

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 or via Android smartphone or tablet with the free App, as an alternative to the Control Unit. After programming, the analyzer box is able to carry out measurements and store measurement data independently.

Ordering data

testo 350 Control Unit

testo 350 Control Unit, displays measurement values and controls analyzer box, incl. rech. battery, measurement data store, USB interface and connection for Testo databus



Part no. 0632 3511

testo 350 analyzer box

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}, NO₂, SO₂, CO₂ NDIR, C_xH_y, H₂S



Part no. 0632 3510

Accessories testo 350 Control Unit		
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	

The testo 350 analyzer box must be equipped with a second gas sensor, otherwise the instrument cannot function. A maximum of five additional sensors can be fitted.

A maximum of five additional sensors can be fitted.	
Dption CO sensor (H ₂ -compensated), 0 to 10,000 ppm, resolution 1 ppm	
Dption CO _{low} sensor (H ₂ -compensated), 0 to 500 ppm, resolution 0.1 ppm	
Dption NO sensor, 0 to 4,000 ppm, resolution 1 ppm	
Dption NO _{low} sensor, 0 to 300 ppm, resolution 0.1 ppm	
Dption NO ₂ sensor, 0 to 500 ppm, resolution 0.1 ppm	
Dption SO ₂ sensor, 0 to 5,000 ppm, resolution 1 ppm	
Dption CO ₂ (NDIR) sensor, 0 to 50 Vol %, resolution 0.01 Vol %, infrared measurement principle, incl. absolute pressure neasurement and CO ₂ -absoption filter with refill pack. For long-term measurements >15 minutes measurement time, he additional Peltier gas preparation option is recommended.	
Dption C _x H _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.	
Dption H ₂ S sensor, 0 to 300 ppm, resolution 0.1 ppm	
Dption 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 neasurements >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	
Dption 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 neasurement 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	
Spare particle filter for testo 350 analyzer box (20 pcs.)	0554 3381	

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
Testo Bluetooth®/IRDA printer incl. 1 roll of printer paper, rechargeable battery and mains unit	0554 0620
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 5; 10; 15; 20 m/s	0520 0034	

Gas sampling 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.

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Modular flue gas probe 335 mm immersion depth, incl. cone, thermocouple NiCr-Ni (TI) Tmax 1000 $^\circ\rm C$ 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 $^\circ\rm C$ 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 $^\circ\rm C$ 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 $^\circ\rm C$ 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 modular gas sampling probes	Part no.
Hose extension; 2.8 m; extension cable for probe	0554 1202
Probe shaft with pre-filter, length 700 mm, incl. cone, Ø 8 mm, Tmax 1000 °C	0554 8767
On one sinks and fillen 0 off	
Spare sintered filter, 2 off	0554 3372
Spare dirt filter, modular probe; 10 off	0554 3372 0554 3385
Spare dirt filter, modular probe; 10 off	0554 3385
Spare dirt filter, modular probe; 10 off Probe shaft, length 700 mm, incl. cone, Ø 8 mm, Tmax 500 °C (on request)	0554 3385 0554 9767

Gas sampling probes for industrial engines	Part no.
Flue gas probe for industrial engines, immersion depth 335 mm, incl. cone and heat shield, Tmax. probe shaft +1000 $^{\circ}$ 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 5.2 m connection cable and additional temperature protection	0600 8895

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

Gas sampling probes

Industrial probes	Details	Part no.
Industrial probe set 1200 °C consisting of: - unheated handle - unheated probe shaft up to 1200 °C flue gas temperature - unheated gas sampling hose incl. inline filter, length 4 m - thermocouple Type K, length 1.2 m The set can optionally come with an extension tube and probe preliminary filter.	Probe shaft: T _{max} +1200 °C Length 1.0 m, Ø 12 mm Material 2.4856 alloy 625 Handle: T _m +600 °C Material: 1.4404 stainless steel Gas sampling hose: 2-chamber hose with PTFE inner core; length 4.0 m TC: Type K, Length 1.2 m, Ø 2 mm Tmax. +1200 °C	0600 7610
Industrial probe set 1800 °C consisting of: - unheated handle - unheated probe shaft up to 1800 °C flue gas temperature - unheated gas sampling hose incl. inline filter, length 4 m	Probe shaft: T _{max.} +1800 °C Material Al2O3 > 99.7% Length 1.0 m, Ø 12 mm Gas sampling hose: 2-chamber hose with PTFE inner core; length 4.0 m Handle: T _{max} +600 °C Material: 1.4404 stainless steel	0600 7620
For temperature measurements > +1370 °C, we recommend a thermocouple Type S.		
Heated industrial probe set consisting of: - heated probe shaft up to 600 °C flue gas temperature - heated gas sampling hose, length 4 m - thermocouple Type K, length 1.2 m	Probe shaft: temperature-proof up to +600 °C Voltage supply 230 V / 50 Hz Length 1.0 m, Ø 25 mm Heating temperature range +200 °C Material stainless steel 1.4571 Gas sampling hose: corrugated hose with PTFE inner core Length 4.0 m; outside diameter 34 mm Heating temperature range > +120 °C TC: Type K Length 1.2 m, Ø 2 mm T _{max.} +1200 °C	0600 7630
The set can optionally come with an extension tube and probe preliminary filter.		
Extension tube 1200 °C for extending the industrial probe set 1200 °C (0600 7610) and heated industrial probe set (0600 7630) The extension tube can be screwed directly onto the unheated probe shaft up to +1200 °C and the heated probe shaft up to +600 °C.	Probe shaft: T _{max.} +1200 °C Length 1.0 m, Ø 12 mm Material 2.4856 alloy 625	0600 7617
Thermocouple Type K, length 2.2 m	Type K Length 2.2 m, Ø 2 mm T _{max.} +1200 °C	0600 7615
ndustrial probe preliminary filter for dust-laden flue gas	Material porous silicon carbide T _{max} +1,000 °C,	0600 7616
The probe preliminary filter can be screwed directly onto the unheated probe shaft up to +1200 °C and the heated probe shaft up to +600 °C.	Length 105 mm, Ø 30 mm Filtration grade 10 μm	
Heated gas sampling hose	Corrugated hose with PTFE inner core Length 4.0 m; outside diameter 34 mm Heating temperature range > +120 °C	on request
Transport case for probes Suitable for all probes with a total length > 335 mm.		0516 7600
Extension cable, 5 m long, between plug-in head cable and		0409 0063

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	$\pm 0.8\%$ of fsv (0 to +25 Vol. % $\rm O_2)$	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 m.v. (+200 to +2.000 ppm CO) ±10% of m.v. (+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 m.v. (+40 to +500 ppm CO) ±2% ppm CO (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 m.v. (+100 to +1.999 ppm NO) ±10% of m.v. (+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 m.v. (+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	$\pm 5\%$ of m.v. (+100 to +500 ppm NO ₂) ± 5 ppm NO ₂ (0 to +9,99 ppm NO ₂)	$\pm 0.1 \text{ ppm NO}_2$ (0 to $\pm 500 \text{ ppm NO}_2$)	40 s
SO ₂ measurement	0 to +5.000 ppm SO ₂	$\pm 5\%$ of m.v. (+100 to +2.000 ppm SO ₂) $\pm 10\%$ of m.v. (+2.001 to +5.000 ppm SO ₂) ± 5 ppm SO ₂ (0 to +99 ppm SO ₂)	$\pm 1 \text{ ppm SO}_2$ (0 to +5.000 ppm SO ₂)	30 s
CO ₂ measurement (IR)	0 to +50 Vol. % CO ₂	±0.3 Vol. % CO₂ + 1% of m.v. (0 to 25 Vol. % CO₂) ±0.5 Vol. % CO₂ + 1.5% of m.v. (>25 to 50 Vol. % CO₂)	0.01 Vol. % CO ₂ (0 to 25 Vol. % CO ₂) 0.1 Vol. % CO ₂ (>25 Vol. % CO ₂)	10 s
H ₂ S measurement	0 to +300 ppm H ₂ S	±5% of m.v. (+40 to +300 ppm) ±2 ppm (0 to +39.9 ppm)	0.1 ppm (0 to +300 ppm)	35 s

* H, 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		1 ppm	2.500 to 50.000 ppm	-	1 ppm
CO _{low} measurement (H ₂ compensated)			0.1 ppm	500 to 2.500 ppm		0.1 ppm
NO measurement	depending on selected dil. factor	±2% of m.v. (additional error)	1 ppm	1.500 to 20.000 ppm	±5 % of m.v. (additional error)	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	Press. range -100 to 0 mbar at probe	1 ppm
С _х Н _v measurement	Methane: 100 to 40,000 ppm Propane: 100 to 21,000 ppm Butane: 100 to 18,000 ppm		10 ppm		tip	
NO ₂ measurement				500 to 2.500 ppm		0.1 ppm
H ₂ S 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_9
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 $O_2 \pm 0.2$ Vol.%	0.01 Vol. % CO ₂ 40 s	
Differential pressure 1	-40 to +40 hPa	±1.5% of m.v. (-40 to -3 hPa) ±1.5% of m.v. (+3 to +40 hPa) ±0.03 hPa (-2.99 to +2.99 hPa)	0.01 hPa (-40 to +40 hPa)	
Differential pressure 2	-200 to +200 hPa	±1.5% of m.v. (-200 to -50 hPa) ±1.5% of m.v. (+50 to +200 hPa) ±0.5 hPa (-49.9 to +49.9 hPa)	0.1 hPa (-200 to +200 hPa)	
Flow velocity	0 to +40 m/s		0.1 m/s (0 to +40 m/s)	
Absolute pressure (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		2% + (2 x m.v. methane)		1
Propane	100 to 21.000 ppm	4.000 ppm) <10% of m.v.	10 ppm	2% + (5 x m.v. propane)	<40 s	1.5
Butane	100 to 18.000 ppm	- (>4.000 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	Trigger input	Voltage 5 to 12 Volt	
Weight	4800 g		(rising or trailing edge) pulse width > 1 sec load: 5 V/max, 5 mA, 12 V/max. 40 mA	
Storage temperature	-20 to +50 °C	Warranty	Measuring instrument 2 years (excepting	
Operating temperature	-5 to +45 °C	(and)	wearing parts e.g. gas sensors)	
Housing material	ABS		<i>Gas sensors</i> CO/NO/NO _/ /SO _/ /H2 _/ /C _v H _v : 1year	
Memory	250,000 readings		O_2 sensor: 1 1/2 years	
Power supply	AC mains unit 100V to 240V (50 to 60 Hz)		CO ₂ -IR sensors: 2 years The warranty applies to average sensor loa Rech. <i>battery:</i> 1 year	
DC voltage input	11 V to 40 V			
Max. dust load	20 g/m ³ dust in flue gas	Protection class	IP40	
Dewpoint calculation	0 to 99 °Ctd	Battery life	Maximum load approx. 2.5 h	
Max. positive pressure	max. +50 mbar			
Max. negative pressure	min300 mbar			
Pump through-flow	1 l/min. with through-flow monitoring			
Hose length 16.2 m (cor	responds to 5 probe hose extensions)			
Max. humidity load	+70 °C dewpoint temperature			

Ordering suggestions

Emission measurement on industrial engines

on industrial engines	Part no.
testo 350 control unit	0632 3511
Option BLUETOOTH® wireless transmission	
testo 350 analyzer unit	0632 3510
Option CO (H2-compensated) sensor, 0 to 10,000 ppm	
Option NO sensor, 0 to 4,000 ppm	
Option NO2 sensor, 0 to 500 ppm	
Option Peltier gas preparation incl. hose pump	
Option BLUETOOTH® wireless transmission	
Option fresh air valve for long-term measurement	
Option measuring range extension	
Flue gas probe for industrial engines	0600 7552
testo BLUETOOTH® printer	0554 0620
easyEmission software	0554 3334
International mains unit for control unit	0554 1096
Transport case	0516 3510

Emission measurement on gas turbines

5 gue ten ten teo	Part no.
testo 350 control unit	0632 3511
Option BLUETOOTH® wireless transmission	
testo 350 analyzer unit	0632 3510
Option COlow (H2 compensated) sensor, 0 to 500 ppm	
Option NOlow sensor, 0 to 300 ppm	
Option NO2 sensor, 0 to 500 ppm	
Option Peltier gas preparation incl. hose pump	
Option BLUETOOTH® wireless transmission	
Option fresh air valve for long-term measurement	
Option measuring range extension	
Flue gas probe for industrial engines	0600 7552
testo BLUETOOTH® printer	0554 0620
easyEmission software	0554 3334
International mains unit for control unit	0554 1096
Transport case	0516 3510

Emission measurement on burners

testo 350 control unit	0632 3511
Option BLUETOOTH® wireless transmission	
testo 350 analyzer unit	0632 3510
Option CO (H2-compensated) sensor, 0 to 10,000 ppm	
Option NO sensor, 0 to 4,000 ppm	
Option NO2 sensor, 0 to 500 ppm	
Option SO2 sensor, 0 to 5,000 ppm	
Option Peltier gas preparation incl. hose pump	
Option BLUETOOTH® wireless transmission	
Option measuring range extension	
Gas sampling probe, modular	0600 8764
testo BLUETOOTH® printer	0554 0620
easyEmission software	0554 3334
International mains unit for control unit	0554 1096
Transport case	0516 3510

Part no.

Emission measurement on thermal processes

Part no.
0632 3511
0632 3510
0600 7610
0554 3334
0554 1096
0516 3510