to the front, > 0.5 m to the sides and back. Sufficient free space above the device.

- The device under test must be securely fixed in the calibrator.
- Ensure adequate ventilation.
- Do not use in potentially explosive atmospheres (flammable or explosive atmospheres).
- Do not operate in the vicinity of flammable substances.
- Do not install in a cabinet or other casing.
- Do not block or cover the ventilation openings.
- Set up the device so that it can be switched off at any time.

Series	TP17 / TPM
Ambient conditions	
Operating temperature	5...50°C
Transport and storage temperature	-10...60°C
Relative humidity	< 80 % up to 31°C, decreasing linearly to 50 % at 40°C (non-condensing environment)
Operating conditions • Location • Height • Operating situation	 Interiors Up to 2000 m Upright / vertical standing

IMPORTANT

The plug of the mains cable serves as an “EMERGENCY STOP” switch.

- The plug must always be freely accessible and easy to reach.
- In an emergency, pull out the plug to disconnect the device from the mains

Electrical Connection

- The voltage specified on the type plate must match the mains voltage.
- Only connect the calibrator to a properly installed and earthed 3-pin socket suitable for earthing contact plugs.
- Protective conductor (PE) must be present.
- Do not use extension cables or adapter plugs.

IMPORTANT

Only use original SIKA cables or cables of the same type with the corresponding specification (H05VV-F 3 G 0.75 mm² with angled earthing contact plugs and IEC socket, length approx. 2 m) as a replacement.

- Connect the power cable to the calibrator’s plug connector.
- Insert the plug of the mains cable into a suitable socket.

Preparing the Calibrator

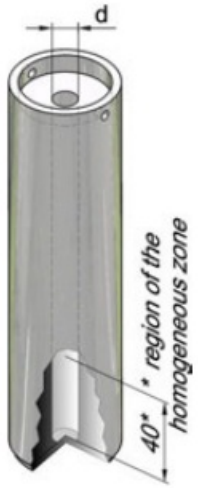
Dry Block Calibration

Type	TP 17165...	TP 17166...	TP 17200...	TP 17450...	TP 17650...	TP M165S	TP M255S
Dry block	✓	✓	✓	✓	✓	-/-	-/-

Calibration inserts with single or multiple holes are used for the calibration of straight temperature sensors.

To achieve the accuracy of the calibrators, the temperature sensor (device under test) and the calibration insert must be matched to each other:

- The borehole of the calibration insert may be a maximum of 0.5 mm larger than the diameter of the device under test.
- The sensor element of the device under test must be located in the homogenous temperature zone of the calibration insert.



Inserting

Only use the supplied calibration inserts made of suitable material.

If in doubt, please contact SIKA.

- Insert the appropriate calibration insert into the metal block using the exchange tool.
- Centre the calibration insert so that there is an even air gap between the calibration insert and the block.

Calibration inserts and exchange tool

Calibration bath

Type	TP 17165...	TP 17166...	TP 17200...	TP 17450...	TP 17650...	TP M165S	TP M255S
Calibration bath	-/-	-/-	-/-	-/-	-/-	✓	✓

WARNING

When using the calibration bath, calibration liquid may splash out. Always wear safety goggles when handling calibration liquids. The calibration bath is used to test sensors with special shapes or dimensions. Direct contact between the sensor and the calibration liquid ensures very good heat transfer. The calibration liquid is filled directly into the tank or into a tub insert. The calibration bath includes the transportation lid, the working lid, the sensor cage, the magnetic stirrer, the drain syringe, the magnet lifter and, as an accessory, the tub insert.

Transportation lid

The transportation lid is used to securely close the calibration bath. It prevents the calibration liquid from leaking during transport.

CAUTION

The safety valve of the transportation lid triggers at a pressure of ~1.5 bar. Hot vapours can escape.

- Always unscrew the transportation lid before putting the calibration bath into operation.
- Do not screw the transportation lid back on until the calibration bath has cooled down

Working lid

The working lid fulfils various tasks during operation.

- It reduces the evaporator of the calibration liquid to a minimum.
- It reduces cooling on the surface of the calibration liquid.
- It ensures stable placement of the devices under test in the calibration bath.

The working lid is screwed onto the calibration bath and has five openings for the devices under test. The unused openings can be closed with suitable silicone plugs.

Sensor cage and magnetic stirrer

The sensor cage is used to protect the magnetic stirrer. It prevents the immersed sensor from blocking the magnetic stirrer. The sensor cage ensures that the stirrer functions properly. The magnetic stirrer ensures an even temperature distribution in the calibration liquid.

Operating the magnetic stirrer

The speed of the magnetic stirrer is set using the dial next to the control (fig.).

To achieve good mixing, set the speed as high as possible.

- Turning the adjusting wheel upwards increases the speed.
- Turning downwards slows down the stirring movement.

Drain syringe and magnet lifter

The calibration liquid is pumped out of the calibration bath tank using the drain syringe. The magnetic stirrer is removed with the magnetic lifter. Both are required before another calibration insert can be inserted into the calibrator.

Tub insert (optional / accessory)

We recommend using the tub insert if you

- switch frequently between the dry block, infrared, surface and calibration bath functions.
- often work with different calibrating fluids.

The tub insert is inserted into the tank using the exchange tool. The tub insert, like the tank, can be closed with the corresponding lid. Both lid screw connections are leak-proof so that the calibration liquid can remain in the tank or tub insert during transport.

Notices on the calibration liquid

Different calibration liquids lead to different calibration results due to their specific properties. Adjustments to the calibration liquid used must be carried out by the manufacturer at the factory. To achieve the greatest possible accuracy of the calibration bath, a suitable calibration liquid must be used

IMPORTANT

Only use clean calibration liquids. When testing temperature measuring devices and temperature sensors, the calibration liquid may become contaminated. These impurities can lead to sanding effects on the bottom of the tank due to the rotating movement of the magnetic stirrer.

- Clean the tank.
- Clean the sensors before calibration.
- Replace worn magnetic stirrers.
- Replace contaminated, cloudy calibration liquids.

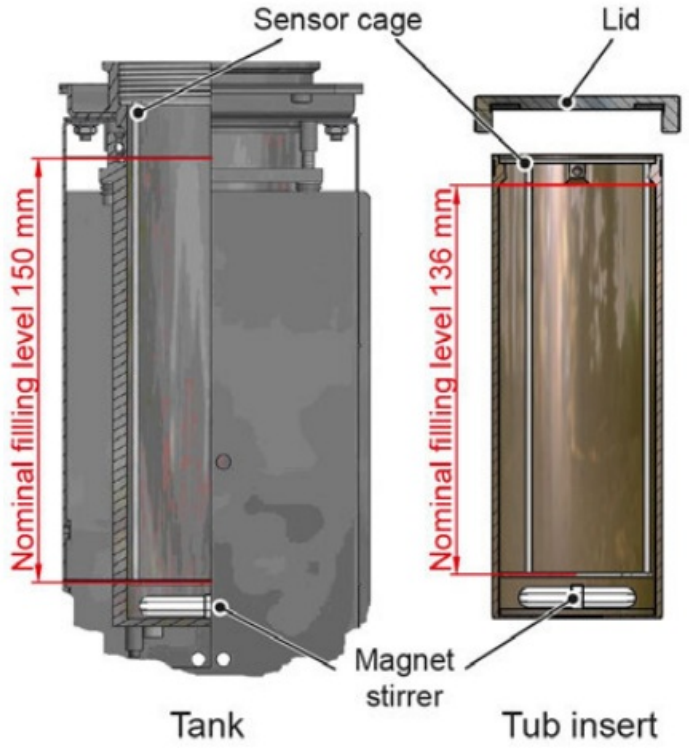
Notices on filling quantity

IMPORTANT

- Above the nominal fill level, the heat dissipation becomes too great, so that the specified tolerance values can no longer be maintained.
- An overflow of the calibration liquid leads to contamination and can damage the calibrator.
- The nominal filling level must not be exceeded during operation.

The filling level in the tank or tub insert is increased by

- Expansion when heated:
  The calibration liquids expand to varying degrees when heated. The increase in the fill level depends on the calibration liquids used and the set reference temperature.
- Displacement by sensors:
  The displaced volume of the sensors to be tested must be taken into account in the filling quantity.
- Increase due to stirring:
  The rotation of the magnetic stirrer creates a vortex in the liquid. This causes the level on the wall to rise.



Nominal fill level of the calibration bath

Tank

The nominal filling level in the tank is marked by the upper edge of the aluminum lining. The nominal filling quantity is ~0.45 litres.

Tub insert

The nominal filling height of the tub insert is located below the holders for the exchange tool. The nominal filling quantity is ~0.32 litres.

Filling the calibration bath1

OBSERVE MAXIMUM FILL LEVEL

- When filling, leave sufficient space for expansion on heating, displacement by the sensors and the rise due to stirring.
- Unscrew the lid from the tank / tub insert.
- For tub insert only: Insert the tub insert into the tank using the exchange tool.
- Place the magnetic stirrer in the tank / tub insert.
- Insert the sensor cage.
- Insert the devices under test into the sensor cage.
  Take into account the volume of the sensors to be tested.
- Fill the calibration liquid into the tank / tub insert.
  Leave enough space for further filling.
- If necessary, remove devices under test again.
- Screw the working lid onto the tank and insert the devices under test through the working lid into the tank / tub

insert.

Switching On, Cooling Down and Switching Off

WARNING

Moisture can penetrate the heating elements (magnesium oxide) after transport, storage or long periods of non-use.

- Heat the calibrator to 120°C for at least 15 minutes to dry the heating elements
- During this process, the calibrator has not yet reached the insulation voltage required for protection class I.

ACCLIMATISE CALIBRATOR

If a cold device is brought into a much warmer environment, humidity can condense on the device.

- Do not expose the calibrator to high humidity for long periods of time.
- Acclimatize the device disconnected from the mains for approx. 2 hours at room temperature.

Switching On

WARNING

The device must be securely connected to the protective earth, otherwise there is a risk of fatal electric shock.

- The earth connection of the calibrator must be properly connected to the protective earth.
- Switch on the main switch.
- The controller is initialized.
- tESt appears in the upper display.
- The version number appears in the lower display, e.g. rL 2.2.

After approx. 5 seconds, initialisation is complete and calibration mode is automatically displayed.

- The built-in heating or cooling elements automatically temper the metal block from room temperature to the set temperature set on the controller.

Cooling Down

To avoid injury or material damage, the calibrator must be brought into a defined operating state:

- Approach a test point in the safe temperature range (≥ 10°C and ≤ 35°C).

POWER FAILURE OR DISCONNECTION FROM THE MAINS

In the event of a power failure, switching off via the main switch or after pulling out the mains plug (“EMERGENCY OFF”), the built-in fan no longer conveys cooling air. Sufficient thermal decoupling between the metal block and the casing is nevertheless guaranteed.

Switching off

IMPORTANT

Before switching off, the calibrator must have reached a safe temperature. Switching off outside the safe temperature range can damage the calibrator.

- Only switch off the calibrator when the safe temperature range has been reached.
- Switch off the main switch.
- Remove and clean the calibration inserts

Control Elements of the Controller

1. Upper display (red)
    - Display of the current reference temperature.
    - Display of the various modes, menu items and parameters.
2. Lower display (green)
    - Display of the set temperature.
    - Display of the heating / cooling power.
    - Display of the operating time.
    - Display of certain parameters in the individual modes and menu items.
3. LED SET
    - Indicates access to the individual menu items and parameters by flashing.
4. P Button
    - Switch to setpoint mode.
    - Input confirmation.
    - Access to menu items and parameters.
5. ▼Button
    - Reduction of values to be set.
    - Select individual menu items.
    - Return by one menu level.
6. ▲Button
    - Increase values to be set.
    - Display of the current heating power in %.
    - Select individual menu items.
    - Return by one menu level.
7. U Button
    - Calling up the saved setpoint temperatures (only with S version).
8. LED OUT 1

    Signals the status of the output for temperature control:

    ☼ If the LED OUT 1 lights up, the calibrator or calibration bath is heating up.
    - If the LED OUT 1 does not light up, the heating or cooling is switched off.

9. 9a – LED OUT 2
    - a) Heating instrument

      Signals the status of the fan control output:

      ☼ 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 a reduced speed.
    - 9b – LED OUT 2
    - b) Heating and cooling instrument Signals the status of the output for temperature control:

      ☼ If the LED OUT 2 lights up, the calibrator or calibration bath is cooling.
    - If the LED OUT 2 does not light up, the cooling is switched off.

Operation

All settings can be made in the menu:

- Press the P button for approx. 5 seconds: The main menu is opened.
- Use the ▼ and ▲ buttons to select the menu item.
- Press the P button to confirm the menu item.

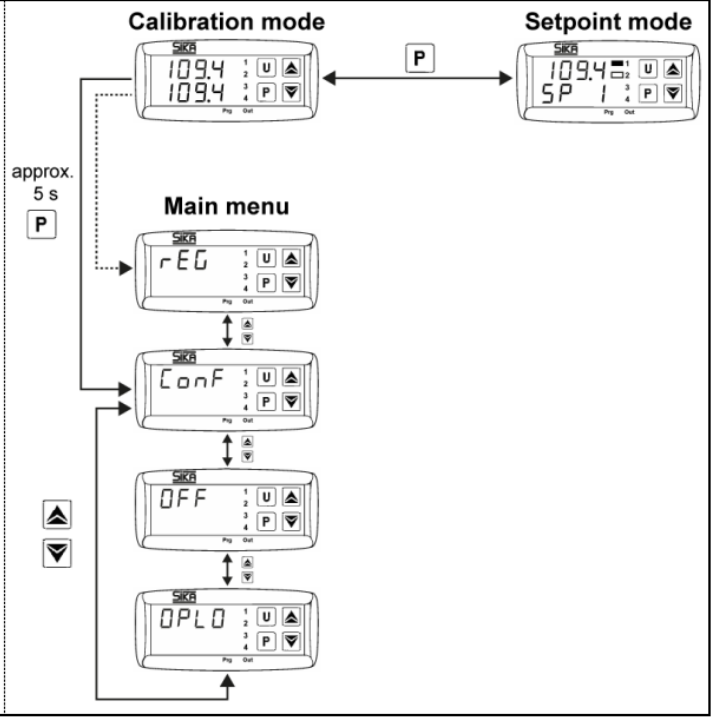
Return to another level

If no button is pressed in the main menu, group or parameter level for approx. 15 seconds, the calibrator automatically returns to calibration mode by one level. You can also return by pressing and holding the ▼ or ▲ button.

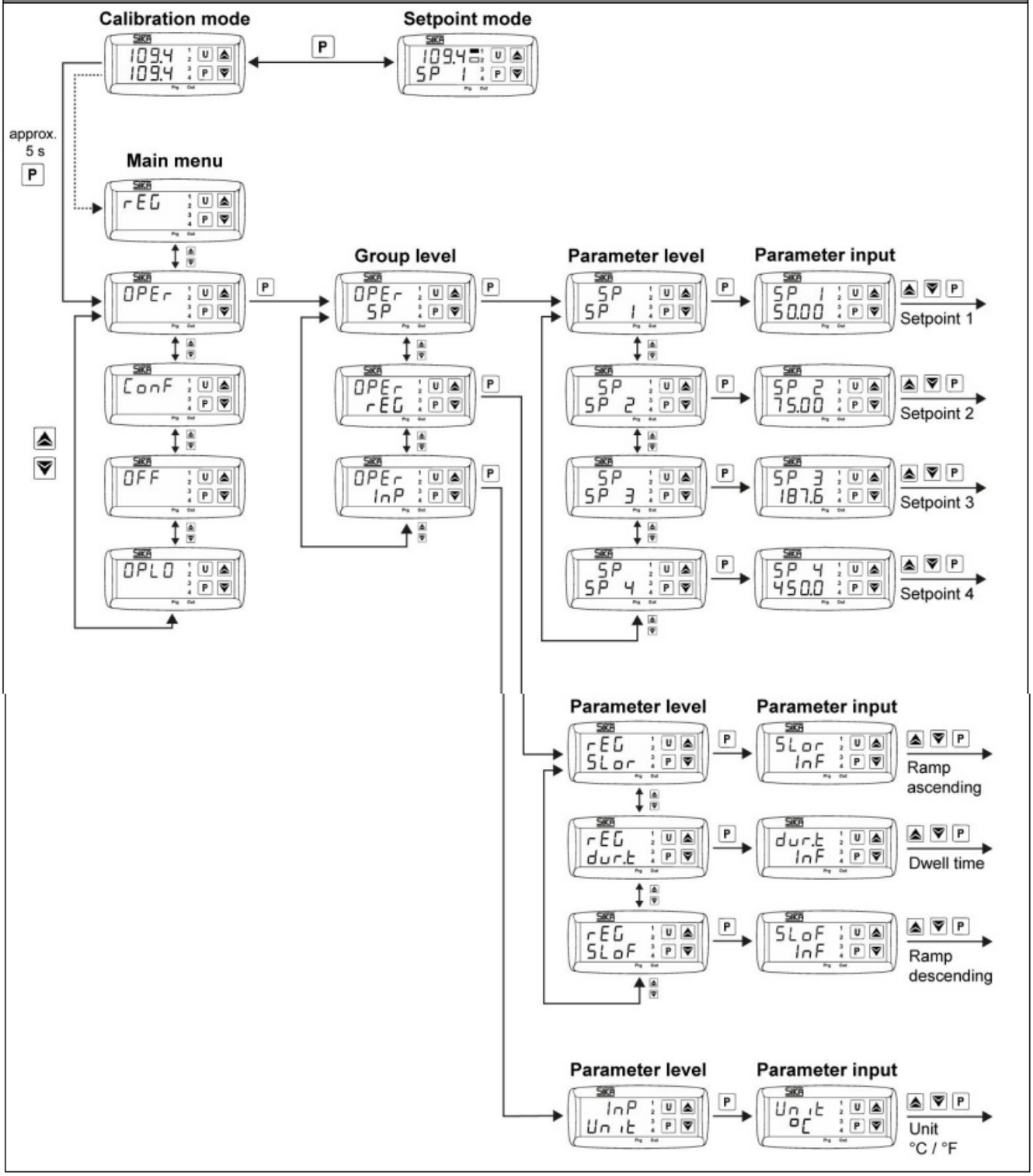
ConF menu

System parameters of the calibrator can be set in the ConF menu. These settings may only be made by authorised SIKA specialists.

This menu is password-protected

TP 17165M TP 17650M(.2)	TP 17165 TP 17166 TP 17200 TP 17450 TP 17650
	

TP 17165S
TP 17166S
TP 17200S
TP 17450S
TP 17650S
TP M165S
TP M255S



Calibration mode

In calibration mode, the heating or cooling power and the operating time of the calibrator can be displayed. The current values of the calibrator appear in the lower display (green).

Display heating or cooling power

- Press and hold the ▲ button.
- The current heating or cooling capacity is displayed as a % of the maximum capacity. “H” displays the heating output and “C” the cooling output.

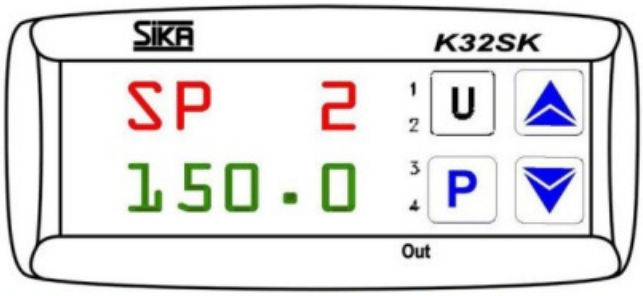
Display operating time

- Press the ▼button briefly.
- The current number of operating hours of the calibrator is displayed for approx. 5 seconds.

Setpoint mode

In this operating state, a saved setpoint temperature can be changed temporarily.

- Press the P button.
  The currently active setpoint memory appears in the upper display, e.g. SP 2 (Setpoint 2).
  The lower display shows the corresponding setpoint temperature.
- Press the ▲ button: The setpoint temperature is increased.
- Press the ▼ button: The setpoint temperature is reduced.
- Press the P button: The newly set setpoint is confirmed.



Temporary setting of the setpoint temperature

TIP

- Pressing the ▲ or ▼buttons increases or decreases the value by 0.1°C. However, if the buttons are held down for at least one second, the value increases or decreases quickly, and even more quickly after two seconds, so that the desired value is reached very quickly.
- If no button is pressed for approx. 15 seconds in setpoint mode, the device automatically returns to calibration mode

Automatic Control

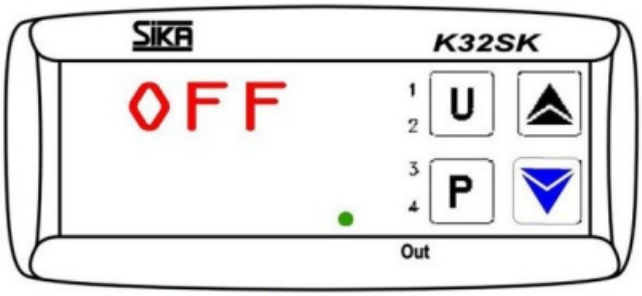
Automatic control can be switched off, e.g. to make settings on the calibrator.

Switch off automatic control

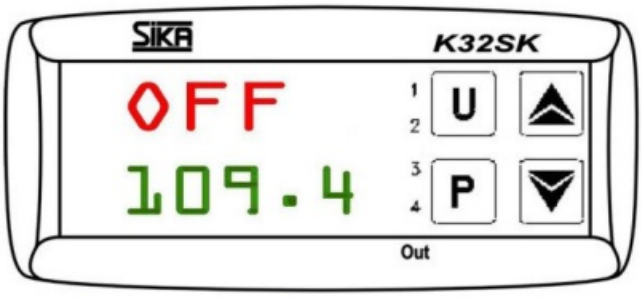
- Press the P button for approx. 5 seconds: The main menu is opened. The last selected function appears in the upper display.

The LED SET flashes in the lower display.

- Press the ▲ or ▼button until OFF appears.
- Confirm with the P button. The upper display shows the current reference temperature alternating with OFF. The currently set target temperature appears in the lower display.



Control OFF menu



Display with OFF control setting

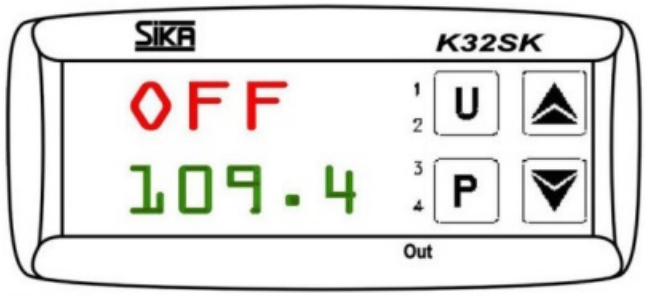
Switch on automatic control

The control is switched off when the following display appears: The upper display shows the current reference temperature alternating with OFF. The currently set target temperature appears in the lower display.

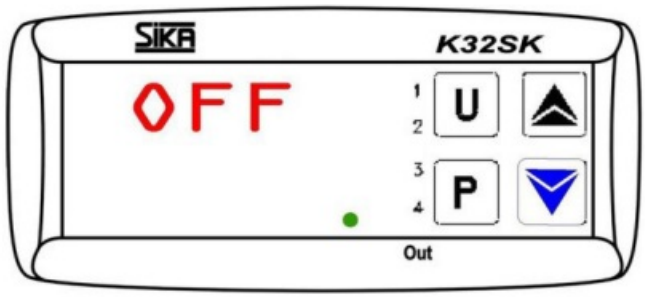
- Press the P button for approx. 5 seconds: The main menu is opened. OFF appears in the upper display.

The LED SET flashes in the lower display.

- Press the ▲ or ▼ button until rEG appears.
- Confirm with the P button.



Display with OFF control setting



Display OFF

Manual Control

Switch on manual control

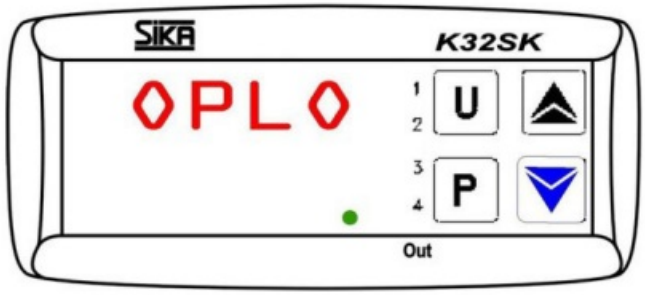
You can switch off the automatic control of the calibrator and approach the desired temperature with manual control.

- Press the P button for approx. 5 seconds: The main menu is opened.
  The last selected function appears in the upper display. The LED SET flashes in the lower display.
- Press the ▲ or ▼ button until OPLO appears.
- Confirm with button P.

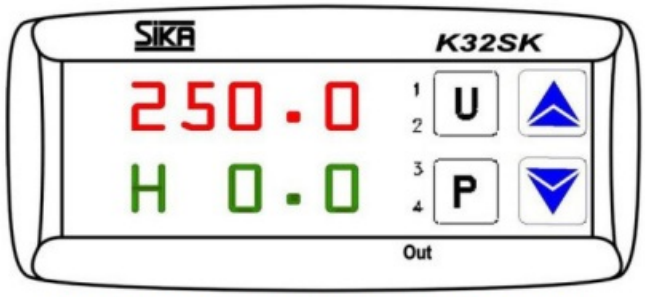
The current reference temperature appears in the upper display.
An H and the currently set output power in % appear in the lower display.

- Press the ▲ button: Output power is increased.
- Press the ▼ button: Output power is reduced.

Pressing the ▲ or ▼buttons increases or decreases the value by 0.1 %. However, if the buttons are held down for at least one second, the value increases or decreases quickly, and even more quickly after two seconds, so that the desired value is reached very quickly.



Manual control menu OPLO



Display for manual control setting OPLO

Switch off manual control

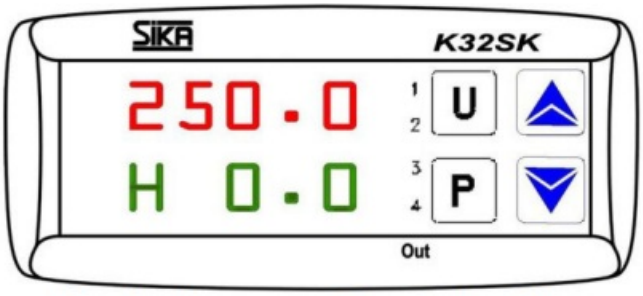
Manual control is switched on when the following display appears: The current reference temperature appears in the upper display.
The lower display shows an H and the currently set output power in %.

- Press the P button for approx. 5 seconds: The main menu is opened.

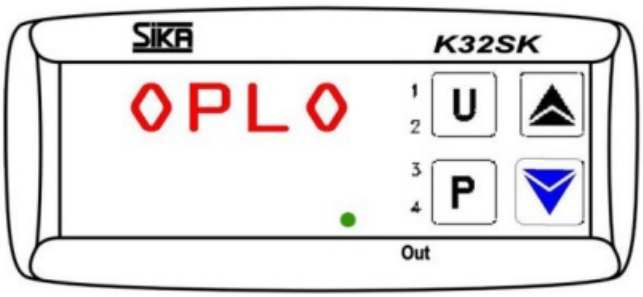
  OPLO appears in the upper display.

The LED SET flashes in the lower display.

- Press the ▲ or ▼ button until rEG appears.
- Confirm with the P button.



Display for manual control setting
OPLO

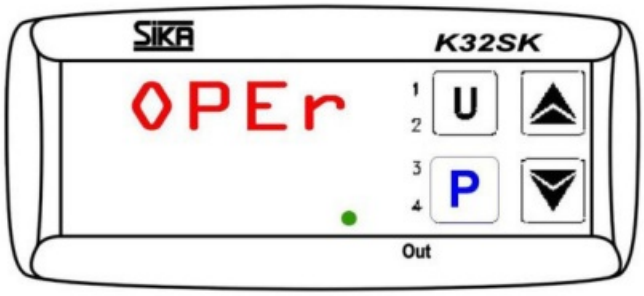


Display OPLO

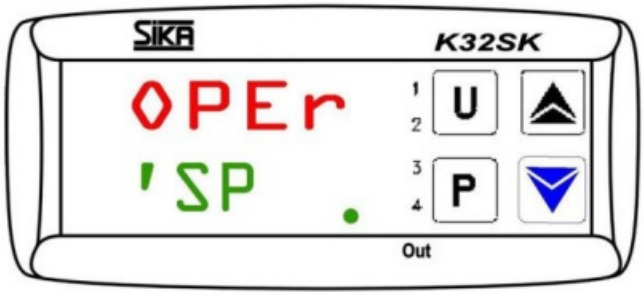
Setting Fixed Setpoint Temperatures (S Version)

To save setpoint temperatures in the calibrator, the corresponding setpoint memory must be opened.

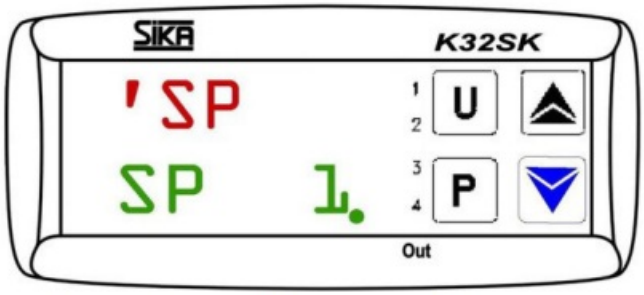
- Press the P button for approx. 5 seconds: Themain menu is opened.
- Press the ▲ or ▼ button until OPEr appears. OPEr appears in the upper display.
  The LED SET flashes in the lower display.
- Press the P button: The group level is opened. OPEr appears in the upper display.
  The lower display shows ′SP and the LED SET also flashes.
- Press the P button: The parameter level is opened.
  The upper display shows ′SP.
  The setpoint memory SP 1 and the LED SET also flash in the lower display.



OPEr menu

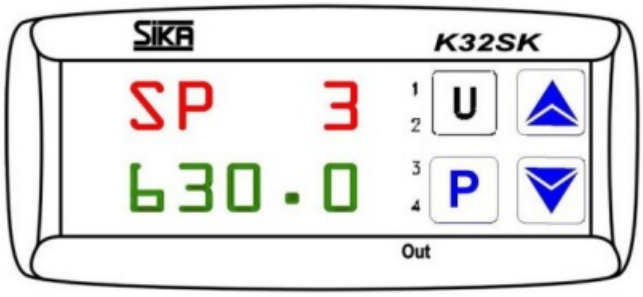


Group SP



Parameters of the setpoint memory SP1

- Select one of the four setpoint memories SP1, SP2, SP3 or SP4 using ▲ or ▼ the button.
- Press the P button: The setpoint memory is opened.
  The selected setpoint memory, e.g. SP 3, appears in the upper display.
  The currently set target temperature appears in the lower display.
- Press the ▲ button: The setpoint temperature is increased.
- Press the ▼ button: The setpoint temperature is lowered.
  Pressing the ▲ or ▼buttons increases or decreases the value by 0.1. However, if the buttons are held down for at least one second, the value increases or decreases quickly, and even more quickly after two seconds, so that the desired value is reached very quickly.
- Press the P button to confirm the newly set setpoint temperature. The setpoint memory is exited and the display returns to the parameter level.
- Press and hold the ▼ or ▲button to return to calibration mode



Input in setpoint memory SP3

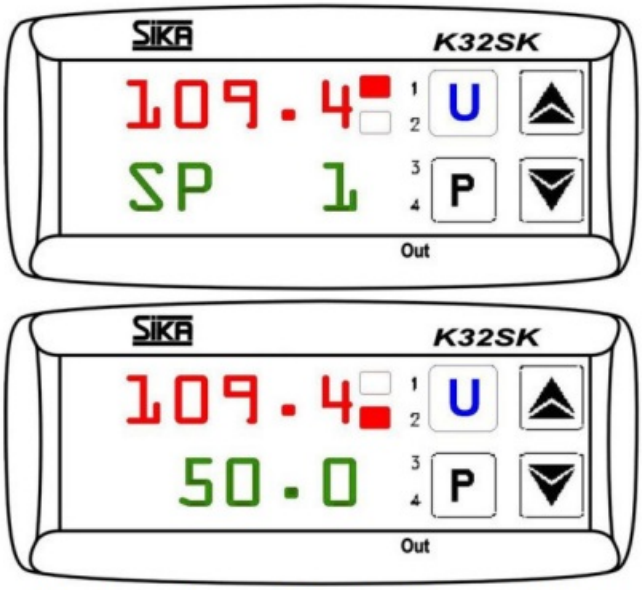
If no button is pressed for approx. 15 seconds, the calibrator automatically returns to calibration mode by one level.

Retrieve stored setpoint temperatures

The stored setpoint temperatures can be retrieved in calibration mode.

- Press the U button for approx. 2 seconds: The current setpoint memory is opened.
  The current reference temperature appears in the upper display.
  The lower display shows the current setpoint memory SP… for 2 seconds and then the currently set setpoint temperature.
- Press the U button to switch to another stored setpoint SP1, SP2, SP3 or SP4.

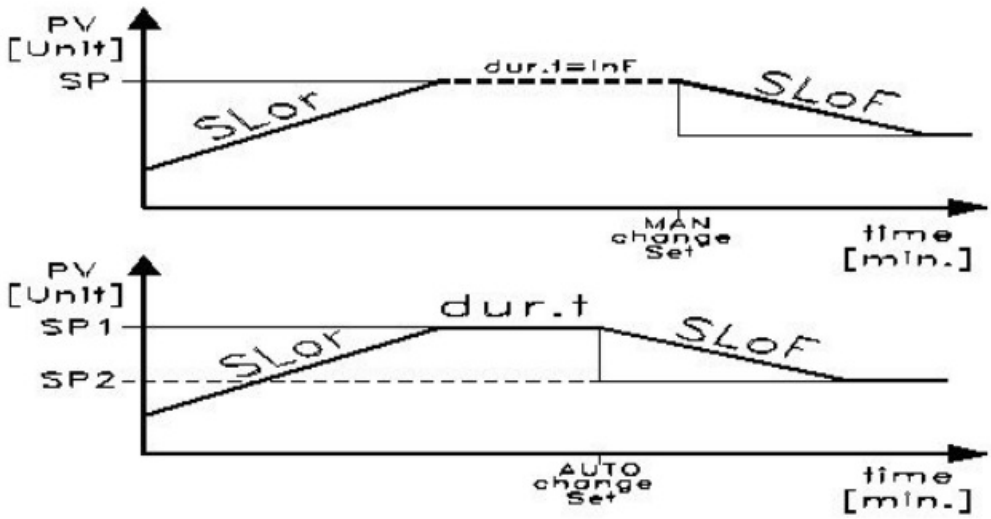
The selected temperature value is accepted and approached directly.



Display when retrieving the setpoint temperatures

Gradient Control / Temperature Profile (S version)

You can set a gradient yourself and thus determine the time in which the target temperature is reached. This time can be shorter or longer than the time normally required by the calibrator. When the set temperature is changed or the calibrator is switched on, it is automatically determined which of the gradients (heating gradient “SLor” or cooling gradient “SLoF”) is used. It is also possible to set the calibrator to automatically switch to the setpoint temperature in setpoint memory SP2 after reaching the setpoint temperature in setpoint memory SP1 after a programmed dwell time “dur.t”, thereby generating a simple temperature profile. After switching on the calibrator, the temperature profile is run through automatically.



Gradient control and temperature profile

Setting values for “SLor” and “SLoF”

Calibrator type	Heating gradient [1] “SLor”	Cooling gradient [2] “SLoF”	
Heating/cooling:			
TP 17165S	< 7°C/min	< 5°C/min	
TP 17166S, TP 17200S	< 3°C/min	< 4°C/min	
TP M165S - with silicone oil 10CS - with distilled water	< 3°C/min < 5°C/min	< 6°C/min < 4°C/min	
Heating:			
TP 17450S, TP 17650S	< 35°C/min	max. ... 300°C 300°C ... 100°C	< 10°C/min < 5°C/min
TP M255S - with silicone oil 50CS	< 22°C/min	200°C ... 50°C 50°C ... 30°C	< 4°C/min < 0.5°C/min
- with distilled water	< 12°C/min	90°C ... 50°C 50°C ... 30°C	< 2°C/min < 0.5°C/min

1. “SLor” heating gradient

   The “SLor” heating gradient is active if the reference temperature is lower than the setpoint temperature. Each calibrator type has a maximum heating power, so only settings below this heating power make sense and extend the time until the setpoint temperature is reached.
2. “SLoF” cooling gradient

   The “SLoF” cooling gradient is active if the reference temperature is higher than the setpoint temperature. Only settings below the cooling capacity of the calibrator have an effect on the cooling gradient.

Dwell time “dur.t”

The dwell time “dur.t” is active when the setpoint temperature SP1 is reached. The calibrator then automatically

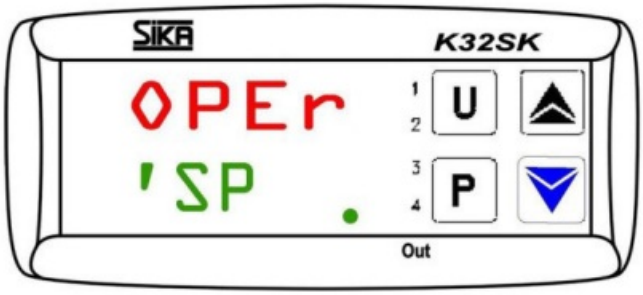
switches to the setpoint temperature SP2.

ACTIVATE TEMPERATURE PROFILE

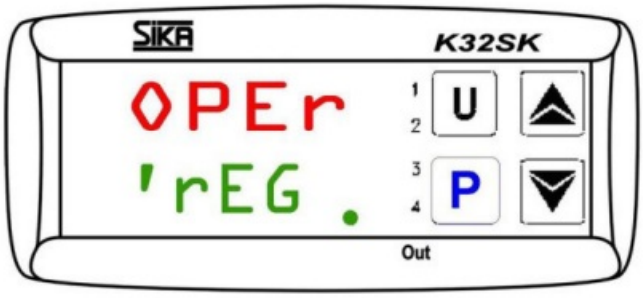
If you have made settings for these three parameters, the calibrator will not use the new values until you either change the set temperature or switch the calibrator off and on again. Another option is to switch off the automatic control before changing the parameters and switch it on again afterwards

Settings for the heating and cooling gradient and the dwell time are made in the parameter level ′rEG.

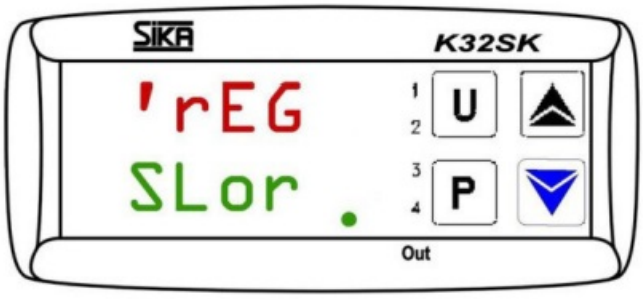
- Press the P button for approx. 5 seconds: The main menu is opened.
  The last selected function appears in the upper display.
  The LED SET flashes in the lower display.
- Press the ▲ or ▼button until OPEr appears.
- Press the P button: The group level is opened. OPEr appears in the upper display.
  The lower display shows ′SP and the LED SET also flashes.
- Use the ▼ button to select the ′rEG group. OPEr appears in the upper display.
  The lower display shows ′rEG and the LED SET also flashes.
- Press the P button: The parameter level is opened. The upper display shows ′rEG. SLor flashes in the lower display.



Group ′SP



Group ′rEG



Parameters for heating gradient SLor

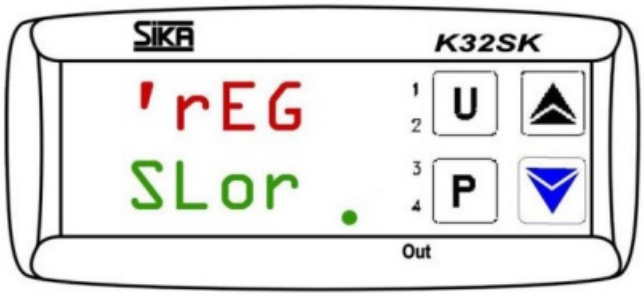
Setting the Heating Gradient (S Version)

The “SLor” heating gradient is active if the reference temperature is below the setpoint temperature. The setting range is between 99.99°C/min and 0.00°C/min. The function is deactivated if SLor = InF (In no Function) is set.

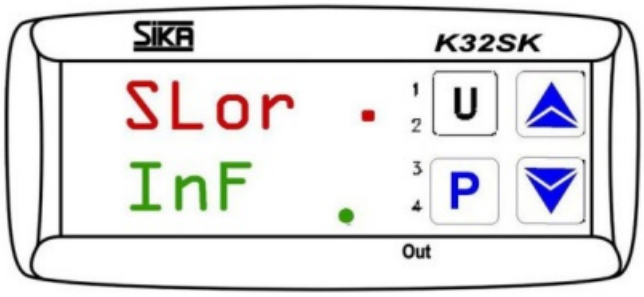
You are at the parameter level.

The upper display shows ‘rEG. SLor flashes in the lower display.

- Press the P button.
  SLor flashes in the upper display.
  The currently set heating gradient appears in the lower display.
- Press the ▲ button : The heating gradient SLor is increased.
  Press the ▲ button: The heating gradient SLor is reduced.



Parameters for heating gradient Slor



Input of the heating gradient

Pressing the ▲ or ▲buttons increases or decreases the value by 0.1. However, if the buttons are held down for at least one second, the value increases or decreases quickly, and even more quickly after two seconds, so that the desired value is reached very quickly.

- Press the P button to confirm the newly set heating gradient SLor. The display returns to the parameter level and you can set the other parameters. If no button is pressed for approx. 15 seconds, the calibrator automatically returns to calibration mode by one level.

ACTIVATE TEMPERATURE PROFILE

After the settings have been made, the calibrator will not use the new value until you either change the set temperature or switch the calibrator off and on again

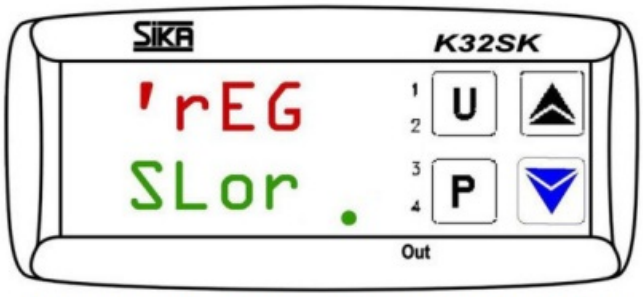
Setting the Cooling Gradient (S Version)

The “SLoF” cooling gradient is active if the reference temperature is higher than the setpoint temperature. The setting range is between 99.99°C/min and 0.00°C/min. The function is deactivated if SLoF = InF (In no Function) is set.

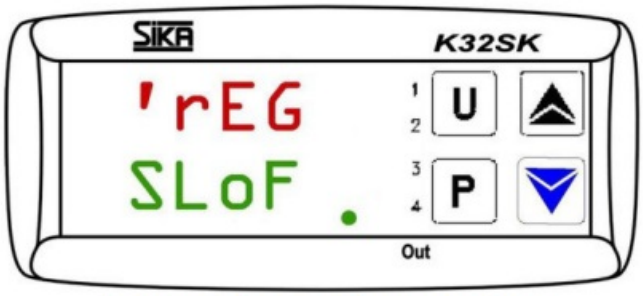
You are at the parameter level.

The upper display shows ‘rEG. SLor flashes in the lower display.

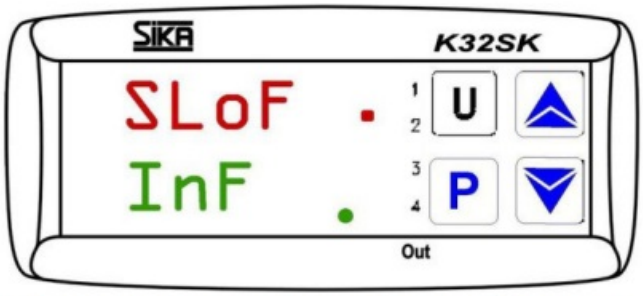
- Use the ▼ or ▲ button to select the SLoF parameter.
  The upper display shows ‘rEG.
  SLoF flashes in the lower display.
- Press the P button.
  SLoF flashes in the upper display.
  The currently set cooling gradient appears in the lower display.
- Press the ▲ button: The SLoF cooling gradient is increased.
- Press the ▼ button: The SLoF cooling gradient is reduced.



Parameters for heating gradient Slor



Input of the cooling gradient



Display when entering the cooling gradient

Pressing the ▲ or ▼ buttons increases or decreases the value by 0.1. However, if the buttons are held down for at least one second, the value increases or decreases quickly, and even more quickly after two seconds, so that the desired value is reached very quickly.

- Press the P button to confirm the newly set SLoF heating gradient.

The display returns to the parameter level and you can set the other parameters. If no button is pressed for approx. 15 seconds, the calibrator automatically returns to calibration mode by one level.

ACTIVATE TEMPERATURE PROFILE

After the settings have been made, the calibrator will not use the new value until you either change the set temperature or switch the calibrator off and on again.

Setting the Dwell Time (S Version)

The dwell time “dur.t” is active when the setpoint temperature SP1 has been reached. The calibrator then automatically switches to the setpoint temperature SP2. The setting range extends from 99:59 [hh:min] to 00:00 [hh:min]. The function is deactivated if dur.t = InF (In no Function) is set.

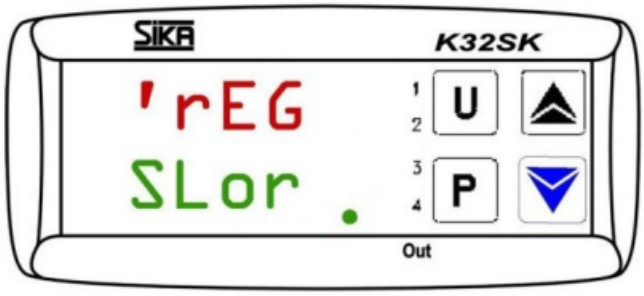
You are at parameter level.

The upper display shows ′rEG. SLor flashes in the lower display.

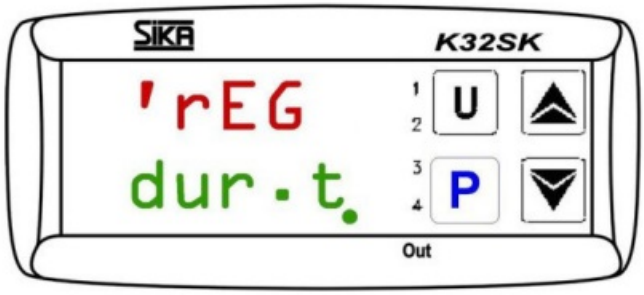
- Use the ▲ or ▼ button to select the dur.t parameter.

The upper display shows ′rEG. dur.t. flashes in the lower display.

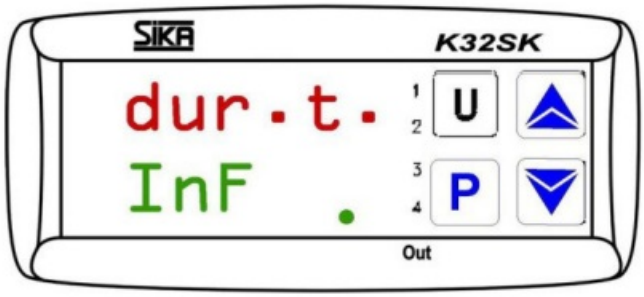
- Press the P button. dur.t appears flashing in the upper display. The currently set dwell time appears in the lower display.
- Press the ▲ button: The dwell time dur.t is increased.
- Press the ▼ button: The dwell time dur.t is reduced.



Parameters for heating gradient Slor



Parameter for dwell time dur.t



Input of the dwell time

Pressing the ▲ or ▼ buttons increases or decreases the value by 0.1. However, if the buttons are held down for at least one second, the value increases or decreases quickly, and even more quickly after two seconds, so that the desired value is reached very quickly.

- Press the P button to confirm the newly set dwell time dur.t. The display returns to the parameter level. If no button is pressed for approx. 15 seconds, the calibrator automatically returns to calibration mode by one level.

ACTIVATE TEMPERATURE PROFILE

After the settings have been made, the calibrator will not use the new value until you either change the set temperature or switch the calibrator off and on again

Setting the Temperature Unit (S Version)

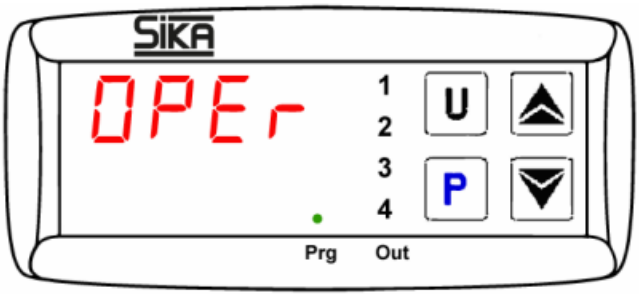
- Press the P button for approx. 5 seconds: The main menu is opened.
- Press the ▲ or ▼button until OPEr appears.
  OPEr appears in the upper display.
  The LED SET flashes in the lower display.
- Press the P button: The group level is opened.
- Use the ▼ button to select the 'InP group.

OPEr appears in the upper display.

The lower display shows ‘InP and the LED SET also flashes.

- Press the P button: The parameter level is opened.

  The upper display shows ‘InP.



OPEr menu

Group InP

Unit menu parameters

Unit flashes in the lower display and the LED SET also appears.

- Press the P button.

  Unit flashes in the upper display.

  The currently set temperature unit appears in the lower display.

Setting the temperature unit

- Press the ▼ button: The temperature unit is changed (°C / °F).
- Press the P button to confirm the newly set temperature unit. The display returns to the parameter level.
- Press and hold the ▼ or ▲button to return to calibration mode. If no button is pressed for approx. 15 seconds,

the calibrator automatically returns to calibration mode by one level.

Troubleshooting and Return Shipment

IMPORTANT

The device cannot be repaired by the user.

- Never open the device and repair it yourself.
- In the event of a defect, send the device to the manufacturer for repair.

Malfunction	Possible cause	Remedy
- - - -	Interruption of the internal reference sensor or the internal reference sensor is defective.	Service case.
uuuu	Measured temperature below the limit value of the internal reference sensor (Underrange -200°C)	
oooo	Measured temperature above the limit value of the internal reference sensor (Overrange +850°C)	
ErEP	Possible fault in the EEPROM memory of the controller	Press the P button.
Fan is not running.	The fan is defective or blocked and the temperature switch has tripped.	Service case.
Final temperature is not reached.	Solid-state relay defective or heating/cooling element has a short circuit or is aged.	Service case.
Sensor breakage.	External reference sensor not connected correctly.	Check connection and plug in correctly.
	Cable break or short circuit.	Service case.
No display.	Controller defective.	Service case.
Calibrator cannot be switched on.	Power supply not available or fuses defective.	Check power supply and fuses.
	RCD has tripped due to moisture in the heating cartridges.	Service case.

If you are unable to rectify an error, please contact SIKA.

Return shipment

Please note the notices on the return procedure on our website (**www.sika.net**).

Maintenance and Cleaning

- The calibrator has cooled down sufficiently.
- The calibrator is switched off and disconnected from the mains.

Maintenance

To ensure safe operation of the calibrator, carry out the following checks at regular intervals:

Before use

- Check the calibrator for damage.
- Check the level of the calibration liquid in the calibration bath. Observe the notices on the filling quantity.

Annually

- Carry out a visual inspection of all parts of the calibrator for corrosion, wear and damage.
- Have a safety check of all electrical parts carried out by a specialist.

Recalibration

- Replace the calibrator after 36 months or after a maximum of 500 operating hours send the calibrator to SIKA for recalibration.

Calibration liquid

Calibration liquids become contaminated or age over time. This depends very much on the type of fluid and the usage behavior.

- Replace contaminated or aged calibration liquid.

Magnetic stirrer

The magnetic stirrer is a wearing part. The bar in the centre reduces friction during rotation.

As soon as the centre bar is worn, the stirring function is no longer guaranteed due to the increased friction.

- Check the bar of the magnetic stirrer for wear and replace it in good time.

Fuse

The fuses of the calibrator are located on the front and are integrated into the mains connection.

If the display remains dark when mains voltage is applied and the fan does not run, check the fuses and replace them if necessary.

- Disconnect the power cable from the calibrator.
- Pry open the fuse compartment from below with your fingernail or a flat screwdriver.
- Remove the fuse compartment.
- Check the fuses and replace both fuses.

Only use fuses of the same type:

Type	TP 17165	TP 17166	TP 17200	TP 17450	TP 17650	TP M165S	TP M255S
Fuse	T6.3AH 250V	T6.3AH 250V	T6.3AH 250V	T10AH 250V	T10AH 250V	T6.3AH 250V	T10AH 250V

Re-insert the fuse compartment and connect the mains cable. If the fuses blow repeatedly, the calibrator is probably defective. In this case, send the calibrator to SIKA for repair

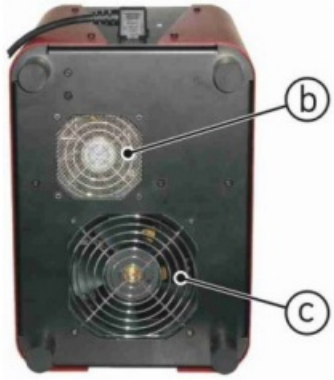
Cleaning

Cleaning the ventilation grille for supply air

If the airflow is too low, the temperature fuse may be triggered. The calibrator is then no longer operational and must be returned to SIKA. The ventilation grilles b + c in the base of the calibrator must therefore be cleaned at regular intervals.

The cleaning intervals depend heavily on the air pollution at the installation site and the daily operating time.

- The ventilation grilles must always be unobstructed.
- Clean the ventilation grilles by vacuuming or brushing.



Cleaning the calibration inserts

- Allow the calibrator to cool down before removing the calibration insert.
- Pull the calibration insert out of the metal block using the exchange tool.
- Clean the calibration insert and metal block.

This prevents the calibration insert from getting stuck in the metal block.

IMPORTANT

Remove the calibration insert from the calibration block before taking the calibrator out of operation for an extended period of time.

Cleaning the tank (calibration bath)

- Empty the tank as completely as possible using the drain syringe.

- Observe the notices in the safety data sheet for the calibration liquid.

Distilled water:

- Remove the sensor cage from the tank.
- Remove the magnetic stirrer with the magnet lifter.
- Dry the tank, sensor cage, magnetic stirrer and drain syringe well.

Silicone oil:

- Remove the sensor cage from the tank.
- Remove the magnetic stirrer with the magnet lifter.
- Clean the basket, magnetic stirrer, and tank with water and plenty of washing-up liquid.
- Remove as much cleaning water as possible from the tank using the drain syringe.
- Dry the tank, sensor cage, magnetic stirrer, and drain syringe well.

Decommissioning and Disposal

Before decommissioning

- The calibrator and the accessories have cooled down completely.

Decommissioning

- Remove all connected sensors and devices.
- Switch off the calibrator and pull out the mains plug.
- Empty the calibrator tank if the calibration liquid is still present.

Disposal of calibration liquid

- Dispose of the calibration liquid in accordance with the Notices in the safety data sheet.

Calibrator disposal

In accordance with 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 device consists of various materials. It must not be disposed of together with household waste.

- Send the device for local recycling or
- Return the device to your supplier or to SIKA.

WEEE reg. no.: DE 25976360

Contact

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- Struthweg 7–9
- 34260 Kaufungen / Germany
- +49 5605 803-0
- +49 5605 803-555
- info@sika.net
- www.sika.net

Documents / Resources

	Sika TP 17165 Temperature Calibrators [pdf] Instruction Manual TP 17165, TP 17165M, TP 17165S, TP 17166, TP 17166S, TP 17200, TP 17200S, TP 17450, TP 17450S, TP 17650, TP 17650M .2, TP 17650S, TP 17165 Temperature Calibrators, TP 17165 , Temperature Calibrators, Calibrators

References

- SIKA » Clevere Mess- & Kalibriertechnik seit 1901
- User Manual