We measure it. testo

Flue gas analyzer

testo 310 – Flue gas analysis the easy way

- Robust design for daily use
- Battery lifetime up to 10 hours
- Integrated measurement menus: Flue gas, draught, ambient CO and pressure
- Fast sensor zeroing in only 30 seconds
- Illuminated display
- Documentation of measurement results via printer with infrared interface

The new flue gas analyzer testo 310 combines simple functions with a high level of masurement accuracy, and is therefore perfectly suited to all basic measurements on a heating system. Long battery lifetimes of up to ten hours guarantee high availability. Its easy handling and compact design make the testo 310 a robust tool for day-to-day work – even when things get rough. Clear reports can be created as required on site thanks to the infrared interface printer specially developed for the testo 310. The current measurement value can be printed out from all measurement menus, either during or after the measurement. The testo 310 offers all avantages of electronic flue gas measurement in high quality at a perfect cost/benefit ratio.

Product properties

Robust
Robust and light instrument for daily use – ideal even for tough and dirty surroundings

Backlit display
Two-line display and clear menu structure. Simple to operate and easy to read.

Fast sensor zeroing
Automatic zeroing of gas sensor in only 30 seconds after starting up, which can be cancelled if not required.

Lithium rechargeable battery
Operation with a Lithium rechargeable battery (1500 mAh) – no change of battery necessary, up to ten hours running time, charging via USB connection possible.

Probe filter
Can be changed quickly and easily.

Attachment
Integrated magnets for easy attachment to the burner.

Condensate trap
Integrated condensate trap – can be emptied very quickly and easily.

Printer
Documentation via infrared printer.

Ordering data

testo 310 flue gas set

testo 310 incl. battery and calibration protocol for the measurement of O_2, CO, hPa and °C; probe 180 mm with cone; case; mains unit incl. cable; silicon hose for pressure measurement; particle filter 5 off.

Part no. 0563 3100

testo 310 flue gas set with printer

testo 310 incl. battery and calibration protocol for the measurement of O_2, CO, hPa and °C; IR printer (0554 3100); probe 180 mm with cone; case; mains unit incl. cable; silicon hose for pressure measurement; particle filter 5 off; 2 rolls spare thermal paper for printer.

Part no. 0563 3110

Testo IR printer

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

Part no. 0554 3100

Accessories

Product sets	**Part no.**	
testo 310 flue gas set	0563 3100	
testo 310 flue gas set with printer	0563 3110	
Accessories for measuring instrument		
USB mains unit incl. cable	0554 1105	
Testo IR printer	0554 3100	
Testo fast printer IRDA	0554 0549	
Spare thermal paper for printer, permanent ink	0554 0568	
Spare particle filter	0554 0040	
Spare gas sensors		
Replacement O_2 sensor	0390 0085	
Spare CO sensor	0390 0119	

Technical data

	Meas. range	Accuracy ±1 digit	Resolution	Adjustment time t_{90}
Temperature (flue gas)	0 to +400 °C	±1 °C (0 to +100 °C) ±1.5% of mv (>100 °C)	0.1 °C	〈 50 s
Temperature (ambient temperature)	-20 to +100.0 °C	±1 °C	0.1 °C	〈 50 s
Draught measurement	-20 to +20 hPa	±0.03 hPa (-3.00 to +3.00 hPa) ±1.5% of mv (remaining range)	0.01 hPa	
Pressure measurement	-40 to 40 hPa	±0.5 hPa	0.1 hPa	
O_2 measurement	0 to 21 Vol. %	±0.2 Vol. %	0.1 Vol. %	30 s
CO measurement (without H_2 compensation)	0 to 4000 ppm	±20 ppm (0 to 400 ppm) ±5% of mv (401 to 2000 ppm) ±10% of mv (2001 to 4000 ppm)	1 ppm	60 s
Ambient CO measurement	0 to 4000 ppm	±20 ppm (0 to 400 ppm) ±5% of mv (401 to 2000 ppm) ±10% of mv (2001 to 4000 ppm)	1 ppm	60 s
Efficiency (ETA)	0 to 120 %	-	0.1%	-
Flue gas loss	0 to 99.9%	-	0.1%	-

General technical data

Storage temp.	-20 to +50 °C
Oper. temp.	-5 to +45 °C
Power supply	Battery: 1500 mAh, mains unit 5V/1A
Memory	No memory

Display	Backlit 2-line display
Weight with probe	Approx. 700 g
Dimensions	201 x 83 x 44 mm
Warranty	Measuring instrument, flue gas probe, gas sensors: 12 months Thermocouple: 12 months Battery: 12 months

We measure it. testo

Highly efficient flue gas analyzer

testo 320 – Just a few “clicks” away from a heating system diagnosis

- High-resolution colour graphic display
- Quick and easy menu structure
- Storage space for 500 measurement values
- Measurement of flue gas, draught, pressure, ambient CO, differential temperature and gas leak detection
- O_2 and CO sensor and flue gas probe with temperature probe
- TÜV-tested according to EN 50379, Parts 1-3

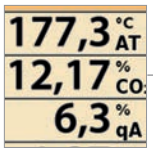
O_2
CO_2
CO
HPA
QA
ETA
°C

The new testo 320 is a high-quality measuring instrument for efficient flue gas analysis. Its wide measuring range makes it a reliable partner for eliminating malfunctions and emergencies, monitoring legal limit values or for daily routine work servicing heating systems. The numerous measurement menus of the testo 320 are clearly structured.

Standarized menu procedures, which are stored in the instrument specifically for your country, simplify operation – depending on which standards you are dealing with. The high-resolution display allows a detailed presentation of the measurement procedures and is easily legible even under the worst conditions.

Product properties

High-resolution colour graphic display
The measurement menus and measurement values are presented in detail and always easily legible.



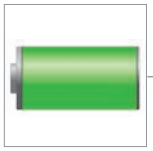
Sensor monitoring
Integrated traffic light system which continuously monitors the sensor functionality.

Fast sensor zeroing
Automatic zeroing of the sensor in only 30 seconds after start-up, and which can be cancelled if not required.

Sensors exchangeable by the user
Easy exchange of sensors by the user – no adjustment necessary.

Memory
Up to 500 measurement protocols can be saved and called up in the memory of the testo 320.

Lithium battery
Operation with a Lithium battery (1500mAh) – no battery change necessary, up to eight hours running time, charging via USB connection possible.



Attachment
Integrated magnets for fast attachment to burner/boiler.

Stamp of approval
The flue gas analyzer testo 320 is TÜV-tested according to EN 50379, Parts 1-3.

Robust design
Robust, durable instrument – ideally suited even to rough surroundings.

Condensate trap
Integrated condensate trap – very easily emptied.

Efficient exchange of probes
Fast and easy exchange of probes via the probe coupling. All gas paths are connected to the instrument at once with the bayonet connection.

Probe filter
Easy exchange of probe filter.

Flexibility with modular probes
A range of probe lengths and diameters ensure a high degree of flexibility for all applications. To exchange the probe shaft, it is simply placed on the probe handle and engages.

Ordering data / Accessories

testo 320 set for chimneysweeps

0632 3220	testo 320 with H2-compensated CO sensor and Bluetooth
0554 1105	USB mains unit
0600 9761	Flue gas probe modular (length 300 mm, Ø 8 mm)
0600 9787	Combustion air probe (length 190 mm)

testo 320 set for heating constructors

0632 3220	testo 320 with H_2-compensated CO sensor
0554 1105	USB mains unit
0516 3300	System case (height: 130 mm)
0554 0549	Testo fast printer IRDA
0600 9741	Compact flue gas probe (length 300 mm, Ø 6 mm)
0600 9787	Combustion air probe (length 190 mm)

Measuring instrument with options	**Part no.**	
testo 320 flue gas analyzer, incl. O_2 sensor, calibration protocol, graphic display	0632 3220	
Option CO sensor without H_2-compensation		
Option H_2-compensated CO sensor		
Option CO_{low} sensor		
Bluetooth option		

Spare gas sensors	**Part no.**	
Spare sensor O_2 for testo 320	0393 0005	
Spare CO sensor (without H_2-compensation) for testo 320	0393 0053	
Spare CO sensor H_2-compensated for testo 320	0393 0105	
Spare CO_{low} sensor for testo 320	0393 0103	

Smoke tester with oil and soot sheet, for measuring soot in flue gas, excl. cone (part no. 0554 9010)	0554 0307	
BLUETOOTH printer set with wireless BLUETOOTH interface; incl. 1 roll thermal paper, rechargeable battery and mains unit	0554 0553	
Testo fast printer IrDA with wireless infrared interface; 1 roll thermal paper; 4 AA batteries	0554 0549	
Spare thermal paper for printer, permanent ink	0554 0568	
PC analysis software easyheat, for presenting measurement procedures as diagrams, tables and for managing customer data	0554 3332	
USB mains unit incl. cable	0554 1105	
Spare battery	0515 0046	
System case (height: 130 mm) for instrument, probes and accessories	0516 3300	
System case with double base (height: 180 mm) for instrument, probes and accessories	0516 3301	
ISO calibration certificate/flue gas	0520 0003	

Probes

Compact basic flue gas probes	Part no.	
Flue gas probe compact; length 180 mm; Ø 6 mm; Tmax. 500 °C; probe stop; NiCr-Ni thermocouple, 2.2 m hose and particle filter included	0600 9740	
Flue gas probe compact; length 300 mm; Ø 6 mm; Tmax. 500 °C; probe stop; NiCr-Ni thermocouple, 2.2 m hose and particle filter included	0600 9741	

Modular flue gas probes	Part no.	
Flue gas probe modular, incl. cone for attachment; thermocouple NiCr-Ni; hose 2.2 m; particle filter; length 180 mm; Ø 8 mm; Tmax. 500 °C; TÜV-tested	0600 9760	
Flue gas probe; length 300 mm; Ø 8 mm; Tmax. 500 °C; TÜV approval; probe stop; NiCr-Ni thermocouple; 2.2 m hose and particle filter included	0600 9761	
Flue gas probe; length 180 mm; Ø 6 mm; Tmax. 500 °C; probe stop; NiCr-Ni thermocouple; 2.2 m hose and particle filter included	0600 9762	
Flue gas probe; length 300 mm; Ø 6 mm; Tmax. 500 °C; probe stop; NiCr-Ni thermocouple; 2.2 m hose and particle filter included	0600 9763	
Flue gas probe flexible; length 330 mm; Tmax. 180 °C; short-term 200 °C; bending radius max. 90 °C for measuring at inaccessible points; probe stop; NiCr-Ni-thermocouple; 2.2 m hose and particle filter included	0600 9764	

Probe accessories	Part no.	
Probe shaft; length 180 mm; 8 mm; Tmax. 500 °C	0554 9760	
Probe shaft; length 300 mm; Ø 8 mm; Tmax. 500 °C	0554 9761	
Probe shaft flexible; length 330 mm; Ø 10 mm; Tmax. 180 °C	0554 9764	
Probe shaft multi-hole; length 300 mm; Ø 8 mm; for mean CO calculation	0554 5762	
Probe shaft multi-hole; length 180 mm; Ø 8 mm; for mean CO calculation	0554 5763	
Hose extension; 2.8 m; extension cable for probe	0554 1202	
Hose connection set with adapter for separate gas pressure measurement	0554 1203	
Spare dirt filter, modular probe; 10 off	0554 3385	
Spare particle filter, compact probe; 10 off	0554 0040	

Probes

Additional probes	Part no.	
Dual wall clearance probe for O_2 supply air measurement	0632 1260	
Gas leak detection probe; 0 to 10000 ppm CH_4/C_3H_8	0632 3330	
Ambient CO probe, for detecting CO in buildings and rooms; 0 to +500 ppm	0632 3331	
Ambient CO_2 probe, Plug-in head, connection cable 0430 0143 or 0430 0145 required	0632 1240	
Differential temperature set; consisting of 2 Velcro probes and temperature adapter	0554 1208	
Fine pressure probe: highly accurate probe for the measurement of differential pressure and temperature, as well as Pitot tube measurement of flow velocities (see technical data)	0638 0330	
Capillary hose set for 4 Pa measurement	0554 1215	

Combustion air temperature probes	Part no.	
Combustion air temperature probe, immersion depth 300 mm	0600 9791	
Combustion air temperature probe, immersion depth 190 mm	0600 9787	
Combustion air temperature probe, immersion depth 60 mm	0600 9797	

Additional temperature probes	Part no.	
Mini ambient air probe; for separate ambient air temperature measurement; 0 to +80 °C	0600 3692	
Very fast reaction surface probe	0604 0194	
Connection cable	0430 0143	

Technical data

	Measuring range	Accuracy ±1 digit	Resolution	Adjustment time t_{90}
Temperature	-40 to +1200 °C	±0.5 °C (0 to +100.0 °C) ±0.5 % of m.v. (remaining range)	0.1 °C (-40 to +999,9 °C) 1 °C (> +1000 °C)	
Draught measurement	-9.99 to +40 hPa	±0.02 hPa or ±5% of m.v. (-0.50 to +0.60 hPa) ±0.03 hPa (+0.61 to +3.00 hPa) ±1.5% of m.v. (+3.01 to +40.00 hPa)	0.01 hPa with fine draught option 0.001 hPa	
Pressure measurement	0 to +300 hPa	±0.5 hPa (0.0 to 50.0 hPa) ±1% of m.v. (50.1 to 100.0 hPa) ±1.5 % of m.v. (remaining range)	0.1 hPa with fine draught option 0.01 hPa	
O_2 measurement	0 to 21 Vol. %	±0.2 Vol. %	0.1 Vol. %	< 20 s
CO measurement (without H_2-compensation)	0 to 4000 ppm	±20 ppm (0 to 400 ppm) ±5% of m.v. (401 to 2000 ppm) ±10% of m.v. (2001 to 4000 ppm)	1 ppm	< 60 s
CO measurement (H_2-compensated)	0 to 8000 ppm	±10 ppm or ±10% of m.v. (0 to 200 ppm) ±20 ppm or ±5% of m.v. (201 to 2000 ppm) ±10% of m.v. (2001 to 8000 ppm)	1 ppm	< 40 s
Determination of degree of effectivity (Eta)	0 to 120%		0.1%	
Flue gas loss	0 to 99.9%		0.1%	
CO_2 determination digital calculation from O_2	0 to CO_2 max	±0.2 Vol. %	0.1 Vol. %	
Option CO_{low} measurement (H_2-compensated)	0 to 500 ppm	±2 ppm (0 to 39 ppm) ±5% of m.v. (40 to 500 ppm)	0.1 ppm	< 40 s
Ambient CO measurement (with CO probe)	0 to 500 ppm	±5 ppm (0 to 100 ppm) ±5% of m.v. (> 100 ppm)	1 ppm	
Gas leak measurement for flammable gases (with gas leak detection probe)	0 to 10.000 ppm CH_4 / C_3H_8	Signal optical display (LED) audible signal via buzzer		< 2 s
Ambient CO_2 measurement (with ambient CO_2 probe)	0 to 1 Vol. % 0 to 10.000 ppm	±50 ppm or ±2% of m.v. (0 to 5000 ppm) ±100 ppm or ±3% of m.v. (5001 to 10000 ppm)		
Differential pressure, flow velocity and temperature via fine pressure probe	±10.000 Pa 0.15 to 3 m/s max. -40 to +1,200 °C (dependent on probe)	±0.5 Pa (0 to 9.99 Pa) plus ±1 Digit ±3% of m.v. (10 to 10.000 Pa) plus ±1 Digit ±0.5 °C (-40 to 100 °C) ±0.5 % of m.v. (rem. measuring range) plus probe accuracy	 0.1 m/s 0.1 °C	

General technical data

Storage temperature	-20 to +50 °C
Operating temperature	-5 to +45 °C
Power supply	Battery: 3.7 V / 2,400 mAh Mains unit: 6 V / 1.2 A
Memory	500 measurement values

Display	Colour graphic display 240 x 320 pixels
Weight	573 g
Dimensions	240 x 85 x 65 mm
Warranty	Instrument/probe/gas sensors: 24 months Battery: 12 months

We measure it. testo

Professional flue gas analyzer

testo 330-LL – Up to 6 years' sensor lifetime

- Many measurement menus for analyses on heating systems, incl. solid fuel and gas pipe test menus
- Integrated sensor monitoring
- 4 years' warranty without maintenance contract
- Dilution up to 30,000 ppm CO (testo 330-2 LL)
- Zeroing in flue possible (testo 320-2 LL)
- High-resolution colour graphic display
- Logger function (up to 2h continuous measurement value recording)
- TÜV-tested according to EN50379, Parts 1-3

°C

HPA

O_2

CO/H_2

NO

ΔP

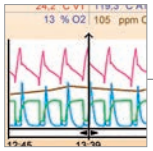
The testo 330 LL is the professional flue gas analyzer. It fulfils the highest demands and can cope with all measurement tasks on heating systems. Multiple country-specific measurement menus are stored in the instrument. It is possible to select from an extensive program of flue gas probes, which often replaces an additional measuring instrument. Other fuels can be defined by the user as desired. Apart from this, gas pipe tests or solid fuel measurement can also be carried out with the testo 330 LL.

The high-quality instrument is especially excellent thanks to the successful combination of outstanding sensor technology, long life and security. It has three high-quality measuring cells for O_2, CO and NO as well as a temperature probe integrated into the flue gas probe for the direct measurement of temperature, O_2, CO and NO. The abbreviation „LL“ stands for „Longlife“. The sensors of the instrument series testo 330 LL have an extended lifetime of up to 6 years. At least one O_2 and CO sensor replacement can be saved in the course of the typical working life.

Product properties

Longlife sensors
The sensors of the instrument family testo 330 LL have a lifetime of up to 6 years. At least one sensor replacement is saved in the course of the typical working life.

Graphic presentation of the measurement data
Fine presentation of the measurement procedures as a flue gas matrix and line diagram



Sensors exchangeable by the user
Easy exchange of the sensors by the user – no adjustment necessary

Stamp of approval
The testo 330 LL is TÜV-tested according to 1. BImSchV EN 50379, Parts 1-3, TÜV-tested solid fuel measurement for O_2 and CO.

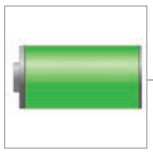
CO dilution
In CO measurement, the automatic dilution to min. 30,000 ppm CO takes place from 8,000 ppm (only for testo 330-2 LL).

Efficient exchange of probes
Fast and easy exchange of probes via the probe coupling. All gas paths are connected to the instrument at once with the bayonet connection.

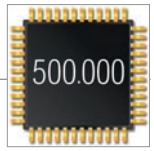
Attachment
Integrated magnets for fast attachment to burner/boiler.

Robust design
Robust and ergonomic instrument – ideally suited even to rough surroundings.

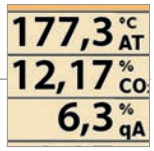
Long battery life
Powerful Li-ion reachargeable battery – no battery replacement. Up to eight hours' lifetime with pump running. Battery chargeable separately in instrument, no memory effect, no deep discharge.



Sensor monitoring
Integrated traffic light system which continuously monitors the sensor functionality.



Memory
Up to 500,000 measurement values can be saved in the memory of the testo 330 LL.



High-resolution colour graphic display
The measurement menus and measurement values are presented in detail and always easily legible.

Draught and gas zeroing
Integrated draught and gas zeroing with probe removal: the probe can remain in the flue during zeroing (only for testo 330-2 LL).

Fast sensor zeroing
Automatic zeroing of the sensor in only 30 seconds after start-up, and which can be cancelled if not required.

Logger function for long-term measurements
Logger function for easy long-term recording of the measurement curve.

Flexibility with modular probes
A range of probe lengths and diameters ensure a high degree of flexibility for all applications. To exchange the probe shaft, it is simply placed on the probe handle and engages.

Condensate trap
Integrated condensate trap – very easily emptied.

Probe filter
Easy exchange of probe filter.

Ordering data

Order suggestion testo 330-1 LL

testo 330-1 LL flue gas analyzer with longlife gas sensors, incl. rechargeable battery and calibration protocol

testo 330-1 LL	0632 3306
Option: H_2-compensated CO sensor	√
Option: Bluetooth	√

Order suggestion testo 330-2 LL

testo 330-2 LL flue gas analyzer with longlife gas sensors and integrated draught and gas zeroing, incl. rechargeable battery and calibration protocol

testo 330-2 LL	0632 3307
Option: H_2-compensated CO sensor	√
Option: Bluetooth	√

Order suggestion longlife set for service technicians and assessors with the fine pressure probe

testo 330-2 LL	0632 3307
Option: H_2-compensated CO sensor	√
Option: Bluetooth	√
International mains unit 100-240 V AC / 6.3 V DC	0554 1096
flue gas probe modular 300 mm, Ø 6 mm	0600 9763
Combustion air temperature probe 190 mm	0600 9787
testo BLUETOOTH® printer	0554 0553
PC analysis software easyheat	0554 3332
USB connection cable instrument-PC	0449 0047
Fine pressure probe	0638 0330

Order suggestion longlife set for customer service and maintenance engineers

testo 330-2 LL	0632 3307
Option: H_2-compensated CO cell	√
Option: Bluetooth	√
International mains unit 100-240 V AC / 6.3 V DC	0554 1096
Flue gas probe modular 300 mm, Ø 6 mm	0600 9763
Combustion air temperature probe 190 mm	0600 9787
testo BLUETOOTH® printer	0554 0553
Hose connection set	0554 1203
Basic system case flat	0516 3330

The gas pipe test is integrated in the testo 330 LL (see ill.). Order **accessory 0554 1213**, and if not included in the set, **accessory 0554 1203**.

Order suggestion longlife set for assessors

testo 330-2 LL	0632 3307
Option: H_2-compensated CO sensor	√
Option: Bluetooth	√
International mains unit 100-240 V AC / 6.3 V DC	0554 1096
Flue gas probe modular 300 mm, Ø 6 mm	0600 9763
Combustion air temperature probe 190 mm	0600 9787
testo 308 smoke count measuring instrument	0632 0309
Probe attachment for testo 308	0554 0616
Basic system case high	0516 3331

Accessories for measuring instrument	**Part no.**	
testo 330-1 LL flue gas analyzer with long life gas sensors, inkl. O2-/CO-sensor; without H2-compensation, incl. rech. battery and calibration protocol; with graphic display	0632 3306	
testo 330-2 LL flue gas analyzer with long-life gas sensors and built-in draught and gas zeroing; incl. O2-/CO-sensor; without H2-compensation, rech. battery and calibration protocol; with graphic display	0632 3307	

	Part no.	
Option: Fine draught measurement, Resolution 0.1 Pa, measurement range to 100 Pa (instead of the standard draught measurement)		
Option fine differential pressure measurement		
Option: NO sensor, meas. range 0 to 3000 ppm, 1 ppm resolution		
Option H_2-compensated CO cell		
Option CO_{low} sensor		
Option NO_{low} sensor		
Option Bluetooth		

Accessories

Spare gas sensors	Part no.	
O_2 sensor for testo 330-1 LL/-2 LL	0393 0002	
CO sensor (without H_2-compensation) for testo 330-1 LL/-2 LL	0393 0051	
CO sensor, H2-compensated, 0 to 8000 ppm for testo 330-1 LL/-2 LL	0393 0101	
Spare CO_{low} sensor for testo 330-1 LL/-2 LL	0393 0103	
Spare NO sensor, 0 to 3000 ppm for testo 330-1 LL/-2 LL	0393 0151	
NO_{low} spare sensor 0 to 300 ppm, 0.1 ppm, ±2 ppm (0 to 39.9 ppm) ±5% of m.v.	0393 0152	

Accessories	Part no.	
Mains unit international 100-240 V AC / 6.3 V DC for mains operation or battery charging in instrument	0554 1096	
Spare battery 2600 mA	0515 0107	
Charger for spare battery	0554 1103	
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	
Readout adapter for automatic furnaces testo 330-1/-2 LL	0554 1206	
Adhesive pockets testo 330-1/-2 LL for printout, paper barcode labels; 50 off	0554 0116	
Smoke tester with oil; soot sheet; for measuring soot in flue gas	0554 0307	
Hose connection set with adapter for separate gas pressure measurement	0554 1203	
Pressure set for testing gas line testo 330-1/-2 LL version 2010	0554 1213	
Differential temperature set; consisting of 2 Velcro probes and temperature adapter	0554 1208	
Spare dirt filter, modular probe; 10 off	0554 3385	
easyheat PC analysis software, shows measurement in form of diagrams, tables and manages customer data.	0554 3332	
USB connection cable instrument to PC testo 330-1/-2 LL / testo 335	0449 0047	
ISO calibration certificate/flue gas	0520 0003	
Basic system case testo 330-1/-2 LL for analyzer, probes and accessories	0516 3330	
System case with double base	0516 3331	
Tools system case with tools section without content	0516 0329	

Probes

Modular flue gas probes, available in 2 lengths, incl. positioning cone, NiCr-Ni thermocouple, 2.2 m hose and particle filter	Part no.	
Flue gas probe modular, incl. cone for attachment; thermocouple NiCr-Ni; hose 2.2 m; particle filter; length 180 mm; Ø 8 mm; Tmax. 500 °C; TÜV-tested	0600 9760	
Flue gas probe; length 300 mm; Ø 8 mm; Tmax. 500 °C; TÜV approval; probe stop; NiCr-Ni thermocouple; 2.2 m hose and particle filter included	0600 9761	
Flue gas probe; length 180 mm; Ø 6 mm; Tmax. 500 °C; probe stop; NiCr-Ni thermocouple; 2.2 m hose and particle filter included	0600 9762	
Flue gas probe; length 300 mm; Ø 6 mm; Tmax. 500 °C; probe stop; NiCr-Ni thermocouple; 2.2 m hose and particle filter included	0600 9763	
Flue gas probe flexible; length 330 mm; Tmax. 180 °C; short-term 200 °C; bending radius max. 90 °C for measuring at inaccessible points; probe stop; NiCr-Ni-thermocouple; 2.2 m hose and particle filter included	0600 9764	

Probe accessories	Part no.	
Probe shaft; length 180 mm; 8 mm; Tmax. 500 °C	0554 9760	
Probe shaft; length 300 mm; Ø 8 mm; Tmax. 500 °C	0554 9761	
Probe shaft length 335 mm, incl. cone, Ø 8 mm, Tmax 1000 °C	0554 8764	
Probe shaft flexible; length 330 mm; Ø 10 mm; Tmax. 180 °C	0554 9764	
Probe shaft multi-hole; length 300 mm; Ø 8 mm; for mean CO calculation	0554 5762	
Probe shaft multi-hole; length 180 mm; Ø 8 mm; for mean CO calculation	0554 5763	
Hose extension; 2.8 m; extension cable for probe and analyzer	0554 1202	

Additional probes	Part no.	
Dual wall clearance probe for O_2 supply air measurement	0632 1260	
Gas leak detection probe; 0 to 10000 ppm CH_4/C_3H_8	0632 3330	
Ambient CO probe, for detecting CO in buildings and rooms; 0 to +500 ppm	0632 3331	
Ambient CO_2 probe (requires connection cable 0430 0143)	0632 1240	
Connection cable for ambient CO_2 probe	0430 0143	
Fine pressure probe: highly accurate probe for the measurement of differential pressure and temperature, as well as Pitot tube measurement of flow velocities (see technical data)	0638 0330	
Capillary hose set for 4 Pa measurement	0554 1215	
Solid fuel set (probe shaft, adapter, upgrade CD)	0600 9765	

Combustion air temperature probes	Part no.	
Combustion air temperature probe, immersion depth 300 mm	0600 9791	
Combustion air temperature probe, immersion depth 190 mm	0600 9787	
Combustion air temperature probe, immersion depth 60 mm	0600 9797	

Additional temperature probes	Part no.	
Mini ambient air probe; for separate ambient air temperature measurement; 0 to +80 °C	0600 3692	
Very fast reaction surface probe	0604 0194	
Connection cable	0430 0143	

Technical data

	Measuring range	Accuracy ±1 digit	Resolution	Adjustment time t_{90}
Temperature	-40 to +1.200 °C	±0.5 °C (0.0 to +100.0 °C) ±0.5 % of m.v. (remaining range)	0.1 °C (-40 to 999.9 °C) 1 °C (remaining range)	
Draught measurement	-9.99 to +40 hPa	±0.02 hPa or ±5% of m.v. (-0.50 to +0.60 hPa) ±0.03 hPa (+0.61 to +3.00 hPa) ±1.5% of m.v. (+3.01 to +40.00 hPa) (the greater value applies)	0.01 hPa	
Pressure measurement	0 to 300 hPa	±0.5 hPa (0.0 to 50.0 hPa) ±1% of m.v. (50.1 to 100.0 hPa) ±1.5 % of m.v. (remaining range)	0.1 hPa	
O_2 measurement	0 to 21 Vol. %	±0.2 Vol. %	0.1 Vol. %	< 20 s
CO measurement (without H_2 compensation)	0 to 4.000 ppm	±20 ppm (0 to 400 ppm) ±5% of m.v. (401 to 2.000 ppm) ±10% of m.v. (2.001 to 4.000 ppm)	1 ppm	< 60 s
CO measurement (H_2-compensated)	0 to 8.000 ppm	±10 ppm or ±10% of m.v. (0 to 200 ppm) ±20 ppm or ±5% of m.v. (201 to 2.000 ppm) ±10% of m.v. (2.001 to 8.000 ppm)	1 ppm	< 60 s
automatic dilution in testo 320-2 LL **CO determination (H_2-compensated)**	0 to 30000 ppm	±100 ppm (0 to 1000 ppm) ±10% of m.v. (1001 to 30000 ppm)	1 ppm	
Efficiency (ETA)	0 to 120%		0.1%	
Flue gas loss	0 to 99.9%		0.1%	
CO_2 determination Digital calculation from O_2	Display range 0 to CO_2 max	±0.2 Vol. %	0.1 Vol. %	< 40 s
Option: CO_{low} measurement	0 to 500 ppm	±5 ppm (0 to 100 ppm) ±5% of m.v. (101 to 2.000 ppm) ±10% of m.v. (2.001 to 3.000 ppm)	0.1 ppm	< 30 s
Option: NO measurement	0 to 3.000 ppm	±5 ppm (0 to 100 ppm) ±5% of m.v. (101 to 2.000 ppm) ±10% of m.v. (2.001 to 3.000 ppm)	1 ppm	< 30 s
Ambient CO measurement (with CO probe)	0 to 500 ppm	±5 ppm (0 to 100 ppm) ±5% of m.v. (>100 ppm)	1 ppm	Approx. 35 s
Gas leak measurement for combustible gases (with gas leak detection probe)	Display range 0 to 10.000 ppm CH_4/C_3H_8	Signal Optical display (LED) Audible alarm via buzzer		< 2 sec.
Ambient CO_2 measurement (with ambient CO_2 probe)	0 to 1 Vol. % 0 to 10.000 ppm	±50 ppm or ±2% of m.v. (0 to 5.000 ppm) ±100 ppm or ±3% of m.v. (5.001 to 10.000 ppm)		Approx. 35 s
NO_{low}	0 to 300 ppm	±2 ppm (0 to 39.9 ppm) ±5% of m.v. (40 to 300 ppm)	0.1 ppm	< 30 s
Differential pressure, flow velocity and temperature via the fine pressure probe	±10.000 Pa 0.15 to 3 m/s max. -40 to +1,200 °C (dependent on probe)	±0.3 Pa (0 to 9.99 Pa) plus ±1 digit ±3% of m.v. (10 to 10.000 Pa) ±0.5 °C (-40 to 100 °C) ±0.5 % of m.v. (rem. meas. range) plus probe accuracy	 0.1 m/s 0.1 °C	

General technical data

Storage temperature	-20 to +50 °C
Operating temperature	-5 to +45 °C
Power supply	Rechargeable battery pack 3.7 V / 2.6 Ah Mains unit 6 V / 1.2 A
Memory	500.000 readings

Display	Colour graphic display with 240 x 320 pixels
Weight	600 g (without rechargeable battery)
Dimensions	270 x 90 x 65 mm
Warranty	Instrument/probe/gas sensors (O_2, CO) 12 months NO, CO_{low} sensor 12 months Thermocouple and rech. battery 12 months

We measure it. testo

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

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.

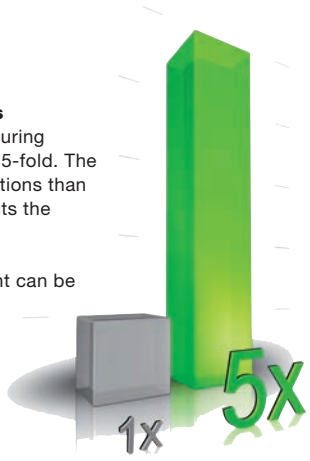
The unique measuring range extension allows unrestricted measurements to be carried out even at high gas concentrations. The testo 340 is equipped with an O_2 sensor as standard. Three further gas sensors can be configured individually, in order to be able to adapt the instrument optimally to the respective 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.

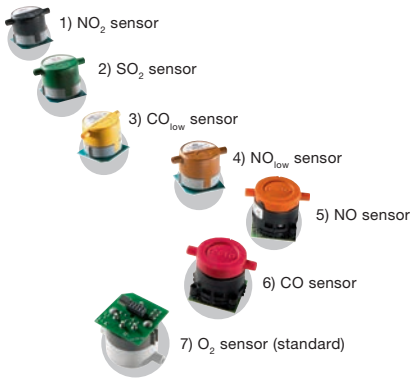
Measurement up to e.g.
max. 50,000 ppm (CO), or
max. 20,000 ppm (NO), or
max. 25,000 ppm (SO_2), without overloading the sensor.



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:



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.

* 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 (Tl) 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 (Tl) 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

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

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.

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 (Tl) 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 (Tl) 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 (Tl) 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 (Tl) 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 (Tl) 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

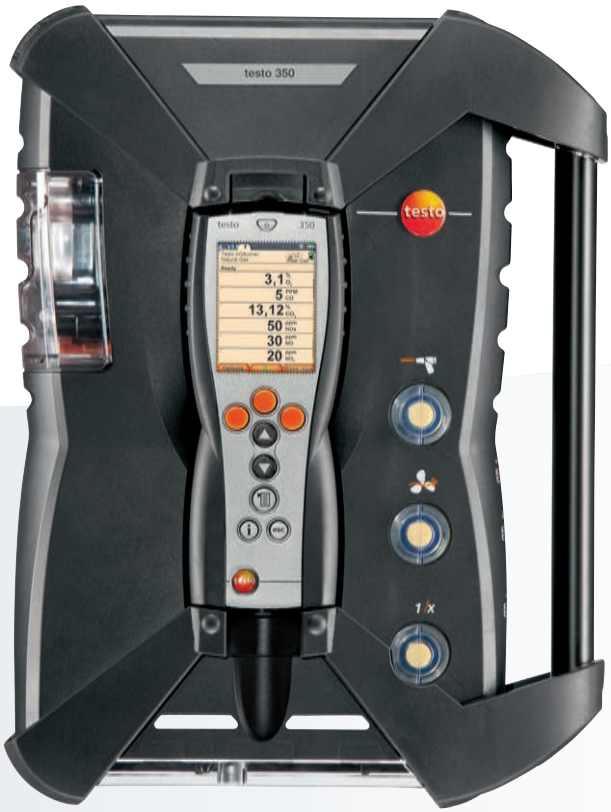
Memory Maximum Per folder Per site	 100 folders Max. 10 sites Max. 200 logs The max. number of logs is determined by the number of folders or sites
User-defined fuels	10 user-defined fuels incl. test gas as fuel
Regulated diaphragm pump Pump flow Hose length Max. pos. press./flue gas Max. neg. press./flue 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	 1 year (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 year

We measure it. testo

Flue gas analyzer for industry

testo 350 – Professional measurement system for portable, industrial emission measurement

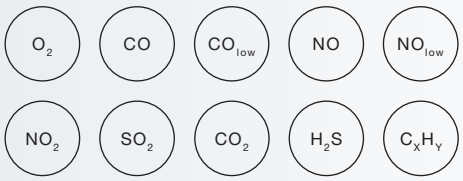


Application-guided operation with useful instrument pre-settings

Large colour graphical display

Industrial-standard design:
- insensitive to impact and dirt thanks to integrated impact protection
- robust plug-in connections
- closed chambers protect the interior of the instrument from dirt

Easy exchange of gas sensors and quick access to wearing parts



The portable flue gas analyzer testo 350 is the ideal tool for professional flue gas analysis. The Control Unit is the removable operation and display unit of the testo 350. 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, several analyzer boxes can be operated and controlled with one Control Unit. The measurement technology is situated in the analyzer box. The robust housing has integrated impact protection.

Downtimes due to contamination of the instrument are almost completely eliminated. Inherently closed chambers protect the interior of the instrument from dirt from the surroundings. Operation can also be carried out in direct connection to a PC or notebook, as an alternative to the Control Unit. After programming, the analyzer box is able to carry out measurements and store measurement data independently.

Product properties

Control Unit

The Control Unit is the operating and display unit of the testo 350. It is removable and equipped as standard with a **Li-Ion rechargeable battery**. All settings are made via the cursor button. The presentation of the measurement values takes place in the **colour graphical 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 be simultaneously and conveniently operated and controlled by one Control Unit.

The **particle filters** are easily accessible and can be exchanged without tools.

Analyzer box

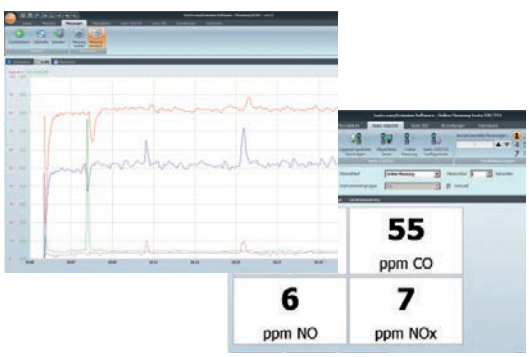
In the testo 350 analyzer box are the gas sensors, the measurement gas and rinsing pumps, the Peltier gas preparation (optional), the gas paths, filters, analysis and storage electronics as well as the mains unit and Li-ion rechargeable batteries. The robust housing has an integrated impact protection for use in tough surroundings. Inherently closed chambers protect the interior of the instrument from dirt from the surroundings. Operation can be carried out either with the Control Unit or in direct connection to a PC or laptop (USB, Bluetooth® 2.0 or CANCase). After programming, the analyzer box can automatically carry out measurements and store measurement data.

The **status display** shows the operational status, and is easily visible from a disance.

The **connections** are industrial-standard thanks to new, mechanically robust plug-in connections (the connections for probes and databus cable are fixed with a bayonet connection, and thus securely connected to the analyzer box. This prevents unintentional removal, avoiding incorrect measurements).

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

- Presentation of measurement values as a table or graph
- User-defined measurement intervals
- Online measurements via BLUETOOTH® wireless tranfer or by USB connection
- Customer- and application specific measurement protocols
- All instrument configurations and settings are easily carried out with easyEmission
- Direct transfer to Excel and PDF formats
- Easy implementation of individual formulae for customized calculations
- Calculation of fuel factors when using customer-specific fuels
- Conduction of individual cross-sensitivity adjustments of the gas sensors



Large colour graphic display with application-specific menu

The following measurement objects are available:

- Burner
- Gas turbine
- Engines (selection between λ > 1 nd λ ≤ 1 regulated industrial engines)
- User-defined

Behind each of these measurement objects, typical fuels, a practicable order of the flue gas parameters in the display, corresponding calculations and useful instrument pre-settings are stored. These include, for example, the activation of the dilution in measurements on λ ≤ 1 regulated industrial engines or the testing of the relevant gas sensor on the dilution slot.

The advantages of application-specific menus:

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

The **service aperture** on the underside of the instrument allows very easy access to all relevant service and wearing part such as pumps and filters, which can then be cleaned or exchanged easily on site.

Li-Ion rechargeable battery, mains-independent power supply over several hours

The **measurement gas pump** transports the gas to the gas sensors

The **condensate transport pump** pumps occuring condensate into the condensate trap. The filling level monitor reports when the condensate trap needs to be emptied. A few minutes after the report, the measurement gas pump is automatically stopped in order to avoid damage to the instrument.

The **sensor chamber** is thermally separated from other instrument components. This reduces possible sensor drifts caused by thermal influences.

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

Condensate trap

The **fresh air and dilution pump** supplies the gas sensors with fresh air as required

The **closed cooling loop** isolates the instrument electronics and sensors from the surrounding air. The interior of the instrument is cooled by a heat exchanger, and does not come into contact with dirty or corrosive ambient air.

Flexible data interfaces

These data interfaces are available for easy communication and data transfer:

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

Ordering suggestions

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 sensor (H_2-compensated), 0 to 10,000 ppm, resolution 1 ppm	
Option NO sensor, 0 to 4,000 ppm, resolution 1 ppm	
Option NO_2 sensor, 0 to 500 ppm, resolution 0.1 ppm	
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 ex-works.	
Option Peltier gas preparation incl. peristaltic pump for automatic condensate trap evacuation	
Option BLUETOOTH® wireless transmission	
Option fresh air valve for long-term measurement, incl. measuring range extension with dilution factor 5 for all sensors. For long-term measurements >2 hours measurement time, the additional Peltier gas preparation option is recommended.	
Option measuring range extension for single slot with the following selectable dilution factors: 0, 2, 5, 10, 20, 40	
Flue gas probe for industrial engines, immersion depth 335 mm, incl. cone and heat shield, Tmax. probe shaft +1000 °C, special hose for NO_2-/SO_2 measurement, length 5 m	0600 7552
BLUETOOTH printer set with wireless BLUETOOTH interface; incl. 1 roll thermal paper, rechargeable battery and mains unit	0554 0553
Software "easyEmission", incl. USB connection cable instrument-PC	0554 3334
Mains unit international 100-240 V AC / 6.3 V DC for mains operation or battery charging in instrument	0554 1096
Transport case for secure and tidy storage of testo 350 flue gas analyzer, flue gas probe and accessories, dimensions 570 x 470 x 210 mm (LxWxH)	0516 3510

Highly accurate NOx measurement
The new testo 350 allows the separate measurement of NO and NO2. The high and fluctuating NO and NO2-components of engine exhaust gas make this measurement necessary in order to be able to display the real NOX value of the engine. In addition to this, the integrated gas preparation and the special flue gas probe for industrial engines with a special hose offer protection from NO_2-/ and SO_2 absorption.

Automatic measuring range extension for unexpectedly high CO concentrations
For measurements on unfamiliar systems or in a less than ideal operational status of the engine, unexpectedly high emission values can occur (e.g CO concentrations up to 50,000 ppm). In these cases, the automatic measuring range extension is activated. This means maximum sensor lifetime. These helpful pre-settings are already stored application-specifically in the instrument.

Special instrument menu for testing flue gas post-preparation systems
This flue gas menu allows the simultaneous measurement of flue gas concentrations before and after the catalytic converter. For this purpose, two analyzer boxes are shown parallel in the display of the Control Unit, allowing a fast overview of the status of the catalytic converter.

Spatial distances
At greater distances between the gas sampling site and the adjustment site, the Control Unit can be connected to the analyzer box via the testo databus cable or by Bluetooth®.

Emission measurement on burners

	Part no.
testo 350 Control Unit	0632 3511
Option BLUETOOTH® wireless transmission	
testo 350 analyzer box	0632 3510
Option CO sensor (H_2-compensated), 0 to 10,000 ppm, resolution 1 ppm	
Option NO sensor, 0 to 4,000 ppm, resolution 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 Peltier gas preparation incl. peristaltic pump for automatic condensate trap evacuation	
Option BLUETOOTH® wireless transmission	
Option measuring range extension for single slot with the following selectable dilution factors: 0, 2, 5, 10, 20, 40	
Modular gas sampling probe, 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 international 100-240 V AC / 6.3 V DC for mains operation or battery charging in instrument	0554 1096
Transport case for secure and tidy storage of testo 350 flue gas analyzer, flue gas probe and accessories, dimensions 570 x 470 x 210 mm (LxWxH)	0516 3510

High availability even under difficult circumstances
The instrument diagnosis as well as warning reports in clear text inform you of the current status of the flue gas analyzer. The large service aperture of the testo 350 offers easy access to all relevant wearing parts such as sensors, filters and pumps. This allows these parts to be easily and quickly cleaned or exchanged on site. The pre-calibrated gas sensors enable sensor exchange without testo gas.

High measurement accuracy even in unsupervised long-term measurements
The integrated gas preparation prevents condensate from entering and damaging the measuring instrument. Any condensate occuring 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 absoption – allowing highly accurate measurement results.

Useful instrument pre-settings which save time
Typical fuels, a practicable order of the flue gas parameters and useful instrument settings are pre-programmed in the instrument behind each application (selection list in display). Information in the display guides the user through the measurement, instrument-specific previous knowledge is not necessary. The testo 350 is ready to use in minutes.

Unrestricted measurement at high concentrations
In the commissioning of burners and during measurements on unfamiliar systems, very high concentrations can occur unexpectedly. In these cases, the measuring range extension is automatically activated.

Emission measurement on gas turbines

	Part no.
testo 350 Control Unit	0632 3511
Option BLUETOOTH® wireless transmission	
testo 350 analyzer box	0632 3510
Option CO_{low} sensor (H_2-compensated), 0 to 500 ppm, resolution 0.1 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 Peltier gas preparation incl. peristaltic pump for automatic condensate trap evacuation	
Option BLUETOOTH® wireless transmission	
Option fresh air valve for long-term measurement, incl. measuring range extension with dilution factor 5 for all sensors. For long-term measurements >2 hours measurement time, the additional Peltier gas preparation option is recommended.	
Option measuring range extension for single slot with the following selectable dilution factors: 0, 2, 5, 10, 20, 40	
Flue gas probe for industrial engines, immersion depth 335 mm, incl. cone and heat shield, Tmax. probe shaft +1000 °C, special hose for NO_2-/SO_2 measurement, length 5 m	0600 7552
BLUETOOTH printer set with wireless BLUETOOTH interface; incl. 1 roll thermal paper, rechargeable battery and mains unit	0554 0553
Mains unit international 100-240 V AC / 6.3 V DC for mains operation or battery charging in instrument	0554 1096
Transport case for secure and tidy storage of testo 350 flue gas analyzer, flue gas probe and accessories, dimensions 570 x 470 x 210 mm (LxWxH)	0516 3510

Easy, accurate test gas adjustment by the user
In order to fulfil the highest accuracy and comparability requirements, the testo 350 can if necessary be adjusted with test gas on site.

Use in rough conditions
Special chambers and inhernetly closed cooling loops isolate the instrument electronics and the sensors from the ambient air. This means that the sensor chamber is thermally separated from other instrument components, reducing possible drifts caused by thermal influences.

Highly accurate NO_x measurements at low concentrations
Emission measurement during test and adjustment work on LowNO_x gas turbines requires a very high level of measurement accuracy because of the low NO concentrations. Thanks to the combination of an NO2 sensor and the special NOlow sensor with a resolution of 0.1 ppm, exactly these requirements are fulfilled. The integrated gas preparation and the special flue gas probe for industrial engines with a special hose additionally offer protection from NO2 absorption.

Combination of measuring range extension and CO_{low} sensor
Thanks to the freely selectable dilution stages of the measuring range extension, measurement of concentrations of up to max. 20,000 ppm are no problem with the CO_{low} sensor.

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 sensor (H_2-compensated), 0 to 10,000 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-absoption filter with refill pack. For long-term measurements >15 minutes measurement time, the additional Peltier gas preparation option is recommended.	
Option NO sensor, 0 to 4,000 ppm, resolution 1 ppm	
Option NO_2 sensor, 0 to 500 ppm, resolution 0.1 ppm	
Option Peltier gas preparation incl. peristaltic pump for automatic condensate trap evacuation	
Option BLUETOOTH® wireless transmission	
Modular gas sampling probe, 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
Software "easyEmission", incl. USB connection cable instrument-PC	0554 3334
Mains unit international 100-240 V AC / 6.3 V DC for mains operation or battery charging in instrument	0554 1096
Transport case for secure and tidy storage of testo 350 flue gas analyzer, flue gas probe and accessories, dimensions 570 x 470 x 210 mm (LxWxH)	0516 3510

Excellently suited to long-term measurements
Processes and furnace cycles can be monitored and analyzed over several days, controlled by defined measurement procedures. The testo 350 carries out the measurements automatically, and stores the data in the internal memory. Control can also take place directly via the PC and software.

Simultaneous flue gas analysis of different measurement points
In order to create a simultaneous profile of the furnace atmosphere or the combustion zones, up to 16 analyzer boxes can be connected to each other into a measurement system via the Testo databus. Control takes place either via the Control Unit or directly via a PC/notebook.

Ideal for measurements at high concentrations
Especially when recording extreme concentrations in the % range, the measuring range extension is automatically activated. The gas sensor is placed under no greater burden than at low gas concentrations, a maximum sensor lifetime is achieved – without additional costs for other gas sensors.

Industrial-standard instrument functions for more security
Inherently closed cooling loops isolate the instrument electronics and the sensors from the ambient air. This means that the testo 350 can also be used without restrictions in dirty and dusty atmospheres. The impact protection integrated into the housing protects the testo 350 from knocks and jars on the way to the measurement site.

Ordering data

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	
Option BLUETOOTH® wireless transmission		
Mains unit international 100-240 V AC / 6.3 V DC for mains operation or battery charging in instrument	0554 1096	

testo 350 analyzer box	Part no.	
testo 350 analyzer box, equipped with O2, 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, CO_{low}, NO, NO_{low}, NO_2, SO_2, CO_2 NDIR, C_xH_y, H_2S	0632 3510	
The testo 350 must be equipped with a second gas sensor, otherwise the instrument cannot function. A maximum of five 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-absoption filter with refill pack. For long-term measurements >15 minutes measurement time, the additional Peltier gas preparation option is recommended.		
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 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 trap evacuation		
Option fresh air valve for long-term measurement, incl. measuring range extension with dilution factor 5 for all sensors. For long-term measurements >2 hours measurement time, the additional Peltier gas preparation option is recommended.		
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 measurement time, the additional Peltier gas preparation option is recommended.		
Option automatic zeroing of pressure sensor for continuous flow velocity/differential pressure measurement		

Accessories testo 350 analyzer box	Part no.	
Exchangeable filter NO sensor (1 off), blocks cross-gas SO_2	0554 4150	
Transport case for secure and tidy storage of testo 350 flue gas analyzer, flue gas probe and accessories, dimensions 570 x 470 x 210 mm (LxWxH)	0516 3510	
Transport backpack for testo 350	0516 3511	
Carrying belt set for flue gas analyzer testo 350	0554 0434	
Spare particle filter for testo 350 analyzer box (20 pcs.)	0554 3381	
Wall holder for analyzer box testo 350, can be locked	0554 0203	

Ordering data

PC software and Testo databus	Part no.	
Software "easyEmission", incl. USB connection cable instrument-PC Functions: user-defined measurement intervals, transfer of measurement values to Microsof EXCEL in seconds, user-defined fuels, presentation of measurement values as a table or graph, easy configuration of customer-specific reports, etc.	0554 3334	
Software "easyEmission" for testo 350 incl. Testo databus controller with USB connection instrument-PC, cable for Testo databus and terminal plug. If several testo 350 flue gas analyzers are connected to the Testo databus, they can then be controlled and read out on a PC (possible measurement interval in databus of 1 measurement per second).	0554 3336	
Connection cable for Testo databus between Control Unit and analyzer box or between several analyzer boxes, with bayonet connection, length 2 m.	0449 0075	
Connection cable for Testo databus between Control Unit and analyzer box or between several analyzer boxes, with bayonet fitting, length 5 m	0449 0076	
More cable lengths up to 800 m on request		
Set Analog output box, 6 channels, 4 to 20 mA, for output of the measurement values on for example an analog recorder, set consists of analog output box, connection cable Testo databus, length 2 m, Testo databus terminal plug	0554 3149	

Printer and Accessories	Part no.	
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	

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 (TI) 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	

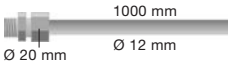
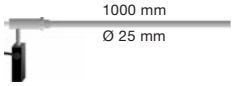
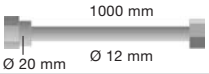
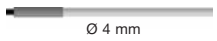
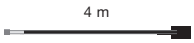
Probe accesories/standard gas sampling probes	Part no.	
Hose extension; 2.8 m; extension cable for probe	0554 1202	
Probe shaft with pre-filter, length 335 mm, incl. cone, Ø 8 mm, Tmax 1000 °C	0554 8766	
Probe shaft with pre-filter, length 700 mm, incl. cone, Ø 8 mm, Tmax 1000 °C	0554 8767	
Spare sintered 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 (on request)	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, immersion depth 335 mm, incl. cone and heat shield, Tmax. probe shaft +1000 °C, special hose for NO_2-/SO_2 measurement, length 5 m	0600 7552	
Flue gas probe for industrial engines with probe shaft pre-filter, 335 mm immersion depth incl. cone and heat shield, Tmax +1000 °C, special hose for NO2-/SO2 measurements, length 5 m	0600 7553	
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	
Thermocouple for exhaust 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 1000 °C	0554 7455	

Temperature probes	Part no.	
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 shield	0635 2042	

Probes

Industrial probes			Part no.	
Heated handle, power supply 115 to 230 V, 50/60 Hz, temperature gas path > 180 °C, IP54, gas input G1/4", gas exit M10x1 external thread		Power consumption: 200 Watt Ready to use : after aprox. 20 min Amb. temperature.: -20 to +50 °C Weight: 1.7 kg	0600 7920	
Adapter, non-heated, IP54, gas input G1/4", gas exit M10x1 external thread		Ambient temp.: -20 to +50 °C Weight: 0.4 kg	0600 7911	
Non-heated sampling pipe to +600 °C, stainless steel 1.4571			0600 7801	
Non-heated sampling pipe to +1200 °C, Inconel 625		Connection: G1/4“ Weight: 0.4 kg	0600 7803	
Non-heated sampling pipe to +1800 °C, Al-Oxide, 1 m			0600 7805	
Heated sampling pipe, power supply 230 V / 50 Hz, stainless steel 1.4571, heating > 180 °C, flue gas temperature max. +600 °C		Power consumption.: 650 Watt; connection: electr. connection in heated handle, connection adapter with screw thread/thread ring G1/4“ *	0600 7820	
Extension pipe to +600 °C, stainless steel 1.4571, 1 m		Connection: Thread screw/screw socket G1/4“; Weight: 0.45 kg	0600 7802	
Extension pipe to +1200 °C, Inconel 625, 1 m			0600 7804	
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.		Connection: G1/4'' Thread; Weight: 0.2 kg	0554 0710	
Thermocouple, NiCr-Ni, -200 to +1200 °C, Inconel 625, length 1.2 m		Connection: To analyzer 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, length 2.2 m			0430 0066	
Special sampling hose for precise NO_2/SO_2 measurements, length 4 m		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, 5 m long, between plug-in head cable and instrument			0409 0063	
Mounting flange, stainless steel 1.4571 adjustable quick-action fitting suitable for all sampling/extension pipes			0554 0760	
Transport case for industrial probes, aluminium, space for: handle, probes, flange and accessories, dimensions 1270 x 320 x 140 mm (LxWxH)			0516 7900	

* Supply via heated handle

Technical data

testo 350 Control Unit

	testo 350 Control Unit	Analog output box (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 h (without wireless connection)	–
Memory	2 MB (250,000 meas. values)	–
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 permits BLUETOOTH® wireless transmission for testo 350

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 testo 350 analyzer box

	Measuring range	Accuracy ±1 digit	Resolution	Reaction time t_{90}
O_2 measurement	0 to +25 Vol. % O_2	±0.8% of fsv (0 to +25 Vol. % O_2)	0.01 Vol. % O_2 (0 to +25 Vol. % O_2)	20 s (t_{95})
CO measurement (H_2 compensated)*	0 to +10.000 ppm CO	±5% of mv (+200 to +2.000 ppm CO) ±10% of mv (+2.001 to +10.000 ppm CO) ±10 ppm CO (0 to +199 ppm CO)	1 ppm CO (0 to +10.000 ppm CO)	40 s
CO_{low} measurement (H_2 compensated)*	0 to 500 ppm CO	±5% of mv (+40 to +500 ppm CO) ±2% of mv (0 to +39,9 ppm CO)	1 ppm CO (0 to +500 ppm CO)	40 s
NO measurement	0 to +4.000 ppm NO	±5% of mv (+100 to +1.999 ppm NO) ±10% of mv (+2.000 to +4.000 ppm NO) ±5 ppm CO (0 to +99 ppm CO)	±1 ppm NO (0 to +4.000 ppm NO)	30 s
NO_{low} measurement	0 to +300 ppm NO	±5% of mv (+40 to +300 ppm NO) ±2 ppm NO (0 to +39.9 ppm NO)	±0.1 ppm NO (0 to +300 ppm NO)	30 s
NO_2 measurement	0 to +500 ppm NO_2	±5% of mv (+100 to +500 ppm NO_2) ±5 ppm NO_2 (0 to +9,99 ppm NO_2)	±0.1 ppm NO_2 (0 to +500 ppm NO_2)	40 s
SO_2 measurement	0 to +5.000 ppm SO_2	±5% of mv (+100 to +2.000 ppm SO_2) ±10% of mv (+2.001 to +5.000 ppm SO_2) ±5 ppm SO_2 (0 to +99 ppm SO_2)	±1 ppm SO_2 (0 to +5.000 ppm SO_2)	30 s
CO_2 measurement (IR)	0 to +50 Vol. % CO_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)	0.01 Vol. % CO_2 (0 to 25 Vol. % CO_2) 0.1 Vol. % CO_2 (>25 Vol. % CO_2)	10 s
H_2S measurement	0 to +300 ppm H_2S	±5% of mv (+40 to +300 ppm) ±2 ppm (0 to +39.9 ppm)	0.1 ppm (0 to +300 ppm)	35 s

* H_2 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 measurement values of O_2, CO_2-(IR) and C_xH_y are not shown in the display.		
	Measuring range	Accuracy ±1 digit	Resolution	Measuring range	Accuracy ±1 digit	Resolution
CO measurement (H_2 compensated)	depending on selected factor	±2% of m.v. (additional error)	1 ppm	2.500 to 50.000 ppm	±5 % of m.v. (additional error) Press. range -100 to 0 mbar at probe tip	1 ppm
CO_{low} measurement (H_2 compensated)	depending on selected dil. factor		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} measurement			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	Methane: 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 testo 350 analyzer box

	Measuring range	Accuracy ±1 digit	Resolution	Reaction time t_{90}
Degree of effectivity	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 s
Differential pressure 1	-40 to +40 hPa	±1.5% of mv (-40 to -3 hPa) ±1.5% of mv (+3 to +40 hPa) ±0.03 hPa (-2.99 to +2.99 hPa)	0.01 hPa (-40 to +40 hPa)	
Differential pressure 2	-200 to +200 hPa	±1.5% of mv (-200 to -50 hPa) ±1.5% of mv (+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 (opt. when equipped with IR sensor)	-600 to +1.150 hPa	±10 hPa	1 hPa	
Flue gas dewpoint calculation	0 to 99.9 °C td		0.1 °C td (0 to 99.9 °C td)	
Type K (NiCr-Ni)	-200 to +1.370 °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 +1.370 °C)	
Type S (Pt10Rh-Pt)	0 to +1.760 °C	±1 °C (0 to +1.760 °C)	0.1 °C (0 to +1.760 °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 CxHy sensor

Meas. parameter	Measuring range[1]	Accuracy ±1 digit	Resolution	Min. O_2 requirement in flue gas	Reaction time t_{90}	Response factor[2]
Methane	100 to 40.000 ppm	‹400 ppm (100 to 4.000 ppm) ‹10% of mv (>4.000 ppm)	10 ppm	2% + (2 x m.v. methane)	‹40 s	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] Lower explosion limit (LEL)must be adhered to.
[2] The HC sensor is adjusted to methane ex-works. It can be adjusted to a different gas (propane or butane) by the user.

General 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 readings
Power supply	AC mains unit 100V to 240V (50 to 60 Hz)
DC voltage input	11 V to 40 V
Max. dust load	20 g/m³ dust in flue gas
Dewpoint calculation	0 to 99 °Ctd
Max. positive pressure	max. +50 mbar
Max. negative pressure	min. -300 mbar
Pump through-flow	1 l/min. with through-flow monitoring
Hose length 16.2 m (corresponds to 5 probe hose extensions)	
Max. humidity load	+70 °C dewpoint temperature

Trigger input	Voltage 5 to 12 Volt (rising or trailing edge) pulse width > 1 sec load: 5 V/max, 5 mA, 12 V/max. 40 mA
Warranty	*Measuring instrument* 1 year (excepting wearing parts e.g. gas sensors...) *Gas sensors* CO/NO/NO_2/SO_2/H2$_2$/C_xH_y: 1year O_2 sensor: 1 year CO_2-IR sensors: 1 year The warranty applies to average sensor load. Rech. *battery:* 1 year
Protection class	IP40
Battery life	Maximum load approx. 2.5 h

We measure it. testo

Exhaust gas analyzer

testo 350 MARITIME – for emission measurement on marine diesel engines

- With GL certificate according to MARPOL Annexe VI and NOx Technical Code 2008
- Easy installation of gas sampling probe
- Immediate operative readiness after switching on
- Fast and easy sensor exchange thanks to pre-calibrated "plug & play" gas sensors
- Easy and convenient transport in robust protective case with trolley function

0098/12

37 811 - 12 HH

°C O_2 CO NO NO_2 SO_2 CO_2

The certified testo 350 MARITIME is the world's first portable exhaust gas analysis system for the measurement of exhaust gas emissions according to MARPOL Annexe VI and NOx Technical Code 2008.
The testo 350 MARITIME has the following certificate: Germanischer LLoyd (GL) certificate no. 37811 - 12 HH, according to MARPOL Annexe VI and NOx Technical Code 2008.
The exhaust gas analyzer additionally fulfils the guideline on marine equipment and has the MED conformity mark 0098/12.

Gas sampling takes place with a special, easy-to-install sampling probe. The certified and durable electrochemical gas sensors (ECS) record the concentrations of the exhaust gas components O2, CO, NOx (NO + NO2 separately) and SO2 highly accurately and with long-term stability. CO_2 is recorded using the certified IR measurement principle. In order to withstand the tough conditions at sea, the complete exhaust gas analyzer incl. accessories is stored in a robust protective case.

Overview of the advantages of the testo 350 MARITME.

On-board verification examination according to NOx Technical Code 2008.

The testo 350 MARITIME measures the gaseous concentrations of O_2, CO, CO_2, NOx and SO_2 and supports you in the following applications:

- Periodic examinations and intermediary examinations
- Direct measurement and monitoring on board
- Simplified test and measurement procedures.

In addition to this, you can use it for official NOx-monitoring measurements to check the NOx limit values prescribed in MARPOL Annexe VI on board.

In addition to this, NOx measurement in special regional zones is also possible with the testo 350 MARITIME, for example for reducing the NOx tax in Norway.

Control unit
testo 350 MARITIME

Analyzer box
testo 350 MARITIME

Gas sampling probe
with probe pre-filter

Practical trolley

Ordering data / Technical data

testo 350 MARITIME

- Analyzer box testo 350 MARITIME V2 equipped with O_2, CO, CO_2-(IR), NO, NO_2, SO_2, incl. gas preparation, measuring range extension for individual slot (for SO_2 only), fresh air valve for continuous measurement, differential pressure sensor, temperature probe input Type K NiCr-Ni and Type S Pt10Rh-Pt, Testo databus connection, rech. battery, integrated combustion air probe (NTC), trigger input, measurement data store, USB interface
- Control unit testo 350 MARITIME V2
- Robust protective case with trolley function
- Gas sampling probe with pre-filter for industrial probes, probe shaft length 335 mm, incl. probe stop, heat protection shield, special hose for NO_2-/SO_2-measurement, Tmax probe shaft 1000 °C, hose length 5.2 m incl. thermocouple for exhaust gas temperature measurement, NiCr-Ni, length 400 mm, Tmax. +1000 °C with 5.4 m connection line and additional temperature protection
- Connection line between exhaust gas analyzer and control unit, length 5 m
- Testo fast printer with wireless infrared interface, 1 roll thermal paper and 4 AA batteries for measurement value printout on site
- Humidity/temperature measuring instrument testo 610
- Silicon hose (Ø 4mm, length 5 m) incl. hose connector for connection to gas sampling probe for measuring exhaust gas
- Germanischer Lloyd certificate no. 37 811 - 12 HH

Part no. 0563 3503

General technical data

Operating temperature	+5 to +45 °C
Storage temperature	-20 to +50 °C
Voltage supply	Li ion rechargeable battery AC mains unit 100 V to 240 V (50 to 60 Hz)
Electrical power consumption	max. 40 W
Max. positive pressure at gas input	50 hPa
Max. negative pressure at gas input	-300 hPa
Weight	Approx. 17 kg
Dimensions (case)	56.5 x 45.5 x 26.5 cm

Technical data testo 350 MARITIME

	Measuring range	Tolerance
°C, exhaust gas	-40 to +1000 °C	max. ±5 K
O_2	0 to 25 Vol. %	According to to MARPOL Annex VI and NO_x Technical Code
CO	0 to 3000 ppm	
NO	0 to 3000 ppm	
NO_2	0 to 500 ppm	
SO_2	0 to 3000 ppm	
CO_2 (IR)	0 to 40 Vol. %	
P_{abs}	600 to 1150 hPa	±5 hPa at +22 °C ±10 hPa at -5 to +45 °C