

Humidity transmitter for critical climate applications



SPECIFICATIONS

testo 6651 + Probe series testo 660x



Not all measurement problems can be solved with "simple" transmitters. The testo 6651 meets special challenges. When combined with the probe series testo 660x, the testo 6651 becomes the first choice in demanding air conditioning technology as well as in many other applications.



SPECIFICATIONS

testo 6651

- Optimum adjustment concept thanks to adjustment of the entire signal chain incl. analog adjustment
- 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 the humidity parameters "relative humidity" and "dewpoint".
- P2A software for parameterization, adjustment and analysis saves time and costs in commissioning and maintenance
- Display with multi-language display
- High-quality plastic housing

Probe series testo 660x

- Testo humidity sensor guarantees highest long-term stability and accuracy up to ± 1.7 %RH
- Digital, exchangeable probes for specific applications:
 - testo 6601: Indoor air probes for wall mounting
 - testo 6602: Air conditioning probes for duct installation
 - testo 6603: Process climate probes for duct installation (up to 120 °C)
 - testo 6604: Ambient condition probes as cable versions
 - testo 6605: Process climate probes as cable versions (stainless steel probes up to 120 °C)

Areas of application:

Stationary measurement of indoor ambient conditions

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

Stationary measurement of production conditions

- Drying processes / high humidity processes
- Food:
 - Maturing cheese
 - Ripening fruit
 - Drying pasta
 - Conditioning chambers for sausage products
- Bio research
- Mushroom farming



Humidity transmitter for critical climate applications

Technical data testo 6651

Parameters	
Humidity	
Units	Relative humidity %RH , °Ctd, °Ftd
Meas. range	0 to 100 %RH
Temperature	
Units	Temperature in °C / °F
Meas. range	Dependent on probe (testo 660x)

Inputs and outputs	
Analog outputs	
Quantity	2 channels (analog signal type uniform for both channels)
Output type	0/4 to 20 mA (2-wire/4-wire) 0 to 1/5/10 V (4-wire)
Measuring 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
Relays	Optional: 4 relays (free allocation to measurement channels or as collective alarm with operating menu/P2A software), up to 250 VDC /3 A (NO/NC)
Other outputs	Mini DIN for Testo P2A software and portable measuring instruments testo 400/650
Power	
Voltage supply	2-wire: 24 VDC ±10 % 4-wire: 20 to 30 VAC/DC
Current consumption	max. 300 mA

General technical data	
Design	
Material	Plastic
Dimensions	122 x 162 x 77 mm (without probe)
Weight	0.62 kg (without probe, without Ethernet module)
Display	
Display	Optional: 2-line LCD with clear text line and relay status display
Resolution	0.1 %RH / 0.01 °C/°F / 0.1 °C _{td} /°F _{td}
Operation	
Parameterization	Four operating buttons for display / P2A software
Installation	
Cable screw fitting	Standard: PG screw fitting Optional: M16 or M20 M plug connection or optional: NPT 1/2 plug connection
Probe connection	Digital plug connection
Other features	
Protection class	IP65
EMC	2004/108/EG

Operating conditions		
	Operating temperature (with integrated relay)	-40 to +60 °C
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



Humidity transmitter for critical climate applications

Technical data probe series testo 660x

	testo 6601	testo 6602	testo 6603	testo 6604	testo 6605
					
Type	Wall	Duct	Duct	Cable	Cable
Operating range	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

Humidity					
Meas. range	0 to 100 %RH				
Measurement uncertainty* (+25 °C)**	±1.7 %RH (0 to 90%) / ±1.9 %RH (90 to 100%) +0.02 %RH per Kelvin dependent on the process and electronics temperature (for a deviation of 25 °C / 77 °F)				
Selectable units	%RH; °Ctd/°Ftd				
Reproduceability	better than ±0.2 %RH				
Sensor	Testo capacitive humidity sensor, plug-in	Testo capacitive humidity sensor, plug-in	Testo capacitive humidity sensor, plug-in	Testo capacitive humidity sensor, plug-in	Testo capacitive humidity sensor; soldered
Response time (without protective filter)	t90 max. 10 sec.				
Temperature					
Selectable units	°C/°F				
Sensor	-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
Measurement uncertainty* (at +25 °C / +77 °F)	±0.2 °C / 0.38 °F (PT1000 Class A)				Pt1000 1/3 Class B

General technical data

Probe shaft	Plastic ABS			Stainless steel	
Cable	FEP coated				
Plug	Plastic ABS				
Probe dimensions (diameter)	12 mm				
Probe dimensions (probe shaft length)	70/200 mm	280 mm	140/280 mm	200/500 mm	
Cable length	–	specially for duct versions	1 / 2 m	1 / 2 / 5 m	

Operating conditions

Pressure tightness	without	1 bar positive pressure (probe tip)	PN 10 (probe tip) PN 1 (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

**Measurement uncertainty calculation according to GUM

GUM (Guide to the Expression of Uncertainty in Measurement): ISO guideline for the calculation of measurement uncertainty, in order to make measurement results comparable worldwide. The following uncertainties are used in the calculation:

- Hysteresis
- Linearity
- Reproduceability
- Adjustment site/factory calibration
- Uncertainty contribution of the test site

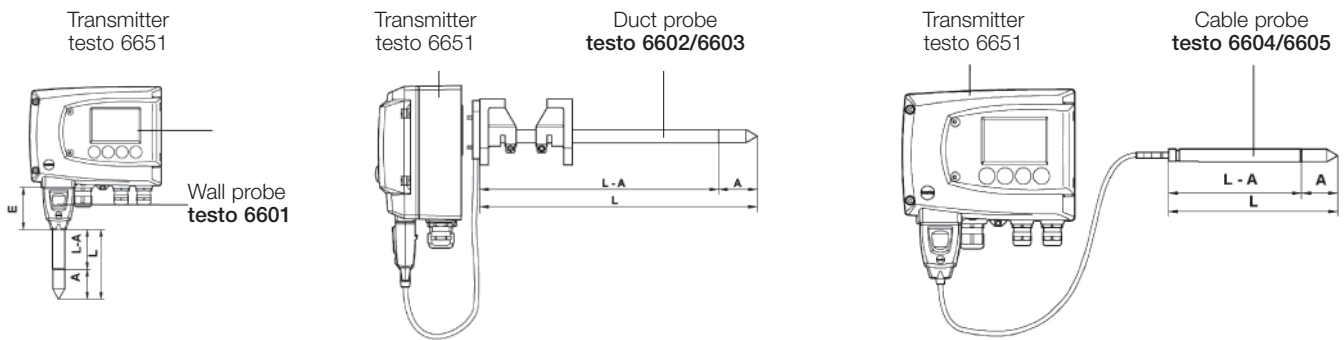
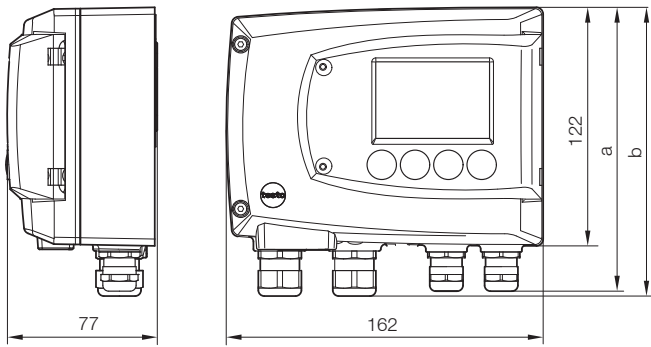
This total view results in an additional uncertainty contribution of ±0.007 x measurement value (in %RH).

Subject to change without notice.



Humidity transmitter for critical climate applications

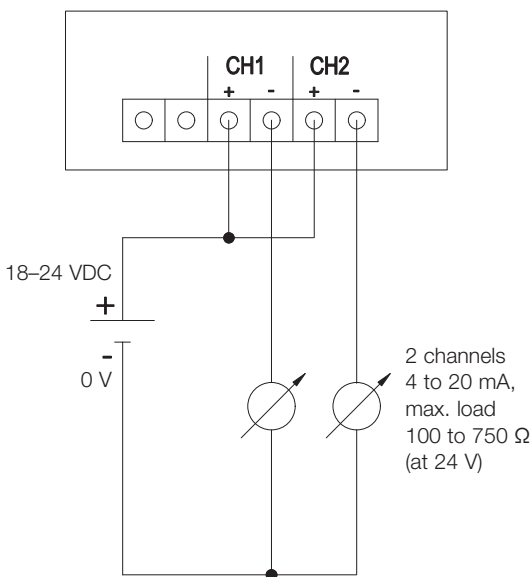
Technical drawings



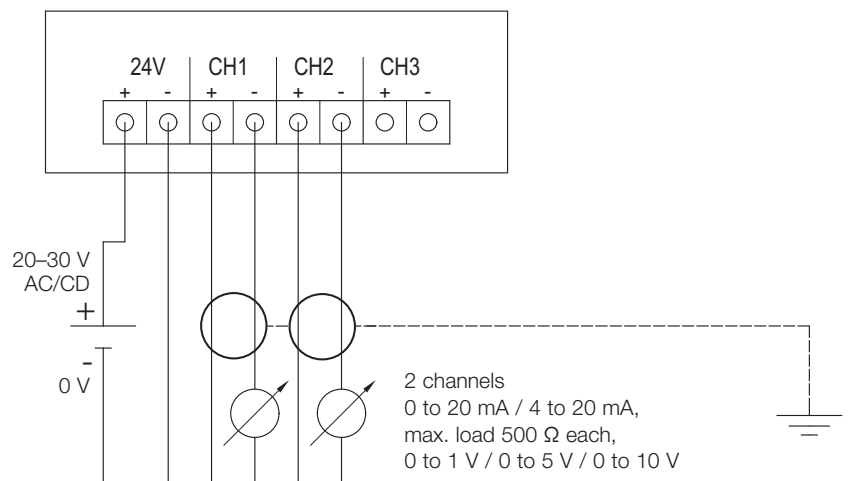
L = Probe length
 L-A = Probe length – length protective cal
 A = 35 mm

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)



Subject to change without notice.



Humidity transmitter for critical climate applications

The following options can be specified for the testo 6651:

Bxx	Analog output / supply
Cxx	Display / menu language
Dxx	Cable entry
Exx	Ethernet
Fxx	Humidity / temperature unit channel 1
Gxx	Humidity / temperature unit channel 2
Hxx	Relay
Kxx	Instruction manual language

K – TEST, s.r.o.
Letná 40
042 60 Košice
Tel/fax.: 055 6253633, 6255159
ktest@iol.sk, ktest@ktest.sk
www.ktest.sk, www.testo.sk
0905 522488

Bxx	Analog output/supply
B01	4 to 20 mA (2-wire, 24 VDC), not possible with relay or Ethernet module
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	0 to 20 mA (4-wire, 24 VAC/DC)

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

Clear text language. Operating menu only available with display.

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 optional relay: M20 cable entry)

Exx	Ethernet
E00	Without Ethernet module
E01	With Ethernet module

Fxx	Humidity/temperature unit Channel 1
F01	%RH / min / max
F02	°C / min / max
F03	°F / min / max
F04	°C _{td} / min / max
F05	°F _{td} / min / max

Channel 1*

Gxx	Humidity/temperature unit Channel 2
G01	%RH / min / max
G02	°C / min / max
G03	°F / min / max
G04	°C _{td} / min / max
G05	°F _{td} / min / max

Channel 2*

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

Kxx	Instruction manual language
K01	IM German-English
K02	IM French-English
K03	IM Spanish-English
K04	IM Italian-English
K05	IM Dutch-English
K06	IM Japanese-English
K07	IM Chinese-English

Example:

Order code for transmitter testo 6651 with the following options:

- 4 to 20 mA (2-wire)
- Cable entry M16/M20
- Factory configuration channel 1:
- %RH with scaling min 0 %, max 100 %
- Factory configuration channel 2:
- °C with scaling min -10 °C/-14 °F,
- max +70 °C/+158 °F*
- without relay
- Instruction manual in German and English

0555 6651 A01 B01 C03 D01 F01 G02 H00 K01

The following options can be specified for the probe testo 660x

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

Lxx	Probe version
L01	Probe 6601 (Wall version)
L02	Probe 6602 (Duct version -20 to 70 °C)
L03	Probe 6603 (Duct version -30 to 120 °C)
L04	Probe 6604 (Duct version -20 to 70 °C)
L05	Probe 6605 (Duct version -30 to 120 °C)

Nxx	Probe length / length mm
N00	Without cable (for probe 6601)
N01	Probe length 1 m (for probe 6604/6605)
N02	Probe length 2 m (for probe 6604/6605)
N05	Probe length 5 m (nur für Sonde 6605)
N23	Probe length, especially for duct versions (for probes 6602/6603)

Example:

Order code for testo 6602 with the following options:

- Duct probe (-20 to +70 °C/-4 to 158 °F sufficient)
- Sintered stainless steel probe
- Probe length 280 mm

Mxx	Protective cap
M01	Stainless steel protective cap
M02	Wire mesh protective filter
M03	PTFE protective cap
M04	Metal protective cap, open
M05	ABS plastic protective cap, open

Pxx	Probe length / length mm
P07	Probe length 70 mm (only for L01)
P14	Probe length 140 mm (only for L04)
P20	Probe length 200 mm (only for L01, L05)
P28	Probe length 280 mm (only for L01, L05)
P50	Probe length 500 mm (only L05)

0555 6600 L02 M01 N23 P28

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

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

*** not with code "B01".

Relay parameterization in commissioning via operating menu (display) or P2A software

K – TEST, s.r.o.
Letná 40
042 60 Košice
Tel/fax.: 055 6253633, 6255159
ktest@iol.sk, ktest@ktest.sk
www.ktest.sk, www.testo.sk
0905 522488