Flue gas analyzer for industry

testo 340 – Portable measuring instrument for industrial emission measurement

Measuring range extension for unrestricted measurement at high gas concentrations

Flue gas analysis with up to 4 gas sensors – freely configurable

Large selection of probes

Bluetooth interface

Convenient measurement data management

TÜV-tested /EN norm

TÜV SÜD
ISO 9001

testo 340

Abgas
Heizöl EL
10.10.2010
10:47 Uhr

1 4,8 Vol.% O2
2 45 ppm CO
3 33 ppm NO
4 40 ppm SO2

drucken   Start   speich.

O$_2$

CO

CO$_{low}$

NO

NO$_{low}$

NO$_2$

SO$_2$

The handy, easy-to-operate emission measuring instrument testo 340 is the right tool for many different emission measurements. The compact design and the reliable technology make it the ideal measuring instrument for commissioning, service and maintenance work and in test measurements on industrial burners, stationary industrial engines, gas turbines and thermal processes.

The unique measuring range extension allows unrestricted measurements to be carried out even at high gas concentrations. The testo 340 is equipped with an O$_2$ sensor as standard. Three further gas sensors can be configured individually, in order to be able to adapt the instrument optimally to the respective measurement task.

Product properties

Automatic sensor protection at high gas concentrations
Thanks to the automatic measuring range extension, the measuring range of your CO, CO_{low}, NO, NO_{low} or SO_2 sensor is extended 5-fold. The sensor is placed under no greater strain at high gas concentrations than at low concentrations. The automatic sensor protection protects the sensor from overload without terminating the measurement.

Optionally, the measuring range of all sensors in the instrument can be simultaneously extended by a factor of 2.

Measurement up to e.g.
max. 50,000 ppm (CO), or
max. 20,000 ppm (NO), or
max. 25,000 ppm (SO_2), without overloading the sensor.
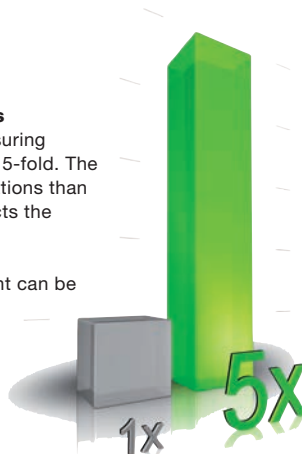
Space for 4 gas sensors
testo 340 is fitted with an O_2 sensor as standard. Three additional toxic gas sensors such as CO, CO_{low}, NO, NO_{low}, NO_2 oder SO_2 can be selected by the user. This guarantees highest flexibility when adapting to changing applications and measurement jobs.

The sensor can be changed or upgraded in an additional gas parameter by the user directly on-site without time-consuming test gas adjustment.

Simply select, change and add the gas sensors required at any time! For this purpose, select from these seven pre-calibrated gas sensors:

1) NO_2 sensor
2) SO_2 sensor
3) CO_{low} sensor
4) NO_{low} sensor
5) NO sensor
6) CO sensor
7) O_2 sensor (standard)

Convenient measurement data management with "easyEmission"
Data can be read out, easily processed, filed and managed using the "easyEmission" software:

Advantages of easyEmission
· Readings are shown in table or graph form
· User-defined measurement spacing (from one measurement / second to one measurement / hour)
· Online measurements via BLUETOOTH® wireless transmission or USB connection
· Customer and application-specific measurement protocols
· Data structure and measurement information can be transmitted from computer to analyzer
· All instrument configurations and settings can be easily carried out with easyEmission
· Direct transmission to Excel and pdf formats
· Easy implementation of individual formulae for your own calculations
· Calculation of fuel factors when using customer-specific fuels

Large selection of flue gas sampling probes
Different probe shaft lengths, diameters and temperature ranges ensure high flexibility for all applications. To change, the probe shaft is simply attached to the probe handle and engages.

Special flue gas probes for industrial engines are designed for positive pressure at the measurement site, making measurements possible even in the toughest conditions. In addition, modular industrial probes are available for rugged process conditions.

Ready to operate immediately
The highly robust fast-action probe coupling for all gas paths eliminates any confusion. The indestructible gas sampling hose cannot be bent, can be extended up to 7.8 m and saves space. The probe can remain positioned in the flue gas during the zeroing phase of the gas sensors. The calibration phase of testo 340 is finished after only 30 seconds.

Bluetooth
Wireless transmission*

* Country permits BLUETOOTH® wireless transmission, see Technical Data on page 8.

Wireless readout, transmission and printing of readings
Wireless connection via Bluetooth® 2.0 to Testo BLUETOOTH® printers and direct communication to notebook/PC over a distance of up to 10 m (free field) are features of the new testo 340 option. Readings and configurations are transmitted wirelessly to your notebook/PC for storage and analysis. Print data is transmitted wirelessly to the printer by infrared interface (visual contact required) or by new BLUETOOTH® wireless transmission. This saves time since the analyzer is ready for use again immediately following data transmission.

Measurement gas pump
The automatically controlled measurement gas pump built into testo 340 is the ideal solution for typical situations which arise when measuring flue gas such as negative or positive pressure (from -200 to +50 mbar). Pump flow is automatically kept constant.

Integrated condensate trap
The Testo design eliminates the possibility of condensation accumulating in the actual gas sensor. The testo 340 warns if the condensation trap needs to be emptied.

Large selection of probes
18 standard fuels and 10 additional user-defined fuels can be adapted specifically to each application.

Ordering suggestions

Your low-budget entry into industrial emission measurement

	Part no.
testo 340 flue gas analyzer, incl. rechargeable battery, calibration protocol and carrying strap, equipped with O_2 sensor, integrated flow/differential pressure measurement	0632 3340
Option CO sensor, 0 to 10000 ppm, resolution 1 ppm	
Option: BLUETOOTH® module	
Modular flue gas probe 335 mm immersion depth, incl. cone, thermocouple NiCr-Ni (TI) Tmax 500 °C and NO_2/SO_2 special hose 2.2 m	0600 9766
Mains unit international 100-240 V AC / 6.3 V DC for mains operation or battery charging in instrument	0554 1096
BLUETOOTH printer set with wireless BLUETOOTH interface; incl. 1 roll thermal paper, rechargeable battery and mains unit	0554 0553
Transport case for flue gas analyzer and probes	0516 3400

The testo 340's high measurement accuracy and easy handling enable efficient and reliable "emission checks" for fast assessment of industrial combustion systems:

Spot measurements for up to two hours
The testo 340 can independently run 5 user-defined measurement programs. Spot measurements of up to max. two hours are therefore possible. Measurement is also possible "online" using Bluetooth or a USB cable.

Simultaneous differential pressure measurement
Simultaneous measurement of flue gas and flow velocity allows calculation of current mass flow.

At different measurement points in your system
Battery operation possible thanks to battery life of more than six hours.

Highest flexibility in the selection of sensors
Equipped with an O_2 sensor as standard, 3 additional gas parameters can be freely selected from the following 6: CO, CO_{low}, NO, NO_{low}, NO_2 and SO_2.

Service and maintenance work on industrial burners and furnaces

	Part no.
testo 340 flue gas analyzer, incl. rechargeable battery, calibration protocol and carrying strap, equipped with O_2 sensor, integrated flow/differential pressure measurement	0632 3340
Option CO sensor, 0 to 10000 ppm, resolution 1 ppm	
Option NO meas. module, 0 to 4000 ppm*	
Option: SO_2 meas. module, 0 to 5,000 ppm	
Modular flue gas probe 335 mm immersion depth, incl. cone, thermocouple NiCr-Ni (TI) Tmax 1000 °C and NO_2/SO_2 special hose 2.2 m	0600 8764
Software "easyEmission", incl. USB connection cable instrument-PC	0554 3334
Transport case for flue gas analyzer and probes	0516 3400

The testo 340 offers many technical functions for safe and efficient commissioning, tuning, efficiency optimization and troubleshooting when servicing industrial burners:

Direct display of air ratio and efficiency
All relevant combustion and calculation parameters for optimum tuning are clearly shown in the display.

Measuring range extension and automatic sensor protection
When commissioning burners or carrying out measurements on unfamiliar systems, very high concentrations can occur unexpectedly. In cases like these, the measuring range extension is automatically activated. This protects the sensor, as the load placed on it is no higher than at low concentrations.

Always ready for use – even in rough daily work
The robust housing protects the analyzer from impact.

*We recommend the NO_{low} sensor (0393 1152) to measure low NO values.

Monitoring and adjustment work on stationary industrial engines

	Part no.
testo 340 flue gas analyzer, incl. rechargeable battery, calibration protocol and carrying strap, equipped with O_2 sensor, integrated flow/differential pressure measurement	0632 3340
Option CO sensor, 0 to 10000 ppm, resolution 1 ppm	
Option NO meas. module, 0 to 4000 ppm	
Option NO_2 meas. module, 0 to 500 ppm	
Option: dilution of all sensors	
Flue gas probe for industrial engines, 335 mm immersion probe incl. cone, integrated condensate trap and heat protection plate, Tmax 1000 °C, special hose for NO_2/SO_2 measurements, length 2.2 m*	0600 7560
Mains unit international 100-240 V AC / 6.3 V DC for mains operation or battery charging in instrument	0554 1096
Software "easyEmission", incl. USB connection cable instrument-PC	0554 3334
Transport case for flue gas analyzer and probes	0516 3400

* We recommend the flue gas probe with probe pre-filter (0600 7561) for measurements on stationary diesel engines.

Versatile combination options of the different gas sensors in testo 340 offer you the highest level of flexibility in measurements on stationary engines:

Separate NO and NO_2 measurement
The real NO_X value is measured with the sensor combination of NO and NO_2. In gas engines, the NO_2 component of the NO_X value can fluctuate greatly, so separate measurement of both gases is necessary for correct NO_X values.

Measurements even at high CO concentrations
Even at unexpectedly high concentrations (up to 50,000 ppm), automatic dilution of the sensor with fresh air allows measurements even when the engine status is undefined, without negatively influencing the life expectancy of the sensor.

Special flue gas probes for industrial engines as accessories
These probes are highly heat-resistant and are specially designed to compensate different pressure conditions, for example in measurements before and after the catalytic converter.

Engine-specific parameters
The most important parameters for industrial engines such as O_2, CO, NO, NO_2, NO_X and Lambda can be displayed simultaneously.

Measurements on turbines

	Part no.
testo 340 flue gas analyzer, incl. rechargeable battery, calibration protocol and carrying strap, equipped with O_2 sensor, integrated flow/differential pressure measurement	0632 3340
Option CO sensor, 0 to 10000 ppm, resolution 1 ppm*	
Option NO_{low} meas. module, 0 to 300 ppm	
Option NO_2 meas. module, 0 to 500 ppm	
Flue gas probe for industrial engines, 335 mm immersion probe incl. cone, integrated condensate trap and heat protection plate, Tmax 1000 °C, special hose for NO_2/SO_2 measurements, length 2.2 m	0600 7560
Mains unit international 100-240 V AC / 6.3 V DC for mains operation or battery charging in instrument	0554 1096
Software "easyEmission", incl. USB connection cable instrument-PC	0554 3334
Transport case for flue gas analyzer and probes	0516 3400

*We recommend the CO_{low} sensor (0393 1102) for measuring low CO values.

To reduce emissions from gas turbines, CO and NO measurements using testo 340 in low ranges are necessary. The CO_{low} and NO_{low} sensors in testo 340 are ideally suited to this task:

Special NO_{low} sensor for low concentrations
The NO_{low} sensor for measurements on $LowNO_X$ turbines can be freely combined with other sensors.

Measuring range extension and CO_{low} sensor
Thanks to the measuring range extension, the CO_{low} sensor can measure up to 2,500 ppm without any problems.

Easy and accurate test gas adjustment by the user
If required, testo 340 can be easily adjusted with test gas on site.

Ordering data

Analyzer / Options	Part no.	
testo 340 flue gas analyzer, incl. rechargeable battery, calibration protocol and carrying strap, equipped with O_2 sensor, integrated flow/differential pressure measurement	0632 3340	
testo 340 must be equipped with a second gas sensor otherwise the analyzer cannot function. Max. 3 additional sensors can be fitted.		
Option CO sensor, 0 to 10000 ppm, Resolution 1 ppm		
Option COlow sensor, 0 to 500 ppm, Resolution 0.1 ppm		
Option NO sensor, 0 to 4000 ppm, Resolution 1 ppm		
Option NO_{low} sensor, 0 to 300 ppm, Resolution 0.1 ppm		
Option NO_2 sensor, 0 to 500 ppm, Resolution 0.1 ppm		
Option: SO_2 sensor, 0 to 5,000 ppm, Resolution 1 ppm		
Option: BLUETOOTH® module		
Option: dilution of all sensors		

Accessories	Part no.	
Transport case for flue gas analyzer and probes	0516 3400	
Mains unit international 100-240 V AC / 6.3 V DC for mains operation or battery charging in instrument, for mains operation or battery charging in instrument	0554 1096	
Software "easyEmission", incl. USB connection cable instrument-PC	0554 3334	
Multiple license/"easyEmission" software	0554 3338	
Testo fast printer IRDA with wireless infrared interface; 1 roll thermal paper; 4 AA batteries	0554 0549	
BLUETOOTH printer set with wireless BLUETOOTH interface; incl. 1 roll thermal paper, rechargeable battery and mains unit	0554 0553	
Spare thermal paper for printer, permanent ink	0554 0568	
Spare rechargeable battery with charger	0554 1087	
Exchangeable filter NO sensor (1 off), blocks cross-gas SO_2	0554 4150	
Replacement filter CO sensor (1 pcs.)	0554 4100	

Calibration Certificates	Part no.	
ISO calibration certificate/flue gas	0520 0003	
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	

Probes

Standard gas sampling probes: Modular flue gas probes, available in 2 lengths, incl. probe stop, NiCr-Ni thermocouple, 2.2 m hose and particle filter	Part no.	
Modular flue gas probe 335 mm immersion depth, incl. cone, thermocouple NiCr-Ni (TI) Tmax 500 °C and NO_2/SO_2 special hose 2.2 m	0600 9766	
Modular flue gas probe 700 mm immersion depth, incl. cone, thermocouple NiCr-Ni (TI) Tmax 500 °C and NO_2/SO_2 special hose 2.2 m	0600 9767	
Modular flue gas probe 335 mm immersion depth, incl. cone, thermocouple NiCr-Ni (TI) Tmax 1000 °C and NO_2/SO_2 special hose 2.2 m	0600 8764	
Modular flue gas probe, 700 mm immersion depth, incl. cone, thermocouple NiCr-Ni Tmax 1000 °C and NO_2/SO_2 special hose 2.2 m	0600 8765	
Modular flue gas probe with pre-filter Ø 14 mm 335 mm immersion depth, incl. cone, thermocouple NiCr-Ni (TI) Tmax 1000°C and NO_2/SO_2 special hose 2.2 m	0600 8766	
Modular flue gas probe with pre-filter Ø 14 mm 700 mm immersion depth, incl. cone, thermocouple NiCr-Ni (TI) Tmax 1000°C and NO_2/SO_2 special hose 2.2 m	0600 8767	

Probes

Probe accesories/standard gas sampling probes	Part no.
Hose extension; 2.8 m; extension cable for probe	0554 1202
Probe shaft with pre-filter, length 335 mm, incl. cone, Ø 8 mm, Tmax 1000 °C	0554 8766
Probe shaft with pre-filter, length 700 mm, incl. cone, Ø 8 mm, Tmax 1000 °C	0554 8767
Spare sintered filter, 2 off	0554 3372
Spare dirt filter, modular probe; 10 off	0554 3385
Probe shaft, length 700 mm, incl. cone, Ø 8 mm, Tmax 500 °C	0554 9767
Probe shaft, length 335 mm, incl. cone, Ø 8 mm, Tmax 1000 °C	0554 8764
Probe shaft, length 700 mm, incl. cone, Ø 8 mm, Tmax. 1000 °C	0554 8765

Engine probes	Part no.
Flue gas probe for industrial engines, 335 mm immersion probe incl. cone, integrated condensate trap and heat protection plate, Tmax 1000 °C, special hose for NO_2/SO_2 measurements, length 2.2 m	0600 7560
Flue gas probe for industrial engines with probe shaft prefilter, immersion depth 335 mm, incl. cone, integrated condensate trap and heat protection plate, Tmax 1000 °C, special hose for NO_2-/SO_2 measurements, length 2.2 m	0600 7561
Thermocouple for exhaust gas temperature measurement, NiCr-Ni, length 400 mm, Tmax. +1000 °C with 2.4 m connection cable and additional temperature protection	0600 8894
Spare particle filter (10 off) for condensate trap in gas sampling hose	0554 3371

Industrial probes	Part no.
Adapter, non-heated, IP54, gas input G1/4", gas exit M10x1 external thread	0600 7911
Extension pipe to +600 °C, stainless steel 1.4571, 1 m	0600 7802
Extension pipe to +1200 °C, Inconel 625, 1 m	0600 7804
Non-heated sampling pipe to +600 °C, stainless steel 1.4571, 1 m	0600 7801
Non-heated sampling pipe to +1200 °C, Inconel 625, 1 m	0600 7803
Non-heated sampling pipe to +1800 °C, Al-Oxide, 1 m	0600 7805
Pre-filter for dusty flue gases, ceramic, dust load max. 20 g/m³, filter pore size 20 µm, temperature max. 1000 °C pre-filter can only be mounted on extension pipe 0600 7802 or 0600 7804.	0554 0710
Gas sampling hose for precise NO_2-/SO_2-measurements with built-in condensate trap, length 2.2 m	0554 3352
Thermocouple, NiCr-Ni, -200 to +1200 °C, Inconel 625, length 1.2 m	0430 0065
Thermocouple, NiCr-Ni, -200 to +1200 °C, Inconel 625, length 2.2 m	0430 0066
Mounting flange, stainless steel 1.4571 adjustable quick-action fitting suitable for all sampling/extension pipes	0554 0760

Temperature probes	Part no.
Mini ambient air probe; for separate ambient air temperature measurement; 0 to +80 °C	0600 3692
Combustion air temperature probe, immersion depth 60 mm	0600 9797

Pitot tubes	Part no.
Pitot tube, 350 mm long, stainless steel, measures flow velocity	0635 2145
Pitot tube, 1000 mm long, stainless steel, measures flow velocity	0635 2345
Connection hose; silicone; 5 m long; max. load 700 hPa (mbar)	0554 0440
Pitot tube, stainless steel, 750 mm long, measures flow velocity with temperature, 3x hoses (5 m long) and heat protection plate	0635 2042

Technical data

	Measuring range	Accuracy ±1 digit	Resolution	Adjustment time t_{90}
O_2 measurement	0 to 25 Vol. %	±0.2 Vol. %	0.01 Vol. %	‹20 sec
CO measurement (H_2 compensated)	0 to 10.000 ppm	±10 ppm or ±10% of mv (0 to 200 ppm) ±20 ppm or ±5% of mv (201 to 2.000 ppm) ±10% of mv (2.001 to 10.000 ppm)	1 ppm	‹40 sec
CO_{low} measurement (H_2 compensated)	0 to 500 ppm	±2 ppm (0 to 39.9 ppm) ±5% of mv (remaining range)[x] [x] data corresponds to 20°C ambient temperature. Additional temperature coefficient 0.25% of reading/K.	0.1 ppm	‹40 sec
NO measurement	0 to 4.000 ppm	±5 ppm (0 to 99 ppm) ±5% of mv (100 to 1.999 ppm) ±10% of mv (2.000 to 4.000 ppm)	1 ppm	‹30 sec
NO_{low} measurement	0 to 300 ppm	±2 ppm (0 to 39.9 ppm) ±5% of mv (remaining range)	0.1 ppm	‹30 sec
NO_2 measurement*	0 to 500 ppm	±10 ppm (0 to 199 ppm) ±5% of mv (remaining range)	0.1 ppm	‹40 sec
SO_2 measurement*	0 to 5.000 ppm	±10 ppm (0 to 99 ppm) ±10% of mv (remaining range)	1 ppm	‹40 sec
Temperature meas. Probe type Type K (NiCr-Ni)	-40 to +1.200 °C	±0.5 °C (0 to +99 °C) ±0.5 % of mv (remaining range)	0.1 °C	
Draught measurement	-40 to +40 hPa	±0.03 hPa (-2.99 to +2.99 hPa) ±1.5 % of mv (remaining range)	0.01 hPa	
Differential pressure measurement	-200 to 200 hPa	±0.5 hPa (-49.9 to 49.9 hPa) ±1.5 % of mv (remaining range)	0.1 hPa	
Absolute pressure measurement	600 to +1.150 hPa	±10 hPa	1 hPa	
Derived parameters				
Efficiency	0 to 120 %		0.1 %	
Flue gas loss	0 to 99.9 %		0.1 %	
Exhaust gas dewpoint	0 to 99.9 °C		0.1 °C	
CO_2 measurement (Calculated from O_2)	0 to CO_2 max.	±0.2 Vol. %	0.1 Vol. %	‹ 40 sec

*To avoid absorption, a maximum measurement duration of 2 hours should not be exceeded.

Bluetooth

Country permits BLUETOOTH® wireless transmission for testo 340
The BLUETOOTH® radio module used by Testo is permitted for the following countries and may only be used in those countries, i.e. the BLUETOOTH® wireless transmission may not be used in any other country!

Europe including all EU member states
Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and Turkey

European countries (EFTA)
Iceland, Liechtenstein, Norway, Switzerland

Non-European countries
Canada, USA, Japan, Ukraine, Australia, Columbia, El Salvador, Mexico, Venezuela, Ecuador, New Zealand, Bolivia, Dominican Republic, Peru, Chile, Cuba, Costa Rica, Nicaragua, Korea, Belarus.

Technical data

Measuring range extension

Single dilution, factor 5 (standard)	Measuring range	Accuracy	Resolution
CO measurement (H$_2$ compensated)	700 ppm to 50.000 ppm	±10 % of mv (additional error)	1 ppm
CO$_{low}$ measurement (H$_2$ compensated)	300 ppm to 2.500 ppm	±10 % of mv (additional error)	0.1 ppm
NO measurement	500 ppm to 20.000 ppm	±10 % of mv (additional error)	1 ppm
NO$_{low}$ measurement	150 ppm to 1.500 ppm	±10 % of mv (additional error)	0,1 ppm
SO$_2$ measurement	500 ppm to 25.000 ppm	±10 % of mv (additional error)	1 ppm
Dilution of all sensors, factor 2 (option, Part no. 0440 3350)			
O$_2$ measurement	When measuring range extension switched on, over all sensors: 0 to 25 Vol.%	±1 Vol.% additional error (0 to 4.99 Vol.%) ±0.5 Vol.% additional error (5 to 25 Vol.%)	0.01 Vol.%
CO measurement (H$_2$ compensated)	700 ppm to 20.000 ppm	±10 % of mv (additional error)	1 ppm
CO$_{low}$ measurement (H$_2$ compensated)	300 ppm to 1.000 ppm	±10 % of mv (additional error)	0.1 ppm
NO measurement	500 ppm to 8.000 ppm	±10 % of mv (additional error)	1 ppm
NO$_{low}$ measurement	150 ppm to 600 ppm	±10 % of mv (additional error)	0.1 ppm
NO$_2$ measurement	200 ppm to 1.000 ppm	±10 % of mv (additional error)	0.1 ppm
SO$_2$ measurement	500 ppm to 10.000 ppm	±10 % of mv (additional error)	1 ppm

General technical data

Memory Maximum Per folder Per site	100 folders Max. 10 sites Max. 200 logs The max. number of logs is determined by the number of folders or sites
User-defined fuels	10 user-defined fuels incl. test gas as fuel
Regulated diaphragm pump Pump flow Hose length Max. pos. press./flue gas Max. neg. press./flue gas	0.6 l/min (regulated) max. 7.8 m (corresponds to two probe hose extensions) +50 mbar -200 mbar
Weight	960 g
Dimensions	283 x 103 x 65 mm
Storage temperature	-20 to +50 °C
Operating temperature	-5 to +50 °C

Display	Graphic display 160 x 240 pixels
Power supply	Battery block 3.7 V / 2.4 Ah Mains unit 6.3 V / 2 A
Housing material	TPE PC
Protection class	IP40
Warranty Analyzer Rech. batt. Sensors	2 years (excluding working parts, e.g. sensors, sensor replacement filter) 1 year CO, NO, CO$_{low}$, NO$_{low}$, NO$_2$, SO$_2$: 1 year O$_2$: 1.5 years

Notes

Notes

We measure it. **testo**

www.testo.com