

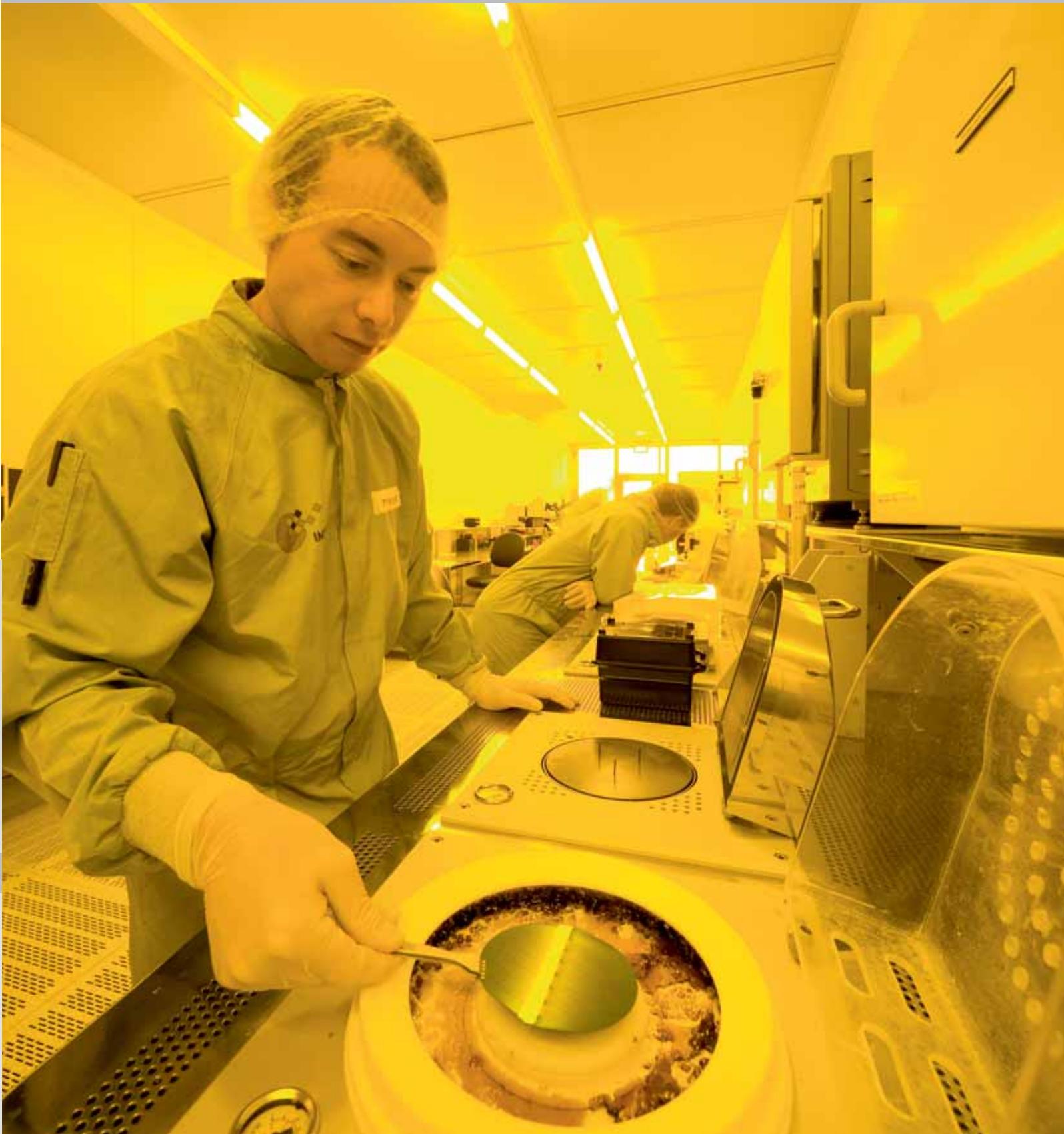


Committing to the future

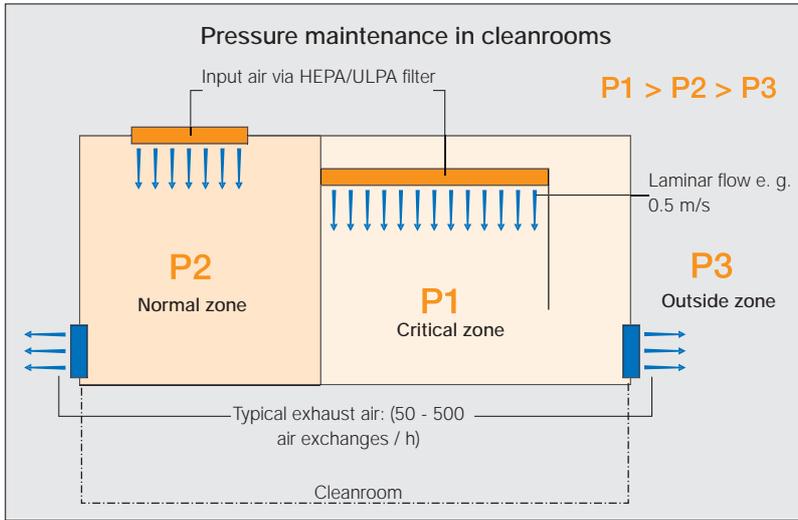
testo 6383 / testo 6381 / testo 6351

Differential Pressure Monitoring in Cleanroom Technology

Highest accuracy and long-term stability with the new transmitters from Testo



Differential pressure measurement in cleanroom applications



Whether in cleanrooms, greyrooms, OP theatres or filling systems:

Lowest differential pressures must be maintained between different rooms or zones in order to prevent contaminated air from entering.

For this reason, continuous measurement and regulation of these low differential pressures (according to cleanroom norm ISO 14644: 5 - 20 Pa) is required.

Annual proof (against zero potential and against adjacent rooms) of this must be provided according to **ISO 14644**.



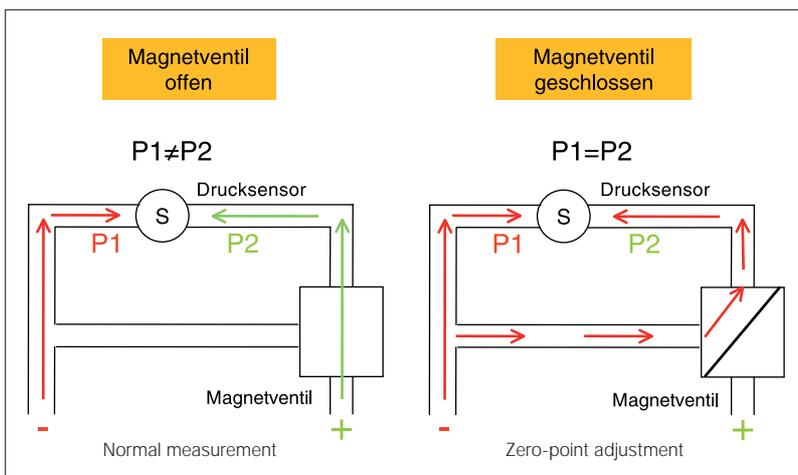
Defined pressure differences between cleanrooms and adjacent rooms ensure quality



Positive pressure in the filling room maintains the hygiene conditions during filling operations in the food and pharmaceuticals industry



In hospitals and research laboratories, the pressure difference (negative pressure) prevents the spread of germs and dust



Functional principle of the automatic zero-point adjustment of the Testo differential pressure transmitter

Automatic zero-point adjustment guarantees highest, temperature-independent accuracy and long-term stability

The zero-point stability of differential pressure transmitters plays a particularly crucial role at lowest pressures (10 Pa or 50 Pa measurement range). Whereas conventional differential pressure transmitters require manual re-adjustment of the zero point, the new transmitter series from Testo is equipped with an automatic microprocessor-controlled zero-point adjustment. It ensures a low level of temperature-dependency of the pressure sensor, guaranteeing the user high accuracy and long-term stability.

In the automatic zero-point adjustment, a magnetic valve causes both sides of the pressure sensor to be exposed to the same pressure a cyclic intervals. This guarantees highest accuracy in cleanroom processes!

Overview of differential pressure transmitters from Testo

	testo 6383	testo 6381	testo 6351
			
Parameters	Differential pressure Optional: humidity/temperature	Differential pressure Flow velocity Volume flow Optional: Humidity/temperature	Differential pressure Flow velocity Volume flow
Selectable measuring ranges	10 Pa to 10 hPa	10 Pa to 1000 hPa	50 Pa to 2000 hPa
Housing	Flat stainless steel housing for flush wall installation (panel design)	Metal housing	Plastic housing
Ethernet networking	– Integration of the transmitters into customers' Ethernet network – Integration of the transmitters into measurement data monitoring systems, e. g. testo Saveris™		
Area of application:	Differential pressure monitoring between cleanrooms (optional: simultaneous measurement of temperature and humidity) Monitoring positive and negative pressure in cleanrooms, operating theatres and isolation rooms Additional monitoring of humidity and temperature in cleanrooms (optional)	Differential pressure monitoring between cleanrooms (optional: simultaneous measurement of temperature and humidity) Differential pressure monitoring in filling processes and spray-painting systems Monitoring drying processes	Differential pressure monitoring between cleanrooms Differential pressure monitoring in filling processes in the process industry Critical air conditioning technology (VAC systems)
Usual installation site in cleanroom	Critical zone: Surface flush installation in cleanroom wall	Normal zone or outside zone	Normal zone or outside zone

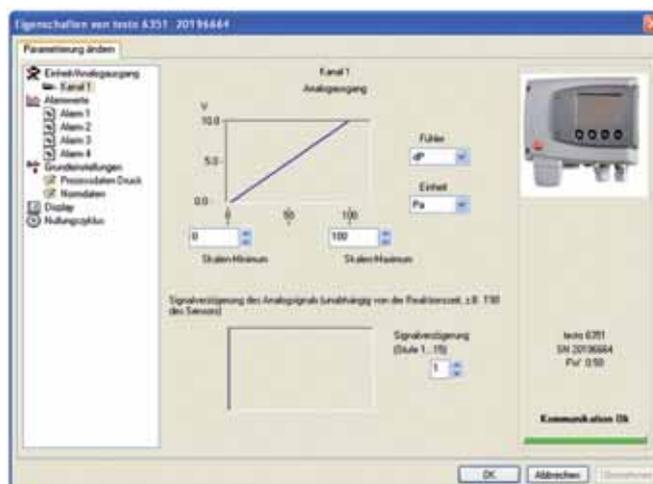
Optimizing processes and saving time in commissioning and maintenance

The Testo transmitters are delivered ready to use. For professional application, the following functions are available via the easy-to-use software:

- Parameterization of unit and scale
- Sensor adjustment and adjustment of the analog outputs (humidity: 1-point, 2-point; pressure: n-point)
- Parameterization and adjustment history of all activities of the P2A software are registered in the PC

An adjustment of the entire signal chain is possible directly at the measurement site thanks to the external interface. This saves time in commissioning and maintenance.

In addition to this, complete parameter files can be stored in the PC. The parameterization of spare transmitters or similar measuring points is thus possible with minimal time expenditure.



Using the P2A software, unit and scale can be easily parameterized, for example

Differential pressure transmitters for installation in critical zones



testo 6383 for differential pressure measurement



testo 6383 with integrated humidity probe

- Combination of differential pressure, humidity, and temperature measurement in one instrument saves investment costs (exchangeable digital humidity probes see page 10)
- Display with multi-language operating menu and optical alarm display
- Ethernet, relay and analog outputs allow optimum integration into individual automation systems
- Self-monitoring of the transmitters guarantees high system availability
- The P2A software for parameterization, adjustment and analysis saves time and costs in commissioning and maintenance
- Scalable measuring range by ± 50 percent of the measuring range final value, and free scalability within the measuring range, allow optimum adaptation to the control requirements

testo 6383 – Overview of features and benefits:

- Measurement of differential pressure, optional: humidity and temperature
- Automatic zero-point adjustment guarantees high, temperature-independent accuracy and long-term stability
- Low measurement range up to 10 Pa ensures highest precision at lowest pressures
- Flat housing allows flush surface integration in the cleanroom wall

Areas of application:

- Monitoring positive and negative pressure in cleanrooms, operating theatres and isolation rooms
- Additional monitoring of humidity and temperature in cleanrooms (optional)

Configuration options testo 6383:

Axx	Measuring range		probe connection testo 6610 / units (pre-set)
Bxx	Analog display/supply	Hxx	Relay
Cxx	Display	Ixx	Units channel 3 (pre-set, only if opt. humidity probe connection available)
Dxx	Integrated humidity probe	Kxx	IM languages (for bilingual printed IMs)
Exx	Ethernet		
Fxx	Differential pressure unit (pre-set)		
Gxx	opt. Analog output for humidity		

This results in a typical ordering code:

0555 6383 AXX BXX CXX DXX EXX FXX GXX HXX IXX KXX

Order no. 0555 6383 **A01** Bxx Cxx Dxx Exx Fxx Gxx Hxx Ixx Kxx

A01	0 to 10 Pa	E00	without Ethernet module
A02	0 to 50 Pa	E01	with Ethernet module
A03	0 to 100 Pa	F01	Pa / min / max
A04	0 to 500 Pa	F02	hPa / min / max
A05	0 to 10 hPa	F03	kPa / min / max
A21	-10 to 10 Pa	F04	mbar / min / max
A22	-50 to 50 Pa	F05	bar / min / max
A23	-100 to 100 Pa	F06	mmH ₂ O / min / max
A24	-500 to 500 Pa	F07	mmH ₂ O / min / max
A25	-10 to 10 hPa	F08	inch HG / min / max
B02	B02 0 to 1 V (4-wire, 24 VAC/DC)	F09	kg/cm ² / min / max
B03	B03 0 to 5 V (4-wire, 24 VAC/DC)	F10	PSI / min / max
B04	B04 0 to 10 V (4-wire, 24 VAC/DC)	G01	% RH/Min/Max
B05	B05 0 to 20 mA (4-wire, 24 VAC/DC)	G02	°C/Min/Max
B06	B06 4 to 20 mA (4-wire, 24 VAC/DC)	G03	°F/Min/Max
C00	without display without operating buttons	G04	°C _{td} / min / max
C02	with display, with operating buttons / English	G05	°F _{td} / min / max
C03	with display, with operating buttons / German	G06	g/kg / min / max
C04	with display, with operating buttons / French	G07	gr/lb /Min/Max
C05	with display, with operating buttons / Spanish	G08	gr/m ³ / min / max
C06	with display, with operating buttons / Italian	G09	gr/ft ³ / min / max
C07	with display, with operating buttons / Japanese	G10	ppmV / min / max
C08	with display, with operating buttons / Swedish	G11	°C _{wb} / min / max
D00	no humidity/temperature probe	G12	°F _{wb} / min / max
D04	humidity/temperature probe integrated in panel	G13	kJ/kg /Min/Max (enthalpy)
D05	preparation for external humidity/temperature probe testo 6610	G14	hPa /min/max (water vapour partial pressure)
		G15	mmH ₂ O / min / max (Water vapour partial pressure)
		G16	°C _{tm} (mixture dewpoint for H ₂ O ₂)
		G17	°F _{tm} (mixture dewpoint for H ₂ O ₂)

Scaling: $\pm 50\%$ of measuring range; freely selectable within measuring range

Only with selection D04 or D05

H00	without relay	I01	% RH/Min/Max	Only with selection D04 or D05
H01	4 relay outputs, limit value monitoring	I02	°C/Min/Max	
H02	4 relay outputs, channel 1 limit values and collective alarm	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	°C _{wb} / min / max	
		I12	°F _{wb} / min / max	
		I13	kJ/kg /Min/Max (enthalpy)	
		I14	hPa /min/max (water vapour partial pressure)	
		I15	mmH ₂ O / min / max (Water vapour partial pressure)	
		I16	°C _{tm} (mixture dewpoint for H ₂ O ₂)	
		I17	°F _{tm} (mixture dewpoint for H ₂ O ₂)	
K01	German/English instruction manual			
K02	French/English instruction manual			
K03	Spanish/English instruction manual			
K04	Italian/English instruction manual			
K05	Dutch/English instruction manual			
K06	Japanese/English instruction manual			
K07	Chinese/English instruction manual			
K08	Swedish/English instruction manual			

testo 6383 – differential pressure, humidity and temperature

Technical data testo 6383

Parameters		
Differential pressure		
Measuring range	0 to 10 Pa 0 to 50 Pa 0 to 100 Pa 0 to 500 Pa 0 to 10 hPa	-10 to +10 Pa -50 to +50 Pa -100 to +100 Pa -500 to +500 Pa -10 to +10 hPa
Measurement uncertainty*	0.3% of measurement range final value ± 0.3 Pa	
Selectable units	Pa, further pressure units see configuration options p. 4	
Sensor	Piezoresistive sensor	
Autom. Zero-point adjustment	via magnetic valve, frequency settable: 15 sec, 30 sec, 1 min, 5 min, 10 min	
Overload capacity	Measuring range	Overload
	0 to 10 Pa	20000 Pa
	0 to 50 Pa	20000 Pa
	0 to 100 Pa	20000 Pa
	0 to 500 Pa	20000 Pa
	0 to 10 hPa	200 hPa
	-10 to 10 Pa	20000 Pa
	-50 to 50 Pa	20000 Pa
	-100 to 100 Pa	20000 Pa
	-500 to 500 Pa	20000 Pa
	-10 to 10 hPa	200 hPa
Humidity		
Measuring range	Version with integrated probe: 0 to 100 %RH; Version with external probe: dependent on connected probe (see p. 10)	
Measurement uncertainty	dependent on connected probe (see p. 10)	
Selectable units	%RH, further calculated humidity parameters see configuration options p. 4	
Temperature dependency/ coefficient	± 0.02 %RH (at temperatures deviating from 25 °C)	
Sensor	Capacitive sensor	
Temperature		
Measuring range	dependent on connected probe (see p. 10)	
Measurement uncertainty	0.15 °C / 32.2 °F	
Selectable units	°C / °F	
Sensor	Pt 1000 1/3 Class B; Pt 100 1/3 Class B (with probe testo 6615)	

* Measurement inaccuracy according to GUM: $\pm 0,5\%$ of measurement range final value ± 0.3 Pa

GUM (Guide to the Expression of Uncertainty in Measurement):
ISO guideline for the determination of measurement inaccuracy, in order to make
measurement results internationally comparable.

The following inaccuracies are used for the determination:

- Hysteresis
- Linearity
- Reproducibility
- Long-term stability
- Adjustment site/factory calibration
- Test site

Inputs/outputs	
Analog outputs	
Quantity	Standard: 1; for humidity/temperature (optional): 3
Output type	0/4 to 20 mA (4-wire) (24 VAC/DC) 0 to 1/5 to 10 V (4-wire) (24 VAC/DC)
Meas. cycle	1/sec
Resolution	12 bit
Scaling	Differential pressure: scalable $\pm 50\%$ of measuring range final value; freely scalable within measuring range
Load	max. 500 Ω
Other outputs	
Ethernet	Optional
Relay	Optional: 4 relays (free allocation to measurement channels or as collective alarm in operating menu/P2A software), up to 250 VAC/3A (NO or NC)
Digital output	Mini-DIN for P2A software
Supply	
Voltage supply	20 to 30 VAC/DC, 300mA current consumption, galvanically separate signal and supply line

General technical data		
Housing		
Material	Stainless steel housing	
Dimensions	without humidity/temperature: 246 x 161 x 47 mm with humidity/temperature: 396 x 161 x 78 mm	
Weight	Version without humidity: 0.9 kg; Version with integrated humidity probe: 1.350 kg; version with preparation for external humidity probe: 1.260 kg	
Display		
Display	optional: 3-line LCD with multi-language operating menu	
Resolution pressure	Measuring range	Resolution
	0 to 10 Pa	0.1 Pa
	0 to 50 Pa	0.1 Pa
	0 to 100 Pa	0.1 Pa
	0 to 500 Pa	0.1 Pa
	0 to 10 hPa	0.01 hPa
	-10 to 10 Pa	0.1 Pa
	-50 to 50 Pa	0.1 Pa
	-100 to 100 Pa	0.1 Pa
	-500 to 500 Pa	0.1 Pa
	-10 to 10 hPa	0.01 hPa
Resolution humidity	0.1 %RH	
Temperature resolution	0.01 °C / °F	
Miscellaneous		
Protection class	IP 65	
Standard reference	EU guideline 2004/108/EC	

Operating conditions	
Operating temperature (housing)	-5 to 50 °C/23 to 122 °F
Storage temperature	-20 to 60 °C/-4 to 140 °F

Differential pressure transmitters for installation in normal zones



testo 6381 – Overview of features and benefits:

- Measurement of differential pressure, flow velocity, volume flow; optional: humidity and temperature
- Automatic zero-point adjustment guarantees high, temperature-independent accuracy and long-term stability
- Low measurement range up to 10 Pa ensures very high precision at lowest pressures
- The robust metal housing protects from tough ambient conditions
- Combination of differential pressure, humidity, and temperature measurement in one instrument saves investment costs (exchangeable digital humidity probe see page 10)
- Display with multi-language operating menu and optical alarm display
- Ethernet, relay and analog outputs allow optimum integration into individual automation systems

- Self-monitoring of the transmitters guarantees high system availability
- The P2A software for parameterization, adjustment and analysis saves time and costs in commissioning and maintenance
- Scalable measuring range by ± 50 percent of the measuring range final value, and free scalability within the measuring range, allow optimum adaptation to the control requirements

Areas of application:

- Differential pressure monitoring between cleanrooms (optional: simultaneous measurement of ambient temperature and humidity)
- Monitoring drying processes
- Differential pressure monitoring in filling processes and spray-painting systems

Configuration options testo 6381:

Axx	Measuring range
Bxx	Analog display/supply
Cxx	Display
Dxx	Cable input
Exx	Ethernet
Fxx	Differential pressure/flow velocity unit (pre-set)
Gxx	opt. Analog output for humidity probe

Hxx	connection testo 6610 / units (pre-set)
Ixx	Relay
Jxx	Units channel 3 (pre-set, only if opt. humidity probe connection available)
Kxx	IM languages (for bilingual printed IMs)

This results in a typical ordering code:

0555 6381 AXX BXX CXX DXX EXX FXX GXX HXX IXX KXX

Order no. 0555 6381 **A01** Bxx Cxx Dxx Exx Fxx Gxx Hxx Ixx Kxx

A01	0 to 10 Pa
A02	0 to 50 Pa
A03	0 to 100 Pa
A04	0 to 500 Pa
A05	0 to 10 hPa
A07	0 to 50 hPa
A08	0 to 100 hPa
A09	0 to 500 hPa
A10	0 to 1000 hPa
A21	-10 to 10 Pa
A22	-50 to 50 Pa
A23	-100 to 100 Pa
A24	-500 to 500 Pa
A25	-10 to 10 hPa
A27	-50 to 50 hPa
A28	-100 to 100 hPa
A29	-500 to 500 hPa
A30	-1000 to 1000 hPa

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)

C00	without display without operating buttons
C02	with display, with operating buttons / English
C03	with display, with operating buttons / German
C04	with display, with operating buttons / French
C05	with display, with operating buttons / Spanish
C06	with display, with operating buttons / Italian
C07	with display, with operating buttons / Japanese
C08	with display, with operating buttons / Swedish

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

E00	without Ethernet module
E01	with Ethernet module

F01	Pa / min / max
F02	hPa / min / max
F03	kPa / min / max
F04	mbar / min / max
F05	bar / min / max
F06	mmH ₂ O / min / max
F07	mmHg / min / max
F08	inch HG / min / max
F09	kg/cm ² / min / max
F10	PSI / min / max
F11	m/s / min / max
F12	ft/min / min / max
F13	m ³ /h / min / max
F14	l/min / min / max
F15	Nm ³ /h / min / max
F16	Nl/min / min / max

Scaling
 $\pm 50\%$ of measuring range; freely selectable within measuring range

G00	without connection possibility for humidity probe testo 6610
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	°C _{wb} / min / max
G12	°F _{wb} / min / max
G13	kJ/kg /Min/Max (enthalpy)
G14	hPa /min/max (water vapour partial pressure)
G15	mmH ₂ O / min / max (Water vapour partial pressure)
G16	°C _{tm} (mixture dewpoint for H ₂ O ₂)
G17	°F _{tm} (mixture dewpoint for H ₂ O ₂)

with connection possibility testo 6610

H00	without relay
H01	4 relay outputs, limit value monitoring
H02	4 relay outputs, channel 1 limit values and collective alarm

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	°C _{wb} / min / max
I12	°F _{wb} / min / max
I13	kJ/kg /Min/Max (enthalpy)
I14	hPa /min/max (water vapour partial pressure)
I15	mmH ₂ O / min / max (Water vapour partial pressure)
I16	°C _{tm} (mixture dewpoint for H ₂ O ₂)
I17	°F _{tm} (mixture dewpoint for H ₂ O ₂)

only possible when G-Code (from G01) selected

K01	German/English instruction manual
K02	French/English instruction manual
K03	Spanish/English instruction manual
K04	Italian/English instruction manual
K05	Dutch/English instruction manual
K06	Japanese/English instruction manual
K07	Chinese/English instruction manual
K08	Swedish/English instruction manual

testo 6381 – differential pressure, humidity and flow velocity

Technical data testo 6381

Parameters		
Differential pressure		
Measuring range	0 to 10 Pa 0 to 50 Pa 0 to 100 Pa 0 to 500 Pa 0 to 10 hPa 0 to 50 hPa 0 to 100 hPa 0 to 500 hPa 0 to 1000 hPa	-10 to 10 Pa -50 to 50 Pa -100 to 100 Pa -500 to 500 Pa -10 to 10 hPa -50 to 50 hPa -100 to 100 hPa -500 to 500 hPa -1000 to 1000 hPa
Measurement uncertainty*	0.5% of measurement range final value ± 0.3 Pa	
Selectable units	Pa, further pressure and flow velocity units see configuration options p. 6	
Sensor	Piezoresistive sensor	
Autom. Zero-point adjustment	via magnetic valve, frequency settable: 15 sec, 30 sec, 1 min, 5 min, 10 min	
Overload capacity	Measuring range	Overload
	0 to 10 Pa	20000 Pa
	0 to 50 Pa	20000 Pa
	0 to 100 Pa	20000 Pa
	0 to 500 Pa	20000 Pa
	0 to 10 hPa	200 hPa
	0 to 50 hPa	750 hPa
	0 to 100 hPa	750 hPa
	0 to 500 hPa	2500 hPa
	0 to 1000 hPa	2500 hPa
	-10 to 10 Pa	20000 Pa
	-50 to 50 Pa	20000 Pa
	-100 to 100 Pa	20000 Pa
	-500 to 500 Pa	20000 Pa
	-10 to 10 hPa	200 hPa
	-50 to 50 hPa	750 hPa
	-100 to 100 hPa	750 hPa
	-500 to 500 hPa	2500 hPa
	-1000 to 1000 hPa	2500 hPa
Humidity		
Measuring range	dependent on connected probe (see p. 10)	
Measurement uncertainty	dependent on connected probe (see p. 10)	
Selectable units	%RH, further calculated humidity parameters see configuration options p. 6	
Temperature dependency/coefficient	± 0.02 %RH (at temperatures deviating from 25 °C)	
Sensor	Capacitive sensor	
Temperature		
Measuring range	dependent on connected probe (see p. 10)	
Measurement uncertainty	0.15 °C / 32.2 °F	
Selectable units	°C / °F	
Sensor	Pt 1000 1/3 Class B; Pt 100 1/3 Class B (testo 6615)	

* Measurement inaccuracy according to GUM: $\pm 0.8\%$ of measurement range final value ± 0.3 Pa

GUM (Guide to the Expression of Uncertainty in Measurement): ISO guideline for the determination of measurement inaccuracy, in order to make measurement results internationally comparable.

The following inaccuracies are used for the determination:
Hysteresis / Linearity / Reproducibility / Long-term stability / Adjustment site/factory calibration / Test site

Inputs/outputs	
Analog outputs	
Quantity	Standard: 1; for humidity/temperature (optional): 3
Output type	0/4 to 20 mA (4-wire) (24 VAC/DC) 0 to 1/5 to 10 V (4-wire) (24 VAC/DC)
Meas. cycle	1/sec
Resolution	12 bit
Scaling	Differential pressure: scalable $\pm 50\%$ of measuring range final value; freely scalable within measuring range
Load	max. 500 Ω
Other outputs	
Ethernet	Optional with Ethernet module
Relay	Optional: 4 relays (free allocation to measurement channels or as collective alarm in operating menu/P2A software), up to 250 VAC/3A (NO or NC)
Digital output	Mini-DIN for P2A software
Supply	
Voltage supply	20 to 30 VAC/DC, 300 mA current consumption, galvanically separate signal and supply line

General technical data		
Housing		
Material	Metal housing	
Dimensions	162 x 122 x 77 mm	
Weight	1,960 kg; optional: Ethernet intermediary layer 0.610 kg	
Display		
Display	optional: 3-line LCD with multi-language operating menu	
Resolution pressure	Measuring range	Resolution
	0 to 10 Pa	0.1 Pa
	0 to 50 Pa	0.1 Pa
	0 to 100 Pa	0.1 Pa
	0 to 500 Pa	0.1 Pa
	0 to 10 hPa	0.01 hPa
	0 to 50 hPa	0.01 hPa
	0 to 100 hPa	0.1 hPa
	0 to 500 hPa	0.1 hPa
	0 to 1000 hPa	1 hPa
	-10 to 10 Pa	0.1 Pa
	-50 to 50 Pa	0.1 Pa
	-100 to 100 Pa	0.1 Pa
	-500 to 500 Pa	0.1 Pa
	-10 to 10 hPa	0.01 hPa
	-50 to 50 hPa	0.01 hPa
	-100 to 100 hPa	0.1 hPa
	-500 to 500 hPa	0.1 hPa
	-1000 to 1000 hPa	1 hPa
Resolution humidity	0.1 %RH	
Temperature resolution	0.01 °C / °F	

Miscellaneous	
Protection class	IP 65
Standard reference	EU guideline 2004/108/EC
Operating conditions	
Operating temperature (housing)	-5 to 50 °C/23 to 122 °F
Storage temperature	-20 to 60 °C/-4 to 140 °F

Differential pressure transmitters for installation in normal zones



testo 6351 – Overview of features and benefits:

- Measurement of differential pressure, flow velocity and volume flow
- Automatic zero-point adjustment guarantees high, temperature-independent accuracy and long-term stability
- Plastic housing
- Display with multi-language operating menu and optical alarm display
- Ethernet, relay and analog outputs allow optimum integration into individual automation systems
- Self-monitoring of the transmitters guarantees high system availability
- The P2A software for parameterization, adjustment and analysis saves time and costs in commissioning and maintenance
- Scalable measuring range by ± 50 percent

of the measuring range final value, and free scalability within the measuring range, allow optimum adaptation to the control requirements

Areas of application:

- Differential pressure monitoring between cleanrooms
- Differential pressure monitoring in filling processes
- Monitoring differential pressure, volume flow and flow velocities in critical air conditioning technology (VAC systems)

Configuration options testo 6351:

Axx	Measuring range	Fxx	Differential pressure/flow velocity unit (pre-set)
Bxx	Analog display/supply	Hxx	Relay
Cxx	Display	Kxx	IM languages (for bilingual printed IMs)
Dxx	Cable input		
Exx	Ethernet		

This results in a typical ordering code:

0555 6351 AXX BXX CXX DXX EXX FXX HXX IXX KXX

Order no. 0555 6351 **A01** **Bxx** **Cxx** **Dxx** **Exx** **Fxx** **Hxx** **Ixx** **Jxx** **Kxx**

A02	0 to 50 Pa
A03	0 to 100 Pa
A04	0 to 500 Pa
A05	0 to 10 hPa
A07	0 to 50 hPa
A08	0 to 100 hPa
A09	0 to 500 hPa
A10	0 to 1000 hPa
A11	0 to 2000 hPa
A22	-50 to 50Pa
A23	-100 to 100 Pa
A24	-500 to 500 Pa
A25	-10 to 10 hPa
A27	-50 to 50 hPa
A28	-100 to 100 hPa
A29	-500 to 500 hPa
A30	-1000 to 1000 hPa
A31	-2000 to 2000 hPa

B02	0 to 1 V (4-wire, 24 VAC/DC)
B03	0 to 5 V (4-wire, 24 VAC/DC)
B04	0 to 10V (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)

C00	without display without operating buttons
C02	with display, with operating buttons / English
C03	with display, with operating buttons / German
C04	with display, with operating buttons / French
C05	with display, with operating buttons / Spanish
C06	with display, with operating buttons / Italian
C07	with display, with operating buttons / Japanese
C08	with display, with operating buttons / Swedish

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

E00	without Ethernet module
E01	with Ethernet module

F01	Pa / min / max
F02	hPa / min / max
F03	kPa / min / max
F04	mbar / min / max
F05	bar / min / max
F06	mmH ₂ O / min / max
F07	mmH ₂ O / min / max
F08	inch HG / min / max
F09	kg/cm ² / min / max
F10	PSI / min / max
F11	m/s / min / max
F12	ft/min / min / max
F13	m ³ /h / min / max
F14	l/min / min / max
F15	Nm ³ /h / min / max
F16	NI/min / min / max

Scaling: $\pm 50\%$ of measuring range; freely selectable within measuring range

H00	without relay
H01	4 relay outputs, limit value monitoring
H02	4 relay outputs, channel 1 limit values and collective alarm

K01	German/English instruction manual
K02	French/English instruction manual
K03	Spanish/English instruction manual
K04	Italian/English instruction manual
K05	Dutch/English instruction manual
K06	Japanese/English instruction manual
K07	Chinese/English instruction manual
K08	Swedish/English instruction manual

testo 6351 – Differential pressure and flow velocity

Technical data testo 6351

Parameters		
Differential pressure		
Measuring range	0 to 50 Pa 0 to 100 Pa 0 to 500 Pa 0 to 10 hPa 0 to 50 hPa 0 to 100 hPa 0 to 500 hPa 0 to 1000 hPa 0 to 2000 hPa	-50 to 50 Pa -100 to 100 Pa -500 to 500 Pa -10 to 10 hPa -50 to 50 hPa -100 to 100 hPa -500 to 500 hPa -1000 to 1000 hPa -2000 to 2000 hPa
Measurement uncertainty*	±0.8% of measurement range final value ±0.3 Pa	
Selectable units	Pa, further pressure and flow velocity units see configuration options p. 8	
Sensor	Piezoresistive sensor	
Autom. Zero-point adjustment	via magnetic valve, frequency settable: 15 sec, 30 sec, 1 min, 5 min, 10 min	
Overload capacity	Measuring range	Overload
	0 to 50 Pa	20000 Pa
	0 to 100 Pa	20000 Pa
	0 to 500 Pa	20000 Pa
	0 to 10 hPa	200 hPa
	0 to 50 hPa	750 hPa
	0 to 100 hPa	750 hPa
	0 to 500 hPa	2500 hPa
	0 to 1000 hPa	2500 hPa
	0 to 2000 hPa	2500 hPa
	-50 to 50 Pa	20000 Pa
	-100 to 100 Pa	20000 Pa
	-500 to 500 Pa	20000 Pa
	-10 to 10 hPa	200 hPa
	-50 to 50 hPa	750 hPa
	-100 to 100 hPa	750 hPa
	-500 to 500 hPa	2500 hPa
	-1000 to 1000 hPa	2500 hPa
	-2000 to 2000 hPa	2500 hPa

* Measurement inaccuracy according to GUM: ±0.8% of measurement range final value ±0.3 Pa

GUM (Guide to the Expression of **U**ncertainty in **M**easurement): ISO guideline for the determination of measurement inaccuracy, in order to make measurement results internationally comparable.

The following inaccuracies are used for the determination:

- Hysteresis
- Linearity
- Reproducibility
- Long-term stability
- Adjustment site/factory calibration
- Test site

Inputs/outputs	
Analog outputs	
Quantity	1
Output type	0/4 to 20 mA (4-wire) (24 VAC/DC) 0 to 1/5 to 10 V (4-wire) (24 VAC/DC)
Meas. cycle	1/sec
Resolution	12 bit
Scaling	Differential pressure: scalable ±50% of measuring range final value; freely scalable within measuring range
Load	max. 500 Ω
Other outputs	
Ethernet	Optional with Ethernet module
Relay	Optional: 4 relays (free allocation to measurement channels or as collective alarm in operating menu/P2A software), up to 250 VAC/3A (NO or NC)
Digital output	Mini-DIN for P2A software
Supply	
Voltage supply	20 to 30 VAC/DC, 300mA current consumption, galvanically separate signal and supply line

General technical data		
Housing		
Material	Plastic housing	
Dimensions	162 x 122 x 77 mm	
Weight	0.7 kg; optional: Ethernet intermediary layer: 0.6 kg	
Display		
Display	Optional: 3-line LCD with multi-language operating menu	
Resolution pressure	Measuring range	Resolution
	0 to 50 Pa	0.1 Pa
	0 to 100 Pa	0.1 Pa
	0 to 500 Pa	0.1 Pa
	0 to 10 hPa	0.01 hPa
	0 to 50 hPa	0.01 hPa
	0 to 100 hPa	0.1 hPa
	0 to 500 hPa	0.1 hPa
	0 to 1000 hPa	1 hPa
	0 to 2000 hPa	1 hPa
	-50 to 50 Pa	0.1 Pa
	-100 to 100 Pa	0.1 Pa
	-500 to 500 Pa	0.1 Pa
	-10 to 10 hPa	0.01 hPa
	-50 to 50 hPa	0.01 hPa
	-100 to 100 hPa	0.1 hPa
	-500 to 500 hPa	0.1 hPa
	-1000 to 1000 hPa	1 hPa
	-2000 to 2000 hPa	1 hPa
Miscellaneous		
Protection class	IP 65	
Standard reference	EU guideline 2004/108/EC	
Operating conditions		
Operating temperature (housing)	-5 to 50 °C/23 to 122 °F	
Storage temperature	-20 to 60 °C/-4 to 140 °F	

External probes for testo 6383 and testo 6381 – probe series testo 6610

	testo 6611*	testo 6612	testo 6613	testo 6614	testo 6615	testo 6617
						
Parameters						
Humidity						
Measuring range	0 to 100 %RH			see trace humidity	0 to 100 %RH	
Measurement uncertainty** (25 °C)	±1,0 %RH (0 to 90%); ±1.4 %RH (90 to 100%)			±1.0 %RH (0 to 100%)	see trace humidity	±1.2 %RH (0 to 90%); ±1.6 %RH (90 to 100%)
Measurement inaccuracy (for deviations from media temperature of ±25 °C)	0.02 %RH/K					
Selectable units	%rF; %RH; °C _{tpd} /°F _{tpd} ; g/m ³ / gr/ft ³ ; g/kg / gr/lb; kj/kg; 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					
Temperature						
Selectable units	°C / °F					
Temperature	-20 to +70 °C, -4 to +158 °F	-30 to +150 °C, -22 to +302 °F	-40 to +180 °C/-40 to +356 °F		-40 to +120 °C, -40 to +248 °F	-40 to +180 °C / -40 to +356 °F
Measurement inaccuracy ** (at 25 °C / 77°F)	±0.15 °C / 32.2 °F (Pt 1000 1/3 Class B)				±0.15 °C / 32.2 °F Pt100 1/3 class B	±0.15 °C / 32.2 °F Pt1000 1/3 Class B
Trace humidity						
Measuring range					-60 to +30 °C _{td} / -76 to +86 °F _{td}	
Measurement uncertainty					±1 K at 0° C _{td} ±2K at -40° C _{td} ±4K at -50° C _{td}	
General technical data						
Probe						
Type	Wall	Channel	Cable	Heated cable	Trace humidity cable (self-adjustment)	Cable with covering electrode monitoring
Probe shaft	Stainless steel					
Cable	Sheathed, FEP					
Connector	ABS plastic					
Probe shaft diameter	12 mm					
Probe shaft length	200 mm	200/300/500/800 mm	120/200/300/500/800 mm	200/500 mm		
Cable length		Customized for duct version	1/2/5/10 m			
Operating conditions						
Area of use	Indoor climate probe wall installation	Process humidity probe, duct installation	Process humidity probe, flexible installation with cable	Humidity probe for high humidity applications/for danger of condensation	Humidity probe for trace humidity/pressure dewpoint (with self-adjustment)	Humidity probe with self-monitoring for sensor-damaging media
Process pressure	1 bar positive pressure (probe tip)		1 to 10 bar (probe tip) 1 bar (probe end)		1 to 16 bar (probe tip) 1 bar (probe end)	1 bar positive pressure (probe tip) 1 bar (probe end)

* Technical data also apply to the integrated humidity probe of the testo 6383.
Probe testo 6611 cannot be connected to the testo 6383.

** Determination of humidity measurement inaccuracy according to GUM

GUM (Guide to the Expression of Uncertainty in Measurement):
ISO guideline for the determination of measurement inaccuracy, in order to make measurement results internationally comparable.
The following inaccuracies are used for the determination:
– Hysteresis
– Linearity
– Reproducibility
– Long-term stability
– Adjustment site/factory calibration
– Test site

Configuration options testo 6610

0555 6610 **Lxx** **Mxx** **Nxx** **Pxx**

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

- M01 Sintered stainless steel filter
- M02 Metal wire protection cap
- M03 Sintered Teflon filter
- M04 Open metal protection cap
- M06 Teflon filter with drip hole
- M07 Teflon filter with drip hole and condensation protector
- M08 Filter for H₂O₂ atmospheres*

Ordering example testo 6613 probes

Cable probe, -40 to +180 °C
 Sintered stainless steel filter
 Cable length 2 m
 Probe length 300 mm

→ 0555 6610 L13 / M01 / N02 / P30

} specially for high humidity (testo 6614 only)

- N00 without cable
- N01 Probe length 1 m
- N02 Probe length 1 m
- N05 Probe length 5 m
- N10 Probe length 10 m
- N23 Probe length, specially for duct versions

	L11	L12	L13	L14	L15	L17
N00	X	-	-	-	-	-
N01	-	-	X	X	X	X
N02	-	-	X	X	X	X
N05	-	-	X	X	X	X
N10	-	-	X	X	X	X
N23	-	X	-	-	-	-

- P12 Probe length 300 mm
- P20 Probe length 200 mm
- P30 Probe length 300 mm
- P50 Probe length 500 mm
- P80 Probe length 800 mm

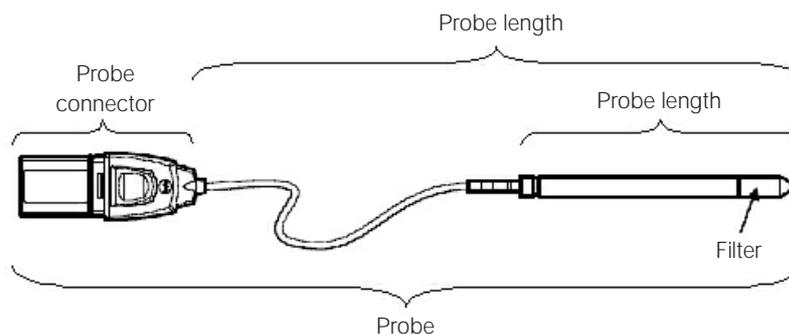
	L11	L12	L13	L14	L15	L17
P12	-	-	X	-	-	-
P20	X	X	X	X	X	X
P30	-	X	X	-	-	-
P50	-	X	X	X	X	X
P80	-	X	X	-	-	-

Ordering procedure:

Thanks to the digital probe interface, the transmitter and the probe can be ordered separately from each other, see ordering example above.

*On H₂O₂ processes:

Testo offers a transmitter which can also be used in hydrogen peroxide (H₂O₂) processes - e. g. in sterilization. The sensor is protected with the help of a special probe (Code M08). In addition, the so-called „mixture dewpoint“ °C_{lm}/°F_{lm} is issued.



Accessories for all transmitters

Ordering data for accessories	Order no.
Mains unit (desktop instrument) 110 to 240 VAC / 24 VDC (350 mA)	0554 1748
Mains unit (top-hat rail mounting) 90 to 264 VAC / 24 VDC (2.5 A)	0554 1749
Process display testo 54-2 AC, two relay outputs (to 250 VAC / 300 VDC, 3A), mains supply 90 to 260 VAC	5400 7553
Process display testo 54-7 AC, two relay outputs (to 250 VAC / 300 VDC, 3A), mains supply 90 to 260 VAC, with RS485 output for online monitoring and with totalizer display	5400 7555
① Ethernet module for installation by the customer (for testo 6351 and testo 6381 only)	0554 6656
Ethernet plug (for testo 6351 and testo 6381 only)	0554 6653
P2A software (parameterization, adjustment, analysis) incl. USB adapter	5546020
Silicon hose ID 4 transparent	0086 0001, by the metre
Tygon hose ID 4.8 transparent	0086 0031, by the metre
Humidity adjustment set 11.3 / 75.3 %RH (for testo 6381 and testo 6383 only)	0554 0660
② Adjustment and extension cable, 10 m (for testo 6381 and testo 6383 only)	0554 6610
Pitot tube, length 350 mm, stainless steel (for testo 6351 and testo 6381 only)	0635 2145
Pitot tube, length 1000 mm, stainless steel (for testo 6351 and testo 6381 only)	0635 2345

Ethernet intermediary layer testo 6381/6351 for installation by customer



The Ethernet module is an intermediary layer („sandwich“ design), which can be optionally integrated into the transmitters testo 6681/6351 ex-works. It can also be subsequently easily and quickly retrofitted on site. Two LEDs provide the responsible system operator with information on the status of the voltage supply and the LAN connection.

By using an industrial Ethernet plug, IP65 housing protection can be guaranteed, enabling the transmitter to withstand the sometimes rough and demanding conditions in industrial processes.

Adjustment and extension cable for external humidity probes



The cable can be used to carry out an adjustment of a humidity probe from the probe series testo 6610 - either on site or in a laboratory. The cable also serves as an extension between the transmitter and the respective probe.

Advantages of the adjustment

and extension cable:

- Flexible installation and maintenance of the humidity probe
- Extension of the normal humidity probe cable by 10 m
- Cable has protection class IP65

Testo – Your partner for calibration, validation and qualification

Calibration and validation/qualification services

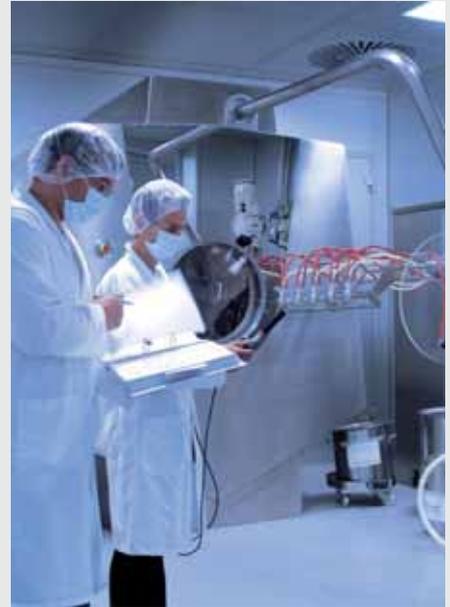
Calibration:

Calibration service in laboratories and on site in numerous countries. Contact your local Testo subsidiary, testo industrial services or Testo's sales partner in your country.

Validation / qualification

The Testo subsidiary testo industrial services (TIS) offers you customized validation and qualification for pharmaceutical projects:

- DQ, IQ, OQ, PQ (qualification)
- Mapping/distribution measurements (for optimum probe site determination)
- Customized risk analysis incorporating GAMP5
- Documentation optionally in Testo or customer format



More information: www.testo-industrial-services.de

testo Saveris™ – Simple, secure and efficient measurement data monitoring

Integrate the new transmitters into testo Saveris™

The measurement data monitoring system measures pressure, temperature and humidity values in the environment and in processes.



In industrial processes, exact temperatures, humidity values and pressure relationships play a crucial role.

In a multitude of applications, testo Saveris helps to collect, safely store and present these data wirelessly (analog coupler) or via Ethernet. A selection of alarms that can be used flexibly supports the responsible parties to keep the values in the required range.

Typical applications:

- Monitoring ambient storage and production conditions
- Monitoring humidity values, e. g. in air-conditioned cabinets
- Monitoring temperatures, e. g. during heat treatment or in air-conditioned cabinets

find out more at: www.testo.com/saveris



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Please ask for our more information:

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Measuring Instruments for Pressure and Refrigeration
Multi-Function Measuring Instruments
Measuring Instruments for Flue Gas and Emissions
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