testo 550i - digital manifold

Instruction manual

Contents

1 About this document

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

Symbols and writing standards

Display	Explanation
	Note: basic or further information
	Warning advice, risk level according to the signal word: **Warning!** Serious physical injury may occur. **Caution!** Minor physical injury or damage to the equipment may occur. > Take the specified precautionary measures.
1 2 …	Action: several steps, the sequence must be followed
-	Result of an action
✓	Requirement
>	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.

2 Safety and disposal

Take the **testo information** document into account (accompanies the product).

3 Product-specific approvals

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

4 Product-specific information

- The measuring instrument being dropped or any other comparable mechanical stress may cause breakage of the pipe pieces in the refrigerant hoses. The valve positioners may also suffer damage, causing further damage inside the measuring instrument that is not necessarily visible externally. Therefore, always replace the refrigerant hoses with new ones after the measuring instrument is dropped or after any comparable mechanical stress. For your own safety, you should return the measuring instrument to the Testo Customer Service for technical inspection.
- Electrostatic charging may destroy the instrument. Integrate all the components (system, manifold's valve block, refrigerant bottle, etc.) into the potential bonding (earthing). Please see the safety instructions for the system and the refrigerant used.
- Refrigerant gases can harm the environment. Please note the applicable environmental regulations.

5 Use

testo 550i is a fully digital, highly reliable app-based manifold for digitally adept AC/R technicians. Equipped with a 2-way valve block, the testo 550i helps AC/R technicians to save time with quick and easy measurements, results and digital documentation. In addition, this compact and robust instrument offers unlimited flexibility thanks to its compatibility with many different wireless probes.

6 Product description

1	Hinged suspension hook (on rear)	**2**	Battery compartment and mini USB connection in battery compartment (on rear)
3	Sight glass for refrigerant flow	**4**	On/off switch
5	LED display	**6**	2 x valve positioner
7	3 x hose bracket for refrigerant hoses	**8**	3 x connections 7/16" UNF, brass Left/right: Low/high pressure for refrigerant hoses with quick release screw fitting; passage for valve positioner lockable Centre: e.g. for refrigerant bottles, with cap Refrigerant hoses with quick-release fitting; passage can be closed with valve positioner.

7 First steps

7.1 Inserting (rechargeable) batteries

1. Unfold the suspension hook and open the battery compartment (clip lock).
2. Insert the batteries (in scope of delivery) or rechargeable batteries (3 x AAA/micro/R03) in the battery compartment. Observe the polarity!
3. Close the battery compartment.

▸ After insertion of the batteries, the instrument switches on automatically and goes into the settings menu.

When not in use for a long period: Take out the (rechargeable) batteries.

7.2 Switching the instrument on and off

7.2.1 Switching the instrument on

1. Press the on/off switch.

▸ The LED indicator flashes. The instrument is on.

7.2.2 Switching the instrument off

1. Press the on/off switch >2 s.

▸ The LED indicator turns off. The instrument is switched off.

7.3 LED status

LED status	Description
Lit up green	Instrument is connected and has sufficient power.
Flashing orange	Search for a Bluetooth® connection begins.
Flashing red	Battery is weak or there is a malfunction.

7.4 Bluetooth®

The testo 550i features the option of connecting to the testo Smart App. The App enables connection of other Bluetooth® probes needed for the measurement.

7.4.1 Compatible probes

Order no.	Designation
0560 2115 02	testo 115i - clamp thermometer operated by smartphone
0560 1805	testo 805i - infrared thermometer operated by smartphone
0560 2605 02	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 2549 02	testo 549i - high-pressure measuring instrument operated by smartphone
0564 2552	testo 552i - vacuum Smart Probe
0560 1905	testo 905i - temperature probe with smartphone operation

7.4.2 Establishing a connection

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

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

Compatibility:

Requires iOS 12.0 or newer/Android 6.0 or newer, requires Bluetooth® 4.0.

7.4.3 Switching on/off

✓ testo 550i is switched on.

✓ Bluetooth® is activated on the tablet or smartphone.

1 Open the App.

- The LED indicator flashes green as soon as the testo 550i is connected to the tablet or smartphone via Bluetooth®.

8 Using the product

8.1 Preparing for measurement

8.1.1 Operating the valve positioners

⚠ WARNING

Risk of injury caused by refrigerant that is at high pressure, hot, cold, or poisonous!

> Wear protective goggles and safety gloves.

> Before applying pressure to the measuring instrument: Always fasten the measuring instrument on the suspension hook to prevent it from falling down (danger of breakage)

> Before each measurement, check the refrigerant hoses are intact and connected properly. Do not use any tools to connect the hoses; only tighten hoses hand-tight (max. torque 5.0Nm/3.7ft*lb).

> Comply with the permissible measuring range (-1 to 60 bar/-14.7 to 870 psi). Pay particular attention to this in systems with R744 refrigerant, since these are frequently operated with higher pressures.

The digital manifold behaves like a conventional three-way manifold with regard to the refrigerant path: The passages are opened by opening the valves. The applied pressure is measured with the valves closed and the valves opened.

> Open the valve: Turn valve positioner anticlockwise.

> Close the valve: Turn valve positioner clockwise.

⚠ WARNING

Valve positioner tightened too tightly.

- Damage to the PTFE seal (1).
- Mechanical deformation of the valve piston (2) leading to the PTFE seal (1) falling out.
- Damage to the thread of the threaded spindle (3) and the valve screw (4).

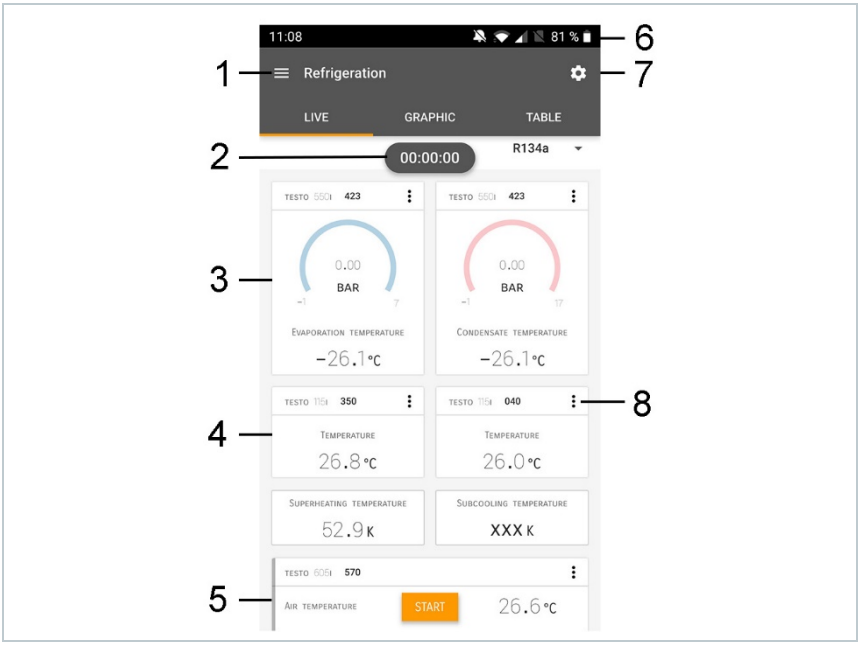
Broken valve knob (5).

Only tighten the valve positioner hand-tight. Do not use any tools to tighten the valve positioners.

8.1.2 Measuring mode

testo 550i automatically detects the pressure difference between the low-pressure and high-pressure sides. If the measured pressure on the low pressure side is 1 bar higher than on the high pressure side, a dialogue appears and the display can be changed accordingly. If “yes” is selected, the low pressure moves from left to right and the high pressure moves from right to left. This mode is especially suitable for air conditioners that cool and heat.

8.2 App – user interface



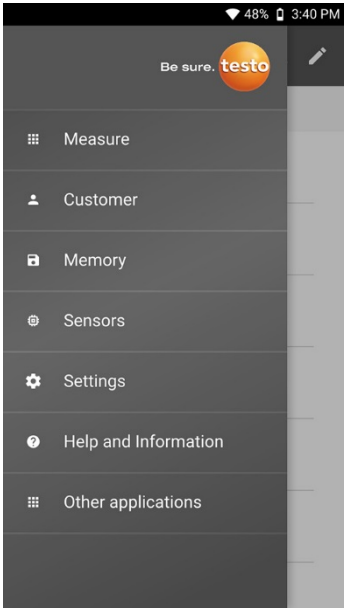
1		Open main menu
2		Display of the measurement period
3		Display of calculated measurement results
4		Reading for each probe
5		Can be controlled with different function keys
6		Instrument status bar
7		Configuration
8		Edit reading display

Further symbols on the user interface (without numbering)

	One level back
	Exit view
	Share report
	Search
	Favourite
	Delete
	Further information
	Display report
	Multiple selection

8.3 Main menu

The **Main menu** can be accessed via the icon at top left. To exit the main menu, select a menu or right-click on the guided menus. The last screen displayed is shown.

Measure	
Customer	
Memory	
Sensors	
Settings	
Help and Information	

Additional icons on the testo 550i:

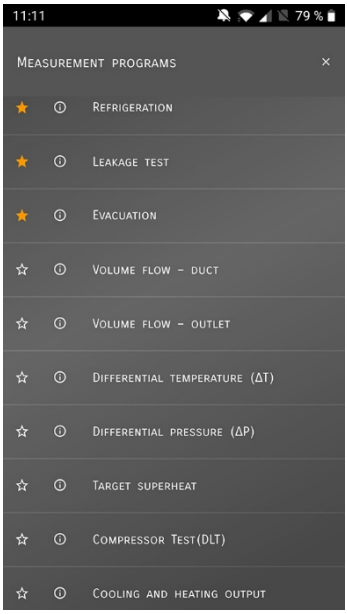
	One level back		Delete
	Exit view		Further information
	Share measurement data/reports		Display report
	Search		Edit
	Favourite		

8.4 Measurement menu

The testo 550i has permanently installed measurement programs. These enable the user to carry out convenient configuration and implementation of specific measuring tasks.

The testo 550i offers the following **Measurement menus**:

Basic view
Volume flow – duct (irrelevant for testo 550i)
Volume flow – outlet (irrelevant for testo 550i)
Differential temperature (ΔT) (irrelevant for testo 550i)
Differential pressure (ΔT) (irrelevant for testo 550i)
Refrigeration
Target superheat
Cooling and heating output (irrelevant for testo 550i)
Leakage test
Evacuation



8.4.1 Basic view

In the **Basic view** application menu, the current measuring values can be read, recorded and saved. The Basic view is particularly suitable for fast, uncomplicated measurements without the specific requirements of a standard-compliant measurement.

All Bluetooth® probes compatible with the testo Smart App are displayed in the **Basic view** angezeigt.

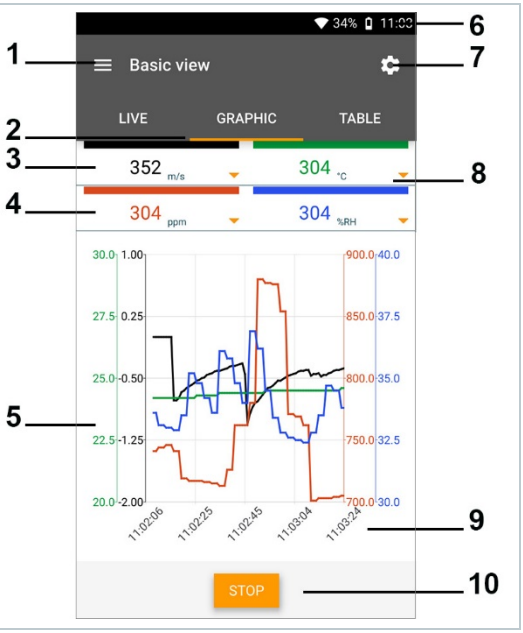
In all application menus, apart from the volume flow measurement, there are three different screens for the measurement - Live (or also Basic view), Graphic and Table.

8.4.1.1 Graphic view

In the Graphic view, the values for a maximum 4 channels can be displayed simultaneously in a chronological trend graph. All measured parameters can be displayed in the Graphic view via the channel selection (click on one of the four selection fields). Once a measurement parameter has been selected, the value is updated automatically.

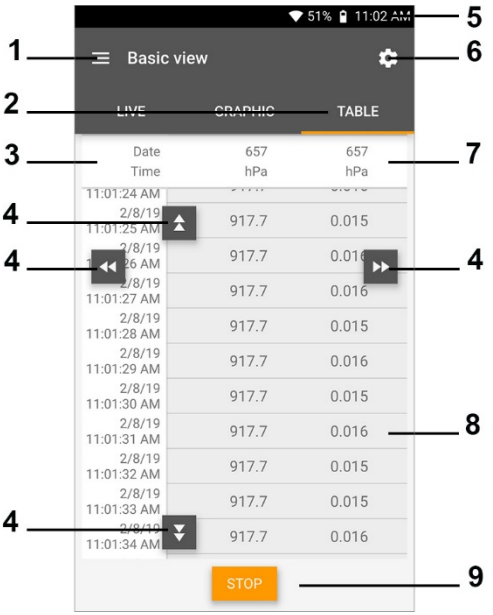
The Zoom touch function allows individual parts of the graphic to be viewed in more detail or time progressions to be displayed compactly.

1	Open the main menu
2	Change of display
3	Reading for selected channel
4	Measurement parameter and measurement unit
5	Graphic with selected channels and 4 Y-axes
6	Status bar
7	Open the configuration menu
8	Selection of other channels
9	Time axis
10	New/Start/Stop/Save button



8.4.1.2 Table view

1	Open the main menu
2	Change of display
3	Column with date and time
4	Arrow keys to go directly to the end of the table
5	Status bar
6	Open the configuration menu
7	Probe ID - measurement unit
8	Measuring values
9	New/Start/Stop/Save button



8.4.2 Refrigeration

The **Refrigeration** application is used to determine the following system measuring values:

- Low-pressure side: Evaporation pressure, refrigerant evaporation temperature to/Ev (T evap.)
- Evaporation pressure: Measured temperature toh/T1
- Evaporation pressure: Superheating Δtoh/SH
- High-pressure side: Condensation pressure, refrigerant condensation temperature tc/Co (T condens.)
- Condensation pressure: Measured temperature tcu/T2
- Condensation pressure: Subcooling Δtcu/SC

The testo 115i clamp thermometer is used for the measurement.

An NTC temperature sensor (accessory) must be connected for measuring the pipe temperature and for automatic calculation of superheating and subcooling. Testo Smart Probes (e.g. testo 115i) can be used.

Before each measurement, check that the refrigerant hoses are in flawless condition.

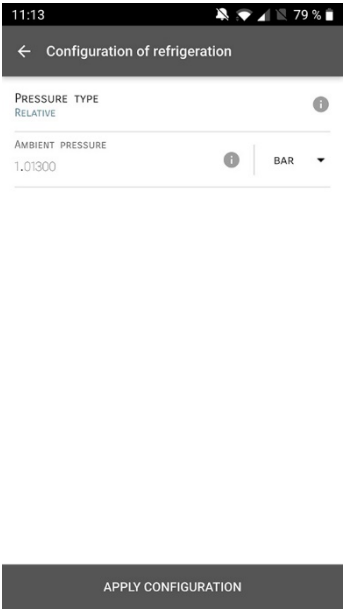
Before each measurement, zero the pressure sensors. All connections must be pressureless (ambient pressure). Press the button [▲] (P=O) for 2 seconds to zero the sensors.

⚠ WARNING

The measuring instrument being dropped or any other comparable mechanical stress may cause breakage of the pipe pieces in the refrigerant hoses. The valve positioners may also suffer damage, causing further damage inside the measuring instrument that is not necessarily visible externally!
> For your own safety, return the measuring instrument to the Testo Customer Service for technical inspection.
> Therefore, always replace the refrigerant hoses with new ones after the measuring instrument is dropped or after any comparable mechanical stress.

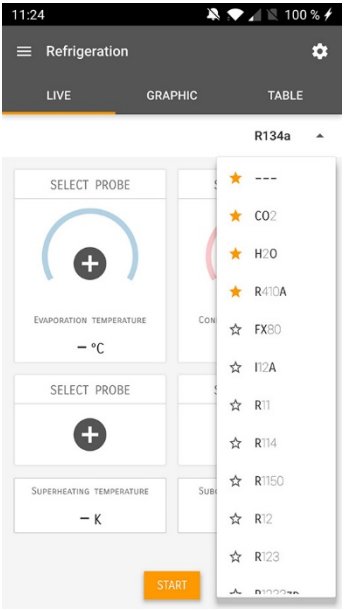
1. Click on **Measure**.
2. Click on **AC + Refrigeration**.
   - The Refrigeration measurement menu opens.
3. Click on .
   - Configuration menu opens.

4 Make the required settings.



5 Click on **Apply Configuration**.

6 Set refrigerant.



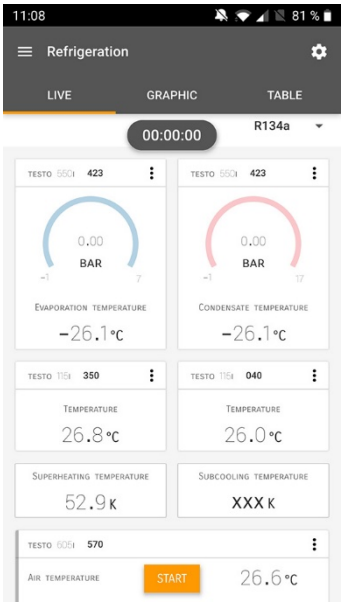
You have the option of setting up favourite refrigerants in the App. These then appear at the beginning of the refrigerant list.
To do this, click on the asterisk next to the refrigerant in the refrigerant list (App).

▸ The newly set refrigerant is displayed in the refrigerant list.

7 Click on **Start**.

▸ The measurement starts.

▸ Values currently being measured are displayed.



▸ Measured values can be saved or a new measurement can be started.

With zeotropic refrigerants, the evaporation temperature to/Ev is displayed after complete evaporation/the condensation temperature tc/Co is displayed after complete condensation.

The measured temperature must be assigned to the superheating or subcooling side (t_{oh} <--> t_{cu}). Dependent on this assignment, the display will show t_{oh}/T1 resp. Δt_{oh}/SH or t_{cu}/T2 resp. Δt_{cu}/SC, depending on the selected display.

Reading and display illumination flash:

- 1 bar/14.5 psi before reaching critical refrigerant pressure

- When max. permissible pressure of 60 bar(870 psi is exceeded.

8.4.3 Target superheat

This feature allows the testo 550i manifold to calculate the target superheat in conjunction with the App and additional testo 605i Smart Probes. This application can only be used for split air conditioning systems/heat pumps with a fixed expansion valve. The two connected testo 605i Smart Probes determine the ODDB and RAWB values. As a result, the target superheat appears in the App.

The following are used for the measurement:

- testo 115i (clamp thermometer)
- testo 605i

Before each measurement, check that the refrigerant hoses are in flawless condition.

Before each measurement, zero the pressure sensors.

⚠ WARNING

The measuring instrument being dropped or any other comparable mechanical stress may cause breakage of the pipe pieces in the refrigerant hoses. The valve positioners may also suffer damage, causing further damage inside the measuring instrument that is not necessarily visible externally!
> For your own safety, return the measuring instrument to the Testo Customer Service for technical inspection.
> Therefore, always replace the refrigerant hoses with new ones after the measuring instrument is dropped or after any comparable mechanical stress.

1 Click on **Measure**.

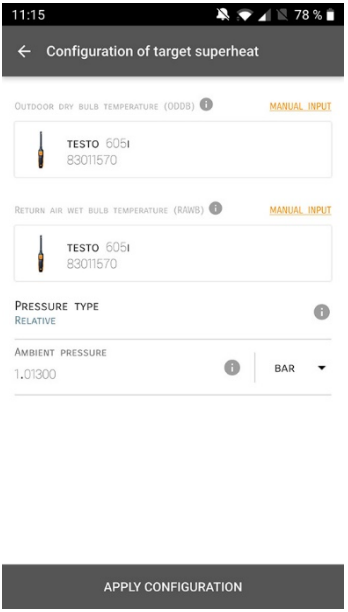
2 Click on **Target superheat**.

▸ The Target superheat measurement menu opens.

3 Click on ⚙.

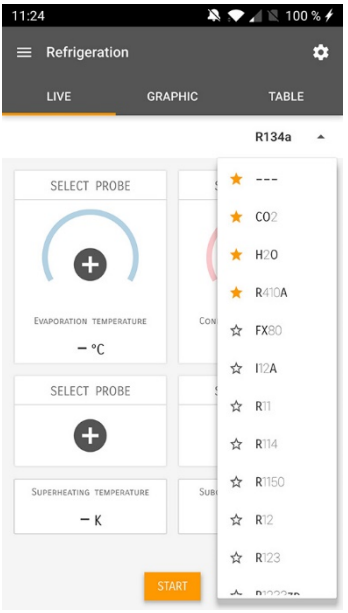
▸ Configuration menu opens.

4 Make the required settings.



5 Click on **Apply Configuration**.

6 Set refrigerant.



▸ The newly set refrigerant is displayed in the refrigerant list.

7 Click on **Start**.

▸ The measurement starts.

▸ Values currently being measured are displayed.

▸ Measured values can be saved or a new measurement can be started.

8.4.4 Leakage testing

The temperature compensated tightness test can be used to check the leak tightness of systems. For this purpose both the system pressure and the ambient temperature are measured over a defined period of time.

For this purpose a temperature sensor to measure the ambient temperature may be connected (recommendation: Deactivate the surface compensation factor and use an NTC air probe or Bluetooth® temperature Smart Probes) or Smart Probe for air temperature measurement. This provides information about the temperature-compensated differential pressure and the temperature at the beginning/end of the test. Due to the temperature compensation, the actual pressure drop is displayed as delta P. If no temperature sensor is connected, you may also perform the tightness test without temperature compensation.

Surface temperature probes (e.g. testo 115i) can also be used for the temperature-compensated tightness testing, but must not be used for measuring surface temperature. They must be positioned as far as possible to measure the air temperature.

The 550i, 550s or 557s manifold is used to perform the measurement.

1 Click on **Measure**.

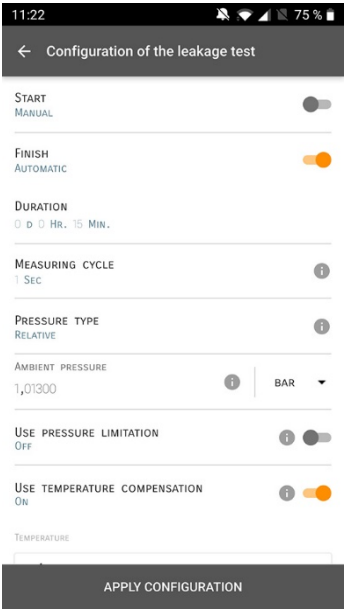
2 Click on **Leakage test**.

▸ The Leakage test measurement menu opens.

3 Click on .

▸ Configuration menu opens.

4 Make the required settings.

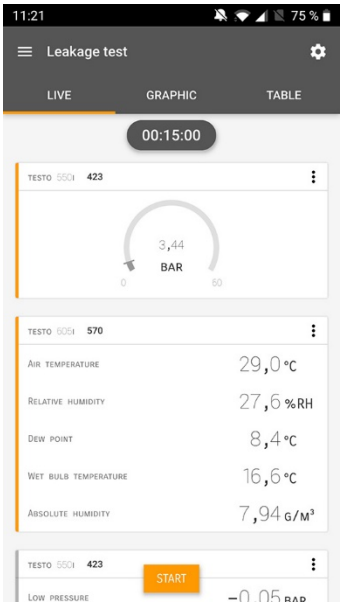


5 Click on **Apply Configuration**.

7 Click on **Start**.

▸ The measurement starts.

- Values currently being measured are displayed.



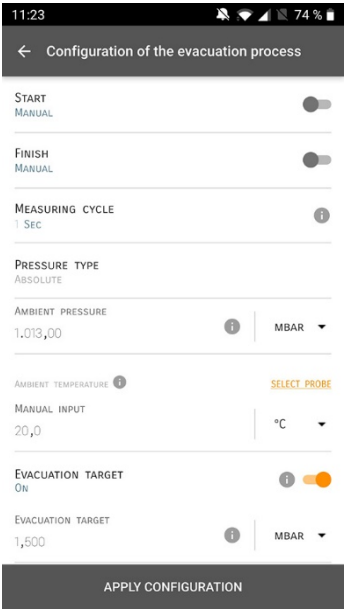
- Measured values are saved. The values can be exported or a report can be created.

8.4.5 Evacuation

With the Evacuation application, foreign gases and moisture can be removed from the refrigeration circuit.

1. Click on **Measure**.
2. Click on **Evacuation**.
   - The Evacuation measurement menu opens.
3. Click on .
   - Configuration menu opens.

4 Make the required settings.

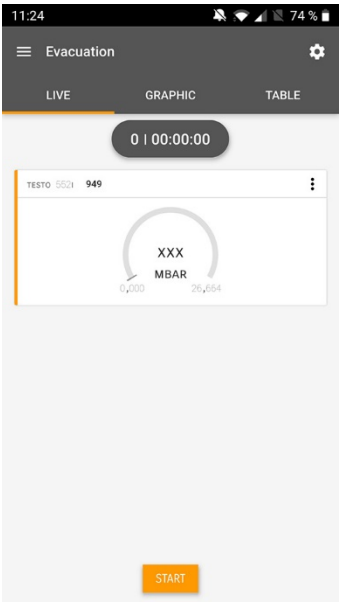


5 Click on **Apply Configuration**.

7 Click on **Start**.

▸ The measurement starts.

- Values currently being measured are displayed.



- Measured values can be saved or a new measurement can be started.

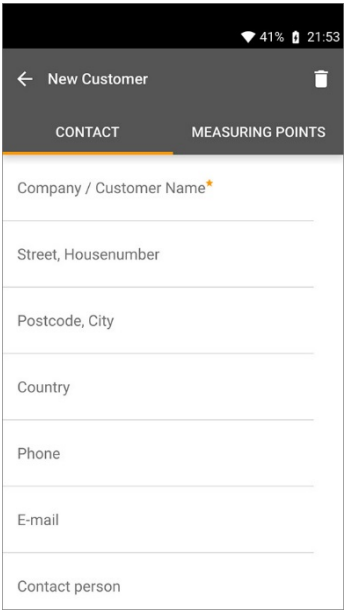
8.5 Customer

In the **Customer** menu, all customer and measuring site information can be created, edited and deleted. Fields marked with * are mandatory. Without any information in this field, no customers or measuring sites can be stored.

8.5.1 Creating and editing a customer

1. Click on ☰.
   - Main menu opens
2. Click on **Customer**.
   - The Customer menu opens.
3. Click on **+ New customer**.
   - A new customer can be created.

4 Store all relevant customer data.



5 Click on **Save**.

▸ The new customer was saved.

8.5.2 Creating and editing measuring sites

1 Click on ☰.

▸ Main menu opens

2 Click on **Customer**.

▸ The Customer menu opens.

3 Click on **+ New customer**.

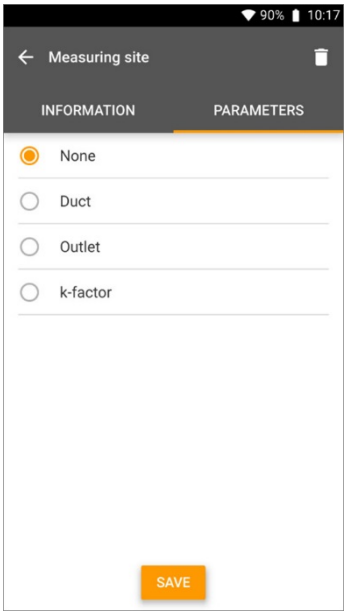
4 Click on the right tab **Measuring point**.

5 Click on **+ New measuring site**.

▸ A new measuring site can be created.

6 Store all relevant measuring site information.

7 Click on right tab **Parameters**.



8 Select further parameters.

For the duct, outlet or duct with k-factor measuring sites, further parameter settings can be implemented.

9 Click on **Save**.

▸ The new measuring site has been saved.

8.6 Memory

In the **Memory** menu, you can call up all the measurements stored with the testo 550i, analyze them in detail and also create and save csv data and PDF reports. When clicking on a measurement, an overview of the measurement results is displayed.

8.6.1 Searching for and deleting measurement results

In the **Memory** menu, all stored measurements are sorted by date and time.

✓ The **Memory** menu is open.

1 Click on  .

▸ Search field with measurements opens.

2 Enter the customer name or measuring site or date/time in the search field.

▸ The result is displayed.

Deleting

1 Click on  .

▸ A check box is displayed in front of each measurement.

2 Click on the required measurement.

▸ A tick is displayed in the respective box.

3 Click on  .

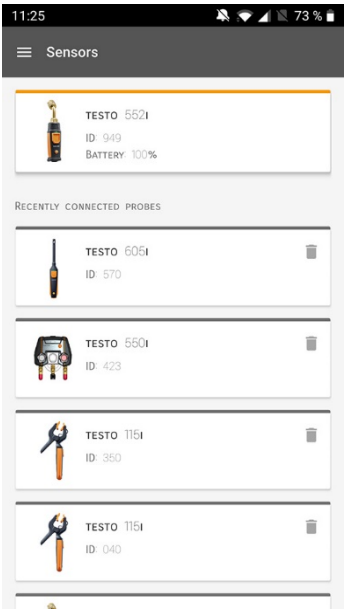
▸ Information window is displayed.

4 Acknowledge the information.

▸ Selected measurements were deleted.

8.7 Sensors

All sensors used with the App can be found in the  **Sensors** menu. There, you can view general information about currently connected probes as well as recently connected probes.



8.7.1 Information

Information is stored for each probe.

✓ The App is connected to testo 550i.

1 Click on ☰.

▸ Main menu opens.

2 Click on **Sensors**.

▸ The Sensors menu opens.

3 Click on one of the displayed probes.

▸ Information is displayed about the model, order number, serial number and firmware version.

8.7.2 Settings

Settings can also be made for each probe.

✓ The probe is connected to the App.

1. Click on ☰.
   - Main menu opens.
2. Click on **Sensors**.
   - The Sensors menu opens.
3. Click on one of the displayed probes.
4. Click on the Settings tab.
5. Click on one of the displayed probes.
   - Settings appear that can be changed if necessary.

8.8 Settings

8.8.1 Language

1. Click on **Settings**.
   - The Settings menu opens.
2. Click on **Language**.
   - A window with different languages opens.
3. Click on the required language.
   - The required language is set.

8.8.2 Measurement settings

1. Click on **Settings**.
   - The Settings menu opens.
2. Click on **Measurement settings**.
   - A window with different basic settings for measurement opens.

3 Click on the required settings and change if necessary.

▸ The required measurement settings are set.

4 Exit Measurement settings.

8.8.3 Company details

1 Click on **Settings**.

▸ The Settings menu opens.

2 Click on **Company details**.

▸ A window with company details opens.

3 Click on the required data and enter if necessary.

▸ The required measurement settings are set.

4 Exit Company details.

8.8.4 Privacy settings

1 Click on **Settings**.

▸ The Settings menu opens.

2 Click on **Privacy settings**.

▸ A window with privacy settings opens.

3 Activate or deactivate the required settings.

▸ The required settings are set.

4 Exit Privacy settings.

8.9 Help and Information

Under Help and Information, you will find information about the testo 550i, and the tutorial can be called up and implemented. This also where legal information can be found.

8.9.1 Instrument information

1  Click on **Help and Information**.

▸ The **Help and Information** menu opens.

2 Click on **Instrument information**.

▸ The current App version, Google Analytics instance ID, refrigerant version and update are displayed for the connected instrument.

Automatic updates for instruments can be enabled or disabled.

> Use the slider to activate or deactivate **Update for connected instruments**.

8.9.2 Tutorial

1  Click on **Help and Information**.

▸ The **Help and Information** menu opens.

2 Click on **Tutorial**.

▸ The tutorial shows you the most important steps prior to commissioning.

8.9.3 Exclusion of liability

1  Click on **Help and Information**.

▸ The **Help and Information** menu opens.

2 Click on **Exclusion of liability**.

▸ The data protection information and licence usage information is displayed.

8.10 testo DataControl archiving software

The free testo DataControl measurement data management and analysis software enhances the functionality of the testo Smart App measuring instrument with lots of useful functions:

- Manage and archive customer data and measuring site information
- Read out, evaluate and archive measurement data
- Presenting readings in graphic form
- Create professional measurement reports from the existing measurement data
- Conveniently add pictures and comments to measurement reports
- Data import from and data export to the measuring instrument

8.10.1 System requirements

Administrator rights are required for installation.

8.10.1.1 Operating system

The software can be run on the following operating systems:

- Windows® 7
- Windows® 8
- Windows® 10

8.10.1.2 PC

The computer must meet the requirements of the operating system in each case. The following requirements must also be met:

- Interface USB 2 or higher
- DualCore processor with minimum 1 GHz
- Minimum 2 GB RAM
- Minimum 5 GB available hard disk space
- Screen with a resolution of at least 800 x 600 pixels

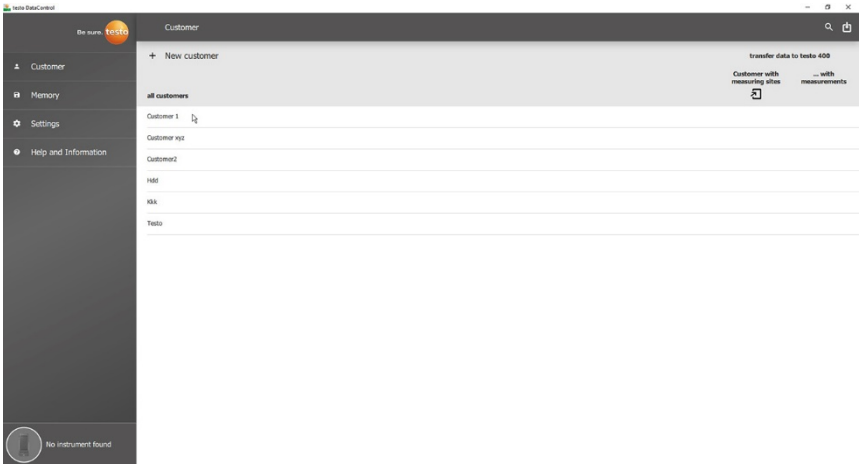
8.10.2 Procedure

✓ To transfer the data from the App to testo DataControl, both instruments must be in the same network.
For example: A notebook with installed testo DataControl and a smartphone with installed testo Smart App are connected to the same WLAN.

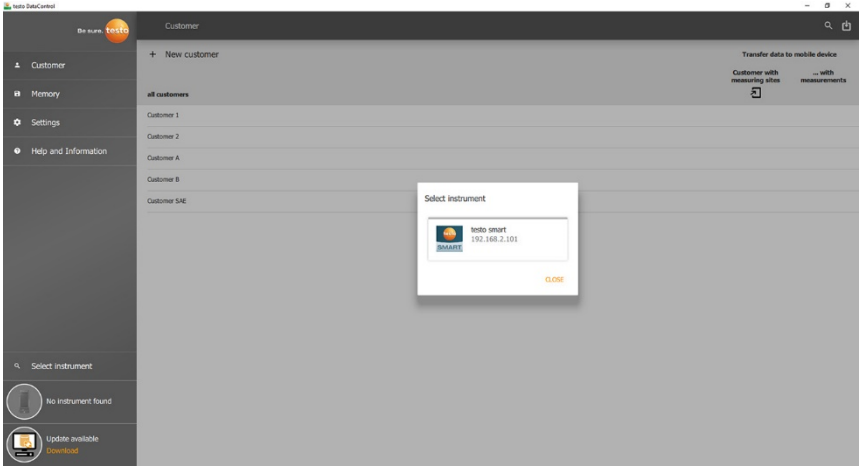
1 Open testo Smart App on the smartphone or tablet.

2 Open the testo DataControl archiving software on the PC.

3 Click on **Select instrument**.

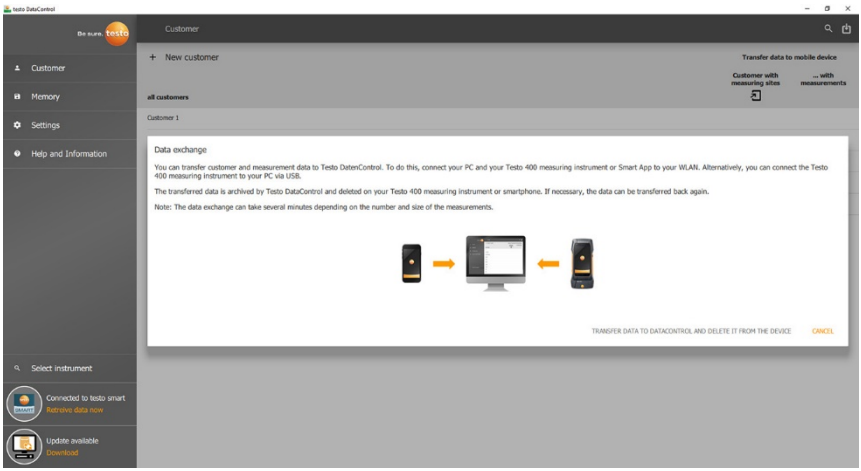


▶ An overview with available instruments opens.



4 Select instrument.

▶ A safety notice is displayed.



5 Click on **Transfer data to DataControl and delete from instrument**.

▸ Data has been successfully transferred.

9 Maintenance

9.1 Calibration

testo 550i is supplied with a factory calibration certificate as standard.

Recalibration once every 12 months is recommended in many applications.

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

Please contact Testo for further information.

9.2 Cleaning the instrument

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

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

9.3 Keeping connections clean

> > Keep screw connections clean and free of grease and other deposits; clean with a damp cloth as required.

9.4 Removing oil residues

> > Carefully blow out oil residues in the valve block using compressed air.

9.5 Ensuring measuring accuracy

> Testo Customer Service will be happy to help you as required.

> Check the instrument regularly for leaks. Keep to the permissible pressure range!

> > Calibrate the instrument regularly (recommendation: once a year).

9.6 Changing batteries/rechargeable batteries

✓ The instrument is switched off.

1. Fold out the suspension hook, release the clip and remove the battery compartment lid.
2. Remove the (rechargeable) batteries and insert new ones into the battery compartment (3 x 1.5V, type AAA, Mignon, LR6). Observe the polarity!
3. Attach and close the battery compartment lid (the clip must click into place).
4. Switch the instrument on.

9.7 Cleaning the vacuum probe

Contaminants such as oil may impair the accuracy of the vacuum sensor. Perform the following steps to clean the sensor.

ATTENTION

Carrying out cleaning with the probe switched on may result in damage to the probe!

> Switch off the vacuum probe!

ATTENTION

Damage to the sensor due to sharp objects!

> Do not insert any sharp objects into the probe!

1. Switch off the vacuum probe.
2. Put a few drops of rubbing alcohol into the sensor opening.
3. Seal the opening by placing your finger on it and shake the vacuum probe briefly.
4. Remove all the alcohol from the probe.
5. Repeat this process at least twice.
6. Leave the probe to dry for at least 1 hour.
   To dry the sensor faster, you can connect the probe directly to a vacuum pump and apply vacuum.

10 Technical data

Feature	Value
Measurement parameters	Pressure: kPa/MPa/bar/psi Temperature: °C/°F/K
Measured value recorder	Connections: 3 Valves: 2 Pressure: 2 x pressure sensor
Measuring cycle	1 s
Interfaces	Pressure ports: 3 x 7/16" UNF, 1 x 5/8" UNF Via the App
Measuring ranges	HP/LP pressure measuring range: -100 to 6000 kPa/-0.1 to 6 Mpa/-1 to 60 bar (rel)/-14.7 to 870 psi
Overload	65 bar; 6500 kPa; 6.5 MPa; 940 psi
Resolution	Resolution pressure: 0.01 bar/0.1 psi/1 kPa/0.001 Mpa
Accuracy (nominal temperature 22°C/71.6°F)	Pressure: ±0.5% of full scale value (±1 digit)
Measurable media	Measurable media: all media stored in the App. Not measurable: ammonia (R717) and other refrigerants which contain ammonia.
Ambient conditions	Storage temperature: -20 to +60 °C/-4 to 140 °F
Housing	Material: ABS/PA/TPE Dimensions: approx. 77 x 109 x 60 mm Weight: 592g (without batteries)
IP class	IP54
Power supply	3 x AAA (rechargeable) batteries Battery life: 130 h
Auto off	10 minutes if activated, Bluetooth® off
Directives, standards and tests	EU Directive: 2014/30/EU You can find the EU declaration of conformity under the product-specific downloads on the Testo website: www.testo.com.

Available refrigerants

Feature	Value		
No. of refrigerants	92		
Selectable refrigerants in the instrument	R114	R407C	R444B
	R12	R407F	R448A
	R123	R407H	R449A
	R1233zd	R408A	R450A
	R1234yf	R409A	R452A
	R1234ze	R410A	R452B
	R124	R414B	R453a
	R125	R416A	R454A
	R13	R420A	R454B
	R134a	R421A	R454C
	R22	R421B	R455A
	R23	R422B	R458A
	R290	R422C	R500
	R32	R422D	R502
	R401A	R424A	R503
	R401B	R427A	R507
	R402A	R434A	R513A
	R402B	R437A	R600a
	R404A	R438A	R718 (H2O)
	R407A	R442A	R744 (CO2)
	R11	R227	R417A
	FX80	R236fa	R417B
	I12A	R245fa	R417C
	R1150	R401C	R422A
	R1270	R406A	R426A
	R13B1	R407B	R508A
	R14	R407D	R508B
	R142B	R41	R600
	R152a	R411A	RIS89
	R161	R412A	SP22
	R170	R413A	

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