



## testo 330i · Flue gas measuring instrument











Instruction manual











[www.testo-international.com/330imanuals](http://www.testo-international.com/330imanuals)

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## 2 Safety and the environment

Please note the information in the document **Commissioning and Safety** (printed version supplied with the product). Make sure that all product users read and observe the safety information!

## 3 Use

The **testo 330i** is a flue gas measuring instrument which in combination with a separate Android or iOS mobile device and the **testo 330i** App enables professional flue gas analysis of combustion systems:

- Small combustion systems (oil, gas, wood, coal)
- Low-temperature and condensing boilers
- Gas water heaters

These systems can be adjusted using the instrument and checked for compliance with the applicable limit values.

The instrument has been verified as a short-term measuring instrument and should not be used as a safety (alarm) instrument.

The following tasks can also be carried out using the instrument:

- Regulating the O<sub>2</sub>, CO and CO<sub>2</sub>, NO, NO<sub>x</sub> values in furnaces for the purpose of ensuring optimal operation.
- Draught measurement.
- Measuring and regulating the gas flow pressure in gas water heaters.
- Measuring and optimising the flow and return temperatures of heating systems.
- Ambient measurement - CO and CO<sub>2</sub>.
- Detection of CH<sub>4</sub> (methane) and C<sub>3</sub>H<sub>8</sub> (propane).
- The instrument can be used for measurements on combined heat and power stations (CHP) in accordance with the first German Federal Immission Control Ordinance (BImSchV).
  - In principal, the CO sensor can also be used for measurements on CHP stations. If you should carry out more than 50 measurements on CHP stations per year, please contact your nearest Testo service centre or send the testo 330i to testo Service for inspection.  
A worn NO<sub>x</sub> filter of the CO sensor can be ordered as a spare part (item no. 0554 4150) and replaced.

**i** Testo guarantees the functionality of its products when used in accordance with their intended purpose. This guarantee does not apply to features of Testo products in combination with unauthorised third-party products. Competitor products are not authorised by Testo. As is common practice, Testo generally excludes support, warranty or guarantee claims relating to functionality that has not been guaranteed by Testo as part of the product offered. Claims shall also be excluded in the event of improper use or handling of the products, e.g. in combination with unauthorised third-party products.

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**i** The use of the wireless module is subject to the regulations and stipulations of the respective country of use, and the module may only be used in countries for which a country certification has been granted. The user and every owner has the obligation to adhere to these regulations and prerequisites for use, and acknowledges that the re-sale, export, import etc. in particular in countries without wireless permits, is his responsibility.

---

## 4 Product description

### 4.1. Measuring instrument

#### 4.1.1. Overview



- 1 Retaining bracket: for attaching to the probe mount testofix®
- 2 Terminal panel left
- 3 Status LEDs:

LED	Display	Meaning
Blue	Off	Instrument off or not ready
	Flashes (0.05 s on/0.5 s off)	Instrument on, start up phase
	Flashes (0.5 s on/0.5 s off)	Instrument on, Bluetooth® Find Device activated
	Light is constant	Instrument on, Bluetooth® connection activated
Red	Flashes (0.05 s on/0.5 s off)	Device error
	Flashes (0.5 s on/0.5 s off)	Mains unit plugged in, battery charging
	Light is constant	Mains unit plugged in, battery fully charged

- 4 ON/OFF button
- 5 Condensate container, condensate outlet plug
- 6 Terminal panel right
7. Magnetic holder (on rear)

### **WARNING**

Magnetic field

**May be harmful to those with pacemakers.**

- > Keep a minimum distance of 15 cm between pacemaker and instrument.

### **ATTENTION**

Magnetic field

**Damage to other devices!**

- > Keep a safe distance away from products that could be damaged by the effects of magnetism (e.g. monitors, computers or credit cards).

### 4.1.2. Terminal panel left/right



- 1 USB interface
- 2 Minus connection for differential pressure measurement
- 3 Mains unit socket
- 4 Flue gas socket
- 5 Probe socket

### 4.2. Modular flue gas probe



- 1 Removable filter chamber with window and particle filter
- 2 Probe module lock release
- 3 Probe module
- 4 Connector plug for measuring instrument
- 5 Probe handle
- 6 Connecting cable



## 5 First steps

### 5.1. Commissioning

Please note the information in the document **Commissioning and Safety** (printed version supplied with the product).

### 5.2. Getting to know the product

#### 5.2.1. Connecting probes

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- i** Always connect the probes to the flue gas socket or probe socket before switching on the measuring instrument; switch the measuring instrument off and restart after replacing a probe.
- 

#### **Connecting flue gas probes/gas pressure adapters/temperature adapters**

- > Insert the connector plug into the flue gas socket and lock by slightly turning it clockwise (bayonet lock).
- 

- i** There must be no more than one extension lead (0554 1201) between measuring instrument and flue gas probe.
- 

#### **Connecting other probes**

- > Insert the connector plug of the probe into the probe socket.

#### 5.2.2. Mains unit/rechargeable battery

If the mains unit is connected, the measuring instrument is automatically powered from the unit.

### 5.2.2.1. **Charging the rechargeable battery**

The rechargeable battery can only be charged at an ambient temperature of 0 to 35 °C. If the rechargeable battery pack has discharged completely, the charging time at room temperature is approx. 5-6 hrs.

1. Connect the instrument plug of the mains unit to the mains unit socket on the measuring instrument.
2. Plug the mains plug of the mains unit into a mains socket.
  - The charging process starts (red LED flashes: 0.5 s on/0.5 s off).
  - The charging process stops automatically when the battery is charged (red LED is constant).


#### **Rechargeable battery care**

- Do not fully exhaust rechargeable batteries.
- Store rechargeable batteries only if charged and at low temperatures, but not below 0 °C. The best storage conditions are with a charge level of 30-70% and an ambient temperature of 0-15 °C. Fully charge before using again.
- Optimal charging temperature at 20 °C ambient temperature.
- Trickle charging should not exceed 2 days.

### 5.2.2.2. **Mains operation**

1. Connect the instrument plug of the mains unit to the mains unit socket on the measuring instrument.
2. Plug the mains plug of the mains unit into a mains socket.
  - The measuring instrument is powered via the mains unit.
  - If the measuring instrument is switched off and a rechargeable battery is inserted, the charging process will start automatically. Switching the measuring instrument on has the effect of stopping the battery charging and the measuring instrument is then powered via the mains unit.


### 5.2.3. Switching on and connecting with a mobile terminal device

- ✓ The **testo 330i** App must be installed on your mobile terminal device. Please note the information in the document **Commissioning and Safety** (printed version supplied with the product).
- 1. Switch on the measuring instrument: Press the  key.
  - Measuring instrument starts up: The blue LED flashes (0.05 s on/0.5 s off).
  - Connecting mode is activated: The blue LED flashes (0.5 s on/0.5 s off).
- 2. Switch on the mobile terminal device.
- 3. Start up the **testo 330i** App on your mobile terminal device.
  - The **Find Device** function is activated: Compatible devices within wireless range are displayed (product designation + serial number).
    - > Tap instrument designation to select an instrument.
  - A Bluetooth<sup>®</sup> connection is established: The blue LED is constant.
  - Measurement type **Flue Gas** screen is displayed.

### 5.2.4. Switching off



Measuring values that have not been saved are lost when the measuring instrument is switched off.






- > Switch off the measuring instrument: Press the  key.
  - This may happen: the pump starts and the sensors are rinsed until the switch-off thresholds ( $O_2 > 20\%$ , other measurement parameters  $< 50$  ppm) are reached. The maximum rinsing period is 3 minutes.
  - The measuring instrument switches off.


### 5.2.5. Using the App

Make sure you are familiar with how your mobile terminal device works before using the App; observe the documentation for your mobile terminal device.

Actions are mainly carried out by touching an icon, a symbol, or a name.

Some actions require a different gesture. This is pointed out in each case in this documentation.

- 1 : Open the **Measurement Types** selection list
- 2 : Open/close the **Menu** selection list
- 3 : Open the **Fuels** selection list
- 4 Select reading display type
- 5 : Open the **Options** selection list
- 6 Start/stop measurement
- 7 : Open the **Protocols** selection list

Please also take note of the tutorial in the App under  | **Help** | **Tutorial**.

## 6 Using the product

### 6.1. Performing settings

#### 6.1.1. Configuring measurements

The measurement parameters/units and the number and order of displayed measurement parameters in the reading display type can be set in the **List**.

Only those parameters and units that are enabled in the reading display appear in the measured value display, in the saved measurement records and on the record printouts.



The settings only apply to the measurement type currently activated.

Overview of measurement parameters (available selection depends on the chosen measurement type, set fuel, and the sensors available in the measuring instrument):

Display	Measurement parameter
<b>FT</b>	Flue gas temperature
<b>AT</b>	Combustion air temperature
<b>Itemp</b>	Instrument temperature
<b>Pump</b>	Pumping capacity
<b>O<sub>2</sub></b>	Oxygen
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>qAnet</b>	Flue gas loss without due consideration of the calorific value range
<b>Effn</b>	Efficiency without consideration of the heat value range

Display	Measurement parameter
qAgr.	Flue gas loss with due consideration of the calorific value range
Effg	Efficiency with due consideration of the calorific value range
Draught	Flue draught
$\Delta P$	Differential pressure
CO	Carbon monoxide
uCO	Carbon monoxide undiluted
NO	Nitrogen monoxide
NO <sub>x</sub>	Nitrogen oxide
$\lambda$	Fuel-air ratio
AmbCO	Ambient carbon monoxide
O <sub>2</sub> ref	Oxygen reference
Dew Pt	Flue gas dewpoint temperature


### Performing actions

- > To add a measurement parameter to the display list: Touch **Add** to open the selection list of measurement parameters.
- > To delete a measurement parameter from the display list: Touch .
- > Change the unit of a measurement parameter: Touch the measurement parameter name to open the selection list of measurement units.
- > To change the position of a measurement parameter in the display list:  press down and drag.
- > To accept changes: Touch **Confirm**.

## 6.1.2. Graphics

In the graphics reading display type, the reading progress can be displayed as a line diagram.

A maximum of 4 measurement parameters can be set at any one time. Only those measurement parameters/units can be displayed that are available in the reading display type **List**.

- > Touch  to open the selection list of measurement parameters/units.

### 6.1.3. | Instrument settings | Country version

The Country version configuration affects the measurement parameters, fuels, fuel parameters, and the basis of and formulas for calculations activated in the measurement box.

The country version setting affects the user screen languages that can be enabled.

### 6.1.4. | Instrument settings | Language

The user interface language can be set.

The number of available languages depends on the activated country version.

### 6.1.5. (Fuels)

In order to obtain the correct readings the used fuel is to be set before taking the readings.

### 6.1.6. | Instrument settings | Sensor protection

Threshold values can be set to protect the CO/NO sensors against overload. The sensor protection is activated if the threshold is exceeded:

- Fresh air dilution if exceeded
- Shutdown if exceeded again

To disable sensor protection the threshold values must be set to 0 ppm.

### 6.1.7. | Instrument settings | O<sub>2</sub> reference

The O<sub>2</sub> reference value of the current fuel can be set.

### 6.1.8. | Instrument settings | O<sub>2</sub> addition

The NO<sub>2</sub> addition value can be set.

### 6.1.9. | Instrument settings | Height compensation

Extremely low absolute pressure causes wrong calculation of the O<sub>2</sub> sensor service life. Therefore, when the measuring instrument is used at great heights, the factory set value should be adjusted so that an O<sub>2</sub> sensor is not displayed prematurely as “expended”.

If using the measuring instrument at heights up to approx. 1800 m above mean sea level (MSL), the factory setting (922 hPa, equals approx. 800 m above MSL) can be retained.

The value can be input directly (**Abs. pressure**), or is automatically calculated when entering the barometric pressure (**Barom. pressure**) and **Altitude**.

## 6.2. Measuring

### 6.2.1. Preparing for measurement

#### 6.2.1.1. Checking the condensate container fill level

Regularly check the fill level of the condensate container and empty it in good time; see Draining the condensate container, page 24.

#### 6.2.1.2. Checking the particle filter

Regularly check the particle filter of the flue gas probe for contamination and replace in good time; see Checking/replacing the particle filter, page 31.

#### 6.2.1.3. Zeroing phases


##### Measuring the combustion air temperature (AT)

If no combustion air temperature probe is connected, the temperature measured by the thermocouple of the flue gas probe during the zeroing phase is used as the combustion air temperature. All dependent parameters are calculated using this value. This method of measuring combustion air temperature is sufficient for systems dependent on ambient air. However, ensure that the flue gas probe is near the intake duct of the burner during the zeroing phase!

If a combustion air temperature probe is connected, the combustion air temperature is measured continuously via this probe.

##### Gas zeroing

The gas sensors are automatically zeroed when the instrument is switched on.

- > To manually start zeroing of the gas sensors:  | **Zeroing Gas Sensors**.

##### Draught/pressure zeroing

The pressure sensors are continuously zeroed.

The flue gas probe can be in the flue gas duct during the zeroing phase, if there is no overpressure in the duct and a separate AT probe is plugged in. The minus connection for differential pressure measurements must be clear (ambient pressure, not closed).

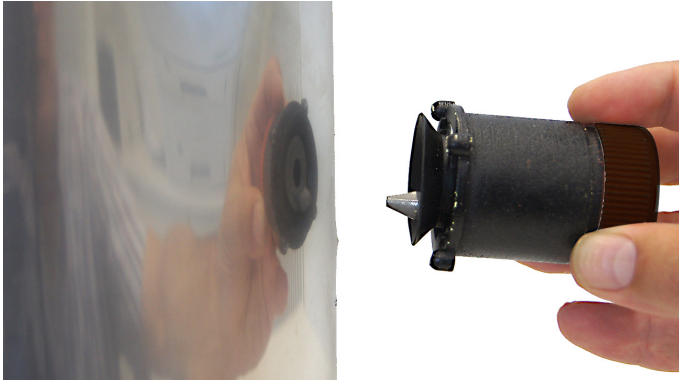
#### 6.2.1.4. Performing a gas path check

Regularly check the measurement system (measuring instrument + flue gas probe) for leaks.

A high O<sub>2</sub> value, in particular, may be an indicator of a leaking measurement system.

>  | **Gas path check.**

#### 6.2.1.5. Installing the probe mount testofix®



1. Insert the probe mount in the measurement aperture of the flue gas duct, making sure the attachment pin is pointing downwards.



2. Attach the probe mount to the flue gas duct by turning the fixing ring clockwise.





3. Slide the measuring instrument onto the probe mount up to the stop.
4. Check if the locking mechanism has latched into the probe mount.



5. Insert the flue gas probe through the probe mount into the flue gas duct.

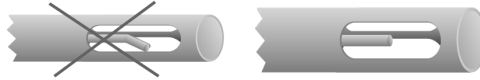
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**i** When using the testofix® probe mount, the measuring instrument is exposed to heat radiating from the flue gas duct during the measurement. In order to prevent consequently affecting the combustion air temperature a AT probe with cable must be used for the measurement!

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### 6.2.1.6. Using the modular flue gas probe

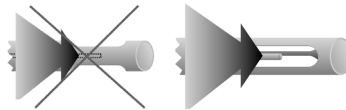
#### Checking the thermocouple



The thermocouple of the flue gas probe must not lie against the probe cage.

> Check before use. Bend the thermocouple back if necessary.

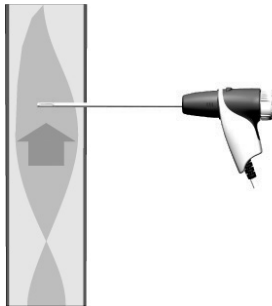
#### Aligning the flue gas probe



The flue gas must be able to flow freely past the thermocouple.

> Align the probe by turning it as required.

#### Searching for the centre of flow



The tip of the probe must be in the core current of the flue gas flow.

1. **Corestream** |

2. Align the flue gas probe in the flue gas duct so that the tip is in the core current (area of the highest flue gas temperature **Max FT**).

- Grey value/grey pointer: Display of current flue gas temperature
- Orange value/orange pointer: Display of maximum flue gas temperature

> Reset values/pointer:

## 6.2.2. | Flue gas

**i** To achieve usable measurement results, the measurement period of a flue gas measurement should be a minimum of 3 minutes and the measuring instrument should display stable measured values.



**i** If a separate measurement of **CO undiluted** has not yet been carried out, this value is calculated using the readings from the flue gas probe and is updated continuously.

1. .

- Readings are displayed.

If the **Draught** measurement parameter is activated in the reading display, a draught measurement is automatically initiated in parallel to the flue gas measurement. In the **List** measurement data screen, the parallel draught measurement can be stopped/restarted. This draught measurement is performed separately to a measurement of the **Draught** measurement type.

**i** For the draught measurement, the minus connection for differential pressure measurements must be clear (ambient pressure, not closed).

> Tap the draught reading display  or  next to it.

2. .

## 6.2.3. | Draught

**i** The minus connection for differential pressure measurements must be clear (ambient pressure, not closed).

1. .



- The reading is displayed.

The pressure sensor is continuously zeroed (every 10 s) to prevent a drift during long measurements. The switching sound of the valve can be heard during zeroing.

2. .

### 6.2.4. | CO undiluted


✓ A multi-hole probe (0554 5762) must be connected.

1. .
  - The reading is displayed.
2. .


### 6.2.5. | Smoke number

The values calculated by a smoke pump tester can be entered.  
The parameters **Smoke** and **Oil depos.** are only available for oil fuels.

### 6.2.6. | Differential pressure

 <b>WARNING</b>	
Dangerous mixture of gases	
<b>Danger of explosion!</b>	
>	Make sure there are no leaks between the sampling point and the measuring instrument.
>	Do not smoke or use naked flames during measurement.

- ✓ The gas pressure set (0554 1203) must be connected.
- ✓ The minus connection for differential pressure measurement must be depressurised at the beginning of measurement (ambient pressure; the instrument not connected to the system being checked), as the pressure sensor is zeroed.

1. .
  - Zeroing the pressure sensor.
  - The reading is displayed.
2. Connect the instrument to the system being checked.



---

**i** Do not measure for longer than 5 minutes, as the drift of the pressure sensor could mean that the measured values are outside the tolerance limits. Re-zero the pressure sensor for longer measurements.



---

3. .

### 6.2.7. | Differential temp.

- ✓ The differential temperature set (0554 1204) must be connected.
- 1. .
- The measured values and the calculated differential temperature  $\Delta t$  (T1 - T2) are displayed.
- 2. .

### 6.2.8. | O<sub>2</sub> supply air


- 1. .
- The reading is displayed.
- 2. .

## 6.3. Printing readings

The current readings can be printed using a report printer (accessories: Testo printer 0554 0621).


### Making print text settings

The reading printout can be supplemented with individual information (header: company address; footer: name of technician).

- 1.  | **Protocols** | **Own Company Data**.
- 2. Make the settings.

A logo cannot be included in the reading printout. This is only used for a report issued in PDF format.

### Printing current readings

- ✓ The printer is switched on and within wireless range.
- >  | **Print values**.

## 6.4. Report

A report can be created of saved measurement data (readings) and other information about the measurement.

Reports can be printed using a report printer (accessories: Testo printer 0554 0621) or sent as a file attachment in an email. The email application installed on the mobile terminal device is used for this.

### 6.4.1. Add to protocol (save measurement)

The measurement data from the last measurement type carried out are stored temporarily on the measuring instrument.

**i** The clipboard is deleted when the measuring instrument is switched off.

Measurements carried out can be saved to back up measurement data and be used for a subsequent report:

>  | **Add to protocol.**

**i** The measurements are stored in the measuring instrument. This memory is not suitable for use as a long-term memory/archive! Generate a report of significant measurements and save this in a suitable place.

### 6.4.2. Finish protocol

1.  | **Finish protocol.**






or

 | **Protocols.**

2. Open the input category: >

3. Enter/select log data:

Category	Description
<b>Own Company Data</b>	Reports can be supplemented with individual information (company address; name of the technician). A logo can only be included when issued in PDF format.
<b>Format and print</b>	Select version format(s): <ul style="list-style-type: none"> <li>• <b>CSV</b> (comma separated text file, e.g. for Microsoft® Excel),</li> <li>• <b>PDF</b></li> <li>• <b>Print values</b> (Testo printer 0554 0621 required (accessories))</li> <li>• <b>ZIV</b> (XML file, complying with the regulations of the 'Federal Association of Chimney Sweeps Germany').</li> </ul>
<b>Customer data</b>	Enter contact details or <b>Import Contact Data</b> (opens the application installed for contacts on the mobile terminal device).

Category	Description
<b>Comments and pictures</b>	<p>Enter comments (file name of log, comment, measuring location name) and <b>Add pictures</b> (opens the application installed for photos and videos on the mobile terminal device).</p> <p>Pictures are only included when issued in PDF format.</p>
<b>Select measurements</b>	<p>All saved measurements are displayed in one of the following time categories, depending on the creation date: <b>Today</b>, <b>Yesterday</b> or <b>Older</b>.</p> <p>The measurements selected to create the report are identified with . New, saved measurements are automatically identified.</p> <p>To display saved readings to check them:</p> <p>&gt; .</p> <p>To delete individual measurement:</p> <p>&gt; .</p> <p>To delete all measurements of a time category:</p> <p>&gt; Touch  next to the time category name.</p> <p>To select/deselect a measurement for the report:</p> <p>&gt; .</p>



All selected pictures and measurements are included in the report. This means the report may reach a file size of several megabytes. Before sending the report, check what your mobile provider may charge for this!

#### 4. **Send.**

## 7 Maintaining the product

### 7.1. Checking instrument status

#### 7.1.1. | Instrument settings | Sensor diagnosis

The current status of the sensors can be displayed.

To change expended sensors, see Replacing sensors , page **28**.

### 7.1.2. | Error list


Instrument errors that have not yet been rectified can be displayed.


## 7.2. Cleaning the measuring instrument

- > If the housing of the measuring 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.

## 7.3. Draining the condensate container

The fill level of the condensate container can be read from the markings. Hold the instrument horizontally or vertically to check the fill level.

-  The condensate consists of a weak mix of acids. Avoid skin contact. Make sure that the condensate does not run over the housing.

 **CAUTION**

Condensate entering the gas path.  
**Damage to sensors and flue gas pump!**

- > Do not empty the condensate container while the flue gas pump is in operation.





1. Open the condensate outlet on the condensate container.
2. Let the condensate run out into a sink.
3. Wipe off any drops still on the condensate outlet with a cloth and close the condensate outlet.

---

**i** The condensate outlet must be completely closed, otherwise measuring errors could occur if external air gets in.

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## 7.4. Opening the measuring instrument

Open the measuring instrument only when this is required for measuring purposes (gas sensors/replacing battery).

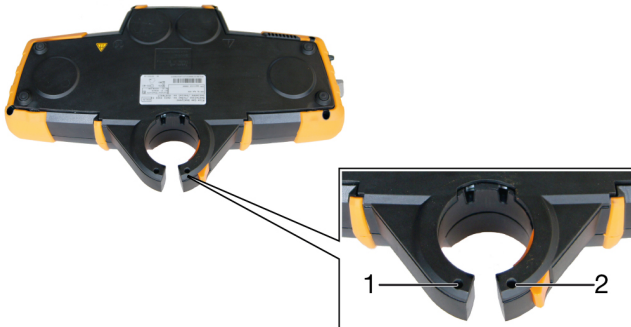
- ✓ The measuring instrument must not be connected to a mains socket via the mains unit. The measuring instrument must be switched off.

---

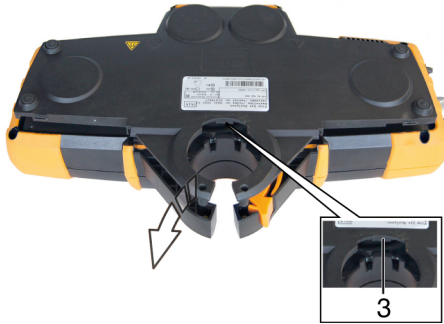
**i** When opening/assembling the instrument, take care not to lose any removed screws. Placing a cloth on the work top is recommended.

---

1. Lay the instrument face down so that the rear of the instrument faces upwards and the side with the retaining bracket faces you.



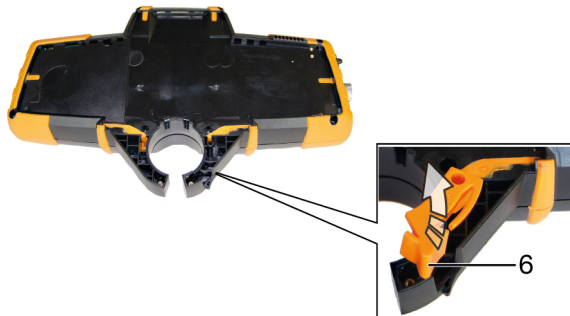
2. Use a cross-head screwdriver to remove the two (short) screws (1 and 2) from the retaining bracket.



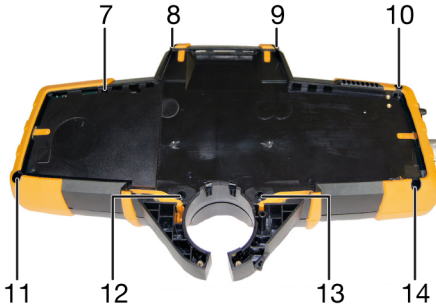
3. Move the catch hook outwards (3) and push the back of the instrument up and lift off.



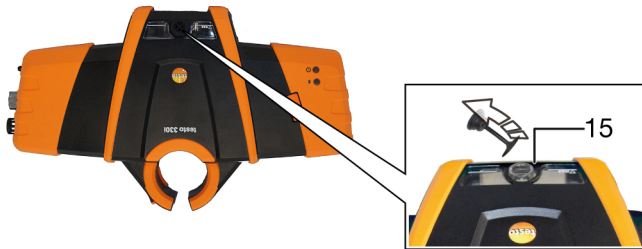
- > If the back of the instrument cannot be removed by hand, this can easily be levered out by applying a screwdriver to both of the recesses 4 and 5.



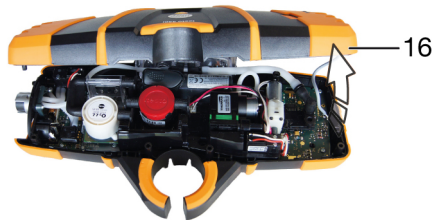
4. Remove the orange locking clips upwards out of the instrument casing (6).



5. Use a cross-head screwdriver to loosen and remove the 4 screws **7** to **10** (short screws) and the 4 screws **11** to **14** (long screws).
6. Turn the instrument over and place on its back so that the front is facing upwards.



7. Remove the condensate trap sealing plug from the condensate outlet (**15**).

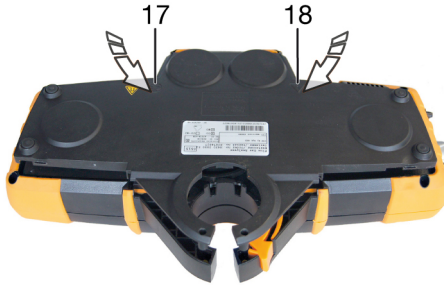


8. Fold up/back the upper instrument casing and place next to the lower casing (**16**). Do this carefully to prevent damaging hoses and lines.

### Assembly

Perform in reverse order to assemble. Please note:

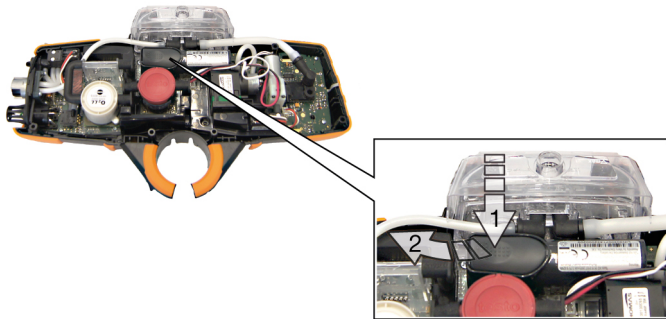
- > Lay hoses and lines in the designated ducts.
- > Make sure that hoses and lines do not get stuck.



- > Insert the teeth on the lower edge of the back of the housing into the lower instrument casing and push at the height of the symbols € (17) and ⚠ (18) to lock into place in the housing.

## 7.5. Replacing the rechargeable battery

- ✓ Measuring instrument is open; see Opening the measuring instrument, page 25.



1. Open the battery lock: Press the grey button (1) and push to the left keeping the button pressed (2).
2. Remove the battery and insert a new rechargeable battery. Use only Testo rechargeable battery 0515 0107!
3. Close the battery lock: Press the grey button and push to the right keeping the button pressed until the battery engages.

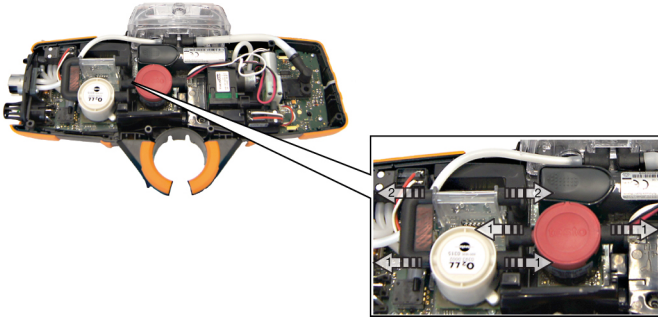
## 7.6. Replacing sensors

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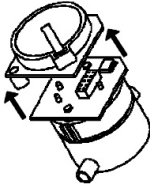
**i** A slot bridge (0192 1552) must be inserted in slots which are not equipped with a sensor. Used sensors must be disposed of as hazardous waste!

---

- ✓ Measuring instrument is open; see Opening the measuring instrument, page 25.



1. Disconnect the hose connections from the faulty sensor (1)/bridge (2).
2. Remove the faulty sensor/bridge from the slot.
- > For NO sensor: Remove the auxiliary circuit board.




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**i** Do not remove the auxiliary circuit board for the NO sensor until immediately before installation. Do not leave the sensor without auxiliary circuit board for longer than 15 minutes.

---

3. Install new sensor/new bridge in the slot:
  - Slot 1: O<sub>2</sub> sensor
  - Slot 2: CO sensor or CO<sub>low</sub> sensor
  - Slot 3: NO sensor or NO<sub>low</sub> sensor
4. Push the hose connections onto the sensor/bridge.
5. Close the measuring instrument.

---

**i** When retrofitting a sensor, the associated measurement parameter/unit must be enabled in the reading display.

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## 7.7. Cleaning the modular flue gas probe

- ✓ Disconnect the flue gas probe from the measuring instrument prior to cleaning.
1. Release the probe catch by pressing the key on the probe handle and remove the probe module.



2. Blow compressed air through the flue gas ducts in probe module and probe handle (see illustration). Do not use a brush!
3. Fit a new probe module on the probe handle and engage it in place.

## 7.8. Replacing the probe module

- ✓ Disconnect the flue gas probe from the measuring instrument.



1. Press the button on the top of the probe handle (1) and remove the probe module (2).
2. Plug in the new probe module and lock it in place (3).

## 7.9. Checking/replacing the particle filter

### Checking the particle filter:

Check the particle filter of the modular flue gas probe periodically for contamination: check visually by looking through the window of the filter chamber.

- > If there is visible contamination or inadequate pump flow, replace the filter.

### Replacing the particle filter:

**i** The filter chamber may contain condensate. This is not a malfunction and will not cause wrong readings.



1. Open the filter chamber: turn slightly anti-clockwise (1). Remove the filter chamber (2).
2. Remove the filter plate (3) and replace it with a new one (4 [0554 3385]).
3. Attach the filter chamber and lock it: turn slightly clockwise.

## 7.10. Changing the thermocouple


1. Release the probe catch by pressing the key on the probe handle and remove the probe module.



2. Remove the thermocouple plug-in head from the socket using a screwdriver and pull the thermocouple out of the probe shaft.
3. Keep inserting the new thermocouple into the probe shaft until the connection head clicks into place.
4. Fit a new probe module on the handle and engage in place.

## 7.11. Updating the instrument software

At [www.testo.com/download-center](http://www.testo.com/download-center) you can download the current instrument software (firmware) for the testo 330i.

- ✓ The measuring instrument must be switched off.
- 1. Plug the measuring instrument mains unit into a mains socket.
- 2.  Press and hold down for 10 s.
  - Both status LEDs (blue/red) slowly flash alternately.
- 3. Insert the connecting cable (0449 0047) into the USB port on the measuring instrument, then connect it to the PC.
  - Your PC identifies the measuring instrument as a removable medium.
- 4. Copy the new instrument software file (ap330ir.bin) to the identified removable medium.
  - Both status LEDs (blue/red) quickly flash alternately. This process may take a few minutes.
- 5. Disconnect the connecting cable from the measuring instrument.
  - Once the instrument software has been updated, the measuring instrument will automatically reboot and is ready for use again.

# 8 Technical data

## 8.1.1. Examinations and licenses

As declared in the Certificate of Conformity, this product complies with Directive 2014/30/EU.

Testo 330i with gas sensors O<sub>2</sub>/CO, H<sub>2</sub>-compensated/NO, combustion air temperature sensor, flue gas temperature sensor and differential pressure sensor (draught) is TÜV-tested in accordance with VDI 4206.

The CO sensor 0393 0101 (CO, H<sub>2</sub>-compensated) is TÜV-tested in accordance with EN 50379 part 2.

The CO sensor 0393 0051 (CO, not H<sub>2</sub>-compensated) is TÜV-tested in accordance with EN 50379 part 3.

For official measurements in accordance with the 1st BImSchV (chimney sweeps), the measuring instrument must be checked



every six months by a technical testing body of the Guild of Master Chimney Sweeps or another testing body recognised by the authorities.

### 8.1.2. Bluetooth® module

Feature	Values
Type designation	Stollmann E+V GmbH BlueMod+SR (August 2013)
Specification	4.0, Bluetooth® Classic/LowEnergy
Coverage	< 10 m/< 32.8 ft.
Product note	BlueMod+SR
Identification	B021281
Company	44784
Certification	<p><b>EU countries:</b>            Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY).</p> <p><b>EFTA countries:</b>            Iceland, Liechtenstein, Norway, Switzerland</p>

### 8.1.3. Measuring ranges and resolution

Measurement parameter	Measuring range	Resolution
O <sub>2</sub>	0 to 21 vol. %	0.1 vol. %
CO	0 to 4,000 ppm	1 ppm
CO (H <sub>2</sub> -compensated)	0 to 8,000 ppm	1 ppm
CO (H <sub>2</sub> -compensated) with fresh air dilution	0 to 30,000 ppm	1 ppm

Measurement parameter	Measuring range	Resolution
CO <sub>low</sub>	0 to 500 ppm	0.1 ppm
NO	0 to 3,000 ppm	1 ppm
CO environment (via flue gas probe)	0 to 2,000 ppm	1 ppm
Draught	-9.99 to 40 hPa	0.01 hPa
ΔP	0 to 300 hPa	0.1 hPa
Temperature	-40 to 1,200 °C	0.1 °C (-40.0 to 999.9 °C) 1 °C (rest of range)
Efficiency	0 to 120%	0.1%
Flue gas loss	0 to 99.9%	0.1%
CO <sub>2</sub> determination (calculation from O <sub>2</sub> )	Display range 0 to CO <sub>2</sub> max	1 ppm

#### 8.1.4. Accuracy and response time

Measurement parameter	Accuracy	Response time
O <sub>2</sub>	± 0.2 vol.%	< 20 s (t <sub>90</sub> )
CO	± 20 ppm (0 to 400 ppm) ± 5% of m.v. (401 to 2,000 ppm) ± 10% of m.v. (2,001 to 4,000 ppm)	< 60 s (t <sub>90</sub> )
CO H <sub>2</sub> -compensated	± 10 ppm or ± 10% of m.v. <sup>1</sup> (0 to 200 ppm) ± 20 ppm or ± 5% of m.v. <sup>1</sup> (201 to 2,000 ppm) ± 10% of m.v. (2,001 to 8,000 ppm)	< 60 s (t <sub>90</sub> )
CO (H <sub>2</sub> -compensated) with fresh air dilution	± 200 ppm or ± 20% of m.v. <sup>1</sup> (0 to 30,000 ppm)	< 60 s (t <sub>90</sub> )

<sup>1</sup> higher value is valid

Measurement parameter	Accuracy	Response time
CO <sub>low</sub>	± 2 ppm (0 to 39.9 ppm) ± 5% of m.v. (rest of range)	< 40 s (t90)
NO	± 5 ppm (0 to 100 ppm) ± 5% of m.v. (101 to 2,000 ppm) ± 10% of m.v. (2,001 to 3,000 ppm)	< 30 s (t90)
Draught	± 0.02 ppm or ± 5% of m.v. <sup>1</sup> (-0.50 to 0.60 hPa) ± 0.03 hPa (0.61 to 3.00 hPa) ± 1.5% of m.v. (3.01 to 40.00 hPa)	-
ΔP	± 0.5 hPa (0.0 to 50.0 hPa) ± 1% of m.v. (50.1 to 100.0 hPa) ± 1.5% of m.v. (rest of range)	-
Temperature	± 0.5 °C (0.0 to 100.0 °C) ± 0.5% of m.v. (rest of range)	depending on the probe
Efficiency	-	-
Flue gas loss	-	-
CO <sub>2</sub> determination (calculation from O <sub>2</sub> )	± 0.2 vol. %	-

### 8.1.5. Other instrument data


#### Flue gas analyzer

Feature	Values
Storage and transport temperature	-20 to 50 °C
Operating temperature	-5 to 45 °C

<b>Feature</b>	<b>Values</b>
Max. surface temperature at the measurement aperture (with probe mount)	140 °C
Ambient humidity	0 to 90% RH, non-condensing
Operating positions	No restriction
Fill level of condensate trap	9 ml Corresponds with a service life of approx. 5 h (EL heating oil)/approx. 2.5 h (natural gas) at 20 °C ambient temperature)
Power supply	Li Ion battery: 3.7 V/2.6 Ah Mains unit: 6 V/2.0 A
Protection class	IP 40
Weight	720 g (excluding battery)
Dimensions	270 x 160 x 57 mm
Memory	500,000 individual readings
Flue gas overpressure	max. 50 mbar
Negative pressure	max. 80 mbar
Rechargeable battery charging temperature	± 0 to 35 °C
Rechargeable battery charge time	approx. 5-6 h
Rechargeable battery life	6 h (pump on, 20 °C ambient temperature)
Warranty	Measuring instrument: 48 months Sensors O <sub>2</sub> , CO: 48 months Other sensors: 24 months Flue gas probe: 48 months Thermocouple: 12 months Rechargeable battery: 12 months Further warranty terms: see website <a href="http://www.testo.com/warranty">www.testo.com/warranty</a>

## 8.1.6. Declaration of conformity



Wir messen es. 

### EG-Konformitätserklärung

### EC declaration of conformity

Für die nachfolgend bezeichneten Produkte:

We confirm that the following products:

**testo 330i**

Best. Nr.: / Order No.: 0632 3000

wird bestätigt, daß sie den wesentlichen Schutzanforderungen entsprechen, die in der Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit (2014/30/EU) festgelegt sind und bei bestimmungsmäßiger Verwendung den grundlegenden Anforderungen gemäß Artikel 3 der R&TTE-Richtlinie 1999/5/EG entspricht. Zur Beurteilung der Erzeugnisse hinsichtlich elektromagnetischer Verträglichkeit wurden folgende Normen herangezogen:

corresponds with the main protection requirements which are fixed in the EEC "Council Directive 2014/30 EU on the approximation of the laws of the member states relating to electromagnetic compatibility" and comply with the essential requirements of Article 3 of the R&TTE 1999/5/EC Directive.

The declaration applies to all samples of the above mentioned product.

*For assessment of the product following standards have been called upon:*

**Störaussendung/ Pertubing radiation:**  
**Störfestigkeit: / Pertubing resistance:**  
**R&TTE-Richtlinie**  
**Sicherheits-Richtlinie:**

DIN EN 50270:2007-05 class B  
DIN EN 50270:2007-05 typ 1  
EN 300 328 V1.8.1: 2012  
EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013

Diese Erklärung wird für:

*This declaration is given in responsibility for:*

**Testo AG**  
**Postfach / P.O. Box 1140**  
**79849 Lenzkirch / Germany**  
**www.testo.com**



abgegeben durch / by:

Der Hersteller betreibt ein zertifiziertes Qualitätssicherungssystem nach DIN ISO 9001

Dr. Rolf Merte  
(Name / name)

Wolfgang Schwörer  
(Name / name)

Head of Research & Development  
(Stellung im Betrieb des Herstellers)  
(Position in the company of the manufacturer)

Head of Firmware & Electronics  
(Stellung im Betrieb des Herstellers)  
(Position in the company of the manufacturer)

Lenzkirch, 20.08.2015  
(Ort, Datum / place, date)


*The manufacturer operates a certified quality assurance system according to DIN ISO 9001*



ppa  
(Rechtsgültige Unterschrift)  
(Legally valid signature)

i.V.  
(Rechtsgültige Unterschrift)  
(Legally valid signature)

## 9 Tips and assistance

### 9.1. Questions and answers

Question	Possible causes/solution
Rechargeable battery low	> Switch to mains operation.
Measuring instrument switches off automatically or cannot be switched on	Rechargeable battery has run out: > Charge rechargeable batteries or switch to mains operation.
Displayed battery capacity seems to be faulty	Rechargeable battery was repeatedly not fully discharged/charged: > Discharge rechargeable battery (until measuring instrument switches off automatically) and then charge fully.
Error message: <b>Main pump flow is too high</b>	Gas outlet blocked: > Make sure that the gas outlet is clear.  Overpressure in flue gas duct too high (> 50 mbar): > Perform draught measurement.
Error message: <b>Sensor protection is active</b>	The switch-off threshold of the CO sensor was exceeded: > Remove probe from flue gas duct.
Error message: <b>Printing not possible</b>	> Switch on printer. > Move printer into wireless range.
Three acoustic signals after switching on the measuring instrument	Device error: > Consult Testo Service or your dealer.
App no longer responds to command inputs	> Open the overview of active applications (refer to your smartphone operating system instructions) and close the App.
Instrument no longer responds to command inputs	> Keep the button pressed down for  10 s to reset and reboot the measuring instrument.

Question	Possible causes/solution
It cannot establish a Bluetooth connection! or Required instrument is not in the Find Device display.	> Keep the button pressed down for  10 s to reset and reboot the measuring instrument.
No instruments are shown in the Find Device display.	> Check the Bluetooth settings on the mobile terminal device. > Switch Bluetooth off and on again on the mobile terminal device.
Connection fails repeatedly with a Bluetooth® error message.	1. Keep the button pressed down for  10 s to reset and reboot the measuring instrument. 2. Switch Bluetooth off and on again on the mobile terminal device. If necessary: switch the mobile terminal device off and on again.
When using two printers: The required printer not found!	The mobile terminal device may be connected to the other printer and this connection is saved in the App. > Close the App and restart it to establish a new connection.
In Excel® the CSV format is not displayed properly.	Open Excel® and create a new template. Click on the <b>Data</b> tab and activate the <b>From Text</b> menu. Select the CSV file and adopt in the Excel template.

If we have not been able to answer your question, please contact your dealer or Testo Customer Service. For contact details, please visit [www.testo.com/service-contact](http://www.testo.com/service-contact).

## 9.2. Accessories and spare parts

### Printer

Description	Article no.
Bluetooth®/IRDA printer, incl. mains unit 5 V/1.0 A with micro USB cable	0554 0621
Mains unit 5 V/1.0 A with micro USB cable	0554 1105

<b>Description</b>	<b>Article no.</b>
Spare thermal paper for printer (6 rolls)	0554 0568

### **Modular flue gas probes**

<b>Description</b>	<b>Article no.</b>
Modular flue gas probe 180 mm, 500 °C, probe shaft diameter: 8 mm, hose 0.6 m	0600 9780
Modular flue gas probe 300 mm, 500 °C, probe shaft diameter: 8 mm, hose 0.6 m	0600 9781
Modular flue gas probe 180 mm, 500 °C, probe shaft diameter: 6 mm, hose 0.6 m	0600 9782
Modular flue gas probe 300 mm, 500 °C, probe shaft diameter: 6 mm, hose 0.6 m	0600 9783
Modular flue gas probe 180 mm, 500 °C, probe shaft diameter: 8 mm, hose 2.2 m	0600 9760
Modular flue gas probe 300 mm, 500 °C, probe shaft diameter: 8 mm, hose 2.2 m	0600 9761
Flexible flue gas probe 330 mm, $T_{max}$ 180 °C, short-term 200 °C, bending radius max. 90° for measurements in difficult to access locations	0600 9770

### **Probe modules/accessories for modular flue gas probes**

<b>Description</b>	<b>Article no.</b>
Probe shaft module 180 mm, 500 °C, thermocouple 0.5 mm, probe shaft diameter: 8 mm	0554 9760
Probe shaft module 300 mm, 500 °C, thermocouple 0.5 mm, probe shaft diameter: 8 mm	0554 9761
Spare thermocouple for module 0554 9760, 0554 9762	0430 9760
Spare thermocouple for module 0554 9761, 0554 9763	0430 9761
Probe mount testofix®, 8 mm	0554 3006
Cone, 8 mm, steel	0554 3330
Multi-hole probe shaft, length 300 mm, Ø 8 mm, for CO mean value calculation	0554 5762
Multi-hole probe shaft, length 180 mm, Ø 8 mm, for CO mean value calculation	0554 5763



<b>Description</b>	<b>Article no.</b>
Flexible probe shaft module	0554 9770
Hose extension; 2.8 m; extension line probe-instrument	0554 1202
Particle filter, 10 pcs.	0554 3385

### Temperature probe

<b>Description</b>	<b>Article no.</b>
Combustion air temperature (AT) probe, 300 mm	0600 9791
Combustion air temperature (AT) probe, 190 mm	0600 9787
Combustion air temperature (AT) probe, 60 mm	0600 9797
Fast reaction surface probe	0604 0194
Mini ambient air probe	0600 3692

### Other probes

<b>Description</b>	<b>Article no.</b>
O <sub>2</sub> dual wall clearance probe	0632 1260
Gas leak probe	0632 3330
Differential temperature set, 2 pipe wrap probes, adapter	0554 1204
Smoke pump tester, incl. oil, soot plates, for measuring soot in flue gas	0554 0307

### Retrofit/spare sensors

<b>Description</b>	<b>Article no.</b>
O <sub>2</sub> sensor	0393 0002
CO sensor	0393 0051
CO sensor H <sub>2</sub> -compensated	0393 0101
CO <sub>low</sub> sensor	0393 0103
NO sensor	0393 0151
NO <sub>low</sub> sensor	on request

**Cases**

System case with double floor (height: 180 mm) for instrument, probes and accessories	0516 3302
System case (height: 130 mm) for instrument, probes and accessories	0516 3303
System case with tool bag without content	0516 0329

**Other accessories**

<b>Description</b>	<b>Article no.</b>
Mains unit	0554 1096
Spare rechargeable battery	0515 0107
Instrument/PC connecting cable	0449 0047
EasyHeat (PC configuration software)	0554 3332
Additional filter	0133 0010
Flue draught set	0554 3150
Fine pressure probe	0638 0330
Set of capillary hoses	0554 1215
Solid fuel measurement module with adapter and probe shaft with sintered filter	0600 9765
Sintered filter for solid fuel measurement probe shaft	0133 0035
Filter material for condensate trap on solid fuel measurement adapter	0133 0012
NO <sub>x</sub> filter	0554 4150
Pressure test set for gas pipe testing	0554 1213
Straight Pitot tube	0635 2050
ISO calibration certificate for flue gas	0520 0003

For a complete list of all accessories and spare parts, please refer to the product catalogues and brochures or visit our website [www.testo.com](http://www.testo.com)



