

testo 175 · Data loggers

Instruction manual



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2 Safety and the environment

2.1. About this document

Use

- > Please read this documentation through carefully and familiarize yourself with the product before putting it to use. Pay particular attention to the safety instructions and warning advice in order to prevent injuries and damage to the products.
- > Keep this document to hand so that you can refer to it when necessary.
- > Hand this documentation on to any subsequent users of the product.

Symbols and writing standards

Representation	Explanation
	Warning advice, risk level according to the signal word: Warning! Serious physical injury may occur. Caution! Slight physical injury or damage to the equipment may occur. > Implement the specified precautionary measures.
i	Note: Basic or further information.
1. ...	Action: more steps, the sequence must be followed.
2. ...	
> ...	Action: a step or an optional step.
- ...	Result of an action.
Menu	Elements of the instrument, the instrument display or the program interface.
[OK]	Control keys of the instrument or buttons of the program interface.
... ...	Functions/paths within a menu.
“...”	Example entries

2.2. Ensure safety

- > Only operate the product properly, for its intended purpose and within the parameters specified in the technical data. Do not use any force.
- > Never use the instrument to measure on or near live parts.
- > Before each measurement check that the connections are correctly closed with blanking plugs or that appropriate sensors have been correctly plugged in. The protection class in the technical data specified for the corresponding instrument may otherwise not be reached.
- > testo 175 T3 : The maximum permissible difference in potential between the sensor inputs is 50 V. Take this into account when using surface sensors with non-isolated thermocouple.
- > After the final measurement, allow probes and probe shafts to cool down sufficiently in order to avoid burns from the hot sensor tip or the probe shaft.
- > Temperatures given on probes/sensors relate only to the measuring range of the sensors. Do not expose handles and feed lines to any temperatures in excess of 70 °C unless they are expressly permitted for higher temperatures.
- > Carry out only the maintenance and repair work on this instrument that is described in the documentation. Follow the prescribed steps exactly. Use only original spare parts from Testo.

2.3. Protecting the environment

- > Dispose of faulty rechargeable batteries/spent batteries in accordance with the valid legal specifications.
- > At the end of its useful life, send the product to the separate collection for electric and electronic devices (observe local regulations) or return the product to Testo for disposal.

3 Specifications

3.1. Use

Data loggers testo 175 are used to store and to read out individual readings and measurement series.

With testo 175 measurement values are measured, saved and transmitted to the PC via USB cable or SD card, where they can be read out and analysed with the software testo Comfort Software. With the software the data loggers can also be individually programmed.

Typical applications

testo 175 T1 and testo 175 T2 are optimally suitable for temperature measurements in refrigerators, freezers, cold-storage rooms and cooling shelves.

testo 175 T3 records two temperatures at the same time and is most suitable e.g. for monitoring the temperature spreading between feed and return flow in a heating system.

testo 175 H1 controls the climatic conditions e.g. in warehouses, offices and in the production area.

3.2. Technical data

testo 175 T1 (0572 1751)

Feature	Values
Measurement parameter	Temperature (°C/°F)
Sensor type	NTC temperature sensor internal
Measurement range	-35 to +55 °C
System accuracy	±0.5 °C (-35 to +55 °C) ± 1 digit
Resolution	0.1 °C
Operating temperature	-35 to +55 °C
Storage temperature	-35 to +55 °C

Feature	Values
Measurement parameter	Temperature (°C/°F)
Battery type	3x battery type AAA or Energizer L92 AAA-size cells
Life	3 years (15 min. measuring cycle, +25 °C)
Degree of protection	IP 65
Dimensions in mm (LxWxH)	89 x 53 x 27 mm
Weight	130g
Housing	ABS/PC
Measuring cycle	10s - 24h (freely selectable)
Interface	Mini-USB, SD card slot
Memory capacity	1 million readings
Warranty	24 months, warranty conditions: see website www.testo.com/warranty
EC Directive	2004/108/EC, complies with the EN standard 12830 ¹

testo 175 T2 (0572 1752)

Feature	Values
Measurement parameter	Temperature (°C/°F)
Sensor type	NTC temperature sensor internal and external
Measurement range	-35 to +55 °C internal -40 to +120 °C external

¹ Please note that, according to EN 12830, this instrument must be regularly checked and calibrated as specified in EN 13486 (recommendation: every year) Contact us for more information.

Feature	Values
Measurement parameter	<u>Temperature</u> (°C/°F)
System accuracy	±0.5 °C (-35 to +55 °C) ± 1 digit
Instrument accuracy	±0.3 °C (-40 to +120 °C) ± 1 digit
Resolution	0.1 °C
Operating temperature	-35 to +55 °C
Storage temperature	-35 to +55 °C
Battery type	3x battery type AAA or Energizer L92 AAA-size cells
Life	3 years (15 min. measuring cycle, +25 °C)
Degree of protection	IP 65
Dimensions in mm (LxWxH)	89 x 53 x 27 mm
Weight	130g
Housing	ABS/PC
Measuring cycle	10s - 24h (freely selectable)
Interface	Mini-USB, SD card slot
Memory capacity	1 million readings
Warranty	24 months, warranty conditions: see website www.testo.com/warranty
EC Directive	2004/108/EC, complies with the EN standard 12830 ²

² Please note that, according to EN 12830, this instrument must be regularly checked and calibrated as specified in EN 13486 (recommendation: every year) Contact us for more information.

testo 175 T3 (0572 1753)

Feature	Values
Measurement parameter	Temperature (°C/°F)
Sensor type	2 thermocouples (type K or T) external
Measurement range	-50 to +400 °C (type T) -50 to +1000 °C (type K)
Instrument accuracy	±0.5 °C (-50 to +70 °C) ± 1 digit ± 0.7% of the measurement value (+70.1 to +1000 °C) ± 1 digit
Resolution	0.1 °C
Operating temperature	-20 to +55 °C
Storage temperature	-20 to +55 °C
Battery type	3x battery type AAA or Energizer L92 AAA-size cells
Life	3 years (15 min. measuring cycle, +25 °C)
Degree of protection	IP 65
Dimensions in mm (LxWxH)	89 x 53 x 27 mm
Weight	130g
Housing	ABS/PC
Measuring cycle	10s - 24h (freely selectable)
Interface	Mini-USB, SD card slot
Memory capacity	1 million readings
Warranty	24 months, warranty conditions: see website www.testo.com/warranty
EC Directive	2004/108/EC

testo 175 H1 (0572 1754)

Feature	Values
Measurement parameter	Temperature (°C/°F), moisture (%rF /%RH/ °Ctd/ g/m ³)
Sensor type	NTC temperature sensor, capacitive humidity sensor
Number of measuring channels	2x internal (stubs)
Measuring ranges	-20 to +55 °C -40 to +50 °Ctd 0 to 100 %rF (not for condensing atmosphere) ³
System accuracy ⁴	±2%rF (2 to 98%rF) at 25 °C ±0.03 %rF/K ± 1 digit ±0.4 °C (-20 to +55 °C) ± 1 digit
Long-term drift of the sensor under normal conditions	<1 %RH/year (ambient temperature +25 °C)
Usage conditions	All specifications call for an atmosphere with a percentage of harmful gases that does not exceed the maximum allowable concentration (MAC). A higher percentage of harmful gases (e.g. ammonia or hydrogen peroxide) may result in damage to the sensor.
Resolution	0.1 %rF, 0.1 °C
Operating temperature	-20 to +55 °C
Storage temperature	-20 to +55 °C
Battery type	3x battery type AAA or Energizer L92 AAA-size cells

³ Long-term condensation in the system may result in damage to the measuring instrument.

⁴ The use of sintered caps may affect the response time of the sensor.

Feature	Values
Measurement parameter	Temperature (°C/°F), moisture (%rF /%RH/ °Ctd/ g/m ³)
Life	3 years (15 min. measuring cycle, +25 °C)
Degree of protection	IP 54
Dimensions in mm (LxWxH)	149 x 53 x 27 mm
Weight	130g
Housing	ABS/PC
Measuring cycle	10s - 24h (freely selectable)
Interface	Mini-USB, SD card slot
Memory capacity	1 million readings
Warranty	24 months, warranty conditions: see website www.testo.com/warranty
EC Directive	2004/108/EC

Battery life

The programming windows of the software provide you with typical guide values for the expected lifetime of the battery. This lifetime is calculated on the basis of the following factors:

- Measuring cycle
- Number of connected sensors

Since the battery life depends on quite a few other factors, the calculated data can only serve as guide values.

The following factors have a negative effect on the battery life:

- longer flashing of the LEDs
- frequent reading out (several times per day) via the SD-card
- extreme fluctuations in operating temperature

The following factors have a positive effect on the battery life:

- display switched off

The battery capacity reading in the display of the data logger is based on the calculated values. However, the

data logger is switched off when a critical voltage level has been reached. It may therefore happen that:

- readings are still recorded, even though the battery capacity reading says "empty".
- the measurement program is stopped, even though the battery capacity reading just before indicated a still remaining battery capacity.

In case of an empty battery or a battery change saved readings will not be lost.

4 First steps

4.1. Unlock the data logger



1. Open the lock with the key (1).
2. Remove the lock (2) from the locking pin.
3. Pull the locking pin (3) out of the holes in the wall bracket.
4. Slide the data logger out of the wall bracket (4).

4.2. Inserting batteries

i In order to reach the battery life under application temperatures below $-10\text{ }^{\circ}\text{C}$ you should use Energizer L92 AAA-size cells.

1. Place the data logger on its front.



2. Loosen the screws on the back of the data logger.
 3. Remove the battery compartment cover.
 4. Insert the batteries (type AAA). Observe the polarity!
 5. Place the battery compartment cover on the battery compartment.
 6. Tighten the screws.
- The display shows **rST**.

4.3. Connecting the data logger to PC

For testo Comfort Software Basic 5:

The software is available in the Internet as a free download requiring registration: www.testo.com/download-center.

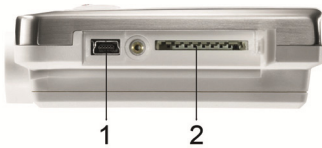
i The instructions for the installation and operation of the software can be found in the testo Comfort Software Basic 5 instruction manual, which can be downloaded together with the software.

i The software can be ordered on CD (article-no: 0572 0580), if the download from the Internet is not desired.

For testo Comfort Software Professional und testo Comfort Software CFR:

- > Insert the CD into the CD-ROM drive.
1. Install the software testo Comfort Software.
 2. Connect the USB cable to a free USB port on the PC.
 3. Loosen the screw on the right side of the data logger.

4. Open the cover.



5. Plug the USB cable into the Mini USB port (1).
6. Configure the [data logger](#), see separate operating instructions testo Comfort Software.

5 Display and control elements

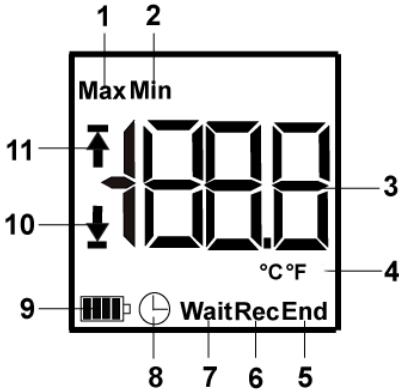
5.1. Display

i The display function can be switched on/off via the software testo Comfort Software.

Depending on the operating status, various information may be shown in the display. A detailed representation of the information that can be called up can be found under Menu overview page 20.

i For technical reasons the display speed of liquid crystal displays becomes slower at temperatures below 0 °C (approx. 2 seconds at -10 °C, approx. 6 seconds at -20 °C). This has no influence on the measuring accuracy.

testo 175 T1



- 1 Highest saved reading
- 2 Lowest saved reading
- 3 Reading
- 4 Units
- 5 Measurement program over
- 6 Measurement program running
- 7 Wait for start of measurement program
- 8 Start criterion Date/ Time programmed
- 9 Battery capacity

Icon	Capacity
	>151 days
	<150 days
	<90 days
	<60 days
	<30 days
	> Read out data and change battery (see Reading out measurement data page 24).

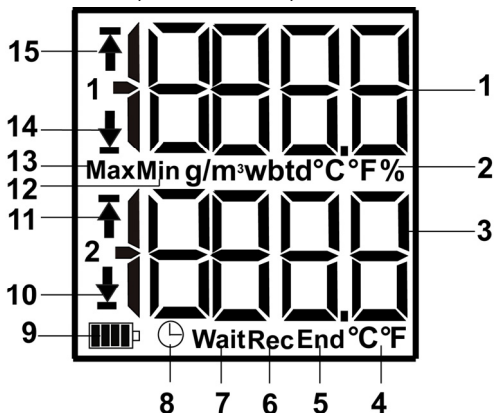
10 Lower alarm value

- Flashes: programmed alarm value is shown
- Lights: programmed alarm values were fallen short of

11 Upper alarm value


- Flashes: programmed alarm value is shown
- Lights: programmed alarm values were exceeded

testo 175 T2, testo 175 T3, testo 175 H1



- 1 Reading channel 1
- 2 Units channel 1
- 3 Reading channel 2
- 4 Units channel 2
- 5 Measurement program over
- 6 Measurement program running
- 7 Wait for start of measurement program
- 8 Start criterion Date/ Time programmed
- 9 Battery capacity

Icon	Capacity
	>151 days
	<150 days
	<90 days
	<60 days
	<30 days

Icon	Capacity
	<30 days > Read out data and change battery (see Reading out measurement data page 24).

10 Lower limit value channel 2:

- Flashes: programmed alarm value is shown
- Lights: programmed alarm values were fallen short of

11 Upper limit value channel 2:

- Flashes: programmed alarm value is shown
- Lights: programmed alarm values were exceeded

12 Lowest saved reading

13 Highest saved reading

14 Lower limit value channel 1:

- Flashes: programmed alarm value is shown
- Lights: programmed alarm values were fallen short of

15 Upper limit value channel 1:

- Flashes: programmed alarm value is shown
- Lights: programmed alarm values were exceeded

5.2. LED

Representation	Explanation
Red LED flashes once every 10 seconds	Remaining battery capacity has dropped below 30 days
Red LED flashes twice every 10 seconds	Remaining battery capacity has dropped below 10 days
Red LED flashes three times every 10 seconds	Battery is empty:
Red LED flashes three times when pressing the button	Limiting value was exceeded/fallen short of

Representation	Explanation
Yellow LED flashes three times	Instrument changes from Wait-mode to Rec-mode.
Yellow LED flashes three times when pressing the button	Instrument is in Rec-mode
Green and yellow LED flash three times when pressing the button.	Instrument is in End-mode
Green LED flashes three times when pressing the button	Instrument is in Wait-mode
Green LED flashes five times when pressing the button	Long pressing of the GO button has set a time mark.
Green, yellow and red LED flash in succession	The battery has been changed.

5.3. Key functions

A detailed representation of the display readings can be found under Menu overview page 20.

- ✓ Instrument in operating status **Wait** and start criterion Button start programmed.
- > Press **[GO]** for approx. 3 seconds to start the measurement program.
- The measurement program starts and **Rec** appears in the display.
- ✓ Instrument is in operating status **Wait**:
- > Press **[GO]** in order to change between displays of upper alarm value, lower alarm value, battery life and last reading.

The displays appear in the specified sequence.

- ✓ Instrument is in operating status **Rec** or **End**:
- > Press **[GO]** in order to change between displays of highest saved reading, lowest saved reading, upper alarm value, lower alarm value, battery life and last reading.

The displays appear in the specified sequence.

6 Using the product

6.1. Connecting a sensor

Observe the following points when connecting sensors to data logger and measuring points.

- > Ensure correct polarity of the plugs.
- > Press the plugs firmly into the ports to ensure leak tightness. However, do not apply force!
- > Make sure that the plugs are firmly connected to the data logger or that the connections are closed with blanking plugs.
- > Ensure correct positioning of the sensor to avoid disturbing influences affecting the measurement.
- > testo 175 T3: Always make sure that you connect the sensor configured (via the software testo Comfort Software) to the individual sockets. The numbers of the connections are printed on the housing.

6.2. Programming data logger

In order to adapt the programming of your data logger to your individual requirements, you require the testo Comfort Software Basic 5 software. It is available in the Internet as a free download requiring registration

www.testo.com/download-center.



The instructions for the installation and operation of the software can be found in the testo Comfort Software Basic 5 instruction manual that is downloaded together with the software.

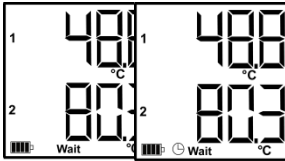
6.3. Menu overview

- i** The menu overview shows exemplary display representations of the data logger testo 175-T2. The display must be switched on to be able to show the corresponding indications. This is accomplished with the software testo Comfort Software.
- The indication in the display is updated according to the programmed measurement rate. Only readings from active channels are displayed. The channels are also activated via the software testo Comfort Software.
- The symbols for upper or lower alarm value light up in operating states Rec and End, if the programmed alarm value has been exceeded or fallen short off.
- After 10 seconds without operating a key the display will return to its initial state.
-

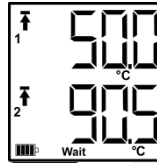
Wait mode: Start criterion is programmed, but not yet fulfilled.

① Last reading⁵

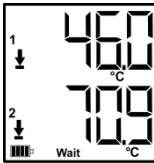
Start criterion key start / PC start
Start criterion Date/Time start



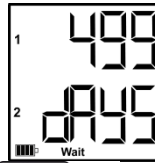
② Upper alarm value



③ Lower alarm value



④ Battery capacity in days

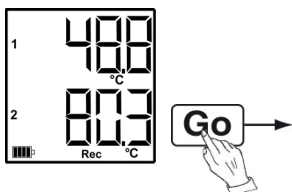


Last reading⁵ (see Fig. ① Wait mode)

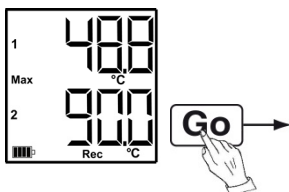
⁵ Measurement value is not saved

Rec mode: Start criterion was fulfilled, data logger saves readings

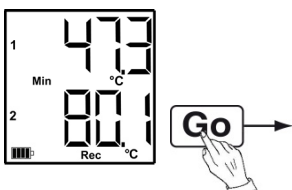
① Last reading



② Highest reading



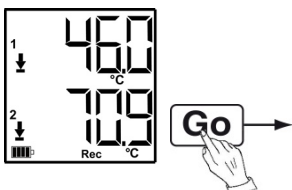
③ Lowest reading



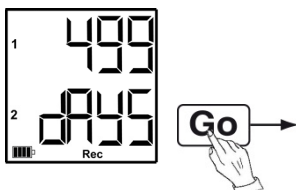
④ Upper alarm value



⑤ Lower alarm value



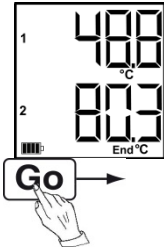
⑥ Battery capacity in days



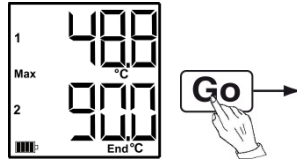
Last reading (see Fig. ① Rec mode)

End mode: Measurement program finished (stop criterion reached – memory full or number of readings) depending on programming

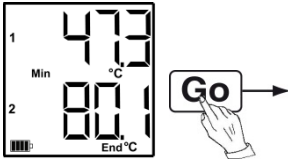
① Last reading



② Highest reading



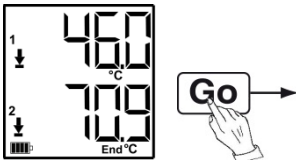
③ Lowest reading



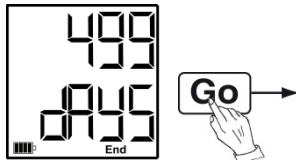
④ Upper alarm value



⑤ Lower alarm value



⑥ Battery capacity in days



Last reading (see Fig. ① End mode)

6.4. Mounting the wall bracket



The scope of delivery does not include mounting materials (e.g. screws, wall plugs).

- ✓ The data logger has been removed from the wall bracket.
- 1. Position the wall bracket at the desired place.
- 2. Use a pen or something similar to mark the location for the fastening screws.
- 3. Prepare the fastening location in accordance with the fastening material (e.g. drill hole, insert wall plugs).

4. Fasten the wall bracket with suitable screws.

6.5. Securing the data logger



- ✓ The wall bracket has been mounted.
1. Slide the data logger into the wall bracket (1).
 2. Push the locking pin (2) through the holes in the wall bracket.
 3. Fasten the lock (3) on the locking pin.
 4. Pull off the key (4).

6.6. Reading out measurement data

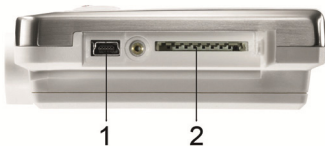
i The measurement data remain stored in the data logger after they have been read out and can therefore be read out several times. The measurement data will only be deleted when the data logger is reprogrammed.

Via USB cable

1. Connect the USB cable to a free USB port on the PC.
 2. Loosen the screw on the right side of the data logger.
-

i Use a coin for this purpose.

3. Open the cover.



4. Plug the USB cable into the Mini USB port (1).

5. Read out the data logger and process the read out data, see separate operating instructions testo Comfort Software.

Via SD card

1. Loosen the screw on the right side of the data logger.



Use a coin for this purpose.

2. Open the cover.



3. Push the SD card into the SD card slot (2).
 - The display shows **Sd** (testo 175 T1) or **Sd CArd** (testo 175 T2, testo 175 T3, testo 175 H1).
4. Hold **[Go]** depressed for longer than 2 seconds.
 - The display shows **CPY** (testo 175 T1) or **COPY** (testo 175 T2, testo 175 T3, testo 175 H1).
 - The yellow LED lights during the copying process.
 - The green LED flashes twice and after the copying process the display shows **OUT**.
5. Remove the SD card.
6. Insert the SD card into the SD card slot on the PC.
7. Process the read out data, see separate operating instructions testo Comfort Software.

7 Maintaining the product

7.1. Changing batteries



The battery change stops the currently running measurement program. However, stored measurement data are preserved.

1. Read out stored measurement data, see Reading out measurement data page 24.
- ✓ If it is no longer possible to read out the saved measurement data because the battery capacity is too low:

- > Change the batteries and read out the stored measurement data after.
2. Place the data logger on its front.



3. Loosen the screws on the back of the data logger.
4. Remove the battery compartment cover.
5. Take the empty batteries out of the battery compartment.
6. Insert three new batteries (type AAA). Observe the polarity!

i Only use new branded batteries. If a partially exhausted battery is inserted, the calculation of the battery capacity will not be performed correctly. In order to reach the battery life under application temperatures below $-10\text{ }^{\circ}\text{C}$ you should use Energizer L92 AAA-size cells.

7. Place the battery compartment cover on the battery compartment.
8. Tighten the screws.
- The display shows **rST**.

i The data logger needs to be reconfigured. For this purpose the software testo Comfort Software must be installed on the computer and a connection to the data logger must be set up.

9. Connect the data logger to the PC with a USB cable.
10. Start the software testo Comfort Software and set up a connection to the data logger.
11. Reconfigure the data logger or load the old, saved configuration, see separate operating instructions testo Comfort Software.
- The data logger is once again ready for use.

7.2. Cleaning the instrument

CAUTION

Damage to the sensor!

> Ensure that no liquid enters the inside of the housing.

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

Do not use any aggressive cleaning agents or solvents! Weak household cleaning agents or soap suds can be used.

8 Tips and assistance

8.1. Questions and answers

Question	Possible causes / solution
FULL appears in the display, the red LED flashes twice, out appears in the display.	Insufficient memory capacity on SD card to save the data. > Remove the SD card, free up more memory space and copy data.
Err appears in the display, the red LED flashes twice, out appears in the display.	An error occurred while saving data to the SD card. > Remove the SD card, free up more memory space and copy data.
nO dAtA appears in the display, the red LED flashes twice.	The logger has not yet recorded any data and is in Wait mode. > Remove the SD card and wait until the logger is in Rec mode.
rST appears in the display.	The battery was changed. No data are recorded. > Reprogram the data logger via the software.
---- appears in the display.	Sensor of data logger defective. > Contact your dealer or the Testo Customer Service.

If you have any questions please contact your local dealer or the Testo Customer Service. You find contact data on the back of this document or in the Internet under www.testo.com/service-contact.

8.2. Accessories and spare parts

Description	Article no.
Wall bracket (black) with lock	0554 1702
Mini USB cable to connect the data logger testo 175 to the PC	0449 0047
SD card to read out the data logger 175	0554 8803
Batteries (alkaline-manganese AAA-size cells) for applications down to -10 °C	0515 0009
Batteries (Energizer L92 AAA-size cells) for applications down to -10 °C	0515 0042
CD testo Comfort Software Basic 5 (if free-of-charge, registered download from website is not wanted)	0572 0580
CD testo Comfort Software Professional	0554 1704
CD testo Comfort Software CFR	0554 1705
ISO moisture calibration certificate, calibration points 11,3 %rF; 50,0 %rF; 75,3 %rF at +25°C/+77°F; per channel/instrument	0520 0076
ISO temperature calibration certificate, calibration points -18°C, 0°C, +40°C; per channel/instrument	0520 0153

For further accessories and spare parts, please refer to the product catalogues and brochures or look up our website: www.testo.com

