Prevent ammonia slip and gain greater efficiencies in your plant's NO_x reduction system with Quantum Cascade Laser analyzers

Background

Nitrogen oxides (NO_x) result from the combustion process in turbines, crackers, combustion engines, boilers, and other locations within a plant. As a powerful pollutant, it is important to control and contain NO_x emissions. Both Selective catalytic/non-catalytic reduction (SCR and SNCR) are techniques used worldwide to remove NO_x. However, this process can result in a byproduct of unreacted ammonia or ammonia slip. Continuous measurement and monitoring of ammonia slip can be a challenge to ensure sample integrity is maintained, especially in high dust, high-temperature applications.

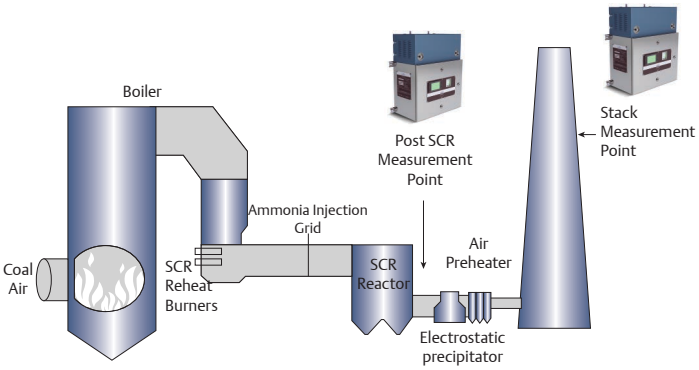
What's your challenge?

To adhere to environmental guidelines, operators must balance using the precise amount of ammonia – not enough results in waste, too much can lead to emissions.

What's your opportunity?

Capable, fast Rosemount QCL/TDL technology delivers the needed measurement precision (0–100 ppm) to ensure production is at its optimum and avoid overdosing issues that result in both economic and environmental problems and cost.

Figure 1 – Typical NO_x Reduction Process



QCL Benefits for NO_x Reduction and Ammonia Slip Detection

Rosemount Quantum Cascade Lasers monitor ammonia slip to avoid the formation of damaging ammonia salts downstream or emission of ammonium chloride or gaseous ammonia, and the regulator fines and penalties that result.

- Interference-free monitoring of the presence of ammonia slip in the toughest environments
- Thousands of measurements per second are recorded using patented laser chirp technique ensures identification of even trace levels of ammonia
- Ammonia slip detection and insight into the efficiency of the plant's NO_x reduction system resulting from real-time measurement and analysis
- Rugged, modular design delivers outstanding reliability and measurement stability in extreme operations
- Monitor up to twelve critical component gases for all industrial applications, toxic gas detection, and plant-wide emissions monitoring
- No consumables, no calibration, and no in-field enclosure or shelters reduce cost and simplify maintenance and upgrades

Table 1 – Typical Measurement Ranges

	Measurement Range		
Component	Range	LOD	Repeatability*
NO	0–200 ppm	0.2	±1 %
NO_2	0–100 ppm	0.05	± 1 %
N_2O	0–200 ppm	0.2	±1 %
NH_2	0–100 ppm	0.1	± 1 %

*Repeatability is ±1 % of reading or the Limit of Detection (LOD), whichever is greater.

Recommended Technology

Rosemount™ CT5100 Continuous Gas Analyzer

- The first Quantum Cascade Laser specifically developed for process gas analysis and emissions monitoring
- Designed for up to six lasers
- Multi-component and simultaneous measurement
- Purged and pressurized enclosure suitable for hazardous areas

Rosemount™ CT5400 Continuous Gas Analyzer

- QCL/TDL gas analyzer purpose built for process analytics
- 19" rack enclosure for incorporation into existing infrastructure
- Able to measure up to twelve gases with modular configuration for up to six lasers
- Embedded ARM processor
- Most powerful analyzer available

Features & Benefits

Emerson's advanced Rosemount analyzers incorporate both Quantum Cascade Laser (QCL) and Tunable Diode Laser (TDL) technology to deliver the most sophisticated industrial gas sensing, analysis, and emission monitoring solution.

Features	Benefits
First hybrid QCL and TDL analyzer	Realize true savings from a more powerful device that gives greater process insight and analysis.
Multiple component measurement in a single device	Detect, analyze, and monitor up to twelve different gases and eliminate the need for multiple analyzers and sample handling systems.
Simple field service and upgrades	Simplify installation, commissioning, upgrades, and any required maintenance with intuitive user interface and all solid-state components.
Fully autonomous operation	Improve uptime with embedded ARM processor, rugged design for extreme environments, and 374 °F (190 °C) maximum sample cell operating temperature.
No consumables	Avoid expense and hassle of high amounts of gas consumables in daily operation.
No costly shelters or enclosures	Lower installation costs with in-the-field wall mount or rack mount configurations.
Calibrations seldom required	Reduce the need for validation/calibration frequency with Inherent calibration stability.

EmersonProcess.com/GasAnalysis

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