

Be sure. **testo**



Measure 1x - save 3x!

Save energy and emissions - and enormous costs!
Good for your business and our environment.
With emission measuring instruments from Testo.

Measure once, save three times.

How efficient is your combustion process?

With measuring instruments from Testo, the key values in the flue gas can be determined easily and quickly. On this basis, you can optimize the process to protect the environment and save threefold: **in energy, emissions and costs.**



Energy demand and global sustainability

Climate protection is a top priority, and achieving the **Paris climate targets** is already part of many companies' business strategy. At the same time, increasingly strict legal requirements apply in many countries.

However, reducing CO₂ emissions remains an enormous challenge in many areas. Where processes require high temperatures, fossil fuels will continue to be needed for the time being.

Emissions: Ecology and economy.



Carbon dioxide as the main cause of the greenhouse effect

The greenhouse effect is caused by gases in the earth's atmosphere. As is well known, the biggest role here is played by carbon dioxide (CO₂), which is produced when fossil fuels are burned.

The more heat obtained from one unit of fuel, the lower the relative CO₂ emission. The optimum operating range of a combustion plant is determined on the basis of the excess air:

the smaller, the more efficient.

Optimum combustion is usually achieved if there is sufficient excess air and therefore oxygen for the complete combustion, but at the same time there is a low ceiling on the amount of excess air, so that as little hot flue gas and therefore thermal energy as possible is lost to the atmosphere.

The optimum efficiency – your optimum cost savings.

A crucial prerequisite for **optimum efficiency** is the analysis of the flue gas with precise determination of the proportions of O_2 , CO and CO_2 . The excess air is determined from these values.

Experience shows that with one percentage point less excess air, the efficiency of a combustion plant increases by one percent.

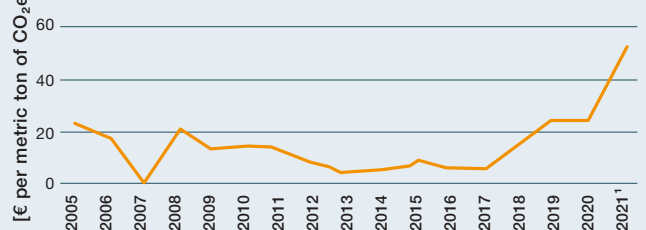


For monthly **fuel costs** of 15 million euros for a medium-sized power plant, this means **up to 150,000 euros** can be saved.

Large savings in emission rights.

In addition to the savings in monthly fuel costs, there is also a savings in the emission rights needed. These become – as a political intention – more and more expensive over time. The unit of measurement for emission rights is the metric ton of CO₂ equivalent (t CO₂e).

CO₂ emission permits:
Annual price development in EU emissions trading until 2021



Price development of CO₂ emission rights in European emissions trading (EU-ETS) from 2005 to 2021 (in euros per metric ton of CO₂ equivalent) (Source: Statista)



Savings in emission permits in a lignite-fired power plant (model calculation)

CO ₂ emissions legislation EU [€/t CO ₂ e]	Output [MW]	Operating hours per year [h]	CO ₂ emissions [t]	CO ₂ savings [%]	Cost savings [€]
53.65	100	8,000	752,038	1	403,468
53.65	500	8,000	3,760,188	1	2,017,341

Average CO₂ emissions caused by power plants, according to plant type. Source: Statista

In 2021, for example, a lignite-fired power plant with a capacity of 500 MW and annual emissions of approx. 3.8 million t CO₂ could save approx. 2 million euros with a reduction of CO₂ emissions by 1% .

Emission measurement for optimal combustion process.

Precise knowledge of the flue gas components and the excess air in the flue gas is the basis for **optimum adjustment of the combustion process.**



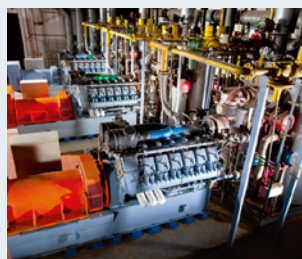
With the mobile **flue gas analyzers testo 340 and testo 350** you can determine the precise value immediately. The flexible measurement can also be used alongside stationary

measurement systems to enable a differentiated view of the flue gas values and to react quickly to special situations.

How does the measurement work?

The compact flue gas analyzers **testo 340 and testo 350** can be used at any measuring location. Equipped with suitable probes and sensors, they determine the relevant flue gas values and show them in plain text on the clear display.

Typical applications include burners, industrial engines, gas turbines, thermal processes, power plants, and steel and cement plants.



Emission analyzers: an overview.

testo 340 – flue gas analyzer for industry.

The testo 340 is the ideal handheld measuring instrument for industrial flue gas analysis. The compact design combined with reliable technology offers maximum mobility, e.g. for international servicing assignments or for commissioning and for check measurements on combustion and power generation plants.

testo 340 flue gas analyzer

testo 340 flue gas analyzer incl. rechargeable battery, calibration protocol and carrying strap, equipped with O₂ sensor and integrated flow/differential pressure measurement, individual dilution and dilution of all sensors.

Order no. 0563 3100



testo 350 – emission measurement for the highest demands.

Ideal for professional flue gas analysis and industrial emission measurement: The testo 350 flue gas analyzer performs a variety of measuring and analysis tasks, is impressive over the long term thanks to its heavy-duty industrial design and is also suitable for complex data acquisition.

testo 350 Control Unit

The testo 350 Control Unit displays the measurement data and controls the analyzer box. Incl. rechargeable battery, measurement data memory, USB interface and connection for Testo data bus.

Order no. 0632 3511



testo 350 analyzer box

testo 350 analyzer box, equipped with O₂, including differential pressure sensor, temperature probe input Type K NiCr-Ni and Type S, Pt10Rh-Pt, Testo data bus connection, rechargeable battery, integrated combustion air probe (NTC), trigger input, measurement data memory, USB interface Upgradable to max. 6 gas sensors from the selection of CO, CO_{low}, NO, NO_{low}, NO₂, SO₂, CO₂ NDIR, C_xH_y, H₂S.

Order no. 0632 3510



Save NOW!

Measure once, save three times!

With process optimization based on flue gas analysis, you reduce energy consumption, emissions and costs. A one-time investment for lasting savings. Ask our experts today about the optimum configuration **for your process!**



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