

## Differential pressure transmitter with humidity/temperature option

testo



### SPECIFICATIONS

testo 6381

The differential pressure transmitter testo 6381 was developed specially for monitoring differential pressure in the measuring range from 10 Pa to 1000 hPa. In cleanroom technology, the maintenance of positive pressure prevents the entry of contaminated air. In order to keep the cleanroom conditions constant, the transmitter additionally calculates the parameters volume flow and flow velocity from the measured differential pressure. Thanks to an optional probe from the probe series 6610, the additional recording of humidity and temperature with one instrument is also possible.

The testo 6381 is particularly outstanding thanks to the automatic zero-point adjustment which ensures high accuracy and long-term stability.

The integrated self-monitoring and early warning function also guarantees the operator high system availability.

Areas of application:

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

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### SPECIFICATIONS

testo 6381

- 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
- 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 transmitter and early warning function guarantee high system availability
- The P2A software for parameterization, adjustment and analysis saves time and costs in commissioning and maintenance
- Scalability of  $\pm 50$  percent of the measuring range final value and free scalability within the measuring range
- Configurable alarm management with adjustable response delay and alarm acknowledgement



## Differential pressure transmitter with humidity/temperature option

## Technical data

Parameters		
<b>Differential pressure</b>		
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 Temperature gain drift: 0.02% of measuring range per Kelvin deviation from nominal temperature 22 °C Zero-point: 0% (thanks to cyclic zero-point adjustment)	
Selectable units	Differential pressure in Pa, hPa, kPa, mbar, bar, mmH <sub>2</sub> O, kg/cm <sup>2</sup> , PSI, inch HG, inch H <sub>2</sub> O calculated parameters: volume flow in m <sup>3</sup> /h, l/min, Nm <sup>3</sup> /h, NI/min Flow velocity in m/s, ft/min	
Sensor	Piezoresistive sensor	
Autom. Zero-point adjustment	via magnetic valve Frequency adjustable: 15 sec, 30 sec, 1 min, 5 min, 10 min	
Overload	<b>Measuring range</b>	<b>Overload</b>
	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	20000 Pa 20000 Pa 20000 Pa 20000 Pa 200 hPa 750 hPa 750 hPa 2500 hPa 2500 hPa 20000 Pa 20000 Pa 20000 Pa 20000 Pa 200 hPa 750 hPa 750 hPa 2500 hPa 2500 hPa

\* 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, reproducibility), 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%.

Parameters						
<b>Humidity/temperature optional</b>						
Probe	testo 6611	testo 6612	testo 6613	testo 6614	testo 6615	testo 6617
Type	Wall	Channel	Channel	Duct heated	Cable trace humidity	Cable with cover electrode monitoring
Parameters	%RH / °C/°F / °C <sub>td</sub> / °F <sub>td</sub> / g/kg / gr/lb / g/m <sup>3</sup> / gr/ft <sup>3</sup> / ppmV / °Cwb / °Fwb / kJ/kg / mbar / inch H <sub>2</sub> O / °Ctm (H <sub>2</sub> O <sub>2</sub> )/°Ftm (H <sub>2</sub> O <sub>2</sub> ) / % Vol					
<b>Meas. range</b>	0 to 100 %RH					
Humidity / trace humidity					-60 to +30 °C td	0 to 100 %RH
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 +180 °C	-40 to +180 °C -40 to +356 °F
<b>Measurement uncertainty*</b>						
Humidity	testo 6611	testo 6612	testo 6613	testo 6614	testo 6615	testo 6617
	±(1.0 + 0.007 * mv) %RH for 0 to 100 %RH / ±(1.4 + 0.007 * mv) %RH for 90 to 100 %RH		±(1.0 + 0.007 * mv) %RH for 0 to 100 %RH		±(1.2 + 0.007 * mv) %RH for 0 to 90 %RH / ±(1.5 + 0.007 * mv) %RH for 90 to 100 %RH	
	for deviations from media temp. ±25 °C: ±0.02 %RH/K					
Dewpoint					±1 K at 0 °C td ±2 K at -40 °C td ±4 K at -50 °C td	
Temp. at +25°C / +77°F	±0.15 °C/ 32.2 °F Pt1000 Class AA			±0.15 °C/ 32.2 °F Pt100 Class AA	±0.15 °C/ 32.2 °F Pt1000 Class AA	

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



# Differential pressure transmitter with humidity/temperature option

## Technical data

### General technical data

<b>Model</b>	
Material	Metal housing
Dimensions	162 x 122 x 77 mm
Weight	1.96 kg; optional: Ethernet intermediary layer 0.61 kg

### Display

Display	optional: 3-line LCD with multi-language operating menu
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### Resolution

Differential pressure	Measuring range	Resolution
	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	0.1 %RH
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Temperature	0.01 °C / 0.01 °F
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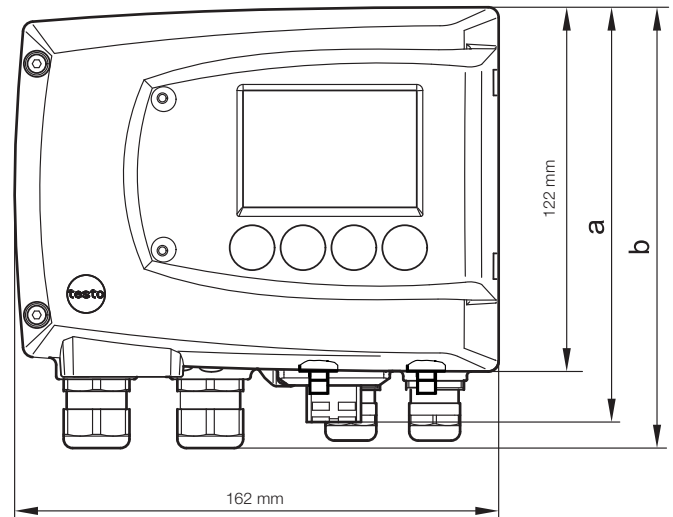
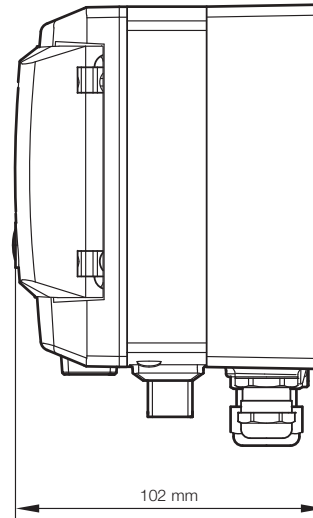
### Miscellaneous

Protection class	IP 65
EMC	EU guideline 2004/108/EC
Connection nipple	Ø 6 mm --> suitable hoses 4 mm + 4.8 mm

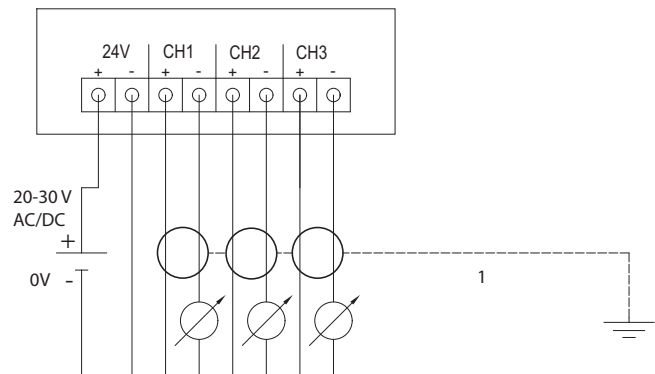
### Operating conditions

With / without display	Operation temperature	-5 to 50 °C / 23 to 122 °F
	Storage temperature	-20 to 60 °C / -4 to 140 °F
	Process temperature	-20 to +65 °C / -4 to +149 °F

## Technical drawings



## Connection plan





## Differential pressure transmitter with humidity/temperature option

The following options can be specified for the testo 6381:

<b>AXX</b>	Measuring range	<b>AXX</b>	Measuring range	<b>GXX</b>	opt. Analog output for humidity probe connection (probe series testo 6610) units (pre-set)
<b>BXX</b>	Analog display/supply	A01	0 to 10 Pa	G00	without connection possibility for humidity probe testo 6610
<b>CXX</b>	Display / menu language	A02	0 to 50 Pa	G01	% RH/Min/Max
<b>DXX</b>	Cable input	A03	0 to 100 Pa	G02	°C/Min/Max
<b>EXX</b>	Ethernet	A04	0 to 500 Pa	G03	°F/Min/Max
<b>FXX</b>	Differential pressure/flow velocity unit (pre-set)	A05	0 to 10 hPa	G04	°Ctd / min / max
<b>GXX</b>	opt. Analog output for humidity probe connection (probe series testo 6610) units (pre-set)	A07	0 to 50 hPa	G05	°Ftd / min / max
<b>HXX</b>	Relay	A08	0 to 100 hPa	G06	g/kg / min / max
<b>IXX</b>	Units channel 3 pre-set (only if opt. humidity probe connection available)	A09	0 to 500 hPa	G07	gr/lb /Min/Max
		A10	0 to 1000 hPa	G08	g/m <sup>3</sup> / min / max
		A21	-10 to 10 Pa	G09	gr/ft <sup>3</sup> / min / max
		A22	-50 to 50 Pa	G10	ppmV / min / max
		A23	-100 to 100 Pa	G11	°Cwb / min / max
		A24	-500 to 500 Pa	G12	°Fwb / min / max
		A25	-10 to 10 hPa	G13	kJ/kg / min / max (enthalpy)
		A27	-50 to 50 hPa	G14	mbar / min / max (water vapour partial pressure)
		A28	-100 to 100 hPa	G15	inch H <sub>2</sub> O / min / max (water vapour partial pressure)
		A29	-500 to 500 hPa	G16	°Ctm / min / max (mixture dewpoint for H <sub>2</sub> O <sub>2</sub> )
		A30	-1000 to 1000 hPa	G17	°Ftm / min / max (mixture dewpoint for H <sub>2</sub> O <sub>2</sub> )
				G18	% Vol
		<b>BXX</b>	Analog display/supply	<b>HXX</b>	Relay
		B02	0 to 1 V (4-wire, 24 VAC/DC)	H00	without relay
		B03	0 to 5 V (4-wire, 24 VAC/DC)	H01	4 relay outputs, limit value monitoring
		B04	0 to 10 V (4-wire, 24 VAC/DC)	H02	4 relay outputs, channel 1 limit values and collective alarm
		B05	0 to 20 mA (4-wire, 24 VAC/DC)		
		B06	4 to 20 mA (4-wire, 24 VAC/DC)	<b>IXX</b>	Units channel 3 (pre-set, only if opt. humidity probe connection available)
		<b>CXX</b>	Display / menu language	I01	% RH/Min/Max
		C00	without display	I02	°C/Min/Max
		C02	with display/English	I03	°F/Min/Max
		C03	with display/German	I04	°Ctd/Min/Max
		C04	with display/French	I05	°Ftd/Min/Max
		C05	with display/Spanish	I06	g/kg / min / max
		C06	with display/Italian	I07	gr/lb /Min/Max
		C07	with display/Japanese	I08	g/m <sup>3</sup> / min / max
		C08	with display/Swedish	I09	gr/ft <sup>3</sup> / min / max
		<b>DXX</b>	Cable input	I10	ppmV / min / max
		D01	Cable input M16 (relay: M20)	I11	°Cwb / min / max
		D02	Cable entry NPT 1/2"	I12	°Fwb / min / max
		D03	Cable contact via M-plug connection for signal and supply	I13	kJ/kg / min / max (enthalpy)
		<b>EXX</b>	Ethernet	I14	mbar / min / max (water vapour partial pressure)
		E00	without Ethernet module	I15	inch H <sub>2</sub> O / min / max (water vapour partial pressure)
		E01	with Ethernet module	I16	°Ctm / min / max (mixture dewpoint for H <sub>2</sub> O <sub>2</sub> )
		<b>FXX</b>	Differential pressure/flow velocity unit	I17	°Ftm / min / max (mixture dewpoint for H <sub>2</sub> O <sub>2</sub> )
		F01	Pa / min / max	I18	% Vol
		F02	hPa / min / max		
		F03	kPa / min / max		
		F04	mbar / min / max		
		F05	bar / min / max		
		F06	mmH <sub>2</sub> O / min / max		
		F07	mmH <sub>2</sub> O / min / max		
		F08	inch HG / min / max		
		F09	kg/cm <sup>2</sup> / min / max		
		F10	PSI / min / max		
		F11	m/s / min / max		
		F12	ft/min / min / max		
		F13	m <sup>3</sup> /h / min / max		
		F14	l/min / min / max		
		F15	Nm <sup>3</sup> /h / min / max		
		F16	NI/min / min / max		

### Example:

Order code for transmitter testo 6381 with the following options:

- Measuring range -100 to 100 Pa
- Analog output 4 to 20 mA (4-wire, 24 VAC/DC)
- Without display
- Cable contact via M-plug connection for signal and supply
- with Ethernet module
- Differential pressure mbar / min / max
- Opt. analog output for humidity probe connection testo 6610/ units g/kg / min / max
- Without relay
- Unit channel 3% RH / min / max

Scaling: 50% of measuring range final value; freely selectable within measuring range

0555 6381 A23 B06 C00 D03 E01 F04 G06 H00 I01