testo 104-IR BT
Combined infrared and penetration thermometer
0560 1045

Instruction manual

Contents

1 About this document

- The instruction manual is an integral part of the instrument.
- Keep this documentation to hand so that you can refer to it when necessary.
- Always use the complete original instruction manual.
- Please read this instruction manual through carefully and familiarize yourself with the product before putting it to use.
- Hand this instruction manual on to any subsequent users of the product.
- Pay particular attention to the safety instructions and warning advice in order to prevent injury and damage to the product.

2 Safety and disposal

2.1 Security

General safety instructions

- Only operate the product properly, for its intended purpose, and within the parameters specified in the technical data.
- Do not apply any force.
- Do not operate the instrument if there are signs of damage to the housing or connected cables.
- Dangers may also arise from objects to be measured or the measuring environment. Always comply with the locally valid safety regulations when carrying out measurements.
- Do not store the product together with solvents.
- Do not use any desiccants.
- Only perform maintenance and repair work on this instrument that is described in this documentation. Follow the prescribed steps exactly when doing the work.
- Use only original spare parts from Testo.

Batteries

- Improper use of batteries may cause the batteries to be destroyed, or lead to injury due to current surges, fire or escaping chemicals.
- Only use the batteries supplied in accordance with the instructions in the instruction manual.
- Do not short-circuit the batteries.
- Do not take the batteries apart and do not modify them.

- Do not expose the batteries to heavy impacts, water, fire or temperatures in excess of 60 °C.
- Do not store the batteries in the proximity of metal objects.
- In the event of contact with battery acid: rinse affected areas thoroughly with water, and if necessary consult a doctor.
- Do not use any leaky or damaged batteries.

Warnings

Always pay attention to any information denoted by the following warnings. Implement the precautionary measures specified!

⚠ DANGER

Risk of death!

⚠ WARNING

Indicates possible serious injury.

⚠ CAUTION

Indicates possible minor injury.

ATTENTION

Indicates possible damage to equipment.

2.2 Disposal

- Dispose of faulty rechargeable batteries and spent batteries in accordance with the valid legal specifications.
- At the end of its useful life, deliver the product to the separate collection point for electric and electronic devices (observe local regulations) or return the product to Testo for disposal.
-  WEEE Reg. No. DE 75334352

3 Product-specific information

- Do not carry out measurements on live components.
- Do not expose handles and feed lines to temperatures in excess of 70°C unless they are expressly approved for higher temperatures. Temperature specifications on probes/sensors refer only to the measuring range of the sensor system.
- Only open the measuring instrument if this is expressly described in the documentation for the purposes of maintenance or servicing.

4 Intended use

The testo 104-IR BT is a robust food thermometer.

The product is designed for the following tasks/areas:

- Food sector: production, food service, spot check measurements, Incoming Goods.
- Measuring liquids, pastes and semi-solid media.

The following product components are designed for continuous contact with foodstuffs in accordance with Regulation (EC) 1935/2004:

The immersion/penetration probe from the measuring tip up to 2 cm in front of the probe's handgrip or the plastic housing. If provided, the information about penetration depths in the instruction manual or the mark(s) on the immersion/penetration probe should be noted.

The product should not be used in the following areas:

- In potentially explosive atmospheres
- For diagnostic measurements in the medical field

During IR measurements, the area of the (retracted) penetration probe tip should not be exposed to heat sources such as hand/fingers. Otherwise, this can lead to measurement errors when several IR measurements are taken in succession, as the temperature sensor in the penetration probe tip is used to compensate for the ambient temperature.

5 Product description

5.1 Instrument overview

1	Infrared sensor	**2**	2-point laser
3	Display	**4**	Control keys: • [ON]: switches the instrument on (folding out the penetration probe also switches the instrument on) • [OFF]: switches the instrument off (press and hold key) • [▲]: switch to IR measurement, carry out IR measurement (press and hold key) • [▼]: switch to contact measurement • [HOLD/ MIN/ MAX/ ⬆]: holds reading, shows minimum / maximum value, sends readings to the testo Smart App (Bluetooth®)
5	Battery compartment (on rear)	**6**	Fold-out/fold-away immersion/penetration probe, folding out the probe switches the instrument on.

⚠ CAUTION	
	**Laser radiation! Class 2 laser** **- Do not look into the laser beam**

Explanation of icons

	Refer to instruction manual
	Do not dispose of old instruments with household waste
	Symbol of the Bluetooth® Special Interest Group (SIG)
	Declaration of conformity: products marked with this symbol comply with all applicable Community regulations of the European Economic Area.
	Certification symbol of the FCC in the USA
	Certification symbol of the National Science Foundation (NSF)
	Australian certification symbol
	Declaration of conformity: products marked with this symbol comply with all applicable regulations of the United Kingdom.
	Russian certification symbol

First steps

6.1 Inserting / changing batteries

⚠ WARNING

Serious risk of injury to the user and/or destruction of the instrument. There is a risk of explosion if the batteries are replaced with the wrong type.

- Only use non-rechargeable alkaline batteries.

✓ The instrument is switched off.

1 Use a slotted screwdriver to undo the screw on the battery compartment.

2 Open battery compartment.

3 Insert or replace batteries (2 x 1.5 V AAA alkaline batteries). Observe the polarity!

4 Close the battery compartment.

5 Tighten the screw.

When not in use for a long period: Remove batteries.

Symbol explanation

	Do not allow children under 6 years of age to play with batteries.
	Do not throw batteries in the trash.
	Do not charge batteries.
	Do not place batteries near fire.
	Batteries are recyclable.

6.2 Getting to know the product

6.2.1 Switching the instrument on and off

Switching on via fold-out probe

1. Fold out the probe.

▸ All display segments light up briefly.
Contact measurement is enabled ( lights up).

Switching on/off via control keys

1. Switch instrument on: press the **[ON]** key.

▸ All display segments light up briefly.
IR measurement is enabled ( lights up).

2. Switch off the instrument: press and hold down the **[OFF]** key until the display goes off.

The instrument switches off automatically if no key is pressed: after 10 minutes when the probe is folded out, or after 1 minute when the probe is folded up.

6.2.2 Implementing settings

If no key is pressed for 3 seconds in setting mode, the instrument switches to the next view.

✓ The instrument is switched off.

1 Press and hold **[▲]** or **[▼]** until **AutoHold** or **Hold** flashes.

2 Switch the AutoHold function on (**AutoHold**) or off (**Hold**): press **[▲]** or **[▼]**.

▸ **°C**, **°F** or **°R** flashes.

3 Set measurement unit to degrees Celsius (**°C**), degrees Fahrenheit (**°F**) or degrees Réaumur (**°R**):

press **[▲]** or **[▼]**.

▸  flashes.

4 Switch measurement spot marking (IR measurement) on (**on**) or off (**oFF**):
press **[▲]** or **[▼]**.

5 Switch Bluetooth® on (**on**) or off (**oFF**):
press **[▲]** or **[▼]**.

▸ The instrument switches to IR measurement.
Bluetooth® is enabled and the instrument is visible to the testo Smart App. When the connection is established, a beep sounds and the Bluetooth® symbol is shown on the display.

Establishing a Bluetooth® connection

The instrument can be connected to the **testo Smart App** via Bluetooth® connection

✓ The measuring instrument is switched on.

6.3.1 Establishing a Bluetooth® connection to the testo Smart App

To establish a connection via Bluetooth®, you need a tablet or smartphone with the Testo Smart App already installed on it.

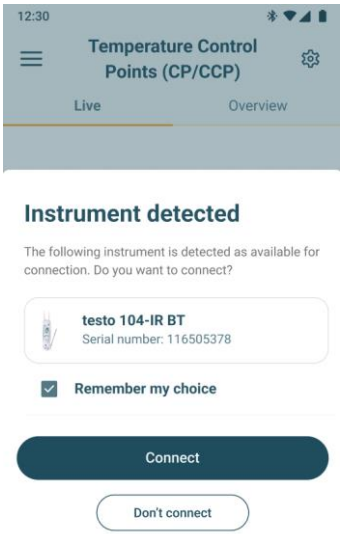
You can get the App for iOS instruments in the App Store or for Android instruments in the Play Store.

Compatibility:

Requires iOS 13.0 or later/Android 8.0 or later, requires Bluetooth® 4.2.

✓ Bluetooth® is enabled in the measuring instrument.

1. Open the testo Smart App.
   - The app automatically searches for Bluetooth® devices in the vicinity and lists them.
2. If multiple devices are found, select the instrument that you need and select **Connect**.
   - If necessary, switch the instrument to be connected off and on again to restart the connection module.
   - If the connection is successful, the Bluetooth® icon stops flashing and the instrument is visible on the app in the **Device list** menu item.



7 Using the product

7.1 Changing the measuring mode

✓ The measuring instrument is switched on.

1 Contact measurement → IR measurement: press [▲].

2 IR measurement → contact measurement: press [▼].

7.2 Measuring

7.2.1 Information on infrared (IR) measurement

Measuring method

IR measurement is a visual measurement:

- Keep the lens clean.
- Do not take measurements with a foggy lens.
- Keep the measuring range (the area between the instrument and the object to be measured) free of interference: no dust or dirt particles, no moisture (rain, vapour) or gases.

IR measurement is a surface measurement:

If there is dirt, dust, hoarfrost, etc. on the surface, only the top layer will be measured, i.e. the dirt.

- Do not measure air pockets in shrink-wrapped food.
- Where the values are critical, always measure separately with a contact thermometer. Particularly in the food sector: measure core temperature with a penetration/immersion thermometer.

Response time:

- If the ambient temperature changes (change of measuring location, e.g. measurement indoors/outdoors), the instrument requires a response time of 15 minutes for infrared measurement.

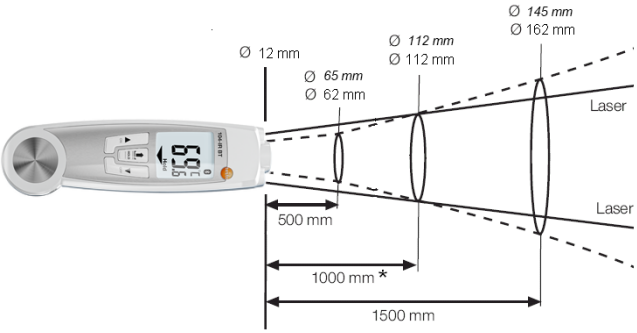
Emissivity

Materials have different emissivity levels. This means that they emit different amounts of electromagnetic radiation. The emissivity of the instrument is factory set to 0.95. This is optimal for the measurement of food, non-metals (paper, ceramic, gypsum, wood, paints and varnishes) and plastics.

Measuring range, distance

Depending on the distance of the measuring instrument from the measurement object, a specific measuring range is recorded.

Measurement optics (ratio of distance: measuring range)



* optimized measuring distance; *in italics* = *laser*; not in italics = measuring range

7.2.2 Carrying out an IR measurement

To transfer the displayed reading to the testo Smart App in Bluetooth® mode, press [⬆].

✓ Instrument is switched on, IR measurement is enabled (▁▂▃ lights up), Bluetooth® mode is enabled.

1 Start measurement: press and hold [▲].

2 Aim at the measurement object using the laser points:
laser points mark the edges of the measuring range.

▸ The current reading is shown.

3 End measurement: release the key.

▸ **Hold** lights up. The last measured value and min./max. value are saved until the next measurement, or until the instrument is switched off.
Switch between min., max. and recorded value:
press [⬆].

The min./max. values can be reset:
press [▲] or switch the instrument off.

4 Restart measurement: press and hold [▲].

5 Set the emissivity level:
- while the IR measurement is active, press and hold [▲] and [▼] simultaneously (lights up).
- The emissivity is displayed.
- Use [▲] or [▼] to change the value and wait for 3 seconds.

7.2.3 Information on contact measurement

- Observe the minimum penetration depth for immersion/penetration probes: 10x probe diameter
- Avoid using in aggressive acids or alkalis.

7.2.4 Carrying out a contact measurement

To transfer the displayed reading to the testo Smart App in Bluetooth® mode, press [ ].

✓ Instrument is switched on, contact measurement is enabled (lights up), Bluetooth® mode is enabled.

1 Position the contact thermometer in the measurement object and initiate the measurement: press [▼].

2 End measurement: press [ ].

▸ **Hold** lights up. The last measured value and min./max. value are saved until the next measurement, or until the instrument is switched off.

AutoHold function: if this function is enabled, the measurement is automatically stopped as soon as the reading has stabilized, **AutoHold** lights up.

▸ Switch between min., max. and recorded value:
press [ ].

The min./max. values can be reset:
switch the instrument off, switch to IR measurement or, while the held reading is displayed (Hold is lit up), press and hold [/ HOLD/ MIN/ MAX] until **Clr** lights up.

3 Restart measurement: press [▼].

8 Controls via testo Smart App

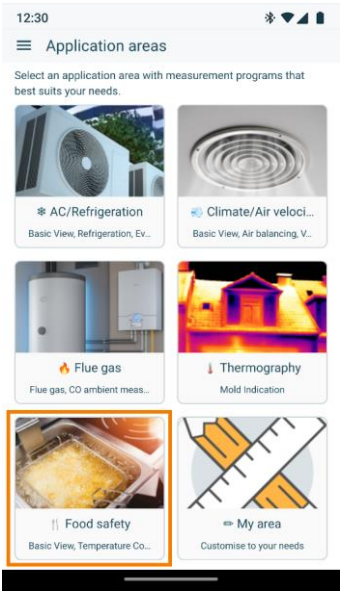
With the testo Smart App, you can extend the range of functions of your testo 104-IR BT and save readings digitally, create reports and make settings. There is a separate measurement program in the testo Smart App for digital CP/CCP control point measurements and documentation.

8.1 Overview of Food Safety

The **Food safety** application area combines all the functions required for monitoring the temperature control points.

1. Click on ☰ in the testo Smart App.
2. Select **Application areas**.
3. Select **Food safety**.

   The menu **Food safety** can be selected as default page of the app by clicking on ⌂.

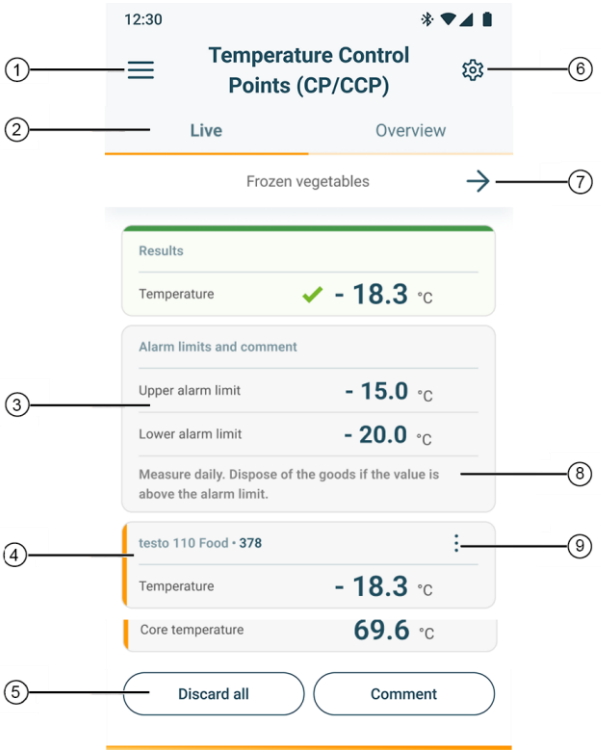


▸ When the **Food safety** menu is called up for the first time, a tutorial with an introduction to the functions starts automatically.

8.2 Overview of temperature control points (CP/CCP) configuration page

1	Choice of applications	**2**	Possibility to define certain measurement programs as favourites
3	Program for temperature control points	**4**	Possibility to define the actual view as default site
5	Tutorials with additional information	**6**	Menu for report generation

8.3 Overview of operating controls

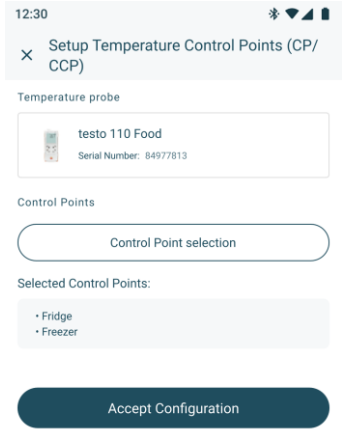


1	Choice of applications	**2**	Switch between the views: - Live = actual contol point - Overview = Overview of selected control points
3	Measurement results (Measured value and alarm interpretation are displayed here after pressing the ENTER button on the device)	**4**	Display of connected measuring instruments
5	Buttons (A comment on the measurement can be stored via Comment)	**6**	Measurement configuration (Selection and configuration of control points)
7	The arrow allows to change to the next control point	**8**	Display of entered comment for the actually selected control point
9	Configuration of the measuring unit		

8.4 Configuring control points

The **Temperature Control Points (CP/CCP)** measurement program makes it possible to create multiple measuring points and then measure them one after the other in a measurement round.

1. Click ☰ in the testo Smart App.
2. Select **Application areas**.
3. Select **Food safety**.
4. Select **Temperature control points (CP/CCP)**.



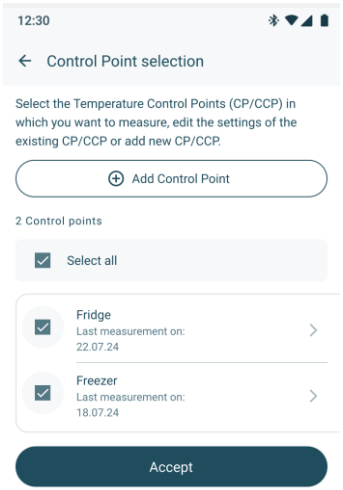
5. Select **[Control Points Selection]**.

▸ The **Control Points Selection** menu is displayed.

6. Select **[Add control point]** if new control points are to be created.

   To do this, enter the **Name** of the control point as well as the **Upper alarm limit** and **Lower alarm limit** and click on **[Apply]** to save.

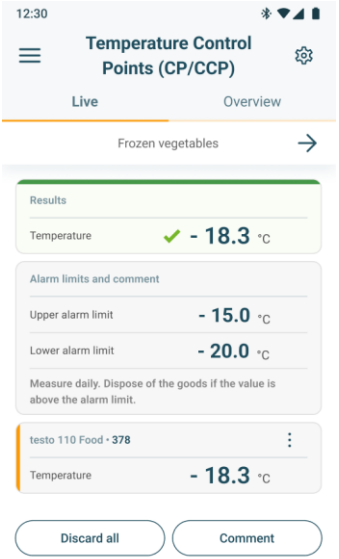
7. Select control points already created for the measurement round and click **[Accept]** to accept the selection.

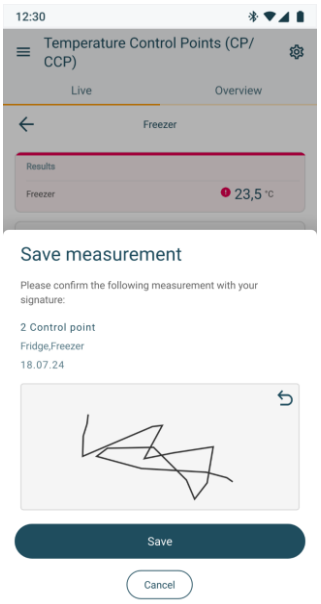


8.5 Measuring control points

The **Temperature Control Points (CP/CCP)** measurement program allows you to measure multiple selected measuring points one after the other in one session and to add a comment and/or a signature to the measurement results.

1. Click ☰ in the testo Smart App.
2. Select **Application areas**.
3. Select **Food safety**.
4. If necessary, use **Control Point Selection** to change the control points selected for the measurement round.
5. Start the measurement round with **Accept Configuration**
6. Measure the first control point and save the reading by pressing the ⬆ **/ HOLD/ MIN/ MAX** key on the measuring instrument.
   - Use **[Comment]** to enter a comment on the measurement.
7. Use the arrow to switch to the next control point, measure this one as well and save the reading by pressing the ⬆ **/ HOLD/ MIN/ MAX** key on the measuring instrument.
8. Measure the control points one after the other.
9. When no more control points are to be measured, select **[Finalize]**.
   - The **Save measurement** menu is displayed with the option of entering a signature.
10. Press **[Save]** to store the readings.





If necessary, enter a signature beforehand.

▶ The **Measurement finalized** menu is displayed.

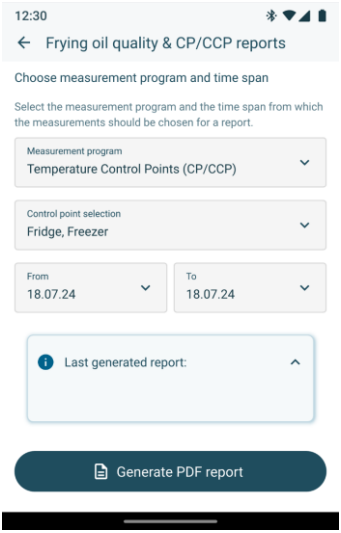
The readings are now available for reporting.

8.6 Exporting readings

Determined measurement results can be displayed and exported as reports in PDF format for one or more control points and freely definable time periods.

1. Click ☰ in the testo Smart App.
2. Select **Application areas**.
3. Select **Food safety**.
4. Select **Report generation**.
5. Specify report details and click **[Generate PDF report]**.

▶ The desired report is generated and can be shared with other apps.



9 Maintaining the product

9.1 Inserting / changing batteries

⚠ WARNING

Serious risk of injury to the user and/or destruction of the instrument. There is a risk of explosion if the batteries are replaced with the wrong type.

- Only use non-rechargeable alkaline batteries.

✓ The instrument is switched off.

1 Use a slotted screwdriver to undo the screw on the battery compartment.

2 Open battery compartment.

3 Insert or replace batteries (2 x 1.5 V AAA alkaline batteries).
Observe the polarity!

4 Close the battery compartment.

5 Tighten the screw.

When not in use for a long period: Remove batteries.

9.2 Cleaning the instrument

1 If the housing of the instrument is dirty, clean it with a damp cloth.

Do not use any aggressive cleaning agents or solvents! Mild household cleaning agents and soap suds may be used.

Technical data for testo 104-IR BT

10.1 Bluetooth® module

The use of a wireless module is subject to the regulations and stipulations of the relevant country of use and the module may only be used in countries for which a national certification has been granted. Users and owners undertake to adhere to these regulations and prerequisites for use and acknowledge that the re-sale, export, import, etc., in particular in, to or from countries without wireless authorisation, is their responsibility.

10.2 General technical data

Feature	Value
Operating temperature	-20 to +50 °C
Storage temperature	-30 to +50 °C (without batteries up to +70 °C)
Voltage supply	2 x 1.5 V AAA alkaline battery
Housing	ABS/TPE/PC and die-cast zinc/stainless steel
IP class	IP65
Dimensions	Immersion/penetration probe folded out: 281 x 48 x 21 mm Immersion/penetration probe folded away: 178 x 48 x 21 mm
Max. operating altitude	≤ 2000 m / 6561 ft
Weight	207 g (incl. batteries)
Standards	EN 13485
EU Directive	2014/53/EU
EU conformity	www.testo.com/eu-conformity

Information on standards

This product complies with the EN 13485 standard for penetration measurement.
Suitability: S, T (storage, transport)
Conditions: E (transportable thermometer)
Accuracy class: 0.5
Measuring range: -50 to +250 °C
According to EN 13485, the measuring instrument should be checked and calibrated regularly under the terms of EN 13486 (recommended frequency: yearly).

Contact us for more information: www.testo.com.

10.3 Contact measurement (penetration probe)

Feature	Value
Sensor type	NTC
Measuring range	-50 to +250 °C
Accuracy (± 1 digit)	±1.0 °C (-50.0 to -30.1 °C) ±0.5 °C (-30.0 to +99.9 °C) ±1% of the measuring range (+100.0 to +250.0 °C)
Solution	0.1 °C/ °F/ °R
Response time t99	10 s (in moving liquid)
Measurement rate	0.5 s

10.4 Infrared measurement

Feature	Value
Optics	10:1 + opening diameter of the sensor (12mm)
Spectral range	8 to 14 µm
Laser type	2-point laser
Power / wavelength	< 1mW / 650nm
Class / standard	2 / DIN EN 60825-1:2007
Measuring range	-30 to +250 °C
Accuracy (at 23°C, ±1 digit)	±2.5 °C (-30.0 to -20.1 °C) ±0.5 °C (-20.0 to -0.1 °C) ±1.5 °C or ±1.5 % of the measuring range (+0.0 to +250.0 °C)
Solution	0.1 °C/ °F/ °R
Measurement rate	0.5 s

11 Tips and assistance

11.1 Questions and answers

Question	Possible cause	Possible solution
lights up	Low batteries	Change batteries
IR measurement: - - - lights up.	Measured value outside the permissible measuring range	Keep to the permitted measuring range.
Contact measurement: - - - lights up.	Measured value outside the permissible measuring range	Keep to the permitted measuring range.
Instrument cannot be switched on	Batteries dead.	Change batteries
Instrument switches itself off.	Instrument switches off automatically after 10 min in contact measurement mode and after 1 min after switching on in IR measurement mode.	Switch the instrument on again.

If we have not been able to answer your question: please contact your local dealer or Testo Customer Service. See the back of this document or the www.testo.com/service-contact web page for contact details.

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