

Be sure. **testo**

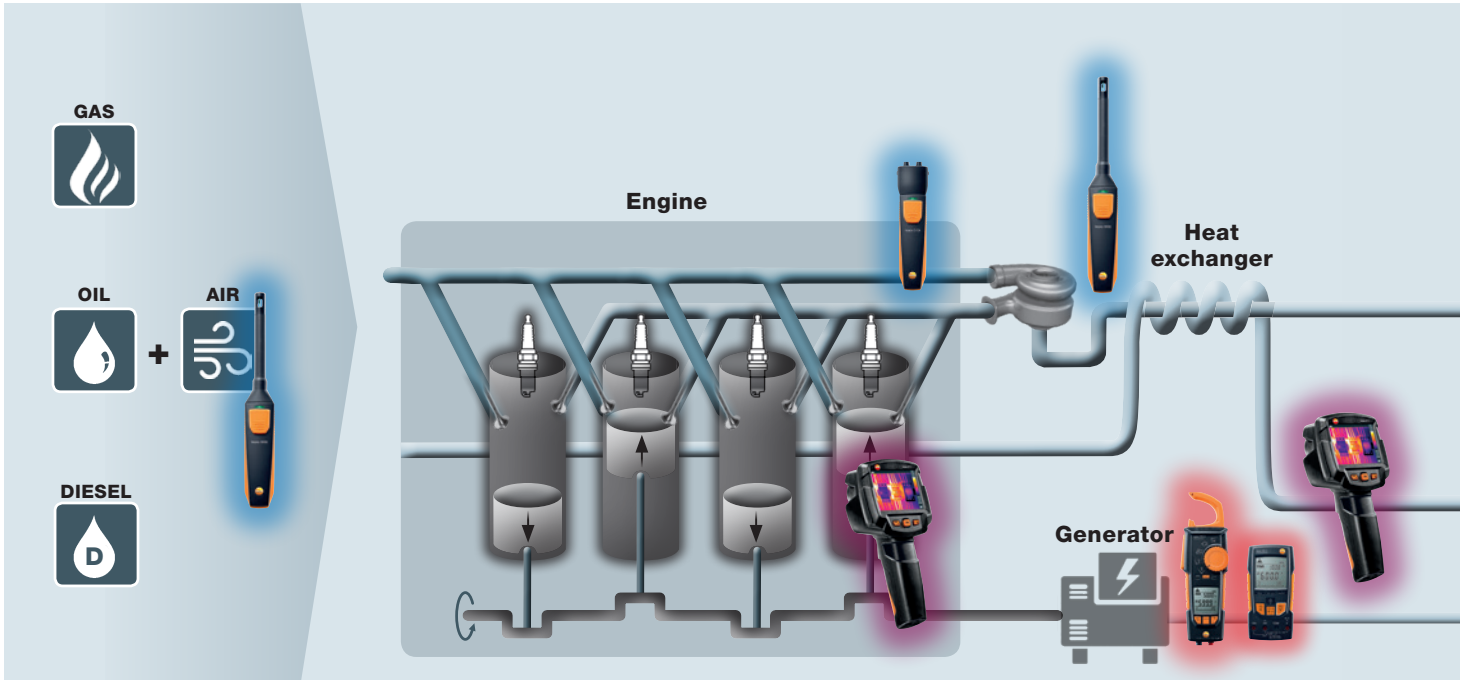


Now with  
new sets

**Versatile measurement  
technology for efficient combined  
heat and power plants.**

Everything for the measurement of emission, temperature, humidity, flow velocity, electrical measuring instruments and for thermography.

# Complete measurement technology from one provider.



## Measurement of emissions



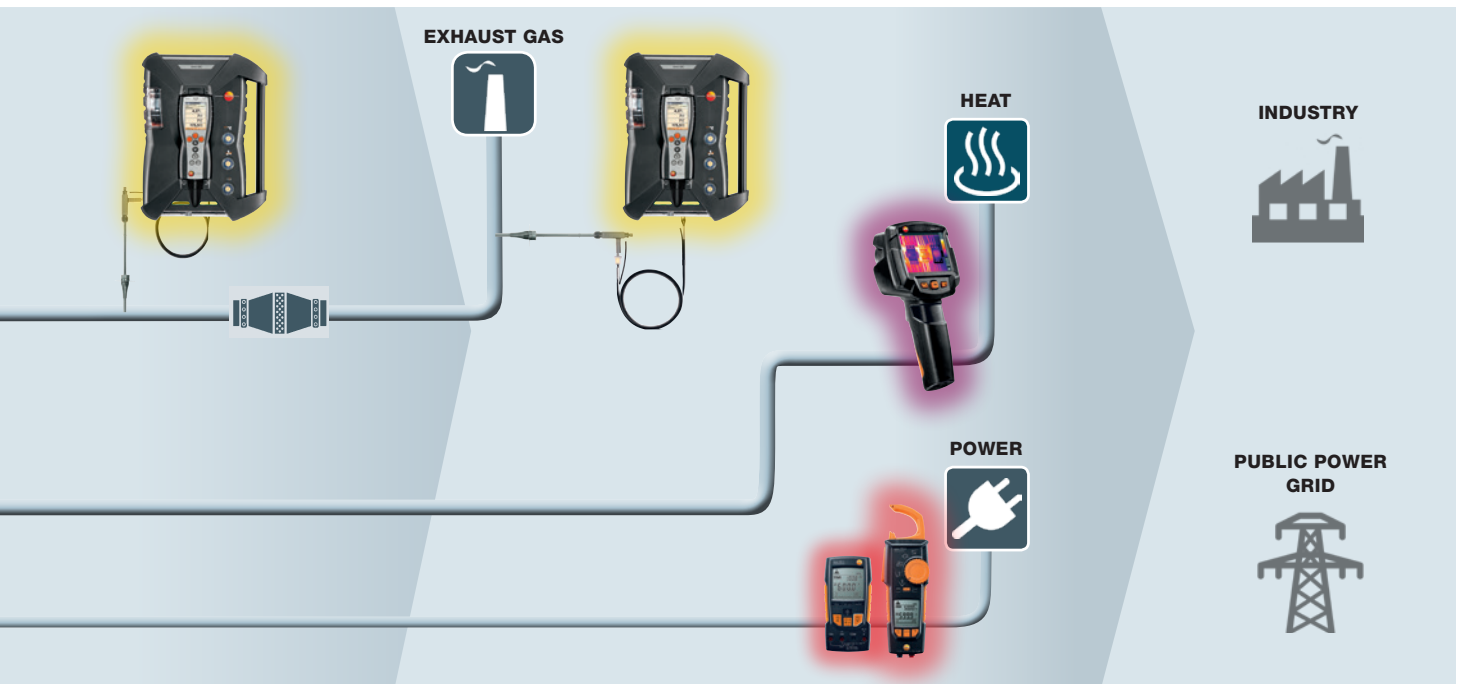
The testo 350 exhaust gas analyzer is the user-friendly solution for emission measurements on CHP\* plants. The analyzer is intuitive to operate and has application-specific setting menus which can be adapted to the relevant applications (e.g.  $\lambda \leq 1$  or  $\lambda > 1$  engines) and support users through various aids. In combination with the high-performance Peltier gas preparation, the testo 350 provides highly accurate measurement values in the shortest possible time.

## Preventive maintenance



A thermal imager can be used to examine electrical and mechanical CHP\* system assemblies for weaknesses during running operation and from a safe distance – ensuring fewer plant downtimes, a longer product lifetime and even more efficient energy use. Compared with the costs of an operational standstill, servicing the plant with a thermal imager is extremely worthwhile.

\* Combined heat and power



**Measurement of temperature, humidity and air flow velocity**



In order to optimize the effectivity of a combined heat and power plant, the temperature and humidity of the air input must be measured. For reasons of longevity, mechanical parts such as the turbocharger may not be allowed to overheat. These parameters, and also the flow velocity of the air, can be measured quickly and easily with the testo Smart Probes.

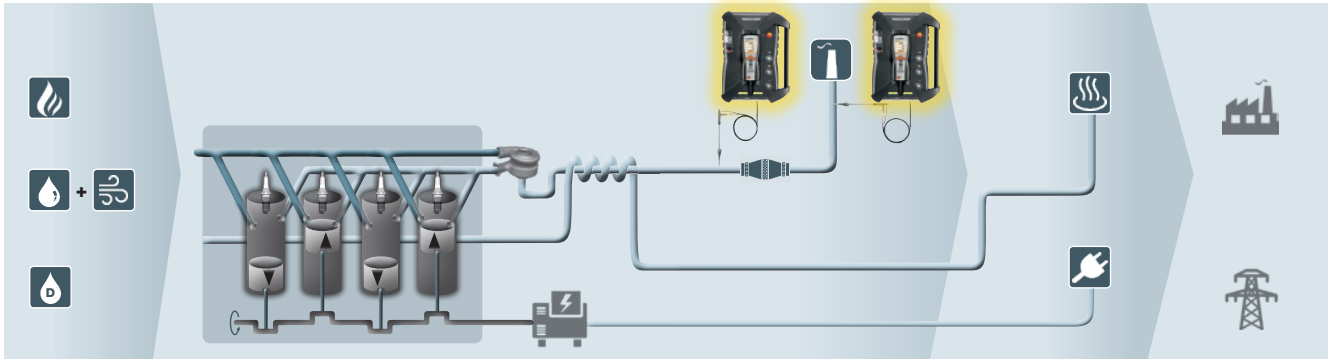
\* Combined heat and power

**Measurement of electrical measurement parameters**



CHP\* systems are supplied with current and controlled by electrical signals. Since every error can lead to considerable and expensive downtimes of the combined heat and power plant, regular servicing is necessary. And in the electrical generator too, electrical parameters must be tested to ensure that the alternating voltages/currents meet the consumers' requirements. Whether multimeters, clamp meters, current testers or voltage testers – the measuring instruments from Testo measure electrical parameters such as current, voltage or resistance more reliably and more precisely.

## Emission: Service and highly precise emission measurements.



Combined heat and power plants are usually modified and enlarged engines from automotive engineering which draw in a combustion gas (e.g. landfill gas, biogas or liquid gas), mix it with air, compress it and burn it. For maximum efficiency and minimum emission, this dynamic process must be very well adjusted. Adjustment with an imprecise measuring instrument can lead to lean misfiring or to mechanical knocking. This in turn increases the temperatures in the engine components and operating fluids (e.g. lubricating oil), promotes wear on the CHP plant and means higher maintenance and repair costs.

### Measurement objectives:

- Checking and inspecting engine efficiency
- Error detection/analysis of the engine's operating conditions, including engine control system
- Optimum adjustment of the engine in order to save fuel costs → higher efficiency
- Correct adjustment of the relations between fuel quality, ignition timing, air surplus etc. of the engine

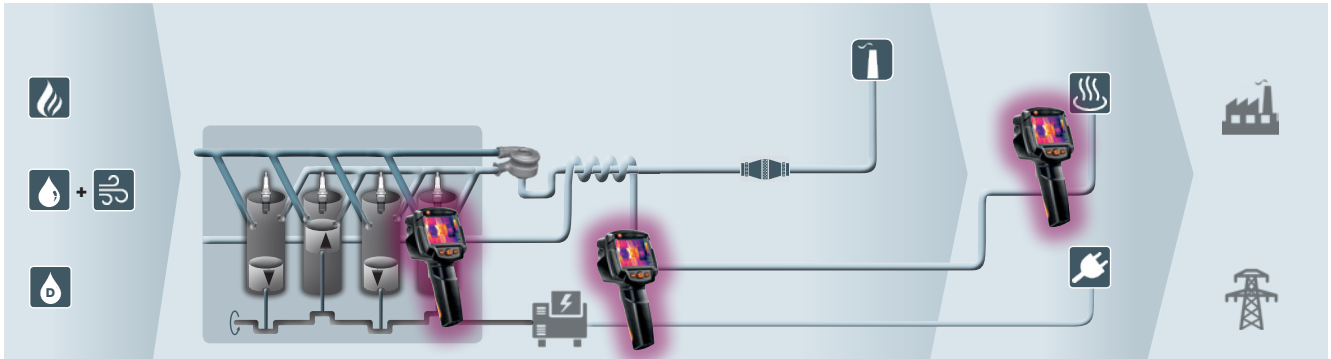
### Advantages of the thermal image testo 350:

- Extension of the service life of the engine and reduction of the maintenance costs by monitoring mechanical wear using the exhaust gas parameters
- Proof of quality in service work thanks to the early identification of wear
- Reduction of a plant's fuel consumption by up to 10 % due to the optimum adjustment of the ignition point, also when fuel quality fluctuates



Exhaust gas analyzer testo 350 (consisting of control unit order no. 0632 3511 and analyzer box order no. 0632 3510) and exhaust gas probe for industrial engines (order no. 0600 7556)

# Thermography: Preventive maintenance.



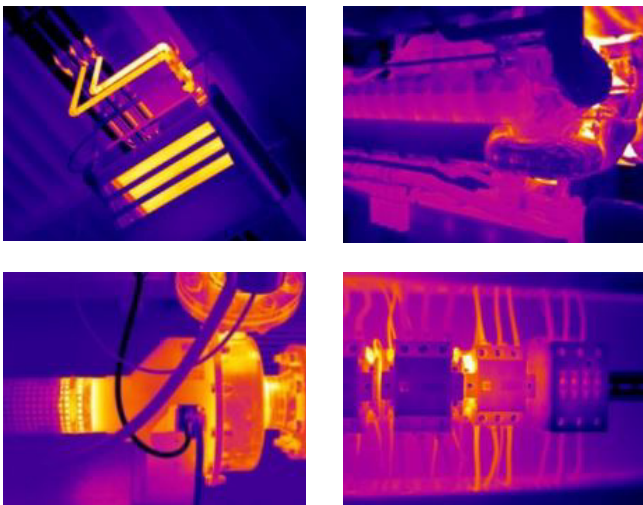
Electrical and mechanical assemblies of CHP plants can be examined for weaknesses under real conditions. The servicing of a plant with a thermal imager is very worthwhile, since plant downtimes can be avoided and the energy produced used more efficiently.

## Measurement objectives:

- Inspection and monitoring of mechanical components of the engine
- Inspection and monitoring of electrical components of the generator
- Extension of product life
- Optimization of energy budget

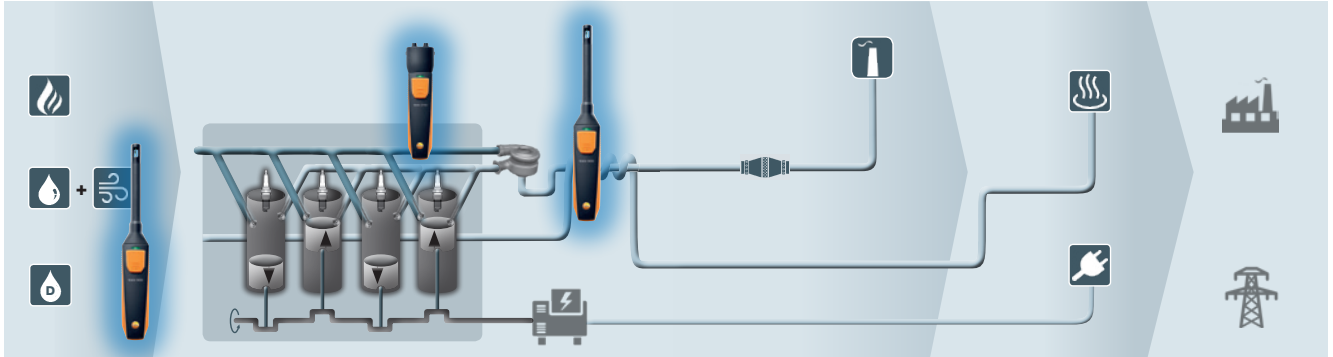
## Advantages of the thermal imager testo 872:

- Professional inspection with 76,800 temperature measurement points: Resolution of 320 x 240 pixels – extendible to 640 x 480 pixels via integrated SuperResolution technology
- Temperature differences identifiable from 0.06 °C
- Temperature measuring range up to +650 °C
- Integrated digital camera and laser marker
- Connectivity with the free Thermography App via wireless LAN
- Connectivity with thermohygrometer testo 605i and clamp meter testo 770-3 via Bluetooth
- Intuitive, one-hand operation for fast and easy thermal analyses
- Free analysis software IRSoft included in delivery



Thermal imager testo 872 (order no. 0560 8721)

# testo Smart Probes: Testing ambient conditions.



The measurement data from diverse probes are transmitted wirelessly to the testo Smart Probes App and can be viewed conveniently on mobile end devices. In addition to this, menus for specific applications are stored in the App, such as for pressure drop incl. alarm function as well as for non-contact infrared temperature measurement with fast image documentation incl. measurement value and measurement spot marker.

### Measurement objectives:

- Optimization of the efficiency of the heat exchanger
- Inspection and monitoring of mechanical components
- Testing ambient conditions such as temperature and air humidity
- Testing air flow velocity

### Davantages of differential pressure measuring instrument testo 510i:

- Measurement of gas flow pressure and static pressure
- Magnetic fixture for easy attachment
- Measurement menu for pressure drop test including alerts

### Advantages of the thermohygrometer testo 605i:

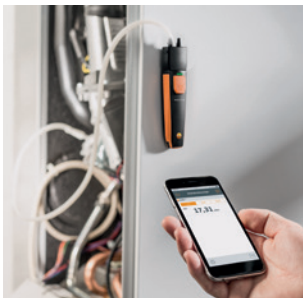
- Ideal for measuring air humidity
- Fast measurement of air temperature

### Advantages of the testo 805i infrared thermometer:

- Non-contact, infrared measurement of the surface temperature
- Measurement spot marking with easily visible 8-point laser circle
- Easy selection of emissivity with stored material list

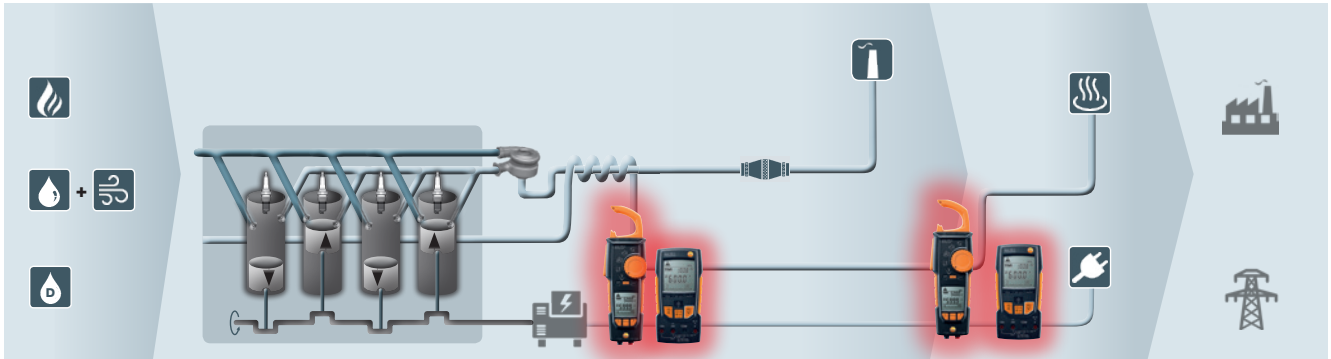
### Other testo Smart Probes:

- Thermometer testo 905i, clamp thermometer testo 115i, thermal anemometer testo 405i



Handy testo Smart Probes with smartphone operation:  
 Infrared thermometer testo 805i (order no. 0560 1805),  
 Differential measuring instrument testo 510i (order no. 0560 1510),  
 Thermohygrometer testo 605i (order no. 0560 1605),  
 Thermometer testo 905i (order no. 0560 1905),  
 Clamp meter testo 115i (order no. 0560 1115)

# Electrical measurement parameters: Preventive maintenance.



With the digital multimeter testo 760 and the clamp meter testo 770, measurements on the generator and its electrical installations can be carried out quickly and easily.

## Measurement objectives:

- Measurements in the distributor box and other electrical installations
- Comparison of output voltages/currents and phases at the generator
- Testing electrical components at the generator

## Advantages of the digital multimeter testo 760:

- Automatic detection and selection of measurement parameters via socket assignment
- Easy operation via function keys and large illuminated display
- With true root mean square measurement TRMS

## Advantages of the clamp meter testo 770:

- Innovative clamp mechanism to grab individual cables without any problem
- With additional functions for starting current, output and measurement in the  $\mu\text{A}$  range
- Communication with the testo Smart Probes App via Bluetooth (testo 770-3)



Multimeter testo 760 (Best.-Nr. 0590 7602),  
Clamp meter testo 770 (order no. 0590 7703)

# Gas engine set 1 Smart Probes bundle

**Gas engine set testo 350 (0563 3504 01)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:  
- O<sub>2</sub> sensor  
- CO sensor (H<sub>2</sub>-compensated)  
- NO sensor  
- NO<sub>2</sub> sensor  
- Fresh air valve  
- Peltier gas preparation  
- Measuring range extension  
- Bluetooth
- Exhaust gas probe for industrial engines, 335 mm (0600 7555)
- Thermocouple (0600 8898)
- testo easyEmission software (0554 3334)
- Transport case (0516 3510)

**Testo Smart Probes**

- testo 510i (0560 1510)
- testo 605i (0560 1605)
- testo 805i (0560 1805)

**Gas engine set 1 Smart Probes bundle** Set price: € x,xxx  
**Order no. 0563 3504 01**

# Gas engine set 2 Electrical bundle

**Gas engine set testo 350 (0563 3504 02)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:  
- O<sub>2</sub> sensor  
- CO sensor (H<sub>2</sub>-compensated)  
- NO sensor  
- NO<sub>2</sub> sensor  
- Fresh air valve  
- Peltier gas preparation  
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- testo easyEmission software (0554 3334)
- Transport case (0516 3510)

**Testo Smart Probes**

- testo 510i (0560 1510)
- testo 605i (0560 1605)
- testo 805i (0560 1805)

**Electrical measurement parameters**

- testo 760-2 (0590 7602)
- testo 770-3 (0590 7703)

**Gas engine set 2 electrical bundle** Set price: € x,xxx  
**Order no. 0563 3504 02**



# Gas engine set 3 Electrical thermal bundle

**Gas engine set testo 350 (0563 3504 03)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:
  - O<sub>2</sub> sensor
  - CO sensor (H<sub>2</sub>-compensated)
  - NO sensor
  - NO<sub>2</sub> sensor
  - Fresh air valve
  - Peltier gas preparation
  - Measuring range extension
  - Bluetooth
- Exhaust gas probe for industrial engines, 335 mm (0600 7555)
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**Testo Smart Probes**

- testo 510i (0560 1510)
- testo 605i (0560 1605)
- testo 805i (0560 1805)

**Electrical measurement parameters**

- testo 760-2 (0590 7602)
- testo 770-3 (0590 7703)

**Thermal imager**

- testo 872 (0560 8721)

**Gas engine set 3 electrical thermal bundle**      **Set price: € X,XXX**  
**Order no. 0563 3504 03**

# Gas engine set 4 Thermal bundle

**Gas engine set testo 350 (0563 3504 04)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:
  - O<sub>2</sub> sensor
  - CO sensor (H<sub>2</sub>-compensated)
  - NO sensor
  - NO<sub>2</sub> sensor
  - Fresh air valve
  - Peltier gas preparation
  - Measuring range extension
  - Bluetooth
- Exhaust gas probe for industrial engines, 335 mm (0600 7555)
- Thermocouple (0600 8898)
- testo easyEmission software (0554 3334)
- Transport case (0516 3510)

**Thermal imager**

- testo 872 (0560 8721)

**Gas engine set 4 thermal bundle**      **Set price: € X,XXX**  
**Order no. 0563 3504 04**

# Biogas engine set 1 Smart Probes bundle

**Biogas engine set testo 350 (0563 3505 03)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:
  - O<sub>2</sub> sensor
  - CO sensor (H<sub>2</sub>-compensated)
  - NO sensor
  - NO<sub>2</sub> sensor
  - H<sub>2</sub>S sensor
  - SO<sub>2</sub> sensor
  - Fresh air valve
  - Peltier gas preparation
  - Measuring range extension
  - Bluetooth
- Exhaust gas probe for industrial engines, 335 mm (0600 7555)
- Thermocouple (0600 8898)
- testo easyEmission software (0554 3334)
- Transport case (0516 3510)

**Testo Smart Probes**

- testo 510i (0560 1510)
- testo 605i (0560 1605)
- testo 805i (0560 1805)

**Biogas engine set 1 Smart Probes bundle** Set price: € x,xxx  
**Order no. 0563 3505 01**

# Biogas engine set 2 Electrical bundle

**Biogas engine set testo 350 (0563 3505 04)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:
  - O<sub>2</sub> sensor
  - CO sensor (H<sub>2</sub>-compensated)
  - NO sensor
  - NO<sub>2</sub> sensor
  - H<sub>2</sub>S sensor
  - SO<sub>2</sub> sensor
  - Fresh air valve
  - Peltier gas preparation
  - Measuring range extension
  - Bluetooth
- Exhaust gas probe for industrial engines, 335 mm (0600 7555)
- Thermocouple (0600 8898)
- testo easyEmission software (0554 3334)
- Transport case (0516 3510)

**Testo Smart Probes**

- testo 510i (0560 1510)
- testo 605i (0560 1605)
- testo 805i (0560 1805)

**Electrical measurement parameters**

- testo 760-2 (0590 7602)
- testo 770-3 (0590 7703)

**Biogas engine set 2 electrical bundle** Set price: € x,xxx  
**Order no. 0563 3504 02**

# Biogas engine set 3 Electrical thermal bundle

**Biogas engine set testo 350 (0563 3505 03)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:
  - O<sub>2</sub> sensor
  - CO sensor (H<sub>2</sub>-compensated)
  - NO sensor
  - NO<sub>2</sub> sensor
  - H<sub>2</sub>S sensor
  - SO<sub>2</sub> sensor
  - Fresh air valve
  - Peltier gas preparation
  - Measuring range extension
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- Exhaust gas probe for industrial engines, 335 mm (0600 7555)
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**Testo Smart Probes**

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- testo 605i (0560 1605)
- testo 805i (0560 1805)

**Electrical measurement parameters**

- testo 760-2 (0590 7602)
- testo 770-3 (0590 7703)

**Thermal imager**

- testo 872 (0560 8721)

**Biogas engine set 3 electrical thermal bundle** Set price: € X,XXX  
**Order no. 0563 3505 03**

# Biogas engine set 4 Thermal bundle

**Biogas engine set testo 350 (0563 3505 04)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:
  - O<sub>2</sub> sensor
  - CO sensor (H<sub>2</sub>-compensated)
  - NO sensor
  - NO<sub>2</sub> sensor
  - H<sub>2</sub>S sensor
  - SO<sub>2</sub> sensor
  - Fresh air valve
  - Peltier gas preparation
  - Measuring range extension
  - Bluetooth
- Exhaust gas probe for industrial engines, 335 mm (0600 7555)
- Thermocouple (0600 8898)
- testo easyEmission software (0554 3334)
- Transport case (0516 3510)

**Thermal imager**

- testo 872 (0560 8721)

**Biogas engine set 4 thermal bundle** Set price: € X,XXX  
**Order no. 0563 3505 04**

# Diesel engine set 1 Smart Probes bundle

**Diesel engine set testo 350 (0563 3506 01)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:  
- O<sub>2</sub> sensor  
- CO sensor (H<sub>2</sub>-compensated)  
- NO sensor  
- NO<sub>2</sub> sensor  
- Fresh air valve  
- Peltier gas preparation  
- Measuring range extension  
- Bluetooth
- Exhaust gas probe for industrial engines with probe shaft pre-filter, 335 mm (0600 7556)
- Thermocouple (0600 8898)
- testo easyEmission software (0554 3334)
- Transport case (0516 3510)

**Testo Smart Probes**

- testo 510i (0560 1510)
- testo 605i (0560 1605)
- testo 805i (0560 1805)

**Diesel engine set 1 Smart Probes bundle** Set price: € X,XXX  
**Order no. 0563 3506 01**

# Diesel engine set 2 Electrical bundle

**Diesel engine set testo 350 (0563 3506 02)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:  
- O<sub>2</sub> sensor  
- CO sensor (H<sub>2</sub>-compensated)  
- NO sensor  
- NO<sub>2</sub> sensor  
- Fresh air valve  
- Peltier gas preparation  
- Measuring range extension  
- Bluetooth
- Exhaust gas probe for industrial engines with probe shaft pre-filter, 335 mm (0600 7556)
- Thermocouple (0600 8898)
- testo easyEmission software (0554 3334)
- Transport case (0516 3510)

**Testo Smart Probes**

- testo 510i (0560 1510)
- testo 605i (0560 1605)
- testo 805i (0560 1805)

**Electrical measurement parameters**

- testo 760-2 (0590 7602)
- testo 770-3 (0590 7703)

**Diesel engine set 2 electrical bundle** Set price: € X,XXX  
**Order no. 0563 3506 02**

# Diesel engine set 3 Electrical thermal bundle

**Diesel engine set testo 350 (0563 3506 03)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:
  - O<sub>2</sub> sensor
  - CO sensor (H<sub>2</sub>-compensated)
  - NO sensor
  - NO<sub>2</sub> sensor
  - Fresh air valve
  - Peltier gas preparation
  - Measuring range extension
  - Bluetooth
- Exhaust gas probe for industrial engines with probe shaft pre-filter, 335 mm (0600 7556)
- Thermocouple (0600 8898)
- testo easyEmission software (0554 3334)
- Transport case (0516 3510)

**Testo Smart Probes**

- testo 510i (0560 1510)
- testo 605i (0560 1605)
- testo 805i (0560 1805)

**Electrical measurement parameters**

- testo 760-2 (0590 7602)
- testo 770-3 (0590 7703)

**Thermal imager**

- testo 872 (0560 8721)

**Diesel engine set 3 electrical thermal bundle**      Set price: € X,XXX  
**Order no. 0563 3506 03**

# Diesel engine set 4 Thermal bundle

**Diesel engine set testo 350 (0563 3506 03)**

- testo 350 control unit with Bluetooth (0632 3511)
- testo 350 analyzer box (0632 3510)  
Option:
  - O<sub>2</sub> sensor
  - CO sensor (H<sub>2</sub>-compensated)
  - NO sensor
  - NO<sub>2</sub> sensor
  - Fresh air valve
  - Peltier gas preparation
  - Measuring range extension
  - Bluetooth
- Exhaust gas probe for industrial engines with probe shaft pre-filter, 335 mm (0600 7556)
- Thermocouple (0600 8898)
- testo easyEmission software (0554 3334)
- Transport case (0516 3510)

**Thermal imager**

- testo 872 (0560 8721)

**Diesel engine set 4 thermal bundle**      Set price: € X,XXX  
**Order no. 0563 3506 04**

# Set overview

## Exhaust gas analyzer testo 350

Set components		Order no.	Sets for gas engines				Sets for biogas engines				Sets for diesel engines			
<b>Exhaust gas analyzer testo 350</b>														
testo 350 control unit		0632 3511	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Option	Bluetooth		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
testo 350 analyzer box		0632 3510	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Options	CO sensor (slot 6 – for dilution)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	NO sensor		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	NO <sub>2</sub> sensor		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Fresh air valve		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Peltier gas preparation		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Measuring range extension for single slot (factor 1 - 40)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bluetooth		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	H <sub>2</sub> S		-	-	-	-	✓	✓	✓	✓	-	-	-	-
SO <sub>2</sub>		-	-	-	-	✓	✓	✓	✓	-	-	-	-	
Probe without preliminary filter	0600 7555		✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-
Probe with preliminary filter	0600 7556		-	-	-	-	-	-	-	-	✓	✓	✓	✓
Thermocouples	0600 8898		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
easyEmission software	0554 3334		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Transport case	0516 3510		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Testo Smart Probes</b>														
testo 510i differential pressure measuring instrument	0560 1510		✓	✓	✓	-	✓	✓	✓	-	✓	✓	✓	-
testo 605i thermohygrometer	0560 1605		✓	✓	✓	-	✓	✓	✓	-	✓	✓	✓	-
testo 805i infrared thermometer	0560 1805		✓	✓	✓	-	✓	✓	✓	-	✓	✓	✓	-
<b>Measuring instruments for electrical measurement parameters</b>														
testo 760-2 digital multimeter	0590 7602		-	✓	✓	-	-	✓	✓	-	-	✓	✓	-
testo 770-3 clamp meter	0590 7703		-	✓	✓	-	-	✓	✓	-	-	✓	✓	-
<b>Thermal imager</b>														
testo 872 thermal imager	0560 8721		-	-	✓	✓	-	-	✓	✓	-	-	✓	✓
			Smart Probes bundle 0563 3504 01	Electrical bundle 0563 3504 02	Electrical thermal bundle 0563 3504 03	Thermal bundle 0563 3504 04	Smart Probes bundle 0563 3505 01	Electrical bundle 0563 3505 02	Electrical thermal bundle 0563 3505 03	Thermal bundle 0563 3505 04	Smart Probes bundle 0563 3506 01	Electrical bundle 0563 3506 02	Electrical thermal bundle 0563 3506 03	Thermal bundle 0563 3506 04

## Also available: Exhaust gas analyzer testo 340

The testo 340 is extremely robustly built and also equipped with very precise measurement technology. For highly accurate measurement results in applications without gas preparation.



Set components	Order no.	Set for gas engines	Set for diesel engines
Exhaust gas analyzer testo 340	0632 3340	✓	✓
Options	CO sensor	✓	✓
	NO sensor	✓	✓
	NO <sub>2</sub> sensor	✓	✓
	Bluetooth	✓	✓
Probe without preliminary filter	0600 7555	✓	-
Probe with preliminary filter	0600 7556	-	✓
Thermocouples	0600 8898	✓	✓
easyEmission software	0554 3334	✓	✓
Transport case	0516 3510	✓	✓

### Advantages of the exhaust gas analyzer testo 340:

- Always ready to use thanks to robust, low-maintenance technology
- Self-cleaning effect in the special hose (PTFE): condensate and dirt particles do not adhere
- Easy setting: the hose extension (up to 7.8 m) means you can see the measuring instrument display even in measuring locations which are a long way away
- No downtimes due to pre-calibrated and exchangeable gas sensors
- Measuring range extension (factor 5): unrestricted measurement of high concentrations (CO up to 50,000 ppm)
- Suitable for use with biogas and the measurement of SO<sub>2</sub> and H<sub>2</sub>S

