Company of the Leister Group

Application Note LGD

Selective Catalytic Reduction (SCR) / De-Nox

SCR process control using Axetris LGD F200

Reducing NOx emissions for a cleaner environment

Selective Catalytic Reduction (SCR) is one of the most popular processes today to reduce the emission of nitrogen oxides (NOx) from combustion sources, such as power plants, stationary power stations, ship engines or even automobiles. Axetris LGD F200 OEM Modules for ammonia (NH_3) detection are being successfully used today to control and test the process of urea injection for NOx reduction.

Reduction of NOx emissions as a major environmental goal

Nitrogen Oxides are a family of poisonous, highly reactive gases. These gases form when fuel is burned at high temperatures. All major international environmental agencies, e.g. US-EPA, EEA, MEP-China, etc. strictly dictate NOx emission limits today.

One of the most popular techniques to reduce NOx emissions is reduction of NOx using urea (effectively NH_3), whereby NOx is reduced to nitrogen and water. The reduction often taken place with the aid of a catalyst (Selective Catalytic Reduction – SCR), but at times, a non-catalytic process (Selective Non-Catalytic Reduction – SNCR).

Ammonia measurement, both for controlling urea injection, as well as for checking for leftover ammonia (so called “Ammonia Slip”) offers many advantages such as tighter process control, longer catalyst lifetime, and lower environmental impact from ammonia slip.

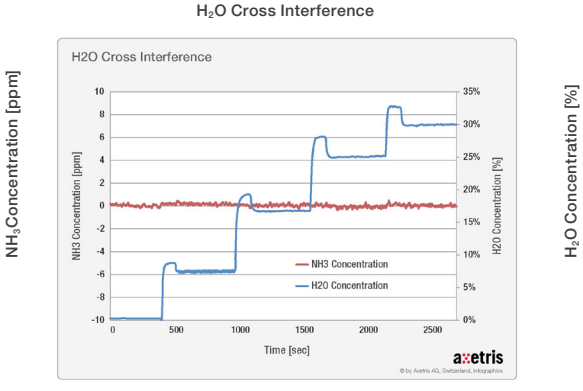
Challenging Measurement Conditions

A number of challenges confront designers of efficient SCR systems, some of which are:

- Complex Gas Matrix
- Corrosive and dust-laden environment
- Need for quick response times
- Ammonium Bisulphate (ABS) formation in high-sulphur environments

Axetris LGD F200 Advantages:

- ✓ Hot-wet (190°C / 374°F) extractive measurement
- ✓ Low ppm level ammonia detection
- ✓ Quick response time; T90 < 5s
- ✓ Intelligent system with status and alarm output for easy field servicing

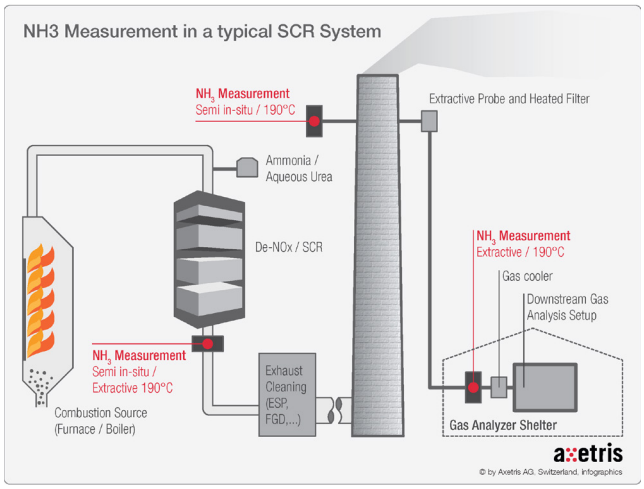


The LGD F200 delivers key advantages for low ppm level ammonia detection, while being highly selective (Graph: No cross-sensitivity with H_2O)

Reliable ammonia measurement with LGD F200

The LGD F200-NH_3 is based on Tunable Diode Laser Spectroscopy (TDLS), and is designed for a hot-wet (typically at 190°C) measurement. The technology combines a precise, contact-less optical measurement with high target gas selectivity over a large measuring range. The LGD F200 delivers a reliable and continuous measurement of NH_3, with reaction times (T90) of less than five seconds.

The LGD F200 is a standalone extractive solution, and can be integrated into ammonia analyzer solutions in a wide variety of ways. The measurement can take place close to the gas stream by drawing a sample ("near in-situ"), or through extraction of a heated sample to a common gas analyzer shelter.



The LGD F200-NH_3 can be integrated into gas analyzer solutions in an extractive or "near insitu" setup.

Laser Gas Detection Modules for OEM Integration

Axetris' Laser Gas Detection (LGD) modules are self-contained, ready-to-use devices for the measurement of gases such as NH_3, HCl, CH_4, CO_2, (H_2O). The modules are designed for integration by OEMs, active in the field of gas detection and monitoring in diverse industries.

The high sensitivity and the large dynamic range of the TDLS detection technology enables measurement from sub-ppm level to high percentage concentration without physical adaptation of the device. The design of the LGD F200 enables a tailor-made application fit for a wide range of gases and applications, including process control, environmental compliance research and medical.

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