

### Axetris' laser gas detection module LGD F200 provides affordable H<sub>2</sub>O measurement

## Increased CEMS Reliability with Direct Measurement of H<sub>2</sub>O

**Axetris' laser gas detection module LGD F200 provides an affordable solution for continuous H<sub>2</sub>O measurement.**

Pollutant gases such as SO<sub>2</sub>, NO, CO, HF, HCl and dust are products of combustion that are regulated by national environmental protection agencies.

Continuous Emission Monitoring Systems (CEMS) are used to permanently measure pollutants. All gases have to be corrected and reported at standard conditions defined as 0°C, atmospheric pressure 1013 mbar, and dry gas. In order to have the concentration values at standard conditions, pressure, temperature and moisture measurements are required. The presence of humidity in a gas stream takes up space that would otherwise be occupied by pollutant. Therefore, the pollutant concentration expressed on a dry gas basis is higher compared to the value expressed on a wet gas basis.

All emission measurements must be reported on dry gas basis. Axetris Laser Gas Detection modules are able to measure H<sub>2</sub>O and H<sub>2</sub>O combined with NH<sub>3</sub> or HCl simultaneously, thus helping to reduce equipment costs and increase long-term measurement reliability.

When the H<sub>2</sub>O value is calculated instead of measured, the following types of oxygen analysers are necessary for the measurement:

- O<sub>2</sub> Wet – Measure with in-situ zirconium oxide analysers
- O<sub>2</sub> Dry – Measure with extractive paramagnetic analysers or electrochemical cells

Emissions of stack gases are usually expressed on a dry gas basis so that variation in the moisture of stack gas does not affect the assessment of the emissions.

To convert concentration values from wet gas to dry gas the following formula is used:

$$\text{Dry gas concentration} = \text{Wet gas concentration} \times \frac{100}{(100 - \text{H}_2\text{O}\%)}$$

Compared to the computational method based on O<sub>2</sub> wet and dry, the direct moisture measurement involves less complexity on equipment level leading to increased reliability over time.



Site installation with CEM system

Axetris AG is a designer and OEM manufacturer of Laser Gas Detection (LGD) solutions based on Tunable Diode Laser Spectroscopy (TDLS). The TDLS technology provides a valid, cost effective solution to many challenges in environmental gas monitoring and process control applications involving the measurement of gases such as NH<sub>3</sub>, HCl, H<sub>2</sub>O, CH<sub>4</sub>, CO<sub>2</sub>.

### Advantages of Axetris' TDLS Technology

- ✓ Precise optical, contactless measurements
- ✓ Excellent target gas selectivity
- ✓ Sub ppm-level detectivity
- ✓ Low cost of ownership
- ✓ High stability and reliability in the field

The modules are designed for integration by Original Equipment Manufacturers (OEMs), operating in the field of gas detection and monitoring in diverse industries. The LGD F200 series is based on a nearinfrared absorption measurement of the target gas. The systems are selfcontained, ready-to-use OEM modules, using a flow-through cell set-up for extractive measurements. The LGD F200 hot version comes with a cell heated up to 220°C for hot gas measurements in

process control and environmental compliance related applications. The LGD F200 module comes with proprietary digital signal processing, providing reliable measurements data through an analog and digital data interface.

Key features of the Axetris LGD F200:

- Made for easy integration by OEMs
- Fast response
- Self-contained
- Continuous sensor status monitoring
- Low maintenance
- 10-30V DC power supply
- Digital and analog data interfaces
- Hot-gas measurement up to 220°C

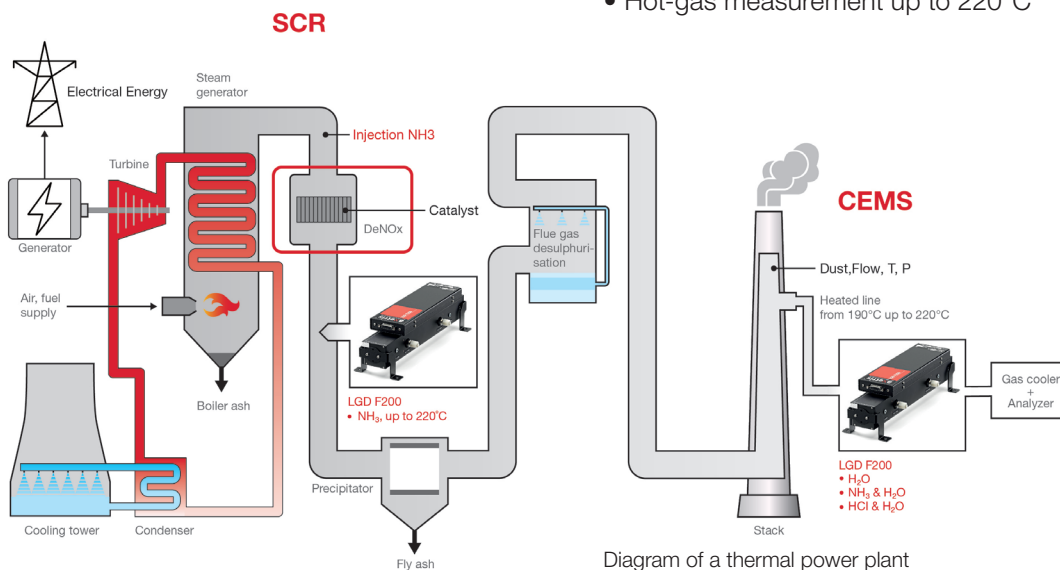


Diagram of a thermal power plant

### About Axetris OEM Gas Sensing Solutions

Laser Gas Detection (LGD), based on Tunable Diode Laser Spectroscopy (TDLS), provides a solution to many gas analysis challenges in emission monitoring and process control. The technology offers unique advantages like precise optical, contactless measurements, excellent target gas selectivity and sub ppm-level detectivity.

Axetris supports their OEM customers with in-depth technology and application expertise from feasibilities until product launch. The Axetris team collaborates with their customers in finding the right product design which best suits their needs in terms performance and costs. As an OEM partner, Axetris assists with setting-up the infrastructure and with technical training.



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