Material Moisture and Compressed Air Monitoring

Material moisture measurements and monitoring compressed air consumption and compressed air quality become more and more important as companies are striving towards increasing product quality and lowering production and maintenance costs.

These parameters have always been difficult to measure but with the development of new measuring technology it has become very easy and affordable to carry out these measurements. Unitemp offers a complete range of portable and stationary measuring instruments for these important parameters.

Compressed air counters – the way into the future

Lowering costs by consumer-allocation

Compressed air is the most costly energy source. If the high costs are only allocated as a “cost block”, those responsible for the systems have no motivation to try and lower costs. However, if the compressed air consumption of each system is recorded individually, the person responsible for the system is motivated to reduce leakages and to apply consumption-saving measures. Unitemp’s sensors provide optimal support here, in that they can have a built-in totaliser function.

Peak load management helps to avoid extended investments

Furthermore, expanding industrial enterprises can be costly because companies are often forced to expand their compressed air production too. A peak load analysis on the basis of compressed air counters helps to avoid such investments. Since it is known when which consumption occurs, the distribution can be specifically regulated so that the existing capacity of compressed air production is sufficient. The result is considerable savings in the compressors as well as in the pipe system.

Protecting valuable compressed air consumers from too high or too low supply

Compressed air consumers require a minimal supply in order to provide the desired performance. Some consumers additionally have to be protected from too high a supply. In some cases, the warranty of the system’s manufacturer is even dependant on this. The compressed air counters perform both tasks optimally thanks to the two switch outputs.

Pressure dew point temperature monitoring

Monitoring trace humidity and avoiding damage

Dry air, compressed air and dry gases are used in all areas of industry. Humidity is normally undesirable because it can cause damage or impair the quality of the end product. Of course, the main reason for using pressure dew point meters is to monitor and avoid excessive humidity in the system so as to avoid damage. In addition, dryer operating costs can be reduced sharply. Unitemp offers a range of stationary and portable pressure dew point meters which can measure accurately down to -80°Ctd.

Compressed Air Counters

Pipe Diameters ½ inch to 2 inch

stock code	Description
UCT-VE-0555 6441	testo 6441 Compressed air counter DN 15 (for 1/2“ pipes)
UCT-VE-0555 6442	testo 6442 Compressed air counter DN 25 (for 1“ pipes)
UCT-VE-0555 6443	testo 6443 Compressed air counter DN 40 (for 1 1/2“ pipes)
UCT-VE-0555 6444	testo 6444 Compressed air counter DN 50 (for 2“ pipes)
UCT-VE-0699 3393	Connection cable 5 m length, with M12x1 socket / open wire ends

Features:

- Totaliser function
- Two signal outputs can be parameterized
- Consumption measurement (pulse output)
- Consumption monitoring (pre-selection counter, i.e. quantity-dependent switch output, time-dependent or time-independent)
- Leakage monitoring (volume flow-dependent switch output or analog output)
- Flow-through measurement (analog output)

The testo 6440 is equipped with integrated totaliser functions (consumption quantity, e.g. in Nm3), which can be used either in the display or as pulse outputs or switch outputs. Make the comparison for yourself: other providers need additional, external evaluation units for these important functions. You can save these costly and time-consuming investments and wirings with the testo 6440.

Technical Data:

	testo 6441	**testo 6442**	**testo 6443**	**testo 6444**
Pipe diameter	DN 15 (for 1/2“ pipes)	DN 25 (for 1“ pipes)	DN 40 (for 1 1/2“ pipes)	DN 50 (for 2“ pipes)
Measuring range (1:300)	0.25 to 75 Nm3/h	0.75 to 225 Nm3/h	1.3 to 410 Nm3/h	2.3 to 700 Nm3/h
Max. display value	90 Nm3/h	270 Nm3/h	492 Nm3/h	840 Nm3/h
Measuring stretch: Thread (both sides) / Material	R 1/2, Stainless steel 1.4301	R1, Stainless steel 1.4301	R1 1/2, Stainless steel 1.4401	R2, Stainless steel 1.4401
Length measurement pipe	300 mm	475 mm	475 mm *	475 mm *
Weight	0.9 kg	1.1 kg	3.0 kg	3.8 kg
Sensor	Thermal glass-coated ceramic sensor			
Accuracy	for compressed air quality classes (ISO 8573: particles – humidity – oil) 1-4-1: ±3% of reading ±0.3% of final value for compressed air quality classes (ISO 8573: particles – humidity – oil) 3-4-4: ±6% of reading ±0.6% of final value			
Reaction time	< 0.1 sec (for damping parameter = 0), delayable via operating menu (0 s to 1 s)			
Temperature display	0 ... +60 °C, inaccuracy ±2 °C			
Display, operation	4-figure alpha-numeric display, two operation buttons, operating menu, LED (4x green for phys. units, 3x yellow for “display x 1,000 or switch status)			
Display units	Nm3/h, Nl/min, Nm3, °C (selected unit displayed by green LED)			
Electrical connection	M12x1 plug, load to 250 mA, short circuit-proof (synchronized), reverse polarity-proof, overload-proof. Testo recommends the accessory cable Part No. 0699 3393			
Voltage supply	19...30 VDC, current consumption < 100 mA			
Output signals	Via operating menu, 4 combination are parameterable			
Pulse output	Consumption counter (value available after reset or voltage loss due to non-deleting store), value 0.001...1,000,000 m3, pulse length 0.02 s ... 2 s, 24 VDC level			
Analogue output	4...20 mA (4-wire), max. load 500 Ohm, freely scalable from 0 to end of measuring range			
Switch output	2 switch outputs, parameterable, (dependent on consumption or volume flow, time-dependent/independent, opener, closer, hysteresis, window), loadable with max. 19...30 VDC or 250 mA each, switch status is displayed via 2 LEDs			
Process conditions	0...+60 °C, PN 16, rel. humidity < 90 %RH, air quality ISO 8573: recommended classes 1-4-1			
Ambient temperature	0...+60 °C			
Storage temperature	-25...+85 °C			
Media contact	Materials stainless steel 1.4301 or 1.4401 (s. above, Material), PEEK, polyester, viton, anodized aluminium, ceramics			
Housing	PBT (GF 20%), zinc diecast, IP65 / III			
EMC	In accordance with guideline 89/336 EWG			

*(shortened measurement stretches)

Compressed Air Counters

Pipe Diameters 2 inch and bigger

stock code	Description
UCT-VE-3300 0080	VA 300-080 (up to 80 Nm/s, immersion depths 220mm)
UCT-VE-3300 0120	VA 300-120 (up to 120 Nm/s, immersion depths 220mm)
UCT-VE-3300 0240	VA 300-240 (up to 240 Nm/s, immersion depths 220mm)

Features:

- Measurement independent of pressure, temperature and relative humidity
- Pressure range up to 50 bar
- Plug-in measuring station
- Current consumption display for m3/h and meter for m3
- 4 to 20 mA analogue output and pulse output for transmission
- Precise, easy installation and removal of probe under pressure
- PC-connected network of up to 32 devices via RS 485 with comfortable analysis software
- Service software for on-site parameterization and calibration
- Certified precision tested with PTB (German national metrology institute) volume flow nozzles

Accessories:

description	part no.
5 point ISO calibration certificate (including adjustment of sensor)	UCT-VA-3200 0001
special sensor modification to measure in O2 only (to be added to selected sensor!)	UCT-VA-3200 0010
stationary volume flow display, 2-line display, wallmounted, with actual volumeflow in Nm³/h and overall flow in Nm³, incl. mains for VA 300 (other units to be displayed can be ordered on request), 4..20mA and pulse / impulse.	UCT-VA-3200 0100

Technical Data:

Measured variables:	m/s, m3/h acc. to DIN 1945, ISO1217 20°C, 1000mbar
Adjustable in software	m3/h, m3/min, l/min, l/s, ft/min, cfm, m/s – Various freely selectable standard conditions – Freely-selectable diameter for volume flow calculation
Principle of meas.:	calorimetric measurement
Sensor:	2 x PT100
Meas. medium:	Air, non-combustible gases
Flow:	in m/s on request
Accuracy:	+/- 4 % m.v. +/- 3 % m.v. via 5 point ISO precision calibration
Application temp.:	-30 to 140°C probe tube -30 to 80°C housing
Operating pressure:	up to 50 bar, higher pressures on request
Analogue output:	4 to 20 mA for m3/h on request: scale for cfm, m3/min, l/min, l/s, ft/min, m/s
Pulse output:	1 pulse per Nm3, high signal 24 VDC, for 2 ms
Digital output:	SDI Standard, RS 485 optional
Power supply:	24 V DC smoothed +/-15%
Working resis.:	< 500 Ohm
Housing:	Polycarbonate
Probe tube:	Stainless steel, 1.4301
Total length	220 mm Ø 9 mm
Screw Thread:	G1/2”

Pressure Dew point Meter – down to -60°Ctd

Basic instrument (incl. plug for analogue signal output)

stock code	description
UCT-HE-0555 6741	testo 6741, G 1/2 thread, without display
UCT-HE-0555 6742	testo 6742, NPT 1/2“ thread, without display
UCT-HE-0555 6743	testo 6743, G 1/2 thread, with display
UCT-HE-0555 6744	testo 6744, NPT 1/2“ thread, with display

Ideal instrument for product dryers

Features:

- Maximum reliability
- Long-term stability, testo humidity sensor applied 100,000 times over
- Correct indication of measurement ranges and data
- Highest manufacturing quality
- Calculation of the most important trace humidity variables
- e.g. °Ctpd, °Ctd atmospheric, ppmv
- Calibration protocol
- Convenient operation
- Via the display menu without additional aids
- Without display via the internal interface and scaling adapter software
- Local 1-point calibration

Accessories:

description	part no.
Cable connection plug for analogue output 4 ... 20mA, with 2 floating switch contacts and 2 LEDs	UCT-HA-0554 3302
Measurement chamber (for 6741, 6742), up to 15bar	UCT-HA-0554 3303
Cooling coil (up to 200°C, use only with measurement chamber)	UCT-HA-0554 3304
Scaling adapter for testo 6741 / 6742 incl. software	UCT-HA-0554 3305
ISO calibration certificate, two calibration points (-10°/-40°Ctp at 6 bar)	UCT-HA-0520 0136
ISO calibration certificate, pressure dewpoint (-40°...0°Ctpd at 6 bar) Basic costs	UCT-HA-0520 0116
Per calibration point (please indicate)	UCT-HA-0520 0116

Technical Data:

Housing	
Material	Plastic, polyacrylamide
Dimensions	199.5x37x37 (with analog output plug) 203.5x37x37 (with limit signal output plug)
Ambient temperature	-20 ... 70°C
Storage temperature	-40 ... 80°C
Protection type	IP 65
Rotation of housing	By 350° (to align display)
Sensor and sensor protection	
Humidity sensor	testo humidity sensor with recorded trace humidity adjustment at -40°Ctpd
Temperature sensor	NTC
Sensor guard	Sintered stainless steel cap
Meas. uncertainty	
Humidity	+/- 1 K at 0°Ctpd +/- 3 K at -20°Ctpd +/- 4 K at -40°Ctpd
Temperature	+/- 0.5 K (0 ...50°C)
Limit signal outputs	(optional, 0554.3302)
Contacts	2 floating NO contacts, max. 30V/0.5 A
Operating points	Standard: 4°/12°CtP, with freely programmable display

Measuring range	
Pressure dewpoint	
temperature (trace humidity)	- 60 to +30 °Ctpd at pressure dewpoints < 0°Ctpd display of frost point, at > 0°Ctpd of dewpoint
Temperature	0 ... 50°C
Atmospheric dewpoint	- 80 ... - 15°Ctd (at 30 bar rel.) - 70 ... + 10°Ctd (at 3 bar rel.) - 60 ... + 30°Ctd (at 0 bar rel.)
Pressure resistance	testo 6740: Up to 50bar absolute Measurement chamber 0554.3303: Up to 15 bar absolute
Analogue output	
Signal	4 ... 20mA, two-wire
Scaling	Freely scalable via display /buttons Standard: 4 ...20mA = -60 ... +30°Ctpd
Output variables	°Ctpd, °Ftpd, °CtA (atm. dewpoint), °FtA, %RH, ppmV, mg/m3, °C, °F
Resolution	12 Bit
Accuracy	+/- 40 µA
Supply	
Voltage 24 VDC	
(10 ... 30 VDC allowed);	with alarm plug (0554 3302) 20 to 28 VDC
Max. load	10 VDC: 100 Ohm, 30 VDC: 950 Ohm
EMC	According to Directive 89 /336 EEC

Pressure Dew point Meter down to -80°Ctd

stock code	description
UCS-HH-0699.3011	FA-300-1 Basic Instrument 4 to 20mA analogue output
UCS-HH-0699.3012	FA-300-1 2 alarm contacts with alarm LED; alarm values +8°Ctd, +12°Ctd; 4 to 20mA analogue output
UCS-HH-0699.3013	FA-300-1 Display and 2 alarm contacts; alarm value +8°Ctd, +12°Ctd; 4 to 20mA analogue output
UCS-HH-0699.3021	FA-300-2 Basic instrument 4 to 20 mA analogue output
UCS-HH-0699.3022	FA-300-2 2 alarm contacts with alarm LED; alarm values -40°Ctd, -35°Ctd; 4 to 20mA analogue output
UCS-HH-0699.3023	FA-300-2 Display and 2 alarm contacts; alarm value -40°Ctd, -35°Ctd; 4 to 20mA analogue output

Ideal instrument for product dryers

Features:

- Automatic calibration
- 4 to 20 mA analogue output
- Pre-alarm/main alarm via LED
- High accuracy up to -80°Ctd
- Quick response time
- g/kg, g/m3, %RH selectable via PC
- Up to 350 bar

Technical Data:

Measuring range:	pressure dewpoint in°Ctd	Operating temperature:	-20 to +70°C
FA 300-1:	-10 to +50°Ctd ≙ 4 to 20mA	Storage temperature:	-40 to +80°C
FA 300-2:	-80 to +20°Ctd ≙ 4 to 20mA	Load for analogue output:	_500 Ohm
		Screw in thread:	G 1/2" stainless steel
Pressure range:	-1 to +50 bar standard	Material of housing:	polycarbonate
Power supply:	24 VDC (10 to 30V DC)	Sensor protection:	sintered filter 50mm stainless steel
Accuracy:	±0.5°Ctd (-10 to +50°Ctd) typical	Display:	Option switching contacts
	±2°Ctd at -40°Ctd		2 floating switching contacts
Output:	4 to 20mA in 2-wire technology		(60 V/1A max. 30W)
Protection class:	IP65	Exceeding alarm values	(pre-alarm / main alarm)
CE conformity to:	DIN EN 61326		

Portable Compressed Air Monitoring – testo 400

stock code	description
UCT-HH-0563 4001	Testo 400 - 2 channel multi-functional reference instrument, incl. Li cell.

Features:

- Memory of up to 500000 readings

The testo 400 can measure the following parameters:

- Pressure dew point
- volume flow in compressed air systems (with VA-300)
- Temperature
- CO2, rpm, current and voltage
- Humidity, pressure
- Velocity, volume flow
- data management with optional software
- printout on site with attachable printer

Accessories:

description	part no
Mains and recharging unit.	UCT-HA-0554 1084
Rechargeable battery set.	UCT-HA-0554 0196

Probes for portable pressure dew point monitoring:

Standard pressure dew point probe for measurements in compressed air systems

0... +100%RH -30... +50°C tpd
±0.9°C tpd (+0.1... +50°C tpd)
±1°C tpd (-4.9... 0°C tpd)
±2°C tpd (-9.9... -5°C tpd)
±3°C tpd (-19.9... -10°C tpd)
±4°C tpd (-30... -20°C tpd)

Part no. 0636 9840

Precision pressure dew point probe for measurements in compressed air systems incl. cert. with test point -40°C tpd

0... +100%RH -60... +50°C tpd
±0.8°C tpd (-4.9... +50°C tpd)
±1°C tpd (-9.9... -5°C tpd)
±2°C tpd (-19.9... -10°C tpd)
±3°C tpd (-29.9... -20°C tpd)
±4°C tpd (-40... -30°C tpd)

Part no. 0636 9841

Connection cable for pressure dew point probes:

	Part no.
Cable, 1.5 m long, connects probe with plug-in head to meas. instrument, PUR coating material	UCT-HP-0430 0143
Cable, 5 m long, connects probe with plug-in head to measuring instrument, PUR coating material	UCT-HP-0430 0145

Probes for compressed air counting:

VA 300-080 (up to 80Nm/s, immersion depths 220mm)	UCT-HP-3300 0080
VA 300-120 (up to 120Nm/s, immersion depths 220mm)	UCT-HP-3300 0120
VA 300-240 (up to 240Nm/s, immersion depths 220mm)	UCT-HP-3300 0240
Connection cable for testo 400 including power supply for sensor	UCT-HP-testo-cable

Technical Data: on request

Material Moisture – testo 635

stock code	description
UCT-HH-0560 6351	testo 635-1, humidity/temperature measuring instrument,
	with battery and calibration protocol
UCT-HH-0563 6352	testo 635-2, humidity/temperature measuring instrument with
	readings memory, PC software and USB data transmission
	cable, with battery and calibration protocol

add probes below to complete the set

Features:

Common advantages testo 635-1/-2:

Connection of 3 wireless probes; Measurement of air humidity, equilibrium humidity and pressure dewpoint in compressed air systems; Display of dewpoint distance, min., max. and mean values Backlit display cyclical printing of readings once a minute, for example.

Additional advantages testo 635-2

Instrument memory for up to 10,000 readings; PC software for analysis, filing and documentation of measurement data; Direct display of material moisture due to freely settable characteristics curves (based on equilibrium humidity), Storage of single measurements or measurement series by measurement location Fast access to the most important functions via user profiles

Probes:

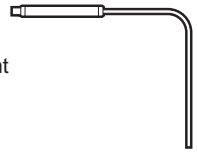
probes
Humidity/temperature probe

-20 to +70°C ±0.3°C
0 to +100%RH ±2%RH (+2 to +98%RH)
Part no. UCT-HP-0636 9735

Robust humidity probe for measurements up to +140°C, Ø 12 mm, in e.g. exhaust ducts and for measuring equilibrium moisture in e.g. bulk material

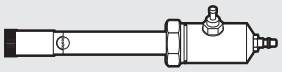
0 to +100%RH ±2%RH (+2 to +98%RH)
-20 to +125°C ±0.2°C (-10 to +50°C)
±0.5°C (remaining range)
Part no. UCT-HP-0636 2161

Thin humidity probe with built-in electronics, incl. 4 attachable Teflon protection caps for material equilibrium humidity measurement



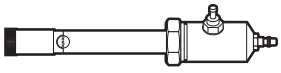
0 to +100% ±2%RH (+2 to +98%RH)
-20 to +70°C ±0.2°C (-10 to +50°C)
±0.5°C (remaining range)
Part no. UCT-HP-0636 2135

Pressure dewpoint probe for measurements in compressed air systems



-30 to +50 °C tpd 0 to +100 %RH
±0.9 °C tpd (+0.1 to +50 °C tpd)
±1 °C tpd (-4.9 to 0 °C tpd)
±2 °C tpd (-9.9 to -5 °C tpd)
±3 °C tpd (-19.9 to -10 °C tpd)
±4 °C tpd (-30 to -20 °C tpd)
Part no. UCT-HP-0636 9835

Precision pressure dewpoint probe for measurements 300 mm in compressed air systems, including certificate with test point at -40°C tpd



-60 to +50°C tpd
0 to +100%RH
±0.8°C tpd (-4.9 to +50°C tpd)
±1°C tpd (-9.9 to -5°C tpd)
±2°C tpd (-19.9 to -10°C tpd)
±3°C tpd (-29.9 to -20°C tpd)
±4°C tpd (-40 to -30°C tpd)
Part no. UCT-HP-0636 9836

Wireless probes
Radio module for upgrading measuring instrument with radio option. Radio module for measuring instrument, 869.85 MHz, approved for South Africa by ICASA

Part no. UCT-HP-0554 0188

Radio handle for temperature and humidity probe heads
Radio handle for plug-in probe heads, incl. T/C adapter, 869.85 MHz FSK, approved for South Africa by ICASA
Part no. UCT-HP-0554 0189

Probe Heads
Probe head for surface temperature measurement, attachable to radio handle, T/C Type K
Part no. UCT-HP-0602 0394

Humidity probe head, attachable to radio handle
Part no. UCT-HP-0636 9736

Technical Data:

Measuring Range:	
Type K (NiCr-Ni)	-200 to +1370°C
NTC (Humidity probe)	-40 to +150°C
Testo humid. sensor, cap.	0 to +100%RH
Absolute pressure probe	0 to 2000hPa

Accuracy:	
Type K (NiCr-Ni)	0.3°C
NTC (Humidity probe)	0.2°C

Oper. temp.	-20 to +50°C
Storage temp.	-30 to +70°C
Battery life	200h
Dimensions	220 x 74 x 46mm

Battery type	Alkali manganese, mignon, Type AA
Weight	428g
Material/Housing	ABS/TPE/Metal