testo 557 · Digital manifold

Instruction manual

1 Contents

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.
	Note: Basic or further information.
1. ... 2. ...	Action: more steps, the sequence must be followed.
> ...	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

> Do not operate the instrument if there are signs of damage at the housing, mains unit or feed lines.

> Do not perform contact measurements on non-insulated, live parts.

> Do not store the product together with solvents. Do not use any desiccants.

> 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.

> Dangers may also arise from the systems being measured or the measuring environment: Note the safety regulations valid in your area when performing the measurements.

> If the measuring instrument falls or another comparable mechanical load occurs, the pipe sections of the refrigerant hoses may break. The valve positioners may also be damaged, whereby further damage to the interior of the measuring instrument may occur that cannot be identified from the outside. The refrigerant hoses must therefore be replaced with new, undamaged refrigerant hoses every time the measuring instrument falls or following any other comparable mechanical load. Send the measuring instrument to Testo Customer Service for a technical check for your own safety.

> Electrostatic charging can destroy the device. Integrate all the components (system, manifold's valve block, refrigerant bottle etc.) into the potential equalisation (earthing). Please see the safety instructions for the system and the refrigerant used.

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.

> Refrigerant gases can harm the environment. Please note the applicable environmental regulations.

3 Specifications

3.1. Use

The testo 557 is a digital manifold for maintenance and service work on refrigeration systems and heat pumps. The device is only to be used by qualified expert personnel.

With its functions the testo 557 replaces mechanical manifolds, thermometers and pressure/temperature charts. Pressures and temperatures can be applied, adapted, tested and monitored.

The testo 557 is compatible with most of the non-corrosive refrigerants, water and glycol. The testo 557 is not compatible with ammoniac refrigerants.

Then product must not be used in explosive environments!

3.2. Technical data

3.2.1. Bluetooth Modul

The Bluetooth® option may only be operated in countries in which it is type approved.

Feature	Values
Bluetooth	Range >20 m (free field)
Bluetooth type	LSD Science & Technology Co., Ltd L Series BLE Module (08 Mai 2013) based on TI CC254X chip
Qualified Design ID	B016552
Bluetooth radio class	Class 3
Bluetooth company	10274

Certification

Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

EFTA countries

Island, Suisse, Norway, Lichtenstein.

Other countries

USA, Turkey, Hong Kong, Canada.

Information from the FCC (Federal Communications Commission)

This device complies with part 15 of the FCC Rules. Commissioning is subject to the two following conditions: (1) This instrument must not cause any harmful interference and (2) this instrument must be able to cope with interference, even if this has undesirable effects on operation.

Changes

The FCC demands that the user be informed that any changes or modifications to the instrument that are not explicitly approved by Testo AG may void the user's right to use this instrument.

3.2.2. General technical data

Feature	Values
Measurement parameters	Pressure: psi/ kPa/MPa/bar Temperature: °F/°C/K Vacuum: micron / inHg / inH_2O / hPa / mbar/ mTorr /Torr / Pa
Sensing element	Pressure: 2 x pressure sensors Temperature: 2 x NTC Vacuum: via external probe
Measuring cycle	0,5s
Interfaces	Pressure connections: 3 x 7/16" UNF, 1x 5/8" UNF NTC measurement External vacuum probe
Measurement ranges	Pressure measurement range HP/LP: -14.7…870 psi / -100…6000 kPa / -0.1…6 MPa / -1…60 bar (rel) Temperature measurement range: -58…302 °F / -50…+150 °C Measurement range vacuum: 0 ... 20.000 Mikron
Overload	940 psi, 65 bar, 6500 kPa, 6.5 MPa

Feature	Values
Resolution	Resolution pressure: 0.1 psi / 0.01 bar / 1 kPa / 0.001 MPa Resolution temperature: 0.1 °F / 0.1 °C / 0.1 K Vacuum resolution: 1 Mikron (from 0 to 1000 Mikron) 10 Mikron (from 1000 to 2000 Mikron) 100 Mikron (from 2000 to 5000 Mikron) 500 Mikron (from 5000 to 10000 Mikron) 5000 Mikron (from 10000 to 20.000 Mikron)
Accuracy (nominal temperature 71.6 °F / 22 °C)	Pressure: ±0.5% of final value (±1 digit) Temperature (-40…302 °F/-40…+150 °C): ±0.9°F (±1 digit), ±0.5 °C (±1 digit) Vacuum: ±(10 Mikron + 10% v. Mw.) (100 ... 1.000 Mikron)
No. of refrigerants	60
Selectable refrigerants	No refrigerant, R11, R12, R22, R123, R1234ze, R125, R13B1, R134a, R14, R142B, R152a, R161, R23, R227, R290, R32, R401A, R401B, R401C, R402A, R402B, R404A, R406A, R407A, R407B, R407C, R407D, R407F, R408A, R409A, R410A, R411A, R412A, R413A, R414B, R416A, R417A, R420A, R421A, R421B, R422A, R422B, R422C, R422D, R424A, R426A, R427A, R434A, R437A, R438A, R502, R503, R507, R508A, R508B, R600, R600a, R718 (H2O), R744 (CO2) (only in permissible measurement range up to 60 bar), R1234yf
Measurable media	Measurable media: all media that is stored in the testo 557. Not measurable: ammonia (R717) and other refrigerants which contain ammonia
Ambient conditions	Operating temperature: -4…122°F / -20…50°C -10 ... 50°C / 14 ... 122 °F (Vacuum) Storage temperature: -4…140°F / -20…60°C Humidity in area of use: 10… 90%rF

Feature	Values
Housing	Material: ABS / PA / TPE Dimensions approx. 280 x 135 x 75 mm Weight: approx. 1200 g (without batteries)
IP-class	42
Power supply	Current source: Rechargeable batteries / batteries 4 x 1.5V type AA / Mignon / LR6 Battery lifetime: approx. 250 h (Bluetooth off, vacuum probe not connected)
Display	Type: Illuminated LCD Response time: 0.5 s
Directives, standards and tests	EC Directive: 2014/30/EC
Warranty	Duration: 2 years Terms of warranty: see website www.testo.com/warranty

4 Product description

4.1. Overview

Display and control elements

1 Front connection for external vacuum probe
2 Sensor socket Mini-DIN for NTC-temperature sensor, with socket cover
3 Suspension attachment, foldable (backside).
4 Display. Instrument status icons:

Icon	Meaning
	Battery capacity
	Bluetooth®, see Switching Bluetooth® on and off, page **16**
	Select measuring mode, see Choosing the measuring mode, page **17**

5 Battery compartment. The rechargeable batteries cannot be charged inside the instrument!

6 Control keys:

Key	Function
[Set]	Set units
[R, ►, ■]	Select refrigerant / Start-Stop leak test
[Mode]	Switch between measuring modes
[Min/Max/Mean]	Show min, max, mean values
[▲]	Up-key: Change display view.
[P=0]	Pressure zeroing
Esc	Switches to the measurement/home view.
[▼]	Down-key: changes display view.
[⏻/☼]	Switch the instrument on/off, Light key: switches display light on/off.

7 Inspection glass for refrigerant flow.

8 4 x valve actuators

9 4 x hose brackets for refrigerant hoses

10 Connection 7/16" UNF, brass.
High pressure, for refrigerant hoses with quick release screw fitting, passage for valve actuator lockable.

11 Connection 5/8" UNF, brass, for vacuum pump

12 Connection 7/16" UNF, brass, for e.g. refrigerant cylinders, with screw cap.

13 Connection 7/16" UNF, brass.
Low pressure for refrigerant hoses with quick release screw fitting, passage for valve actuator lockable.

14 On the back below the battery compartment cover, mini-USB connection for firmware update.

5 First steps

Inserting batteries/rechargeable batteries

1. Unfold the suspension attachment and open the battery compartment (clip lock).
2. Insert the batteries (scope of delivery) or rechargeable batteries (4 x 1.5 V, type AA / Mignon / LR6) into 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 long period: Take out the batteries / rechargeable batteries.

Performing settings

1. Press **[Set]** repeatedly,
2. Press **[▲]** or **[▼]** to select the unit/parameter.

– The settings will be accepted once the last selection has been made.

Key functions

Representation	Explanation
[▲] or **[▼]**	Change parameter, select unit
[Set]	Select units/parameters

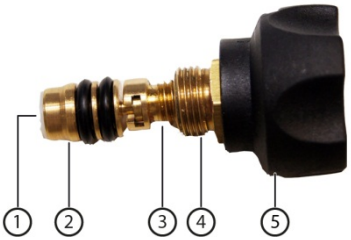
Adjustable parameters

Representation	Explanation
°C, °F	Set unit for temperature.
bar, kPa, MPa, psi	Set unit for pressure.
Pabs, Prel or **psig**	Depending on the chosen unit for pressure: Change between absolute and relative pressure displays.
micron, inHg, Pa, hPa, mTorr,Torr, inH2O, mbar	Set pressure unit for vacuum.
/ /	Select the measuring mode
AUTO OFF	Automatic switch-off time, instrument switches off after 30 minutes if no temperature probe is connected and there is no pressure apart from ambient pressure.
T_{fac}	Temperature compensation factor, icon is shown on the display if the function is disabled.

Operating the valve actuators

With respect to the refrigerant flow path the digital manifold behaves just like a conventional four-way manifold. 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 actuator anticlockwise.
> Close the valve: Turn valve actuator 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).

Tighten the valve positioner only hand-tight. Do not use any tools to tighten the valve positioner.

6 Using the product

6.1. Preparing for measurement

6.1.1. Switching the instrument on

> Press [⏻].

Zeroing the pressure sensors

Zero the pressure sensors before every measurement.

✓ All connections must be pressureless (ambient pressure).

> Press for 2 seconds key **[P=0]** and execute zeroing.

6.1.2. Connecting the temperature sensor

Surface temperature sensor

An NTC temperature sensor (accessory) must be connected for measuring the pipe temperature and for automatic calculation of superheating and subcooling.

Deactivating the surface compensation factor for insertion and air temperature sensor

A surface compensation factor has been set in the measuring instrument to reduce the measuring errors in the main field of applications. This reduces measuring errors when using surface temperature sensors.

1. Press **[Set]** repeatedly until T_{fac} is displayed.
2. Press **[▲]** or **[▼]** to set T_{fac} to Off.
3. Press **[Set]** to continue through the settings menu until the measurement/home view is displayed.

- T_{fac} is shown on the display if T_{fac} is disabled.

Connecting the refrigerant hoses

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

✓ The valve actuators are closed.

1. Connect the refrigerant hoses for low-pressure side (blue) and high-pressure side (red) to the measuring instrument.
2. Connect the refrigerant hoses to the system.

WARNING

The measuring instrument dropping down or any other comparable mechanical load can cause breakage of the pipe pieces in the refrigerant hoses. The valve actuators may also suffer damage, which in turn could result in further damage inside the measuring instrument, which may not be detectable from outside.

> For your own safety you should return the measuring instrument to the Testo Service for technical inspection.

> You should therefore always replace the refrigerant hoses with new ones after the measuring instrument has dropped down or after any comparable mechanical loading.

Setting the refrigerant

1. Press **[R, ►, ■]**.

- This opens the refrigerant menu and the currently selected refrigerant flashes.

2. Setting the refrigerant:

Key functions

Representation	Explanation
[▲] or **[▼]**	Changing the refrigerant
[R, ►, ■]	Confirm the setting and exit the refrigerant menu.

Available refrigerants

Representation	Explanation
R...	Refrigerant number of refrigerant acc. to ISO 817
---	no refrigerant selected.

Example: Setting refrigerant R401B

1. Press [▲] or [▼] several times, until R401B flashes.
2. Press [R, ►, ■] to confirm the setting.

Quitting the refrigerant selection

> Press [R, ►, ■] or automatically after 30 s, if no other key has been pressed.

6.1.3. Connecting the vacuum probe

> Open the front cover of the connector and connect up the vacuum probe.

- The instrument automatically switches to the vacuum measurement mode.

6.1.4. Switching Bluetooth® on and off

In order to be able to establish a connection via Bluetooth, you need a tablet or smartphone with the Testo app **Refrigeration** already installed on it.

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

Information about compatibility can be found in the relevant app store.

1. Press [▲] and [▼] simultaneously and hold down for 3 seconds.

- Once the Bluetooth icon is shown on the display, Bluetooth is switched on.

Display	Explanation
Bluetooth flashes	There is no Bluetooth connection, or a potential connection is being searched for.
Bluetooth is permanently displayed	There is a Bluetooth connection.
Bluetooth is not displayed	Bluetooth is disabled.

2. Press [▲] and [▼] simultaneously and hold down for 3 seconds.

- Once the Bluetooth icon is no longer shown on the display, Bluetooth is switched off.

6.1.5. Choosing the measuring mode

1. Press [Set] several times
2. Press [▲] or [▼] to select the function.
3. Saving settings: Press [Set].

- The measuring mode is displayed.

Display	Mode	Function
❄	Refrigeration system	Normal function of the digital manifold
🔥	Heat pump	Normal function of the digital manifold
🔥❄	Automatic mode	When automatic mode is activated the digital manifold testo 557 automatically reverse the display of high and low pressure. This automatic reversal occurs when the pressure in the low pressure side is 1 bar higher than the pressure in the high pressure side. This switching over is indicated by ---- flashing in the display. This mode is particularly suitable for air conditioning systems that provide cooling and heating.

6.2. Performing the measurement

WARNING

Risk of injury caused by pressurized, hot, cold or toxic refrigerants!

> Wear protective goggles and safety gloves.

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

> Before each measurement check the refrigerant hoses for flawless condition and correct connection. Do not use any tools to connect the hoses, tighten hoses only hand-tight (max. torque 5.0 Nm / 3.7 ft*lb).

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

Measuring

✓ The actions described in the chapter “Preparing for measurement” have been performed.

1. Apply pressure to the measuring instrument.
2. Read the measuring values.

With zeotropic refrigerants, the evaporation temperature to/Ev is displayed after the 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 are flashing.
  - 14,5 psi/1 bar before the critical pressure of the refrigerant is reached,
  - when the max. permissible pressure of 870 psi/60 bar is exceeded.

Key functions

> **[▲]** or **[▼]**: Change the readings display.

Possible display combinations:

Evaporation pressure **Refrigerant evaporation temperature** to/Ev	**Condensation pressure** **Refrigerant condensation temperature** tc/Co

or (only with inserted temperature sensor)

Evaporation pressure **Measured temperature** t_{oh}/T1	**Condensation pressure** **Measured temperature** t_{cu}/T2

or (only with inserted temperature sensor)

Evaporation pressure **Superheating** Δt_{oh}/SH	**Condensation pressure** **Subcooling** Δt_{cu}/SC

With two inserted NTC sensors Δt is additionally displayed.

> **[Mean/Min/Max]**: Hold readings, min. / max. readings, show mean values (since switching on).

Leak test / pressure drop test

The temperature compensated leak 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 (see page 14) and use NTC air sensors Art.-No. 0613 1712). This provides information about the temperature compensated differential pressure and about the temperature at the beginning/end of the test as a result. If no temperature sensor is connected, you may also perform the leak test without temperature compensation.

✓ The actions described in the chapter “Preparing for measurement” have been performed.

1. Press **[Mode]**
- The leak test view is opened. **ΔP** is displayed.
2. Start the leak test: Press **[R, ►, ■]**.
3. End the leak test: Press **[R, ►, ■]**.
- The result is displayed.
4. Confirm the message: Press **[Mode]**.
- Main menu display.

Evacuation / vacuum display

> Connect vacuum probe.

Vacuum measurement

✓ The vacuum probe is plugged into the front connection of the manifold and connected to the system.

1. Press **[Mode]**.

- The vacuum measurement menu appears. If ambient pressure is applied to the vacuum probe, then **oooo** is shown on the display.

2. Start the vacuum pump.

- Once the measuring range 0 to 20,000 microns is reached, the current vacuum value is shown on the instrument display. The instrument also displays the current ambient temperature, the water evaporation temperature, which corresponds to the vacuum reading, and the delta between these two temperatures.

3. To leave vacuum mode, remove the vacuum probe from the testo 557 or switch to the standard measurement view using the mode button.

7 Maintaining the product

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.

Keeping connections clean

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

Removing oil residues

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

Ensuring the measuring accuracy

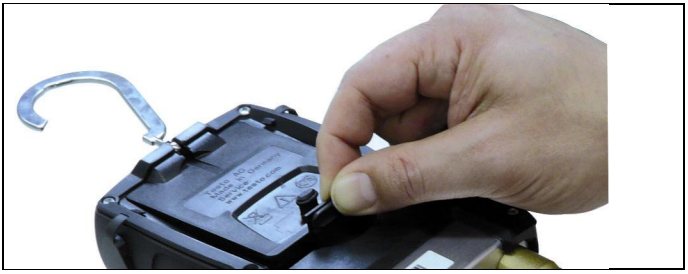
Testo Customer Service would be glad to further assist you if you so wish.

> Check instrument regularly for leaks (recommended: annually). Keep to the permissible pressure range!

> Calibrate instrument regularly (recommended: annually).

Changing batteries/rechargeable batteries

✓ Instrument is switched off.



1. Fold out the suspension device, loosen the clip and remove the cover of the battery compartment.
2. Remove empty batteries/rechargeable batteries and insert new batteries/rechargeable batteries (4x 1.5 V, type AA, Mignon, LR6) in the battery compartment. Observe the polarity!

3. Set on and close cover of the battery compartment (clip must engage).
4. Switch the instrument on.

Cleaning the vacuum probe

Contaminants such as oil may impair the accuracy of the vacuum sensor.

CAUTION

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

> Remove the vacuum probe from the testo 557!

CAUTION

Damage to the sensor due to sharp objects!

> Do not insert any sharp objects into the probe!

1. Remove the vacuum probe from the testo 557.
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 draw vacuum.

8 Tips and assistance

8.1. Questions and answers

Question	Possible causes/solution
flashes	Batteries are almost empty. > Change batteries.
The instrument switches off automatically.	Residual capacity of the batteries is too low. > Change batteries.
uuuu lights up instead of the parameter display	The permissible measuring range has been undershot. > Keep to the permitted measuring range.
oooo lights up instead of the parameter display	The permissible measuring range has been exceeded. > Keep to the permitted measuring range.

8.2. Measurement parameters

Name		Description
bar, °C	**Psi, °F**	
Δtoh	SH	Superheating, evaporation pressure
Δtcu	SC	Subcooling, condensation pressure
to	Ev	Refrigerant evaporation temperature
tc	Co	Refrigerant condensation temperature
toh	T1	Measured temperature, evaporation
tcu	T2	Measured temperature, condensation

8.3. Error reports

Question	Possible causes/solution
---- is lit up instead of measurement parameter display	Sensor or cable defective > Please contact your dealer or Testo Customer Service
Display **EEP FAIL**	Eeprom defective > Please contact your dealer or Testo Customer Service
Display **BT ERR**	No BT module connected or BT module defective. > Please contact your dealer or Testo Customer Service
Display **ERR 2 - 5**	Damaged vacuum sensor > Please contact your dealer or Testo Customer Service

If you have any questions, please contact your dealer or Testo Customer Service. The contact details can be found on the back of this document or on the Internet at **www.testo.com/service-contact.**.

8.4. Accessories and spare parts

Description	Article no.
Clamp probe for temperature measurement at pipes (1,5m)	0613 5505
Clamp probe for temperature measurement at pipes (5m)	0613 5506
Pipe wrap probe with Velcro tape for pipe diameters of up to max. 75 mm, Tmax. +75 °C, NTC	0613 4611
Watertight NTC surface probe	0613 1912
Precise, robust NTC air probe	0613 1712
External vacuum probe	Please contact Testo Service.

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

9 EC Declaration of Conformity

CE

Wir messen es. testo

EG-Konformitätserklärung

Für die nachfolgend bezeichneten Produkte:

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

Zur Beurteilung der Erzeugnisse hinsichtlich elektromagnetischer Verträglichkeit wurden folgende Normen herangezogen:

Störaussendung/ *Pertubing radiation*: **DIN EN 61326-1:2013 class B**
Störfestigkeit: / *Pertubing resistance*: **DIN EN 61326-1:2013 table 1**
R&TTE Richtlinie: **EN 300 328 V1.8.1: 2012**
EN 301 489-1 V1.9.2: 2011
EN 301 489-17 V2.2.1: 2012-08
Sicherheits-Richtlinie: **EN 60950-1:2006** +A11:2009 +A1:2010 +A12:2011 +A2:2013
Healt Assessment: **EN 62479:2010**

EC declaration of conformity

We confirm that the following products:

testo 557

Best. Nr.: / Order No.: 0560 1557

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

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

Diese Erklärung wird für:

This declaration is given in responsibility for:

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

abgegeben durch / *by*:

Burkart Knospe
(Name / *name*)

Managing Director
(Stellung im Betrieb des Herstellers)
(Position in the company of the manufacturer)

Lenzkirch, 01.06.2015
(Ort, Datum / *place, date*)

(Rechtsgültige Unterschrift)
(*Legally valid signature*)

Uwe Haury
(Name / *name*)

Head of Qualification & Test
(Stellung im Betrieb des Herstellers)
(Position in the company of the manufacturer)

i.V.

(Rechtsgültige Unterschrift)
(*Legally valid signature*)

ISO 9001 TESTO QUALITY certified

Der Hersteller betreibt ein zertifiziertes Qualitätssicherungssystem nach DIN ISO 9001

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

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