



testo 950  
testo 650  
testo 400

## Portable Reference Technology

The Intelligent, Modular Measuring Instrument Series



°F

% RH

td

g/kg

PSI

fpm

cfm

ppm

CO

ppm

CO<sub>2</sub>

U/min

mA

mV

# Portable Reference Measurements

## Probes



Precision reference class instruments have everything necessary to complete complicated measurement tasks efficiently, accurately and conveniently.

All of the Pro Class instruments measure the basic parameters of temperature, CO<sub>2</sub>, rpm, current and voltage. When used together with the new high accuracy probe 0614 0240, testo 950 has a system accuracy of 0.09°F at a resolution of up to 0.0001°F (measuring range 32 to 200°F). The testo 650 additionally measures humidity and pressure and the testo 400 adds velocity and volume flow to its capabilities. Both the testo 950 and testo 650 can be upgraded at any time.

Testo's Professional Class instruments stay current with intelligent electronics to ensure the latest technology is utilized through software updates.

Upgradable, highly reliable and of the highest quality - these are the properties which guarantee you are equipped for the future.

### Sophisticated but not complex

The Pro Class instruments recognize the respective probe connected and show the next possible steps in the display to ensure that the measuring tasks can be carried out quickly, easily and efficiently.

The drop down menus provide effortless operation.

Three fast function buttons, defined by the user, make it possible to quickly call up the most commonly used measurements or calculations at the touch of a button.

The large display can show up to 6 readings simultaneously.

Press one button to save data to memory or to print on location.

### Powerful data processing

Measurements are easily organized by creating files and folders either in the meter or your PC.

Numerous display, format and analysis options, like calculations, tables, diagrams, histograms, and other forms are available in your PC and facilitated by the ComSoft 3 Software.

### Ideal for long-term or snapshot readings

All relevant parameters such as the beginning and end of a measurement, measurement intervals, limit exceeded and date/time can be programmed for long-term measurement.

Online measurement to a PC is also possible.

Spot checks with immediate printouts of the file and program, including the user's company logo, address and other notes can be printed as well.

### Quick and informative

Using the Ventilation Air Conditioning (VAC) module, assessment of the required functionality of a system in accordance with ASHRAE immediately on location without the need for extensive additional calculations. (testo 400)

Other important parameters from the psychrometric chart are saved for calculations. (testo 400/650)

All of the Proc Class meters easily calculate and display minimum, maximum and mean values, such as, dewpoint, wet bulb, and absolute humidity (testo400/650).



Attachable printer (optional)

Fast function buttons

Saves/  
Prints

Data communication  
via RS232 and barcode  
pen input

Back lit display

Power supply  
connection/  
Fast battery  
recharging

2 freely assignable  
probe inputs

## - the right probe for all applications

Highly accurate immersion/penetration probe with a system accuracy of 0.05°C in the measurement range from 0 to 100°C and a resolution of up to 0.001°C

Quick-action surface probe  
to measure surface temperature

Precision air probe  
to measure air temperature

Quick-action immersion/penetration probes  
to measure liquids and food

Globe thermometer  
to measure radiation heat

Current/voltage cable ( $\pm 1$  V,  $\pm 10$  V, 20 mA)  
for example, to check stationary transmitters

CO<sub>2</sub> probe  
to determine ambient air quality

Highly accurate reference humidity/temperature probes  
For highest accuracy ( $\pm 1\%$  RH)

Quick-action surface probe  
to measure surface temperature

Precision air probe  
to measure air temperature

Equilibrium probe to determine equilibrium moisture

Differential and absolute pressure probes  
for pressure and velocity measurements

Refrigerant-proof high pressure probes  
for maintenance on refrigeration systems/water measurement

Pitot tubes to measure velocity in dirty, hi-temp, or high velocity  
application conditions

Smaller diameter vane probes  
For measurements in ducts, with temperature measurement

Large diameter vane probes  
For integrating measurements on outlets

Quick-action hot wire probes  
For low velocities in supplies

Rugged hot bulb probe  
For direction-independent velocity measurements

Comfort level probe  
For turbulence level measurements to ASHRAE 2

### Temperature measurements

- "Smart" probes with built-in EPROMS store calibration data in the probe
- Patented crossband probe for fast surface measurements
- Custom-designed temperature probes for your application
- System accuracy of testo 950 is up to 0.05°C with precision probe 0614 0240

### Current and voltage measurements

- Optional connection of external transmitters, such as particle counters and pressure transmitters and scaling of input in instrument

### CO and CO<sub>2</sub> measurements

- Long-term stable, 2 channel / IR sensor for CO<sub>2</sub> measurements

### Humidity measurements

- The first PTB accredited DKD laboratory for air moisture and dew point temperature guarantees reliable readings
- Worldwide patented (capacitive) Testo humidity sensor
- Inter-laboratory tests in national and international institutes confirm a sensor accuracy of  $\pm 1\%$  RH
- 2 year guaranteed long-term stability of the Testo humidity sensor ( $< 1\%$  / year)
- Easy calibration

### Pressure measurements

- Very high accuracy in lower measuring range (.01 psi) from +/- (4.3 psi + 0.5 % of reading)
- Temperature-compensated pressure measurement

### Velocity measurements

- Efficient readings by one of the first PTB accredited laboratories for velocity
- Reference laser Doppler anemometer guarantees calibration accuracy from 0.5 % of reading
- Thermal probes for high accuracy up to +/- (6 fpm + 5% of reading) in measuring range up to 4000 fpm
- Density independent measurement from 200 "H<sub>2</sub>O absolute pressure or up to 660 °F ambient temperature with vanes in measuring range from 80 fpm to 1200 fpm

### Comfort level measurements

- High accuracy to determine degree of turbulence from  $\pm$  (6 fpm + 4% of reading)

**testo 950 - Reference temperature meter / logger**

**The testo 950 measures:**

- Temperature
- CO<sub>2</sub>, rpm, current and voltage

**Functions:**

- System accuracy up to 0.09°F and up to a resolution of 0.001°F with the new high precision probe 0614 0240
- Stores a surface addition for EEPROM probes
- The system for each probe can be adjusted to "zero error" at an adjustment point via precision adjustment, i.e. system adjustment in a highly accurate adjustment bath to "zero error".
- Adjustment of a quick-action EEPROM temperature probe to a highly accurate precision probe ensuring fast and highly accurate measurement.
- Fast temperature measurement with extrapolation to full-scale value



Example of probe

testo 950	
● Temperature	
● CO <sub>2</sub> , rpm and current/voltage	
testo 950 without probes	
Part no.	0563 9501

**testo 650 - Reference humidity / pressure meter / logger**

**testo 650 also measures:**

- Temperature
- CO<sub>2</sub>, rpm, current and voltage
- Humidity, Pressure

**Functions:**

- All functions of testo 950 and
- Calculation of all parameters in the Mollier (psychrometric) chart:
- Relative humidity %RH, dew point and pressure dew point (td, tpd)
- Absolute humidity g/m<sup>3</sup>, psychrometric wet bulb temperature
- Degree of humidity (g/kg), partial pressure in water vapor in "H<sub>2</sub>O/psi
- Enthalpy (kcal/kg)
- Water activity measurements
- Barometric air pressure



Example of probe

testo 650	
● Humidity, pressure	
● Temperature	
● CO <sub>2</sub> , rpm and current/voltage	
Part no.	0563 6501

**testo 400 - The multi-function meter / logger**

**The testo 400 also measures:**

- Temperature
- CO<sub>2</sub>, rpm, current and voltage
- Humidity, pressure
- Velocity, volume flow

**Functions:**

- All functions of testo 650 and testo 950 and
- Input of duct cross-sections for volume flow calculations
- Absolute pressure compensation in thermal probes
- Density calculation for velocity measurement with reference to temperature, humidity and absolute pressure
- Assessment of volume flow measurements with calculation of total inaccuracy of measurement in accordance with ASHRAE



Example of probes

testo 400	
● Velocity, volume flow	
● Humidity, pressure	
● Temperature	
● CO <sub>2</sub> , rpm and current/voltage	
Part no.	0563 4001



## . . . guarantee quality

### testo 950



### Proof of temperature



Guaranteeing quality usually involves maintaining a certain temperature. This ranges in the food industry from frozen food temperatures to component temperatures in the electronics industry. Easy documentation and filing of this measurement data is possible with testo 950.

### testo 650



Highly accurate and efficient measurement of humidity and temperature is required in many industrial processes to guarantee continuous quality. Testo 650 calculates many moisture measurements like dewpoint and absolute humidity

### testo 400

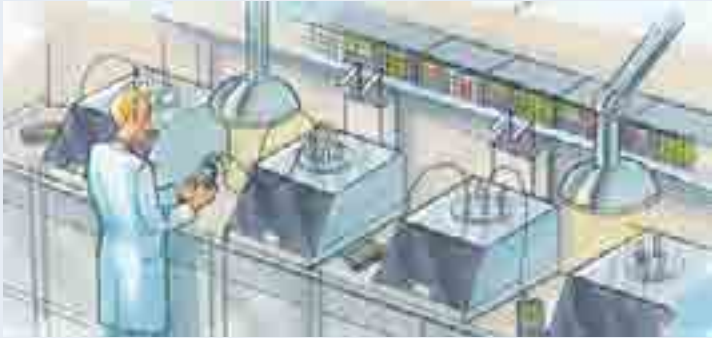


Sensitive products require the right air conditions during production and storage. The testo 400 includes all the functions needed to analyse air with reference to temperature, humidity and air flow.

# for reference measurements

## . . . sets standards

### Precision temperatures



testo 950 has a system accuracy of 0.09°F in the measurement range from 32 to 200°F and a resolution of up to 0.001°F when used together with precision probe 0614 0240. This high accuracy level makes testo 950 ideal as a working standard.

### Reference humidity



testo 650 is setting new standards in accuracy and long-term stability with its worldwide inter-laboratory tests carried out in leading international institutes enabling accurate monitoring of air humidity fluctuations of  $\pm 1\%$  RH.

### Comfort level



testo 400 offers standard assessment of temperature, humidity, velocity and CO<sub>2</sub> for employees, employers and companies such as HVAC and mechanical contractors.

## . . . documents processes

### Production



Products and systems are subjected to different temperatures during a production process. testo 950 has extensive monitoring options, for example, a measurement program is started when a temperature value is exceeded.

### Compressed air unit



Extensive economic damage, depending on the application, could be caused by uncontrolled moisture ingress. It is possible to measure and document readings over a long period of time using the testo 650.

### Air conditioning systems



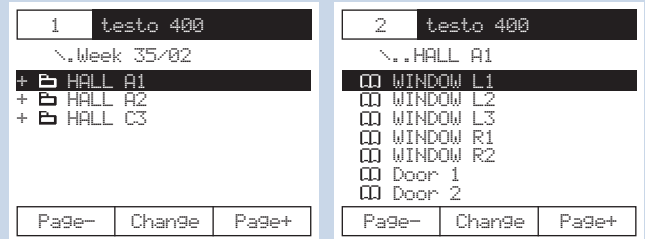
If the volume flow is too low in HVAC systems, there will be insufficient fresh air. If the volume flow is too high, this will cause inefficient operation. The testo 400 easily calculates the CFM's of ventilation systems.



## Organize - Measure - Printout on-site

### Organizing Data:

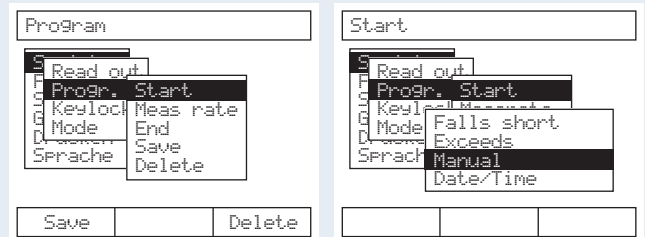
- Save readings at each location
- The "tree structure" (files, sub-files and measurement programs) guarantees clear viewing
- Additional information, such as user notes or required value inputs, can be saved with the location/file.
- Use of the optional bar code pen accesses locations with incredible speed and accuracy.
- Measuring assignments can be uploaded for effective time use and planning



### Long-term Recordings

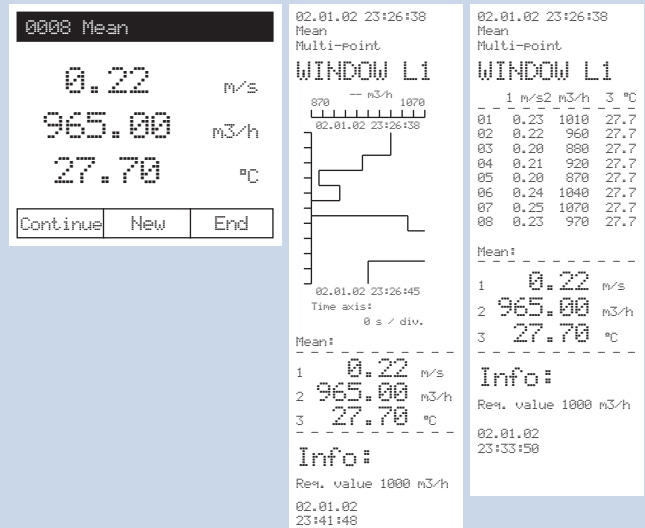
#### User-friendly data logging

- The beginning of the measurement can be...
  - determined manually each time.
  - activated if a user defined limit value is exceeded.
  - set according to date/time.
- The measurement is completed when...
  - the predefined number of readings is reached.
  - date/time is reached.
  - the memory is full.
  - input manually.
- Non-stop wrap-around memory...
  - deletes the oldest respective value.
  - can be de-activated manually.



### Documentation on-site:

- The individual programs can be either saved or deleted following analysis.
- The printer immediately provides documentation.
- The attachable comfort printer also offers graphical analysis options.
- Thermal paper printouts are legible for up to 10 years





# Measurements with ComSoft 3 software:

## Preparation - Analysis - Filing - Documentation

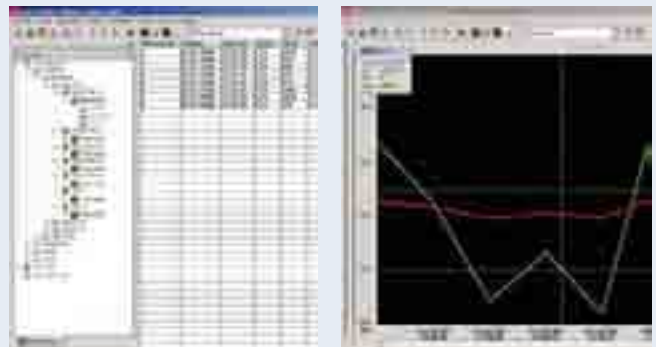
### Easy reading management:

- Preparation of the measurement:
  - The measurement program is determined and loaded into instrument
  - Measuring assignments can be drawn up based on locations and loaded into instrument.
- The instrument is downloaded once measuring is complete:
  - The saved files are conveniently stored via the software using "Drag & Drop" or are analyzed in Data.
- Monitor readings on-line via RS232 connections and ComSoft 3 Software



### Comprehensive analysis, easy filing:

- Analysis:
  - with calculation functions
  - with crosshairs
  - with mean calculation
  - with calculation of standard deviation
  - taking all conventional refrigerants into consideration (refrigerant, optional)
- Display:
  - as table or as graph
  - as digit field or as histogram
  - with analog display
  - Measurement channels can be activated or deactivated at the touch of a button
- Documenting:
  - Data is easily transferred to Excel using "Copy and Paste".



### Individual configuration options:

- Your company logo can be included on the printouts.
- Functions can be selected from the function list and the finished profile can be saved.
- The online interface is available for LabVIEW software.
- Menus can be individually tailored to your needs.





## Ordering Information



**testo 950**, Pro-Class reference thermometer  
**testo 650**, Reference humidity meter/logger  
**testo 400**, Pro-Class multifunction meter



**Barcode pen** to read in measurement locations  
 Part no. 0554 0460



**ComSoft 3** Software for data management and analysis  
 Part no. 0554 0830  
 NEW testo 575 fast printer, incl. 1 roll of thermal paper and batteries  
 Part no. 0554 1775



**Pro Class SoftCase** with carrier strap, magnetic holder and probe holder  
 Part no. 0516 0401  
**SoftCase** for attachable printer  
 Part no. 0516 0411



**Attachable printer** with 1 roll of thermal paper and batteries. Quickly prints readings on location.  
 Part no. 0554 0570



**IR printer** with 1 roll of thermal paper and 4 AA size batteries. Prints readings on location.  
 Part no. 0554 0545



**testovent 410**, volume flow funnel, dia.: 13", 13" x 13" incl. case (for inlets only)  
 Part no. 0554 0410  
**testovent 415**, volume flow funnel, dia.: 8", 7.5" x 7.5", incl. case (for inlets only)  
 Part no. 0554 0415



**Pro Class System case (plastic)**  
 Part no. 0516 0400  
**Pro Class System case (aluminium)**  
 Part no. 0516 0410

Pro Class Meters	Part no.
<b>testo 950, Pro Class Reference thermometer</b> , with battery, Li cell and calibration certificate 2 channel instrument (thermocouple, RTD, NTC) with option of connecting CO, CO <sub>2</sub> , rpm and mV/mA transmitter	0563 9501
<b>testo 650, Pro Class Meter/Logger</b> with battery, Li cell and calibration certificate 2 channel humidity and temperature meas. instrument with aw value measurement, pressure measurement with option of connecting pressure probes, CO, CO <sub>2</sub> , rpm, mV/mA transmitters	0563 6501
<b>testo 400, Pro Class Multifunction Meter/Logger</b> , incl. battery, Li cell and calibration certificate 2 channel multi-function measuring instrument	0563 4001

Accessories	Part no.
Memory upgrade to 500,000 readings...(via service)	0554 9481
Rechargeable battery set for quick recharging in instrument	0554 0196
Power Supply 230 V, for instrument (European plug)	0554 1084
Car charging adapter	0554 0424
Spare Li cell to save RAM data during battery changes or recharging	0515 0028

Printer	Part no.
Attachable printer, with 1 roll of thermal paper and batteries	0554 0570
Testo printer with 1 roll of thermal paper and 4 AA size batteries	0554 0545
NEW testo 575 fast printer, incl. 1 roll of thermal paper and batteries.	0554 1775
Infrared thermal line printer with graphics function	0554 0110
Recharger for printer (with 4 standard rech. batt.)	
Spare thermal paper for printer (6 rolls)	0554 0569
Enhanced thermal paper for printer (6 rolls) <i>Printouts legible for up to 10 years</i>	0554 0568
Label thermal paper (Testo patent) for testo 575 printer (6 rolls), can be applied directly	0554 0561

Softcase for instrument and printer	Part no.
Instrument SoftCase with carrier strap, magnetic holder and probe holder	0516 0401
Printer SoftCase for attachable printer	0516 0411

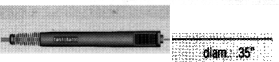













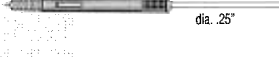




Barcode and accessories	Part no.
Barcode pen to read in measurement locations	0554 0460
Barcode labels, self-adhesive (1200 pcs.)	0554 0411
Adhesive pockets (50 pcs.) for printout, paper barcode labels...	0554 0116

Software and accessories	Part no.
ComSoft 3 for data management Incl. data base, analysis and graphics function, data analysis, trend curve	0554 0830
RS232 cable Connects instrument to PC (4 ft.) for data transfer	0409 0178
NEW Ethernet adapter, RS 232 - Ethernet incl. software driver, mains unit Facilitates data communication in network	0554 1711
Electrical isolation for RS232 (connects measuring instrument to PC)	0554 0006

VAC module for testo 400 only	Part no.
Memory upgrade to 500,000 readings. Upgrades memory capacity (via service)	0554 9481
VAC module upgrade. Volume flow calculation in ducts with error calculation function in instrument	0450 4010
VAC module upgrade, PC software, (for ComSoft 3 software)	0554 4030
Printout of standard measurement files	

Refrigeration module for testo 650, testo 400 only	Part no.
"Refrigeration technology" update with saved curves of all typical refrigerants	0554 4035

Pro Class System Cases	Part no.
Plastic case for transport and storage of instrument and probes	0516 0300
Plastic System Case for transport and storage of instrument, probes and accessories	0516 0400
Aluminum System Case for instrument, probes and accessories	0516 0410

Air probes	Illustration	Meas. range	Accuracy	Sec.	Conn.	Part no.
<b>NTC probes</b>						
Highly accurate air probe for air and gas temperature measurements with bare, mechanically protected sensor	 diam.: .35"	-40... +260 °F	To UNI curve	60 s	Fixed cable	0610 9714
<b>RTD probes</b>						
Standard air probe	 6" diam.: .1" diam.: .35"	-330... +1100 °F	Class A	75 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 9773
Precision air probe	 6" diam.: .35"	-100... +750 °F	1/10 Class B (0 to 100°C); 1/5 Class B (rem. range) to EN 60751	75 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0628 0017
<b>Type K t/c probes</b>						
Fast action immersion/penetration probe for measurements in gases and liquids with a low-mass tip	 78" diam.: .1"	-330... +1100 °F	Class 1	1 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 9794 0614 9794
Thermocouple, made of fibre-glass insulated thermal pipes, pack of 5 Insulation: twin conductor, flat, oval, opposed and covered with fibre-glass, both conductors are wrapped together with fibre-glass and soaked with lacquer, please order adapter 0600 1693	 78" diam.: .1"	-330... +750 °F	Class 1	5 s	Please order adapter 0600 1693	0644 1109
Adapter to connect Type K thermocouples and probes with open wire ends					Fixed cable	0600 1693
<b>Surface probes</b>						
<b>NiCr-Ni probes</b>						
Quick-action surface probe with sprung thermocouple strip, measuring range short-term to +900°F	 dia. .39"	-330... +570 °F	Class 2	3 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 0194 0614 0194
Fast action surface probe, probe tip at 90° angle, with sprung thermocouple strip	 dia. .39"	-330... +570 °F	Class 2	3 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 0994
Rugged surface probe	 dia. .16" dia. .16"	-330... +1100 °F	Class 1	25 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 9993 0614 9993
Rugged surface probe, (90° angle)	 dia. .16" dia. .16"	-330... +1100 °F	Class 1	25 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 9893 0614 9893
Rugged surface probe with sprung thermocouple strip for temperatures up to +1300°F	 dia. .6"	-330... +12900 °F	Class 2	3 s	Fixed cable, coiled	0600 0394
Roller surface probe for measurements on moving items speed range: 59 - 1312"/min	 dia. 1.30"	-60... +470 °F	Class 2		Fixed cable, coiled	0600 5093
Magnetic probe, adhesive force approx. 4 lbs., for measurements on metal surfaces	 dia. .8"	-60... +340 °F	Class 2		Fixed cable	0600 4793
Magnetic probe, adhesive force approx. 2 lbs., for higher temperatures, on metal surfaces	 dia. .8"	-60... +750 °F	Class 2		Fixed cable	0600 4893
Miniature surface probe for measurements on electronic components, small motors...	 dia. .25"	-330... +750 °F	Class 2	3 s	Fixed cable	0600 1494
Adhesive thermocouple, pack of 2, carrier material: aluminum foil Is fixed at the measuring point using conventional adhesives or silicone heat paste 0554 0004	 Diameter extension 2 x Ø 01"	-330... +400 °F	Class 1		Please order adapter 0600 1693	0644 1607
Adapter to connect Type K thermocouples and probes with open wire ends					Fixed cable	0600 1693
<b>RTD probes</b>						
Rugged surface probe	 dia. .16" dia. .35"	-60... +750 °F	Class B	40 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 9973 0628 0018
<b>Infrared probes</b>						
Infrared surface probe for fast non-contact temperature measurement on live, inaccessible and rotating parts		-0.4... +500 °F	±2% of rdg. (+150... +500 °F) ±2 °F (-0.4... +150 °F)	2 s	Fixed cable coiled	0600 0750
<b>Accessories</b>						
Silicone heat paste (5 oz.), Tmax = +500°F Improves heat transfer in surface probes						0554 0004

\*with EEPROM:


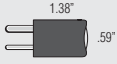
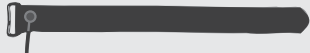





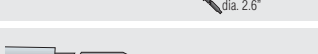
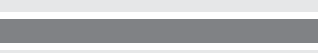



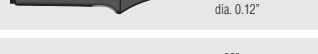
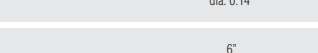

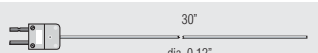
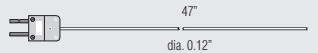
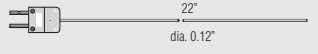

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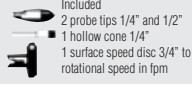


easur

range saved in probe; 195 extrapolat

irface

measuring

Pipe wrap probes	Illustration	Meas. range	Accuracy	Sec	Conn.	Part no.
<b>NTC probes</b>						
Pipe wrap probe for pipes with diameter of up to 2", for flow/return temperature measurement in hydronic systems		-80... +270 °F	Class 2	5 s	Fixed cable	0600 4593
Spare meas. head for pipe wrap probe		-80... +270 °F	Class 2	5 s		0602 0092
<b>Pt100 probes</b>						
Velcro probe for pipes with diameter of max. 4"		-60... +300 °F	Class B	40 s	Fixed cable	0628 0019
<b>Immers./penetr. probes</b>						
<b>type k t/c probes</b>						
Fast response immersion/penetration probe		-330... +750 °F	Class 1	3 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 0293 0614 0293
Fast quick-action immersion/penetration probe for liquids		-330... +750 °F	Class 1	1 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 0493 0614 0493
Fast quick-action immersion/penetration probe for high temperatures		-330... +2000 °F	Class 1	1 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 0593 0614 0593
Fast quick-action immersion/penetration probe for measurements in gases and liquids with a low-mass tip		-330... +1100 °F	Class 1	1 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 9794 0614 9794
Stainless steel immersion/penetration probe, waterproof and heat proof, (ideal for food industry)		-330... +750 °F	Class 1	3 s	Fixed cable	0600 2593
Smelting probe for measurements in non-ferrous melting baths, with exchangeable measuring tips		-330... +2300 °F	Class 1	60 s	Fixed cable	0600 5993
Spare measuring tip for smelting probe		-330... +2300 °F	Class 1	60 s		0363 1712
<b>RTD probes</b>						
Standard immersion/penetration probe		-330... +750 °F	Class A	20 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 0273
Standard immersion/penetration probe		-330... +1100 °F	Class A	20 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0604 0274
NEW Highly accurate immersion/penetration probe incl. certificate		-150... +750 °F	$\pm 0.05^{\circ}\text{C}$ ( $\pm 0.01... \pm 100^{\circ}\text{C}$ ) $\pm (0.05^{\circ}\text{C} \pm 0.05\%$ of mv) $(-40... 0^{\circ}\text{C}) \pm 0.05^{\circ}\text{C}$ $\pm 0.05\%$ of mv) $(\pm 100.01... -300^{\circ}\text{C})$	30 s	Plug-in head, connection cable 0410 0143 or 0430 0145 required	0614 0240
Highly accurate immersion/penetration probe		-150... +750 °F	1/10 Class B (0 to 212°F) 1/5 Class B (rem. range) to EN 60751	30 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0628 0015
Flexible precision immersion probe, cable heat-proof up to +500°F		-150... +500 °F	1/10 Class B (0 to 212°F) 1/5 Class B (rem. range) to EN 60751	80 s	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0628 0016
Robust immersion/penetration probe with sharpened measuring tip, waterproof and oven-proof		-330... +750 °F	Class A	30 s	Fixed cable	0604 2573
<b>Plug-in measuring tips</b>						
Plug-in measuring tip, 30" long, flexible, for high temperatures, outer casing: stainless steel 1.4541		-330... +1650 °F	Class 1	4 s	Please order handle with Part no. 0600 5593	0600 5393
Plug-in measuring tip, 47" long, flexible, for high temperatures, outer casing: stainless steel 1.4541		-330... +1650 °F	Class 1	4 s	Please order handle with Part no. 0600 5593	0600 5493
Plug-in measuring tip, 22" long, flexible, for high temperatures, outer casing: Inconel 2.4816		-330... +2000 °F	Class 1	4 s	Please order handle with Part no. 0600 5593	0600 5793
Plug-in measuring tip, 40" long, flexible, for high temperatures, outer casing: Inconel 2.4816		-330... +2000 °F	Class 1	4 s	Please order handle with Part no. 0600 5593	0600 5893
Handle for plug-in measuring tip						0600 5593

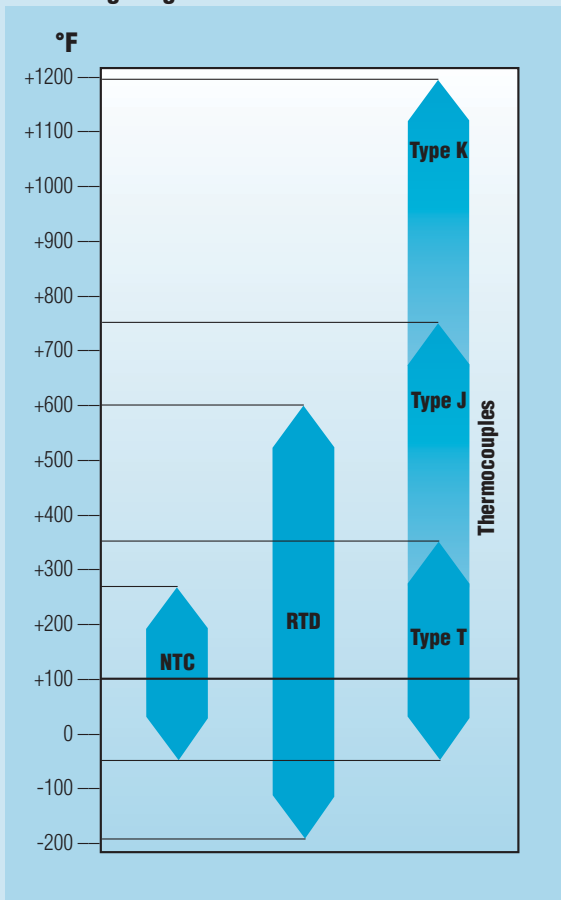
Other temperature probes	Illustration	Meas. range	Accuracy	Conn.	Part no.
Globe thermometer to measure radiant heat	 dia.: 6"	32... +250 °F	±0.9 °F (32... +122 °F) ±1.8 °F (+122... +250 °F)	Fixed cable	0554 0670
<b>More probes</b>					
CO probe to measure CO level in ambient air	 7.5" dia.: 98"	0... +500 ppm CO	±5% of mv (+100.1... +500 ppm CO) ±5 ppm CO (0... +100 ppm CO)	Fixed cable	0632 1247
CO2 probe measures indoor air quality and monitors the workplace. With plug-in head, connection cable 0430 0143 or 0430 0145 required		0... +1 Vol. % CO2 0... +10000 ppm CO2	±(50 ppm CO2 ±2% of mv) (0... +5000 ppm CO2) ±(100 ppm CO2 ±3% of mv) (+5001... +10000 ppm CO2)	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0632 1240
Mechanical rpm probe with plug-in head		+20... +20000 rpm	± 1 digit	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0640 0340
Included 2 probe tips 1/4" and 1/2" 1 hollow cone 1/4" 1 surface speed disc 3/4" to measure rotational speed: rpm = rotational speed in fpm					
Current/voltage cable (±1 V, ±10 V, 20 mA)		0... +1000 mV 0... +10 V 0... +20 mA	±1 mV (0... +1000 mV) ±0.01 V (0... +10 V) ±0.04 mA (0... +20 mA)		0554 0007
<b>NEW</b> 4 to 20 mA-interface for the connection of and intermittent supply to transmitters (scalin via hand-held instrument), in robust metal housing with impact protection, incl. magnet for fast attachment		0/4 to 20 mA	±0.04 mA	Plug-in head connection cable 0430 0143 or 0430 0145 required	0554 0528

Accessories for temperature probes	Part no.
Cable, 5 ft. long, connects probe with plug-in head to meas. instrument PUR coating material	0430 0143
Cable, 16 ft. long, connects probe with plug-in head to measuring instrument PUR coating material	0430 0145
Extension cable, 16 ft. long, between plug-in head cable and instrument PUR coating material	0409 0063

Accessories for temperature probes	Part no.
Telescopic handle, max. 3 ft., for probe with plug-in head Cable: 8 ft. long, PUR coating material	0430 0144
Glass pipe for immersion/penetration probe to protect from corrosive agents For probes with Part nos. 0604 0273 and 0628 0015	0554 7072

## Selecting the right temperature sensor

### Measuring range



### Accuracy

Select the sensor with the accuracy required for your application from the diagram or table.


























Sensor	Temp. range	Class	Maximum tolerances	
			Fixed value	Referred to temperature
<b>Thermocouple</b>	-40...+2000 °F	2	±4.5 °F	±0,0075 x Itl
Type K	-40...+1830 °F	1	±2.7 °F	±0,004 x Itl
Type T	-40...+660 °F	1	±0.9 °F	±0,001 x Itl
Type J	-40...+1400 °F	1	±2.7 °F	±0,004 x Itl
<b>Pt100</b>	-100...+400 °F	B	± (0,3 + 0,005 • Itl)	
	-330...+1112 °F	A	± (0,15 + 0,002 • Itl)	
<b>NTC (Standard)</b>	-60...-13 °F	-	±0.7 °F	
	-4...+165 °F		±0.4 °F	
	+165...+300 °F		±0.5 % of reading	
<b>NTC (High temp.)</b>	-13...-4 °F	-	±1.8 °F	
	-4...32 °F		±1 °F	
	+32...+165 °F		±0.9 °F	
	+170...+525 °F	- °F	±0.9 °F ±0.5 % of reading	

Itl=Measuring temperature

Data for thermocouples to EN 60584-1 (formerly IEC 584-1). Two values are given. One fixed value in °F and a formula. The larger value always applies. Data for Pt100 to EN 60751 (formerly IEC 751). There is no standardization for NTC sensors.

In the case thermocouples, Accuracy Class 1 applies to the measurement range -40 to 1832 °F. In the range -330 to -40 °F Class 3 applies corresponding to ± 4.5 °F or 0,015 • Itl.



Probes	Illustration	Meas. range	Accuracy	Sec. Conn.	Part no.	
<b>Air probes</b>						
Standard indoor air quality probe up to +160°F		0... +100 %RH -4... +160 °F	±2 %RH (+2... +98 %RH) ±0.7 °F (-14... +122 °F) ±0.9 °F (-4... 14 °F) ±0.9 °F (+122... +160 °F)	12 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0636 9740	
Duct humidity/temperature probe can be connected to telescopic handle <small>Telescopic handle (H) J 9715, see Ordering data for Accessories</small>		0... +100 %RH -4... +160 °F	±2 %RH (+2... +98 %RH) ±0.7 °F (-14... +122 °F) ±0.9 °F (-4... 14 °F) ±0.9 °F (+122... +160 °F)	12 s Fixed cable		
Thin humidity probe incl. 4 attachable protection caps for ambient air measurements, measuring as robust as duct and equilibrium moisture measurements		0... +100 %RH -4... +160 °F	±2 %RH (+2... +98 %RH) ±0.7 °F (-14... +122 °F) ±0.9 °F (-4... 14 °F) ±0.9 °F (+122... +160 °F)	15 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0636 2130	
Highly accurate reference humidity/temp. probe Calibration certificate included		0... +100 %RH -4... +160 °F	±1 %RH (+10... +90 %RH)* ±2 %RH (0... +9.9 %RH) ±2 %RH (+90.1... +100 %RH) ±0.7 °F (-14... +122 °F) ±0.9 °F (-4... 14 °F) ±0.9 °F (+122... +160 °F)	12 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0636 974	
Humidity/temperature probe		0... +100 %RH -4... +160 °F	±2 %RH (+2... +98 %RH) ±0.7 °F (+32... +122 °F) ±0.9 °F (-20... 32 °F) ±0.9 °F (+122... +140 °F)	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0636 9742	
<b>Process humidity</b>						
Standard pressure dew point probe for measurements in compressed air systems		0... +100 %RH -20... +120 °F tpd	±1.6 °F tpd (+32... +122 °F tpd) ±1.8 °F tpd (-23... 32 °F tpd) ±3.6 °F tpd (14... 23 °F tpd) ±5.4 °F tpd (-4... 14 °F tpd) ±7.2 °F tpd (-22... -4 °F tpd)	300 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0636 9840	
Precision pressure dew point probe for measurements in compressed air systems incl. cert. with test point -40°F tpd		0... +100 %RH -80... +120 °F tpd	±1.6 °F tpd (23... +120 °F tpd) ±1.8 °F tpd (14... 10 °F tpd) ±3.6 °F tpd (-4... 14 °F tpd) ±5.4 °F tpd (-22... -4 °F tpd) ±7.2 °F tpd (-40... -22 °F tpd)	300 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0636 984	
NEW High humidity level probe heated sensor element, no condensation on sensor.		0... +100 %RH -110... +250 °F	±2.5 %RH (0... +100 %RH) ±0.7 °F (-13... 120 °F) ±0.9 °F (-13... -13 °F) ±0.9 °F (+120... +185 °F)	30 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0628 0014	
Rugged high temperature/humidity probe up to +360°F		0... +100 %RH -4... +360 °F	±2 %RH (+2... +98 %RH) ±0.7 °F (+32... +120 °F) ±0.9 °F (-4... 32 °F) ±0.9 °F (+120... +360 °F)	30 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0628 0021	
Flexible humidity probe (does not retain shape) for measurements in inaccessible places		0... +100 %RH -4... +360 °F	±2 %RH (+2... +98 %RH) ±0.7 °F (+32... +120 °F) ±0.9 °F (-4... 32 °F) ±0.9 °F (+120... +360 °F)	30 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0628 0022	
<b>Material and equilibrium moisture</b>						
Flexible humidity probe with mini module sensor, cable length 60" probe tip 2" x 0.75" x 0.3"		0... +100 %RH -4... +250 °F	±2 %RH (+2... +98 %RH) ±0.7 °F (14... +120 °F) ±0.9 °F (-4... 14 °F) ±0.9 °F (+120... +250 °F)	20 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0628 0013	
Sword probe for measuring humidity and temperature in stacked material		0... +100 %RH -4... +160 °F	±2 %RH (+2... +98 %RH) ±0.7 °F (14... +120 °F) ±0.9 °F (-4... 14 °F) ±0.9 °F (+120... +160 °F)	12 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0636 0340	
Rugged humidity probe for high temperature applications up to 250°F		0... +100 %RH -4... +250 °F	±2 %RH (+2... +98 %RH) ±0.7 °F (14... +120 °F) ±0.9 °F (-4... 14 °F) ±0.9 °F (120... +250 °F)	30 s Plug-in head, connection cable 0430 0143 or 0430 0145 required	0636 2140	
Material moisture probe				Free scaling, reference measurement, no water level	0636 0365	
Material/building moisture cable		0 to 100 k Ohm 100 to 0 %		Displayed values in instrument mean: 100 to 66 wet; 0 to 1 very dry	0636 0565	
<b>aw value</b>						
Water Activity Set, pressure-tight precision humidity probe with certificate, measurement chamber and 5 sample bowls (plastic)		0... +1 aW 0... +100 %RH	±0.01 aW (+0.1... +0.9 aW) ±0.02 aW (+0.9... +1 aW) ±0.7 °F (14... +120 °F) ±0.9 °F (-4... 14 °F) ±0.9 °F (+120... +160 °F)	Reproducibility of aw value ±0.003	0628 0024	
<b>Pressure probes</b>						
NEW Precision pressure probe in metal housing with magnet for fast attachment		Differential pressure probe	0 to +40" H <sub>2</sub> O	±(0.12" H <sub>2</sub> O Pa ±0.5% of mv) (0 to +40" H <sub>2</sub> O)	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0638 1347
NEW Precision pressure probe, in metal housing with magnet for fast attachment		Differential pressure probe	0 to +4" H <sub>2</sub> O	±0.012" H <sub>2</sub> O hPa (0 to +4" H <sub>2</sub> O)	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0638 144
NEW Precision pressure probe, in metal housing with magnet for fast attachment		Differential pressure probe	0 to +40" H <sub>2</sub> O	±0.5% of mv (+8 to 40" H <sub>2</sub> O) ±0.04" H <sub>2</sub> O (0 to 8" H <sub>2</sub> O)	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0638 154
NEW Precision pressure probe, in metal housing with quick-closing coupling magnet for fast attachment		Differential pressure probe	0 to +400" H <sub>2</sub> O	±0.04" H <sub>2</sub> O (0 to 80" H <sub>2</sub> O) (80 to 400" H <sub>2</sub> O)	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0638 1647
NEW Precision pressure probe, in metal housing with quick-closing coupling magnet for fast attachment		Differential pressure probe	0 to +800" H <sub>2</sub> O	±0.8" H <sub>2</sub> O (0 to 160" H <sub>2</sub> O) (160 to 800" H <sub>2</sub> O)	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0638 1747
NEW Precision pressure probe, in metal housing with quick-closing coupling magnet for fast attachment		Absolute pressure probe	0 to +800" H <sub>2</sub> O	±2" H <sub>2</sub> O (0 to 800" H <sub>2</sub> O)	Plug-in head, connection cable 0430 0143 or 0430 0145 required	0638 184
Low pressure probe, refrigerant-proof stainless steel, without cable		Screw-in thread 7/16" UNF	Low pressure probe	-15 to 150 psi Overload -480 psi (-15 to 150psi)	Plug-in head, connection cable 0409 0202 required	0638 1741
High pressure probe, refrigerant-proof stainless steel, without cable		Screw-in thread 7/16" UNF	High pressure probe	0 to 450 psi Overload 1000 psi (0 to 450 psi)	Plug-in head, connection cable 0409 0202 required	0638 1841
High pressure probe, refrigerant-proof st. steel, up to 600 psi, with cable		Screw-in thread 7/16" UNF	High pressure probe	0 to 600 psi Overload 1000 psi (0 to 600 psi)	Plug-in head, connection cable 0409 0202 required	0638 194

the temperature

<b>NEW</b> High pressure probe, refrigerant-proof stainless steel, up to 1450 psi		Screw-in thread 7/16" UNF	Relative pressure probe	-14 to +1450 psi	±1% of f.v. (-14 to +1450 psi) Overload 3626 psi	Plug-in head, connection cable 0400-0202 required	0638 2041
<b>NEW</b> High pressure probe, refrigerant-proof stainless steel, up to 5800 psi		Screw-in thread 7/16" UNF	Relative pressure probe	-14 to +5800 psi	±1% of f.v. (-14 to +5800 psi) Overload 8700 psi	Plug-in head, connection cable 0400-0202 required	0638 2141

Caps for humidity probes (0.5" and 0.8")	Illustration	For humidity probes:	Part no.
Metal protection cage, 0.8" diam. for humidity probes, material: 316 stainless steel. Quick adjustment time, robust and temperature-proof. Used when measuring velocities of less than 2000 fpm.		All humidity probes with 0.8" diam.	0554 0655
Metal protection cage, 0.5" diam. for humidity probes, material: 316 stainless steel. Quick adjustment time, robust and temperature-proof. Used when measuring velocities of less than 2000 fpm.		0636 9740, 0636 9715	0554 0755
Wire mesh filter, 0.8" diam., insertable filter for metal protection cage and plastic cap. Material: 316 stainless steel, quick adjustment time, protects from dirt and damage. Applications: meteorology, splashwater, condensation.		All humidity probes with 0.8" diam.	0554 0667
Cap with wire mesh filter, 0.5" diam.		All humidity probes with 0.5" diam.	0554 0757
Teflon sintered filter, 0.8" diam., PTFE. Not affected by condensation, water-repellent, resistant to corrosive substances. Applications: compressed air measurements, high humidity range (continuous measurements), high velocities.		All humidity probes with 0.8" diam.	0554 0666
Teflon sintered filter, 0.5" diam., PTFE. Not affected by condensation, water-repellent, resistant to corrosive substances. Applications: compressed air measurements, high humidity range (continuous measurements), high velocities.		0636 9769, 0636 9740, 0636 9715	0554 0756
Stainless steel sintered cap, 0.8" diam., made of stainless steel V2A. Highly rugged, suitable for penetration, clean with compressed air, mechanical protection of sensor. Applications: high mechanical loads, high velocity speeds.		All humidity probes 0.8" diam.	0554 0640
Stainless steel (V2A) sintered cap, 0.5" diameter. Highly rugged, suitable for penetration, should be cleaned with compressed air, mechanical protection of sensor. Applications: high mechanical loads, high velocity speeds, Teflon cap, a 5mm, attachable, PTFE material, (Soft). Applications: dust protection, high humidity level measurements, high velocities.		0636 9740, 0636 9715	0554 0647

Accessories for humidity probes/sensors	Part no.
Probe connection cable - 5 ft. PUR coating material	0430 0143
Probe connection cable - 16 ft. PUR coating material	0430 0145
16 ft. probe extension cable PUR coating material	0409 0063
Telescopic handle, max. 3 ft., for probe with plug-in head. Cable: 8 ft. long, PUR coating material	0430 0144
Telescopic handle, 13" to 31" long	0430 9715
Adapter for surface humidity measuring on 0.5" diameter humidity probes to locate damp spots on walls	0628 0012
Cap for bore holes, for humidity probe with 0.5" diameter. Measures equilibrium moisture in bore-holes	0554 2140
Humidity Calibration Kit (11.3% & 75.3%RH) inc. adapter for probes	0554 0660
33% RH salt solution for calibration and/or storage of humidity probes	0554 0636

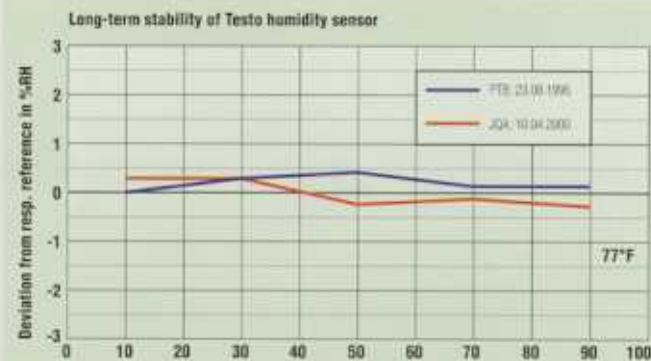
Accessories for pressure probes	Part no.
Connection cable 8ft. long for pressure probes 0636 1740, 0638 1840, 0638 1940	0409 0202
Magnetic holder for pressure probes. For pressure probes 0638 1345/, 1445/, 1545/, 1645	0554 0225
Adapter for pressure probes, 1/2" outer thread, 1/4" inner thread	0699 3127
Connection hose, silicone 16ft. long. Max load 280 psi	0554 0440
Connection hose set, 7x9ft., coiled, incl. 1/8" screw connection. Pressure-tight up to 290 psi, for probe 0638 1647/1747/1847	0554 0441

## Why you should choose humidity meas. instr. from Testo



### Inter-lab. tests

Three precision probes were subjected to extensive inter-laboratory tests at the PTB in Berlin, NIST in the USA, the French national institute CETIAT, the Italian institute IMGC, the English national institute NPL, the Spanish national institute INTA, JQA in Japan, KRIS in Korea, NRC CRM in Peking and in Testo's DKD calibration laboratory. The results confirm an accuracy of ±1%RH for the probes, as indicated by Testo.



### Reference humidity probes for highest precision

- Accuracy ±1%RH
- 2 year guaranteed long-term stability under normal conditions

Results of the worldwide inter-laboratory test on 3 precision humidity probes 1995-1997

Vane probes	Illustration	Probe type	Meas. range	Accuracy	Part no.
Vane probe, (diam. .5")		Vane	+120 to 4000 fpm Oper. temp. -22... +280 °F	±(40 fpm ±1% of mv) (+120 to 400 fpm)	0635 9443
Vane/temperature probe, (diam. 0.6")		Vane Type K (NiCr-Ni)	+80 to 1200 fpm -22... +280 °F	±(40 fpm ±1% of mv) (+80 to 1200 fpm)	0635 9540
Vane/temperature probe, (diam. 1")		Vane Type K (NiCr-Ni)	+80 to 8000 fpm -22... +280 °F	±(40 fpm to ±1% if mv) (+80 to 8000 fpm)	0635 9640
90° rotating head vane probe (diam. 2.5")		Vane	+50 to 4000 fpm Oper. temp. 32... +140 °F	±(20 fpm ±1.5% of mv) (+50 to 4000 fpm)	0635 9440
90° rotating head vane probe (diam. 4")		Vane	+40 to 3000 fpm Oper. temp. 32... +140 °F	±(20 fpm ±1.5% of mv) (+40 to 3000 fpm)	0635 9340
Vane probe, for stationary assembly, 9ft. cable (PVC)		Vane	+80... +1200 fpm	±(40 fpm ±1% of mv) (+80... +1200 fpm)	0628 0036
High temperature vane probe, (diam. 1"), with handle for continuous measurements up to +670°F		Vane Type K t/c	+120 to 4000 fpm -40... +660 °F	±(60 fpm ±1% of f.v.) (+120 to 4000 fpm)	0635 6045

Accessories/Vane probes	Part no.
Professional telescopic handle for plug-in vane probes, max: 3 ft. long, extension on request	0430 0941
Extension for telescopic handle, 6 ft. long Please also order the 0409 0063 extension cable	0430 0942
Handle for plug-in vane probes	0430 3545

Accessories/Vane probes	Part no.
Swan neck, flexible connection between probe and instrument	0430 0001
Magnetic probe holder for vane probes	0554 0430

Thermal probes	Illustration	Probe type	Meas. range	Accuracy	Part no.
Hot bulb probe, for measurements in the lower velocity range, 6 ft. cable (PVC)			0 to 2000 fpm -4... +160 °F	±(6 fpm ±5% of mv) (0 to 2000 fpm)	0628 0035
Low cost rugged hot bulb probe, (diam. 12"), for measurements in the lower velocity range, with handle		Hot bulb NTC	0 to 2000 fpm -4... +160 °F	±(6 fpm ±5% of mv) (0... +2000 fpm)	0635 1549
Rugged hot bulb probe, (diam. 12"), with handle and telescopic handle for measurements in the lower velocity range		Hot bulb NTC	0 to 2000 fpm -4... +160 °F	±(6 fpm ±5% of mv) (0 to 2000 fpm)	0635 1049
Quick-action hot wire probe, (diam. .4"), with telescopic handle, for measurements in the lower velocity range with direction recognition		Hot wire NTC	0 to 4000 fpm -4... +160 °F	±(6 fpm ±4% of mv) (0 to 4000 fpm)	0635 1041
NEW Thermal anemometer, w. telescopic handle, measures air flow in lab fume cupboards to DIN EN 14175 (draft)		Hot wire NTC	0 to 1000 fpm 32 to +122 °F	±(6 fpm ±4% of mv) (0 to 1000 fpm)	0635 1047

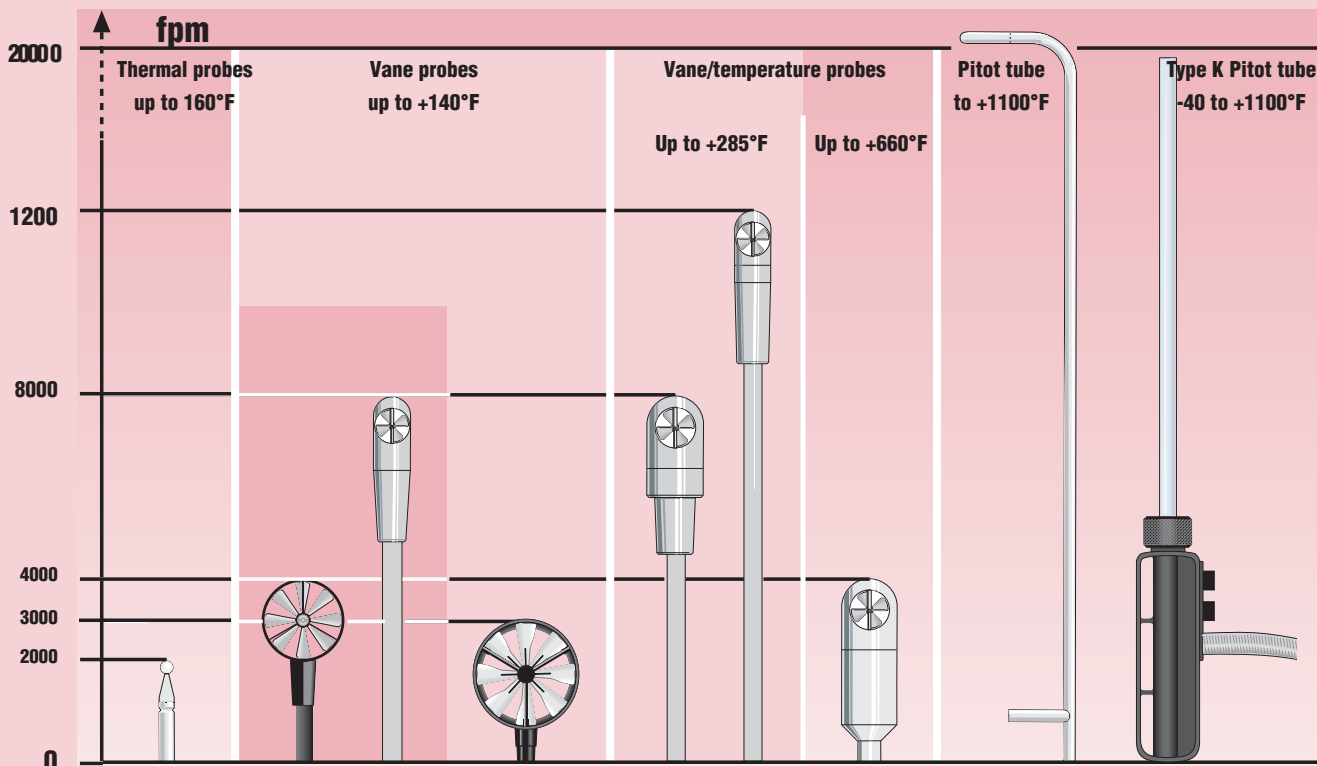
Pitot tube measurement	Illustration	Probe type	Meas. range	Accuracy	Part no.
<b>Differential pressure probes</b>					
NEW Precision pressure probe, in metal housing with magnet for fast attachment		Differential pressure probe	0 to 40" H <sub>2</sub> O	(0.12" H <sub>2</sub> O ±0.5% of mv) 0 to 40" H <sub>2</sub> O	Plug-in head, connection cable 0430 0143 or 0430 0145 required 0638 1347
NEW Pressure probe, in metal housing with magnet for fast attachment		Differential pressure probe	0 to 40" H <sub>2</sub> O	0.12" H <sub>2</sub> O (0 to 4" H <sub>2</sub> O)	Plug-in head, connection cable 0430 0143 or 0430 0145 required 0638 1447
NEW Pressure probe, in metal housing with magnet for fast attachment		Differential pressure probe	0 to 40" H <sub>2</sub> O	±0.5% of mv (+8 to +40" H <sub>2</sub> O) ±0.04" H <sub>2</sub> O (0 to 8" H <sub>2</sub> O)	Plug-in head, connection cable 0430 0143 or 0430 0145 required 0638 1547

Pitot tubes	Illustration	Probe type	Meas. range	Accuracy	Part no.
Pitot tube, 12" long, stainless steel, measures velocity in connection with pressure probes 0638 1345/.1445/.1545			Oper. temp. 32 to +1100 °F		0635 2245
Pitot tube, 14" long, stainless steel, measures velocity flow in connection with pressure probes 0638 1345/.1445/.1545			Oper. temp. 32 to +1100 °F		0635 2145
Pitot tube, 20" long, stainless steel, measures velocity in connection with pressure probes 0638 1345/.1445/.1545			Oper. temp. 32 to +1100 °F		0635 2045
Pitot tube, 40" long, stainless steel, measures velocity in connection with pressure probes 0638 1345/.1445/.1545			Oper. temp. 32 to +1100 °F		0635 2345



Pitot tube measurement		Illustration	Probe type	Meas. range	Accuracy	Part no.
<b>Straight Pitot tubes</b>						
Pitot tube, stainless steel, 14" long, measures velocity with temperature, for pressure probes 0638 1345/..1445/..1545		14" diam. .31"	Type K (t/c)	-40... +1100 °F		0635 2040
Pitot tube, stainless steel, 20" long, measures velocity with temperature, for pressure probes 0638 1345/..1445/..1545		20" diam. .31"	Type K (t/c)	-40... +1100 °F		0635 2140
Pitot tube, stainless steel, 40" long, measures velocity with temperature, for pressure probes 0638 1345/..1445/..1545		40" diam. .31"	Type K (t/c)	-40... +1100 °F		0635 2240
<b>Accessories for pressure probes</b>		<b>Part no.</b>	<b>Accessories for pressure probes</b>		<b>Part no.</b>	
Connection hose, silicone, 16 ft. long Silicone hose connects Pitot tube and pressure probe, 16 ft. long		0554 0440	Magnetic holder for pressure probes For pressure probes 0638 1345/..1445/..1545/..1645		0554 0225	
<b>Comfort level measurement</b>						
3-function probe for simultaneous measurement of temperature, humidity and velocity. With plug-in head, 0430 0143 connection cable required		11" diam. .83"	Hot bulb Testo humid. sensor, capacitive NTC	0... +2000 fpm 0... +100 %RH -4... +160 °F	±(6fpm ±5% of mv) (0 to 2000 fpm) ±2 %RH (+2... +98 %RH) ±0.9 °F (32 to 120 °F) ±0.7 °F (-4 to 32 °F) ±0.7 °F (-120 to 160 °F)	0635 1540
Comfort level probe for measuring turbulence levels, with telescope and stand. Fulfills DIN 1946 Part 2 or VDI 2080 requirements		35" diam. 3.5"	Hot wire NTC	0 to 1000 fpm 32 to +120 °F	±(6 fpm ±4% of mv) (0... +1000 fpm) ±0.5 °F (32... +120 °F)	0628 0009
NEW Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case.		35" diam. 3.5"	Hot wire NTC	0 to 1000 fpm 32 to +120 °F	In accordance with ISO 7243 or DIN 33403	0635 8888
<b>Accessories for 3-function probe</b>		<b>Part no.</b>	<b>Accessories for 3-function probe</b>		<b>Part no.</b>	
Adapter for humidity adjustment of 3-function probe 0635 1540 Order with adjustment set		0554 0661	Probe connection cable - 5ft. PUR coating material		0430 0143	
<b>Other</b>						
Shell anemometer, 10 ft. cable, for wind speed measurements			Vane	140 to 6000 fpm	±(60 fpm ±5% of mv) (+140 to 6000 fpm)	0635 9045

## Measuring and application ranges of velocity probes



The air velocity range between 0 to 20,000 fpm can be divided into three measuring areas:

- Low-speed velocity 0 to 1000 fpm
- Mid-speed velocity 1000 to 10,000 fpm
- High-speed velocities over 10,000 fpm

Thermal anemometers are best suited for low speed velocities, vane are utilized for the mid-speed range, while pitot tubes achieve maximum accuracy in high-speed air velocity. The appropriate choice of the right air velocity probe also

depends on the application temperature. Thermal anemometers, for example, have only a very limited operating range. Testo designs and manufacturers air velocity instruments utilizing all three measuring technologies. If the

measuring technology that best suits your application needs is not on display in this brochure, please call Testo today to obtain additional information.



# Highly accurate temperature measurement

The demand for a highly accurate temperature measurement system came mainly from sectors involved with quality assurance, calibration services and laboratories. This demand is accommodated by a revolutionary highly accurate immersion/penetration probe with a system accuracy of up to 0.09 °F.

The overall system measurement uncertainty of temperature measurement in conventional measuring instruments is made up of the measurement uncertainty of both the instrument and the probe. The instrument measurement uncertainty results mainly from the analog measurement technology to analyse the probe signal, analog-to-digital conversion, linearisation and resolution. The probe measurement uncertainty is determined by the precision of the temperature sensor used.

The new, highly accurate measurement system from Testo eliminates instrument uncertainty and reduces probe measurement uncertainty. Technologically, it is based on the following components:

#### Intelligent probe

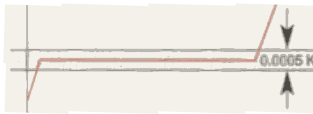
The reading is processed completely in the probe from the analog sensor signal to the digital reading. The overall instrument measurement uncertainty therefore does not apply.

#### Individual probe adjustment

Since each reading is processed completely in the probe, each probe is adjusted separately using highly accurate fixed point cells.

Adjustment with fixed point cells

κ ↑



At the melting/solidification point, the fixed point cells used keep the temperature constant over a longer time period in the 0.0005 K range. The immersion/penetration probe is adjusted in this phase.

#### Platinum sensor

A specially developed platinum wire, integrated in a high-purity aluminium oxide pipe, guarantees highest accuracy, metrological stability as well as high resistance even if exposed to high loads such as acceleration and vibration. Consequently, errors are eliminated thanks to the individual parametering of the sensor characteristic line in the probe.

The overall system uncertainty is reduced considerably thanks to the elimination of the instrument measurement uncertainty and the reduced probe measurement uncertainty:

System accuracy at rated temperature of 22 °C:	
-40 °C to 32 °F	±0.09 °F + 0.05% of reading
32 °F to +212 °F	±0.09 °F
+212 °F to +570 °F	±0.09 °F + 0.05% of reading

99 QUALITY

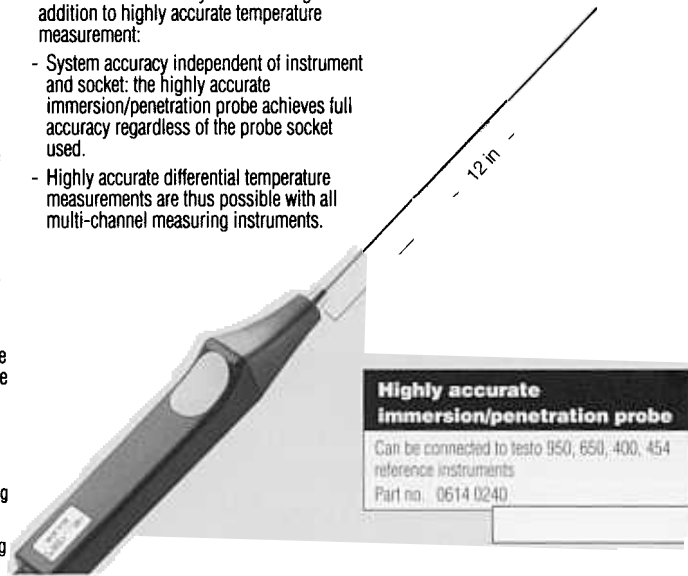
23.267 °F

old MaxMin: 07.00

Technical data for testo 400, 650, 950

There are even more system advantages in addition to highly accurate temperature measurement:

- System accuracy independent of instrument and socket: the highly accurate immersion/penetration probe achieves full accuracy regardless of the probe socket used.
- Highly accurate differential temperature measurements are thus possible with all multi-channel measuring instruments.



Highly accurate immersion/penetration probe

Can be connected to testo 950, 650, 400, 454 reference instruments  
Part no. 0614 0240

## testo 950

### Precision measuring instrument with up to 0.09 °F system accuracy



System  
Adjust  
with a

ge: Quick

#### Recommended kit:

Part no.

testo 950, reference temperature meas. instr., with battery, Li cell and calibration protocol	0563 9501
2 channel instrument (thermocouple, RTD, NTC) with option of connecting CO <sub>2</sub> , CO <sub>2</sub> , rpm and mV/mA transmitter	
Highly accurate immersion/penetration probe incl. certificate	0614 0240
Plug-in head, connection cable 0430 0143 or 0430 0145 required	
Cable, 5ft. long, connects probe with plug-in head to meas. instrument	0430 0143
PUR coating material	
Attachable printer (securely attached) including 1 roll of thermal paper and batteries	0554 0570
System case (plastic) for measuring instrument, probes and accessories	0516 0400
Probes in lid make it easy to find parts in case	
<b>We recommend:</b> 4 point adjustment for 0614 0240 probe	0520 0142
Incl. ISO certificate at -40, 32, 212, 400, 570 °F	
4 point adjustment for 0614 0240 probe	0554 0241
Incl. NIST certificate at -40, 32, 212, 400, 570 °F	
ComSoft 3 - Professional with data management	0554 0830
Incl. database, analysis and graphics function, data analysis, trend curve	
RS232 cable	0409 0178
Connects instrument to PC (6ft.) for data transfer	



## Water Activity Kit



Quality control monitoring of pharmaceuticals.

Advantage: Results are traceable to national standards.

testo 650 automatically indicates when a sample reaches equilibrium, signalling the end of the test. Constant monitoring is therefore not required.

Different measurement samples can be read by barcode.

Advantage: Additional information such as

min./max. values, mixing ratios... are saved in the barcode.

Calibration on location with control and adjustment set, with NIST calibration certificate if required.

Advantage: This provides additional quality assurance.

## Description:

testo 650 Pro Class Meter/Logger with battery, Li cell and calibration certificate

## Part no.

0563 6501

Water Activity Kit: pressure-tight precision humidity probe with certificate, measurement chamber and 5 sample bowls (plastic)

0628 0024

Attachable printer with 1 roll of thermal paper and batteries

0554 0570

SoftCase for instrument with carrier strap, magnetic holder and probe holder

0516 0401

SoftCase for attachable printer (protects printer from dirt/impact) Protects from impact and falls

0516 0411

**We recommend:** NIST Calibration Certificate: Humidity Calibration points freely selectable from 5 to 95%RH at +77°F

0520 0216

**We recommend:** HumidityCalibration Kit (11.3%RH/75.3%RH) incl. adapter for humidity probes

0554 0660

## testo 650

## Refrigeration Kit



Measurement in a refrigeration unit, low/high pressure.

testo 650 and pressure probes make it possible to take measurements on either supply or returns of a refrigeration unit. The temperature of the refrigerant on the pipe surface can be measured using the pipe clamp probe. The integrated data memory automatically saves the data for future reporting.

Advantage: The different temperature curves of all conventional refrigerants can be shown

using special software.

## Recommended kit:

testo 650, Pro Class Meter/Logger with battery, Li cell and calibration certificate

## Part no.

0563 6501

Low pressure probe, refrigerant-proof stainless steel, up to 140 psi Screw-in thread 7/16" UNF

0638 1741

High press. probe, refrigerant-proof st. steel, up to 580 psi Screw-in thread 7/16" UNF

0638 1941

Connection cable, 8ft. long, for pressure probes 0638 1741/ 1841/ 1941/ 2041/ 2141

0409 0202

Connection cable, 8ft. long, for pressure probes 0638 1741/ 1841/ 1941/ 2041/ 2141

0409 0202

Pipe wrap probe for pipes with diameter of up to 2", for flow/return temperature measurement in hydronic systems

0600 4593

Attachable printer with 1 roll of thermal paper and batteries

0554 0570

SoftCase for instrument with carrier strap, magnetic holder and probe holder

0516 0401

SoftCase for attachable printer (protects printer from dirt/impact) Protects from impact and falls

0516 0411

System case (plastic) for instrument, probes and accessories

0516 0400

ComSoft 3 Software

0554 0830

Incl. data base, analysis and graphics function, data analysis, trend curve "Refrigeration technology" update with saved curves of all usual refrigerants

0554 4035

## The Clean Room Kit

Description:	Part no.
testo 400, Pro Class Multifunction Meter/Logger, incl. battery, Li cell and ISO certificate	0563 4001
Precision pressure probe, 40" H <sub>2</sub> O, measures differential pressure and velocities (in connection with Pitot tube)	0638 1347
Precision air probe Plug-in head, connection cable 0430 0143 or 0430 0145 required	0628 0017
1% reference humidity/temperature probe Plug-in head, connection cable 0430 0143 or 0430 0145 required	0636 9741
Probe connection cable - 5 ft. PUR coating material	0430 0143
Probe connection cable - 5 ft. PUR coating material	0430 0143
Quick-action hot wire probe, diam 0.4", with telescopic handle, for measurements in the lower velocity range with direction recognition	0635 1041
Attachable printer with 1 roll of thermal paper and batteries	0554 0570
SoftCase for instrument with carrier strap, magnetic holder and probe holder	0516 0401
SoftCase for attachable printer (protects printer from dirt/impact)	0516 0411
System case (aluminum) for instrument, probes and accessories	0516 0410
ComSoft 3 Software Incl. data base, analysis and graphics function, data analysis, trend curve	0554 0830
RS232 cable Connects instrument to PC (4 ft.) for data transfer	0409 0178
<b>We recommend:</b> NIST calibration certificates for temperature, humidity, velocity, pressure	



Checks air pressure in clean rooms

Advantage: Measurements in the lower velocity range

### Additional applications:

Checks for positive or negative pressure using the 100 Pascal probe.

Advantage: High accuracy of  $\pm(0.3 \text{ Pa} + 0.5\%$  of reading)

Measurements with the highly accurate reference humidity/temperature probe provides accurate monitoring of fluctuations in air moisture with an accuracy of  $\pm 1\% \text{RH}$

Highly accurate temp./air measurement

Advantage: Analysis of data on PC with convenient ComSoft 3 software

## testo 400

### The Professional Kit for AC/Ventilation Systems

Description:	Part no.
testo 400, Pro Class Multifunction Meter/Logger, incl. battery, Li cell and ISO certificate	0563 4001
CO2 probe monitors air quality in the workplace includes plug-in head - connection cable 0430 0143 or 0430 0145 required	0632 1240
Probe connection cable - 5 ft. PUR coating material	0430 0143
Standard humidity/temperature probe (up to +160°F) Measures all physical parameters in the Mollier diagram	0636 9740
Comfort level probe for measuring turbulence levels, with telescope and stand. Fulfills ANSI/ASHRAE55-1992US	0628 0009
Quick-action surface probe with sprung thermocouple strip, measuring range short-term to +900°F	0604 0194
Probe connection cable - 5 ft. PUR coating material	0430 0143
Attachable printer with 1 roll of thermal paper and batteries	0554 0570



The environmental comfort and safety of people in the workplace depends, to a large extent, on ambient air temperature, air humidity, air speed and air quality.

These conditions can be easily measured on-site using the testo 400 and a wide selection of probes.

The testo 400 Meter/Logger fulfills the accuracy specifications of DIN 1946 Part 2, VDI 2080, ISO 7726

The attachable printer documents measured data on-site.

## For fast measurements on VAC systems

The **testo 400** with its VAC module is currently the only measuring system worldwide which can quickly and objectively assess the functionality of a ventilation system without requiring any additional calculations.

Measurement stipulations are based on internationally recognized standards; *AHSRAE 111*, *VDI 2080 (Germany)*, *the 12599 Draft EN (Europe)*.

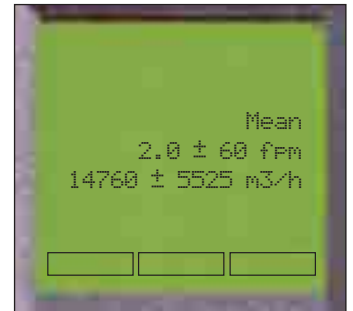
These are the first automated measurement procedures which fulfill the requirements of these standards.

### Simple to Use

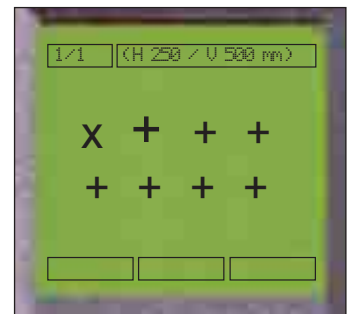
Position the testo 400 meter on the ventilation duct. The magnetic back holds the meter in place and allows easy hands free operation. The location data, including location name, measurement coordinates, duct area, correction factor etc. are automatically read into the meter with the bar code pen.

### Data Analysis

- Data calculations are done automatically by the testo 400 and then saved.
- Transmit this data to your PC at the touch of a button.
- The measurement results are printed using a standard layout (ASHRAE, VDI or EN).



Assessment of measurement directly on location with integrated uncertainty calculation



The coordinates required for the grid measurement are shown in the display. The depth information on the vane telescopic handle makes the task that much easier.

Description:	Part no.
testo 400, Pro Class Multifunction Meter/Logger incl. battery, Li cell and ISO certificate	0563 4001
Memory upgrade to 500,000 readings	0554 9481
VAC module upgrade Volume flow calculation in ducts with error calculation function in instrument	0450 4010
ComSoft 3 for data management Incl. data base, analysis and graphics function, data analysis, trend curve	0554 0830
VAC module upgrade for ComSoft 3 software Printout of standard measurement protocols	0554 4030
RS232 cable Connects instrument to PC (14 ft.) for data transfer	0409 0178
90° Vane probe (diam. 4"), attachable to handle or telescopic handle, for ventilation duct measurements	0635 9340
Vane/temperature probe, (diam. 0.6"), attachable to handle or telescopic handle	0635 9540
Professional telescopic handle for plug-in vane probes, max. 3 ft. long, extension on request	0430 0941
Attachable printer with 1 roll of thermal paper and batteries	0554 0570
SoftCase for instrument with carrier strap, magnetic holder and probe holder	0516 0401
SoftCase for attachable printer (protects printer from dirt/impact)	0516 0411
System case (aluminum) for instrument, probes and accessories	0516 0410
<b>We recommend:</b> NIST Calibration Certificate: Temperature instruments with air/immersion probe; cal. points selectable from -40 to +1800°F	0520 0201



The Professional's Kit for fast assessment of ventilation/air conditioning systems

## The professional set for assessing workplaces subjected to heat



The measurement task involves assessing workplaces, particularly those subjected to heat radiation:

The WBGT probe is used to determine the WBGT (Wet Bulb Globe Temperature) climate index in accordance with DIN 33403 and ISO 7243.

The testo 400 measuring instrument calculates indices and shows them in the display.

Recommended kit:	Part no.
testo 400, multifunction measuring instrument, incl. battery, Li cell and calibration certificate	0563 4001
Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case	0635 8888 ID No. 0699 4239/1
Attachable printer (securely attached) including 1 roll of thermal paper and batteries Quickly prints readings on location	0554 0570
We recommend the following for each of the 3 temperature probes: ISO calibration certificate / Temperature For air/immersion probes, calibration points 18°F, 32°F, 104°F	0520 0181

Temperature Calibration Certificates for testo 950, 650, 400	Part no.	
<b>NIST Calibration Certificates - Temperature</b>		
Meter with air/immersion probe Calibration range freely selectable from -110 to +2400 °F (-40 to +2400 °F) (-110 to -40 °F)	0520 0101	
Meter with surface probe Calibration range freely selectable from +60 to +750 °F	0520 0121	
Meter w/ air/immersion probe, no multi-function probes (%RH / °F or fpm / °F) calibration range -0.4, 32, +140 °F	0520 0001	
Humidity Calibration Certificates for testo 650, 400	Part no.	
<b>NIST Calibration Certificates - Humidity</b>		
Calibration range freely selectable from 5 to 95 % RH at +15 to +95°F (max TP +160°F/min TP -22°F) at -0.4 to +110°F	0520 0106	
Calibration range 11.3 and 75.3 % RH at +77 °F	0520 0006	
Pressure Calibration Certificates for testo 650, 400	Part no.	
<b>NIST Calibration Certificates - Pressure</b>		
Calibration range freely selectable from 14 to 1000 psi absolute (14 to 3600 psi positive overload) (-14 to -0.0145 bar negative overload)	0520 0105	
5 calibration points in the range from -14 to 3600 psi, evenly distributed	0520 0005	
Velocity Calibration Certificates for testo 400	Part no.	
<b>NIST Calibration Certificates - Velocity</b>		
All velocity probes Cal. range freely selectable from 98 to 5300 fpm at +77 °F	0520 0104	
All velocity probes Cal. range freely selectable from 60 to 96; 5300 to 10,000 fpm	0520 0104	
Hot wire and bulb probes: calibration range 200, 400, 1000, 20000 fpm Vane probes: calibration range 1000 2000, 3000, 4000 fpm	0520 0004 0520 0034	
Hot wire and bulb probes Calibration range 100 / 160 / 200 / 300 fpm	0520 0024	
Calibration certificates/Pressure	Part no.	
<b>ISO calibration certificate/Pressure</b>	Differential pressure, accuracy > 0.6 (% of full-scale value)	0520 0005
<b>DKD calibration certificate/Pressure</b>	Differential pressure, accuracy > 0.6 (% of full-scale value)	0520 0225
<b>DKD calibration certificate/Pressure</b>	Absolute pressure, accuracy 0.1 to 0.6 (% of full-scale value)	0520 0212
<b>DKD calibration certificate/Pressure</b>	Differential pressure, accuracy 0.1 to 0.6 (% of full-scale value)	0520 0215

**We will calibrate and maintain all your testing equipment - all makes and instrument types - and SAVE you money!**



## Technical data

<b>Probe type</b>	<b>Vane</b>	<b>Thermal</b>			
Meas. range	0 to 12,000 fpm	0 to 4000 fpm			
Accuracy ± 1 digit	See Probes data for system accuracy	±2 fpm (0 to 400 fpm) ±4 fpm (400 to 1000 fpm) ±8 fpm (1000 to 4000 fpm)			
Resolution	2 fpm (for 2" & 4" diam.), 20 fpm (for remaining probes)	2 fpm (0 to 4000 fpm)			
<b>Probe type</b>	<b>Testo humid. sensor, capacitive</b>	<b>Pressure</b>	aw value		
Meas. range	0... +100 %RH	0 to 800" H <sub>2</sub> O	0... +1 aW		
Accuracy ± 1 digit	See probe data	Probe 0638 1345 Probe 0638 1445 Probe 0638 1545 Probe 0638 1645 ±0.1% of mv Probe 0638 1740 Probe 0638 1840 Probe 0638 1940 ±0.2% of mv	See probe data		
Resolution	0.1 %RH (0... +100 %RH)	0.001 hPa (0638 1345 probe) 0.0004" H <sub>2</sub> O (0638 1445 probe) 0.004" H <sub>2</sub> O (0638 1545 probe) 0.4" H <sub>2</sub> O (0638 1645 probe) 0.15 psi (0638 1740 probe) 0.15 psi (0638 1840 probe) 0.15 psi (0638 1940 probe)			
<b>Probe type</b>	<b>NTC</b>	<b>RTD</b>	<b>Type K (t/c)</b>	<b>Type S (Pt10Rh-Pt)</b>	<b>Type J (Fe-CuNi)</b>
Meas. range	-40... +300 °F	-330... +1500 °F	-330 to 2500 °F	32 to 3200 °F	-330... +1830 °F
Accuracy ± 1 digit	±0.4 °F (14... +120 °F) ±0.7 °F (-40... 14 °F) ±0.7 °F (120... +300 °F)	±0.2 °F (-60... +210 °F) ±0.7 °F (-150... -60 °F) ±0.7 °F (210... +400 °F) ±1.8 °F (-330... -150 °F) ±1.8 °F (+400... +1500 °F)	±0.7 °F (-150... +400 °F) ±1.8 °F (-330... -150 °F) ±1.8 °F (+400... +2500 °F)	±1.8 °F (32 to 3200 °F)	±0.7 °F (-240... +300 °F) ±1.8 °F (-330... -240 °F) ±1.8 °F (+300... +1830 °F)
Resolution	0.2 °F (-40... +300 °F)	0.01 °F (-150... +570 °F) 0.2 °F (-330... -150 °F) 0.2 °F (+570... +1500 °F)	0.2 °F (-330... +3200 °F)	1.8 °F (32... +3200 °F)	0.2 °F (-330... +1830 °F)
<b>Probe type</b>	<b>CO<sub>2</sub> probe</b>	<b>CO probe</b>	<b>Mechanical</b>	<b>Current/voltage measurement</b>	<b>Current/voltage measurement</b>
Meas. range	0... +1 Vol. % CO <sub>2</sub> 0... +10000 ppm CO <sub>2</sub>	0... +500 ppm CO	+20... +20000 rpm	0... +20 mA	0... +10 V
Accuracy ± 1 digit	See probe data	±5% of mv (0... +500 ppm CO)	(+20... +20000 rpm)	±0.04 mA (0... +20 mA)	±0.01 V (0... +10 V)
Resolution			1 rpm (+20... +20000 rpm)	0.01 mA (0... +20 mA)	0.01 V (0... +10 V)
Oper. temp.	32 to 120°F	PC	RS232 interface	Memory space in basic version: 128 kB corresponds to approx. 45,000 readings Memory upgrade: 1 MB (500,000 rdgs.) Other features: automatic probe recognition Power: 4AA batteries (std.); quick rechargeable batteries (opt); or 120 VAC power supply/recharger Battery life varies depending upon probe type	
Storage temp.	-13... +140 °F				
Battery type	1.5 V AA				
Battery life	18 hr				
Weight	18 oz				
Warranty	3 years				

### testo Inc.

35 Ironia Rd.,  
Flanders, NJ 07836  
800-227-0729  
973-252-1729 fax  
www.testo.com  
e-mail: info@testo.com