

**A1 Overview versions and applications humidity transmitters testo 6621, testo 6651, testo 6681**

Testo offers three classes of new transmitters for humidity measurement. The following is a rough presentation of the three classes. After this, each class is described in detail.

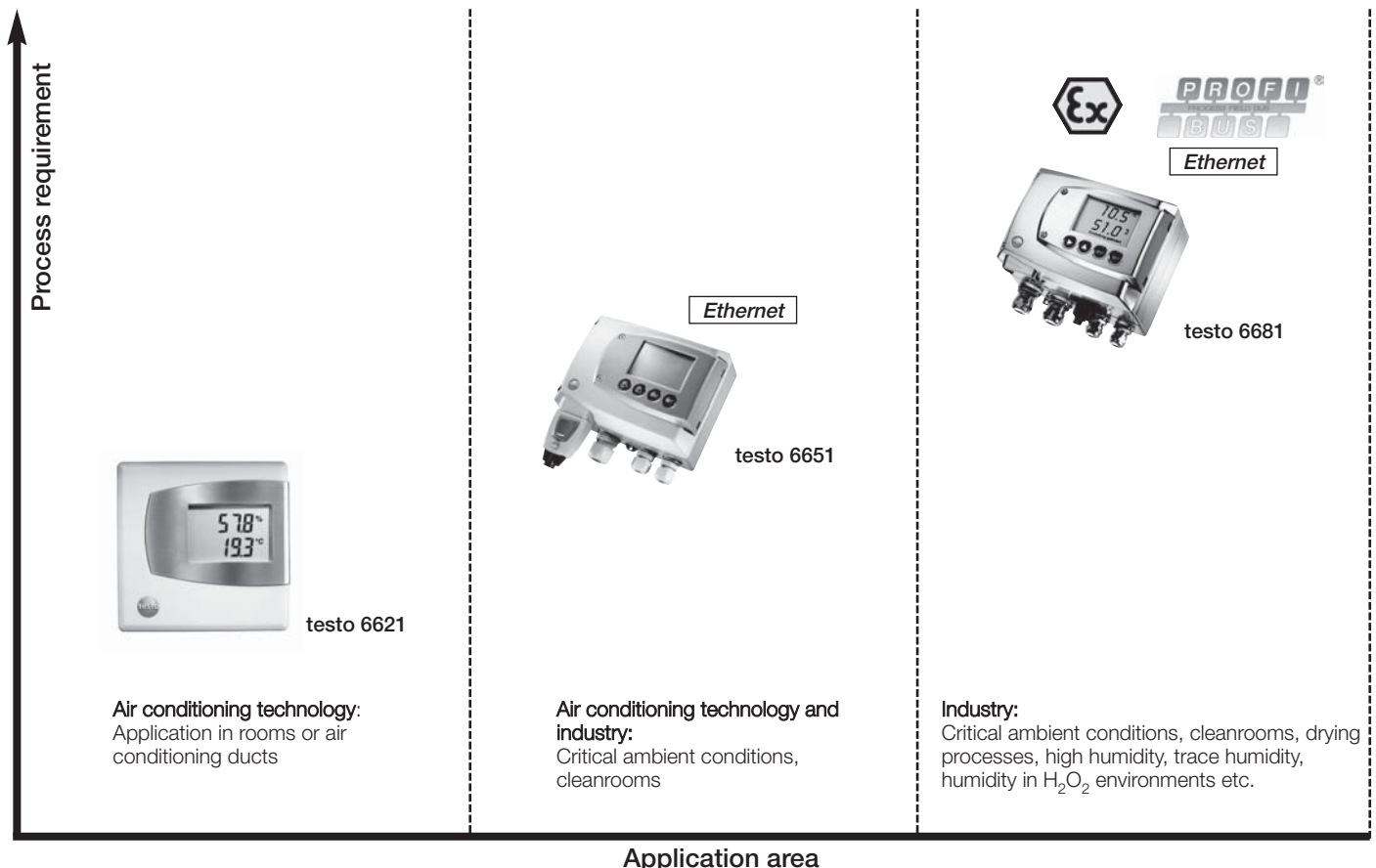
The price and performance of the testo 6621 make it ideal for air conditioning applications in buildings. The models testo 6651 and testo 6681, are positioned in the middle to upper performance range. They are designed for the monitoring of critical climate in process engineering and also in compressed air technology. The demanding measurement is realized with the further developed Testo humidity sensor, with its well-known and highly-valued long-term stability. Unmatched state-of-the-art technology in humidity measurement, with solutions for highest accuracy as well as for special applications (high humidity, humidity in H<sub>2</sub>O<sub>2</sub>, trace humidity etc.) is provided.

Both instrument series present many innovations, including world firsts such as a Profibus interface in the humidity transmitter testo 6681 and an Ethernet interface in the humidity transmitters testo 6681 and testo 6651.

It is a completely newly developed generation of instruments, which in particular offers solutions for safe and service-friendly use, meaning high reliability and operational security for industry:

- exchangeable probes
- early warning reports
- variable possibilities for adjustment

In addition, they also continue to use already existing technology such as the external interface for communication, for example for the parameterization and adjustment software P2A from Testo.



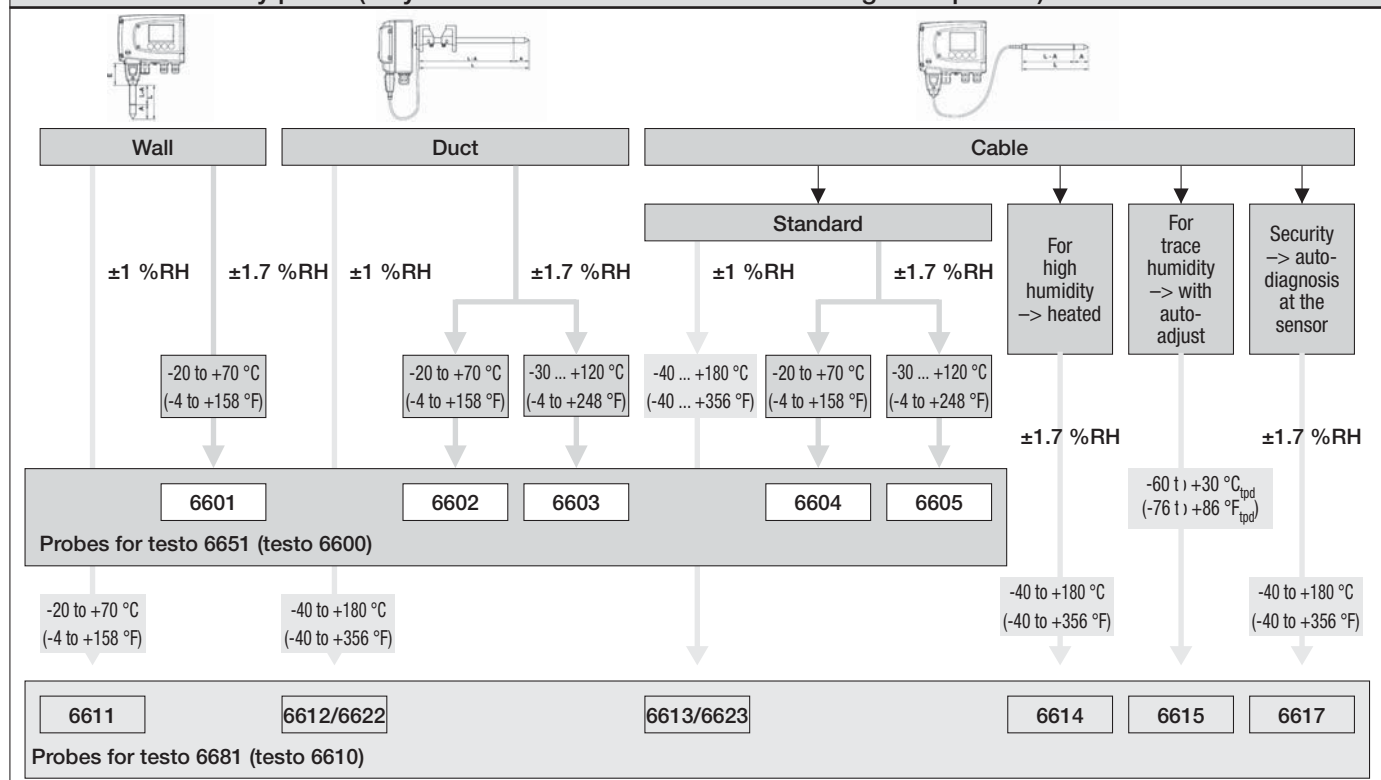
**Product selection by instrument**

	testo 6621	testo 6651	testo 6681	
<b>Measuring range</b>	Humidity	0 to 100 %RH (no high humidity processes)	0 to 100 %RH (no high humidity processes)	0 to 100 %RH
	Temperature (dependent on probe)	0-20 to +120 °C (not for high humidity processes), duct: -20 to +70 °C (-4 to +158 °F)	-20 to +120 °C (-4 ... +248 °F)	-40 to +180 °C (-40 ... +356 °F)
<b>Accuracy at +25 °C (+77 °F)</b>	Humidity**	±2.5 %RH (0 to 90 %RH) ±4 %RH (90 to 100 %RH)	±1,7 %RH (0to90%) ±1,9 %RH (90to100%)	up to ±1,0 %RH (0to90%) ±1,4 %RH (90to100%), dependent on probe
	Temperature	±0.5 °C / 0.9 °F	Pt1000 Klasse A: ±0,2 °C / 0,38 °F * Pt1000 1/3 Klasse B: ±0,15 °C / 0,27 °F * (testo 6605)	Pt1000 1/3 Class B / Pt 100 1/3 Class B for testo 6615 ±0.15 °C / 0.27 °F *
<b>Measurement parameters</b>	°C, °F, %RH	°C/°F, %rF/%RH, °C <sub>td</sub> /°F <sub>td</sub>	°C/°F, %rF, %RH, °C <sub>td</sub> , °F <sub>td</sub> , g/m <sup>3</sup> , gr/ft <sup>3</sup> , g/kg, gr/lb, enthalpy, °C <sub>tw</sub> , °F <sub>tw</sub> , inch H <sub>2</sub> O, ppm(vol), % Vol for H <sub>2</sub> O <sub>2</sub> -applications: °C <sub>tm</sub> /°F <sub>tm</sub>	
<b>Signal outputs</b>	4 to 20 mA, 2-wire (duct version only) 0 to 1 Volt, 4-wire 0 to 5/10 Volt, 4-wire	4 to 20 mA, 2-wire 0/4 to 20 mA, 4-wire 0 to 1/5/10 Volt, 4-wire	4 to 20 mA, 2-wire (not for testo 6614/6615) 0/4 to 20 mA, 4-wire 0 to 1/5/10 Volt, 4-wire	
<b>Mounting variants</b>	Wall or duct installation	Wall probe testo 6601 Duct probe testo 6602/6603 Cable probe testo 6604/6605	Wall probe testo 6611 Duct probe testo 6612 Cable probe testo 6613/6614/6615/6617	
<b>max. cable length</b>	–	5 m	10 m	
<b>Housing</b>	ABS and nickel-plated ABS	ABS, plastic, IP65	Metal, IP65	
<b>Interfaces</b>	digital Testo (for P2A software or testo 400/650)	digital Testo (for P2A software or testo 400/650) Ethernet (optional intermediary layer)	digital Testo (cf. testo 6651) Profibus (optional intermediary layer) Ethernet(optional intermediary layer)	
<b>Special features</b>	External interface, adjustability	4 relays (optional) early warning system (via display or relay collective alarm)	Special probe versions for • Temperature ranges up to +180 °C (+324 °F) • Trace humidity testo 6615 • High humidity testo 6614 • Self-diagnosis testo 6617 4 relays, optional early warning system (via display, relay collective alarm or Profibus)	

\*Other accuracies apply for the wall probe with 70 mm length in combination with a current output (P07):

Operation: with 2 channels at 12 mA, without display illumination, relay off, additional measurement inaccuracy to above data at +25 °C (+77 °F), humidity ±2.5 %RH, temperature ±1 °C (1.8 °F)

\*\*For more detailed explanation on the determination of the measurement uncertainty according to GUM, see p. 20/25

**Product selection by probe (only testo 6651 / testo 6681 with exchangeable probes)**


## A1 Humidity transmitters testo 6621, testo 6651, testo 6681

An exact and continuous measurement of temperature and humidity is vital in many industrial processes.

The most important areas of application for the testo 6651/6681 are

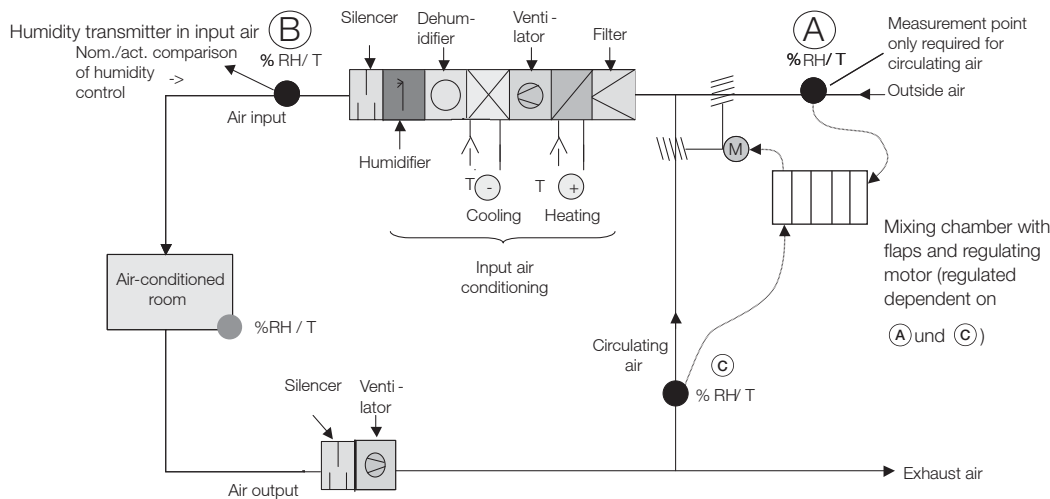
- continuous monitoring or regulation of climate (e.g. production air quality or storage)
- Drying processes / high humidity processes,
- Humidity measurements in H<sub>2</sub>O<sub>2</sub> atmospheres

Depending on the model, the Testo humidity transmitters fulfil the strict, or strictest, demands placed on humidity measurement accuracy and long-term stability.

The following table helps with the allocation of the transmitter models to the applications. (Note: The following table only provides general information - please adapt the selected model and ordering options to the demands of the process yourself. Testo's Sales Department will be happy to assist you with your selection):

### Air conditioning applications

Application	Recommendation	Alternative
Semi-conductors (cleanroom) in air ducts	testo 6681 with 6612 / 6613	testo 6651 with 6602 / 66109
Pharmaceuticals (cleanroom) in air ducts	testo 6681 with 6612 / 6613	testo 6651 with 6602 / 6603
Paintshops	testo 6681 with 6612 / 6613 and PTFE protective cap	testo 6651 with 6602 / 6603 with PTFE protective cap
Storage of hygroscopic materials	testo 6651 v 6611 / 6613 or testo 6681 with 6611 / 6613	testo 6651 with 6602 or testo 6681 with 6612
Storage of electronic components	testo 6681 v 6613	testo 6651 with 6601 / 6603
Production air quality	testo 6651 v 6611	testo 6681 with 6611



In air conditioning systems, there are three potential measurement points for the transmitters outside air-conditioned rooms. First the condition of the outside air (A) is recorded, after filtration, cooling/heating and, where necessary humidifying/dehumidifying, the condition of the input air is recorded (B). The third measurement point is in the circulating air (C). The data from (B) serve to control the input air conditioning; the data from (A) and (C), on the other hand, decide the position of the flaps in the mixing chamber (mixture of outside and circulating air).

- = Typical installation sites for hygrotest: DHT if hygrotest directly in duct, PHT if hygrotest dislocated from measurement site, ● WHT inside air-conditioned rooms/zones

For installation in rooms:  
Do not install WHT close to ventilation outlets or on badly isolated outside walls

### Drying processes / high humidity processes

#### For high humidity applications note:

A high humidity application is when the humidity > 90%RH for longer periods!

For high humidity applications with constant temperatures, the testo 6681 with 6613 with a PTFE protective cap + condensation protection is used.

For high humidity applications with changing temperatures, the use of the PTFE protective cap with condensate drip hole (0554.9913) and condensation protection (0554.0166) is recommended.

Application	Recommendation	Alternative
Climate cabinets	testo 6681 with 6613	
Maturing cheese	testo 6681 with 6613 / 6614 incl. PTFE protective cap with drip hole and condensation protection	
Drying pasta	testo 6651 with 6612 or testo 6681 with 6612	
Drying tobacco	testo 6681 with 6613 / 6614 with PTFE protective cap	
Concrete testing chambers	testo 6681 with 6614 with PTFE protective cap with drip hole and condensation protection	
Drying wood	testo 6681 with 6614 with PTFE protective cap	testo 6681 with 6613 with PTFE protective cap (if low reaction speed is sufficient)
Drying ceramics	testo 6681 with 6613 / 6614 and condensation protection	
Bio-research/greenhouses	testo 6681 with 6614 and condensation protection	