

testo 6681 + Probe series testo 661x

The industrial humidity transmitter

testo



SPECIFICATIONS

testo 6681 + Probe series testo 661x

Industrial humidity measurement demands absolute professionalism. Not only in running the system, but also in the measuring technology used. The industrial humidity transmitter testo 6681, combined with the probe series testo 661x fulfils these high demands. The testo 6681 has a number of additional features, above and beyond the properties and benefits of a conventional transmitter, which will delight practitioners.

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SPECIFICATIONS

testo 6681

- Optimum adjustment concept thanks to adjustment of the entire signal chain incl. analog adjustment
- Profibus, Ethernet, relay and analog outputs allow optimum integration into individual automation systems
- Self-monitoring and early warning guarantee high system availability
- Calculation and presentation of all relevant humidity parameters
- P2A software for parameterization, adjustment and analysis saves time and costs in commissioning and maintenance
- Display with multi-language display
- Robust, easy-to-clean metal housing

Probe series testo 661x

- Testo humidity sensor guarantees highest long-term stability and accuracy up to ± 1.0 %RH
- Digital, exchangeable probes for specific applications:
 - testo 6611: Indoor air probes for wall mounting
 - testo 6612: Process climate probes for duct installation
 - testo 6613: Process humidity probes as duct version
 - testo 6614: Humidity probes for high humidity applications
 - testo 6615: Trace humidity probe with self-adjustment
 - testo 6617: Humidity probe with self-monitoring for sensor-damaging media.

Areas of application:

Stationary humidity measurement in production/process technology:

- Drying processes:
 - Drying tobacco,
 - Ceramics production
 - Drying roof tiles
- Spray-painting booths
- Food:
 - Maturing cheese
 - Ripening fruit
 - Drying pasta
- Bio research
- Mushroom farming
- Special areas high humidity
- Sterilization processes in H_2O_2 -atmospheres

Stationary measurement of indoor ambient conditions:

- Monitoring comfort levels
- Museums
- Storage of hygroscopic substances
- Storage of electronic components



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Technical data testo 6681

Measurement parameters	
Humidity	
Selectable units	Dependent on probe, available are: relative humidity %RH; normed atm. dewpoint in °CtdA (°Ftd); dewpoint in °Ctd (°Ftd); absolute humidity in g/m ³ (gr/ft ³); degree of humidity in g/kg (gr/lb); enthalpy in kJ/kg (BTU/lb); psychrometer temperature in °Ctw (°Ftw); water vapour partial pressure in hPa/H ₂ O; water content in ppmV; mixture dewpoint H ₂ O ₂ in °Ctm/°Ftm; %RH acc. to WMO; temperature in °C/°F
Measuring range	0 to 100 %RH
Trace humidity	
Selectable units	Dewpoint in °Ctd/°Ftd
Measuring range	-60 to +30 °Ctd / -76 to +86 °Ftd (only with testo 6610)
Temperature	
Selectable units	Temperature in °C/°F
Measuring range	Dependent on probe (testo 661x)

General technical data	
Design	
Material	Metal
Dimensions	122 x 162 x 77 mm (without probe)
Weight	1.5 kg (without probe, without Profibus/Ethernet module)
Display	
Display	Optional: 2-line LCD with clear text line and relay status display
Resolution	0.1 %RH / °Ctd / °Ftd / °Ctw / °Ftw or 0.01 °C/°F 1g / kg / g/m ³ / ppm
Operation	
Parameterization	4 operating buttons for display / P2A software
Installation	
Probe connection	Digital probe connection
Miscellaneous	
Protection class	IP65
EMC	2004/108/EG

Inputs and outputs	
Analog outputs	
Quantity	2 channels (analog signal type uniform for both channels, decided when ordering), additional 3rd channel (optional)
Output type	0/4 to 20 mA (2-wire/4-wire) 0 to 1/5/10 V (4-wire)
Measurement rate	1/s
Galvanic isolation	Galvanic isolation of the output signals (2-wire and 4-wire), isolation of supply from outputs (4-wire)
Resolution	12 bit
Accuracy of the analog outputs	0/4 to 20 mA ± 0.03 mA 0 to 1 V ± 1.5 mV 0 to 5 V ± 7.5 mV 0 to 10 V ± 15 mV
Max. load	2-wire: 12 VDC: max. 100 Ω / 24 VDC: max. 500 Ω / 30 VDC: max. 625 Ω; 4-wire: 500 Ω
Further outputs	
Ethernet	Optional: module can be fitted as intermediary layer
Profibus-DP	Optional: module can be fitted as intermediary layer, cannot be combined with Ethernet module
Relays	Optional: 4 relays (free allocation to measurement channels or as collective alarm with operating menu/PsA software), up to 250 VDC / 3 A (NO/NC)
Other outputs	Mini DIN for Testo P2A software and portable measuring instruments testo 400/650
Supply	
Voltage supply	2-wire: 24 VDC ± 10 % 4-wire: 20 to 30 VAC/DC
Current consumption	max. 300 mA

Operating conditions	
Operating temperature (with integrated relay)	
Without display	Operating temperature: -40 to +70 °C / -40 to +158 °F Storage temperature: -40 to +80 °C / -40 to +176 °F
With display	Operating temperature: 0 to +50 °C / +32 to +122 °F Storage temperature: -40 to +80 °C / -40 to +176 °F
Measurement medium	Air, nitrogen; more on request: applicationsupport@testo.de

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Technical data probe range testo 6610						
	testo 6611	testo 6612	testo 6613	testo 6614	testo 6615	testo 6617
Type	Wall	Cable	Cable	Heated cable	Cable trace humidity (self-adjustment)	Cable with cover electrode monitoring
Operating range	Room climate probe wall mounting	Process humidity probe duct mounting	Process humidity probe flexible with cable	Humidity probe for high humidity applications / when risk of condensation	Humidity probe for trace humidity / dewpoint (with self-adjustment)	Humidity probe with self-monitoring for sensor-damaging media

Measurement parameters						
Humidity	0 to 100 %RH					
Measuring range***	see trace humidity				0 to 100 %RH	
Measurement uncertainty* (+25 °C)**	testo 6611/12/13: $\pm(1.0 + 0.007 \cdot mv)$ %RH for 0 to 100 %RH / $\pm(1.4 + 0.007 \cdot mv)$ %RH for 90 to 100 %RH; testo 6614: $\pm(1.0 + 0.007 \cdot mv)$ %RH for 0 to 100 %RH; testo 6617: $\pm(1.2 + 0.007 \cdot mv)$ %RH for 0 to 90 %RH / $\pm(1.6 + 0.007 \cdot mv)$ %RH for 90 to 100 %RH +0.02 %RH per Kelvin dependent on the process and electronics temperature (for a deviation of 25 °C / 77 °F)					
Selectable units	%RH; °C _{td} /°F _{td} ; g/m ³ / gr/ft ³ ; g/kg / gr/lb; BTU/lb; °C _{tw} /°F _{tw} ; hPa; inch H ₂ O ₂ ; ppm vol %; %vol; °C _{tm} (H ₂ O ₂)/ °F _{tm} (H ₂ O ₂)					
Reproduceability	better than ± 0.2 %RH					
Sensor	Testo capacitive humidity sensor, plug-in		Testo capacitive humidity sensor; soldered			
Response time	t90 max. 10 sec.					
Temperature	°C/°F					
Selectable units	°C/°F					
Measuring range	-20 to +70 °C/ -4 to +158 °F	-30 to +150 °C/ -22 to +248 °F	-40 to +180 °C/-40 to +356 °F		-40 to +120 °C/ -22 to +302 °F	-40 to +180 °C/ -40 to +356 °F
Measurement uncertainty* (at +25 °C / +77 °F)	± 0.15 °C / 0.27 °F (Pt1000 Class AA)				Pt100 Class AA	Pt1000 Class AA
Trace humidity	-60 to +30 °C _{td}					
Measurement uncertainty					± 1 K at 0° C _{td}	± 2 K at -40° C _{td} ± 4 K at -50° C _{td}

General technical data						
Probes	Stainless steel					
Probe shaft	Stainless steel					
Cable	FEP coated					
Plug	Plastic ABS					
Probe dimensions (diameter)	12 mm					
Probe dimensions (probe shaft length)	70/200 mm	200/300/500/ 800 mm	120/200/300/500/ 800 mm		200/500 mm	
Cable length	—	especially for duct versions	—		1/2/5/10 m	

Operating conditions						
Pressure tightness	1 bar positive pressure (probe tip)		PN 10 (probe tip) PN 1 (probe tip)	PN 16 (probe tip)		1 bar positive pressure (probe tip)

* Other accuracies apply for wall probe length 70 mm combined with a current output (P07):
Operation: 2 channels at 12 mA, without display illumination, relay off, additional measurement error to above values at +25 °C (+77°F), humidity ± 2.5 % RH

***For continuous applications in high humidity (>80 %RH at ≤ 30 °C for >12 h, >60 %RH at > 30 °C for >12h), please contact us via www.testo.com. testo 6614 is suitable for high humidity applications.

**The determination of measurement uncertainty takes place according to GUM (Guide to the Expression of Uncertainty in Measurement):
For the determination of measurement uncertainty, 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, the value of k=2 of the extension factor, which is usual in measurement technology is used as a basis, which corresponds to a trust level of 95%.

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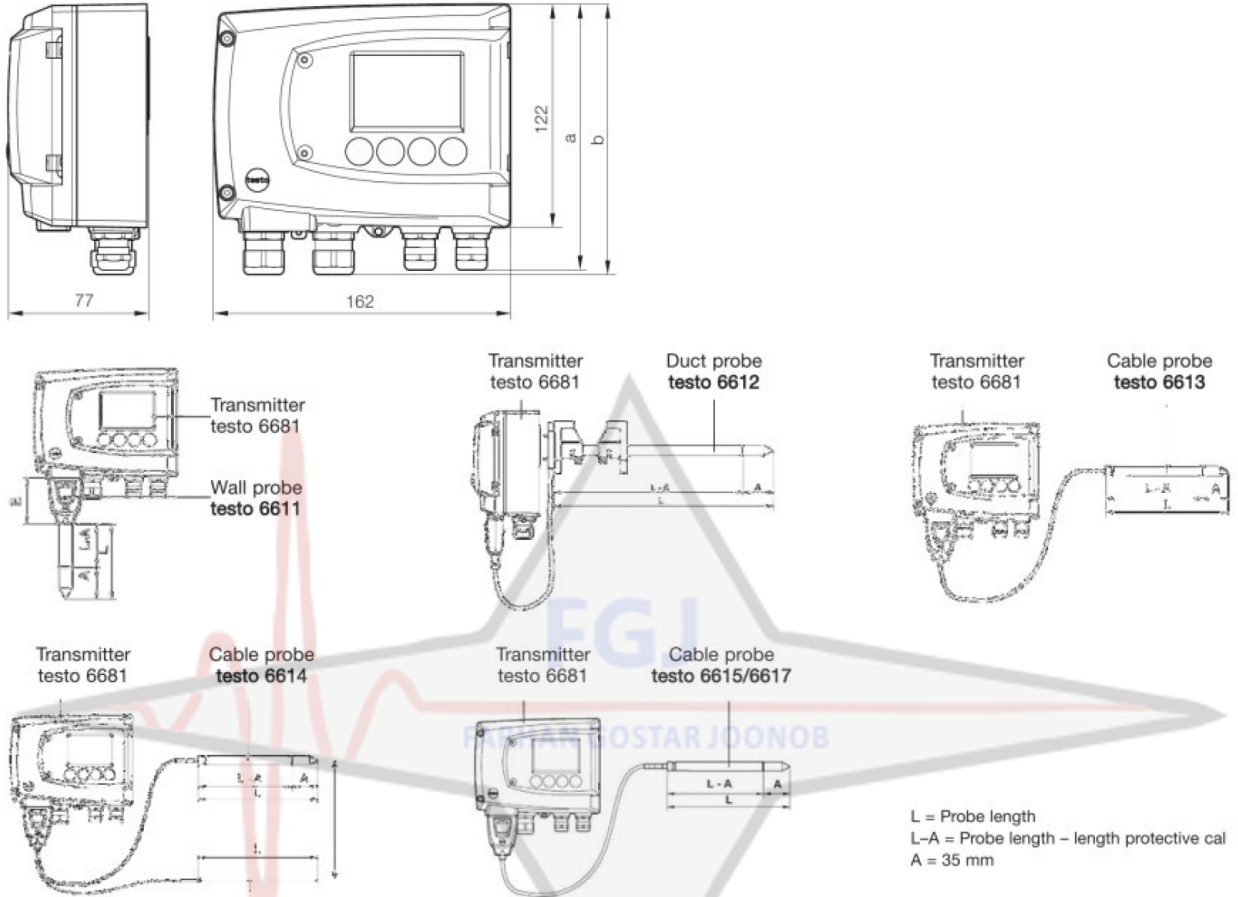
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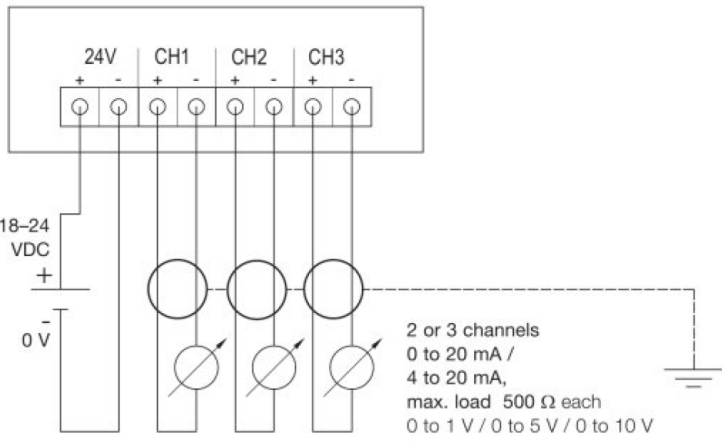
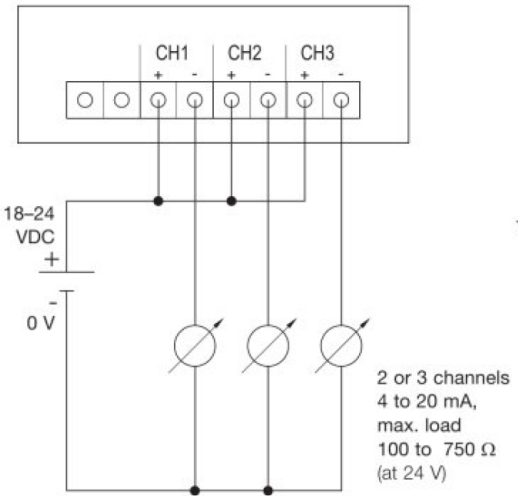
Technical drawings



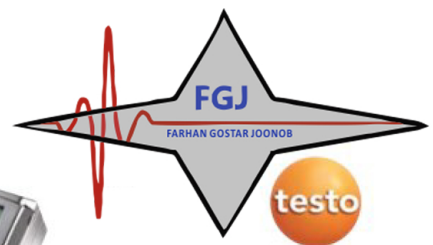
Connection plan

Connection plan 2-wire technology
(4 to 20 mA)

Connection plan 4-wire technology
(0 to 20 mA / 4 to 20 mA / 0 to 1 V / 0 to 5 V / 0 to 10 V)



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The following options can be specified for the testo 6681:

Bxx	Analog output / supply
Cxx	Display / menu language
Dxx	Cable entry
Exx	Ethernet
Fxx	Humidity / temperature unit
Gxx	Humidity / temperature unit
Hxx	Relay
Ixx	Humidity / temperature unit (optional)

Bxx	Analog output / supply
B01	4 to 20 mA (2-wire, 24 VDC), not possible with relay, Ethernet module or probe testo 6614/6615
B02	0 to 1 V (4-wire, 24 VAC/DC)
B03	0 to 5 V (4-wire, 24 VAC/DC)
B04	0 to 10 V (4-wire, 24 VAC/DC)
B05	0 to 20 mA (4-wire, 24 VAC/DC)
B06	4 to 20 mA (4-wire, 24 VAC/DC)
B77	Profibus-DP

Gxx	Humidity/temperature unit
G01	%RH / min / max
G02	°C / min / max
G03	°F / min / max
G04	°C _{td} / min / max
G05	°F _{td} / min / max
G06	g/kg / min / max
G07	gr/lb / min / max
G08	g/m ³ / min / max
G09	gr/ft ³ / min / max
G10	ppmV / min / max
G11	°Cwb / min / max (wet bulb)
G12	°Fwb / min / max (wet bulb)
G13	kJ/kg / min / max (enthalpy in air)
G14	hPa / max (water vapour partial pressure)
G15	inch H ₂ O / min / max (water vapour partial pressure)
G18	%Vol.

Cxx	Display/menu language
C00	without display / without operating menu
C02	with display and operating menu / English
C03	with display and operating menu / German
C04	with display and operating menu / French
C05	with display and operating menu / Spanish
C06	with display and operating menu / Italian
C07	with display and operating menu / Japanese
C08	with display and operating menu / Swedish

Dxx	Cable entry
D01	Cable entry M16 (relay: M20)
D02	Cable entry NPT 1/2"
D03	Cable contact via M plug connection for signal and supply (for optionale relay: M20 cable entry)

Exx	Ethernet
E00	Without Ethernet module
E01	With Ethernet module

Fxx	Humidity/temperature unit
F01	%RH / min / max
F02	°C / min / max
F03	°F / min / max
F04	°C _{td} / min / max
F05	°F _{td} / min / max
F06	g/kg / min / max
F07	gr/lb / min / max
F08	g/m ³ / min / max
F09	gr/ft ³ / min / max
F10	ppmV / min / max
F11	°Cwb / min / max (wet bulb)
F12	°Fwb / min / max (wet bulb)
F13	kJ/kg / min / max (enthalpy in air)
F14	hPa / max (water vapour partial pressure)
F15	inch H ₂ O / min / max (water vapour partial pressure)
F18	%Vol.

Hxx	Relay
H00	Without relay
H01	4 relay outputs, limit value monitoring
H02	4 relay outputs, limit values Channel 1 + collective alarm

Ixx	Humidity/temperature unit (optional)
I00	no optional 3rd analog output
I01	%RH / min / max
I02	°C / min / max
I03	°F / min / max
I04	°C _{td} / min / max
I05	°F _{td} / min / max
I06	g/kg / min / max
I07	gr/lb / min / max
I08	g/m ³ / min / max
I09	gr/ft ³ / min / max
I10	ppmV / min / max
I11	°Cwb / min / max (wet bulb)
I12	°Fwb / min / max (wet bulb)
I13	kJ/kg / min / max (enthalpy)
I14	hPa / min / max (water vapour partial pressure)
I15	inch H ₂ O / min / max (water vapour partial pressure)
I16	°Ctm / mixture dewpoint for H ₂ O ₂
I17	°Ftm / mixture dewpoint for H ₂ O ₂
I18	%Vol.

Example:

Order code for transmitter testo 6681 with the following options:

- Housing with display with menu setting English
- 4 to 20 mA (4-wire)
- Cable entry M16/M20
- Ethernet module
- Factory configuration Channel 1: °Ctpd with scaling min 0 °Ctd, max 100 °Ctd*
- Factory configuration Channel 2: °C with scaling min -10 °C/-14 °F max +70 °C/+158 °F*
- with relay
- without 3rd channel

0555 6681 A01 B06 C02 D01 E01 F03 F04 0 100 G02 -10 +70 H01 I00

The following options can be specified for the probe testo 661x:

Lxx	Probe version
Mxx	Protective cap
Nxx	Probe shaft length
Pxx	Probe length / length mm

Lxx	Probe version
L11	Probe 6611 (wall version)
L12	Probe 6612 (duct version up to 150 °C)
L13	Probe 6613 (duct version up to 180 °C)
L14	Probe 6614 (heated cable version)
L15	Probe 6615 (trace humidity cable version)
L17	Probe 6617 (self-monitored cable version)

N00	Without cable (only L11)
N01	Probe length 1 m (not for L11, L12)
N02	Probe length 2 m (not for L11, L12)
N05	Probe length 5 m (not for L11, L12)
N10	Probe length 10 m (not for L11, L12)
N23	Probe length 0.6 m, specially for duct versions (only L12)

Protective cap	
M01	Stainless steel protective cap
M02	Wire mesh protective filter
M03	PTFE protective cap
M04	Metal protective cap, open
M06	PTFE protective cap with condensate drip hole
M07	PTFE protective cap with condensation protection and condensate drip hole
M08	Protective cap for H2O2 atmospheres

Pxx	Probe length / length mm
P07	Probe length 70 mm (only L11)
P12	Probe length 120 mm (only L13)
P20	Probe length 200 mm
P30	Probe length 300 mm (only L12, L13, L14)
P50	Probe length 500 mm (not with L11)
P80	Probe length 800 mm (only L12, L13)

Nxx	Probe length / length mm
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0555 6610 L13 M01 N02 P30

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* The standard scaling is supplied if "min" and "max" are not specified.

** Plug connection M12, 5-pin plug and socket available as accessories.