

# Waste

Broad range of solutions for  
waste-to-energy plants

Waste-to-energy plants



# Tasks in the waste industry

The objective of the recycling economy is limiting the dumping of waste in landfills to a minimum as well as a strong push for recycling. Sorting, recycling of waste and recovery of energy from waste are growing in importance. Endress+Hauser offers ideal automation and safety solutions for collection, sorting and recycling of waste. Emissions are also subject to strict requirements, e.g. the Industrial Emissions Directive (IED) 2010/75 / EU for waste incineration plants and the newly-revised BREF for waste incineration. Analyzer systems are used for incineration optimization, flue gas purification and the continuous monitoring of emissions. We offer complete measurement technology and data evaluation from a single source.



## Emission monitoring



The regulatory requirements for emission monitoring and reporting are becoming more stringent in nearly every country in the world. Our analyzers and system solutions monitor and check emission limit values, contaminant emissions and the release of other substances into the environment.

## Flue gas treatment



Scrubbers, catalytic reactors and particulate filters all remove gaseous pollutants from the flue gas. Process gas analyzers provide real-time measurement to optimize removal efficiency. This leads to significant savings of material and to less maintenance for plant operators.

## Plant safety



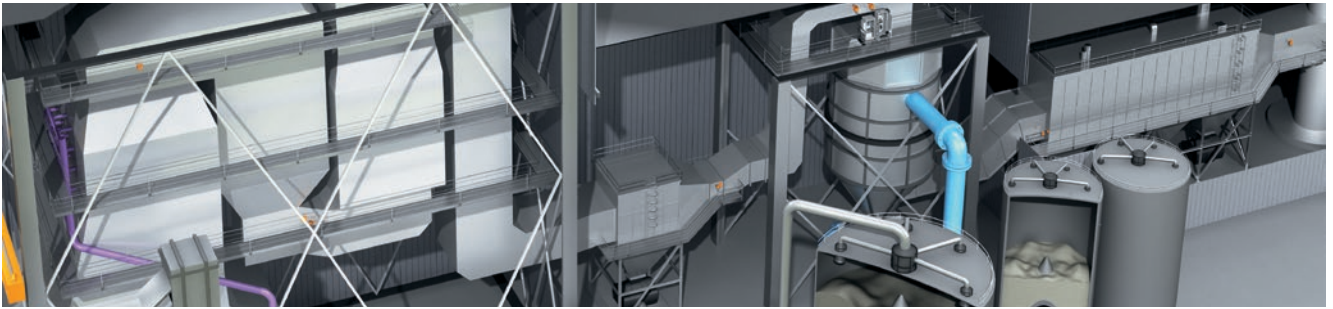
Gas analyzers, dust monitors and level sensors ensure plant operation and safety. They monitor e.g. biomass bunker. Our sensors monitor electrostatic precipitators, bag filters and control the stock of necessary reagents.

## Service



Competent consulting, qualified planning support, detailed project planning and engineering, installation and start-up – Endress+Hauser provides all of these services by its own personnel and also provides service support of equipment.

# Optimize incineration, purificate exhaust gas



## Monitoring incineration efficiency (O<sub>2</sub>)



The ZIRKOR200 in-situ gas analyzer is used to measure O<sub>2</sub>. It quickly, reliably, and continuously measures the oxygen concentration during incineration. This allows optimal regulation of oxygenation from primary and secondary air, achieving permanent monitoring for the purposes of combustion optimization.

### ZIRKOR200 in-situ gas analyzer



[www.endress.com/zirkor200](http://www.endress.com/zirkor200)

## Operation of a SNCR or SCR denitrification system



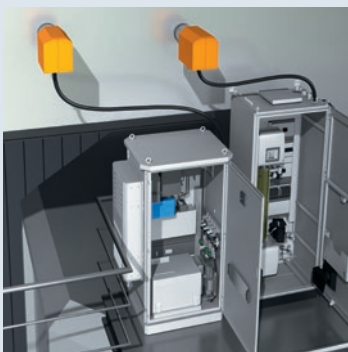
For gas purification through selective non-catalytic reduction, NH<sub>3</sub> or an aqueous urea solution is directly injected behind the combustion chamber at a temperature of 900 °C to 1,100 °C (1,650 °F to 2,000 °F). This causes the NO<sub>2</sub> to react with the ammonium compounds and turn into nitrogen and water. This reduces NO<sub>x</sub> emissions. At the combustion chamber outlet, the GM32 measures NO, and the GM700 measures NH<sub>3</sub> slip. At low NO and CO concentrations, the MCS200HW can also be used for this process application.

### GM32 and GM700 in-situ gas analyzers or MCS200HW extractive analyzer



[www.endress.com/gm32](http://www.endress.com/gm32)  
[www.endress.com/gm700](http://www.endress.com/gm700)  
[www.endress.com/mcs200hw](http://www.endress.com/mcs200hw)

## Process measurement at flue gas scrubber inlets



In the flue gas scrubber, among others, HCl and SO<sub>2</sub> are reduced with reagents. Activated carbon is added for mercury removal. The MCS300P HW simultaneously measures the SO<sub>2</sub>, HCl, H<sub>2</sub>O, and optionally O<sub>2</sub>. Using the Zeeman measuring principle, MERCEM300Z measures Hg without cross sensitivity, even at high SO<sub>2</sub> concentrations, stable and with low-maintenance effort. Countermeasures can be taken in a short time to reduce Hg peaks (>3,000 µg/m<sup>3</sup>). These measurements considerably contribute to lower the operating costs of the reagents.

### MERCEM300Z, MCS200HW extractive gas analyzer



[www.endress.com/mercem300z](http://www.endress.com/mercem300z)  
[www.endress.com/mcs200hw](http://www.endress.com/mcs200hw)

# Continuous emission monitoring



## Monitoring of dust emissions



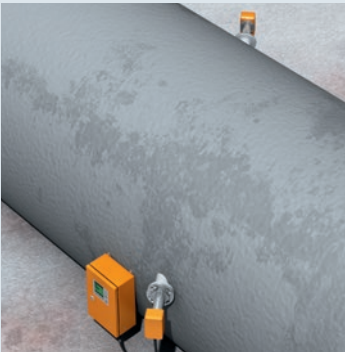
Dust can be measured extractively in the case of moist exhaust gases, or continuously in-situ under dry stack conditions. We have a fitting solution for both applications. For the standard application with dry flue gas (above the acid dew point), a DUSTHUNTER SB (scattered light measuring principle) is best suited. In the case of wet flue gas (under the acid dew point), the FWE200DH is used. Here, the gas to be measured is removed as a bypass from the stack, heated to above the acid dew point, and continuously measured.

## DUSTHUNTER SB100, SP100 and FWE200DH dust measuring devices



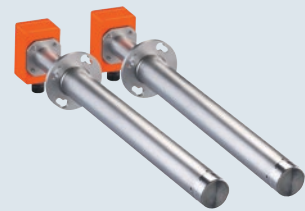
[www.endress.com/dusthunter-sb100](http://www.endress.com/dusthunter-sb100)  
[www.endress.com/dusthunter-sp100](http://www.endress.com/dusthunter-sp100)  
[www.endress.com/fwe200dh](http://www.endress.com/fwe200dh)

## Gas flow measurement in the stack



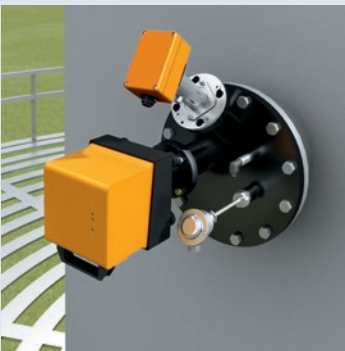
The FLOWSIC100 volume flow measuring device continuously measures gas flow in the stack with no contact needed. The device requires minimal maintenance due to the ultrasonic technology used. Ultrasonic measurements are particularly reliable because the volume flow is measured over the entire stack cross-section. High quality of measurement is key, as pollutant concentrations are given in relation to the volume of flue gas measured and are indicated in kg/h. This is a legal requirement under the applicable EU standard (IED 2010/75/EC).

## FLOWSIC100 volume flow measuring device



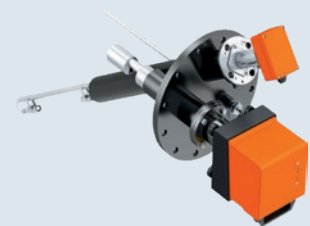
[www.endress.com/flowsic100](http://www.endress.com/flowsic100)

## Space-saving solution for measuring dust, flow, pressure, and temperature



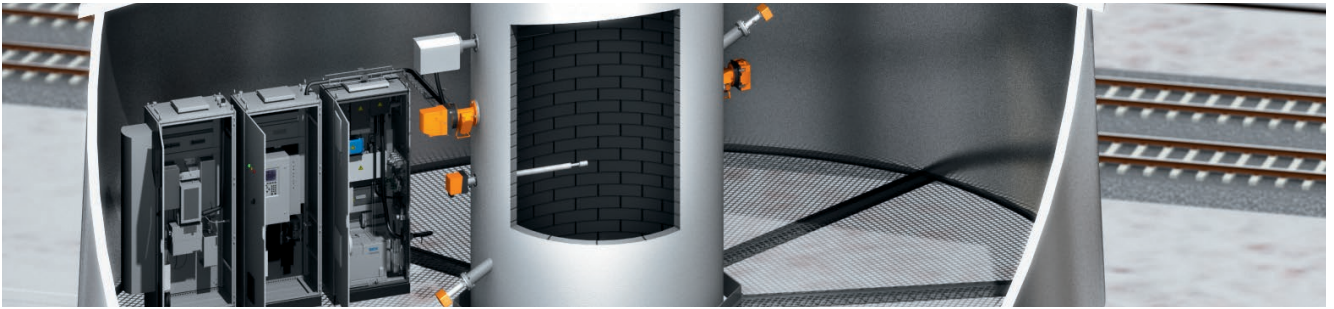
With the CP100 combined probe, dust, flow, pressure, and temperature can be measured in the stack with minimal usage of space. This solution involves installing a DUSTHUNTER SP100 (scattered light principle), a FLOWSIC100 PR (ultrasonic measuring principle), and a PT100 temperature sensor and pressure sensor on a combination flange (DN250 PN6). This renders additional couplings or flanges unnecessary. This space-saving solution especially proves its worth where redundant design of the measuring devices is required.

## Combiprobe CP100 CEMS solution



[www.endress.com/combiprobe-cp100](http://www.endress.com/combiprobe-cp100)

# Continuous emission monitoring



## Continuous emissions monitoring of all pollutant components in exhaust gases



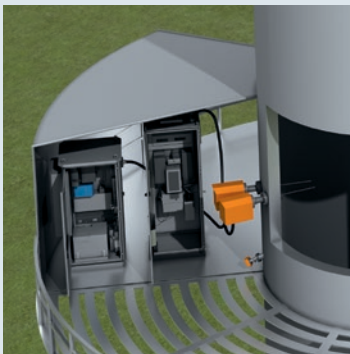
The MCS100FT can continuously measure the following components using one single extractive heated gas sample: HCl, CO, NO<sub>x</sub> as the sum of NO and NO<sub>2</sub>, SO<sub>2</sub>, NH<sub>3</sub>, O<sub>2</sub>, H<sub>2</sub>O, CO<sub>2</sub>, C<sub>ges</sub>, and HF. For normalization, pressure and temperature parameters are also measured. The QAL3 test can be carried out without test gas with the certified, integrated filter.

### MCS100FT multi-component CEMS solutions



[www.endress.com/mcs100ft](http://www.endress.com/mcs100ft)

## Monitoring mercury in emissions



The MERCEM300Z extractive gas analyzer has one of the smallest certified measuring range of all measuring systems suitability tested in accordance with EN 15267-3, with a range from 0 to 10 µg/m<sup>3</sup> total mercury content. It is also suitable for continuously monitoring the annual threshold of 10 µg/m<sup>3</sup>. The greatest advantage of the MERCEM300Z is that it transforms oxidized mercury into elemental mercury without the addition of chemicals or converters, which significantly reduces the amount of maintenance required in comparison to all other measuring systems.

### MERCEM300Z extractive gas analyzer



[www.endress.com/mercem300z](http://www.endress.com/mercem300z)

## Emissions data management



The MEAC300 emissions data management is ideal for recording, saving, normalizing, evaluating, displaying, and forwarding a continuous flow of data. It is available in several variants, which perform reporting according to the applicable local legislation. MEAC300 is TÜV-tested and certified, and provides data analysis that takes into account QAL3 data on drift control, amongst other elements and also provides solutions involving MEAC for redundant operation. For digital data transfer to the control system, all standard data transmission protocols are available.

### MEAC300 emissions data management system



[www.endress.com/meac300](http://www.endress.com/meac300)

# From a single device to a complete analyzer system

Our capabilities do not end with the sale of a single product. We employ an extensive team of custom system planning and project engineers as well as detail engineers with expertise in electrical and mechanical engineering. The system engineers plan

and design tailored solutions from Endress+Hauser including the complete range of peripheral equipment such as walk-in shelters, PLC connections, calibration gas distribution and data handling and evaluation. All solutions are designed and built in

accordance with recognized international standards. An experienced project manager follows the project from initial order through to site acceptance test and hand over to local field service specialists.



Analyzers and measurement systems supply monitoring and control-relevant information and protect people and systems. When optimally integrated and maintained, these

components and systems guarantee safe processes, constant product quality and protect people and the environment. From the outset and over many years, our services provide

suitable services for all aspects of your measurement systems and plants: from planning and conception to commissioning and ongoing operations, all the way to conversions and upgrades.



[www.addresses.endress.com](http://www.addresses.endress.com)

---

50 8030416 / EHS / EN / 01.00