

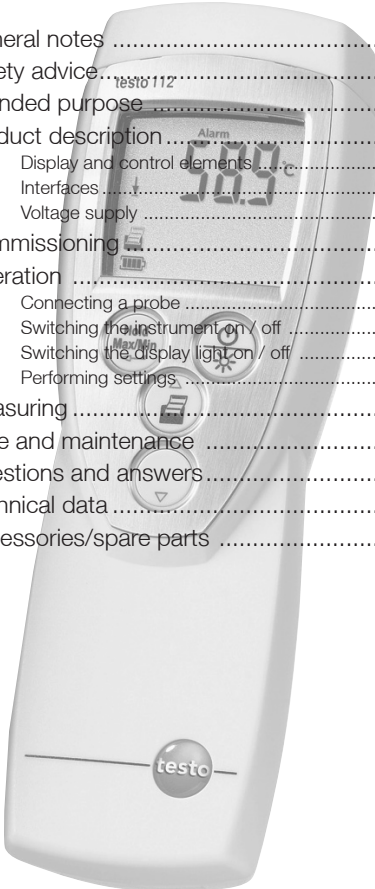


testo 112
NTC-/Pt100 measuring instrument

Instruction manual

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General notes

This chapter provides important advice on using this documentation.

The documentation contains information that must be applied if the product is to be used safely and efficiently.

Please read this documentation through carefully and familiarise yourself with the operation of the product before putting it to use. Keep this document to hand so that you can refer to it when necessary.

Identification

Representation Meaning		Comments
	Note	Offers helpful tips and information.
 1, 2	Objective	Denotes the objective that is to be achieved via the steps described. Where steps are numbered, you must always follow the order given!
	Condition	A condition that must be met if an action is to be carried out as described.
 1, 2, ...	Step	Carry out steps. Where steps are numbered, you must always follow the order given!
Text	Display text	Text appears on the instrument display.
	Control button	Press the button.
-	Result	Denotes the result of a previous step.
	Cross-reference	Refers to more extensive or detailed information.

1. Safety advice

This chapter gives general rules which must be followed and observed if the product is to be handled safely.

Avoid personal injury/damage to equipment

- › Do not use the measuring instrument and probes to measure on or near live parts.
- › Never store the measuring instrument/probes together with solvents and do not use any desiccants.

Product safety/preserving warranty claims

- › Operate the measuring instrument only within the parameters specified in the Technical data.
- › Always use the measuring instrument properly and for its intended purpose. Do not use force.
- › Do not expose handles and feed lines to temperatures in excess of 70 °C unless they are expressly permitted for higher temperatures.
Temperatures given on probes / sensors relate only to the measuring range of the sensors.
- › Open the instrument only when this is expressly described in the documentation for maintenance and repair purposes.
Carry out only the maintenance and repair work that is described in the documentation. Follow the prescribed steps when doing so. For safety reasons, use only original spare parts from Testo.

Ensure correct disposal

- › Take faulty rechargeable batteries/spent batteries to the collection points provided for them.
- › Send the product back to Testo at the end of its useful life. We will ensure that it is disposed of in an environmentally friendly manner.

2. Intended purpose

This chapter gives the areas of application for which the product is intended.

Use the product only for those applications for which it was designed. Ask Testo if you are in any doubt.

testo 112 is a compact, accurate measuring instrument for measuring temperatures by means of plug-in temperature probes. Thanks to the possibility of connecting not only NTC probes, but also Pt100 probes, the testo 112 covers a wide measurement range and at the same time provides a high level of measurement accuracy.



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

The measurement probe up to 1 cm before the probe handle or the plastic housing. If provided, the information about penetration depths in the instruction manual or the mark(s) on the measurement probes should be noted.

The product was designed for the following tasks/applications:

- Food sector
- Laboratories
- Applications requiring official calibration (only relevant for Germany):

The testo 112 is approved for official calibration by the Physikalisch-Technisches Institut PTB (national metrology institute in Germany).

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Approval mark: **05.01**

The product should not be used in the following areas:

- Areas at risk of explosion
- Diagnostic measurements for medical purposes

3. Product description

This chapter provides an overview of the components of the product and their functions.

3.1 Display and control elements

Overview



- ① Infrared interface, probe socket
- ② Display
- ③ Control buttons
- ④ Battery compartment (rear)

Button functions

Button	Functions
	Switch instrument on; switch instrument off (press and hold)
	Switch display light on / off
	Keep reading, display maximum/minimum value
	Open/leave configuration mode (press and hold); In configuration mode: Confirm input
	In configuration mode: Increase value, select option
	In configuration mode: Reduce value, select option
	Print data

Important displays

Display	Meaning
	Battery capacity (bottom right in display): · 4 segments in the battery symbol are lit: Instrument battery is fully charged · No segments in the battery symbol are lit: Battery is almost spent
	Print function: Readings are sent to the printer
	Upper alarm limit: Lit if exceeded
	Lower alarm limit: Lit if undershot

3.2 Interfaces

Infrared interface

Measurement data can be sent to a Testo printer via the infrared interface on the head of the instrument.

Probe socket

A plug-in measuring probe can be connected via the probe socket on the head of the instrument.

3.3 Voltage supply

Voltage is supplied by means of a 9V monobloc battery (included in delivery) or rechargeable battery. It is not possible to run the instrument from the mains supply or charge a rechargeable battery in the instrument.

4. Commissioning

This chapter describes the steps required to commission the product.

- **Removing the protective film on the display:**
 - Pull the protective film off carefully.
- **Inserting a battery/rechargeable battery:**
 - 1** To open the battery compartment on the rear of the instrument, push the lid of the battery compartment in the direction of the arrow and remove it.
 - 2** Insert a battery/rechargeable battery (9V monobloc). Observe the polarity!
 - 3** To close the battery compartment, replace the lid of the battery compartment in position and push it against the direction of the arrow.

5. Operation

This chapter describes the steps that have to be executed frequently when using the product.

5.1 Connecting a probe

Plug-in probes

Plug-in probes must be connected before the measuring instrument is switched on so that they are recognised by the instrument.

- › Insert the connector of the probe into the probe socket.

5.2 Switching the instrument on / off

➤ Switching the instrument on:

- › Press .
- A segment test is carried out: All LCD-segments in the display briefly light up.
- A function test of the instrument and the probe is carried out. The instrument tests the entire measurement channel regarding the adherence to allowed margins of error.
The type of probe attached is displayed for approx. 2s (NTC or Pt 100).

An error is detected:

- **rEF Error** is displayed for approx. 2s, then ----- is displayed. Please contact your dealer or Testo customer service.

The function test was successful:

- Measurement view is opened: The current reading is displayed.

➤ **Switching the instrument off:**

- Press and hold  (for approx. 2s) until the display goes out.

5.3 Switching the display light on / off

➤ **Switching the display light on/off:**

- ✓ The instrument is switched on.
- Press .

5.4 Performing settings

1 To open configuration mode:

- ✓ The instrument is switched on and is in measurement view. **Hold**, **Max** or **Min** are not activated.
- Press and hold  (for approx. 2s) until the display changes.
 - The instrument is now in configuration mode.
- i** You can change to the next function with . You can leave configuration mode at any time. To do so, press and hold  (for approx. 2s) until the instrument has changed to measurement view. Any changes that have already been made in configuration mode will be saved.

2 To set the alarm function:

- ✓ Configuration mode is opened, **ALARM** is lit.
- 1 Select the desired option with  /  and confirm with :
 - **oFF**: Switches the alarm function off.
 - **on**: Switches the alarm function on.

oFF was selected:

- ⇒ Continue with objective TO SET THE MAX./MIN. PRINT FUNCTION.

on was selected:

- 2 Use  /  to set the value for the upper alarm threshold ($\uparrow$) and confirm with .
- 3 Use  /  to set the value for the lower alarm threshold ($\downarrow$) and confirm with .

3 To set the max./min. print function:

- ✓ Configuration mode is opened,  **MaxMin** is flashing.
- › Select the desired option with  /  and confirm with :
 - **on**: Maximum and minimum values are printed out as well when current or recorded readings are printed.
 - **oFF**: Maximum and minimum values are not printed out as well when current or recorded readings are printed.

4 To set Auto Off:

- ✓ Configuration mode is opened, **AutoOff** is flashing.
- › Select the desired option with  /  and confirm with :
 - **on**: The measuring instrument switches off automatically if no button is pressed for 10min (**Hold** or **Auto Hold** is lit).
 - **oFF**: The measuring instrument does not switch itself off automatically.

5 To set the date/time:

- ✓ Configuration mode is opened, **YEAR** is lit.
- 1 Use  /  to set the current YEAR and confirm with .
- 2 Use  /  to set the other values for the month (**MONTH**), day (**DAY**) and time (**TIME**) and confirm each one with .

6 To set the unit of measurement:

- ✓ Configuration mode is opened, **UNIT** is lit.
- Select the desired unit of measurement with  /  and confirm with .

7 To reset:

- ✓ Configuration mode is opened, **RESET** is lit.
- Select the desired option with  /  and confirm with :
 - **no**: Instrument is not reset.
 - **Yes**: Instrument is reset. The instrument is reset to the factory settings.
The setting of date/time is not reset.
- The instrument returns to measurement view.

6. Measuring

This chapter describes the steps that are required to perform measurements with the product.

➤ Taking a measurement:

- ✓ The instrument is switched on and is in measurement view.
- Put the probe in position and read off the readings.
With the alarm function on and if the alarm threshold is exceeded or undershot:
 - ↑ or ↓ flashes and a signal tone is given.
 - The alarm goes out if the reading goes below the upper or above the lower threshold again.

➤ Holding the reading, displaying the maximum/minimum value:

The current reading can be recorded. The maximum and minimum values (since the instrument was last switched on) can be displayed.

- Press Hold / Max / Min several times until the desired value is displayed.
 - The following are displayed in turn:
 - **Hold**: the recorded reading
 - **Max**: Maximum value
 - **Min**: Minimum value
 - The current reading
 - In addition to the maximum or minimum readings, the 2nd reading line shows the current reading.

➤ Resetting the maximum/minimum values:

The maximum/minimum values of all channels can be reset to the current reading.

- 1 Press  several times until **Max** or **Min** lights up.
- 2 Press and hold  (approx. 2s).
 - All maximum or minimum values are reset to the current reading.

➤ Printing readings:

The readings shown on the display (current reading, recorded reading or max./min. reading) can be printed out.

A Testo printer is required (accessory part).

i With the Max./Min. print function switched on, the maximum and minimum values are printed out as well as the current reading or recorded reading.

➡ See the chapter PERFORMING SETTINGS.

- 1 Configure the instrument so that the value to be printed is shown on the display.
- 2 Press .
 - The printout starts. On the printout appears:
 - The measurement value
 - The date and time

Only relevant for applications requiring official calibration in Germany:

- A protocol line with the text:
Der ausgedruckte Messwert stimmt mit der Anzeige des geeichten Messgeräts überein. (The printed measurement value corresponds to the display of the officially calibrated measuring instrument.)
- A signature line

7. Care and maintenance

This chapter describes the steps that help to maintain the functionality of the product and extend its service life.

➤ **Cleaning the housing:**

- Clean the housing with a moist cloth (soap suds) if it is dirty. Do not use aggressive cleaning agents or solvents!

➤ **Changing the battery/rechargeable battery:**

- ✓ The instrument is switched off.
- 1** To open the battery compartment on the rear of the instrument, push the lid of the battery compartment in the direction of the arrow and remove it.
- 2** Remove the spent battery/rechargeable battery and insert a new battery/rechargeable battery (9 V monobloc). Observe the polarity!
- 3** To close the battery compartment, replace the lid of the battery compartment in position and push it against the direction of the arrow.

8. Questions and answers

This chapter gives answers to frequently asked questions.

Question	Possible causes	Possible solution
 is lit (bottom right in display).	Instrument battery is almost spent.	Replace instrument battery.
Instrument switches itself off automatically.	- Auto Off function is switched on. - Residual capacity of battery is too low.	- Switch function off. - Replace battery.
Display: -----	- Probe is not plugged in. - Probe break.	- Switch instrument off, connect probe and switch instrument back on again. - Please contact your dealer or Testo Customer Service.
Display reacts slowly	Ambient temperature is very low.	Raise ambient temperature.
Display: uuuuu	Permitted measuring range was undershot.	Keep to permitted measuring range.
Display: 00000	Permitted measuring range was exceeded.	Keep to permitted measuring range.
Display: rEF Error	Reference measurement out of tolerance of $\pm 0.1^{\circ}\text{C}$	Please contact your dealer or Testo Customer Service.

If we are unable to answer your question, please contact your dealer or Testo Customer Service. Contact details can be found on the guarantee card or on the Internet under www.testo.com.

9. Technical data

Instrument

Characteristic	Value
Parameters	Temperature (°C/°F)
Measuring range	Pt100 probe: -50...+300°C / -58...+572°F NTC probe: -50...+120°C / -58...+248°F
Resolution	0.1 °C / 0.1 °F
Accuracy	↔ See SYSTEM ACCURACY
Probe	1x mini DIN socket for Pt100 or NTC temperature probe
Measuring rate	2/s
Operating temperature range	-20...+50 °C / -4...+122 °F
Storage temperature	-30...+70 °C / -22...+158 °F
Voltage supply	1x 9V monobloc battery/rech. battery
Battery life	approx. 70 h
Protection class	with TopSafe (accessory part) and probe connected: IP65
EC Directive	89/336/EEC
Warranty	2 years

System accuracy

Measuring range	Instrument	Probe	System
Measuring instrument + NTC temperature probe			
-50.0°C...-25.1°C	±1% of reading	±0.7% of reading	±1.8% of reading
-25.0...+40.0°C	±0.2°C	±0.2°C	±0.5°C
+40.1...+80.00°C	±0.3°C	±0.4°C	±0.8°C
+80.1...+120.0°C	±0.5°C	±0.6°C	±1.2°C
Measuring instrument + Pt100 temperature probe			
-50.0...-25.1°C	±0.2°C	±0.3°C	±0.6°C
-25.0...+40.0°C	±0.2°C	±0.2°C	±0.5°C
+40.1...+140.0°C	±0.2°C	±0.4°C	±0.7°C
+140.1...+200.0°C	±0.2°C	±0.6°C	±0.9°C
+200.1...+300.0°C	±0.3°C	±0.8°C	±1.2°C

10. Accessories/spare parts

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Name	Part no.
NTC probes	
Water-proof NTC immersion/penetration probe	0613 1212
Water-proof NTC surface probe for smooth surfaces	0613 1912
Efficient, robust air probe, NTC	0613 1712
Pt100 probes	
Robust, water-proof Pt100 immersion/penetration probe	0609 1273
Efficient, robust air probe, Pt100	0609 1773
Miscellaneous	
TopSafe testo 112, protects from impact and dirt particles	0516 0221

For a complete list of all accessories and spare parts, please refer to the product catalogues and brochures or look up our website: www.testo.com



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