

1 Description

The standard humidity transmitter:

- High accuracy and very good long-term stability
- Exchangeable, adjustable probe from the series 6600
- Optimum adjustment possibilities on site
- Early warning reports
- Operation via the parameterization/analysis/adjustment software P2A from Testo or directly via 4 buttons
- Traceability of all settings/reports via internal record
- All common variants of design and signal output can be ordered customer-specifically
- Option for Ethernet interface

2 Exchangeable probes, probe series testo 6600
2.1 Description probe series
Functions and application

The plug-in, adjusted probes from the testo 6600 series are used in conjunction with the humidity measurement transmitter testo 6651

Examples of suitable areas of application for these measuring systems are:

- Process measurement technology
- Test benches
- Production and storage air quality
- Demanding HVAC applications
- Pasta drying.

Digital probes

The probes are adjusted ex-works, and transfer their adjustment data to the internal store of the testo 6651. The synchronization of information between the probe and the measurement transmitter takes place digitally. This means that for adjustment or service purposes, the probes can be separated from the measurement transmitter, which can remain at the measurement site. The measurement transmitter recognizes the probe, and stores in its history which probes have been connected.

In order to guarantee the very high accuracy of the probe series testo 6610, the sensor in the probe cannot be exchanged by the customer.

For a change of sensor, please contact Testo customer service.

Self-diagnosis

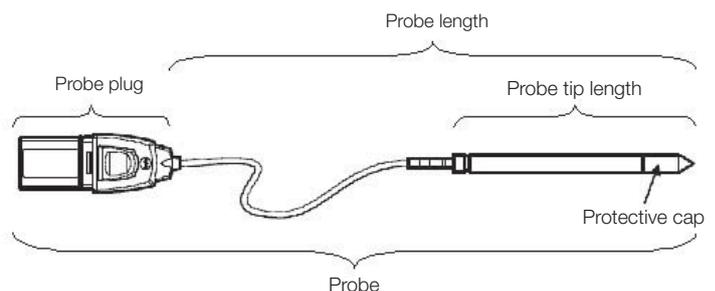
The probes of the series testo 6600 monitor their function themselves and report the following malfunctions:

- Sensor breakage
- Sensor short circuit
- Condensation
 - The condensation report is made at a measurement value of 100 %RH, and deactivated again as soon as the measurement values return to the permitted range.
- Value for relative humidity less than 0:
 - The switching threshold is set at -3 %RH. The result of this is that an error is not reported until a clear effect is recognizable.

Included in delivery

Included in delivery of the probe series 6600:

- Probe plug
- Probe shaft with filter and sensors (%RH and °C/°F)
- Fixing bracket (for duct versions testo 6602 / 6603)
- Probe cable (for duct and cable versions testo 6602 to 6605)



A4 3 Technical data

3.1 testo 6651

GENERAL					
Housing	Plastic				
Dimensions	122 x 162 x 77 mm (without probe)				
Weight	0.62 kg (without probe)				
Display	2-line LCD with clear-text line (optional) and relay status display. Four operating buttons for operating menu.				
Resolution display	0.1 %RH or 0.01 °C / °F / °C td / °Ftd / °Ctw / °Ftw or 1g / kg / g/m ³ / ppm				
Cable screw fitting	M 16 x 1.5 (2x) with inner diameter 4-8 mm for signal/supply cable (for option D01) M 20 x 1.5 (2x) with inner diameter 6-12 mm for relay cable (for options D01 or D03)				
Probe connection	Digital plug-in connection				
Voltage supply	2-wire: 24 VDC (12 VDC to 30 VDC) 4-wire: 20 to 30 VAC/DC, 200 mA max. current consumption				
Protection class	IP 65				
EMC	2004/108/EG				
Operating temperature housing	-40 to +70 °C (-40 to +158 °F), with display 0 to +50 °C (+32 to +122 °F), optimal at +15 to 35 °C, (+59 to +95 °F)				
Storage temperature	-40 to +80 °C (-40 to +176 °F)				
Measurement parameters	Temperature in °C / °F Relative humidity %rF / %RH Dewpoint in °C _{td} / °F _{td}				
Measurement medium	Air, nitrogen, more on request: applicationsupport@testo.de				
SENSOR (more data see probes)					
Humidity	Testo humid. sensor, cap.				
Reproduceability	better than ±0.5 %RH				
Measurement inaccuracy %RH	cf. probe data				
Probes	6601	6602	6603	6604	6605
Measuring range (Standard scaling)	0 to 100 %RH				
	Humidity				
	Temperature	-20 to +70 °C (-4 to +158 °F)	-20 to +70 °C (-4 to +158 °F)	-30 to +120 °C (-22 to +248 °F)	-20 to +70 °C (-4 to +158 °F) -30 to +120 °C (-22 to +248 °F)
	Dewpoint	-60 to +100 °C _{td} or -76 to +212 °F _{td}			
Reaction time without protective filter	t 90 max. 10 s				
ANALOG OUTPUT (uniform for all channels, specify when ordering)					
Quantity	2 channels (type analog signal uniform for both channels, specify when ordering)				
Current/accuracy	4 to 20 mA ±0.03 mA (2-wire) 0 to 20 mA ±0.03 mA (4-wire) 4 to 20 mA ±0.03 mA (4-wire) for heated sensor technology				
Voltage/accuracy	0 to 1 V ±1.5 mV (4-wire) 0 to 5 V ±7.5 mV (4-wire) 0 to 10 V ±15 mV (4-wire)				
Galvanic isolation	Galvanic isolation of the output channels (2-wire and 4-wire), isolation of supply from outputs (4-wire)				
Resolution	12 bit				
Maximum load	2-wire 12 VDC: 100 Ohm 24 VDC: 500 Ohm 30 VDC: 625 Ohm 4-wire 500 Ohm				
FURTHER OUTPUTS					
Relays (optional)	4 relays (free allocation to measurement channels or as collective alarm with operating menu/P2A software), up to 250 VAC / 3 A, (NC/C/NO)				
Digital output	Mini DIN for Testo P2A parameterization software and Testo portable instruments 400/650				
Ethernet	Ethernet with Saveris connection or open protocol with XML output. IP address allocation possible via P2A software				

3.2 Probe series testo 6600

Model	testo 6601	testo 6602	testo 6603	testo 6604	testo 6605
Type	Wall	Duct	Duct	Cable	Cable
Application	Room climate probe wall mounting	Climate probe duct mounting	Process climate probe duct mounting for higher process temperatures	Climate probe with cable	Stainless steel process probe with cable for higher process temperatures
Measurement parameters	%rF/%RH, °C _{td} /°F _{td} , °C/°F				
Measuring range	0 to 100 %RH				
	-20 to +70 °C (-4 to +158 °F)		-30 to +120 °C (-22 to +248 °F)		-30 to +120 °C (-22 to +248 °F)
Material	Probe shaft	Plastic ABS			Stainless steel
	Cable	FEP coated			
	Plug	Plastic ABS			
Measurement inaccuracy*	Humidity: (+25 °C)**	±1.7 %RH (0 to 90%) / ±1.9 %RH (90 to 100%)			
	Humidity: for deviations from the media temperature ±25 °C	+0.02 %RH/K			
	Temperature: at +25 °C / +77 °F	±0.2 °C / 0.38 °F (PT1000 Class A / PT1000 1/3 Class B)			±0.15 °C / 0.27 °F (PT1000 1/3 Class B)
Reproduceability	Humidity	better than ±0.5 %RH			
Probe dimensions	Diameter	12 mm			
	Probe shaft length L	70/200 mm	280 mm	140/280 mm	200/500 mm
Cable length		-	especially for duct versions	1/2 m	1/2/5 m
Pressure tightness	without	1 bar positive pressure (probe tip) (14.5 psi) no negative pressure			1 to 10 bar (probe tip) (14.5 psi) 1 bar (probe tip) (14.5 psi)
Drawings		Measurement transmitter testo 6651 	Duct probe testo 6602/6603	Measurement transmitter testo 6651 	Cable probe testo 6604/6605

****Determination of measurement uncertainty according to GUM**
 (Guide to the Expression of Uncertainty in Measurement)

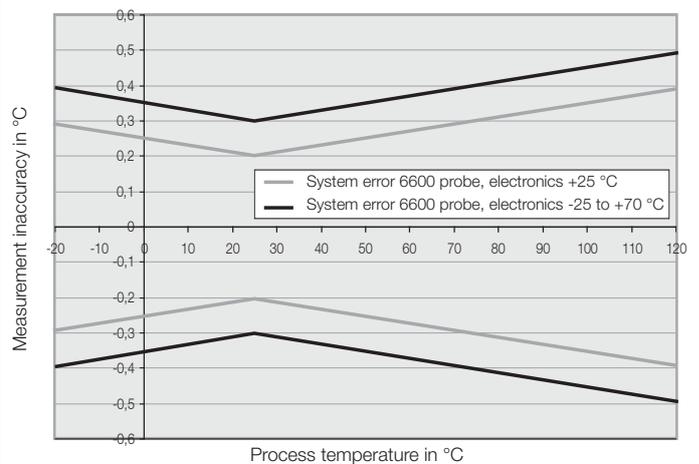
GUM is a procedure for making the measurement results comparable in the recording and presentation of measurement inaccuracies. This procedure is also intended to assist the determination of a realistic and traceable measurement inaccuracy. This involves taking inaccuracy factors into account which influence the entire measurement inaccuracy.

The following uncertainty factors are taken into account in determination:

- Hysteresis
- Linearity
- Reproduceability
- Adjustment site/uncertainty of factory calibration

This total view results in an additional humidity-dependent uncertainty of ±0.007 x m.v. (in %RH)

Temperature error dependent on process temperature and electronics temperature



*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)