

Committing to the future

2010

Measuring Instruments For Indoor Air Quality, Light And Sound



Information

Measurement Engineering For Indoor Air Quality, Light and Sound

CO2 measurement engineering

Why CO2 measurement?

CO2 concentration is used as an indicator when assessing indoor air quality. If the CO2 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 CO2 concentration in demand controlled ventilating (DCV) systems is used to regulate the supply of fresh air. Stationary CO2 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.



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 μ Pa 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).



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Measurement systems

testo 400

The reference measuring instrument for A/C and ventilation systems

Page 24

testo					
testo 31	6-1	Detector	for leaks in na	atural gas pipes	
The testo 310 quickly detect leaks. testo 316-1, e detector with including batt protocol Part no. 0632 0316	6-1 gas leak detector ts even the smallest electronic gas leak flexible probe, tery and calibration	 Flexible meator reach locator Optical and a when limits a TopSafe castimpact (optic DVGW approximation of the provided set of the	surement probe for hard titons audible alarms signal re exceeded e protects from dirt and anal) aval		
Technical data	a			Accessories	Part no.
Probe type Meas. range	Semi-conductor sensor 0 to 10,000 ppm CH ₄	Battery type Battery life	9V block battery > 5 h	TopSafe for testo 316, indestructible protection case incl. stand, protects from dirt and impact	0516 0189

Transport case (plastic)

for transport and secure storage of measuring instrument and accessories

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Jas	leak	aetector v	NIT	Dulit-In	pum	p

190 x 57 x 42 mm

Approx. 300 g

ABS

1st alarm limit: from 200 ppm CH4 2nd alarm limit: 10,000 ppm CH4

Optical and audible alarm with bar

Trend display shows maximum

• Flexible measurement probe for

• Earphone connection for secure

leakage localization in loud

gas concentrations

inaccessible places

leakage

Integrated pump

surroundings

display for increasing and dangerous

2 years

Dimensions

Material/Housing

Weight

Warranty

The testo 316-2 gas leak detector indicates when gas concentration

testo 316-2

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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.

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 ${\rm CH_4}$ 100 ppm ${\rm C_3H_8}$ 200 ppm ${\rm H_2}$
2nd alarm limit	10.000 ppm $\rm CH_4$ 5.000 ppm $\rm C_3H_8$ 10.000 ppm $\rm H_2$
Display	18 segment bar display

ballery lype	NINI Dattery
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

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0516 3120

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

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testo 317-1

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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.

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

Part no. **0632 3170**

lechnical 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



Flue gas spillage detector

• Reliable recognition of escaping flue

Bendable measurement probe for

Audible and visual alarm

DVGW approved

points which are difficult to access

gases

testo 317-2

Gas leak detector

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

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

protocol Part no. 0632 3172

- 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



esto.

35 mm

400-200

6.0

Ø 10 mm





testo 317-3

COSIC

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.

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 Oper. temp. -5 to +45°C Accuracy ± 10 ppm (0 to +99 ppm) Battery type 2 batteries Type AAA ± 10 % (+100 to +499 Battery life ±1 digit 150 h (with beeper ppm) switched off) ±20 % (>+500 ppm) Reaction time 40 s Resolution 1 ppm Warranty

testo 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.

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

Part no. 0632 0323

Ambient carbon monoxide warning

- 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



Gas detector

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



Technical data					
Display range Methane CH ₄ 1	1 to 999 ppm, 0.1 to 4.4 vol.%	Reaction time	2-3 s		
	Propane C ₃ H ₈	1 to 999 ppm, 0.1 to 1.9 vol.%	Oper. temp.	-15 to +40 °C	
	Hydrogen H ₂	1 to 999 ppm, 0.1 to 4.0 vol.%		Storage temp.	-25 to +70 °C
Resolution	1 ppm / 0.1 vol.%			Dimensions	190 x 40 x 28 mm
First reaction	>10 ppm			Weight	320 g
Voltage supply	Built-in battery block, Nil	MH, 1600 mAh		Warranty	2 years on instrument, 1
Ex-Protection	Sensor intrinsically-safe	in accordance with DMT test institute			year on sensor
Battery life	>8 h				

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testo 315-2

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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.

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

Part no. 0632 0317

CO warning instrument

- 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)



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) co clip and magnetic holder	nsisting of multi-function	0554 0398
Case for secure storage of measuring instrument		0516 0191
Transport case (plastic) for transport and secure storage of measuring inst	rument and accessories	0516 3120
Printer and Accessories		
Testo fast printer with wireless infrared interface, 1 AA batteries	I roll thermal paper and 4	0554 0549
External fast charger for 1-4 AA rech. batteries, int with individual cell charging and charge control dis charging, integrated discharge function, with built- plug, 100-240 V, 300 mA, 50/60 Hz	cl. 4 Ni-MH rech. batteries splay, incl. impulse trickle in international mains	0554 0610
Spare thermal paper for printer (6 rolls)		0554 0569
Spare thermal paper for printer (6 rolls), permanen measurement data documentation legible for up to	nt ink o 10 years	0554 0568
Additional Accessories and Spare Par	ts	
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% 02; 100 and 1000 ppm C	0; 800 ppm NO; 80 ppm N	0520 0003 102; 1000 ppm SO2
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 ±10 ppm CO (0 to +100 ppm CO) ±1 digit ppm CO)

Resolution Alarm limits Zero point adjustment

ppm C0) ±10% of mv (+100 to +2000 ppm C0)

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1 ppm CO
50/100/500 ppm
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

615

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.



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	BestNr.
Druckset mit Kaminzugsonde		215 mm				0554 3150
		Ø 5 mm				
Rohranlegefühler mit Klettband, für die Temperaturmessung an Rohren mit Durchmesser bis max. 120 mm, Tmax +120 °C, TE Typ K	Festkabel gestreckt	20 a 395 mm	-50 +120 °C nm	Klasse 1	90 sec	0628 0020

esto.

Versatile CO measurement - For safety and service

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

testo

Accessories and Technical data

Accessories	Part no.	Technical data			
Transport and Protection		Meas. range	0 to +2000 ppm CO	-200 to +200 hPa	-40 to +40 hPa
TopSafe (protection case), with bench stand protects instrument from dirt and impact	0516 0443	Accuracy ±1 digit	±10% of mv (+100 to +2000 ppm C0)	±0.5 hPa (-49.9 to +49.9 hPa)	±1.5% of mv (-40 to -3 hPa)
Multi-function clip (for instrument with TopSafe) consisting of multi-function clip and magnetic holder	0554 0398	-	±10 ppm CO (0 to +100 ppm CO)		$\pm 1.5\%$ of mV (+3 to +40 hPa) ± 0.03 hPa (-2.99 to
Case for secure storage of measuring instrument	0516 0191			hPa)	+2.99 hPa)
Transport case (plastic) for transport and secure storage of measuring instrument and accessories	0516 3120	Resolution	1 ppm CO (0 to +2000 ppm CO)	0.1 hPa (-200 to +200 hPa)	0.01 hPa (-40 to +40 hPa)
Printer and Accessories					
Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4	0554 0549				
AA batteries		Meas. range	-40 to +600 °C	-100 to +100 µA	
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	Accuracy ±1 digit	±0.5% of mv (+100 to +600 °C) ±0.5 °C (0 to +99 °C)	±3 μA (-100 to +100 μA)	
Spare thermal paper for printer (6 rolls)	0554 0569	Devel ile	0.1 °C (40 to ; 600 °C)	1 u 4 (100 to 1 100 u 4)	
Spare thermal paper for printer (6 rolls), permanent ink measurement data documentation legible for up to 10 years	0554 0568	Resolution	0.1 0 (-40 10 +000 0)	τ μΑ (-100 to +100 μΑ)	
Additional Accessories and Spare Parts					
9V rech. battery for instrument	0515 0025	Oper. temp.	+5 to +45 °C		
instead of battery		Storage temp.	-20 to +50 °C		
Recharger for 9V rechargeable battery	0554 0025	Display	LCD, 2 lines		
for external recharging of 0515 0025 battery		Battery type	9V block battery		
Calibration Certificates		Battery life	16 h		
ISO calibration certificate/flue gas	0520 0003	Dimensions	215 x 68 x 47 mm		
calibration points 2.5% 02; 100 and 1000 ppm CO; 800 ppm NO; 80 ppm N	IO2; 1000 ppm SO2	Weight	400 g		
ISO calibration certificate/CO	0520 0039	Material/Housing	ABS		
CO probes; calibration points 0; 80 ppm		Warranty	2 years		

teste

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).



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, AA batteries	1 roll thermal paper and 4	0554 0549		
External fast charger for 1-4 AA rech. batteries, in with individual cell charging and charge control dia charging, integrated discharge function, with built plug, 100-240 V, 300 mA, 50/60 Hz	cl. 4 Ni-MH rech. batteries splay, incl. impulse trickle -in international mains	0554 0610		
Spare thermal paper for printer (6 rolls)		0554 0569		
Spare thermal paper for printer (6 rolls), permaner measurement data documentation legible for up to	nt ink o 10 years	0554 0568		
Additional Accessories and Spare Pa	rts			
Accessories set (for instrument without TopSafe) in carrier loop, probe holder	ncludes multi-function clip,	0554 0550		
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	on options	0554 1143		
Calibration Certificates				
ISO calibration certificate/CO2 CO2 probes; calibration points 0; 1000; 5000 ppr	n	0520 0033		

Technical data Measurin Probe type 2 channel infrared sensor Measurin Meas. range 0 to +9999 ppm CO2 Measurin Accuracy ±(50 ppm CO2 ±2% of mv) (0 to +5000 ppm CO2) Battery ti Battery ti Dimension ±1 digit ±(50 ppm CO2 ±3% of mv) (+5001 to +9999 ppm CO2) Dimension Weight Display Material/I Resolution 1 ppm CO2 Warranty

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	Measuring medium	Air
	Oper. temp.	0 to +50 °C
	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

CO2 instrument with probe for HVAC fitters and engineers

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



teste

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.



Part no. 0560 0540

 Technical data

 Meas. range
 0 to 99,999 Lux
 Measurer

 Accuracy
 ±3 % (compared to reference Class B, DIN 5032 Part 7)
 Protection 0per. tem Battery ty Battery tif

 Resolution
 1 Lux (0 to 19.999 Lux)
 Dimension

 Weight
 10 Lux (remaining range)
 Weight

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

2 years

Pocket-sized light intensity measuring instrument

- 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



Accessories

Calibration Certificates

esto.

ISO calibration certificate/light; Calibration points 0;500;1000;2000;4000 0520 0010 Lux

Part no.

10.5

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.



Part no.

ISO calibration certificate/light

Calibration points 0;500;1000;2000;4000 Lux



Accessories		Part no.
Transport and Protection		
Transport case (plastic) for measuring instrument, pr now larger for safe and orderly storage	robes and accessories	0516 0445
Case for secure storage of measuring instrument		0516 0191
Printer and Accessories		
Testo fast printer with wireless infrared interface, 1 r AA batteries	roll thermal paper and 4	0554 0549
External fast charger for 1-4 AA rech. batteries, incl. with individual cell charging and charge control disp charging, integrated discharge function, with built-in plug, 100-240 V, 300 mA, 50/60 Hz	. 4 Ni-MH rech. batteries Ilay, incl. impulse trickle n international mains	0554 0610
Spare thermal paper for printer (6 rolls)		0554 0569
Spare thermal paper for printer (6 rolls), permanent measurement data documentation legible for up to 1	ink 10 years	0554 0568
Software und Zubehör		
ComSoft 3 - Professional with data management incl. database, analysis and graphics function, data a	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 dri facilitates data communication in network	iver, mains unit	0554 1711
Calibration Certificates		

0520 0010

Light meter with location management

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



Recommended set

testo 545, Comfort Set incl. printer

esto.

- 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.
- resto 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	Display	LCD, 4 lines
		PC	RS232 interface
Accuracy ±1 digit	Accuracy to DIN 13032- 1: f1 = 6% = V (Lambda) adaptation f2 = 5% = cos like rating	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
Resolution	1 Lux (0 to +32000 Lux) 10 Lux (0 to +100000 Lux)	Dimensions	220 x 68 x 50 mm
		Weight	500 g
		Material/Housing	ABS
		Warranty	2 years

teste

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.

Flexible fiberscope for fast diagnoses

- 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 ٠ flexibility
- 3-arm gripper: Grips small objects



testo 319	testo
testo 319 fiberscope	Fibers
	319 fil
	magn
	bag
Part no.	Part n
0632 3191	056

319 set

scope set, consisting of testo berscope, gooseneck tube, et and mirror attachments,

3 3191

Accessories	Part no.
Flexible push-on gooseneck tube,	0554 3196
Decabon push-on tube	0554 3191
Two-channel push-on hose	0554 3190
Magnet attachment	0554 3195
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.

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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.

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, test	o 816 0554 0452		
Calibration Certificates			
ISO calibration cert./sound pressure calibration points 94 dB; 104 dB; 114 dB at differ	0520 0111 ent frequencies		
ISO calibration certificate sound pressure calibrate	ors 0520 0411		

Technical data				
Meas. range	+32 to +130 dB	Oper. temp.	0 to +40 °C	
		Storage temp.	-10 to +60 °C	
Accuracy	±1.0 dB	Battery type	9V block battery	
±1 digit		Battery life	70 h	
Resolution	0.1 dB	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	r: -0.0016 dB/hPa	

Sound level measuring instrument

- 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



Technical data Sound level calibrator (0554 0452)

Battery type	9V block battery
Battery life	40 h
Warranty	2 years
Accuracy	$\pm 0.5~\text{dB}$ 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 $1/2 \mbox{ and } 1 \mbox{ inch microphones by other manufacturers}$



615

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.

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

ISO calibration certificate sound pressure calibrators

Part no. **0563 8165**

Technic

Meas. ran Accuracy ±1 digit Resolutior

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

- 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 connectionBar graph display
- AC output for connecting recorders and amplifiers
- DC output with 10 mV/dB for connecting recorders or data loggers

0520 0411

Accessories	Part no.
Accessories	
Calibrator, for regular calibration of testo 815, testo 816	0554 0452
Mains unit 230 V/ 8 V/ 1 A, for instrument (European plug) for mains operation and battery recharging	0554 1084
Calibration Certificates	
ISO calibration cert./sound pressure calibration points 94 dB; 104 dB; 114 dB at different frequencies	0520 0111

al data			
ge	+30 to +130 dB 3.5 to 8 kHz	Oper. temp.	0 to +40 °C
		Storage temp.	-10 to +60 °C
	±1.0 dB	Battery type	9V block battery
		Battery life	50 h
I	0.1 dB	Weight	315 g
		Dimensions	309 x 68 x 50 mm
		Warranty	2 years
		Section meas. ranges dB; 80 to 130 dB Time weighting: FAST s setting	: 30 to 80 dB; 50 to 100 125 ms setting / SLOW 1
		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	$\pm 0.5~\text{dB}$ 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

itesto.





615

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 CO2, 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 CO2, 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 435-1, multi-functional meas. instr., for A/C, ventilation and Indoor Air Quality, with battery and calibration protocol

Part no. 0560 4351

testo 435-2

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

Part no. 0563 4352

testo 435-3

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

Part no. 0560 4353

testo 435-4

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. 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 $+50 ^{\circ}\text{C}$ 0 to $+1000 ^{\circ}\text{RH}$ $^{\circ}$ to $+10000 ^{\circ}\text{ppm co}^2$ $+600 ^{\circ}\text{to} +1150 ^{\circ}\text{hPa}$	±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 I ±3 hPa	0632 1535 ^{CO} 2)
Ambient CO probe, for detecting CO in buildings and rooms		0 to +500 ppm C0	$\pm5\%$ 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 $^{\circ}{\rm C}$		+0.6 to +40 m/s Oper. temp. 0 to +60 °C	\pm (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 $^\circ\text{C}$		+0.25 to +20 m/s Oper. temp. 0 to +60 °C	\pm (0.1 m/s +1.5% of mv)	0635 9335
Hot wire probe for m/s and °C, \emptyset 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 20 for ventilator (330 x 330 mm) for in- and outgoing a	00) and funnel 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 05 m 04	-50 to +125 °C	±0.2 °C (-25 to +80 °C) 60 s ±0.4 °C (remaining range)	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 - Fived cable	-60 to +130 °C	Class 2 [★] 5 s	0602 4592
Clamp probe for measurements on pipes, pipe		-50 to +100 °C	Class 2* 5 s	0602 4692
diameter 15 to 25 mm (max. 1"), meas. range short-term up to +130°C, TC Type K	Conn.: Fixed cable			
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	114 mm 50 mm 0 5 mm 0 3.7 mm Conn.: Fixed cable 1.2 m 0	-60 to +400 °C	Class 2* 7 s	0602 1293
435-2/-4			•	<u> </u>
Comfort level probes for degree of turbulence measurement with telescopic handle (max. 820 mm) and stand, meets EN 13779 requirements	max. 820 mm	0 to +50 °C 0 to +5 m/s	<u>±0.3 °C</u> ±(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	● Ø 12 mm	-20 to +70 °C 0 to +100 %RH	±0.3 °C ±2 %RH (+2 to +98 %RH)	0636 9735
Prandtl's Pitot tubes	Illustration		Oper temp	Part no
Pitot tube, 350 mm long, stainless steel,	indefault		-60 to +400 °C	0635 2145
measures flow in combination with pressure ዋርያትዊዬbe, 500 mm long Pitot tube, 1000 mm long	350 mm / 500 mm / 1000 mm 0 7 m	m	0 to +600 °C 0 to +600 °C	0635 2045 0635 2345
, · · · ·				2000 2010

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

testo

Accessories / Technical data

Technical data	Technical data								
Probe type	NTC	Туре К	Туре Т	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	$\begin{array}{c} \pm 0.2 \ ^\circ C \ (-25 \ to \ +74.9 \ ^\circ C) \\ \pm 0.4 \ ^\circ C \ (-50 \ to \ -25.1 \ ^\circ C) \\ \pm 0.4 \ ^\circ C \ (+75 \ to \ +99.9 \ ^\circ C) \\ \pm 0.5\% \ of \ mv \ (remaining \ range) \end{array}$	$\pm 0.3 \ ^{\circ}\text{C} (-60 \ \text{to} +60 \ ^{\circ}\text{C}) \\ \pm (0.2 \ ^{\circ}\text{C} +0.3\% \ \text{of mv}) \\ (remaining range)$	± 0.3 °C (-60 to +60 °C) $\pm (0.2$ °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)	0.01 m/s	0.1 hPa	1 ppm CO ₂	

-20 to +50 °C

-30 to +70 °C

220 x 74 x 46 mm Alkali manganese, mignon, Type AA

200 h (typical vane measurement)

ABS/TPE/Metal

450 g

2 years

Technical data	a 435-2/-4	Technical da	Oper. temp.	
Probe type	Lux	Probe type	Differential pressure	Storage temp.
			probe, internal	Dimensions
Meas. range	0 to +100000 Lux	Meas. range	0 to +25 hPa	Battery type
Accuracy	See probe data	Accuracy ±1 digit	±0.02 hPa (0 to +2 hPa)	
±1 digit			1% of mv (remaining range)	Battery life
				Weight
Resolution	1 Lux / 0.1 Hz	Overload	200 hPa	Material/Housing
		Resolution	0.01 hPa	Warranty

Accessories		Part no.
Transport and Protection		
Service case for basic equipment of measuring instru dimensions: 400 x 310 x 96 mm	ment and probes,	0516 0035
Service case for measuring instrument, probe and act 520 x 380 x 120 mm	cessories, dimensions	0516 0435
Additional Accessories and Spare Parts		
Handle for attachable humidity probe head for connect probe wire, for measurement / calibration of humidity	ction to testo 635, incl. probe head	0430 9735
Lithium battery button cellCR2032 mignon type batter	ry for radio handle	0515 0028
Plug-in mains adapter, 5 VDC 500 mA with European	adapter, 100-250 VAC,	0554 0447
testovent 410, volume flow funnel, Ø 340 mm/330x3	30 mm, incl. case	0554 0410
testovent 415, volume flow funnel, Ø 210 mm/210x2	10 mm, incl. case	0554 0415
Funnel set consisting of funnel for disc outlets (Ø 200 ventilator (330 x 330 mm) for in- and outgoing air)) and funnel for	0563 4170
Connection hose, silicone, 5m long, max. load 700 hF	² a (mbar)	0554 0440
testo saline pots for control and humidity adjustment 11.3 %RH and 75.3 %RH with adapter for humidity p calibration of humidity probe	of humidity probes, robe, quick checks or	0554 0660
Sintered PTFE filter, Ø 12 mm, for corrosive media, Hi (long-term measurements), high flow velocities.	igh humidity range	0554 0756
Stainless steel sintered cap, Ø 12 mm, is screwed on measurements at higher flow velocities or in contamin	to humidity probe, for nated 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 re AA batteries, for printing out measurements on site	oll thermal paper and 4	0554 0549
Spare thermal paper for printer (6 rolls), permanent in documentation legible for up to 10 years	nk, measurement data	0554 0568
Spare thermal paper for printer (6 rolls)		0554 0569
External fast charger for 1-4 AA rech. batteries, incl. with individual cell charging and charge control displa charging, integrated discharge function, with built-in plug, 100-240 V, 300 mA, 50/60 Hz	4 Ni-MH rech. batteries ay, incl. impulse trickle international mains	0554 0610
Calibration Certificates		
ISO calibration certificate/temperature, meas. instr. w calibration points +60°C; +120°C; +180°C	vith surface probe;	0520 0071
ISO calibration certificate humidity, Calibration points %RH at +25°C	11.3 %RH and 75.3	0520 0006
ISO calibration certificate/pressure, differential press (% of fsv)	ure, accuracy 0.1 to 0.6	0520 0025
ISO calibration certificate velocity, hot wire, vane and points 0.5; 0.8; 1; 1.5 m/s $$	mometer; calibration	0520 0024
ISO calibration certificate velocity, hot wire, vane ane calibration points 1; 2; 5; 10 m/s	mometer, Pitot tube;	0520 0004
ISO calibration certificate/Velocity, hot wire, vane ane calibration points 5; 10; 15; 20 m/s	emometer, Pitot tube;	0520 0034
ISO calibration certificate/light, Calibration points 0;5 Lux	00;1000;2000;4000	0520 0010
ISO calibration certificate/CO2, CO2 probes; calibration 5000 ppm	on points 0; 1000;	0520 0033



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

Ordering data Option: Radio

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	,99						
Radio handle for attachable probe heads with T/C probe head for surface measurement -50 to +350 °C 0 5 mm 0 12 mm	Radio handle: $\pm(0.5 \text{ °C} + 0.3\% \text{ of mv}) (-40 \text{ to } +500 \text{ °C})$ $\pm(0.7 \text{ °C} + 0.5\% \text{ of mv}) (remaining range)$ T/C probe head: Class 2	0.1 °C (-50 to +199.9 °C) 1.0 °C (remaining range)	58						
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	r 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 +9 ±0.3 °C	8 %RH)	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, E PT, SI, MT, CY, SK, LU, EE, LT, IE, LV, NO	es, IT, Se, AT, DK, FI, HU, CZ	, PL, GR, CH,	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: G	eneral technical data				
	Radio handle	Measuring rate	0.5 s or 10 s, adjustable on handle	Radio transmission	Unidirectional
Battery type	2 AAA micro batteries			Oper. temp.	-20 to +50 °C
Battery life	215 h (meas. rate 0.5 s) 6 months (meas. rate 10 s)	Radio coverage	Up to 20 m (without obstructions)	Storage temp.	-40 to +70 °C
Protection class	IP54				

Testo fast printer

teste

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), permanen documentation legible for up to 10 years	t ink, measurement data 0554 0568
External fast charger for 1-4 AA rech. batteries, inc with individual cell charging and charge control dis charging, integrated discharge function, with built- plug, 100-240 V. 300 mA. 50/60 Hz	I. 4 Ni-MH rech. batteries 0554 0610 play, incl. impulse trickle n international mains

Ethernet adapter

The new 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

Access Ethernet with testo measuring instruments

Long-term monitoring of ambient data

The parameters temperature and humidity, are measured and saved on site by the data logger. Using the Ethernet adapter, measurement data stored in the logger can be read out and filed via the PC network. The measurement data is then easily analysed and checked on your PC in the office.

The Ethernet adapter therefore has the following advantages:

- Affordable operation since it is no longer necessary to read out data on site
- or take the logger to the office.Fast access times because current

measurement data can be accessed at any time.





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.

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

Part no. 0554 1711

AccessoriesPart no.System accessories: testo 400, testo 650, testo 950ComSoft 3 - Professional with data management, incl. database, analysis
and graphics function, data analysis, trend curve0554 0830RS232 cable, connects instrument to PC (1.8 m) for data transfer0409 0178

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



Ambient and Indoor Air Quality

Measuring Instruments

Use measuring instrument for the data to:

structure - measure - print on-site



²² Additional information at WWW_testo.

Use ComSoft 3 software on measurements to:

prepare - analyse - file - document



- Analysis:
- with calculation functions
- with crosshairs
- with mean calculationwith 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.

Part no. 0554 0830

- 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

Accessories RS232 cable connects instrument to PC (1.8 m) for data transfer

www.iesio.

Part no. 0409 0178

10.5

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

The reference measuring instrument for A/C and ventilation systems

- 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

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. guick-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 FN 13779 requirements (Part no. 0628 0009)

We recommend:

testo 400	ComSoft 3 - Professional with data management incl. database, analysis and graphics function, data analysis, trend curve	0554 0830
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	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
Can be used for:	SoftCase for attachable printer (protects printer from dirt/impact) protects from impact and falls	0516 0411
 Velocity, volume flow Humidity, pressure Temperature CO₂, rpm and current/voltage 	System case (aluminium) for measuring instrument, probes and accessories probes in lid make it easy to find parts in case $\label{eq:system}$	0516 0410
	DKD calibration certificate/velocity for laboratory fume cupboard probe	
Part no. 0563 4001	ISO calibration certificate/velocity for laboratory fume cupboard probe	

Part no. 0563 4001

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Recommended Sets and Accessories

Recommended set

- 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:

SO calibration certificate/temperature	0520 0181
for air/immersion probes, calibration points -8°C; 0°C; +40°C	

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	0636 9740

Measures all physical parameters in the psychrometric chart	
Quick-action surface probe with sprung thermocouple strip, measuring range short-term to $+500^{\circ}\text{C}$	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, 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	0510 0400
System case (plastic) for measuring instrument, propes and accessories	UD 10 U4UU

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)

System case (aluminium) for measuring instrument, probes and accessories 0516 0410 probes in lid make it easy to find parts in case

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Calibration certificates and Probe examples

Calibration Certificates	Part no.	Calibration Certificates	Part no.	
Calibration certificates/temperature		Calibration certificates/pressure		
ISO calibration certificate/temperature for air/immersion probes, calibration points -18°C; 0°C; +60°C	0520 0001	ISO calibration certificate/pressure differential pressure; 5 points distributed over meas. range	0520 0005	
ISO calibration certificate/temperature Meas. instr. with air/immersion probe; cal. points 0°C; +150°C; +300°C	0520 0021	DKD calibration certificate/pressure diff. and pos. pressure; 6 meas. points distributed over meas. range (>0.6%	0520 0225 of fsv)	
ISO calibration certificate/temperature meas. instr. with surface probe; calibration points +60°C; +120°C; +180°	0520 0071 C	ISO calibration certificate/pressure differential pressure, accuracy 0.1 to 0.6 (% of fsv)	0520 0025	
DKD calibration certificate/temperature meas. instr. with air/immersion probe; calibration points -20°C; 0°C; +60°	0520 0211 C	DKD calibration certificate/pressure diff. and pos. pressure; 11 measuring points distributed over the instr. meas.	0520 0215 range	
DKD calibration certificate/temperature 0520 0271 contact surface temperature probes; calibration points +100°C; +200°C; +300°C		ISO calibration certificate/absolute pressure, 5 measurement points distributed over meas. range	0520 0125	
Calibration certificates/humidity		absolute pressure, accuracy 0.1 to 0.6 (% of fsv)		
ISO calibration certificate/humidity cal. points freely selectable from 5 to 95%RH at +15 to +35°C or at -18 to	0520 0106 p +80°C	DKD calibration certificate/pressure absolute pressure; 11 measuring points distributed over meas. range	0520 0212	
ISO calibration certificate humidity 0520 0006		Calibration certificates/velocity		
Calibration points 11.3 %RH and 75.3 %RH at +25°C		ISO calibration certificate/velocity	0520 0104	
ISO calibration certificate dewpoint two adjustment points -10/-40 °Ctd at 6 bar	0520 0136	all velocity probes, calibration points selectable from 0.3 to 50 m/s at +25°C ISO calibration certificate velocity	0520 0004	
ISO calibration certificate/humidity	0520 0013	hot wire, vane anemometer, Pitot tube; calibration points 1; 2; 5; 10 m/s		
saturated saline solutions: calibration point 11.3%RH		ISO calibration certificate/Velocity	0520 0034	
ISO calibration certificate/humidity	0520 0083	hot wire, vane anemometer, Pitot tube; calibration points 5; 10; 15; 20 m/s		
saturated saline solutions, calibration point 75.3%RH		ISO calibration certificate velocity	0520 0024	
DKD calibration certificate/humidity	0520 0206	hot wire, vane anemometer; calibration points 0.5; 0.8; 1; 1.5 m/s		
electronic hygrometers; calibration points 11.3%RH and 75.3%RH at +25	°C	DKD calibration certificate/velocity	0520 0244	
DKD calibration certificate/humidity 0520 0216		hot wire, vane anemometer; calibration points 0.5; 1; 2; 5; 10 m/s		
cal. points freely selectable from 5 to 95%RH at +25°C or -18°C to +70°C		DKD calibration certificate/velocity 0520 0204		
UKD calibration certificate/humidity saturated saline solutions: calibration point 11 3%RH	0520 0213		0500.0004	
Julia collection contribution contribution point 11.0 /0111	0500.0000	UKU Calibration Certificate/velocity bot wire anemometer: calibration points 0.1: 0.2: 0.5: 0.8: 1 m/s	0520 0224	
saturated saline solutions: calibration point 75.3%BH	0020 0283			

Probe examples testo 400	Illustration	Meas. range	Accuracy	Part no.
Globe thermometer to measure radiant heat	Ø 150 mm	0 to +120 °C	±0.5 °C (0 to +49.9 °C) ±1 °C (+50 to +120 °C)	0554 0670
	Conn.: Fixed cable		Accuracy corresponds to ISO 7243, ISO 7720 27726, DIN 33403 requirements	6, DIN EN
Thermal anemometer probe, Ø 10 mm, w. telescopic handle, measures air flow in lab fume cupboards to DIN EN 14175	760 mm Ø 10 mm	0 to +5 m/s 0 to +50 °C	\pm (0.02 m/s \pm 5% of mv) (0 to +5 m/s)	0635 1047
Ambient CO probe, for detecting CO in buildings and rooms	Conn.: Fixed cable 1.5 m	to +500 ppm CO	$\pm 5\%$ of mv (+100.1 to +500 ppm CO) ± 5 ppm CO (0 to +100 ppm CO)	0632 3331
C02 probe measures indoor air quality and monitors the workplace. With plug-in head, connection cable 0430 0143 or 0430 0145 required	Conn.: Plug-in head. connection cable 0430 0143 or 0430 0145 required	0 to +1 Vol. % CO ₂ 0 to +10000 ppm ² CO ₂	$\begin{array}{l} \pm (50 \mbox{ ppm CO}_2 \ \pm 2\% \mbox{ of mv})(0 \ to \\ \pm 5000 \mbox{ ppm CO}_2) \\ \pm (100 \mbox{ ppm CO}_2 \ \pm 3\% \mbox{ of mv})(+5001 \\ to \ + 10000 \mbox{ ppm CO}_2) \end{array}$	0632 1240
Standard ambient air probe up to $+70^{\circ}$ C	0 12 mm Plug-in head. connection cable 0430 0143 or 0430 0145 required	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, can be connected to telescopic handle 0430 9715 Telescopic handle 0430 9715, see Ordering data/Accessorie	180 mm 0 12 mm ^S Fixed cable	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	250 mm 0 4 mm Plug-in head. connection cable 0430 0143 or 0430 0145 required	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 21 mm Plug-in head. connection cable 0430 0143 or 0430 0145 required	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 21 mm Plug-in head. connection cable 0430 0143 or 0430 0145 required	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)	Plug-in head. connection cable 0430 0143 or 0430 0145 required	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 90 mm	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	Ø 150 mm	0 to +120 °C	In accordance with ISO 7243 or DIN 33403	0635 8888 ID No. 0699 4239/1

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Technical data

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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 1547 Probe 0638 1547 Probe 0638 1547 Probe 0638 1747 Probe 0638 1747 Probe 0638 1741 Probe 0638 1741 Probe 0638 1941 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 1547) 0.1 hPa (Probe 0638 1547) 0.1 hPa (Probe 0638 1747) 0.1 hPa (Probe 0638 1847) 0.01 bar (Probe 0638 1841) 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) $\pm (0.1$ °C + 0.1% of mv) (remaining range)	\pm (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 (0554 0007) to +20 mA) See probe (0554 0528) data	±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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