We measure it. testo

Industrial emission analysis for the highest demands.

Measurement system testo 350: 6 gas sensors, removable control unit – ideal for complex measurement tasks and data transfer over greater distances.

Precision sensors and intuitive operation – robustly packaged.

Whether it's a case of professional flue gas analysis or industrial emissions measurement: the testo 350 flue gas analyzer performs a wide variety of measurement and analysis tasks, is impressive thanks to its heavy-duty design for long-term use in harsh environments, and is also suitable for sophisticated data acquisition. The testo 350 consists of a control unit and an analyzer unit. The removable **control unit** with clear graphic colour display is the control and display unit of the testo 350. The robust **analyzer unit** contains 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 Li-ion rechargeable battery.

1 I **Graphic colour display with application-specific menu guidance** takes you through the measurement and provides information on the status of the instrument. Information is issued in clear text and the current status of the flue gas analyzer is constantly displayed.

2 I **Automatically monitored condensate trap** reports when the condensate container needs to be emptied and automatically stops the measuring gas pump in order to protect the sensors from condensate.

3 I **Housing with integrated rubber edge protection** protects sensors, pumps, analysis and storage electronics.

4 I **Status display** shows the current operating mode and can be observed from a distance.

5 I **Dirt filters** are easily accessible and can be replaced without tools.

6 I **Industrial-strength connections** thanks to robust mechanical plug-in connections.

A I **Control unit** controls the analyzer unit, guides the user safely through the measurement and displays the readings.

B I **Analyzer unit** with shock-proof sensors, pumps, analysis and storage electronics

12 I Fresh air and dilution pump

13 I Condensate pump

14 I Measuring gas pump

7 I **Thermally decoupled sensor chamber** prevents sensor drifts due to thermal influences, increases the reliability of the measuring instrument and the measurement results.

8 I **Easy replacement of the gas sensors** without test gas adjustment directly on site by the user.

9 I **Li-ion rechargeable battery** for several hours of mains-independent power supply.

10 I **External cooling loop** isolates the instrument electronics and sensors from the ambient air. The interior of the instrument is cooled by a heat exchanger, and does not come into contact with contaminated ambient air.

11 I **Easily accessible service apertures** enable easy access to all relevant service and wearing parts such as pumps and filters, which means that these can be quickly cleaned or replaced on site.

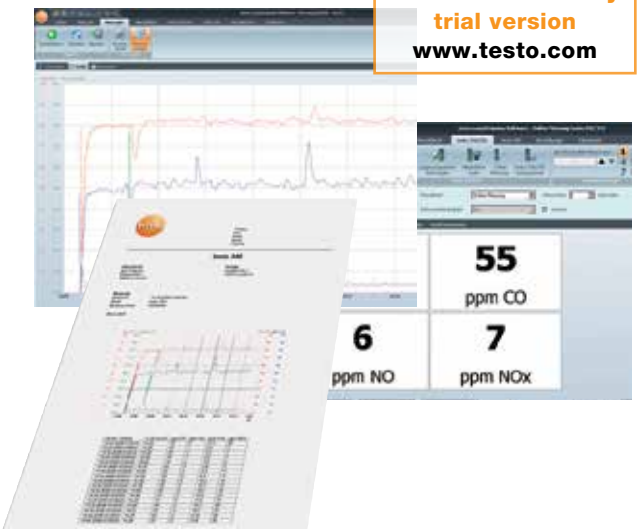
Automatic zeroing of the pressure sensor enables unsupervised volume and mass flow measurements over a longer period of time and in parallel with the emissions measurement.

Convenient measurement data management.

testo easyEmission software: **read, edit, archive and manage data.**

The testo easyEmission software can be used to read, edit, archive and manage measurement data from the testo 350. In addition, the measuring instrument can carry out online measurement when directly connected to testo easyEmission via Bluetooth® or USB port. An online measurement allows you to display real-time values on the screen even while the measurement is ongoing. Readings can be displayed in graph or table form. Once the measurement has finished, the readings can easily be transferred to Excel. There is also the option of saving the measurement protocol in PDF format. The software also offers the option of easily creating customer-specific and application-specific measurement protocols depending on the requirement.

Download and try out the free 30-day trial version www.testo.com



Further advantages of testo easyEmission:

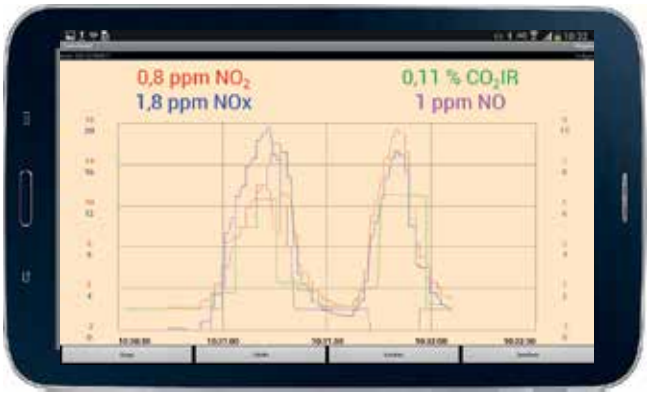
- User-defined measurement intervals
- Adjust instrument settings
- Simple implementation of individual formulas for your own calculations
- Calculation of fuel factors when using customer-specific fuels
- Carry out individual cross-sensitivity adjustment of the gas sensors

App: remote control via smartphone / tablet.

The free app turns your Android smartphone or tablet into a display unit for the testo 350. Your measurement can therefore be controlled regardless of measuring location, for example if the measuring instrument needs to be installed at a place that is difficult to access. The display app means that the readings can be read directly where the system is set up – without taking up any additional time.

Functions:

- Start/stop current measurements
- Send measurement protocols via e-mail
- Save measurement protocols on the memory card of your smartphone/tablet
- Display measurement data in table or graph form
- Print out current readings on the testo Bluetooth® printer
- Read out the readings from another app or HTML application in accordance with the ZIV specification



Infrared, USB or Bluetooth®: overview of the data interfaces of the testo 350.

This shows how easy it is to control measurements and read, transmit and print measurement data. These data interfaces are available for easy communication and data transmission:

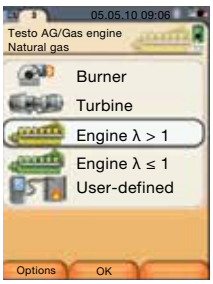
Testo data bus up to 800 m cable length for the simultaneous operation of up to 16 analyzer units. Control either via PC, Testo data bus controller or control unit.

Emissions measurements in 5 steps.

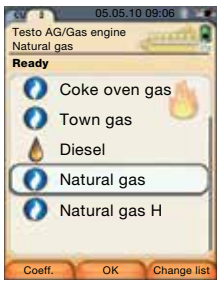
The testo 350 guides you step by step through the entire measurement process in a way that is easy to understand. The graphic colour display provides information relevant to the situation and guides the user through the measurement. No previous instrument-specific knowledge is therefore required, even for complex measuring processes. Specific fuels, as well as application-specific flue gas parameters, are preset for the various applications.

Instrument settings, such as the gas sensors dilution function, are activated by application. The testo 350 automatically checks whether relevant gas sensors are fitted onto the designated dilution slot.

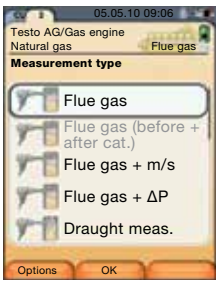
The testo 350 has a special measuring mode for testing catalytic converters with two flue gas analyzers.



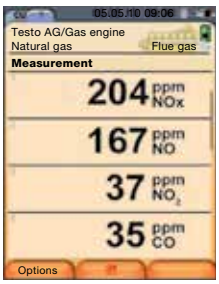
1. Application selection



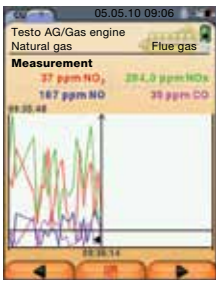
2. Fuel selection



3. Measurement type selection



4. Start measurement



5. Documentation

Video on carrying out a measurement at www.testo.com/...

testo 350 provides information via the instrument diagnosis.

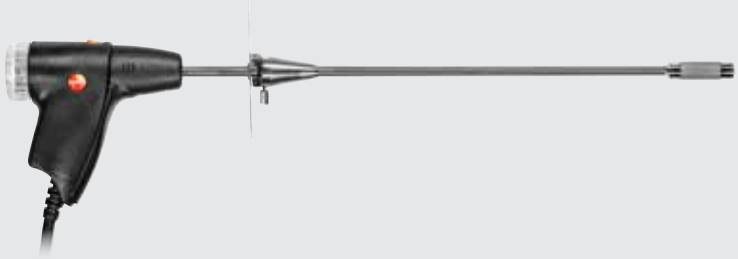
The testo 350 has a large number of instrument diagnosis functions, with information issued in clear text. The current status of the flue gas analyzer is constantly displayed. This guarantees:

- Low downtimes thanks to early warning messages, for example when gas sensors are spent
- No false measurements due to faulty instrument components
- Better planning of measurement work
- Accurate information to hand regarding the current status of the testo 350

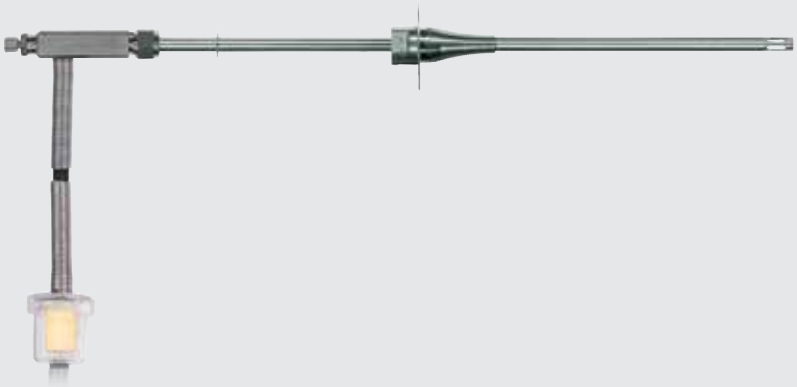
The Testo probe concept.

The probes for the testo 350 were specially designed by our engineers to be able to measure aggressive condensate, high dust concentrations or mechanical stress reliably and accurately, even at very high temperatures – by professionals for professionals.

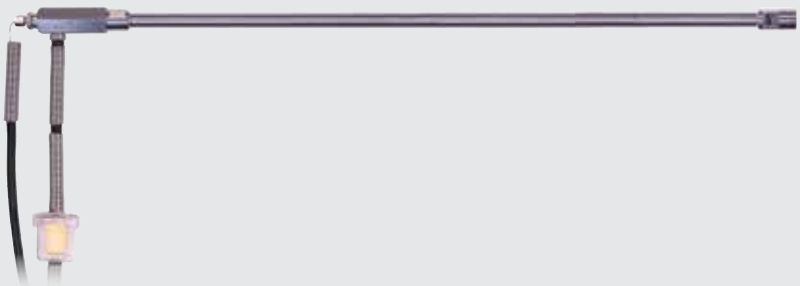
Modular standard gas sampling probes
Standard gas sampling probes are available for different temperature ranges (500 °C / 1,000 °C), in different lengths (335 mm / 700 mm) and even for dusty flue gas (with preliminary filter).



Gas sampling probes for measurements on industrial engines
The gas sampling probes for industrial engines are particularly suitable for measurements on stationary industrial engines (e.g. gas engines / diesel engines).



Industrial gas sampling probes
The unheated or heated industrial gas sampling probe is used for measurements involving high temperatures, high dust loads or wet flue gas. The industrial gas sampling probe can be customized to the relevant measuring task by adding accessories.



Service measurement on industrial engines.

Use the testo 350 to optimally configure gas or diesel engines, e.g. during commissioning, at regular maintenance intervals or for troubleshooting unstable operational processes. The engine is tuned to the optimum operating parameters to comply with the limit value regulations in force – with measurements often being taken over several hours. In particular, the high and fluctuating proportion of NO_2 in the engine exhaust gas makes the separate measurement of NO and NO_2 necessary to provide a highly accurate indication of the real NO_X value of the engine. The integrated gas preparation and the special flue gas probe for industrial engines with special hose provide protection against NO_2 and SO_2 absorption and allow readings to be compared, irrespective of ambient conditions.

Automatic measuring range extension at unexpectedly high CO concentrations

When performing measurements on unknown plants or engine operating conditions that are not ideal, unexpectedly high emission values (e. g. CO concentrations of up to 50,000 ppm) may occur. In this case the measuring range extension is automatically activated. This ensures maximum sensor service life.

Special instrument menu for testing flue gas treatment systems

This flue gas menu enables synchronous measurement of flue gas concentration before and after the catalytic converter. For this purpose, two analyzer units are connected to each other with a Testo data bus cable. The readings of both analyzer units are displayed in parallel on the display of the control unit, providing a quick overview of the condition of the catalytic converter.

Spatial distances

For greater distances between the gas sampling point and the adjustment site, the control unit can be connected to the analyzer unit either via the Testo data bus cable or via Bluetooth®.

Service measurement on industrial burners.

For whatever purpose combustion plants are used, whether for heating, generating electrical power, steam or hot water, for the production or surface treatment of certain materials, or to incinerate waste and scrap materials, the best possible way of managing combustion most definitely includes the right knowledge about the composition of fuels and combustion air, and their relationship to one another. With the testo 350, all relevant gases can be analyzed and the combustion process optimally configured. This means that you can adjust your combustion plant to its optimum working range to enable it to meet or come within stipulated emission limit values, while achieving a maximum level of efficiency in terms of combustion. The accurate flue gas analyzer testo 350, suited to tough practical conditions, is not only used for commissioning purposes, but also for repeat gas analyses during operation.

High availability even under difficult conditions
The instrument diagnosis provides information on the current status of the flue gas analyzer. The large service opening in the testo 350 enables easy access to all relevant wearing parts, e. g. sensors, filters and pumps. These can therefore be cleaned or replaced quickly and easily on site. The pre-calibrated gas sensors enable sensor changes without test gas adjustment.

High measuring accuracy also in the event of unsupervised long-term measurements
The integrated gas preparation prevents condensate from getting into the measuring instrument and causing damage. Any accumulating condensate is automatically removed by a peristaltic pump. In addition to this, the gas preparation and the PTFE cable in the gas sampling probes prevent NO_2 and SO_2 absorption.

Unrestricted measurement at high concentrations
When commissioning burners or carrying out measurements on unfamiliar systems, very high concentrations can occur unexpectedly. The measuring range extension is automatically activated in such cases.

Service measurement on gas turbines.

Flue gas limit values of gas turbines must be adhered to during operation and regularly checked depending on the size of the system. The system's emission values are checked for compliance with limit values and the manufacturer's specifications. In an optimally tuned turbine, the CO and NO_X values may be very low. To keep the measuring accuracy constant, falsification of readings and NO_2 absorption due to humidity in the flue gas must be prevented. Flue gas is measured on a turbine at various load stages, which are initiated by the service technician. The O_2 content in the flue gas can be used to analyze the fuel/air mix, for example. CO and NO_X values provide information on the current status of the system.

Highly accurate NO_X measurement at low concentrations

Due to the low NO concentrations, emissions measurement on LowNO_X gas turbines needs to be extremely accurate. Thanks to the combination of NO_2 sensor and special NO_{low} sensor with a resolution of 0.1 ppm, the testo 350 completely fulfils these requirements. In addition, the integrated gas preparation and special flue gas probe provide protection against NO_2 absorption and allow readings to be compared, irrespective of date and ambient conditions.

Easy, precise test gas adjustment

In order to meet the highest demands in terms of accuracy and comparability, the testo 350 can be adjusted with test gas, if required.

Use also under harsh environmental conditions

Special chambers, as well as fully closed cooling circuits, isolate the instrument electronics and the sensors from the ambient air. The sensor chamber is thus thermally decoupled from other instrument components and possible sensor drifts caused by thermal influences are thereby reduced.

Combination of measuring range extension and CO_{low} sensor

Due to the freely selectable dilution stages of the measuring range extension, the CO_{low} sensor (measuring range 500 ppm) is able to measure concentrations of up to 20,000 ppm, for example when starting up the turbine or when checking the various load stages.

Analysis of thermal processes.

In process combustion systems, in continuous furnaces for the glass, ceramics and cement industry or in steel melting, hardening furnaces, etc., substances may pass from the product being processed into the flue gas, increasing the emissions produced by the combustion system. Vice versa, pollutants may pass from the gas and become part of the product being processed. These hazards can be prevented using the testo 350. Monitoring the process-related gas atmosphere ensures the optimum quality of the processed products. The gas analysis provides information for process-related measures, such as the design of the furnace interior, flame control, fired product and furnace temperature, or the combustion air supply. At the same time, the gas analysis contributes to optimum operation of the system in terms of operating costs and safety.

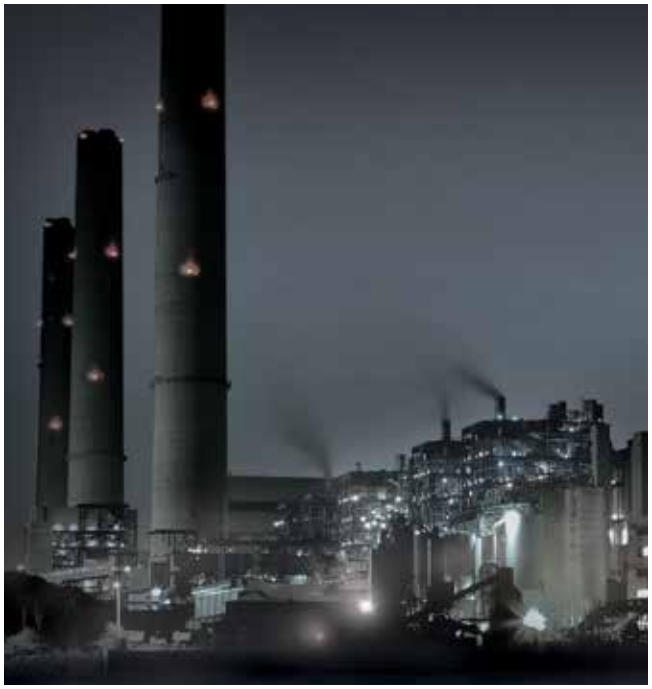
Ideally suitable for long-term monitoring
Processes and furnace cycles can be monitored and analyzed over several days, controlled via defined measuring sequences. The testo 350 automatically carries out the measurements and saves the data in the internal memory. These processes can also be directly controlled via the PC and the testo easyEmission software.

Simultaneous flue gas analysis of different measuring points
Up to max. 16 analyzer units can be linked together to a measurement system via the Testo data bus, in order to generate a simultaneous profile of the furnace atmosphere or the burner zones in large plants.

Ideal for measurements at high concentrations
The measuring range extension is automatically activated, especially when recording extremely high concentrations right up into the %-range. This enables continuation of the measurement. The gas sensor is not stressed any further than at low gas concentrations, and a maximum sensor service life is achieved – without any additional costs for high-range gas sensors.

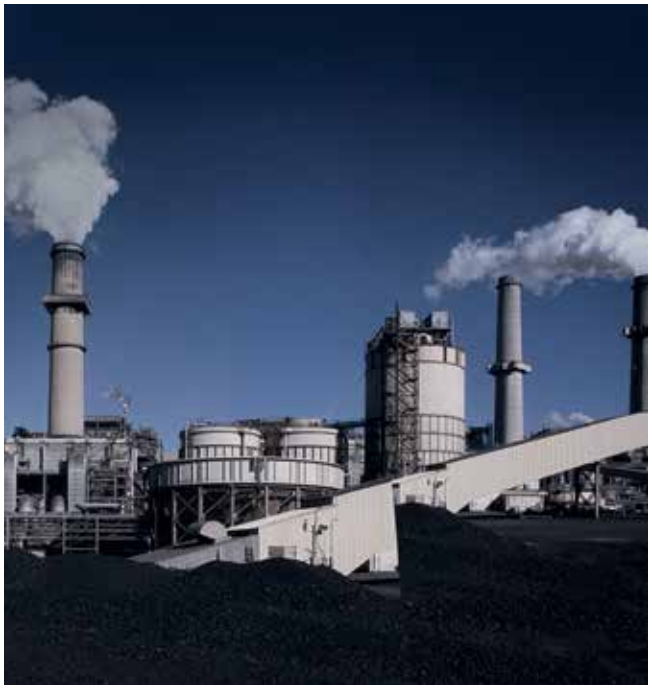
Industrially compatible instrument functions for greater security
Inherently closed cooling loops isolate the instrument electronics and the sensors from the ambient air. The testo 350 can therefore also be used in dirty and dusty environments without reservation. The shock and impact protection integrated in the housing protects the testo 350 against shock and impact on the way to the measuring point.

Official emissions measurement: compliance testing.



In the majority of countries, all kinds of industrial plants are subject to strict regulations in respect of flue gas emissions into the atmosphere. Suitable measures must be taken to ensure and regularly verify that the components defined as pollutants do not exceed certain limit values in the flue gas. The flue gas analyzer testo 350 can be used to carry out a preliminary analysis prior to an official emissions measurement, or, depending on the country and directive, the actual official compliance testing.

Service measurement on flue gas after-treatment systems.



Restrictive limit values necessitate the use of a portable flue gas analyzer to reliably determine the flue gas parameters upstream and downstream of a flue gas after-treatment system. In addition to the regular inspections for mechanical damage and contamination, the flue gas measurement provides information about the efficiency and functional reliability of a system. The bus function of the testo 350 flue gas analyzer allows flue gas to be measured simultaneously upstream and downstream of a flue gas after-treatment system; this enables fast and easy assessment of the system. Any system modifications can be obtained from the measurement protocol.

The testo 350 is portable and has a sealed housing with integrated impact protection – ideal for use in harsh environments.

Ordering data

testo 350 control unit

testo 350 control unit displays the measurement data and controls the analyzer unit, incl. rechargeable battery, measurement data memory, USB port and connection for Testo data bus

Order no. 0632 3511

testo 350 analyzer unit

testo 350 analyzer unit, fitted with O_2, incl. differential pressure sensor, temperature probe input Type K NiCr-Ni and Type S Pt10Rh-Pt, Testo data bus connection, rechargeable battery, integrated combustion air probe (NTC), trigger input, measurement data memory, USB port, can be upgraded to max. 6 gas sensors from the selection of CO, CO_{low}, NO, NO_{low}, NO_2, SO_2, CO_2 NDIR, C_XH_Y, H_2S, Carrying strap set for analyzer unit and control unit

Order no. 0632 3510

Accessories for testo 350 control unit	**Order no.**	
Option BLUETOOTH® wireless transmission		
International mains unit 100-240 V AC / 6.3 V DC; for mains operation or battery charging in instrument	0554 1096	

The testo 350 must be fitted with a second gas sensor, otherwise the instrument is unable to function.
Up to 5 additional sensors can be fitted.

Option CO sensor (H_2-compensated), 0 to 10,000 ppm, resolution 1 ppm	
Option CO_{low} sensor (H_2-compensated), 0 to 500 ppm, resolution 0.1 ppm	
Option NO sensor, 0 to 4,000 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 CO_2 (NDIR) sensor, 0 to 50 Vol%, resolution 0.01 Vol%, infrared measurement principle, incl. absolute pressure measurement and CO_2 absorption filter with refill pack. For long-term measurements >15 minutes, the option Peltier gas preparation is recommended in addition.	
Option C_xH_y sensor, methane 100 to 40,000 ppm, propane 100 to 21,000 ppm, butane 100 to 18,000 ppm, resolution 10 ppm. Pellistor is adjusted to methane at the factory.	
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 drainage	
Option fresh air valve for long-term measurement, incl. measuring range extension with dilution factor 5 for all sensors. For measurements >2 hours, the option Peltier gas preparation is recommended in addition.	
Option measuring range extension for single slot with the following selectable dilution factors: 0, 2, 5, 10, 20, 40	
Option DC voltage input 11 V to 40 V	
Option special gas pump for long-term measurements with extended warranty. For long-term measurements >2 hours, the option Peltier gas preparation is recommended in addition.	
Option auto-zeroing pressure sensor for continuous flow/differential pressure measurement	

Accessory testo 350 analyzer unit	**Order no.**	
Replacement filter for NO sensor (1 pcs.), blocks transverse gas SO_2	0554 4150	
Transport case for safe, neat storage of the testo 350 flue gas analyzer, gas sampling probe and accessories, dimensions 570 x 470 x 210 mm (LxWxH)	0516 3510	
Spare dirt filter for analyzer unit, 20 pack	0554 3381	
Cable with battery clips and adapter for connection to DC voltage input testo 350 analyzer box	0554 1337	

Ordering data

PC software and Testo data bus	Order no.	
“testo easyEmission” software including instrument/PC USB connection cable Functions: user-definable measuring intervals, transfer of readings to Microsoft Excel within seconds, user-definable fuels, representation of readings as table or graph, simple adjustment of customer-specific measurement protocols etc.	0554 3334	
“testo easyEmission” software for testo 350 incl. testo data bus controller with instrument/PC USB connection, cable for testo data bus and terminal plug. For example, if several testo 350 flue gas analyzers are connected to the testo data bus, they can be controlled and read out via a PC (possible measurement interval in data bus from 1 measurement per second)	0554 3336	
“easyEmission” software multi-user licence	on request	
Connecting cable for Testo data bus between control unit and analyzer unit or between several analyzer units, with bayonet connection, length 2 m	0449 0075	
Connecting cable for Testo data bus between control unit and analyzer unit or between several analyzer units, with bayonet connection, length 5 m	0449 0076	
Other cable lengths up to 800 m		
Analog output unit set, 6 channels, 4 to 20mA, for outputting readings on an analog printer, for example, set consists of analog output unit, Testo data bus connection cable, length 2 m, Testo data bus terminal.	0554 3149	

Printers and accessories	Order no.	
Testo fast printer IRDA with wireless infrared interface, 1 roll of thermal paper and 4 AA batteries	0554 0549	
testo BLUETOOTH®-/IRDA printer, incl. 1 roll of thermal paper, rech. battery and mains unit	0554 0620	
Spare thermal paper for printer, permanent ink	0554 0568	

Calibration certificates	Order no.	
ISO calibration certificate for flue gas	0520 0003	
ISO calibration certificate for flow; hot wire/vane anemometer, Pitot tube; calibration points 5; 10; 15; 20 m/s	0520 0034	

Gas sampling probes

Standard gas sampling probe Modular flue gas probes, available in 2 lengths, incl. probe stop for fixing, thermocouple NiCr-Ni, hose 2.2 m and dirt filter	**Order no.**	
Flue gas probe, modular, 335 mm immersion depth, incl. probe stop, thermocouple NiCr-Ni (Tl) Tmax 500 °C and NO_2/SO_2 special hose 2.2 m	0600 9766	
Flue gas probe, modular, 700 mm immersion depth, incl. probe stop, thermocouple NiCr-Ni (Tl) Tmax 500 °C and NO_2/SO_2 special hose 2.2 m	0600 9767	
Flue gas probe, modular, 335 mm immersion depth, incl. probe stop, thermocouple NiCr-Ni (Tl) Tmax 1,000 °C and NO_2/SO_2 special hose 2.2 m	0600 8764	
Flue gas probe, modular, 700 mm immersion depth, incl. probe stop, thermocouple NiCr-Ni Tmax 1,000 °C and NO_2/SO_2 special hose 2.2 m	0600 8765	
Flue gas probe, modular, with preliminary filter Ø 14 mm 335 mm immersion depth, incl. probe stop, thermocouple NiCr-Ni (Tl) Tmax 1,000°C and NO_2/SO_2 special hose 2.2 m	0600 8766	
Flue gas probe, modular, with preliminary filter Ø 14 mm 700 mm immersion depth, incl. probe stop, thermocouple NiCr-Ni (Tl) Tmax 1,000°C and NO_2/SO_2 special hose 2.2 m	0600 8767	

Probe accessories, standard gas sampling probes	**Order no.**	
Hose extension; 2.8 m; extension line probe-instrument	0554 1202	
Probe shaft with pre-filter Ø 14 mm, length selectable up to 2500 mm, incl. cone, Ø 8 mm, thermocouple NiCr-Ni (Tl) Tmax. 500 °C	on request	
Probe shaft with pre-filter Ø 14 mm, length selectable up to 2500 mm, incl. cone, Ø 8 mm, thermocouple NiCr-Ni (Tl) Tmax. 1000 °C	on request	
Spare probe pre-filter (sinter filter) 2 off	0554 3372	
Spare dirt filter for probe handle, modular probe; 10 pcs.	0554 3385	
Probe shaft length 700 mm, incl. probe stop, Ø 8 mm, Tmax 500 °C	on request	
Probe shaft length 335 mm, incl. probe stop, Ø 8 mm, Tmax 1,000 °C	0554 8764	
Probe shaft length 700 mm, incl. probe stop, Ø 8 mm, Tmax. 1,000 °C	0554 8765	

Gas sampling probes for measurements on industrial engines	**Order no.**	
Flue gas probe for industrial engines, 335 mm immersion depth incl. probe stop and heat protection plate, Tmax. +1,000 °C, special hose for NO_2/SO_2 measurements, length 4 m	0600 7555	
Flue gas probe for industrial engines with probe shaft preliminary filter, 335 mm immersion depth incl. probe stop and heat protection plate, Tmax. +1,000 °C, special hose for NO_2/SO_2 measurements, length 4 m	0600 7556	
Thermocouple for flue gas temperature measurement, NiCr-Ni, length 400 mm, Tmax +1,000 °C, with 4 m connecting cable and additional heat protection	0600 8898	

SO_2 low probes for measurements after flue gas post-treatment systems (e.g. scrubbers)	**Order no.**	
SO_2 low set unheated, consisting of: SO_2 low sensor, measuring range 0 to 200 ppm, resolution 0.1 ppm, special SO_2 low gas sampling probe, probe shaft length 735 mm, Tmax. probe shaft 220 °C, hose length 2.35 m, Ø probe shaft 8 mm, incl. cone, thermocouple NiCr-N (Tl)	0563 1251	
Spare thermocouple	0430 0053	
Spare SO_2 sensor	0393 0251	
SO_2 low set heated, consisting of: SO_2 low sensor, measuring range 0 to 200 ppm, resolution 0.1 ppm, industrial probe set heated 0600 7630, heated probe shaft, heated gas sampling hose, thermocouple NiCr-Ni (Tl)	0563 2251	
Spare SO_2 low sensor	0393 0251	

Combustion air temperature probe	**Order no.**	
Combustion air temperature probe, immersion depth 60 mm	0600 9797	

Pitot tubes for measuring flow speed	**Order no.**	
Pitot tube, 350 mm long, stainless steel, measures flow speed	0635 2145	
Pitot tube, 1,000 mm long, stainless steel, measures flow speed	0635 2345	
+Connection hose, silicone, length 5 m, maximum load capacity 700 hPa (mbar)	0554 0440	
Pitot tube, stainless steel, length 750 mm for measuring flow speed incl. temperature measurement, 3-fold hose (5 m length) and heat protection plate	0635 2042	

Gas sampling probes

Industrial gas sampling probes	Details	Order no.	
Industrial probe set 1200 °C consisting of: - unheated handle - unheated probe shaft up to 1200 °C flue gas temperature - unheated gas sampling hose incl. inline filter, length 4 m - thermocouple Type K, length 1.2 m *The set can optionally come with an extension tube and probe preliminary filter.*	**Probe shaft:** $T_{max.}$ +1200 °C Length 1.0 m, Ø 12 mm Material 2.4856 alloy 625 **Handle:** $T_{max.}$ +600 °C Material: 1.4404 stainless steel **Gas sampling hose:** 2-chamber hose with PTFE inner core; length 4.0 m **TC:** Type K, Length 1.2 m, Ø 2 mm $T_{max.}$ +1200 °C	0600 7610	
Industrial probe set 1800 °C consisting of: - unheated handle - unheated probe shaft up to 1800 °C flue gas temperature - unheated gas sampling hose incl. inline filter, length 4 m *For temperature measurements > +1370 °C, we recommend a thermocouple Type S.*	**Probe shaft:** $T_{max.}$ +1800 °C Material Al2O3 > 99.7% Length 1.0 m, Ø 12 mm **Gas sampling hose:** 2-chamber hose with PTFE inner core; length 4.0 m **Handle:** Tmax. +600 °C Material: 1.4404 stainless steel	0600 7620	
Heated industrial probe set consisting of: - heated probe shaft up to 600 °C flue gas temperature - heated gas sampling hose, length 4 m - thermocouple Type K, length 1.2 m *The set can optionally come with an extension tube and probe preliminary filter.*	**Probe shaft:** temperature-proof up to +600 °C Voltage supply 230 V / 50 Hz Length 1.0 m, Ø 25 mm Heating temperature range +200 °C Material stainless steel 1.4571 **Gas sampling hose:** corrugated hose with PTFE inner core Length 4.0 m; outside diameter 34 mm Heating temperature range > +120 °C **TC:** Type K Length 1.2 m, Ø 2 mm $T_{max.}$ +1200 °C	0600 7630	
Extension tube 1200 °C for extending the industrial probe set 1200 °C (0600 7610) and heated industrial probe set (0600 7630) *The extension tube can be screwed directly onto the unheated probe shaft up to +1200 °C and the heated probe shaft up to +600 °C.**	**Probe shaft:** Tmax. +1200 °C Length 1.0 m, Ø 12 mm Material 2.4856 alloy 625	0600 7617	
Thermocouple Type K, length 2.2 m	Type K Length 2.2 m, Ø 2 mm $T_{max.}$ +1200 °C	0600 7615	
Industrial probe preliminary filter for dust-laden flue gas. *The probe preliminary filter can be screwed directly onto the unheated probe shaft up to +1200 °C and the heated probe shaft up to +600 °C.**	Material porous silicon carbide $T_{max.}$ +1,000 °C, Length 110 mm, Ø 30 mm Filtration grade 10 µm	0600 7616	
Transport case for probes *suitable for all unheated probes with a total length > 335 mm*		0516 7600	
Extension lead for temperature probe, length 5 m, between plug-in head cable and instrument		0409 0063	
Mounting flange with adjustable quick-action clamping device for all sampling tubes	Stainless steel 1.4571	0554 0760	
Heated gas sampling hose	Corrugated hose with PTFE inner core Length 4.0 m; outside diameter 34 mm Heating temperature range > +120 °C	on request	
Spare dirt filter (10 off)		0554 3371	

*For ease of tightening and releasing, we recommend the use of ceramic paste on the thread. This is available from retailers.

Technical data

testo 350 control unit

	testo 350 control unit	Analog output unit (mA Out)
Operating temperature	-5 to +45 °C	-5 to +45 °C
Storage temperature	-20 to +50 °C	-20 to +50 °C
Battery type	Lithium battery	–
Battery life	5 hours (without radio link)	–
Memory	2 MB (250,000 readings)	–
Weight	440 g	305 g
Dimensions	88 x 38 x 220 mm	200 x 89 x 37 mm
Protection class	IP40	–
Warranty	2 years	3 years

Country-specific permits for Bluetooth® wireless transmission for 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, Mexico, Venezuela, Ecuador, New Zealand, Bolivia, Dominican Republic, Peru, Chile, Cuba, Costa Rica, Nicaragua, Korea, Belarus.

Technical data for testo 350 analyzer unit

	Measuring range	Accuracy ±1 digit	Resolution	Response time t_{90}
O_2 measurement	0 to 25 Vol%	±0.8% of f.v.	0.01 Vol%	20 sec (t_{95})
CO measurement (H_2-compensated)*	0 to 10,000 ppm	±5% of m.v. (200 to 2,000 ppm) ±10% of m.v. (2,001 to 10,000 ppm) ±10 ppm (0 to 199 ppm)	1 ppm CO	40 sec
CO_{low} measurement (H_2-compensated)*	0 to 500 ppm	±5% of m.v. (40 to 500 ppm) ±2 ppm CO (0 to 39.9 ppm)	1 ppm CO	40 sec
NO measurement	0 to 4,000 ppm	±5% of m.v. (100 to 1,999 ppm) ±10% of m.v. (2,000 to 4,000 ppm) ±5 ppm (0 to 99 ppm)	±1 ppm	30 sec
NO_{low} measurement	0 to 300 ppm	±5% of m.v. (40 to 300 ppm) ±2 ppm (0 to 39.9 ppm)	±0.1 ppm NO	30 sec
NO_2 measurement	0 to 500 ppm	±5% of m.v. (100 to 500 ppm) ±5 ppm (0 to 99.9 ppm)	±0.1 ppm	40 sec
SO_2 measurement	0 to 5,000 ppm	±5% of m.v. (100 to 2,000 ppm) ±10% of m.v. (2,001 to 5,000 ppm) ±5 ppm (0 to 99 ppm)	±1 ppm	30 sec
CO_2 measurement (IR)	0 to 50 Vol%	±0.3 Vol% +1% of m.v. (0 to 25 Vol%) ±0.5 Vol% +1.5% of m.v. (>25 to 50 Vol%)	0.01 Vol% (0 to 25 Vol%) 0.1 Vol% (>25 Vol%)	10 sec
H_2S measurement	0 to 300 ppm	±5% of m.v. (40 to 300 ppm) ±2 ppm (0 to 39.9 ppm)	0.1 ppm	35 sec

* H_2 display only as an indicator

	Single dilution with selectable dilution factor (x2, x5, x10, x20, x40)			Dilution of all sensors (factor 5) When dilution of all sensors is activated, the O_2, CO_2-(IR) and C_XH_Y readings are not shown on the display.		
	Measuring range	**Accuracy** ±1 digit	**Resolution**	**Measuring range**	**Accuracy** ±1 digit	**Resolution**
CO measurement (H_2-compensated)	depending on the factor selected	±2% of m.v. (additional error)	1 ppm	2,500 to 50,000 ppm	±5% of m.v. (additional error) Pressure range -100 to 0 mbar at probe tip	1 ppm
CO_{low} meas. (H_2-compensated)	depending on the dilution factor selected		0.1 ppm	500 to 2,500 ppm		0.1 ppm
NO measurement			1 ppm	1,500 to 20,000 ppm		1 ppm
NO_{low} meas.			0.1 ppm	300 to 1,500 ppm		0.1 ppm
SO_2 measurement			1 ppm	500 to 25,000 ppm		1 ppm
C_XH_Y measurement	Natural gas: 100 to 40,000 ppm Propane: 100 to 21,000 ppm Butane: 100 to 18,000 ppm		10 ppm			
NO_2 measurement				500 to 2,500 ppm		0.1 ppm
H_2S measurement				200 to 1,500 ppm		0.1 ppm

Technical data

Technical data for testo 350 analyzer unit

	Measuring range	Accuracy ±1 digit	Resolution	Response time t_{90}
Efficiency	0 to +120%		0.1% (0 to +120%)	
Flue gas loss	0 to +99.9% qA		0.1% qA (-20 to +99.9% qA)	
CO_2 calculation	0 to $CO_{2\ max}$ Vol% CO_2	calculated from O_2 ±0.2 Vol%	0.01 Vol. % CO_2	40 sec
Differential pressure 1	-40 to +40 hPa	±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)	0.01 hPa (-40 to +40 hPa)	
Differential pressure 2	-200 to +200 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)	0.1 hPa (-200 to +200 hPa)	
Flow velocity	0 to +40 m/s		0.1 m/s (0 to +40 m/s)	
Absolute pressure (optionally when IR sensor is installed)	-600 to +1,150 hPa	± 10 hPa	1 hPa	
Flue gas dewpoint calculation	0 to 99.9 °Ctd		0.1 °Ctd (0 to 99.9 °Ctd)	
Type K (NiCr-Ni)	-200 to +1370 °C	±0.4 °C (-100 to +200 °C) ±1 °C (-200 to -100.1 °C) ±1 °C (+200.1 to +1370 °C)	0.1 °C (-200 to +1370 °C)	
Ambient temperature probe (NTC)	-20 to +50 °C	±0.2 °C (-10 to +50 °C)	0.1 °C (-20 to +50 °C)	

Technical data for CxHy sensor

Measurement parameter	Measuring range[1]	Accuracy ±1 digit	Resolution	Min. O_2 requirement in the flue gas	Response time t_{90}	Response factor[2]
Methane	100 to 40,000 ppm	< 400 ppm (100 to 4,000 ppm) < 10% of m.v. (> 4,000 ppm)	10 ppm	2% + (2 x m.v. methane)	‹40 sec	1
Propane	100 to 21,000 ppm			2% + (5 x m.v. propane)		1.5
Butane	100 to 18,000 ppm			2% + (6.5 x m.v. butane)		2

[1] Compliance with the lower explosive limit (LEL) is mandatory.
[2] The HC sensor is calibrated to methane at the factory. It can be calibrated to another gas (propane or butane) by the user.

General technical data

Dimensions	330 × 128 × 438 mm
Weight	4800 g
Storage temperature	-20 to +50 °C
Operating temperature	-5 to +45 °C
Housing material	ABS
Memory	250,000 readings
Power supply	AC mains unit 100V to 240V (50 to 60 Hz)
DC voltage input	11V to 40V
Max. dust load	20 g/m³ dust in the flue gas
Dew point calculation	0 to 99 °Ctd
Max. overpressure	max. +50 mbar
Max. negative pressure	min. -300 mbar
Pump volumetric flow rate	1 l/min. with flow monitoring
Hose length	max 16.2 m (corresponds to 5 probe hose extensions)

Max. humidity load	+70 °C dew point temperature at the measurement gas inlet of the analyzer unit
Trigger input	Voltage 5 to 12 V (rising or falling flank) Pulse 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, etc.) Gas sensors CO/NO/NO_2/SO_2/$H2_2$/C_XH_Y: 1 year O_2 sensor: 1 1/2 years CO_2-IR sensor: 2 years The warranty applies to average sensor load. Rechargeable battery: 1 year
Protection class	IP40
Rechargeable battery life	Maximum load approx. 2.5 h

Order recommendations

Emissions measurement on industrial engines

	Order no.	
testo 350 control unit	0632 3511	
Option BLUETOOTH® wireless transmission		
testo 350 analyzer unit	0632 3510	
Option CO (H_2-compensated) sensor, 0 to 10,000 ppm		
Option NO sensor, 0 to 4,000 ppm		
Option NO_2 sensor, 0 to 500 ppm		
Option Peltier gas preparation incl. hose pump		
Option BLUETOOTH® wireless transmission		
Option fresh air valve for long-term measurement		
Option measuring range extension		
Flue gas probe for industrial engines	0600 7555	
testo BLUETOOTH®-/IRDA printer	0554 0620	
easyEmission software	0554 3334	
International mains unit for control unit	0554 1096	
Transport case	0516 3510	

Service measurement on industrial burners

	Order no.	
testo 350 control unit	0632 3511	
Option BLUETOOTH® wireless transmission		
testo 350 analyzer unit	0632 3510	
Option CO (H_2-compensated) sensor, 0 to 10,000 ppm		
Option NO sensor, 0 to 4,000 ppm		
Option NO_2 sensor, 0 to 500 ppm		
Option SO_2 sensor, 0 to 5,000 ppm		
Option Peltier gas preparation incl. hose pump		
Option BLUETOOTH® wireless transmission		
Option measuring range extension		
Gas sampling probe, modular	0600 8764	
testo BLUETOOTH®-/IRDA printer	0554 0620	
easyEmission software	0554 3334	
International mains unit for control unit	0554 1096	
Transport case	0516 3510	

Emissions measurement on gas turbines

	Order no.	
testo 350 control unit	0632 3511	
Option BLUETOOTH® wireless transmission		
testo 350 analyzer unit	0632 3510	
Option CO_{low} (H_2 compensated) sensor, 0 to 500 ppm		
Option NO_{low} sensor, 0 to 300 ppm		
Option NO_2 sensor, 0 to 500 ppm		
Option Peltier gas preparation incl. hose pump		
Option BLUETOOTH® wireless transmission		
Option fresh air valve for long-term measurement		
Option measuring range extension		
Flue gas probe for industrial engines	0600 7555	
testo BLUETOOTH®-/IRDA printer	0554 0620	
easyEmission software	0554 3334	
International mains unit for control unit	0554 1096	
Transport case	0516 3510	

Analysis of thermal processes

	Order no.	
testo 350 control unit	0632 3511	
Option BLUETOOTH® wireless transmission		
testo 350 analyzer unit	0632 3510	
Option CO (H_2-compensated) sensor, 0 to 10,000 ppm		
Option CO_2 (NDIR) sensor, 0 to 50 Vol%		
Option NO sensor, 0 to 4,000 ppm		
Option NO_2 sensor, 0 to 500 ppm		
Option Peltier gas preparation incl. hose pump		
Option BLUETOOTH® wireless transmission		
Industrial probe set 1200 °C	0600 7610	
testo BLUETOOTH®-/IRDA printer	0554 0620	
International mains unit for control unit	0554 1096	
Transport case	0516 3510	

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