Committing to the future

2011

Measuring Instruments For Indoor Air Quality, Light And Sound

CH_4

C_3H_8

CO

CO_2

Lux

dB

kHz

°C

%RH

m/s

hPa

V

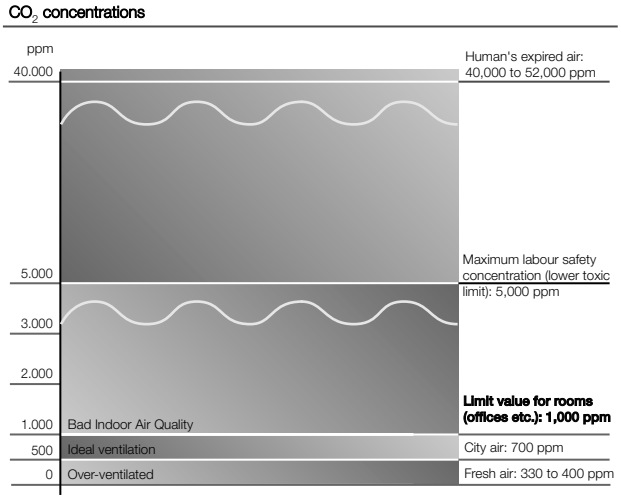
CO_2 measurement engineering

Why CO_2 measurement?

CO_2 concentration is used as an indicator when assessing indoor air quality. If the CO_2 concentration in indoor air is too high (limit value: 1000 ppm), the air feels „stuffy and stale“.

Bad air quality in rooms (e.g. offices) can lead to tiredness, lack of concentration and illness (Sick Building Syndrome SBS) and is caused, in many cases, by insufficient ventilation.

The CO_2 concentration in demand controlled ventilating (DCV) systems is used to regulate the supply of fresh air. Stationary CO_2 transmitters are used and should be checked on a regular basis using hand-held measuring instruments.



The parameter light

Approximately 80% of all sensations are experienced by the eye. Light is required for this purpose.
Approximately 25% of human energy is needed for the sight process.

Spectral response of the eye

Light is made up of very high electromagnetic oscillation between 380 and 770 nm. They are experienced by the eye as light.

Light intensities

Humans are day-active creatures, i.e. we are used to a light intensity such as that which is available during the day. Values lie between approx. 5000 Lux on a dull winter's day and approx. 100 000 Lux on a sunny summer's day.

The light intensity of artifical lights is ususally between 100 and 1000 Lux.

Effects

Fatigue on account of too little light occurs more in the organism as a whole than in the eye itself. For this reason, insufficient or bad lighting conditions cannot be identified as the cause of accidents or fatigue.

According to documentation available approx. 30% of all accidents result directly or indirectly from inadequate lighting. In the interest of accident prevention it is imperative that steps are taken to monitor the situation.

Different light intensities are recommended by standards bodies, depending on the task. Light intensities of approx. 100 to 250 Lux are sufficient for simple tasks. A minimum of 1000 Lux is required for precision work.

Light intensity Unit: Lux (lx) Light intensity is the ratio of the light flux on an area to the area.	**Light flux:** Unit: lumen (lm) Light flux is the total radiation power emitted from a light source and photometrically assessed.
Light intensity (lx) = $\frac{\text{Light flux (lm)}}{\text{Area (m}^2\text{)}}$	$E = \frac{\Phi}{A}$

The parameter sound

Sound waves are fluctuations in air pressure

If they are audible to the human ear we talk about audible sound. The fluctuations in pressure occurring with audible sound are extremely low. At a normal pressure of 1013 mbar even changes in the µPa range can stimulate the human ear. A suitable pressure sensor with the appropriate sensitivity is the microphone.

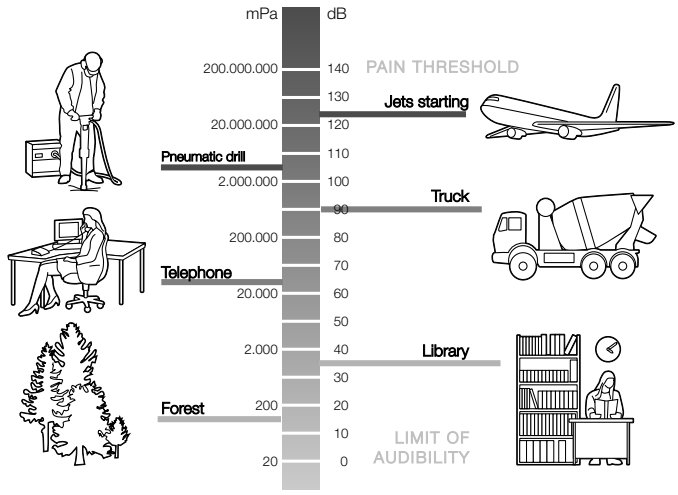
Sound level meters have been designed for measurements in the free field. There is also a free field if the level falls by 6 dB per duplication of the distance from the source. This is the case in most rooms.

Example:

– Office with carpet, curtains and partitions = Free field !
– Cellar with concrete walls, without furniture, highly reverberant = Reverberant field !

Measuring tips

Measuring conditions are ideal if there are absolutely no interfering objects in the sound field. This would be the case, for example, on top of a mountain. Because there are no walls or ceilings on which sound can be reflected, free dispersion is guaranteed (free field). In a closed room there is usually a wall opposite the noise source. This can cause reflections which distort the measured result (reverberant field).



Contents

Measuring Instruments

Accessories

Measurement systems

testo 316-1

Detector for leaks in natural gas pipes

The testo 316-1 gas leak detector quickly detects even the smallest leaks.

- Flexible measurement probe for hard to reach locations
- Optical and audible alarms signal when limits are exceeded
- TopSafe case protects from dirt and impact (optional)
- DVGW approval

Electronic gas leak detector with flexible measurement probe and battery and calibration protocol

Part no.
0632 0316

Technical data	
Probe type	Semi-conductor sensor
Meas. range	0 to 10,000 ppm CH_4

Battery type	9V block battery
Battery life	> 5 h
Dimensions	190 x 57 x 42 mm
Weight	Approx. 300 g
Material/Housing	ABS
Warranty	2 years

1st alarm limit: from 200 ppm CH_4
2nd alarm limit: 10,000 ppm CH_4

Accessories	Part no.
TopSafe for testo 316, protection case incl. stand, protects from dirt and impact	0516 0189
Transport case (plastic) for transport and secure storage of measuring instrument and accessories	0516 3120

testo 316-2

Gas leak detector with built-in pump

The testo 316-2 gas leak detector indicates when gas concentration increases or becomes dangerously high. The combination of optical and audible warnings as well as the option of zeroing during the measurement mean that leaks can be detected quickly and reliably.

- Optical and audible alarm with bar display for increasing and dangerous gas concentrations
- Trend display shows maximum leakage
- Integrated pump
- Flexible measurement probe for inaccessible places
- Earphone connection for secure leakage localization in loud surroundings

Electronic gas leak detector with flexible measurement probe, incl. mains charger and earphones

Part no.
0632 3162

Technical data	
Meas. range	10 ppm to 4,0 Vol. % CH_4 10 ppm to 1,9 Vol. % C_3H_8 10 ppm to 4,0 Vol. % H_2
Lower response thresholds	10 ppm
1st alarm limit	200 ppm CH_4 100 ppm C_3H_8 200 ppm H_2
2nd alarm limit	10.000 ppm CH_4 5.000 ppm C_3H_8 10.000 ppm H_2
Display	18 segment bar display

Battery type	NiMH battery
Battery life	6 h
Oper. temp.	-5 to +50 °C
Storage temp.	-25 to +60 °C
Dimensions	190 x 57 x 42 mm
Weight	348 g
t90	< 2 s
Heat-up time	60 s
Other features	Earphone socket
Warranty	2 years

Accessories	Part no.
Earphones, black with ear cushions	0554 5001
Mains unit (output: 12V, DC, 300mA)	0554 1093

testo 317-1

Flue gas spillage detector

The testo 317-1 flue gas spillage detector reliably detects escaping heating gases. The practical instrument immediately gives off a visual and audible alarm. It is therefore not necessary to actually see the detector. The bendable probe facilitates applications in confined areas.

- Reliable recognition of escaping flue gases
- Bendable measurement probe for points which are difficult to access
- Audible and visual alarm
- DVGW approved

teto 317-1, electronic flue gas spillage detector with flexible probe, incl. battery

Part no.
0632 3170

Technical data

Measuring medium	Ambient air
Reaction time	2 s
Battery type	3 AAA micro batteries
Dimensions	128 x 46 x 18 mm
Weight	300 g
Display	Visual/audible
Warranty	2 years

Diameter/Probe pipe tip	Ø 10 mm
Length of probe pipe tip	35 mm
Length of probe pipe	200 mm

testo 317-2

Gas leak detector

Highly practical gas leak detector for fast checks on gas pipe connections, with visual bar display.

- Shows gas concentration in visual bar display
- Sensor self-test following switch-on
- Audible confirmation of readiness to operate
- Increasing alarm sounds with increasing gas concentration
- Continuous sound if alarm threshold is exceeded
- Battery monitoring with optical display
- Self-test function

testo 317-2, Gas leak detector including case with belt clip and wrist strap, batteries and calibration protocol

Part no.
0632 3172

Technical data

Meas. range	0 to 20.000 ppm CH_4 0 to 10.000 C_3H_8
Display	8 segment trend display
Alarm thresholds	10.000 ppm CH_4 5000 C_3H_8
Lower response thresholds	100 ppm CH_4 50 C_3H_8
t90	< 5 s
Heat-up time	60 s

Battery type	2 batteries type micro AAA 1.5 V (LR03)
Battery life	4 h (LR03)
Oper. temp.	-5 to +45 °C
Storage temp.	-20 to +50 °C
Audible emitter	85 dB(A)

testo 317-3

Ambient carbon monoxide warning

The testo 317-3 CO monitor detects the presence of carbon monoxide in the surrounding area and warns the user both visually and audibly about dangerous gas concentrations e.g. when installing and servicing gas heaters.

- 3 year warranty on CO sensor
- Visual and audible alarm
- No zero phase, instrument can be used immediately
- Adjustable alarm threshold
- CO zeroing at site

testo 317-3, testo 317-3 CO monitor incl. carrying case with belt clip, headphones, wrist strap, sampler and calibration protocol

Part no.
0632 3173

Technical data

Meas. range	0 to +1999 ppm
Accuracy ±1 digit	±10 ppm (0 to +99 ppm) ±10 % (+100 to +499 ppm) ±20 % (>+500 ppm)
Resolution	1 ppm

Oper. temp.	-5 to +45°C
Battery type	2 batteries Type AAA
Battery life	150 h (with beeper switched off)
Reaction time	40 s
Warranty	2 years on the instrument 3 years on the CO sensor

testo gas detector

Gas detector

According to DVGW leaflet G 465-4, gas detectors are approved for above-ground gas detection up to the "lower explosive limit (LEL)". Testo's gas detector is a multi-range gas detector for the gas types methane, propane and hydrogen. Gas concentrations are measured by the semi-conductor sensor in the ppm range and are shown in the display with a resolution of 1 ppm.

- Audible signals if approaching lower explosion limit
- Continuous tone and warning in display if explosion limit is reached

Gas detector incl. flexible probe extension, rechargeable battery and mains unit for mains operation and battery recharging, with calibration protocol

Part no.
0632 0323

Technical data

Display range	Methane CH_4	1 to 999 ppm, 0.1 to 4.4 vol.%
	Propane C_3H_8	1 to 999 ppm, 0.1 to 1.9 vol.%
	Hydrogen H_2	1 to 999 ppm, 0.1 to 4.0 vol.%
Resolution	1 ppm / 0.1 vol.%	
First reaction	>10 ppm	
Voltage supply	Built-in battery block, NiMH, 1600 mAh	
Ex-Protection	Sensor intrinsically-safe in accordance with DMT test institute	
Battery life	>8 h	

Reaction time	2-3 s
Oper. temp.	-15 to +40 °C
Storage temp.	-25 to +70 °C
Dimensions	190 x 40 x 28 mm
Weight	320 g
Warranty	2 years on instrument, 1 year on sensor

testo 315-2

CO warning instrument

Use testo 315-2 to check the CO level in ambient air. Even low concentrations of the highly poisonous gas are detected. In this way, you can judge whether the burner flue gases are being fully drawn off.

- Reliable warning of CO poisoning
- DVGW approval
- Adjustment of different alarm limits
- Printout with date/time and recommended value (alarm limit)
- With calibration protocol
- TopSafe, protection case for tough applications
- Quick and practical documentation of data on location, printout with date/time and recommended value (alarm limit)

testo 315-2 , CO warning instrument, with battery and calibration protocol

Part no. **0632 0317**

Accessories	Part no.
Transport and Protection	
TopSafe (protection case), with bench stand protects instrument from dirt and impact	0516 0443
Multi-function clip (for instrument with TopSafe) consisting of multi-function clip and magnetic holder	0554 0398
Case for secure storage of measuring instrument	0516 0191
Transport case (plastic) for transport and secure storage of measuring instrument and accessories	0516 3120
Printer and Accessories	
Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4 AA batteries	0554 0549
External fast charger for 1-4 AA rech. batteries, incl. 4 Ni-MH rech. batteries with individual cell charging and charge control display, incl. impulse trickle charging, integrated discharge function, with built-in international mains plug, 100-240 V, 300 mA, 50/60 Hz	0554 0610
Spare thermal paper for printer (6 rolls)	0554 0569
Spare thermal paper for printer (6 rolls), permanent ink measurement data documentation legible for up to 10 years	0554 0568
Additional Accessories and Spare Parts	
9V rech. battery for instrument instead of battery	0515 0025
Recharger for 9V rechargeable battery for external recharging of 0515 0025 battery	0554 0025
Spare particle filter (10 off) for CO flue gas probe	0554 0040
Calibration Certificates	
ISO calibration certificate/flue gas calibration points 2.5% O2; 100 and 1000 ppm CO; 800 ppm NO; 80 ppm NO2; 1000 ppm SO2	0520 0003
ISO calibration certificate/CO CO probes; calibration points 0; 80 ppm	0520 0039

Recommended set

testo 315-2, CO warning set

- CO warning instrument, with battery and calibration protocol (Part no. 0632 0317)
- TopSafe (protection case), with bench stand (Part no. 0516 0443)
- Case (Part no. 0516 0191)

Technical data

Meas. range	0 to +2000 ppm CO
Accuracy ±1 digit	±10 ppm CO (0 to +100 ppm CO) ±10% of mv (+100 to +2000 ppm CO)
Resolution	1 ppm CO
Alarm limits	50/100/500 ppm
Zero point adjustment	Automatically when switched on
Oper. temp.	+5 to +45 °C
Battery type	9V block battery
Dimensions	215 x 68 x 47 mm
Weight	400 g
Display	LCD, 2 lines
Material/Housing	ABS
Warranty	2 years

testo 315-1

Versatile CO measurement – For safety and service

testo 315-1 provides you with all the measurement functions needed to service gas heating systems. While measuring draught, pressure difference ortemperature, the instrument can also simultaneously show the CO level in ambient air. In this way, you always have the system´s safety under your watchful eye.

- Reliable CO warning
- Three alarm thresholds are freely adjustable
- Audible and visual alarm
- Automatic zero point adjustment
- Two temperature sockets to compare flow and return temperature
- Compensation of deviations in readings due to temperature
- TopSafe case protects from dirt, water and impact (optional)

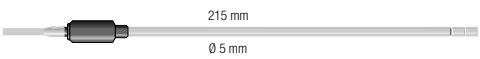
testo 315-1 , CO warning and servicing instrument for gas heating systems, with battery and calibration protocol

Part no.	
0632 0315	

Recommended set

The testo 315-1 service set with printout on-site

- CO warning and servicing instrument for gas heating systems, with battery and calibration protocol (Part no. 0632 0315)
- Pressure set with flue draught probe (Part no. 0554 3150)
- Pipe wrap probe with Velcro strip, for temperature measurement on pipes with diameter up to max. 120 mm, Tmax +120°C, TC Type K (Part no. 0628 0020)
- Pipe wrap probe with Velcro strip, for temperature measurement on pipes with diameter up to max. 120 mm, Tmax +120°C, TC Type K (Part no. 0628 0020)
- Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4 AA batteries (Part no. 0554 0549)
- TopSafe (protection case), with bench stand (Part no. 0516 0443)
- Transport case (plastic) (Part no. 0516 3120)

Weitere Fühler	Abbildung	Messbereich	Genauigkeit	t99	Best.-Nr.
Druckset mit Kaminzugsonde					0554 3150
Rohranlegefühler mit Klettband, für die Temperaturmessung an Rohren mit Durchmesser bis max. 120 mm, Tmax +120 °C, TE Typ K		-50 ... +120 °C	Klasse 1	90 sec	0628 0020

Accessories	Part no.
Transport and Protection	
TopSafe (protection case), with bench stand protects instrument from dirt and impact	0516 0443
Multi-function clip (for instrument with TopSafe) consisting of multi-function clip and magnetic holder	0554 0398
Case for secure storage of measuring instrument	0516 0191
Transport case (plastic) for transport and secure storage of measuring instrument and accessories	0516 3120
Printer and Accessories	
Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4 AA batteries	0554 0549
External fast charger for 1-4 AA rech. batteries, incl. 4 Ni-MH rech. batteries with individual cell charging and charge control display, incl. impulse trickle charging, integrated discharge function, with built-in international mains plug, 100-240 V, 300 mA, 50/60 Hz	0554 0610
Spare thermal paper for printer (6 rolls)	0554 0569
Spare thermal paper for printer (6 rolls), permanent ink measurement data documentation legible for up to 10 years	0554 0568
Additional Accessories and Spare Parts	
9V rech. battery for instrument instead of battery	0515 0025
Recharger for 9V rechargeable battery for external recharging of 0515 0025 battery	0554 0025
Calibration Certificates	
ISO calibration certificate/flue gas calibration points 2.5% O2; 100 and 1000 ppm CO; 800 ppm NO; 80 ppm NO2; 1000 ppm SO2	0520 0003
ISO calibration certificate/CO CO probes; calibration points 0; 80 ppm	0520 0039

Technical data			
Meas. range	0 to +2000 ppm CO	-200 to +200 hPa	-40 to +40 hPa
Accuracy ±1 digit	±10% of mv (+100 to +2000 ppm CO) ±10 ppm CO (0 to +100 ppm CO)	±0.5 hPa (-49.9 to +49.9 hPa) ±1.5 hPa (-200 to -50 hPa) ±1.5 hPa (+50 to +200 hPa)	±1.5% of mv (-40 to -3 hPa) ±1.5% of mv (+3 to +40 hPa) ±0.03 hPa (-2.99 to +2.99 hPa)
Resolution	1 ppm CO (0 to +2000 ppm CO)	0.1 hPa (-200 to +200 hPa)	0.01 hPa (-40 to +40 hPa)

Meas. range	-40 to +600 °C	-100 to +100 µA	
Accuracy ±1 digit	±0.5% of mv (+100 to +600 °C) ±0.5 °C (0 to +99 °C)	±3 µA (-100 to +100 µA)	
Resolution	0.1 °C (-40 to +600 °C)	1 µA (-100 to +100 µA)	

Oper. temp.	+5 to +45 °C
Storage temp.	-20 to +50 °C
Display	LCD, 2 lines
Battery type	9V block battery
Battery life	16 h
Dimensions	215 x 68 x 47 mm
Weight	400 g
Material/Housing	ABS
Warranty	2 years

testo 535

CO2 instrument with probe for HVAC fitters and engineers

testo 535, the efficient CO2 measuring instrument for measuring indoor air quality. Bad air quality in rooms can lead to tiredness, lack of concentration and illness (Sick Building Syndrome) due to high CO2 concentration (greater than 1000 ppm)

You can print the data on location with date and time on the Testo printer. The TopSafe case protects the instrument from dust, dirt and impact (optional).

- Long-term monitoring based on maximum and mean calculation
- Long-term stable 2 channel infrared sensor
- Highly accurate, highly efficient
- Repeated calibration is unnecessary

testo 535, CO2 measuring instrument with permanently attached probe, batteries and calibration protocol

Part no.
0560 5350

Accessories	Part no.
Transport and Protection	
TopSafe (protection case) with bench stand protects instrument from impact and dirt	0516 0183
Case for secure storage of measuring instrument	0516 0191
Printer and Accessories	
Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4 AA batteries	0554 0549
External fast charger for 1-4 AA rech. batteries, incl. 4 Ni-MH rech. batteries with individual cell charging and charge control display, incl. impulse trickle charging, integrated discharge function, with built-in international mains plug, 100-240 V, 300 mA, 50/60 Hz	0554 0610
Spare thermal paper for printer (6 rolls)	0554 0569
Spare thermal paper for printer (6 rolls), permanent ink measurement data documentation legible for up to 10 years	0554 0568
Additional Accessories and Spare Parts	
9V rech. battery for instrument instead of battery	0515 0025
Recharger for 9V rechargeable battery for external recharging of 0515 0025 battery	0554 0025
Desk-top power supply with international connection options	0554 1143
Calibration Certificates	
ISO calibration certificate/CO2 CO2 probes; calibration points 0; 1000; 5000 ppm	0520 0033

Technical data			
Probe type	**2 channel infrared sensor**	Measuring medium	Air
Meas. range	0 to +9999 ppm CO_2	Oper. temp.	0 to +50 °C
Accuracy ±1 digit	±(50 ppm CO_2 ±2% of mv) (0 to +5000 ppm CO_2) ±(100 ppm CO_2 ±3% of mv) (+5001 to +9999 ppm CO_2)	Storage temp.	-20 to +70 °C
		Battery type	9V block battery
		Battery life	6 h
		Dimensions	190 x 57 x 42 mm
		Weight	300 g
		Display	LCD, 2 lines
		Material/Housing	ABS
		Warranty	2 years
		Auto Off	10 min
Resolution	1 ppm CO_2		

testo 540

Pocket-sized light intensity measuring instrument

The sensor of the testo 540 is adapted to the spectral sensitivity of the eye. This makes testo ideal for the measurement of light intensity. The Hold function allows an easy readout of the measurement values. Max. and min. values are displayed at the press of a button. testo 540 is very handy, small and easy to operate.

- Sensor adapted to spectral sensitivity of the eye
- Hold function and max./min. values
- Display light
- Protective cap for safe storage
- Including wrist strap and belt holder
- Incl. calibration protocol

testo 540; light intensity measuring instrument incl. protective cap, batteries and calibration protocol

Part no.
0560 0540

Technical data	
Meas. range	0 to 99,999 Lux
Accuracy ±1 digit	±3 % (compared to reference Class B, DIN 5032 Part 7)
Resolution	1 Lux (0 to 19.999 Lux) 10 Lux (remaining range)

Measurement rate	0.5 s
Storage temp.	-40 to +70 °C
Protection class	IP40
Oper. temp.	0 to +50 °C
Battery type	2 batteries Type AAA
Battery life	200 h (average, without display illumination)
Dimensions	133 x 46 x 25 mm
Weight	95 g (incl. batteries and protective cap)
Warranty	2 years

Accessories	Part no.
Calibration Certificates	
ISO calibration certificate/light; Calibration points 0;500;1000;2000;4000 Lux	0520 0010

testo 545

Light meter with location management

In order to have good quality light, luminous intensity in the workplace, hospitals, offices or schools has to fulfill specific minimum guidelines. This can be checked using testo 545.

A location list with individual luminous intensity values can be saved and later connected to form a curve using software. This "light profile" provides information on the uniformity of the lighting.

- Multi-point or timed mean calculation
- Stores up to 99 file locations
- Logger function (3000 readings)
- Fast documentation on site on the Testo printer

testo 545, light meter, incl. probe, battery and calibration protocol

Part no.
0560 0545

Accessories	Part no.
Transport and Protection	
Transport case (plastic) for measuring instrument, probes and accessories now larger for safe and orderly storage	0516 0445
Case for secure storage of measuring instrument	0516 0191
Printer and Accessories	
Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4 AA batteries	0554 0549
External fast charger for 1-4 AA rech. batteries, incl. 4 Ni-MH rech. batteries with individual cell charging and charge control display, incl. impulse trickle charging, integrated discharge function, with built-in international mains plug, 100-240 V, 300 mA, 50/60 Hz	0554 0610
Spare thermal paper for printer (6 rolls)	0554 0569
Spare thermal paper for printer (6 rolls), permanent ink measurement data documentation legible for up to 10 years	0554 0568
Software und Zubehör	
ComSoft 3 - Professional with data management incl. database, analysis and graphics function, data analysis, trend curve	0554 0830
RS232 cable connects instrument to PC (1.8 m) for data transfer	0409 0178
Ethernet adapter, RS232 - Ethernet incl. software driver, mains unit facilitates data communication in network	0554 1711
Calibration Certificates	
ISO calibration certificate/light Calibration points 0;500;1000;2000;4000 Lux	0520 0010

Recommended set

testo 545, Comfort Set incl. printer

- testo 545, light meter, incl. probe, battery and calibration protocol (Part no. 0560 0545)
- Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4 AA batteries (Part no. 0554 0549)
- Transport case (plastic) for measuring instrument, probes and accessories (Part no. 0516 0445)

Technical data

Meas. range	0 to +100000 Lux
Accuracy ±1 digit	Accuracy to DIN 13032-1: f1 = 6% = V (Lambda) adaptation f2 = 5% = cos like rating
Resolution	1 Lux (0 to +32000 Lux) 10 Lux (0 to +100000 Lux)

Display	LCD, 4 lines
PC	RS232 interface
Conn.	Fixed cable, coiled
Memory	3000
Oper. temp.	0 to +50 °C
Storage temp.	-20 to +70 °C
Battery type	9V block battery
Battery life	50 h
Dimensions	220 x 68 x 50 mm
Weight	500 g
Material/Housing	ABS
Warranty	2 years

testo 319

Flexible fiberscope for fast diagnoses

The testo 319 fibre-glass fiberscope facilitates easy inspections at difficult-to-access points such as in air ducts, ventilators, machines and motors etc. Diagnoses such as corrosion, friction wear, condition of welding joints, loose parts and lots more can be made very early, very quickly and very easily using endoscopy.

The flexible testo 319 can be guided through hollow spaces, bore holes and bends. You can adjust the focus using the focussing wheel. In this way the damaged point can be appraised without the need for dismantling.

- Optics: 6,000 pixels with a field of view of 50°
- Low bending radius (50 mm), small diameter (6 mm)
- Stability thanks to Decabon pipe
- Gooseneck casing for medium flexibility
- 3-arm gripper: Grips small objects (optional)

testo 319	
testo 319 fiberscope	
Part no. **0632 3191**	

testo 319 set	
Fiberscope set, consisting of testo 319 fiberscope, gooseneck tube, magnet and mirror attachments, bag	
Part no. **0563 3191**	

Accessories	Part no.
Flexible push-on gooseneck tube,	0554 3196
Decabon push-on tube	0554 3191
Two-channel push-on hose	0554 3190
Mirror attachment 45° angle	0554 3194
Temperature probe for two-channel hose	0554 3193
3-arm gripper, for two-channel hose	0554 3192
Bag for basic set testo 319, gooseneck tube, magnet and mirror attachment	0516 3192

Technical data	
Number of pixels:	6,000
Fiber optical illumination field of vision:	50°
Angle field of vision:	45° +/- 5°
Min. focus distance:	15 mm (focus)
Max. focus distance:	150 mm (light)
Operating and storage temperature:	-20° to +60°C
Working temperature probe:	-20° to +80°C
Probe diameter:	6.5 mm
Probe length:	1247 mm +/- 6
Max. bend radius:	50 mm
Light source:	LED two-point lamp
Lamp life:	typically 50,000 h
Probe durability:	Probe tip waterproof up to handle
	Short-term resistant to silicone oils, gasoline and kerosene. Oils or gasoline must be wiped off immediately after immersion!
Housing:	black
Battery type:	3 AA mignon 1.5 V
	Battery life: 4 h
Warranty:	2 years. This warranty does not cover damage caused by misuse, accidents or changes made to the instrument. The warranty becomes void if the handle is opened by the user.

testo 815

Sound level measuring instrument

The ideal instrument for daily use. Whether it is for air conditioning or heating, disco noise, machine noise or noise in combustion systems, testo 815 is the ideal partner.

- Easy to adjust (adjustment screwdriver included)
- Frequency weighting in accordance with characteristic curve A and C
- Maximum and minimum value memory
- Built-in tripod knuckle screw (1/4 inch)
- Switchable time weighting Fast/Slow

testo 815, Sound level meter, incl. microphone, wind protection cap and battery

Part no.
0563 8155

Accessories	Part no.
Accessories	
Calibrator, for regular calibration of testo 815, testo 816	0554 0452
Calibration Certificates	
ISO calibration cert./sound pressure calibration points 94 dB; 104 dB; 114 dB at different frequencies	0520 0111
ISO calibration certificate sound pressure calibrators	0520 0411

Technical data

Meas. range	+32 to +130 dB
Accuracy ±1 digit	±1.0 dB
Resolution	0.1 dB

Oper. temp.	0 to +40 °C
Storage temp.	-10 to +60 °C
Battery type	9V block battery
Battery life	70 h
Weight	195 g
Dimensions	255 x 55 x 43 mm
Warranty	2 years

Section meas. ranges: 30 to 80 dB; 50 to 100 dB; 80 to 130 dB
Time weighting: FAST 125 ms setting / SLOW 1 s setting
Pressure dependency: -0.0016 dB/hPa

Technical data Sound level calibrator (0554 0452)

Battery type	9V block battery
Battery life	40 h
Warranty	2 years
Accuracy	±0.5 dB in accordance with Class 2 to IEC 60942

Sound pressure level: 94 dB(A)/104 dB(A), adjustable
Frequency: 1000 Hz
Distortion factor: less than 3%

Also suitable for 1/2 and 1 inch microphones by other manufacturers

testo 816

Sound level measuring instrument with AC/DC output for data readout

Compared to testo 815, the larger model has additional features which make it ideal for assessors, workplace measurements and for measuring industrial and environmental noise.

- Easy to adjust (adjustment screwdriver included)
- Frequency weighting in accordance with characteristic curve A and C
- Maximum and minimum value memory
- Built-in tripod knuckle screw (1/4 inch)
- Switchable time weighting Fast/Slow
- Automatic range switchover
- Backlit display
- Mains unit connection
- Bar graph display
- AC output for connecting recorders and amplifiers
- DC output with 10 mV/dB for connecting recorders or data loggers

testo 816, Sound level meter, incl. microphone, wind protection cap, battery, stereo jack 3.5 mm, in a practical measurement case

Part no.
0563 8165

Accessories	Part no.
Accessories	
Calibrator, for regular calibration of testo 815, testo 816	0554 0452
Plug mains unit 8V DC, 1000 mA with exchangeable plugs	0554 1094
Calibration Certificates	
ISO calibration cert./sound pressure calibration points 94 dB; 104 dB; 114 dB at different frequencies	0520 0111
ISO calibration certificate sound pressure calibrators	0520 0411

Technical data	
Meas. range	+30 to +130 dB 31.5 Hz to 8 kHz
Accuracy ±1 digit	±1.0 dB
Resolution	0.1 dB

Oper. temp.	0 to +40 °C
Storage temp.	-10 to +60 °C
Battery type	9V block battery
Battery life	50 h
Weight	315 g
Dimensions	309 x 68 x 50 mm
Warranty	2 years

Section meas. ranges: 30 to 80 dB; 50 to 100 dB; 80 to 130 dB
Time weighting: FAST 125 ms setting / SLOW 1 s setting
Pressure dependency: -0.0016 dB/hPa

Technical data Sound level calibrator (0554 0452)

Battery type	9V block battery
Battery life	40 h
Warranty	2 years
Accuracy	±0.5 dB in accordance with Class 2 to IEC 60942

Sound pressure level: 94 dB(A)/104 dB(A), adjustable
Frequency: 1000 Hz
Distortion factor: less than 3%

Also suitable for 1/2 and 1 inch microphones by other manufacturers

testo 435

All-round talent for ventilation and Indoor Air Quality

All measurement parameters for air conditioning

The testo 435 provides the possibility of analysing the indoor air. On the one hand, this serves as an indicator for the well-being of people at their workplaces, and on the other hand as an important and deciding factor in storage and production processes.

In addition to this, the Indoor Air Quality signals whether the air conditioning system (HVAC) is working with as much energy economy as possible, or whether it needs to be adjusted with the help of testo 435.

The parameters CO_2, relative humidity and room temperature are available for evaluating the quality of the air. Absolute pressure, draught, Lux, U-value and surface temperature can additionally be determined. In order to determine the volume flow, all the possibilities of flow velocity measurement are available, such as thermal probes, vane anemometers and Pitot tubes.

Versatility with wireless probes

In addition to classical probes on wires, a wireless measurement up to a distance of 20 m (without obstruction) is possible. Damage to the wire or hindrances in usage are thus eliminated. A maximum of three wireless probes can be recorded and displayed with testo 435. The wireless probes are for the measurement parameters temperature and, depending on the instrument type, humidity. The optional, easily plugged-in radio module can be retrofitted at any time.

Common product advantages testo 435

- ·Wide selection of probes:
  - IAQ probe for evaluating the indoor air quality via CO_2, air temperature, indoor air humidity and absolute pressure
  - Thermal probe with integrated temperature and air humidity measurement
  - Vane and hot wire probes
  - Radio probes for temperature
- Easy operation with user profiles
- Printout on the testo printer

Further product advantages of the variants

- Integrated differential pressure measurement (435-3/-4, not retrofittable)
  - for flow measurement
  - for monitoring filters
- Extended instrument function (435-2/-4, not retrofittable)
  - Instrument store for 10,000 readings
  - PC software for analysing, archiving and documenting measurement data
  - Humidity probes with radio or wire
  - Lux probe connection possible
  - Comfort level probe connection possible
  - U-value probe connection possible

testo 435-1	testo 435-2	testo 435-3	testo 435-4
testo 435-1, multi-functional meas. instr., for A/C, ventilation and Indoor Air Quality, with battery and calibration protocol	testo 435-2, multi-functional measuring instrument for A/C, ventilation and Indoor Air Quality with readings memory, PC software and USB data transmission cable, incl. battery and calibration protocol	testo 435-3, multi-functional measuring instrument with built-in differential pressure measurement for air conditioning, ventilation and Indoor Air Quality, with battery and calibration protocol	testo 435-4, multi-functional meas. instr. with built-in differential pressure measurement for A/C, ventilation and Indoor Air Quality with readings memory, PC software and USB data transmission cable, with battery and calibration protocol
Part no. 0560 4351	Part no. 0563 4352	Part no. 0560 4353	Part no. 0563 4354

435-1/-2/-3/-4 Probes

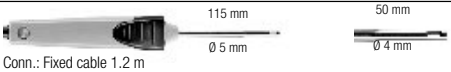
435-1/-2/-3/-4

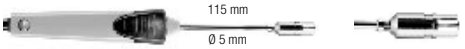
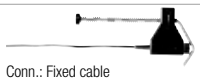
IAQ probes	Illustration	Meas. range	Accuracy	Part no.
IAQ probe to assess Indoor Air Quality, CO_2, humidity, temperature and absolute pressure measurement, with desk-top stand		0 to +50 °C 0 to +100 %RH 0 to +10000 ppm CO_2 +600 to +1150 hPa	±0.3 °C ±2 %RH (+2 to +98 %RH) ±(50 ppm CO_2 ±2% of mv) (0 to +5000 ppm CO_2) ±(100 ppm CO_2 ±3% of mv) (+5001 to +10000 ppm CO_2) ±3 hPa	0632 1535
Ambient CO probe, for detecting CO in buildings and rooms		0 to +500 ppm CO	±5% of mv (+100.1 to +500 ppm CO) ±5 ppm CO (0 to +100 ppm CO)	0632 1235

Flow probe	Illustration	Meas. range	Accuracy	Part no.
Thermal velocity probe with built-in temperature and humidity measurement, Ø 12 mm, with telescopic handle (max. 745 mm)		-20 to +70 °C 0 to +100 %RH 0 to +20 m/s	±0.3 °C ±2 %RH (+2 to +98 %RH) ±(0.03 m/s +4% of mv)	0635 1535
Vane meas. probe, 16 mm diameter, with telescopic handle max. 890 mm, e.g. for meas. in ducts, can be used from 0 to +60 °C		+0.6 to +40 m/s Oper. temp. 0 to +60 °C	±(0.2 m/s +1.5% of mv)	0635 9535
Vane meas. probe, 60 mm diameter, with telescopic handle max. 910 mm, e.g. for meas. at duct exit, can be used from 0 to +60 °C		+0.25 to +20 m/s Oper. temp. 0 to +60 °C	±(0.1 m/s +1.5% of mv)	0635 9335
Hot wire probe for m/s and °C, Ø probe head 7.5 mm, with telescopic handle (max. 820 mm)		0 to +20 m/s -20 to +70 °C	±(0.03 m/s +5% of mv) ±0.3 °C (-20 to +70 °C)	0635 1025

Funnel measurement	Illustration	Meas. range	Accuracy	Part no.
Vane meas. probe, 100 mm diameter, for measurements with funnel set 0563 4170		+0.3 to +20 m/s	±0.5 °C	0635 9435
Funnel set consisting of funnel for disc outlets (Ø 200) and funnel for ventilator (330 x 330 mm) for in- and outgoing air				0563 4170

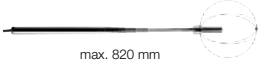
Absolute pressure probes	Illustration	Meas. range	Accuracy	Part no.
Absolute pressure probe 2000 hPa		0 to +2000 hPa	±5 hPa	0638 1835

Air probes	Illustration	Meas. range	Accuracy	t99	Part no.
Efficient, robust NTC air probe	 Conn.: Fixed cable 1.2 m	-50 to +125 °C	±0.2 °C (-25 to +80 °C) ±0.4 °C (remaining range)	60 s	0613 1712

Surface probes	Illustration	Meas. range	Accuracy	t99	Part no.
Fast-action surface probe with sprung thermocouple strip, also for uneven surfaces, measurement range short-term to +500°C, TC Type K	 Conn.: Fixed cable	-60 to +300 °C	Class 2*	3 s	0602 0393
Pipe wrap probe for pipe diameter 5 to 65 mm, with exchangeable measuring head. Meas. range short-term to +280°C, TC Type K	 Conn.: Fixed cable	-60 to +130 °C	Class 2*	5 s	0602 4592
Clamp probe for measurements on pipes, pipe diameter 15 to 25 mm (max. 1"), meas. range short-term up to +130°C, TC Type K	 Conn.: Fixed cable	-50 to +100 °C	Class 2*	5 s	0602 4692
Temperature probe to determine U-value, triple sensor system for measuring wall temperature, modelling clay included		-20 to +70 °C	Class 1±0.1 ±2% of mv		0614 1635

Immers./penetr. probes	Illustration	Meas. range	Accuracy	t99	Part no.
Waterproof immersion/penetration probe, TC Type K	 Conn.: Fixed cable 1.2 m	-60 to +400 °C	Class 2*	7 s	0602 1293

435-2/-4

IAQ probes	Illustration	Meas. range	Accuracy	Part no.
Comfort level probe for degree of turbulence measurement with telescopic handle (max. 820 mm) and stand, meets EN 13779 requirements		0 to +50 °C 0 to +5 m/s	±0.3 °C ±(0.03 m/s +4% of mv)	0628 0109
Lux probe, for measuring light intensity			Accuracy to DIN 5032, Part 6: f1 = 6% = V(Lambda) adjustment f2 = 5% = cos-like weighting, Class C	0635 0545

Humidity probes	Illustration	Meas. range	Accuracy	Part no.
Humidity/temperature probe		-20 to +70 °C 0 to +100 %RH	±0.3 °C ±2 %RH (+2 to +98 %RH)	0636 9735

435-3/-4

Prandtl's Pitot tubes	Illustration	Oper. temp.	Part no.
Pitot tube, 350 mm long, stainless steel, measures flow in combination with pressure probes		-60 to +400 °C	0635 2145
Pitot tube, 500 mm long		0 to +600 °C	0635 2045
Pitot tube, 1000 mm long		0 to +600 °C	0635 2345

*According to standard EN 60584-2, the accuracy of Class 2 refers to -40 to +1200 °C.

Technical data

Probe type	NTC	Type K	Type T	Testo humid. sensor, cap.	Vane	Hot wire	Absolute pressure probe	CO_2 (IAQ probe)
Meas. range	-50 to +150 °C	-200 to +1370 °C	-200 to +400 °C	0 to +100 %RH	0 to +60 m/s	0 to+20 m/s	0 to +2000 hPa	0 to +10000 ppm CO_2
Accuracy ±1 digit	±0.2 °C (-25 to +74.9 °C) ±0.4 °C (-50 to -25.1 °C) ±0.4 °C (+75 to +99.9 °C) ±0.5% of mv (remaining range)	±0.3 °C (-60 to +60 °C) ±(0.2 °C +0.3% of mv) (remaining range)	±0.3 °C (-60 to +60 °C) ±(0.2 °C +0.3% of mv) (remaining range)	See probe data	See probe data	See probe data	See probe data	See probe data
Resolution	0.1 °C	0.1 °C	0.1 °C	0.1 %RH	0.01 m/s (60 vane) 0.1 m/s (16 vane)	0.01 m/s	0.1 hPa	1 ppm CO_2

Technical data 435-2/-4

Probe type	Lux
Meas. range	0 to +100000 Lux
Accuracy ±1 digit	See probe data
Resolution	1 Lux / 0.1 Hz

Technical data 435-3/-4

Probe type	Differential pressure probe, internal
Meas. range	0 to +25 hPa
Accuracy ±1 digit	±0.02 hPa (0 to +2 hPa) 1% of mv (remaining range)
Overload	200 hPa
Resolution	0.01 hPa

Oper. temp.	-20 to +50 °C
Storage temp.	-30 to +70 °C
Dimensions	220 x 74 x 46 mm
Battery type	Alkali manganese, mignon, Type AA
Battery life	200 h (typical vane measurement)
Weight	450 g
Material/Housing	ABS/TPE/Metal
Warranty	2 years

Accessories	Part no.
Transport and Protection	
Service case for basic equipment of measuring instrument and probes, dimensions: 400 x 310 x 96 mm	0516 0035
Service case for measuring instrument, probe and accessories, dimensions 520 x 380 x 120 mm	0516 0435
Additional Accessories and Spare Parts	
Handle for attachable humidity probe head for connection to testo 635, incl. probe wire, for measurement / calibration of humidity probe head	0430 9735
Lithium battery button cellCR2032 mignon type battery for radio handle	0515 0028
Plug-in mains adapter, 5 VDC 500 mA with European adapter, 100-250 VAC, 50-60 Hz	0554 0447
testovent 410, volume flow funnel, Ø 340 mm/330x330 mm, incl. case	0554 0410
testovent 415, volume flow funnel, Ø 210 mm/210x210 mm, incl. case	0554 0415
Funnel set consisting of funnel for disc outlets (Ø 200) and funnel for ventilator (330 x 330 mm) for in- and outgoing air	0563 4170
Connection hose, silicone, 5m long, max. load 700 hPa (mbar)	0554 0440
testo saline pots for control and humidity adjustment of humidity probes, 11.3 %RH and 75.3 %RH with adapter for humidity probe, quick checks or calibration of humidity probe	0554 0660
Sintered PTFE filter, Ø 12 mm, for corrosive media, High humidity range (long-term measurements), high flow velocities.	0554 0756
Stainless steel sintered cap, Ø 12 mm, is screwed onto humidity probe, for measurements at higher flow velocities or in contaminated air	0554 0647
Adhesive material for fixing and sealing	0554 0761

Accessories	Part no.
Printer and Accessories	
Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4 AA batteries, for printing out measurements on site	0554 0549
Spare thermal paper for printer (6 rolls), permanent ink, measurement data documentation legible for up to 10 years	0554 0568
Spare thermal paper for printer (6 rolls)	0554 0569
External fast charger for 1-4 AA rech. batteries, incl. 4 Ni-MH rech. batteries with individual cell charging and charge control display, incl. impulse trickle charging, integrated discharge function, with built-in international mains plug, 100-240 V, 300 mA, 50/60 Hz	0554 0610
Calibration Certificates	
ISO calibration certificate/temperature, meas. instr. with surface probe; calibration points +60°C; +120°C; +180°C	0520 0071
ISO calibration certificate humidity, Calibration points 11.3 %RH and 75.3 %RH at +25°C	0520 0006
ISO calibration certificate/pressure differential pressure; 5 points distributed over meas. range	0520 0005
ISO calibration certificate velocity, hot wire, vane anemometer; calibration points 0.5; 0.8; 1; 1.5 m/s	0520 0024
ISO calibration certificate velocity, hot wire, vane anemometer, Pitot tube; calibration points 1; 2; 5; 10 m/s	0520 0004
ISO calibration certificate/Velocity, hot wire, vane anemometer, Pitot tube; calibration points 5; 10; 15; 20 m/s	0520 0034
ISO calibration certificate/light, Calibration points 0;500;1000;2000;4000 Lux	0520 0010
ISO calibration certificate/CO2, CO2 probes; calibration points 0; 1000; 5000 ppm	0520 0033

435-1/-2/-3/-4

Radio module for upgrading measuring instrument with radio option

Country versions	Radio freq.	Part no.
Radio module for measuring instrument, 869.85 MHz, approval for the countries: DE, FR, UK, BE, NL, ES, IT, SE, AT, DK, FI, HU, CZ, PL, GR, CH, PT, SI, MT, CY, SK, LU, EE, LT, IE, LV, NO	869.85 MHz FSK	0554 0188
Radio module for measuring instrument, 915.00 MHz FSK, approval for USA, CA, CL	915.00 MHz FSK	0554 0190

Assembled for you: Radio handles with probe head

Radio handles with probe head for surface measurement		Meas. range	Accuracy	Resolution	t 99 5 s
Radio handle for attachable probe heads with T/C probe head for surface measurement		-50 to +350 °C Short-term to +500 °C	Radio handle: ±(0.5 °C +0.3% of mv) (-40 to +500 °C) ±(0.7 °C +0.5% of mv) (remaining range) T/C probe head: Class 2	0.1 °C (-50 to +199.9 °C) 1.0 °C (remaining range)	

Country versions	Radio freq.	Part no.
Radio handle for plug-in probe heads, incl. T/C adapter, approval for the countries: DE, FR, UK, BE, NL, ES, IT, SE, AT, DK, FI, HU, CZ, PL, GR, CH, PT, SI, MT, CY, SK, LU, EE, LT, IE, LV, NO	869.85 MHz FSK	0554 0189
Radio immersion/penetration probes, T/C probe head for surface measurement, attachable to radio handle, T/C Type K		0602 0394
Radio handle for plug-in probe heads, incl. T/C adapter, approval for USA, CA, CL	915.00 MHz FSK	0554 0191
T/C probe head for surface measurement, attachable to radio handle, T/C Type K		0602 0394

435-2/-4

Radio probes incl. humidity probe head		Meas. range	Accuracy	Resolution
Radio handle for attachable probe heads with humidity probe head		0 to +100 %RH -20 to +70 °C	±2 %RH (+2 to +98 %RH) ±0.3 °C	0.1 %RH 0.1 °C

Country versions	Radio freq.	Part no.
Radio handle for plug-in probe heads, incl. T/C adapter, approval for the countries: DE, FR, UK, BE, NL, ES, IT, SE, AT, DK, FI, HU, CZ, PL, GR, CH, PT, SI, MT, CY, SK, LU, EE, LT, IE, LV, NO	869.85 MHz FSK	0554 0189
Humidity probe head, attachable to radio handle		0636 9736
Radio handle for plug-in probe heads, incl. T/C adapter, approval for USA, CA, CL	915.00 MHz FSK	0554 0191
Humidity probe head, attachable to radio handle		0636 9736

Radio probes: General technical data

	Radio handle					
Battery type	2 AAA micro batteries		Measuring rate	0.5 s or 10 s, adjustable on handle	Radio transmission	Unidirectional
Battery life	215 h (meas. rate 0.5 s) 6 months (meas. rate 10 s)		Radio coverage	Up to 20 m (without obstructions)	Oper. temp.	-20 to +50 °C
Protection class	IP54				Storage temp.	-40 to +70 °C

Testo fast printer

The universal printer with infrared interface saves you time since it saves the print data prior to printing. Data transfer is completed within 2 seconds. The instrument is then immediately ready for operation.

The readings are saved black on white with date and time.

Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4 AA batteries

Part no.	
0554 0549	

Universal infrared printer

- System compatibility with other Testo measuring instruments (also downward compatibility)
- Fast data transfer, the measuring instrument is ready for use again within 2 sec.
- Fast print function thanks to newest line printer
- Energy-saving Auto-off/Wake-up function
- Testo design with integrated magnetic plate
- Robust housing (adapted to testo 327)
- Mains operation possible (same mains unit as for testo 327/330)

Technical data			
Printer type	infrared-controlled thermal printer, adjustable contrast, graphic-capable	Oper. temp.	0 to +50 °C
		Storage temp.	-40 to +60 °C
		Power supply	4 AA batteries 1.5 V (or rechargeables) Mains unit GV/1.2A
Reception radius	max. 2 m	Weight	430 g
Dimensions	147 x 77 x 47 mm		

Accessories	Part no.
Spare thermal paper for printer (6 rolls)	0554 0569
Spare thermal paper for printer (6 rolls), permanent ink, measurement data documentation legible for up to 10 years	0554 0568
External fast charger for 1-4 AA rech. batteries, incl. 4 Ni-MH rech. batteries with individual cell charging and charge control display, incl. impulse trickle charging, integrated discharge function, with built-in international mains plug, 100-240 V, 300 mA, 50/60 Hz	0554 0610

Ethernet adapter

The Ethernet adapter enables the following:

- On-site measurements, e.g. in production, storage halls, Incoming Goods
- Measuring instrument remains on site, transport not necessary
- Data inspection from office or administration
- Centralised filing of measurement data

Ethernet offers:

- Fast transmission of readings
- Use of an existing network without additional cabling
- Long transmission distances
- Identification of measuring instruments in system networks

Ethernet adapter, RS232 - Ethernet incl. software driver, mains unit facilitates data communication in network (not for use in Ex-zone)

Part no.
0554 1711

Access Ethernet with testo measuring instruments

Multi-point checks on site

Testo's portable measuring instruments are used in production or in Incoming Goods to take spot checks on site. Using an Ethernet adapter, measurement data can be transmitted immediately to a central office which enables fast reaction times, if further actions are required.

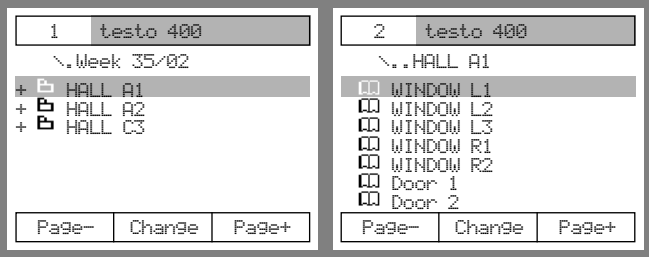
Accessories	Part no.
System accessories: testo 400, testo 650, testo 950	
ComSoft 3 - Professional with data management, incl. database, analysis and graphics function, data analysis, trend curve	0554 0830
RS232 cable, connects instrument to PC (1.8 m) for data transfer	0409 0178

Technical data			
Dimensions	45 x 48 x 14 mm	Management and software configuration	Internet browser e.g. from Netscape or Microsoft Telnet
Oper. temp.	+0 to +70 °C		
Software	Microsoft Windows 2000 / NT 4.0 / ME / 98 / 95	Interface	Serial interface on computer board with terminal program Provision of a local virtual COM port (Windows systems)
Power supply	Mains unit, 5 volt approx. 230 mA		
Humidity class	F to DIN 40040		
EMC	Radio interference and interference resistance		
Interface	25 pin RS 232 connection with 25/9 pin adapter		
Logs	TCP/IP, LPR, Telnet, SNMP, DHCP DDNS, ARP, BOOTP, ICMP		

structure - measure - print on-site

Structuring measurement data:

- Readings can be saved at individual locations – with guarantee of refinding.
- The “tree structure” – folders, sub-folders and measurement protocols – guarantees an uncomplicated overview.
- Practical additional information such as measurement information or required value input can be saved with the location.
- The locations can be selected via barcode labels using the pen.
- It is easy to draw an effective tour plan using the locations list.



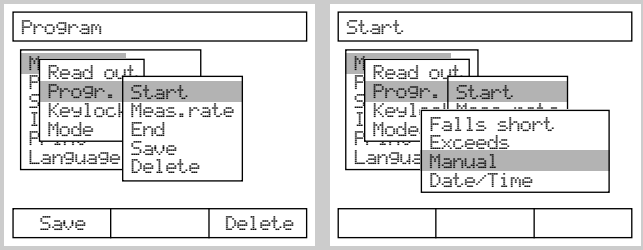
Long-term control made easy:

User-friendly data logging, not only for spot checks

- **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.

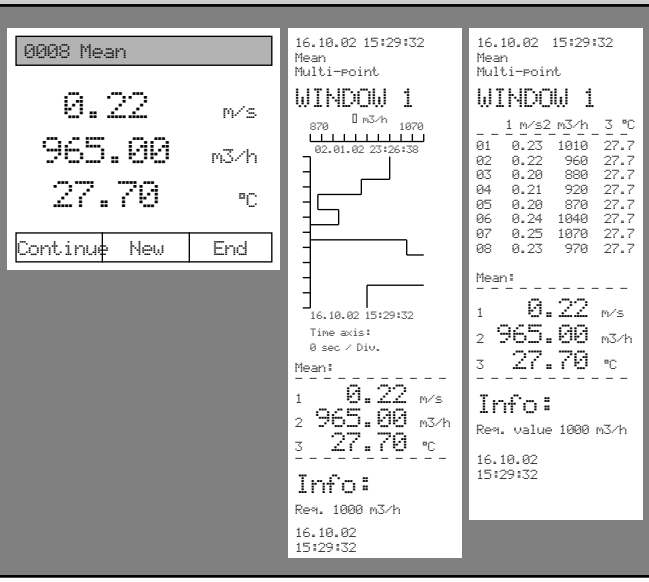
- **The measurement is completed when...**
  - the predefined number of readings is reached.
  - date/time is reached.
  - the memory is full.
  - ended manually.

- **Non-stop measurement via wrap-around memory...**
  - deletes the oldest respective value.
  - is deactivated manually.



Documentation on-site:

- Individual measurement protocol can be either saved or deleted following analysis.
- Printer immediately supplies the documentation required.
- Attachable comfort printer also offers graphical analysis options.
- Thermal paper for long-term legible measurement data documentation for up to 10 years.

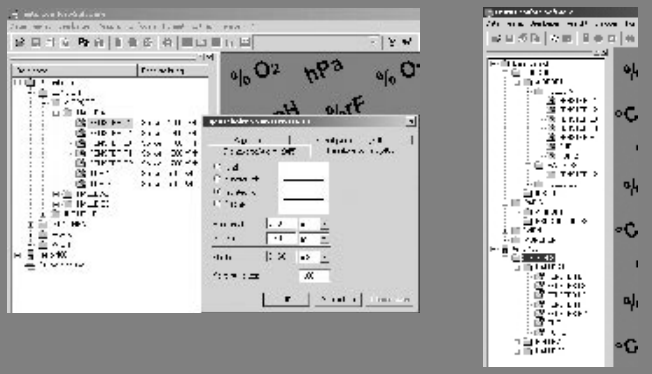


Use ComSoft 3 software on measurements to:

prepare - analyse - file - document

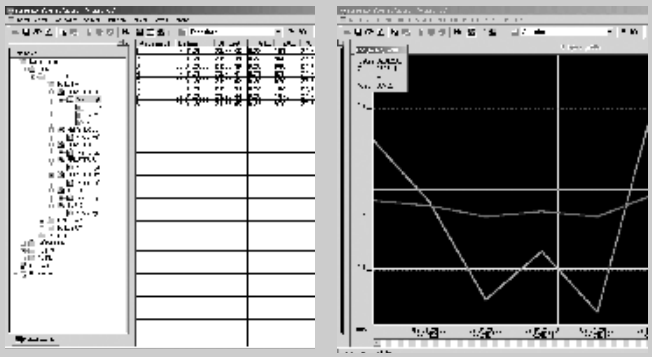
Easy reading management:

- Preparation of the measurement:
  - The measurement program is determined and loaded into instrument
  - Tour plan is drawn up based on locations and is loaded into instrument.
- The measuring instrument is downloaded once measuring is complete:
  - The saved protocols are conveniently filed via the software using "Drag & Drop" or are analysed in Data.
- The readings are determined using the measuring instrument and can also be displayed online using the software.



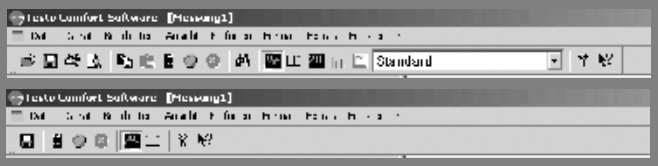
Comprehensive analysis, easy filing:

- Analysis:
  - with calculation functions
  - with crosshairs
  - with mean calculation
  - with calculation of standard deviation
  - taking all conventional refrigerants into consideration (refrigeration module, optional)
- Display:
  - as table or as graphic
  - 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 transferred to Excel table using "Drag and Drop".



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.
- Menu can be individually tailored to your needs.



ComSoft 3 - Professional for:

- **testo 545 monitoring instrument**
- **testo 400 reference measuring instruments**

ComSoft 3 - Professional with data management
incl. database, analysis and graphics function, data analysis, trend curve

Part no.	
0554 0830	

Accessories	Part no.
RS232 cable connects instrument to PC (1.8 m) for data transfer	0409 0178

testo 400

The reference measuring instrument for A/C and ventilation systems

Precision reference class measuring instruments have everything the professional user needs to complete complicated measurement tasks efficiently, accurately and conveniently.

testo 400 includes the parameters temperature, CO2, rpm, current, voltage, relative humidity, pressure, velocity and volume flow.

Intelligent electronics ensure the latest technology is used thanks to software updates. The measuring instrument can always keep up with the measurement tasks at hand thanks to upgrades.

Upgradable and teachable, highly reliable and of the highest quality - they are the properties which guarantee that the customer is equipped for the future.

Useful instument functions:

- System accuracy up to 0.05 °C and up to a resolution of 0.001 °C
- All functions of testo 650 and testo 950
- Input of cross-sections for volume flow calculation
- Absolute pressure compensation in thermal probes
- Density calculation for velocity measurement with reference to temperature, humidity and absolute pressure
- Turbulence degree measurement to EN 13779
- Assessment of volume flow measurements with calculation of total uncertainty of measurement in accordance with EN 12599 with VAC module

- VAC module for evaluating the measurement directly on site with integrated inacurracy calculation
- Clear graphics display
- 3 user defined function buttons
- Save up to max. 500,000 readings) or print at the touch of a button
- Mains connection/quick battery recharge
- Attachable printer (optional)
- Prints readings on site in a matter of seconds
- Data communication via PC
- User friendly operation with cursor via menu structure
- Integrated reading memory for up to 500,000 readings

Attachable printerReadings can be printed on-site in the matter of seconds

Clear graphics display

Data communication by PC, barcode reader

3 user-defined function buttons

Saves or prints at the touch of a button

Easy operation with cursor

Power connection/quick battery recharge

2 user-defined probe sockets

testo 400

testo 400, multi-functional measuring instrument, incl. measurement value store up to 500,000 readings, VAC-module (determination of volume flow with error calculation), battery, Li-cell and calibration protocol

Can be used for:
- **Velocity, volume flow**
- **Humidity, pressure**
- **Temperature**
- **CO_2, rpm and current/voltage**

Part no.
0563 4001

Recommended set

Set for inspecting laboratory fume cupboards

- testo 400, multi-functional measuring instrument, incl. measurement value store up to 500,000 readings, VAC-module (determination of volume flow with error calculation), battery, Li-cell and calibration protocol (Part no. 0563 4001)
- Mains unit 230 V/ 8 V/ 1 A, for instrument (European plug) (Part no. 0554 1084)
- Rech. batt. set for instr. (2 rech. 2.4V/1100mAh) (Part no. 0554 0196)
- Thermal anemometer probe, Ø 10 mm, w. telescopic handle, measures air flow in lab fume cupboards to DIN EN 14175 (Part no. 0635 1047)
- Standard ambient air probe up to +70°C (Part no. 0636 9740)
- Pressure probe, 2000 hPa, measures absolute pressure, in robust metal housing with impact protection, incl. quick-closing coupling (M8 x 0.5), magnet for fast attachment (Part no. 0638 1847)
- Precision pressure probe, 100 Pa, in robust metal housing with impact protection, incl. magnet for fast attachment, to measure differential pressure and flow speeds (in combination with Pitot tube) (Part no. 0638 1347)
- Cable, 1.5 m long, connects probe with plug-in head to meas. instrument (Part no. 0430 0143)
- Comfort level probe for measuring degree of turbulence, with telescopic handle and stand. Fulfills EN 13779 requirements (Part no. 0628 0009)

We recommend:

ComSoft 3 - Professional with data management incl. database, analysis and graphics function, data analysis, trend curve	0554 0830
RS232 cable connects instrument to PC (1.8 m) for data transfer	0409 0178
Attachable printer (securely attached) including 1 roll of thermal paper and batteries	0554 0570
SoftCase (protects instrument from impact) 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 (aluminium) for measuring instrument, probes and accessories probes in lid make it easy to find parts in case	0516 0410
DAkkS calibration certificate/velocity for laboratory fume cupboard probe (Successor organization of the DKD)	
ISO calibration certificate/velocity for laboratory fume cupboard probe	

testo 400 — Recommended Sets and Accessories

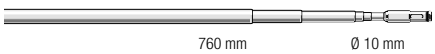
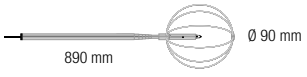
Recommended set	
The pro set for assessing workplaces subjected to heat	
- testo 400, multi-functional measuring instrument, incl. measurement value store up to 500,000 readings, VAC-module (determination of volume flow with error calculation), battery, Li-cell and calibration protocol (Part no. 0563 4001) - Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case (Part no. 0635 8888) - Attachable printer (securely attached) including 1 roll of thermal paper and batteries (Part no. 0554 0570) - ISO calibration certificate/temperature (Part no. 0520 0181)	
We recommend:	
ISO calibration certificate/temperature for air/immersion probes, calibration points -8°C; 0°C; +40°C	0520 0181
testo 400, the Pro set for comfort level meas. & occupational safety/health	
- testo 400, multi-functional measuring instrument, incl. measurement value store up to 500,000 readings, VAC-module (determination of volume flow with error calculation), battery, Li-cell and calibration protocol (Part no. 0563 4001) - Comfort level probe for measuring degree of turbulence, with telescopic handle and stand. Fulfills EN 13779 requirements (Part no. 0628 0009) - Attachable printer (securely attached) including 1 roll of thermal paper and batteries (Part no. 0554 0570)	
We recommend:	
CO2 probe measures indoor air quality and monitors the workplace. With plug-in head, connection cable 0430 0143 or 0430 0145 required	0632 1240
Cable, 1.5 m long, connects probe with plug-in head to meas. instrument PUR coating material	0430 0143
Standard ambient air probe up to +70°C Measures all physical parameters in the psychrometric chart	0636 9740
Quick-action surface probe with sprung thermocouple strip, measuring range short-term to +500 °C	0604 0194
Cable, 1.5 m long, connects probe with plug-in head to meas. instrument PUR coating material	0430 0143

Accessories	Part no.
Accessories for measuring instrument	
Rech. batt. set for instr. (2 rech. 2.4V/1100mAh) selected for quick recharging in instrument	0554 0196
Mains unit 230 V/ 8 V/ 1 A, for instrument (European plug) for mains operation and battery recharging	0554 1084
Lithium battery button cellCR2032 mignon type battery for radio handle	0515 0028
Printer and Accessories	
Attachable printer (securely attached) including 1 roll of thermal paper and batteries	0554 0570
Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4 AA batteries	0554 0549
Fast testo 575 printer, incl. 1 roll of thermal paper and batteries infrared thermal line printer with graphics function	0554 1775
External fast charger for 1-4 AA rech. batteries, incl. 4 Ni-MH rech. batteries with individual cell charging and charge control display, incl. impulse trickle charging, integrated discharge function, with built-in international mains plug, 100-240 V, 300 mA, 50/60 Hz	0554 0610
Spare thermal paper for printer (6 rolls)	0554 0569
Spare thermal paper for printer (6 rolls), permanent ink measurement data documentation legible for up to 10 years	0554 0568
Label thermal paper (Testo patent) for testo 575 printer (6 rolls), can be applied directly	0554 0561
SoftCase for instrument and printer	
SoftCase (protects instrument from impact) 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
Software and Accessories	
ComSoft 3 - Professional with data management incl. database, analysis and graphics function, data analysis, trend curve	0554 0830
RS232 cable connects instrument to PC (1.8 m) for data transfer	0409 0178
Ethernet adapter, RS232 - Ethernet incl. software driver, mains unit facilitates data communication in network	0554 1711
System case	
System case (plastic) for measuring instrument, probes and accessories probes in lid make it easy to find parts in case (540 x 440 x 130 mm)	0516 0400
System case (aluminium) for measuring instrument, probes and accessories probes in lid make it easy to find parts in case	0516 0410

Calibration Certificates	Part no.
Calibration certificates/temperature	
ISO calibration certificate/temperature for air/immersion probes, calibration points -18°C; 0°C; +60°C	0520 0001
ISO calibration certificate/temperature Meas. instr. with air/immersion probe; cal. points 0°C; +150°C; +300°C	0520 0021
ISO calibration certificate/temperature meas. instr. with surface probe; calibration points +60°C; +120°C; +180°C	0520 0071
DAkkS calibration certificate/temperature* meas. instr. with air/immersion probe; calibration points -20°C; 0°C; +60°C	0520 0211
DAkkS calibration certificate/temperature* contact surface temperature probes; calibration points +100°C; +200°C; +300°C	0520 0271
Calibration certificates/humidity	
ISO calibration certificate/humidity cal. points freely selectable from 5 to 95%RH at +15 to +35°C or at -18 to +80°C	0520 0106
ISO calibration certificate humidity Calibration points 11.3 %RH and 75.3 %RH at +25°C	0520 0006
ISO calibration certificate dewpoint two adjustment points -10/-40 °Ctd at 6 bar	0520 0136
ISO calibration certificate/humidity saturated saline solutions: calibration point 11.3%RH	0520 0013
ISO calibration certificate/humidity saturated saline solutions, calibration point 75.3%RH	0520 0083
DAkkS calibration certificate/humidity* electronic hygrometers; calibration points 11.3%RH and 75.3%RH at +25°C	0520 0206
DAkkS calibration certificate/humidity* cal. points freely selectable from 5 to 95%RH at +25°C or -18°C to +70°C	0520 0216
DAkkS calibration certificate/humidity* saturated saline solutions; calibration point 11.3%RH	0520 0213
DAkkS calibration certificate/humidity* saturated saline solutions; calibration point 75.3%RH	0520 0283

Calibration Certificates	Part no.
Calibration certificates/pressure	
ISO calibration certificate/pressure differential pressure; 5 points distributed over meas. range	0520 0005
DAkkS calibration certificate/pressure* diff. and pos. pressure; 6 meas. points distributed over meas. range (>0.6% of fsv)	0520 0225
ISO calibration certificate/pressure differential pressure, accuracy 0.1 to 0.6 (% of fsv)	0520 0025
DAkkS calibration certificate/pressure* diff. and pos. pressure; 11 measuring points distributed over the instr. meas. range	0520 0215
ISO calibration certificate/absolute pressure, 5 measurement points distributed over meas. range absolute pressure, accuracy 0.1 to 0.6 (% of fsv)	0520 0125
DAkkS calibration certificate/pressure* absolute pressure; 11 measuring points distributed over meas. range	0520 0212
Calibration certificates/velocity	
ISO calibration certificate/velocity all velocity probes, calibration points selectable from 0.3 to 50 m/s at +25°C	0520 0104
ISO calibration certificate velocity hot wire, vane anemometer, Pitot tube; calibration points 1; 2; 5; 10 m/s	0520 0004
ISO calibration certificate/Velocity hot wire, vane anemometer, Pitot tube; calibration points 5; 10; 15; 20 m/s	0520 0034
ISO calibration certificate velocity hot wire, vane anemometer; calibration points 0.5; 0.8; 1; 1.5 m/s	0520 0024
DAkkS calibration certificate/velocity* hot wire, vane anemometer; calibration points 0.5; 1; 2; 5; 10 m/s	0520 0244
DAkkS calibration certificate/velocity* hot wire, vane anemometer, Pitot tube; calibration points 2; 5; 10; 15; 20 m/s	0520 0204
DAkkS calibration certificate/velocity* hot wire anemometer; calibration points 0.1; 0.2; 0.5; 0.8; 1 m/s	0520 0224

*Successor organization of the DKD

Probe examples testo 400	Illustration	Meas. range	Accuracy	Part no.
Globe thermometer to measure radiant heat		0 to +120 °C	±0.5 °C (0 to +49.9 °C) ±1 °C (+50 to +120 °C) Accuracy corresponds to ISO 7243, ISO 7726, DIN EN 27726, DIN 33403 requirements	0554 0670
Thermal anemometer probe, Ø 10 mm, w. telescopic handle, measures air flow in lab fume cupboards to DIN EN 14175		0 to +5 m/s 0 to +50 °C	±(0.02 m/s ±5% of mv) (0 to +5 m/s)	0635 1047
Ambient CO probe, for detecting CO in buildings and rooms		0 to +500 ppm CO	±5% of mv (+100.1 to +500 ppm CO) ±5 ppm CO (0 to +100 ppm CO)	0632 3331
CO2 probe measures indoor air quality and monitors the workplace. With plug-in head, connection cable 0430 0143 or 0430 0145 required		0 to +1 Vol. % CO_2 0 to +10000 ppm CO_2	±(50 ppm CO_2 ±2% of mv)(0 to +5000 ppm CO_2) ±(100 ppm CO_2 ±3% of mv)(+5001 to +10000 ppm CO_2)	0632 1240
Standard ambient air probe up to +70°C		0 to +100 %RH -20 to +70 °C	±0.4 °C (-10 to +50 °C) ±0.5 °C (remaining range) ±2 %RH (+2 to +98 %RH)	0636 9740
Duct humidity/temperature probe Telescopic handle 0430 9715, see Ordering data/Accessories		0 to +100 %RH -20 to +70 °C	±0.4 °C (-10 to +50 °C) ±0.5 °C (remaining range) ±2 %RH (+2 to +98 %RH)	0636 9715
Thin humidity probe incl. 4 attachable protection caps for ambient air measurements, measurements in exhaust air ducts and equilibrium moisture measurements		0 to +100 %RH -20 to +70 °C	±0.4 °C (-10 to +50 °C) ±0.5 °C (-20 to -10.1 °C) ±0.5 °C (+50.1 to +70 °C) ±2 %RH (+2 to +98 %RH)	0636 2130
Highly accurate reference humidity/temp. probe		0 to +100 %RH -20 to +70 °C	±0.2 °C (+10 to +40 °C) ±0.4 °C (remaining range) ±1 %RH (+10 to +90 %RH)* ±2 %RH (remaining range)	0636 9741
Humidity/temperature probe		0... +100 %RH -20 to +70 °C	±0.4 °C (+0.1 to +50 °C) ±0.5 °C (-20 to 0 °C) ±0.5 °C (+50.1 to +70 °C) ±2 %RH (+2... +98 %RH)	0636 9742
Precision pressure probe, 100 Pa, in robust metal housing with impact protection, incl. magnet for fast attachment, to measure differential pressure and flow speeds (in combination with Pitot tube)		0 to +100 Pa	±(0.3 Pa ±0.5% of mv)	0638 1347
Comfort level probe for measuring degree of turbulence, with telescopic handle and stand. Fulfills EN 13779 requirements		0 to +5 m/s 0 to +50 °C	±(0.03 m/s ±4% of mv) (0 to +5 m/s) ±0.3 °C (0 to +50 °C)	0628 0009
Wet Bulb Globe temperature probe to assess workplaces subjected to heat, in accordance with ISO 7243 or DIN 33403, incl. WBGT case		0 to +120 °C	In accordance with ISO 7243 or DIN 33403	0635 8888 ID No. 0699 4239/1

* in the temperature range from +15°C to +30°C

testo 400 — Technical data

Technical data

Probe type	Vane	Thermal	Testo humid. sensor, cap.	Pressure	aw value
Meas. range	0 to +60 m/s	0 to +20 m/s	0 to+100 %RH	0 to +2000 hPa	0 to +1 aW
Accuracy ±1 digit	See probe data for system accuracy	See probe data for system accuracy	See probe data	Probe 0638 1347 Probe 0638 1447 Probe 0638 1547 Probe 0638 1647 Probe 0638 1747 Probe 0638 1847 ±0.1% of mv Probe 0638 1741 Probe 0638 1841 Probe 0638 1941 Probe 0638 2041 Probe 0638 2141 ±0.2% of mv	See probe data
Resolution	0.01 m/s (for Ø 60/100 mm), 0.1 m/s (for rem. probes)	0.01 m/s (0 to +20 m/s)	0.1 %RH (0 to +100 %RH)	0.001 hPa (Probe 0638 1347) 0.001 hPa (Probe 0638 1447) 0.01 hPa (Probe 0638 1547) 0.1 hPa (Probe 0638 1647) 0.1 hPa (Probe 0638 1747) 0.1 hPa (Probe 0638 1847) 0.01 bar (Probe 0638 1741) 0.01 bar (Probe 0638 1841) 0.01 bar (Probe 0638 1941) 0.01 bar (Probe 0638 2041) 0.01 bar (Probe 0638 2141)	

Probe type	NTC	Pt100	Type K (NiCr-Ni)	Type S (Pt10Rh-Pt)	Type J (Fe-CuNi)
Meas. range	-40 to +150 °C	-200 to +800 °C	-200 to +1370 °C	0 to +1760 °C	-200 to +1000 °C
Accuracy ±1 digit	±0.2 °C (-10 to +50 °C) ±0.4 °C (-40 to -10.1 °C) ±0.4 °C (+50.1 to +150 °C)	±0.1 °C (-49.9 to +99.9 °C) ±(0.1 °C + 0.1% of mv) (remaining range)	±(0.3 °C + 0.1% of mv)	±1 °C (0 to +1760 °C)	±0.4 °C (-150 to +150 °C) ±1 °C (-200 to -150.1 °C) ±1 °C (+150.1 to +1000 °C)
Resolution	0.1 °C (-40 to +150 °C)	0.01 °C (-99.9 to +300 °C) 0.1 °C (-200 to -100 °C) 0.1 °C (+300.1 to +800 °C)	0.1 °C (-200 to +1370 °C)	1 °C (0 to +1760 °C)	0.1 °C (-200 to +1000 °C)

Probe type	CO2 probe	CO probe	Mechanical	Current/voltage measurement	Current/voltage measurement
Meas. range	0 to +1 Vol. % CO_2 0 to +10000 ppm CO_2	0 to +500 ppm CO	20 to 20000 rpm	0 to +20 mA (0554 0007) 0/4 to 20 mA (0554 0528)	0 to +10 V
Accuracy ±1 digit	See probe data	±5% of mv (0 to +500 ppm CO)	±1 digit	±0.04 mA (0 to +20 mA) (0554 0007) See probe data (0554 0528)	±0.01 V (0 to +10 V)
Resolution			1 rpm	0.01 mA (0 to +20 mA)	0.01 V (0 to +10 V)

Oper. temp.	0 to +50 °C
Storage temp.	-25 to +60 °C
Display	LCD, 4 lines
Battery type	1,5 V AA
Battery life	18 h
PC	RS232 interface
Weight	500 g
Material/Housing	ABS
Warranty	3 years
Memory	500.000

Memory space: 1 MB corresponding to approx. 500,000 readings
Other features: automatic probe recognition
Power: Battery/rech. battery, alternatively 8 V mains unit
Battery life in continuous operation with 2 T/C probes

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