



## testo 440 – Climate Measuring Instrument

Instruction manual





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# 1 Safety and disposal

## 1.1 About this document

- The instruction manual is an integral part of the instrument.
- Pay particular attention to the safety instructions and warning advice in order to prevent injury and damage to the product.
- Keep this documentation to hand so that you can refer to it when necessary.
- Hand this instruction manual on to any subsequent users of the product.

## 1.2 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 on the housing, mains unit 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.
- Maintenance work that is not described in this documentation must only be carried out by trained service engineers.
- Temperature information given on probes/sensors relates only to the measuring range of the sensor technology. Do not expose handles and feed lines to temperatures in excess of 70 °C (158 °F), unless they are expressly authorized for use at higher temperatures.
- Do not carry out any contact measurements on uninsulated, live parts.

- Transport and store the instrument only in the associated packaging, in order to prevent any damage to the sensor.

### **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.
- Do not use any leaky or damaged batteries.
- Take the rechargeable battery out of the instrument immediately if it is not functioning properly or if it shows signs of superheating. Rechargeable battery may be hot!
- In the event of contact with battery acid: rinse affected areas thoroughly with water, and if necessary consult a doctor.
- When not in use for a long period of time, take the rechargeable battery out of the instrument to prevent exhaustive discharge.

## 1.3 Warning notices

Always pay attention to any information marked with the following warning notices along with warning pictograms. Implement the specified precautionary measures!

 **DANGER**

Risk of death!

---

 **WARNING**

Indicates possible serious injury.

---

 **CAUTION**

Indicates possible minor injury.

---

**CAUTION**

Indicates possible damage to equipment.

---

## 1.4 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.

## 2 Authorisations and certification

Please find the current country approvals in the attached **Approval and Certification** document.

## 3 Description of the instrument

### 3.1 Use

The testo 440 is used for measuring climate-related parameters. The testo 440 is particularly suitable for comfort level measurements for the workplace evaluation and disturbance measurements in and at air conditioning systems.

The instrument is only to be used by qualified expert personnel.

The product must not be used in potentially explosive atmospheres!

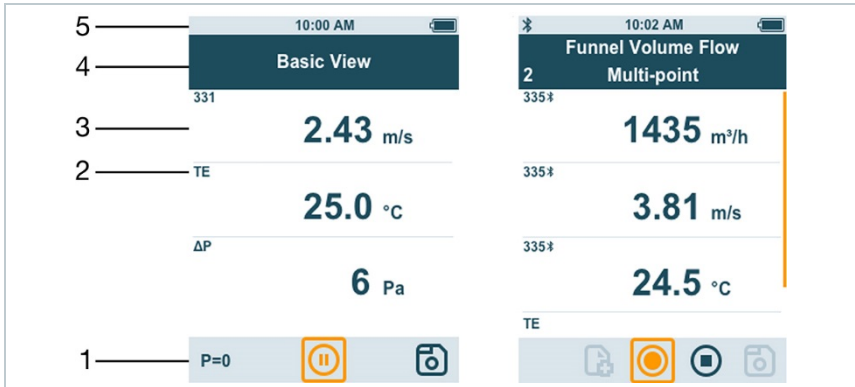


## 3.2 Overview of testo 440



Element	Element
<b>1</b> Settings	<b>2</b> Confirm input/selection
<b>3</b> Menu	<b>4</b> Testo Universal Connector (TUC) for connection of cabled probes with corresponding plug
<b>5</b> Type K thermocouple connection	<b>6</b> Back
<b>7</b> Navigation	<b>8</b> Instrument ON/OFF
<b>9</b> Micro USB port for data transfers or connection to external power supply	<b>10</b> Connections for differential pressure measurements (+ / - labelling on rear of instrument, only testo 440 dP)

### 3.3 Display overview



Element		Element	
1	Check line	2	Probe identification
3	Measuring values	4	Header
5	Status bar		

Symbol	Meaning
	Start measurement
	Stop measurement
	Carry out multi-point measurement
	Pause measurement
	Save measurement
	New measurement
<b>P=0</b>	Zero pressure sensor

### 3.4 Magnetic holder

Two magnets are integrated in the testo 440 measuring instrument. These can be used as a holder on magnetic surfaces.



Element	Element
1 Integrated magnet	2 Battery compartment

#### **⚠ DANGER**

##### **Integrated magnet**

##### **Danger to life for persons with pacemakers!**

- Keep a distance of at least 20 cm between your pacemaker and the measuring instrument.

#### **CAUTION**

##### **Integrated magnet**

##### **Damage to other devices!**

- Keep a safe distance from devices that may be damaged by magnetism (e.g. monitors, computers, credit cards, memory cards, etc.).

## 3.5 Power supply



Element	Element
<b>1</b> Mains connection via micro USB cable (must be connected to the power source). No batteries are required for operation	<b>2</b> Battery compartment - 3 x AA batteries



When connected to a power supply, the rechargeable batteries used will not be recharged.

## 3.6 Probe overview



### 3.6.1 Compatible cable probes

Order number	Name
0635 1032	Hot wire probe including temperature sensor, fixed cable
0635 1572	Hot wire probe including temperature and humidity sensor, fixed cable
0635 9572	Vane probe (Ø 16 mm) including temperature sensor, fixed cable
0635 9372	High-precision vane probe (Ø 100 mm) including temperature sensor, fixed cable
0635 9432	Vane probe (Ø 100 mm) including temperature sensor, fixed cable
0636 9772	High-precision temperature-humidity probe, fixed cable
0636 9775	Robust temperature-humidity probe for temperatures up to +180 °C, fixed cable

### 3 Description of the instrument

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Order number	Name
0636 9732	Temperature-humidity probe, fixed cable
0635 0551	Lux probe
0632 1552	CO <sub>2</sub> probe including temperature and humidity sensor, fixed cable
0632 1272	CO probe, fixed cable
0628 0152	Turbulence probe, fixed cable
0635 9532	Vane probe (Ø 16 mm) fixed cable
0635 1052	Fume cupboard probe, fixed cable

#### 3.6.2 Compatible Bluetooth® probes

Order number	Name
0635 1571	Hot wire probe with Bluetooth®, including temperature and humidity sensor
0635 9571	Vane probe (Ø 16 mm) with Bluetooth®, including temperature sensor
0635 9431	Vane probe (Ø 100 mm) with Bluetooth®, including temperature sensor
0636 9771	High-precision temperature-humidity probe with Bluetooth®
0636 9731	Temperature-humidity probe with Bluetooth®
0632 1551	CO <sub>2</sub> probe with Bluetooth®, including temperature and humidity sensor
0632 1271	CO probe with Bluetooth®

#### 3.6.3 Compatible NTC probes

Order number	Name
0615 1212	Waterproof immersion/penetration probe – with NTC temperature sensor
0615 1712	Robust air probe – with NTC temperature sensor
0615 4611	Temperature probe with Velcro and NTC temperature sensor
0615 5505	Clamp probe with NTC temperature sensor – for measurements on pipes (Ø 6-35 mm)
0615 5605	Pipe wrap probe with NTC temperature sensor – for measurements on pipes (Ø 5-65 mm)

### 3.6.4 Compatible Smart Probes

Order number	Name
0560 1115	testo 115i - clamp thermometer operated by smartphone
0560 1805	testo 805i - infrared thermometer operated by smartphone
0560 1605	testo 605i - thermohygrometer operated by smartphone
0560 1405	testo 405i - thermal anemometer operated by smartphone
0560 1410	testo 410i - vane anemometer operated by smartphone
0560 1510	testo 510i - differential pressure measuring instrument operated by smartphone
0560 1549	testo 549i - high-pressure measuring instrument operated by smartphone

## 4 Operation

### 4.1 Commissioning



The testo 440 is supplied with inserted batteries. The batteries are secured by a battery safety strip.

- 1 Open the battery compartment cover.
  - 2 Remove the battery safety strip.
  - 3 Close the battery compartment cover.
- ▶ The testo 440 is ready for use.



### 4.2 Switching the testo 440 on/off

#### Initial activation




For initial commissioning or after a factory reset, the **Initial Operation** menu is opened automatically. In normal mode, the last menu used is displayed after switching it on.

Language
Deutsch (German)
English
Čeština (Czech)
简体中文 (Chinese)
繁體中文 (Chinese trad.)
Dansk


Date/Time	
Date	Time
Year	◀ 2017 ▶
Month	◀ 12 ▶
Day	◀ 01 ▶
Next	

Units
Units <span style="border: 1px solid black; padding: 2px;">Iso</span> <span style="border: 1px solid black; padding: 2px;">US</span>
Preview
ISO: 20.5 °C 2.5 m/s
Finish




- 1 Press .
- ▶ The **Initial Operation** menu is displayed.
- 2 Make the following settings in sequence:
  - Language [**Language**]
  - Date (year/month/day) and time (format, time) [**Date/Time**]
  - Unit system (ISO/US) [**Units**]
- ▶ The basic settings have been set. They can be adjusted any time in Settings.

### Switching on

- 1 Press .
- ▶ The last active menu when the instrument was switched off is displayed.

### Switching off

- 1 Press and  for at least 3 seconds.
- ▶ The testo 440 switches itself off.

## 4.3 Making basic settings



Use the menu key to go to the testo 440 Settings menu. The following settings are available in this menu:


Menu item	Function/Settings
Basic View	Show current measuring values
Select Application	Select required application for the measurement
Memory	Show and manage saved measurements

Menu item	Function/Settings
Settings	Making basic settings: <ul style="list-style-type: none"><li>- Bluetooth</li><li>- Power Management Ambient Conditions</li><li>- Units</li><li>- Date/time</li><li>- Languages</li><li>- General (instrument and probe status, reset)</li></ul>

### 4.3.1 Establishing a Bluetooth® connection


✓ testo 440 is switched on.

1 Press  and  at the same time for at least 3 seconds.


▶ Bluetooth® is activated or deactivated and  either appears or disappears from the display.

or

✓ You are in the **Settings** menu.

1 Use  to select **Bluetooth**.

2 Use  to enable **Bluetooth**.

▶ Bluetooth® is activated or deactivated and  either appears or disappears from the display.

3 Press  or  to exit the menu.

### 4.3.2 Setting power options



You can manage the energy consumption for your testo 440. The following functions are available for this purpose:

- Auto Off: testo 440 switches off automatically after 5 minutes of inactivity

- Power Saving: the screen brightness is reduced to 10% after a minute; the set brightness is restored by pressing the button
- Brightness: setting the screen brightness from 10% to 100%

✓ You are in the **Settings** menu.

1 Use  to select **Power Management**.

2 Press  or  on the navigation key.

3 Use  to select the required setting and make changes.



If the Auto Off function is enabled, the testo 440 automatically switches itself off after 5 minutes of inactivity.




If the testo 440 is in logger mode, the Auto Off function is automatically deactivated during an active measurement.

4 Press  or  to exit the menu.

### Setting Auto Off

✓ You are in the **Power Management** menu.

1 Use  to select **Auto Off**.

2 Use  to switch the **On** or **Off** function on or off.

3 Press  or  to exit the menu.

### Setting power saving

✓ You are in the **Power Management** menu.

1 Use  to select **Power Saving**.


2 Use  to switch the **On** or **Off** function on or off.

- 3 Press  or  to exit the menu.

### Setting brightness

- ✓ You are in the **Power Management** menu.

- 1 Use  to select **Brightness**.

- 2 Use  to set the brightness.

- 3 Press  or  to exit the menu.



### 4.3.3 Setting the ambient conditions


In the **Ambient Conditions** menu, you can configure the following parameters:


- Ambient Pressure  
Pressure unit: Pa/mbar/hPa/mmH<sub>2</sub>O/inH<sub>2</sub>O/Torr/inHg/kPa/psi
- Ambient temperature  
Unit of temperature: °C/°F

- ✓ You are in the **Settings** menu.

- 1 Use  to select **Ambient Conditions**.

- 2 Press  or  on the navigation key.

- 3 Use  to select the parameters to be modified.

- 4 Use  to configure the parameters to be modified.

- 5 Press  or  to exit the menu.

### 4.3.4 Configuring the unit system


In the **Units** menu, you can switch between the European ISO and American US unit system.

✓ You are in the **Settings** menu.

1 Use  to select the **ISO/US**.

The following units are used depending on what has been selected:

ISO unit	US unit
m/s	fpm
m <sup>3</sup> /h	cfm
°C	°F
wb °C	wb °C
dp °C	dp °F

2 Use  to select the required setting.

3 Press  or  to exit the menu.





When the unit system is changed, the units specified in the Basic View are overwritten.


### 4.3.5 Setting the date and time

You can set the date and time in the **Date/Time** menu. You can set the time in the formats 24 h, PM and AM.

✓ You are in the **Settings** menu.



1 Use  to select the **Date/Time**.

2 Press  or  on the navigation key.

3 Use  to select the required settings.

4 Press  or  to exit the menu.

### 4.3.6 Setting the language


- ✓ You are in the **Settings** menu.
- 4 Use  to select **Language**.
- 5 Press **OK** or ► on the navigation key.
- 6 Use  to select the required **Language**.
- 7 Confirm by clicking **OK**.
- Exit from the menu is automatic and the language is applied.



When the unit system is changed, the units specified in the Basic View are overwritten.

### 4.3.7 Showing general device information

Under the **General** menu item, you will find all of the information about the testo 440 and connected probes. You can also reset the instrument to default settings.

- ✓ You are in the **Settings** menu.
- 1 Use  to select **General**.
- 2 Press **OK** or ► on the navigation key.

The following information can be viewed:

About Device	<ul style="list-style-type: none"><li>- Name</li><li>- Serial Number</li><li>- Firmware Version</li><li>- Battery</li><li>- Memory</li></ul>
About Probe (visible once probe is connected)	<ul style="list-style-type: none"><li>- Probe Name</li><li>- Serial Number</li><li>- Firmware Version</li><li>- Battery</li></ul>

Humidity Adjustment

See Section 3.3.8




### 4.3.8 Humidity adjustment

For humidity adjustment, the measurement parameter of the connected probe is adjusted to the reference value at the two standard adjustment points 11.3% RH and 75.3% RH; any deviations between the measuring value and the nominal value are minimised across the entire measuring range.

The Testo calibration set provides a reference value to calculate the offset for a humidity adjustment.

Humidity adjustment is possible with the following probes:

Order number	Name
0636 9771	High-precision temperature-humidity probe with Bluetooth®
0636 9772	High-precision temperature-humidity probe, fixed cable
0636 9731	Temperature-humidity probe with Bluetooth®
0636 9732	Temperature-humidity probe, fixed cable
0636 9775	Robust temperature-humidity probe for temperatures up to +180 °C, fixed cable

- ✓ testo 440 is switched on and the corresponding probe is connected. Probe is already exposed to reference conditions (e.g. salt pot) for an adequate adjustment time.  
Adjustment time for humidity probe: at least 30 minutes.
- ✓ You are in the **Humidity Adjustment** menu.
- 1 Select the relevant reference point of 11.3 or 75.3% RH with .
- 2 Select the probe to be adjusted.
- 3 Use  to select **Adjust** and confirm with .
- ▶ An information window displays the remaining adjustment time and the adjustment is carried out.
- ▶ An information window displays the text **Adjustment successful**.

4 Press  or  to exit the menu.






After performance of a probe reset, the probe uses the calibration data set by the factory.

---

### 4.3.9 Resetting the instrument or probe to default settings


✓ You are in the **Settings** menu.



4 Use  to select **General**.

5 Press  or  on the navigation key.

6 Use  to select **Reset Device** or **Reset Probe**.

7 Press .

8 Use  to select **Confirm**.

9 Press  or  on the navigation key.

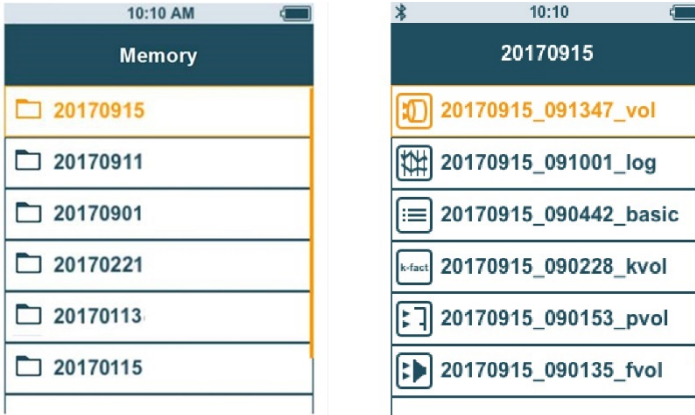
▶ When the instrument is restarted, it will be reset to default settings.

## 4.4 Managing saved measurement data

In the **Memory [Memory]** menu item, all measurements from the application menu are saved with the time and date.

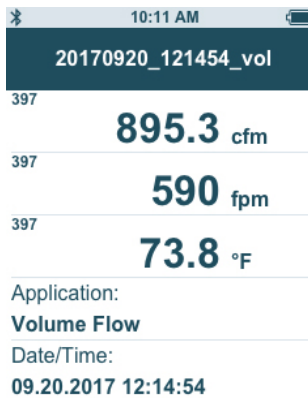
Measurements are saved in the last folder set up. If there is no folder available, one will automatically be set up. Every day, a new folder is automatically set up on the measuring instrument.





### Showing saved measurements

This function can be used to retrieve saved measurement results.

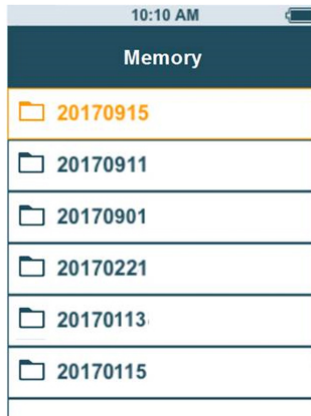


- ✓ You are in the **Memory** menu [Memory].
- 3 Press **OK** or **▶** on the navigation key.
- 4 Use **OK** to select the required folder.
- 5 Press **OK** or **▶** on the navigation key.
- 6 Use **OK** to select the required measurement.



- 7 | Press **OK** or **▶** on the navigation key to display measurement results.

### Creating and deleting folders

This function can be used to create and delete folders for your measurements.







If you delete a folder, you will also delete the measurements it contains.

- ✓ You are in the **Memory** menu [**Memory**].
- 1 | Press  in the folder view.
- ▶ The drop-down menu is displayed.
- 2 | Use  to select either **Create Folder** or **Delete Folder**.
- 3 | Press **OK**.

### Deleting saved measurement data

This function can be used to delete saved measurements.



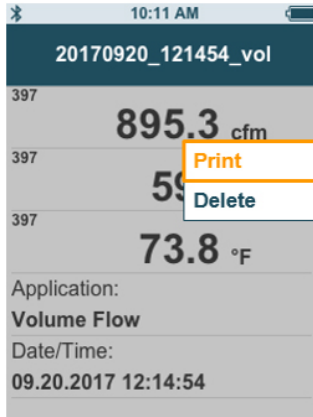
- ✓ You are in the **Memory** menu.
- ✓ You have selected a folder containing measurement data or selected a measurement file with .
- 1 Use  to select the required folder.
- 2 Press **OK**.
- 3 Use  to select the required measurement.
- 4 Press .
- ▶ The drop-down menu is displayed.
- 5 Press **OK** to delete the selected measurement data.


### 4.4.1 Printing

You can print out your measurement protocols directly on site using the Bluetooth® printer (order no. 0554 0621).



Please refer to the relevant instruction manual for details on operating the printer.



- ✓ The Bluetooth® printer is connected to the testo 440.
- 1 Select the required measurement in the memory.
- 2 Press .
- 3 Select **Print** [Print].
  - ▶ The Bluetooth® connection to the printer is automatically established. This process may take a few seconds.
  - ▶ The protocol is printed.



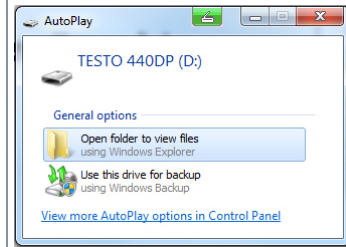
During printing, the testo 440 interrupts the Bluetooth® connection to the connected probe. The connection is automatically restored after printing has finished.

---

### 4.4.2 CSV export

- 1 Connect the testo 440 to your computer using the micro USB cable.
  - ▶ The **AutoPlay** window opens automatically on your screen.

- 2 Click on **Open folder to view files** [Open folder to view files].



- ▶ The window with available file folders opens.

- 3 Click on the required folder.

Name	Date modified	Type	Size
20170907	29.11.2017 10:54	File folder	
20170911	29.11.2017 10:54	File folder	
20170912	29.11.2017 10:54	File folder	
20170913	29.11.2017 10:54	File folder	
20170914	29.11.2017 10:55	File folder	
20170915	29.11.2017 10:55	File folder	
20170920	29.11.2017 10:55	File folder	

- ▶ The window with available files opens.

- 4 Drag the file from the folder to the target folder on your computer.

Name	Date modified	Type	Size
20170907_112006_baseic	29.11.2017 10:56	Microsoft Excel C...	1 KB
20170907_113006_baseic	29.11.2017 10:56	Microsoft Excel C...	1 KB
20170907_103001_log	29.11.2017 10:56	Microsoft Excel C...	1 KB



If your file format is not displayed correctly, this is probably because the language version of your operating system and your device are different.

In this case, please open Excel and the relevant measurement data document on the testo 440 from within Excel. A corresponding Excel wizard enables modification of the file format.

You can add other details about the project to the CSV file.

### Protocol Volume Flow

\*\*\*\*\*

Project	_____	Date:	_____
	_____		
Installation	_____		
	_____		
Contact	_____	Job Number	_____
	_____		

\*\*\*\*\*

### Measurement Information

Application:	Volume Flow	
Date/Time:	10/28/2017	15:32:51
Measuring Type:	Multi-Point	
Measured Points:	4	
Geometry:	Round	
Diameter:	500.0	mm
Area:	250000	mm <sup>2</sup>
Correction Factor:	100%	
Ambient Pressure:	1013.00	hPa



\*\*\*\*\*



## 4.5 Carrying out measurements

### 4.5.1 Connecting the cable probe with testo 440

- 1 | Connect the testo 440 to the probe using the TUC slot.
- 2 | Remove the connector from the instrument to disconnect it.

### 4.5.2 Connecting the Bluetooth® probe with testo 440

- 1 | Activate Bluetooth® using fast activation (press  and  at the same time for a minimum of 3 seconds) or the **Settings** menu (see Section 3.3.1).

- ▶  is displayed.
- ▶  is shown top left on the display, as soon as the probe and testo 440 are connected to each other.



A connection to compatible Bluetooth® probes is automatically searched for and established. Only one probe can be connected to the testo 440 by Bluetooth®.

Please observe the relevant instructions for the probe when commissioning it.

- 2 Press the button on the probe handle.
  - ▶ The LED on the handle flashes yellow. The LED flashes green while the connection is being established.
- 3 Press the button on the probe handle a minimum of 3 seconds to switch the probe off.

### LED status

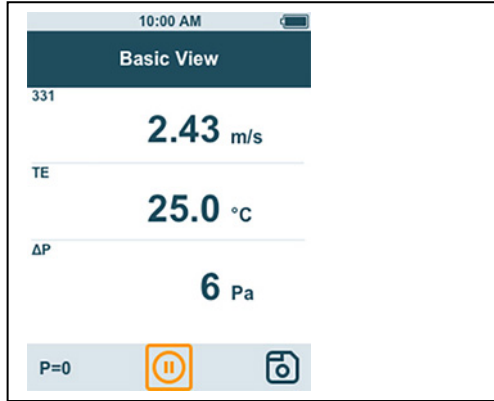
LED status	Description
Flashing red	Low battery status
Flashing yellow	Probe is switched on and searching for the Bluetooth® connection.
Flashing green	The probe is switched on and connected via Bluetooth® to the testo 440.

### 4.5.3 Basic View


In the **Basic View** [Basic View], both current and minimum and maximum measuring values can be read and saved. All compatible probes can be used. For a list of all compatible probes see Section 2.6.

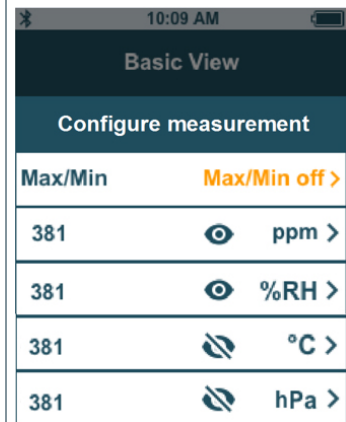
The **maximum** of following probes can be connected at the same time:

- 1x TC
- 1x Bluetooth® probe
- 1x cable probe



Depending on the connected probe, parameters can be configured for the measurement, for example, visibility of individual values or units.

- 1 Press  to open the **Configuration menu** [Configure measurement].



Individual values being hidden does not affect the application, only the Basic View and long-term measurement. The configured units, on the other hand, are also taken up in the application menus.



For the instrument model testo 440 dP, zeroing can also be undertaken in the Basic View.



The accuracy specification applies immediately after zeroing of the sensor. The sensor is affected by changes in position or attachment to magnetic surfaces. Therefore, zero the sensor only in the instrument end position.



## 4.5.4 Selecting application menus

The testo 440 has permanently installed application menus. These enable the user to carry out convenient configuration and implementation of specific measuring tasks.



Available application menus are enabled as soon as a probe is connected. Unavailable application menus are greyed out on the display. More than one probe has to be connected to make some application menus accessible.

The units for the measuring values depend on the ISO/US setting and configuration in the **Basic View**.

## 4.5.5 Volume flow application [Volume Flow]

Use this application to measure the volume flow at the outlet or in a ventilation system duct. There are different options for this. These mainly differ in the measuring range and require corresponding probes:

- Thermal probes (including temperature measurement and possibly humidity measurement) for low flow velocities
- 16 mm wheel measuring head (including temperature measurement) for average flow velocities
- Pitot tube for measurements at high velocities and in heavily contaminated flows with a high particle content

This application menu is accessed by one of the following probes:

Order number	Name
0635 1032	Hot wire probe including temperature sensor, fixed cable
0635 1571	Hot wire probe with Bluetooth®, including temperature and humidity sensor
0635 1572	Hot wire probe with Bluetooth®, including temperature and humidity sensor
0635 9571	Vane probe (Ø 16 mm) with Bluetooth®, including temperature sensor
0635 9572	Vane probe (Ø 16 mm) including temperature sensor, fixed cable
0635 9371	High-precision vane probe (Ø 100 mm) with Bluetooth®, including temperature sensor

Order number	Name
0635 9372	High-precision vane probe (Ø 100 mm) including temperature sensor, fixed cable
0635 9431	Vane probe (Ø 100 mm) with Bluetooth®, including temperature sensor
0635 9432	Vane probe (Ø 100 mm) including temperature sensor, fixed cable
0635 1052	Fume cupboard probe, fixed cable
0560 1405	testo 405i - thermal anemometer operated by smartphone
0560 1410	testo 410i - vane anemometer operated by smartphone



A maximum of 1 Bluetooth® probe and one cable probe can be connected. If two flow probes are connected, the cable probe is used for the volume flow measurement.



### Preparing for measurement

- 1 Press to configure the measurement.

You can set the following parameters:

- Geometry: round, rectangular, area
- Measuring Type: multi-point/timed avg.
- Volume Flow Unit: m<sup>3</sup>/h, cfm, l/s, m<sup>3</sup>/s
- Correction Factor: 1% to 200%




In a multi-point measurement, a mean value is calculated from the individual measuring values.

In a timed average measurement, a mean value is calculated over a certain period.

Several points can be measured. This generates a timed average/multi-point total mean value.

2

Use  to select the required parameter and make settings.

3

Press  or  to exit the menu.

### Carrying out the measurement



A suitable probe is connected to the testo 440.

1

Remove the protective cap from the probe head.



For measurements in flows with a known direction, the arrow mark on the probe head must point in the direction of flow.

2

Move the probe into the flow.

3

Align the probe with the assumed flow axis.

4

Read off the readings.



Low flow velocities may result in greater measurement uncertainty during temperature and humidity measurement.

5

Carry out the measurement and save the measuring values.

## 4.5.6 Funnel volume flow application [Funnel Volume Flow]

A volume flow rate funnel is required to determine the flow rate on ventilation systems. The measurement can be carried out with a compatible vane probe in conjunction with a funnel set. Alternatively, a thermal anemometer can also be used in conjunction with a funnel.

The funnels differ in size. When selecting the funnel, make sure that the opening of the funnel covers the grille completely and tightly.

The application menu is enabled by one of the following probes:

Order number	Name
0635 1032	Hot wire probe including temperature sensor, fixed cable
0635 1571	Hot wire probe with Bluetooth®, including temperature and humidity sensor
0635 1572	Hot wire probe including temperature and humidity sensor, fixed cable
0635 9571	Vane probe (Ø 16 mm) with Bluetooth®, including temperature sensor
0635 9572	Vane probe (Ø 16 mm) including temperature sensor, fixed cable
0635 9371	High-precision vane probe (Ø 100 mm) with Bluetooth®, including temperature sensor
0635 9372	High-precision vane probe (Ø 100 mm) including temperature sensor, fixed cable
0635 9431	Vane probe (Ø 100 mm) with Bluetooth®, including temperature sensor
0635 9432	Vane probe (Ø 100 mm) including temperature sensor, fixed cable
0635 1052	Fume cupboard probe, fixed cable
0560 1405	testo 405 i - thermal anemometer operated by smartphone



A maximum of 1 Bluetooth® probe and one cable probe can be connected. If two flow probes are connected, a cable probe is used for the funnel volume flow.



## Preparing for measurement

- 1 Press  to configure the measurement.

You can set the following parameters:

- Measuring Type: multi-point/timed avg.
- Volume Flow Unit: m<sup>3</sup>/h, cfm, l/s, m<sup>3</sup>/s
- Correction Factor: 1% to 200%



In a multi-point measurement, a mean value is calculated from the individual measuring values.

In a timed average measurement, a mean value is calculated over a certain period.

Several points can be measured. This generates a timed average/multi-point total mean value.

- 2 Use  to select the required parameter and make settings.

- 3 Press  or  to exit the menu.

## Carrying out the measurement

- ✓ A suitable probe is connected to the measuring instrument.
- 1 Place the flow hood tightly on the air outlet. The flow hood must fully cover the air outlet.
  - 2 Carry out the measurement and save the measuring values.

### 4.5.7 Pitot volume flow application [Pitot Volume Flow]

The Pitot volume flow measurement is suitable for high velocities and flows with a high particle content.



The application menu can only be accessed with testo 440 dP or used in combination with a testo 510i with Bluetooth®.



### Preparing for measurement

1 Press  to configure the measurement.

You can set the following parameters:

- Geometry: round, rectangular or area
- Measuring Type: multi-point/timed avg.
- Units: mm or cm, mm<sup>2</sup> or cm<sup>2</sup>
- Pitot Tube Factor: 0.00 to 1.00
- Correction Factor: 1% to 200%
- Volume Flow Unit: m<sup>3</sup>/h, cfm, l/s, m<sup>3</sup>/s



The Pitot tube factor for Pitot tubes is generally the same and must be entered prior to starting measurement:

- Prandtl Pitot tubes (0635 2045, 0635 2145, 0635 2345): Pitot tube factor: 1.00
- Straight Pitot tubes (0635 2043, 0635 2143, 0635 2243): Pitot tube factor: 0.67
- Air flow velocity matrix (0699 7077): Pitot tube factor: 0.82

For Pitot tubes from other manufacturers, refer to the instruction manual for the Pitot tube factor or ask your supplier.






In a multi-point measurement, a mean value is calculated from the individual measuring values.

In a timed average measurement, a mean value is calculated over a certain period.

---

Several points can be measured. This generates a timed average/multi-point total mean value.

---

- 2 | Use  to select the required parameter and make settings.
- 3 | Press  or  to exit the menu.

### Carrying out the measurement

- ✓ A suitable probe is connected to the measuring instrument.
- 1 | Define the channel parameters in the application menu.
- 



Observe the minimum clearances to points of discontinuity:

- From points of discontinuity upstream of the flow, observe a clearance of at least six times the hydraulic diameter  $D_h = 4A/U$  (A: channel cross-section, U: channel circumference).
  - From points of discontinuity downstream of the flow, observe a clearance of at least twice the hydraulic diameter  $D_h = 4A/U$  (A: channel cross-section, U: channel circumference).
- 

- 2 | Insert the Pitot tube in the channel.
- 3 | Carry out the measurement and save the measuring values.

## 4.5.8 K-factor volume flow application [K-Factor Volume Flow]

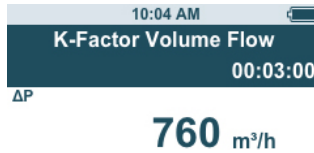
The testo 440 can determine the volume flow by measuring the reference resistance and input of the K-factor. This allows the testo 440 to remain connected to the air outlet during adjustment work and the changes in volume flow can be read directly on the display.

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The application menu can only be accessed with testo 440 dP or used in combination with a testo 510i with Bluetooth®.

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This process for determining volume flow can always be used when there are appropriate specifications available from the component manufacturer. In line with these specifications, the differential pressure is measured at a position specified by the manufacturer or supplier. The volume flow is determined from the differential pressure via a component-specific K-factor using the following mathematical equation:

$$v = k * \sqrt{\Delta P}$$

### Prepare for measurement

- 1 Press  to configure the measurement.

You can make the following settings:

- Measuring Type: multi-point/timed avg.
- K-Factor: from 0.01 to 999.99
- Unit k-Factor: Pa, kPa, hPa, mbar, psi, mmH<sub>2</sub>O, mmHg, inH<sub>2</sub>O, inHg, Torr
- Volume Flow Unit: m<sup>3</sup>/h, cfm, l/s, m<sup>3</sup>/s






In a multi-point measurement, a mean value is calculated from the individual measuring values.

In a timed average measurement, a mean value is calculated over a certain period.

Several points can be measured. This generates a timed average/multi-point total mean value.

---



- 2 Use  to select the required parameter and make settings.
- 3 Press  or  to exit the menu.

### Carrying out the measurement

- 1 Position the testo 440 ready for measurement and stabilise.
- 2 Carry out the measurement and save the measurement results.

## 4.5.9 Heating/cooling load application

### [Heating/Cooling Load]

Use this application to calculate the heating/cooling load of a thermal installation.

The Application menu is enabled by two of the following probes:

Order number	Name
0636 9771	High-precision temperature-humidity probe with Bluetooth®
0636 9772	High-precision temperature-humidity probe, fixed cable
0636 9775	Robust temperature-humidity probe for temperatures up to +180 °C, fixed cable
0636 9731	Temperature-humidity probe with Bluetooth®
0636 9732	Temperature-humidity probe, fixed cable
0632 1551	CO2 probe with Bluetooth®, including temperature and humidity sensor
0632 1552	CO2 probe including temperature and humidity sensor, fixed cable
0560 1605	testo 605 i - a thermohygrometer operated by smartphone



A minimum of two probes are to be connected in each combination via Bluetooth® and cable.



### Preparing for measurement

- 1 Press  to configure the measurement.

You can set the following parameters:




- SA Probe ID
- RA Probe ID
- Measuring Type: multi-point/timed avg.
- Volume Flow Unit: m<sup>3</sup>/h, cfm, l/s, m<sup>3</sup>/s
- Volume flow: 0.0 to 99999.0
- Heating/Cooling Load Unit: kW, BTU/h



In a multi-point measurement, a mean value is calculated from the individual measuring values.

In a timed average measurement, a mean value is calculated over a certain period.

Several points can be measured. This generates a timed average/multi-point total mean value.

- 2 Use  to select the required parameter and make settings.
- 3 Press  or  to exit the menu.

### Carrying out the measurement

- ✓ Two suitable probes are connected to the measuring instrument.

- 1 | Place the SA-configured probes in the supply air of your system.
- 2 | Place the RA-configured probes in the exhaust air of your system.
- 3 | The humidity and temperature values for supply air and exhaust air are shown on the display with the heating/cooling load calculated from these.
- 4 | Carry out the measurement and save the measuring values.

## 4.5.10 Mould indication application [Mould Indication]

Use this application to measure the risk of mould in rooms.

The application menu is enabled by the following probes:

Order number	Name
0636 9771	High-precision temperature-humidity probe with Bluetooth®
0636 9772	High-precision temperature-humidity probe, fixed cable
0636 9731	Temperature-humidity probe with Bluetooth®
0636 9732	Temperature-humidity probe, fixed cable
0632 1551	CO2 probe with Bluetooth®, including temperature and humidity sensor
0632 1552	CO2 probe including temperature and humidity sensor, fixed cable
0615 1712	Robust air probe – with NTC temperature sensor
0615 4611	Temperature probe with Velcro and NTC temperature sensor
0560 1805	testo 805i - infrared thermometer operated by smartphone
TE (independent of manufacturers)	

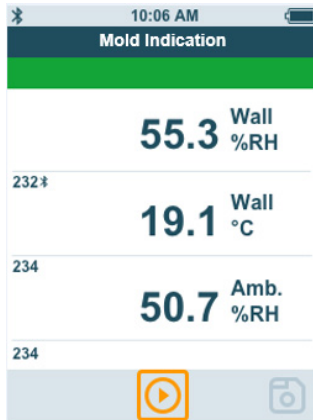


A minimum of 1 temperature probe (TE, NTC, 805i) and 1 humidity probe is to be connected via Bluetooth® and cable.


Only one probe can be connected to the testo 440 by Bluetooth®.

The display shows the risk of mould using the traffic light system.

Display	Meaning
Green	Low risk
Yellow	Medium risk
Red	High risk






### Preparing for measurement

- 1 Press  to configure the measurement.  
If a testo 805i is used, the following settings can be made:
  - Emissivity



Please refer to the testo 805i instruction manual for detailed information on emissivity.

- 2 Use  to select the required parameter and make settings.
- 3 Press  or  to exit the menu.

### Carrying out the measurement

- ✓ A suitable probe is connected to the measuring instrument.
- 1 Take a humidity measurement in the room.

- 2 | Take a temperature measurement at the spot where there is a presumed risk of mould.
  - ▶ | The risk of mould is indicated by a colour indicator on the display.
- 3 | Save the measurement.

## 4.5.11 Turbulence measurement application

### [Draught Rate]

With this application menu, the measurement of the degree of turbulence and draught can be determined in accordance with DIN EN 13779 or DIN EN ISO 7730.

The measurement is carried out automatically over a period of 3 minutes. For ideal implementation, we recommend the use of:

Order number	Name
0554 1590	Measuring tripod for comfort level measurements with standard-compliant positioning of probes (including case)

The application menu is enabled by the following probe:

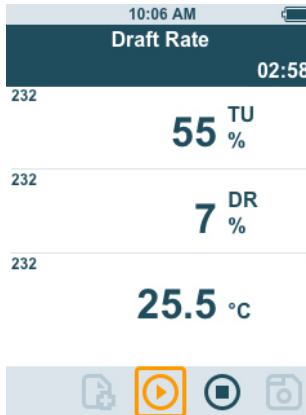
Order number	Name
0628 0152	Turbulence probe, fixed cable



The probe requires a warm-up period of around 3 seconds after connection to the testo 440. Carry out the measurement after this.

The display shows the draught rate using the traffic light system.

Display	Meaning
Green	Draught rate 0-20%
Yellow	Draught rate 21-30%
Red	Draught rate 31-100%



### Carrying out the measurement

- ✓ A suitable probe is connected to the measuring instrument.
- 1 Attach the probe to the tripod for the best measuring task result.
- 2 Carry out the measurement and save the measuring values.

### 4.5.12 Performing long-term measurement application [Logger Mode]

This application menu allows you to record measurement data over a user-defined period of time at a specified interval.

All compatible probes can be used.

The **maximum** of following probes can be active at the same time:


- 1x TC
- 1x Bluetooth® probe
- 1x cable probe



1 Press  to configure the measurement.

You can make the following settings:

- Measuring interval: in s
- Measurement duration: in hrs and min

2 Use  to select the required parameter and make settings.

3 Press  or  to exit the menu.



The maximum measurement period depends on the condition of the battery, how much free memory there is and the probe used. This is displayed during configuration.



testo recommends using an external power supply for each micro USB in the case of particularly long measurements. It is then possible to record significantly longer measurement series.  
0554 1105 - USB mains unit including cable

## 5 Maintenance

### 5.1 Battery replacement

- 1 | Open the battery compartment cover.



- 2 | Replace the batteries. Observe the polarity!



Only use new branded batteries. If a partially exhausted battery is inserted, the battery capacity will not be calculated correctly.

- 3 | Close the battery compartment cover.

- ▶ | The testo 440 is ready for use.

### 5.2 Cleaning testo 440



Never use abrasive cleaning agents or solvents; instead use household detergent or soapy water.



Always keep the connections clean and free of grease and other deposits.

- 1 | Clean the unit with a damp cloth and dry it.
- 2 | If necessary, clean all the connections using a damp cloth.

### 5.3 Calibration



The probe and the handle are supplied with a factory calibration certificate as standard.

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In many applications, it is recommended that you recalibrate the probe with the handle and the testo 440 once a year.

This can be carried out by Testo Industrial Services (TIS) or other certified service providers.

Please contact Testo for further information.

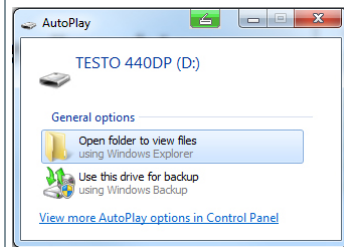
## 5.4 Carrying out a firmware update



Information on current firmware for testo 440 can be found at [www.testo.com](http://www.testo.com) on the product page.

- ✓ You have downloaded the firmware file to your computer.
- 1 Connect the testo 440 to your computer using the micro USB cable.
- ▶ The **AutoPlay** window opens automatically.

- 2 Click on **Open folder [Open folder to view files]** to view files.



- ▶ The window with available file folders opens.
- 3 Drag the firmware file to the open window.

Name	Date modified	Type	Size
20170907	29.11.2017 10:54	File folder	
20170911	29.11.2017 10:54	File folder	
20170912	29.11.2017 10:54	File folder	
20170913	29.11.2017 10:54	File folder	
20170914	29.11.2017 10:55	File folder	
20170915	29.11.2017 10:55	File folder	
20170920	29.11.2017 10:55	File folder	

- ▶ The copying process is completed.
- 4 Disconnect the testo 440 from the computer.
- 5 Switch the testo 440 off and then on again.
- ▶ The firmware is automatically installed.

## 6 Technical data

Temperature (NTC)	testo 440	testo 440 dP
Measuring range	-40 to +150 °C	
Accuracy ( $\pm 1$ digit) at 22 °C	$\pm 0.4$ °C (-40 to -25.1 °C) $\pm 0.3$ °C (-25 to +74.9 °C) $\pm 0.4$ °C (+75 to +99.9 °C) $\pm 0.5\%$ of m.v. (remaining meas. range)	
Resolution	0.1 °C	

Temperature (TE)	testo 440	testo 440 dP
Measuring range	-200 to +1370 °C	
Accuracy ( $\pm 1$ digit)	$\pm(0.3$ °C + 0.3% of m.v.) $\pm 0.5$ °C for cold junction	
Resolution	0.1 °C	

Pressure	testo 440	testo 440 dP*
Measuring range	-	-150 to +150 hPa
Accuracy ( $\pm 1$ digit) at 22 °C		$\pm 0.05$ hPa (0 to +1.00 hPa) $\pm 0.2$ hPa + 1.5% of m.v. (1.01 to 150 hPa)
Resolution		0.01 hPa

\* The accuracy specification applies immediately after zeroing of the sensor. The sensor is affected by changes in position or attachment to magnetic surfaces. Therefore, zero the sensor only in the instrument end position.

Probe connections	testo 440	testo 440 dP
Type K thermocouple connection		1x
Testo Universal Connector (TUC) for connection of cabled probes with corresponding plug		1x
Bluetooth® probe	1x digital Bluetooth® probe or testo Smart Probe	
Differential pressure	-	+

Technical data	testo 440	testo 440 dP
Operating temperature	-20 to +50 °C	

Technical data	testo 440	testo 440 dP
Storage temperature		-20 to +50 °C
Bluetooth® range (latest generation testo climate probes with Bluetooth®)		20 m free field
Bluetooth® range (Smart Probes)		3 m free field
Battery type		3 x AA batteries
Battery life		12 hours
Weight		250 g
Dimensions		154 x 65 x 32 mm

Connected probe (order no.)	Name	Battery life*
0635 1032	Hot wire probe including temperature sensor, fixed cable	8 hrs
0635 1572	Hot wire probe including temperature and humidity sensor, fixed cable	8 hrs
0635 9532	Vane probe (Ø 16 mm) fixed cable	11 hrs
0635 9372	High-precision vane probe (Ø 100 mm) including temperature sensor, fixed cable	10 hrs
0635 9432	Vane probe (Ø 100 mm) including temperature sensor, fixed cable	10 hrs
0636 9772	High-precision temperature-humidity probe, fixed cable	12 hrs
0636 9775	Robust temperature-humidity probe for temperatures up to +180 °C, fixed cable	12 hrs
0636 9732	Temperature-humidity probe, fixed cable	12 hrs
0635 0551	Lux probe	11 hrs
0632 1552	CO2 probes including temperature and humidity sensor, fixed cable	8 hrs
0632 1272	CO probe, fixed cable	11 hrs
0628 0152	Turbulence probe, fixed cable	9 hrs
0635 1052	Fume cupboard probe, fixed cable	9 hrs

\* All information at 22 °C, 50% screen brightness, power saving mode ON, Auto-Off off.

## 7 Tips and assistance

### 7.1 Questions and answers

#### 7.1.1 LED status Bluetooth® probe

LED status	Description
Flashing red	Low battery status
Flashing yellow	Probe is switched on and searching for the Bluetooth® connection.
Flashing green	Probe is switched on and connected with Bluetooth®.

#### 7.1.2 Hot wire measurement not possible

Before measurement, the cap must be opened on the hot wire probe.

### 7.2 Accessories and spare parts

#### Bluetooth® probe

Order number	Name
0635 1571	Hot wire probe with Bluetooth®, including temperature and humidity sensor
0635 9571	Vane probe (Ø 16 mm) with Bluetooth®, including temperature sensor
0635 9371	High-precision vane probe (Ø 100 mm) with Bluetooth®, including temperature sensor
0635 9431	Vane probe (Ø 100 mm) with Bluetooth®, including temperature sensor
0636 9771	High-precision temperature-humidity probe with Bluetooth®
0636 9731	Temperature-humidity probe with Bluetooth®
0632 1551	CO <sub>2</sub> probe with Bluetooth®, including temperature and humidity sensor
0632 1271	CO probe with Bluetooth®

**Cable probe**

Order number	Name
0635 1032	Hot wire probe including temperature sensor, fixed cable
0635 1572	Hot wire probe including temperature and humidity sensor, fixed cable
0635 9572	Vane probe (Ø 16 mm) including temperature sensor, fixed cable
0635 9372	High-precision vane probe (Ø 100 mm) including temperature sensor, fixed cable
0635 9432	Vane probe (Ø 100 mm) including temperature sensor, fixed cable
0636 9772	High-precision temperature-humidity probe, fixed cable
0636 9775	Robust temperature-humidity probe for temperatures up to +180 °C, fixed cable
0636 9732	Temperature-humidity probe, fixed cable
0635 0551	Lux probe
0632 1552	CO <sub>2</sub> probe including temperature and humidity sensor, fixed cable
0632 1272	CO probe, fixed cable
0628 0152	Turbulence probe, fixed cable
0635 9532	Vane probe (Ø 16 mm) fixed cable
0635 1052	Fume cupboard probe, fixed cable

For more accessories, please visit the testo 440 product page at:  
[www.testo.com/testo440](http://www.testo.com/testo440).



**Testo SE & Co. KGaA**  
Testo-Straße 1, 79853 Lenzkirch  
Telefon: +49 7653 681-0  
Fax: +49 7653 681-100  
E-Mail: [info@testo.de](mailto:info@testo.de)  
Internet: [www.testo.com](http://www.testo.com)