testo 6621
Air-conditioning transmitter for relative humidity and temperature
P2A software for testo 6621

Instruction manual   en

Contents

Safety and the environment

About this document

- Please read this documentation through carefully and familiarize yourself with the product before putting it to use. Keep this documentation to hand so that you can refer to it when necessary. Hand this documentation on to any subsequent users of the product.

- Pay particular attention to information emphasized by the following symbols:

  With the signal word **Caution!**:
  Warns against hazards which could result in minor physical injury or damage to equipment if the precautionary measures indicated are not taken.

  · Important.

Avoiding personal injury / damage to equipment

- Never store the product together with solvents and do not use any desiccants.

- Only operate the product properly, for its intended purpose and within the parameters specified in the technical data. Do not use force.

- Only carry out the maintenance and repair work that is described in the documentation. Follow the prescribed steps when doing so. Use only OEM spare parts from Testo.

Protecting the environment

- Send the product back to Testo at the end of its useful life. We will ensure that it is disposed of in an environmentally friendly manner.

PART 1: TESTO 6621

Specifications

Functions and use

The testo 6621 is a transmitter for relative humidity and temperature. In the A01 (wall/voltage output) (see identification plate), the sensors are located in the housing; in the A02 (duct) version and the version A03 (wall/current output), the sensors are located in a permanently connected probe shaft. The transmitter is available with an integrated display for the reading as an option (cannot be retrofitted by the customer).

Applications include: Air conditioning, particularly in air conditioning in buildings and during storage. The product is not suitable for high-humidity drying processes (relative humidity constantly over 90 %).

The transmitters must only be assembled, wired and connected by qualified personnel.

The product must **not** be used in areas at risk of explosion!

Ordering overview

0555 6621 Axx / Bxx / Cxx / Fxx / Gxx / Mxx / Kxx	
A01	Wall version (not with B01/B05)
A02	Duct version
A03	Wall version with external probe for 4...20mA analog output (only with B01)
B01	4 - 20 mA (2-wire, 24 V DC), two analog outputs (humidity/temperature)
B02	0 - 1 V (4-wire, 24 V AC/DC), two analog outputs (humidity/temperature)
B03	0 - 5 V (4-wire, 24 V AC/DC), two analog outputs (humidity/temperature)
B04	0 - 10 V (4-wire, 24 V AC/DC), two analog outputs (humidity/temperature)
B05	4 - 20 mA (2-wire, 24 VDC), humidity: analog output, temperature: passive, Ni1000
B06	0 - 1 V (4-wire, 24 VAC/DC), humidity: analog output, temperature: passive, Ni1000
B07	0 - 5 V (4-wire, 24 VAC/DC), humidity: analog output, temperature: passive, Ni1000
B08	0 - 10 V (4-wire, 24 VAC/DC), humidity: analog output, temperature: passive, Ni1000
C00	Without display
C01	With display
E01	Housing colour light grey, with Testo-Logo (coloured)
E02	Neutral housing, white (RAL9010), without Testo-Logo
E03	Neutral housing, white (RAL9010), with Testo-Logo (black-white)
F01	Relative humidity (% RH)
G02	Temperature (°C) (only with B01 to B04)
G03	Temperature (°F) (only with B01 to B04)
M01	Sintered stainless steel filter (only for A02 and A03)
M02	Metal wire protection cap (only for A02 and A03)
M03	Sintered PTFE filter (only for A02 and A03)
M04	Open metal protection cap (only for A02 and A03)
M05	Open plastic (ABS) cap (only for A02 and A03)

Sample orders

· Duct version with 0 - 10 V outputs, with display, neutral housing without Testo-logo, % RH, °C, open plastic capl:
  0555 6621 / A02 / B04 / C01 / E02/ F01 / G02 / M05

· Wall version with 0...5 V outputs, without display, housing colour light grey, % RH, °F: 0555 6621 / A01 / B03/
  C00 / E01/ F01 / G03 / K04

Technical data

Parameters
· Humidity: % RH, temperature: °C/°F

Sensor
· Humidity: Testo humidity sensor, temperature: NTC
· Temperature active signal output: NTC (B01...B04)
· Temperature passive signal output: NI1000 (B05..B08)

Interfaces
· 1x mini-DIN for / PC

Measuring ranges
· Humidity: 0 - 100 % RH (> 90% RH only briefly)
· Temperature 6621-A01/A03: 0 - +60 °C/32 - 140 °F,
  Temperature 6621-A02: -20 - +70 °C/-4 - +158 °F

Measuring medium/pressure range:
· Non-contaminated air (filtered air in air-conditioning systems or air-conditioned rooms)
· Max. 1 bar positive pressure

Resolution
· Humidity: 0.1 % RH, temperature: 0.1 °C/0.1 °F

Accuracy
· Humidity*: ±2 % RH (0 - 90 % RH), ±4 % RH (> 90 - 100 % RH)
· Temperature active : ±0.5 °C/0.9 °F
· Temperature passive, Tolerance Ni1000 temperature sensor (B05 to B08) :
    <0 °C: 0.4 °C + (0.028 x ltl)
    >0 °C: 0.4 °C + (0.007 x ltl)

Other measurement-related data
· Analog outputs (2 channels each) (Order code B01 to B04)
· Analog output 1 channel (Order code B05 to B08)
· Meas. cycle: 1/s
· Temperature coefficient (based on 25 °C): 0.05 % RH/K
· Response time t90: < 15s at 2m/s
  In calibration / adjustment, observe: The response time can be considerably higher in still air.

Ambient conditions
· Operating temperature: -20 - 70 °C/-4 - 158 °F (A02), with display from 0 - 50 °C/32 - 122 °F
· Application temperature: 0...60°C / 32...140°F (A01/A03), with display 0...50°C / 32...122°F
· Storage temperature: -40 - 70 °C/-40 - 176 °F

Analog outputs
· 0 - 1 V ±2.5 mV (4-wire)/
  0 - 5V ±12.5 mV (4-wire)/
  0 - 10 V ±25 mV (4-wire)/
  4 - 20 mA ±0.05 mA (2-wire)
· Scaling range: -50...100°C / -58...212°F, -50...100%RH

Voltage supply
· 2-wire (4 - 20 mA): 24 V DC ±10 %
· 4-wire (0 - 1 V/0 - 5 V/0 - 10 V): 20 - 30 V AC/V DC

Housing
· Material: ABS
· Dimensions 6621-A01/A03: 81 x 81 x 26 mm, probe A03 see drawing
  Dimensions 6621-A02: 81 x 81 x 42 mm, see drawing for probe
· Weight 6621-A01: 80 g,
  Weight 6621-A02: 160 g
  Weight 6621-A03: 90g
· Protection class 6621-A01/6621-A03: IP30,
  Protection class 6621-A02: IP65 (with closed cable screw fitting and connection socket sealed with rubber plug, or with USB adapter attached)
· Cable couplings 6621-A02: 1 x M16 x 1.5

Display (optional)
· 2-line LCD

**Directives, standards and tests**
· EC Directive: 2014/30/EC

* The determination of the measurement uncertainty takes place according to GUM (Guide to the Expression of Uncertainty in Measurement).
  In the determination, the accuracy of the measuring instrument (hysteresis, linearity, reproduceability), the uncertainty contribution of the test site as well as the uncertainty of the adjustment site/works calibration are taken into account. For this purpose, k=2 of the extension factor, the usual value in measurement technology, is used as a basis, corresponding to a trust level of 95%.
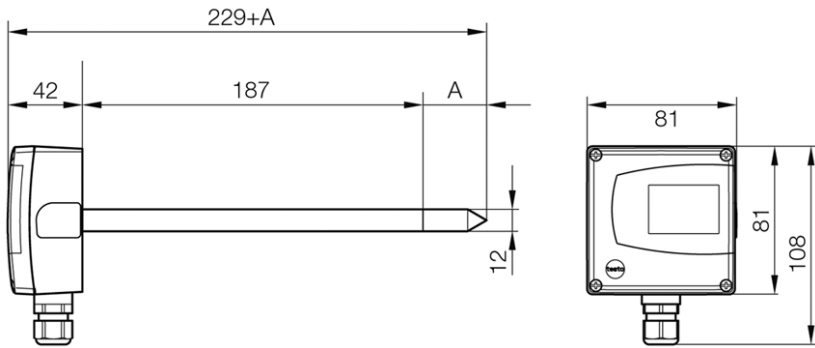
Dimensions

testo 6621-A01 (wall):
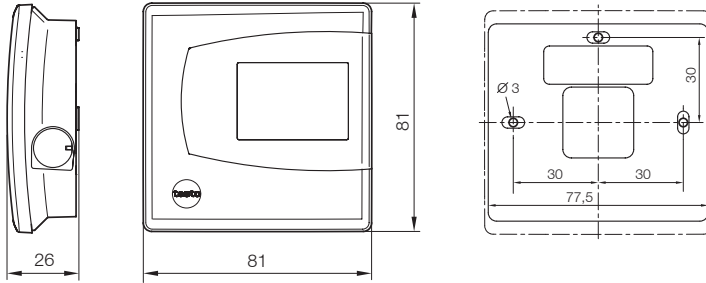
testo 6601-A03 (wall/current version):
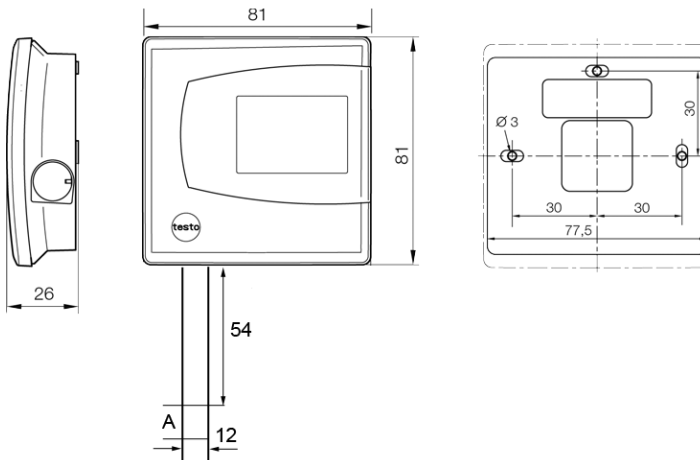
testo 6621-A02 (duct):

A = length of sensor protection cap used

Sensor protection cap	Order code	Length A in mm
Sintered stainless steel filter	M 01	33
Wire mesh filter	M 02	40.3
Sintered PTFE filter	M 03	35
Metal protection cap (open)	M 04	35
Plastic protection cap (open)	M 05	25

Choice of filter dependent on exposure to particles:

Velocity	Exposure to particles		
	none	fine	coarse
< 7 m/s	M04/05	M02	M03
> 7 m/s	M 01	M02*	M01*

* also use condensation protection 0554 0166, serves as flow protection

Product description
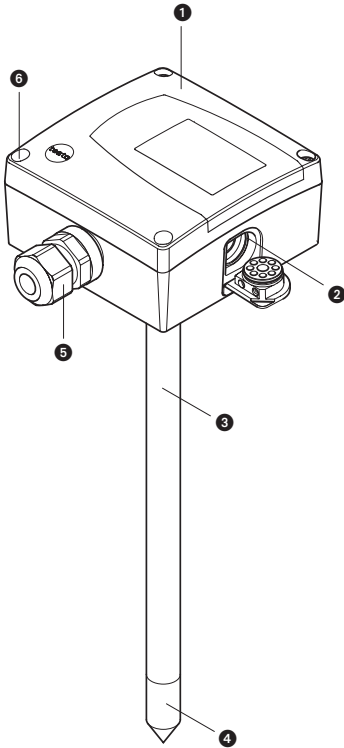
At a glance: testo 6621-A01 (wall/voltage version)
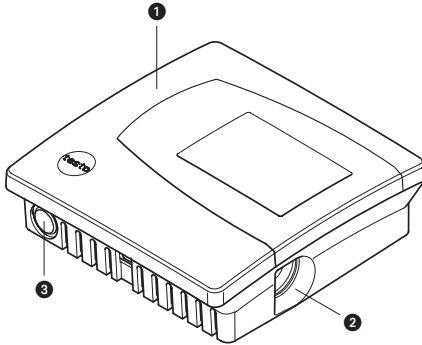
1 Top part of housing, display (option, cannot be retrofitted) for displaying readings:
1st line Relative humidity (duct 1),
2nd line Temperature (duct 2).

2 Mini-DIN port.

3 Opening for feeding cable through from underneath, predetermined breaking point in housing wall

At a glance: testo 6621-A03 (wall/curent version)
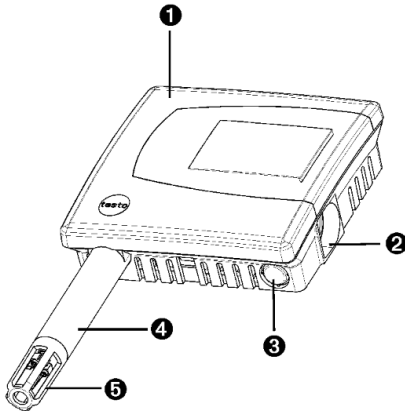
1 Housing cover, display (option, not retrofittable) for measurement value display:
1 line relative humidity (channel 1),
2 line temperature (channel 2).

2 Mini-DIN-connection socket.

3 Opening for cable inertion from below, break-out point in housing wall.

4 Probe shaft

5 Sensor protection cap

At a glance: testo 6621-A02 (duct)

1 Top part of housing, display (option, cannot be retrofitted) for displaying readings:
1st line Relative humidity (duct 1),
2nd line Temperature (duct 2).
2 Mini-DIN port, protected by rubber plug.
3 Probe shaft.
4 Sensor protection cap.
5 Cable coupling for feeding cable through.
6 4 screws (Phillips) for fastening the top part of the housing.

Commissioning

Assembling the instrument

➣ Assembling the testo 6621-A01/03 (wall):
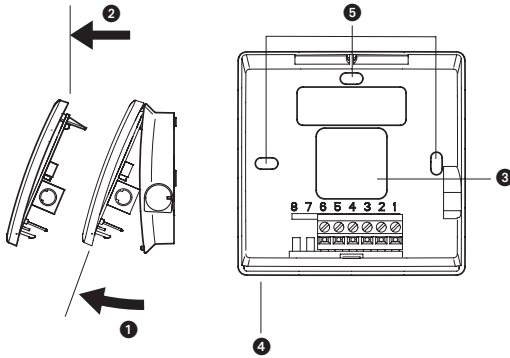
ℹ Please note that assembling the instrument on poorly insulated exterior walls will result in humidity and temperature readings that do not reflect the average values in the room. It is recommended that the instrument be installed on well insulated exterior or interior walls.

1 To open the housing (no connector may be inserted in the mini-DIN socket): lift up the upper part of the housing (1) and remove (2).

2 Guide the cable from behind (3) or underneath (4), detach pre-punched area of the housing) into the lower part of the housing.

3 Depending on the conditions in situ: Fasten lower part of housing at the slots (5) using appropriate screws (not supplied).

4 After wiring (see chapter Wiring the instrument): Replace the upper part of the housing.

➤ Assembling the testo 6621-A02 (duct):

1 Assemble the instrument according to the conditions in situ.

The illustration below shows the instrument assembled on a duct with the wall/duct holder (accessory, 0554 6651) as an example:
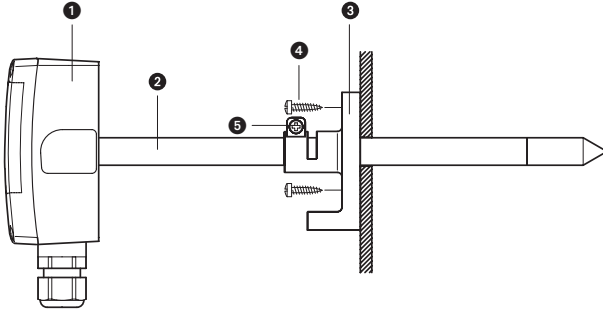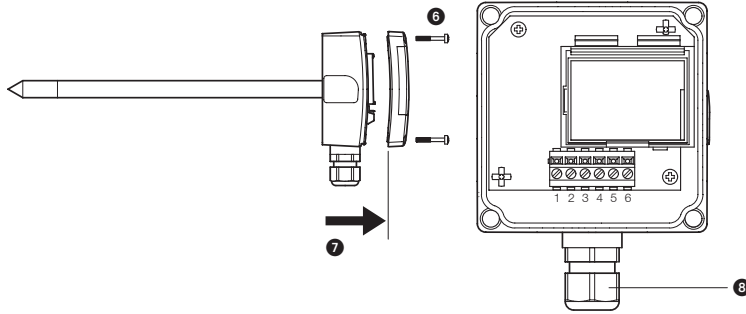

The illustration below shows the instrument assembled on a wall with the wall/duct holder (accessory, 0554 6651) as an example:
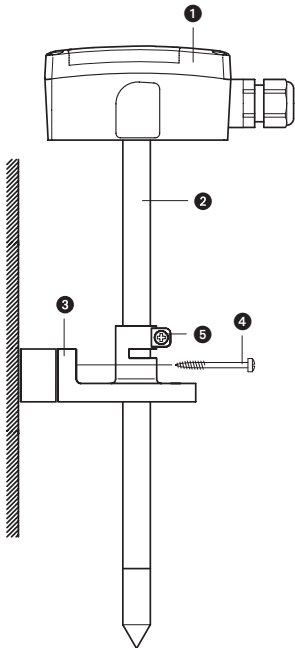
1 testo 6621-A02 (duct).
2 Probe shaft.
3 Wall/duct holder (accessory 0554 6651), for assembly on wall with spacer.
4 Fastening screws (customer-specific, not included).
5 Locking screw for fastening the probe shaft.

2 To open the housing: Loosen the 4 screws in the upper part of the housing (6) and remove the upper part of the housing (7).

3 Guide the cable through the cable coupling (8) into the lower part of the housing.

4 After wiring (see below): Close the cable coupling to fix the cable (right-handed thread) and replace upper part of housing.

Wiring the instrument

Make sure when routing the cables that there is space between the signal lines and interfering external lines.
If electromagnetic interference is likely, use a shielded and/or twisted cable. The shield must be connected to earth on the side facing away from the transmitter. Recommendation: 8-wire line with a tightly plaited shield, wire cross-section of 0.25 - 0.5 mm².
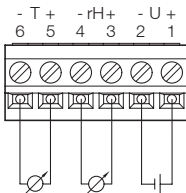If overvoltages are likely, install overvoltage protection devices.

Wire the instrument according to the application in hand:

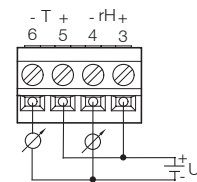## 2-wire/4-wire technology (2 analog outputs active)
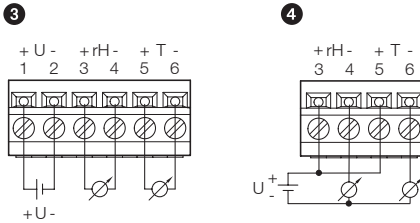testo 6621 (wall) View of wiring side (rear of housing)

1 Voltage output A01 (4-wire, 0 - 1 V/0 - 5 V/0 - 10 V): U = 20 - 30 V DC/AC

2 Current output A03 (2-wire, 4...20 mA), max. load 500 W

testo 6621-A02 (duct) View of wiring side

3   Voltage output (4-wire,
0 - 1 V/0 - 5 V/0 - 10 V):
U = 20 - 30 V AC/DC

4   Current output (2-wire,
4 - 20 mA), max. load 500 W

2-wire/4-wire technology (1 analog output active for humidity, 1 passive temperature signal output)

testo 6621-A01 (wall) View of wiring side (rear of housing)
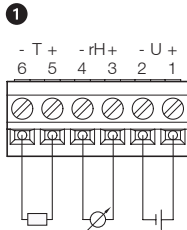
1   Voltage output A01 (4-wire,
0...1V / 0...5V / 0...10V):
U = 20...30V DC/AC,
Temperature signal output
Ni1000 passive

testo 6621-A02 (duct) View of wiring side
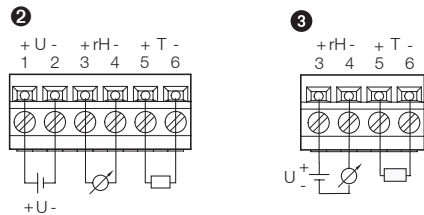
2   Voltage output (4-wire,
0...1V / 0...5V / 0...10V):
U = 20...30V AC/DC,
Temperature signal output
Ni1000 passive

3   Current output (2-wire,
4...20mA), max. load 500W,
Temperature signal output
Ni1000 passive

3-conductor technology (2 analog outputs active)

All earth connections are connected to each other (= one common earth).

⚠️ **Attention!** Incorrect polarity wil destroy the instrument (instrument not reverse polarity-proof).

- Connections for voltage supply: connect common earht to pin 2!

testo 6621-A01 (Wall) View of wiring side (rear of housing)

testo 6621-A02 (Duct) View of wiring side

Parameterizing/adjusting/analyzing the instrument

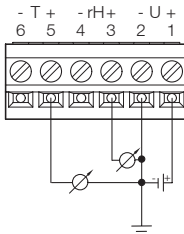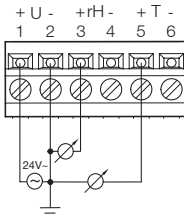❏ The analog outputs can be scaled in the following ranges, beyond the measurement range of the measurement transmitter: -50…100°C / -58…212°F, -50…100%RH.

The instrument is parameterized, adjusted and analyzed using the P2A Software, see "Part 2: testo P2A Software".

Maintaining the product

➢ Cleaning the housing:
- Clean the housing with a damp cloth (soap suds) if it is dirty. Do not use aggressive cleaning agents or solvents!

➢ Cleaning the sensor of the testo 6621-A01 (wall/voltage version):

❏ Do not touch sensor.
- Open the housing and carefully clean the reflective surface of the sensor (top right, assembled vertically on the circuit board) with distilled water or ethanol. Allow the sensor to dry completely.

➢ Cleaning the sensor of the testo 6621-A02 (duct), testo 6621-A03 (wall/current version):

❏ Do not touch sensor.
- Unscrew the sensor protection cap and carefully rinse the reflective surface of the sensor with distilled water or ethanol. Allow the sensor to dry completely.

➢ Cleaning the filter of the testo 6621-A02 (duct), testo 6621-A03 (wall/current version):
- If using a sintered filter:
Clean regularly by blowing out with compressed air or ultrasonic bath, depending on the level of contamination created by the process.

Tips and assistance

Questions and answers

Question	Possible causes / solutions
Signal response too slow.	· Clean the filter

If we could not answer your question, please contact your dealer or Testo Customer Service. For contact data, see back of this document or web page www.testo.com/service-contact.

Accessories and spare parts

Designation	Article no.
Parameterizing, adjusting and analyzing software (P2A Software incl. adapter cable for USB to mini-DIN)	0554 6020
Control and adjustment set for 2-point adjustment (11.3 % and 75.3 % RH), only for testo 6621 - A02	0554 0660
Wall/duct holder	0554 6651
Replacement sensors (% RH) for testo 6621-A02	0420 0023
Mains unit (bench unit), 110 - 240 V AC/24 V DC (350mA)	0554 1748
Mains unit (top-hat rail mounting), 90 - 264 V AC/24 V DC (2.5A)	0554 1749
ISO calibration certificate for humidity at 11.3% and 75.3% RH	0520 0076
ISO-calibration certificate humidity	0520 0176
Sintered stainless steel filter	0554 0647
Wire mesh filter	0554 0757
Sintered PTFE filter	0554 0759
Metal protection cap (open)	0554 0755
Plastic protection cap (open)	0192 0265

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

PART 2: TESTO P2A SOFTWARE

Specifications

Functions and use

The P2A software is used for the parameterization, adjustment and analysis of Testo transmitters. The following applies:

• If a Testo transmitter is bought at a later stage (and is therefore more recent than the existing P2A software version), a software update is required.

• You can find the free upgrade on the Testo website www.testo.com under the product-specific downloads.

• The software therefore only needs to be bought once, even for owners of several Testo transmitters.

System requirements

Operating system

Windows® 7, Windows® 8 oder Windows® 10

Computer

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

• USB 1.1 interface or higher

• Graphics resolution of at least 1024 x 768

• Date and time settings are automatically adopted by the PC. The administrator must make sure that the system time is regularly compared with a reliable time source, and adjusted if necessary, in order to ensure the authenticity of the data

First steps

Installing the software / driver

🛈 Administrator rights are required for the installation of the testo P2A Software.

➢ **Installing the P2A Software:**

🛈 Without the input of a licence key, the software will run only as a demo version (time limit 30 days).

1. You can download the software under the following link:
   https://www.testo.com/download-center
   If the installation program does not start automatically: > Open download folder and start P2A.exe.

2. Follow the instructions of the installation wizard.

3. Click on [Finish] to complete the software installation.

➢ **Installing the USB drivers:**

1. You can download the USB driver under the following link:
   https://www.testo.com/download-center (Testo USB driver)
   If the installation program does not start automatically: > Open download folder and start USBDriver.exe

2. Follow the instructions of the installation wizard.

3. Click on [Finish] to complete the software installation.

➢ **P2A Software update:**

P2A software update

1. You can find the P2A software upgrade on the Testo website www.testo.com under the product-specific downloads. Download and save P2A software upgrade.

2. Start P2A upgrade.exe file.

3. Follow the instructions of the installation wizard.

Starting the software

➢ Starting the program:

Windows program menu

Windows® 7

> Click on [Start] > All Programs > Testo > P2A Software (double-click on left mouse button).
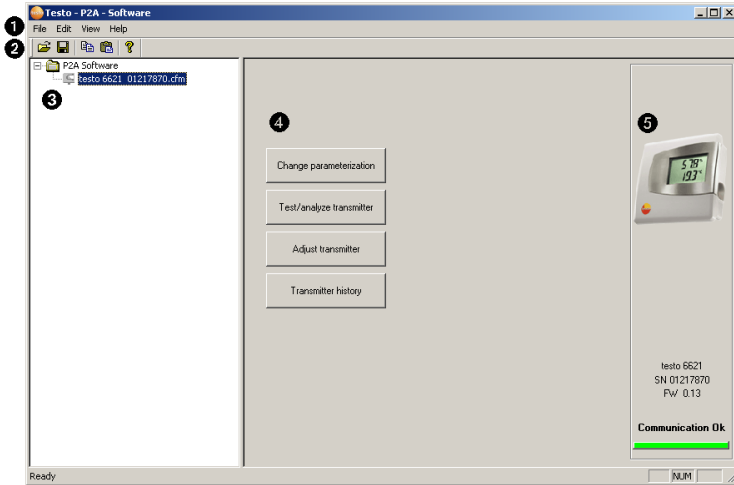
Windows® 8

> Click on [Start] | right mouse button | Search | Enter the name of the application in the search field | P2A Software. (double-click on left mouse button).

Windows® 10

> Click on [Start] | All Apps | Testo | P2A Software. (double-click on left mouse button).

Product description

User interface

1 Menu bar.

2 Toolbar.

3 File list: List of all instrument/parameter files.

File symbols

	: Instrument file, connection to the unit has not been established.
	: Instrument file, connection to the unit has been established.
	: Parameter file.

File identifications

· Instrument files: "[Type] [serial number].cfm"; file identifications cannot be changed.
Instrument files contain all the data relating to a particular instrument. These are the parameter data and represent the parameterization and adjustment history of the instrument.

· Parameter files: "[Type] [serial number] [date] [time].cfp"; file identifications can be changed.
Parameter files only contain parameter data. These can be copied to another instrument or parameter file for the same type of instrument so that several instruments have the same parameter settings.

4 List of functions.

5 Instrument information:

Information displayed

· Instrument files: Type, serial number, firmware version and connection status of the instrument.
· Parameter file: Type, serial number and firmware version of instrument with which the parameter file was created.
· Connection status (instrument files only): "green" connection is active, "red" connection is inactive.

Using the product

➢ Establishing a connection with the device:

Several instruments can be connected to the PC and administered via the P2A software, but only one connection can ever be active at any one time.

Non-wired instruments can also be connected to the P2A Software for parameterization/adjustment. The supply to the instruments is then effected via the USB interface (analog outputs not functional).

1 Connect the USB/mini-DIN adapter to the external interface (mini-DIN) of the instrument.

2 Connect the USB connector of the adapter to the PC.

- The instrument file for the instrument connected appears in the instrument file/parameter file list.

➢ Selecting the instrument/parameter file, activating a connection with the device:

Click on the requisite instrument/parameter file.

- The selected file is highlighted in colour.

- For instrument files only: if a connection with the instrument has been established, this is automatically activated.

➢ Changing an instrument/parameter file:

  ✓ The required instrument/parameter file is selected.

  1 Click on Change parameterization button.

  2 Select channel.

  3 Enter parameters in the corresponding fields.

  4 Click on Apply to confirm entries.

  5 To leave the parameterization screen, click on OK.

➢ Saving the parameters in a parameter file:

The parameter data for the selected instrument/parameter file can be saved.

  i Only parameter data stored in the standard file can be loaded into an instrument!

  ✓ The required instrument/parameter file is selected.

  1 In the menu bar, click on File > Save as.

  2 Select the storage location and enter the file name.

  3 Click on Save to confirm entries.

➢ Opening a parameter file:

All parameter files stored in the standard directory path are automatically displayed in the file list when the software is started. Parameter files stored in other directories can also be opened.

  i Only parameter data stored in the standard file can be loaded into an instrument!

  1 In the menu bar, click on File > Open.

  2 Select the storage location and click on the requisite parameter file.

  3 Click on Open to confirm entries.

➢ Copying the parameter data:

The parameter data for an instrument/parameter file can be transferred to another instrument/parameter file for the same type of instrument. History data for instrument files are not transferred.

  1 Select file from which the parameter data are to be copied.

  2 In the menu bar, click on Edit > Copy.

  3 Select the file which is to be modified.

  4 In the menu bar, click on Edit > Paste.

➢ Analyzing/testing the instrument:

✓ The required instrument file is selected.

1 Click on Test / analyze transmitter button.

2 Perform tasks:

Options
· Carry out factory reset: Reset the parameter unit, scaling limits and adjustment to the factory settings (Values instrument-specific, see specification plate).
· Transmitter tests (voltage supply via terminals required): Current reading displayed and analog output test carried out for each channel; see below for procedure.
· Min./max. values: Change to display of minimum/maximum values.

Procedure: testing analog output (voltage supply via terminals required)
1 Choose channel.
2 Connect reference multimeter (min. 6.5 digits resolution) to the analog output terminals of the transmitter.
3 Set the default value in the P2A Software and click on Activate.
4 Compare value displayed with reference value of multimeter.

3 To leave the analyzing/test screen, click on OK.

➢ Carrying out/resetting a 1-point adjustment (offset):

ℹ Make sure that the reference instrument has a higher level of accuracy than the test specimen!.

1 Click on Adjust transmitter button.

2 Select the channel under 1-point adjustment.

3 Expose the reference measuring instrument and the instrument to be adjusted to the same constant conditions and wait for equalization period to lapse.

4 Enter reference value and perform adjustment by clicking on Carry out 1-point adjustment.

To reset an offset value, click on Set Offset to zero.

5 Click on OK to confirm entries.

➢ Carrying out a 2-point adjustment:

1 Click on Adjust transmitter button.

2 Select the adjustment point under 2-point adjustment.

3 Position the entire testo 6621-A01 (wall) or the probe shaft of the testo 6621-A02/A03 in a precision humidity generator/air conditioning cabinet and route the USB cable to the P2A Software outwards.

4 To set the humidity generator: Temperature of 25 °C and humidity of 11.3 % RH or 75.3 % RH (depending on adjustment point chosen).**5** After a sufficient equalization period (at least 1.5 h): Enter reference value and perform adjustment by clicking on **Lower adjustment point** or **Upper adjustment point** (depending on adjustment point chosen).

6 Repeat steps **3** to **5** for the second adjustment point accordingly.

7 Click on **OK** to confirm entries.

ℹ For the testo 6621-A02/A03 (duct), a 2-point adjustment can also be performed using the testo control and adjustment set (0554 0660). Please also refer to the instruction manual for the control and adjustment set. The reference values are entered and the adjustment is carried out in the same way as for an adjustment with a humidity generator/air conditioning cabinet (see steps **5** to **7**).

➢ Carrying out an analog adjustment:

ℹ Voltage supply via terminals required.

1 Click on **Adjust transmitter** button.

2 Choose channel.

3 Connect reference multimeter (min. 6.5 digits resolution) to the analog output terminals of the transmitter.

4 Click on **Start Wizard...** button and follow the instructions issued by the P2A Software.

5 Click on **OK** to confirm entries.

➢ Viewing a transmitter history:

The current history data are always displayed as stored in the instrument file. A distinction is made between parameterization and adjustment histories.

ℹ Dates and times refer to the PC time when the P2A Software was being used.
History data are only stored in the instrument file (PC), not in the testo 6621.

1 Click on **Transmitter history** button.

2 To move between the views, click on **Parameterization history** or **Adjustment history**.

To print the history data, click on **Print**.

➢ Deleting parameters from an instrument/parameter file:

The parameter data for the selected instrument/parameter file can be deleted.

3 The required instrument/parameter file is selected.

1 Right-click on the instrument/parameter file.

2 Select Delete.

3 Click on Yes to confirm.

➢ Creating a new folder:

3 The folder **to which the new folder is to be added** is selected.

1 In the menu bar, click on File > Add Folder.

2 Give the new folder a name.

Tips and assistance

Questions and answers

Question	Possible causes/solutions
Connection to instrument cannot be established.	· Check connecting cable and plug contacts. · USB driver not/incorrectly installed: Re-install.
Adjustment is to be reversed.	· Carry out factory reset: Click on Test / analyze transmitter > Click on Carry out factory reset.

If we could not answer your question, please contact your dealer or Testo Customer Service. For contact data, see back of this document or web page www.testo.com/service-contact.