Flue gas analysis – brilliantly easy: testo 350

– the first flue gas analyzer that thinks ahead

The new flue gas analyzer testo 350 offers advantages and real benefits – as you can see!

- Innovative: The application-guided operation with helpful instrument pre-settings
- Elegant and clear: The large colour graphic display
- Robust design: The sealed housing makes the testo 350 insensitive to knocks and dirt
- Cost and time-savings: The new service concept offers fast access to wearing parts

❶ **Control Unit**

controls the analyzer box and displays the measurement values

❸ **Analyzer box**

robust, stable housing with integrated rubber edges, protects the sensors, pumps, analysis and memeory electronics

The status display shows the current operational status, visible from a distance

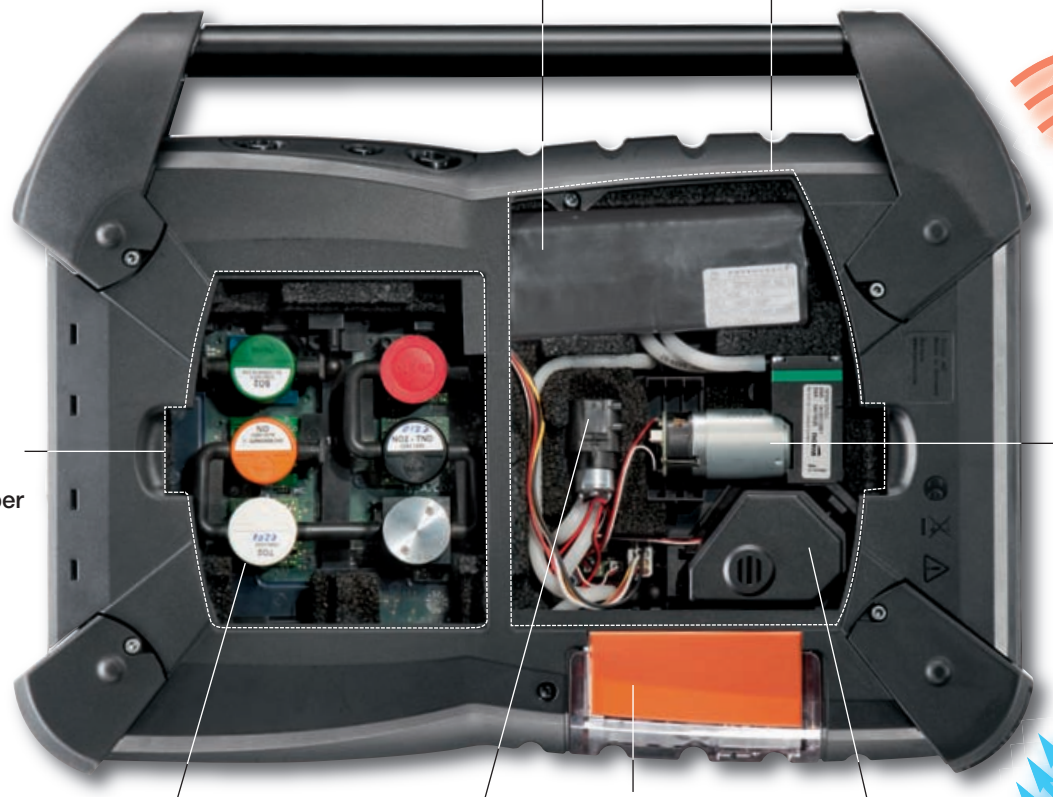
❷ **Colour graphic display**

innovative operating convenience thanks to an easy, clear menu structure

The connections are of industrial standard thanks to new, mechanically robust connection sockets

The dirt filters are easily accessible and can be changed without the use of tools

The new flue gas analyzer testo 350 offers insights and creates transparency ...



Plug & play: Easy gas sensor replacement

Condensate container: Condensate container quickly and easily emptied

testo 350 – Flue gas measurement at the highest level, thanks to:

❹ Easily accessible service opening

The service opening in the underside of the instrument allows very easy access to all relevant service and wearing parts such as pumps and filters, which can then be quickly cleaned and/or exchanged on site. The advantages:

✓ Reduction of instrument unavailability due to service times.
✓ Cost savings due to instrument maintenance and/or exchange and cleaning of wearing parts by the user.
✓ Immediate access to all relevant wearing parts

❺ Thermally separated sensor chamber

The sensor chamber is thermally separated from the other instrument components. This reduces possible sensor drifts caused by thermal influences.
This allows the maximum reliability pf the measuring instrument to be achieved.

❻ Easy exchange of the gas sensors

The gas sensors are pre-calibrated and can be exchanged, replaced or extended by further measurement parameters without test gas – if necessary directly at the measurement site.

✓ No more long service times
✓ Flexible extension of the testo 350 by further gas measurement parameters when applications or regulations change.
✓ A report is immediately issued when the NO sensor filter is used up. Then only the filter needs to be changed, and no longer the whole NO sensor.

❼ Automatically monitored condensate trap

The automatic monitoring of filling level reports when the condensate container needs to be emptied, and a few minutes after the report, the measurement gas pump is automatically stopped. This provides the highest protection of the analyzer box and the gas sensors from damage by condensate entry.

❽ External cooling loop

Closed cooling loops isolate the instrument electronics and sensors from the ambient air. The interior of the instrument is cooled via a heat exchanger and therefore does not come into contact with dirty or aggressive ambient air.

✓ Damage to the internal electronics are thus effectively prevented.
✓ The instrument can also be safely used in dusty or dirty atmospheres

Further advantages...

Diagnosis function – integrated and intelligent

The testo 350 has a number of instrument diagnosis functions. Error reports are issued in clear text, and are thus easily understandable. The current status of the flue gas analyzer is constantly displayed.

This guarantees:

✓ Low downtimes thanks to early warning reports, for example when gas sensors are spent.
✓ No false measurements due to faulty instrument components.
✓ Better planning of measurement work
✓ More reliability in emission measurement and up-to-date information on the instrument status.

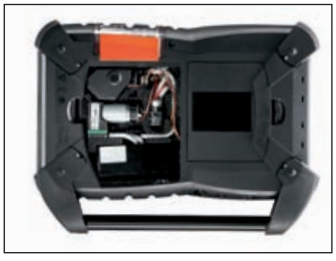
Automatic zeroing of the pressure sensor

This option allows volume nad mass flow velocity to be measured without supervision over a longer period of time and parallel to the emission measurement. The pressure sensor is automatically zeroed at regular intervals. This avoids the typical drift of the pressure sensor when ambient conditions change.

Gas sensor zeroing

When the instrument is switched on, or manually if needed, the gas sensors are zeroed with ambient air. In the testo 350, this procedure is already completed in 30 seconds. This means that fast availablilty with tested and zeroed gas sensors is always guaranteed.

Filters can be easily exchanged without tools



Service opening with easy access to wearing parts

Continuous condensate drain-off for long -term measurements

Control unit connections

Flue gas analysis – brilliantly easy: testo 350, the only one that thinks ahead!

The portable flue gas analyzer testo 350 is the ideal tool for professional flue gas analysis. Helpful instrument settings guide the user safely through typical measurement tasks such as:

- ✓ Flue gas analysis in commisioning, setting, optimization or operational measurements on industrial burners, stationary industrial engines, gas turbines and flue gas purification systems.
- ✓ Control and monitoring of officially prescribed emission limits in exhaust gas.
- ✓ Function testing of stationaryy emission measuring instruments.
- ✓ Control and monitoring of defined gas atmospheres in furnace rooms or kilns in different processes.

❶ Control unit – small and convenient

The control unit is the operating and display unit of the testo 350. It can be removed and equipped as standard with a Li-ion rechareable battery. All settings are carried out using the cursor button. The presentation of the measurement values takes place via the colour graphic display. Thanks to the internal memory, measurement data can be transferred from the analyzer box to the control unit. If required by the measurement, several analyzer boxes can conveniently be operated and controlled using one control unit

The advantages of the testo 350 control unit:

- ✓ Operation of the analyzer box and transfer of the measurement data even when the flue gas pipe and the adjustment site are separated, especiall helpful for industrial burners, for example.
- ✓ Measurement data can be transferred from the analyzer box to the control unit. This means the analyzer box can remain at the measurement site for further measurements, and the control unit taken away in order to process the measurement data.
- ✓ In order to protect the display in measurements over a longer period or during transport to different measurement sites in a system, the control unit can be attached to the analyzer box face-down.

❷ Large colour graphic display with application-specific menu

The following measurement objects are available:

- Burner
- Gas turbine
- Engines (Select l > 1 or l 1 regulated industrial engines)
- User-defined.

Typical fuels, a practicable order of the exhaust gas parameters in the display, the corresponding calculations as well as useful instrument pre-settings, are stored under each of these measurement objects. Examples of these are the activation of the dilution in measurements on l 1 regulated industrial engines and gas engines, or the testing of the relevant gas sensor in the dilution slot.

The advantages of the application-specific menu

- ✓ Information in the display guides the user through the menu.
- ✓ Easy operation without previous knowledge of the instrument
- ✓ Reduction of the work steps before the start of the measurement.

❸ Analyzer box – industrial standard, robust and reliable

In the analyzer box are the gas sensors, the measurement gas and rinsing pumps, the Peltier gas preparation (optional), gas paths, filters, analysis and storage electronics as well as the mains unit and the Li-ion battery.

The robust housing has built-in impact protection (specially constructed X-shaped rubber edges), allowing the analyzer box to be used in tough conditions. Downtimes due to dirt in the instrument are almost completely eliminated by intelligent design and robustness. Inherently sealed chambers protect the interior of the instrument from dirt from the surroundings. Operation can be carried out with the control unit or in derict connection with a PC or notebook (USB, *Bluetooth*® 2.0 oder CANCase). The analyzer box can, after programming, independently carry out measurements and store measurement data.

The plug-in connections for the probes and bus cables are locked by bayonet fittings, and therefore securely connected to the analyzer box. This prevents unintentional removal, avoiding false measurements.

The advantages of the analyzer box

- ✓ Special chambers offer comprehensive protection for the sensors and electronics from dust and deposits.

Control unit is simply clicked in

Control unit turned over: safe transport to the measurement site

Robust flue gas analyzer for industrial use, even under the toughest conditions

Ideal order suggestion for emission measurement on industrial engines

	Part no.
testo 350 Control Unit	0632 3511
Option BLUETOOTH® wireless transmission	
testo 350 Analyzer box	0632 3510
Option CO (H_2-compensated) sensor, 0 to 10000 ppm	
Option NO sensor, 0 to 4000 ppm, resolution 1 ppm	
Option NO_2 sensor, 0 to 500 ppm, resolution 0.1 ppm	
Option CxHy sensor (Pellistor)	
Option Peltier gas preparation incl. hose pump	
Option BLUETOOTH® wireless transmission	
Option fresh air valve for long-term measurement, incl. measuring range extension with dilution factor 5 for all sensors	
Option measuring range extension for individual slot with the following selectable dilution factors: 0, 2, 5, 10, 20, 40	
Flue gas probe for industrial engines, probe shaft length 335 mm, incl. cone, heat protection shield, special hose for NO_2-/SO_2 measurement, Tmax probe shaft 1000 °C, hose length 2.2 m	0600 7550
Set BLUETOOTH® printer with wireless Bluetooth interface, incl. 1 roll of thermal paper, rech. battery, mains unit	0554 0553
easyEmission software	0554 3334
Mains unit for testo 350 Control Unit, 230V / 8V / 1A	0554 1084
Transport case for safe and tidy storage for flue gas analyzer testo 350, gas sampling probe and accessories, dimensions 570 x 470 x 210 mm (LxWxH)	0516 3510

Ideal order suggestion for emission measurement on burners

	Part no.
testo 350 Control Unit	0632 3511
Option BLUETOOTH® wireless transmission	
testo 350 Analyzer box	0632 3510
Option CO (H_2-compensated) sensor, 0 to 10000 ppm resolution 1 ppm)	
Option NO sensor, 0 to 4000 ppm, resolution 1 ppm	
Option NO_2 sensor, 0 to 500 ppm, resolution 0.1 ppm	
Option SO_2 sensor, 0 to 5000 ppm, resolution 1 ppm	
Option Peltier gas preparation incl. hose pump	
Option BLUETOOTH® wireless transmission	
Option measuring range extension for individual slot with the following selectable dilution factors: 0, 2, 5, 10, 20, 40	
Gas sampling probe, modular, incl. special hose for NO_2-/SO_2 measurement, cone, thermocouple NiCr-Ni (Tl), probe shaft length 335 mm, Tmax probe shaft 1000 °C, hose length 2.2 m	0600 8764
Mains unit for testo 350 Control Unit, 230V / 8V / 1A	0554 1084
Transport case for safe and tidy storage for flue gas analyzer testo 350, gas sampling probe and accessories, dimensions 570 x 470 x 210 mm (LxWxH)	0516 3510

✓ Highly accurate NOx measurement

The testo 350 allows the separate measurement of NO and NO_2. The high and fluctuating NO_2 components in engine exhaust gas make this measurement necessary, in order to display the real NOx value of the engine. In addition to this, the integrated gas preparation and the exhaust gas probe with a special hose provide protection from NO_2 and SO_2 absorbtion.

✓ Automatic measurement range enxtension for unexpectedly high CO concentrations

In measurements on unfamiliar systems, or under less than ideal operating conditions, unexpectedly high emission values (e.g. CO concentrations up to 50,000 ppm) can occur. In these cases, the measurement range extension is automatically activated. This means maximum sensor life. These useful pre-settings are already stored application-specifically in the instrument – the testo 350 thinks ahead!

Advantages in emission measurement on industrial engines

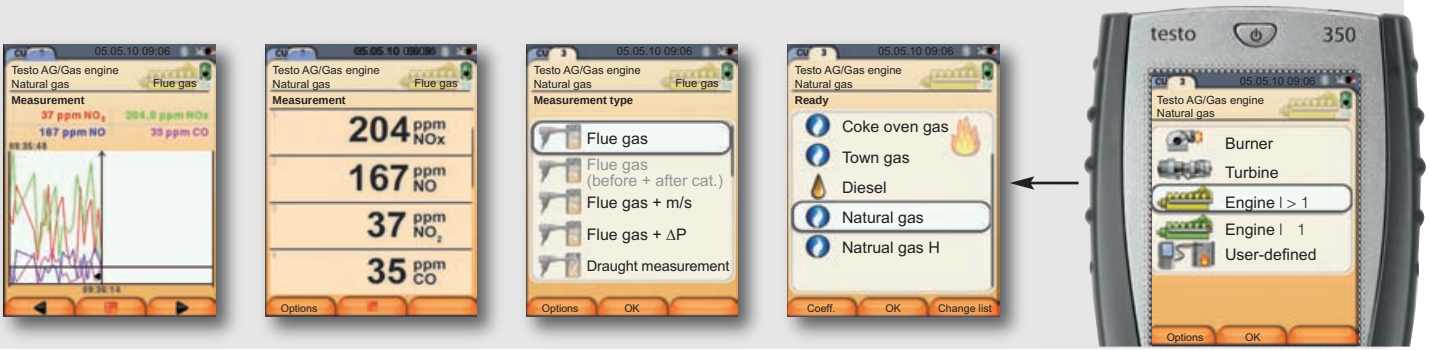
✓ Special instrument menu for the testing of exhaust gas preparation systems

This exhaust gas menu allows the simultaneous measurement of exhaust gas concentrations before and after the catalytic converter. For this purpose, two analyzer boxes are connected to each other with the Testo databus cable. The measurement values of the two analyzer boxes are shown parallel to each other in the control unit's display, enabling a fast overview of the status of the converter.

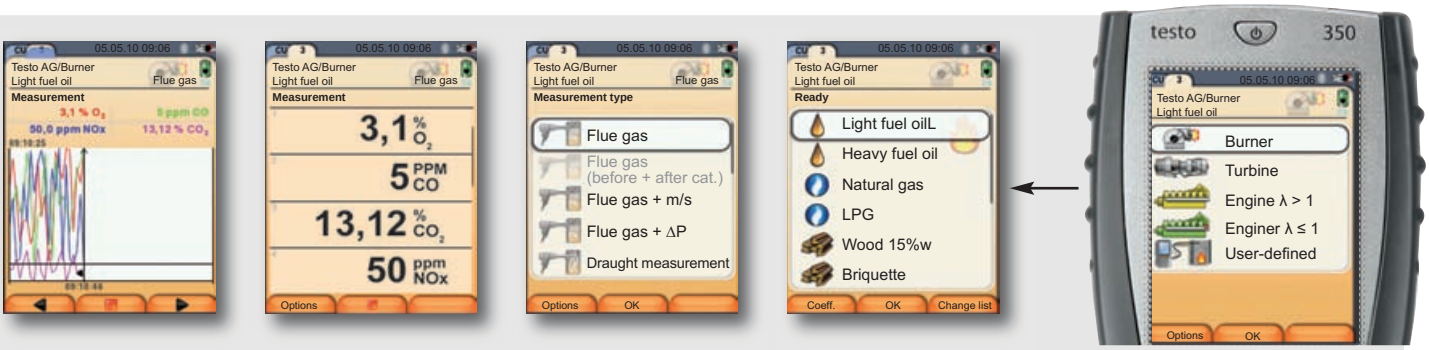
✓ Spatial distances

For greater distances between the gas sampling site and the adjustnment site, the control unit can be connected with the analyzer box either via the Testo databus cable or by Bluetooth®

testo 350: Flue gas analysis



5. Documentation ← **4.** Start measurement ← **3.** Exhaust gas selection ← **2.** Fuel selection ← **1.** Application selection



✓ High availability even under difficult conditions

The instrument diagnosis as well as warning reports in clear text inform the user of the current status of the flue gas analyzer. The large service opening in the testo 350 provides easy access to all relevant wearing parts such as sensors, filters and pumps. This means they can be quickly and easily cleaned or exchanged on site. The pre-calibrated sensors allow the exchange of sensors without test gas.

✓ High measurement accuracy even in unsupervised measurements

The integrated gas preparation prevents condensate from entering the measuring instrument and damaging it. Condensate which occurs is automatically pumped off by a peristaltic pump. In addition to this, the gas preparation and the PTFE hose in the gas sampling probe avoid NO_2 and SO_2 absorbtion 0 this makes highly accurate measurements possible.

Advantages in emission measurement on burners

✓ Helpful instrument pre-settings save time

Typical fuels, a practicable order of the exhaust gas parameters in the display as well as useful instrument pre-settings are stored under each application (selection list in display. Information in the display guides the user through the menu, previous familiarity with the instrument is not necessary. The testo 350 is ready for use after only a few minutes.

✓ Unrestricted measurement at high concentrations

When commissioning burners and in measurements on unfamiliar systems, very high concnetrations can take the user by surprise. In these cases, the automatic measuring range extension is activated.

Advantages in emission measurement on gas turbines

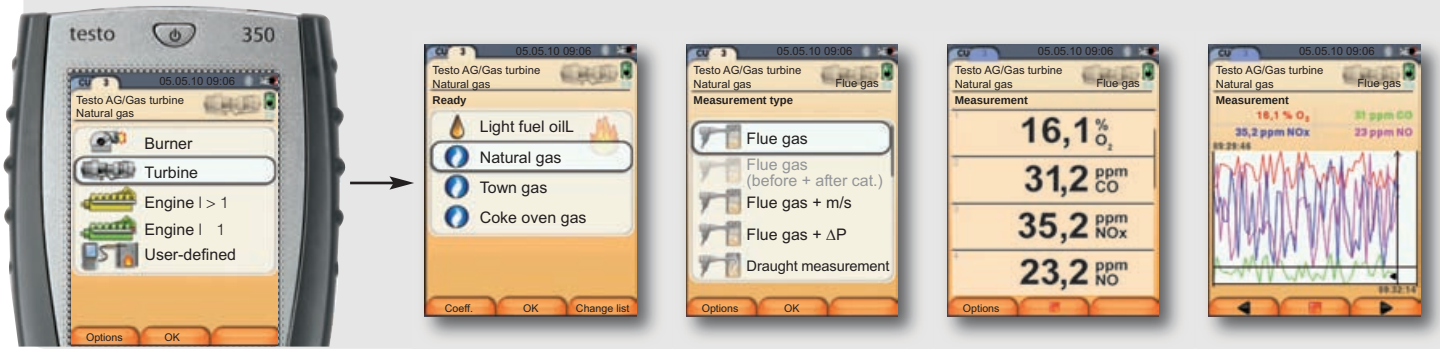
✓ Easy, precise test gas adjustment by the user
In order to fulfil the highest accuracy and comparability requirements, the testo 350 can, if needed, be adjusted using test gas on site.

✓ Use under tough conditions
Special chambers and closed cooling loops isolate the instrument electronics and sensors from the ambient air. This means the sensor chamber is thermally separated from the other instrument components, and possible drift of the sensors due to thermal influences are reduced.

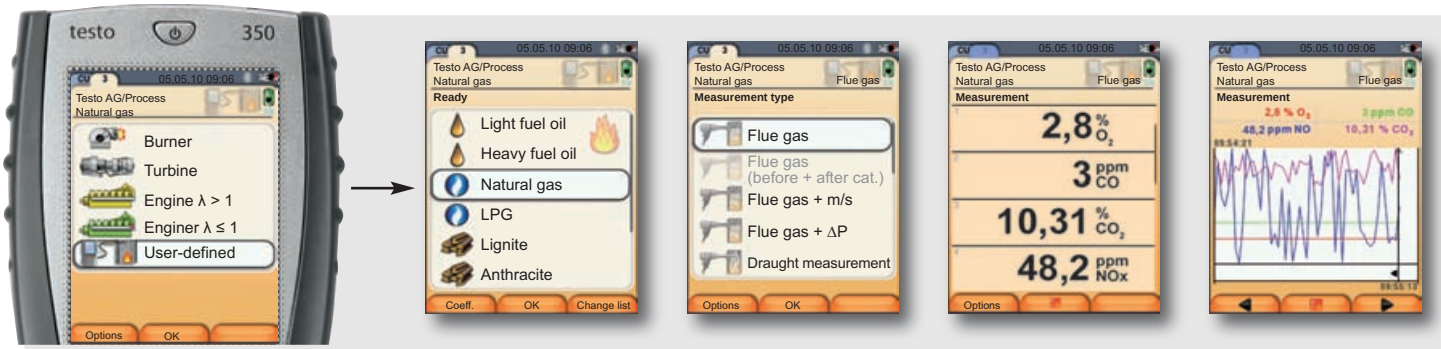
✓ Highly accurate NOx measurements at low concentrations
Emission measurement during monitoring and adjustment work on Low-NOx gas turbines requires a very high level of measurement accuracy because of the low NO concentrations. Thanks to the combination of the NO_2 sensor and the special NOlow sensor with a resolution of 0.1 ppm, exactly these requirements are fulfilled. In addition to this, the integrated gas preparation and the special exhaust gas probe for industrial engines with a special hose provides protection from NO_2 absorbtion.

✓ Combination of measuring range extension and COlow sensor
Thanks to the freely selectable dilution levels, concentrations of up to a maximum of 20,000 ppm can also be measured without any problems with the COlow sensor (measuring range 500 ppm).

in only 5 steps



1. Application selection → **2.** Fuel selection → **3.** Exhaust gas selection → **4.** Start measurement → **5.** Documentation



Advantages in emission measurement in thermal processes

✓ Excellently suited to long-term measurements
Controlled by defined measurement procedures, processes/furnace cycles can be monitored and analyzed over several days. The testo 350 conducts the measurements and saves the data in its internal store. The control can also be carried out directly via a PC and the easyEmission software.

✓ Simultaneous exhaust gas analysis at different measuremnt sites
In order to create a simultaneous profile of the furnace atmosphere and the combustion zones in large systems, up to 16 analyzer boxes can be connected with each other into a measurement system using the Testo databus cable. The control and operation can be carried out optionally either via the control unit or directly via a PC/notebook.

✓ Ideal for measurements at high concentrations
Especially when recording extreme concentrations up to the % range, the measuring range extension is automatically activated. This allows the continuation of the measurement. The gas sensor is placed under no greater load than at low concentrations, a maximum sensor life is achieved – without additional costs for further gas sensors.

✓ Industrial standard instrument functions for more security
Inherently closed cooling loops isolate the instrument's electronics and sensor from the ambinet air. This means using the testo 350 in dusty or dirty surroundings is no problem. The impact protection integrated into the housing protects the testo 350 from knocks and jars on the way to the measurement site.

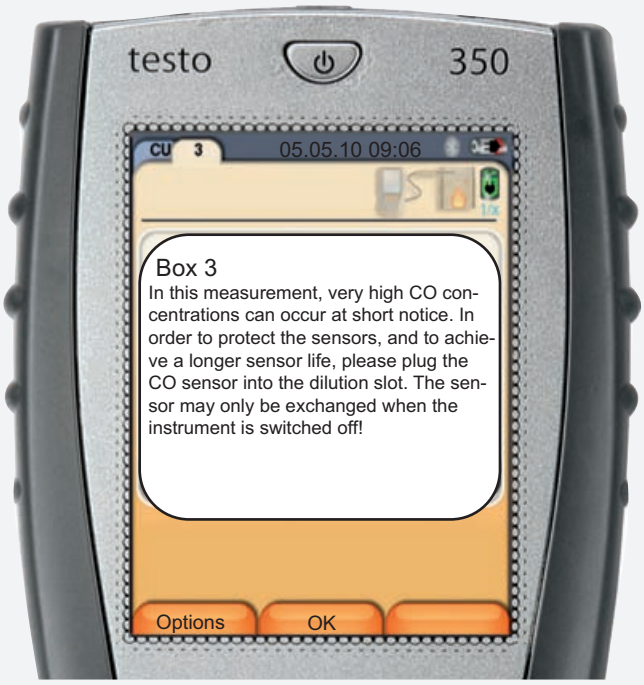
Ideal order suggestion for emission measurement on gas turbines

	Part no.
testo 350 Control Unit	0632 3511
Option BLUETOOTH® wireless transmission	
testo 350 Analyzer box	0632 3510
Option COlow (H_2-compensated) sensor, 0 to 500 ppm, resolution 0.1 ppm	
Option NOlow-Sensor, 0 to 300 ppm, resolution 0.1 ppm	
Option NO_2 sensor, 0 to 500 ppm, resolution 0.1 ppm	
Option Peltier gas preparation incl. hose pump	
Option BLUETOOTH® wireless transmission	
Option fresh air valve for long-term measurement, incl. measuring range extension with dilution factor 5 for all sensors	
Option measuring range extension for individual slot with the following selectable dilution factors: 0, 2, 5, 10, 20, 40	
Flue gas probe for industrial engines, probe shaft length 335 mm, incl. cone, heat protection shield, special hose for NO_2-/SO_2 measurement, Tmax probe shaft 1000 °C, hose length 2.2 m	0600 7550
Mains unit for testo 350 Control Unit, 230V / 8V / 1A	0554 1084
Transport case for safe and tidy storage for flue gas analyzer testo 350, gas sampling probe and accessories, dimensions 570 x 470 x 210 mm (LxWxH)	0516 3510

Ideal order suggestion for emission measurement on thermal processes

	Part no.
testo 350 Control Unit	0632 3511
Option BLUETOOTH® wireless transmission	
testo 350 Analyzer box	0632 3510
Option CO (H_2-compensated) sensor, 0 to 10000 ppm, resolution 1 ppm	
Option CO_2 (NDIR) sensor, 0 to 50 Vol %, resolution 0.01 Vol %, infrared measurement principle, incl. absolute pressure measurement, condensate container filling level monitoring and CO2 absorbtion filter with filler pack	
Option NO sensor, 0 to 4000 ppm, resolution 1 ppm	
Option NO_2 sensor, 0 to 500 ppm, resolution 0.1 ppm	
Option Peltier gas preparation incl. hose pump	
Option BLUETOOTH® wireless transmission	
Gas sampling probe, modular, incl. special hose for NO_2-/SO_2 measurement, cone, thermocouple NiCr-Ni (TI), probe shaft length 335 mm, Tmax probe shaft 1000 °C, hose length 2.2 m	0600 8764
easyEmission software	0554 3334
Mains unit for testo 350 Control Unit, 230V / 8V / 1A	0554 1084
Transport case for safe and tidy storage for flue gas analyzer testo 350, gas sampling probe and accessories, dimensions 570 x 470 x 210 mm (LxWxH)	0516 3510

testo 350 facilitates emission measurements ...



Example of display of the control unit
diagnosis function and information in clear text

... thanks to a colour display with graphic menu

- ✓ Step by step – Information in the display guides through the measurement, meaning no previous familiarity with the instrument is necessary
- ✓ Specific fuels are pre-set for the application
- ✓ Application-specific flue gas parameters are stored in the menu
- ✓ Instrument settings such as the dilution factor of gas sensors are activated by application
- ✓ Automatic testing of whether the relevant gas sensors are connected to the intended dilution slot
- ✓ Special measurement mode for the testing of catalytic converters with two flue gas analyzers
- ✓ Faster and easier analysis of the system status thanks to graphic and coloured presentation of the measurement values – a glance is enough!

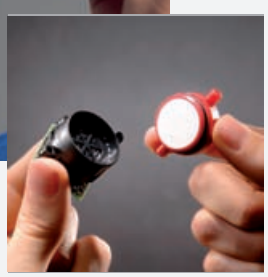
... thanks to the instrument diagnosis

- ✓ Information on the current status of the flue gas analyzer testo 350 at any time
- ✓ Early warning reports of approaching replacement of wearing parts – to be on the safe side.

Efficient emission measurements which are also cost-effective in the long term:

- Easy exchange of the gas sensor by the user.
- After a warning report from the flue gas analyzer, wearing parts can always be replaced in time.
- Probe shafts can be easily exchanged or replaced.
- Further gas measurement parameters can be added at any time. Simply order additional gas sensors, install, and measure safely.
- Thanks to the unique measuring range extension, measurements can be carried out flexibly with only one gas sensor.
- The cross-sensitivity filter of the NO sensor can be echanged by the user after a report

Exchanging probe shaft



Replacing filter

easyEmission software – convenient measurement data management

Using the "easyEmission" software, data can be read out, conveniently processed, archived and managed.

Advantages of easyEmission

- ✓ Presentation of the measurement values as a table or a graph
- ✓ User-defined measurement intervals(from one measurement / second to one measurement / hour)
- ✓ Online measurement via BLUETOOTH® wireless transfer or by USB connection
- ✓ Customer and application-specific measurement protocols
- ✓ Data structure and measurement information are transferrable from the PC/notebook to the instrument
- ✓ All instrument configurations and settings are easily carried out with easyEmission
- ✓ Direct export to Excel and PDF formats
- ✓ Easy implementation of individual formulas for the user's own calculations
- ✓ Calculation of fuel factors when using customer-specific fuels
- ✓ Control of the bus system with up to 16 flue gas analyzer boxes
- ✓ Implementation of individual cross-sensitivity adjustments of the gas sensors

An overview of the testo 350 data interfaces

It is this easy to control measurements, read out, transfer and print measurement data! These data interfaces are selectable for easy communication and data transfer:

- **Bluetooth®**
  2.0 (up to 100 m without obstruction)
- **USB**
- **Infrared interface**
  (Communication with the Testo printer)
- **Testo databus**
  (up to 800m cable length) for the simultaneous operation of up to 16 analyzer boxes. Control optionally via PC, Testo databus controller or control unit.

Ordering data testo 350

testo 350 Control unit	Part no.
testo 350 Control Unit, displays measurement values and controls analyzer box, incl. rech. battery, measurement data store, USB interface and connection for Testo databus	0632 3511
testo 350 Option for control unit testo 350	
Option BLUETOOTH® wireless transmission	

testo 350 Accessories for control unit testo 350	
Mains unit for testo 350 Control Unit, 230V / 8V / 1A	0554 1084

testo 350 analyzer box testo 350	Part no.
testo 350 analyzer box, equipped with O_2, incl. differential pressure sensor, temperature probe input Type K NiCr-Ni and Type S Pt10Rh-Pt, connection Testo databus, rech. battery, integrated combustion air probe (NTC), trigger input, measurement data store, USB interface, updatable to max. 6 gas sensors selected from CO, COlow, NO, NOlow, NO_2, SO_2, CO_2 NDIR, CxHy, H_2S	0632 3510
A second gas sensor must be installed in testo 350-S, otherwise the instrument is unable to function. Up to 5 additional sensors can be fitted.	
Option CO (H_2-compensated) sensor, 0 to 10000 ppm, resolution 1 ppm	
Option COlow (H_2-compensated) sensor, 0 to 500 ppm, resolution 0.1 ppm	
Option NO sensor, 0 to 4000 ppm, resolution 1 ppm	
Option NOlow 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 5000 ppm, resolution 1 ppm	
Option CO_2 (NDIR) sensor, 0 to 50 Vol %, resolution 0.01 Vol %, infrared measurement principle, incl. absolute pressure measurement, condensate container filling level monitoring and CO2 absorbtion filter with filler pack	
Option CxHy sensor, methane 100 to 40000 ppm, propane 100 to 21000 ppm, butane 100 to 18000 ppm, resolution 10 ppm. Pellistor is adjusted to methane ex-works	
Option H_2S sensor, 0 to 300 ppm, resolution 0.1 ppm	
Option BLUETOOTH® wireless transmission	
Option Peltier gas preparation incl. peristaltic pump for automatic condensate evacuation	
Option fresh air valve for long-term measurement, incl. measuring range extension with dilution factor 5 for all sensors	
Option measuring range extension for individual slot with the following selectable dilution factors: 0, 2, 5, 10, 20, 40	
Option DC voltage input 11V to 40V	
Option special gas pump for long-term measurements with extended guarantee. For measurements >2 hours, the option Peltier gas preparation is additionally recommended.	
Option automatic zeroing of pressure sensor for continuous flow velocity / differential pressure measurement	

Accessories testo 350 analyzer box and transport case	Part no.
Cable with battery terminals and adapter for connection to DC voltage input testo 350 analyzer box	0554 1337
Exchangeable filter NO sensor (1 off), blocks cross-gas SO_2	0554 4150
Transport case for safe and tidy storage for flue gas analyzer testo 350, gas sampling probe and accessories, dimensions 570 x 470 210 mm (LxWxH) Carrying strap set for analyzer box testo 350	0516 3510
Carrying strap set for analyzer box testo 350	0554 0434
Spare dirt filter for analyzer box testo 350 (20 off)	0554 3381
Hose set to convey flue gas from analyzer box testo 350, length 5m	0554 0451
Wall holder for flue gas analyzer testo 350, lockable	0554 0203
Current/voltage cable (0 to 1000 mV, 0 to 10 V, 0 to 20 mA)	0554 0007

PC software and Testo databus	
Software “easyEmission”, incl. USB connection cable instrument-PC. Functions: user-definable measuring intervals, transfer of readings to Microsoft EXCEL within seconds, user-definable fuels, representation of readings as table or graph, simple production of customer-specific measurement protocols etc.	0554 3334
Software “easyEmission”, incl. Testo Databus Controller with USB-connection cable instrument-PC, cable for Testo databus. For example, if several Testo 350 flue gas analyzers are connected to the Testo databus, they can be controlled and read out via a PC (possible measurement interval in databus from 1 measurement per second)	0554 3336
Mutiple software licence “easyEmission” for flue gas analyzer testo 350	0554 3337
Connection cable for Testo databus between Control Unit and analyzer box or between several analyzer boxes, with bayonet fitting, length 2 m	04490075
Connection cable for Testo databus between Control Unit and analyzer box or between several analyzer boxes, with bayonet fitting, length 5 m	0049 0076
Connection cable for Testo databus between Control Unit and analyzer box or between several analyzer boxes, with bayonet fitting, length 20 m	00490077
Other cable lengths up to 1000 m on request	
Analog ouput box set, 6 channels, 4 to 20mA, for transfer of measurement values to e.g. analog recorder, set consists of analog output box, connection cable Testo databus, length 2 m, Testo databus input impedance.	05543149

Printers and accessories	
Testo fast printer with wireless infrared interface, 1 roll of thermal paper and 4 mignon batteries for printing readings out on site	0554 0549
Set BLUETOOTH® printer with wireless Bluetooth interface, incl. 1 roll of thermal paper, rech. battery and mains unit	0554 0553
Spare thermal paper for printer (6 rolls), permanent, measurement data documentation can be read for up to 10 years	0554 0568
Spare thermal paper for printer (6 rolls)	0554 0569

Calibration certificates	
ISO calibration certificate flue gas, calibration points 2.5 Vol% O_2 100 and 1000 ppm CO 800 ppm NO 80 ppm NO2 1000 ppm SO_2	0554 0003
ISO calibration certificate flow velocity, hot wire/vane anemometer, Pitot tube; calibration points 1, 2, 5, 10 m/s	0554 0004
ISO calibration certificate flow velocity, hot wire/vane anemometer, Pitot tube; calibration points 5, 10, 15, 20 m/s	0554 0034

Ordering data testo 350

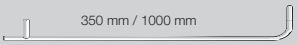
Standard gas sampling probes	Part no.
Modular flue gas probes, available in 2 lengths, incl. probe stop, NiCr-Ni thermocouple, 2.2 m hose and particle filter 	
Gas sampling probe, modular, incl. special hose for NO_2-/SO_2 measurement, cone, thermocouple NiCr-Ni (Tl), probe shaft length 335 mm, Tmax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

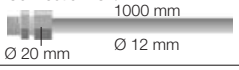
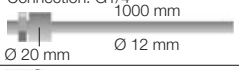
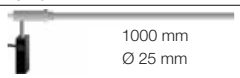
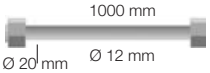
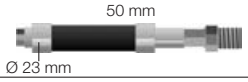
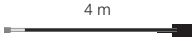
Accessories standard gas sampling probes	Part no.
Hose extension, length 2.8 m	0554 1202
Probe shaft with pre-filter, probe shaft length 335 mm, Tmax probe shaft 1000°C, Ø pre-filter 14 mm	0554 8766
Probe shaft with pre-filter, probe shaft length 700 mm, Tmax probe shaft 1000°C, Ø pre-filter 14 mm	0554 8767
Spare sintered filters (2)	0554 3372
Probe shaft, length 700 mm, Tmax probe shaft 500°C	0554 9767
Probe shaft, length 335 mm, Tmax probe shaft 1000°C	0554 8764
Probe shaft, length 700 mm, Tmax probe shaft 1000°C	0554 8765
Spare dirt filter for probe handle	0554 3385

Flue gas probes for industrial engines	Part no.
Engine probes 	
Flue gas probe for industrial engines, probe shaft length 335 mm, incl. cone, heat protection shield, special hose for NO_2-/SO_2 measurement, Tmax probe shaft 1000 °C, hose length 2.2 m	0600 7550
Flue gas probe with pre-filter for industrial engines, probe shaft length 335 mm, incl. cone, heat protection shield, special hose for NO_2-/SO_2 measurement, Tmax probe shaft 1000 °C, hose length 2.2 m	0600 7551

Flue gas probe accessories for industrial engines	Part no.
Thermocouple for flue gas temperature measurement, NiCr-Ni, length 400 mm, Tmax. +1000 °C with 2.4 m connection cable and additional temperature protection	0600 8894
Thermocouple for flue gas temperature measurement, NiCr-Ni, length 400 mm, Tmax. +1000 °C with 5.2 m connection cable and additional temperature protection	0600 8895
Spare probe shaft with pre-filter for flue gas probe for industrial engines, probe shaft length 335 mm, Tmax probe shaft 1000°C	0554 7455

Temperature sensors	Part no.
Combustion air temperature probe, immersion depth 60 mm	0600 9797

Pitot tubes	Part no.
	
Pitot tube stainless steel, 350 mm long, for measurement of flow velocity	0554 2145
Pitot tube, 1000 mm long, stainless steel, measures flow velocity	0554 2345
Connection hose, silicon, length 5 m, load to maximum 700 hPa (mbar)	0554 0440
Straight Pitot tube, stainless steel, length 350 mm for measuring flow velocity, incl. temperature measurement, 3-fold hose (5 m length) and heat protection shield	0554 22041
Straight Pitot tube, stainless steel, length 750 mm for measuring flow velocity, incl. temperature measurement, 3-fold hose (5 m length) and heat protection shield	0554 2042

Industrial gas sampling probes – modular system			Part no.
Heated handle, voltage supply 115 to 230 V, 50/60Hz, temperature gas path > 180 °C, IP54, gas input G1/4'', gas output M10x1 outer thread		Power consumption: 200 watts; Temp. gas path: > 180 °C; Ready to operate: after approx. 20 min; Length of mains cable: 3 m; Protection class: IP54; Ambient temp.: -20 to +50 °C; gas inlet: G1/4"; gas outlet: M 10x1 outer thread; weight: 1.7 kg	0600 7920
Adapter, unheated, IP54, gas input G1/4'', gas output M10x1 outer thread		Ambient temp.: -20 to +50 °C; Protection class: IP54; Gas inlet: G1/4"; Gas outlet: M 10x1 outer thread; Weight: 0.4 kg	0600 7911
Unheated sampling probes +600 °C, stainless steel 1.4571, length 1 m	Connection: G1/4" 	Weight: 400 g	0600 7801
Unheated sampling probe up to +1200 °C, Inconel 625, length 1 m			0600 7803
Unheated sampling probe up to +1800 °C, Al oxide, length 1 m	Connection: G1/4" 	Weight: 400 g	0600 7805
Heated sampling probe, voltage supply 230 V / 50 Hz, stainless steel 1.4571, heating > 180°C, exhaust gas temperature max. +600 °C		Heating: > +180 °C; power consumption: 650 watts; Connection: electr. connection to heated handle, connection adapter with thread connection/screw socket G1/4"; Max. flue gas temp.: +600 °C	0600 7820
Extension shaft up to +600 °C, stainless steel 1.4571, length 1 m		Connection: Thread screw/screw socket G1/4"; Weight: 0.45 kg	0600 7802
Extension shaft up to +1200 °C, Inconel 625, length 1 m			0600 7804
Pre-filter for dusty flue gases, ceramic, dust load max. 20g/m³, filter pore size 20µm, temperature max. 1000 °C		Dust load: max. 20 g / m3; filter fineness: 20 µm; Temperature: max. 1000 °C; Material: ceramic; Connection: G1/4" thread nipple; Weight: 0.2 kg	0554 0710
Thermocouple, NiCr-Ni, -200 to +1200 °C, Inconel 625, 1.2 m long		Connection: To analyser via 4 m connection cable with 8 pin plug; Weight: 0.15 kg. The length depends on the number of sampling and extension pipes used.	0430 0065
Thermocouple, NiCr-Ni, -200 to +1200 °C, Inconel 625, 2.2 m long			0430 0066
Thermocouple, NiCr-Ni, -200 to +1200 °C, Inconel 625, 3.2 m long			0430 0067
Special sampling hose for accurate NO_2-/SO_2- measurements, length 4m		Hose material inside: PFFE hose with 2 mm inner diameter (lowest absorption, self-cleaning effect); Material outside: rubber; length: 4.0 m; Weight: 0.45 kg	0554 3384
Extension cable, length 5 m, between plug-in head cable and instrument			0554 0063
Mounting flange, stainless steel 1.4571, adjustable quick-action fitting, suitable for all sampling7extension pipes	 Ø 160 mm		0554 0760
Transport case for industrial probes, aluminium profile, space for: handle, probes, flange and accessories, dimensions 1270 x 320 x 140 mm (LxWxH)			0554 7900

Technical data Control Unit

	Control-Unit testo 350	Analog output box (mA Out)
Oper. temp.	-5 to +45 °C	-5 to +45 °C
Storage temp.	-20 to +50 °C	-20 to +50 °C
Battery type	Li-Ionen	–
Battery life	58 hh (without wireless connection)	–
Memory	2 MB (250,000 measurement values)	–
Weight	440 / 850 g	305 / 850 g
Dimensions	88 / 252 x 115 x 58 mm	200 / 252 x 115 x 58 mm
Warranty	2 years	3 / 2 years
Protection class	IP 40	–

Country permits BLUETOOTH® wireless transmission for flue gas analyzers testo 350

The BLUETOOTH® wireless module used by Testo has permits for the following listed countries, and can only be used in those countries, i. e. BLUETOOTH® wireless transfer 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 and Switzerland

Non-European countries
Canada, USA, Japan, Ukraine, Australia, Colombia, El Salvador and Venezuela.

Technical data Analyzer box testo 350

	O_2 measurement	COlow meas. (H2 compensated)*	COlow meas. (H2 compensated)*	NO measurement	NOlow measurement	NO_2 measurement	SO_2 measurement	CO_2 meas. (IR)	H_2S measurement
Meas. range	0 to +25 Vol. % O_2	0 to +10000 ppm CO	0 to +500 ppm CO	0 to +4000 ppm NO	0 to +300 ppm NO	0 to +500 ppm NO_2	0 to +5000 ppm SO_2	0 to +50 Vol. % CO_2	0 to +300 ppm H_2S
Accuracy	±0.8% of fsv (0 to +25 Vol. % O_2)	±5% of mv (+200 to +2000 ppm CO) ±10% of mv (+2001 to +10000 ppm CO) ±10 ppm CO (0 to +199 ppm CO)	±5% of mv (+40 to +500 ppm CO) ±2 ppm CO (0 to +39.9 ppm CO)	±5% of mv (+100 to +1999.9 ppm NO) ±10% of mv (+2000 to +3000 ppm NO) ±5 ppm NO (0 to +99 ppm NO)	±5% of mv (+40 to +300 ppm NO) ±2 ppm NO (0 to +39.9 ppm NO)	±5% of mv (+100 to +500 ppm NO_2) ±5 ppm NO_2 (0 to +99.9 ppm NO_2)	±5% of mv (+100 to +2000 ppm SO_2) ±10% of mv (+2001 to +5000 ppm SO_2) ±5 ppm SO_2 (0 to +99 ppm SO_2)	±0.3 Vol. % CO_2 + 1% of mv (0 to 25 Vol. % CO_2) ±0.5 Vol. % CO_2 + 1.5% of mv (>25 to 50 Vol. % CO_2)	±5% of mv (+40 to +300 ppm) ±2 ppm (0 to +39.9 ppm)
Resolution	0.01 Vol. % O_2 (0 to +25 Vol. % O_2)	1 ppm CO (0 to +10000 ppm CO)	0.1 ppm CO (0 to +500 ppm CO)	1 ppm NO (0 to +3000 ppm NO)	0.1 ppm NO (0 to +300 ppm NO)	0.1 ppm NO_2 (0 to +500 ppm NO_2)	1 ppm SO_2 (0 to +5000 ppm SO_2)	0.01 Vol. % CO_2 (0 to 25 Vol. % CO_2) 0.1 Vol. % CO_2 (>25 Vol. % CO_2)	0.1 ppm (0 to +300 ppm)
Reaction time	20 s	40 s	40 s	30 s	30 s	40 s	30 s	á10 s	35 s
Reaction type	t_{95}	t_{90}	t_{90}	t_{90}	t_{90}	t_{90}	t_{90}	t_{90}	t_{90}

* H2 display only as an indicator

Individual dilution with selectable dilution factor (x2, x5, x10, x20, x40)

	CO (H_2 compensated)	COlow meas. (H_2 compensated)	NO measurement	NOlow measurement	SO_2 measurement	CxHy measurement
Meas. range	dilution factor-dependent	dilution factor-dependent	dilution factor-dependent	dilution factor-dependent	dilution factor-dependent	dilution factor-dependent
Accuracy	±2 % of m.v. (additional error)	±2 % of m.v. (additional error)	±2 % of m.v. (additional error)	±2 % of m.v. (additional error)	±2 % of m.v. (additional error)	±2 % of m.v. (additional error)
Resolution	1 ppm	0.1 ppm	0.1 ppm	0.1 ppm	1 ppm	10 ppm

Dilution of all sensors (Factor 5)

	CO (H_2 compensated)	COlow meas. (H_2 compensated)	NO measurement	NOlow measurement	SO_2 measurement	NO_2 measurement	H_2S measurement
Meas. range	2500 to 50000 ppm	500 to 2500 ppm	1500 to 20000 ppm	300 to 1500 ppm	500 to 25000 ppm	500 to 2500 ppm	200 to 1500 ppm
Accuracy	±5 % of m.v. (additional error) Pressure range -100 to 0 mbar at probe tip	±5 % of m.v. (additional error) Pressure range -100 to 0 mbar at probe tip	±5 % of m.v. (additional error) Pressure range -100 to 0 mbar at probe tip	±5 % of m.v. (additional error) Pressure range -100 to 0 mbar at probe tip	±5 % of m.v. (additional error) Pressure range -100 to 0 mbar at probe tip	±5 % of m.v. (additional error) Pressure range -100 to 0 mbar at probe tip	±5 % of m.v. (additional error) Pressure range -100 to 0 mbar at probe tip
Resolution	1 ppm	0.1 ppm	1 ppm	0.1 ppm	1 ppm	0.1 ppm	0.1 ppm

Technical data Analyzer box testo 350

	Degree of effectivity	Exhaust gas loss	CO_2 calculation	Differential pressure 1	Differential pressure 2	Flow velocity	Absolute pressurek (opt. if IR sensor equipped)	Flue gas dewpoint calculation
Meas. range	0 to +120 %	0 to +99.9 % qA	0 to CO_2 max Vol. % CO_2	-40 to +40 hPa	-200 to +200 hPa	0 to +40 m/s	-600 to +1150 hPa	0 to +99.9 °Ctd
Accuracy			Calculated from O_2 ±0.2 Vol. %	±1.5% of m.v. (-40 to -3 hPa) ±1.5% of m.v. (+3 to +40 hPa) ±0.03 hPa (-2.99 to +2.99 hPa)	±1.5% of m.v. (-200 to -50 hPa) ±1.5% of m.v. (+50 to +200 hPa) ±0.5 hPa (-49.9 to +49.9 hPa)		± 10 hPa	
Resolution	0.1 % (0 to +120 %)	0.1 % qA (-20 to +99.9 % qA)	0.01 Vol. % CO2	0.01 hPa (-40 to +40 hPa)	0.1 hPa (-200 to +200 hPa)	0.1 m/s (0 to +40 m/s)	1 hPa	0.1 °Ctd (0 to +99.9 °Ctd)
Reaction time			430 s					
Reaction type			t_{90}					

Technical data CxHy censor

Measurement parameter	Methane	Propane	Butane
Meas. range [1]	100 to 40,000 ppm	100 to 21,000 ppm	100 to 18,000 ppm
Accuracy	< 400 ppm (100 to 4000 ppm) < 10 % of m.v. (> 4000 ppm)	< 400 ppm (100 to 4000 ppm) < 10 % of m.v. (> 4000 ppm	< 400 ppm (100 to 4000 ppm) < 10 % of m.v. (> 4000 ppm
Resolution	10 ppm	10 ppm	10 ppm
Min. O_2 requirement in flue gas	2% + (2 x m.v. methane)	2% + (5 x m.v. propane)	2% + (6.5 x m.v. butane)
Respopnse time t90	< 40 sec.	< 40 sec.	< 40 sec.
Response-Faktor [2]	1	1.5	2

[1] Lower explosion limit must be adhered to.
[2] The HC sensor is adjusted to methane in the factory. It can be adjusted to another gas (propane or butane) by the user.

Other technical data

Dimensions:	330 x 128 x 438 mm
Weight:	4800 g
Storage temperature:	-20 to +50 °C
Operating temperature:	-5 to +45 °C
Housing material:	ABS
Memory:	250,000 Measurement values
Power supply:	AC mains unit 90V to 260V (47 to 65 Hz)
DC voltage supply:	11V to 40V
Max. dust load:	20 g/m³ dust in flue ags
Dewpoint calculation:	0 to 99 °C td
Max. pos. pressure flue gas:	max. +50 mbar
Max. neg. pressure:	min. -300 mbar
Pump through-put:	1 l/min. with through-put monitoring
Hose length:	max 16.2 m (corresp. to 5 probe hose extensions)

Max. humidity load:	+70 °C
Dewpoint temperature at measurement gas input of analyzer box	
Trigger input:	Voltage 5 to 12 Volt
	(risin g or falling flank)
	Impulse width > 1 sec
	Load: 5 V/max, 5 mA, 12 V/max. 40 mA
Warranty:*	Measuring instrument 2 years (apart from wearing parts, e.g. gas sensors...);
Gas sensors:	CO/NO/NO_2/SO_2/H_2S/C_XH_Y: 1 year;
O_2 sensor:	1 1/2 years;
CO_2-IR sensor:	2 years.
Rech. battery	1 year
Protection class:	IP40
Battery life:	Maximum load approx. 2.5 h

*Warranty applies for average sensor load.

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