

Achieve unmatched sensitivity and real-time measurement performance of your hydrogen and nitrogen impurities with Quantum Cascade Laser analyzers

Background

Assuring hydrogen and nitrogen gas purity is critical across multiple processing industries and applications. For several key processes, the purity of the gas must be precisely monitored and controlled to ensure the product is within specification and avoid damage to equipment or process line. The purity of these gases also plays an important role in controlling reactions and reactor performance, avoiding contaminating valuable catalysts, and ensuring the efficiency of the synthesis process and resulting product quality.

What's your challenge?

The success and profitability of many gas processing industries and applications relies on the accurate and reliable detection and removal of gas impurities in each stage of the reaction process.

What's your opportunity?

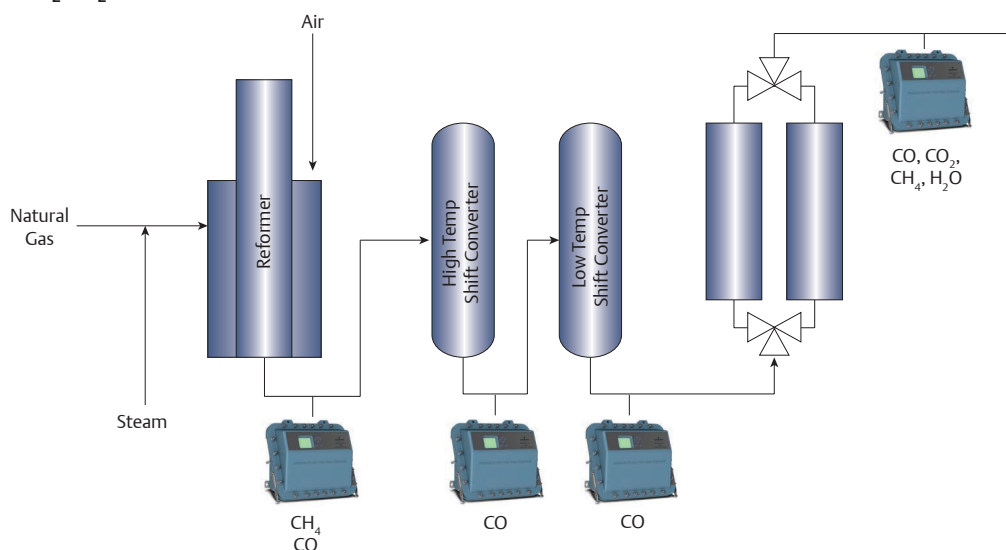
Rosemount QCL/TDL technology delivers extremely fast and highly accurate measurement identification and analysis of gas impurities in a single analyzer instrument.

QCL Benefits for Hydrogen / Nitrogen Purity

The use of high-purity hydrogen and nitrogen gases is vital to avoid equipment plugging and resulting damage, ensure proper catalyst integrity and reactions, and achieve improved process performance. Rosemount QCL/TDL lasers deliver real-time monitoring performance using a single analyzer device for increased process efficiency and minimized cost.

- Multiple QCL/TDL lasers in a single analyzer for ultrafast detection and analysis of CO, CO₂, and NH₃, Methane, and moisture
- Analysis time of <1 second delivers critical purity monitoring and identification performance
- Unmatched sensitivity and real-time measurement detect a variety of components and impurities, even in complex mixtures
- Patented laser chirp technique analyses natural gas continuously down to sub ppm concentrations, to provide sub-second measurements
- No consumables, no calibration, and no in-field enclosure or shelters reduce cost and simplify maintenance and upgrades
- Easy-to-install instrumentation and fast technician training

Figure 1 - Typical H₂ / N₂ Purity Process



Recommended Technology

Rosemount™ CT5800 Continuous Gas Analyzer

A unique cell design enables the CT5800 to deliver highly accurate measurement of very low concentrations of impurities in gas streams. The device can have up to six Quantum Cascade Lasers to measure multiple components simultaneously in a single analyzer. In addition to ethylene applications, it is also ideal for nitrogen and hydrogen purity applications. The CT5800 is designed for hazardous areas with a flameproof enclosure.



Table 1 – Typical Measurement Ranges

Component	Measurement Range		
	Range	LOD	Repeatability*
CO	0–5 ppm	0.05	±1 %
CO ₂	0–5 ppm	0.02	±1 %
H ₂ O	0–10 ppm	0.1	±1 %
CH ₄	0–50 ppm	0.5	±1 %
NH ₃	0–10 ppm	0.05	±1 %

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

Features & Benefits


Multi-component QCL analyzer

- Measure up to 12 components simultaneously
- Accurate and sensitive gas measurements
- Excellent linearity of response and repeatability
- Auto validates analyzer performance to insure control performance without field maintenance intervention
- Low maintenance and low lifetime costs
- Continuous health diagnostic reporting
- Embedded ARM processor for fully autonomous operation
- Intuitive, simple front panel user interface allows access to all instrument functions

Field serviceable and field configurable

- Interchangeable modular configuration for up to six lasers

EmersonProcess.com/GasAnalysis

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Emerson Process Management

Cascade Technologies
Glendevon House
Castle Business Park
Stirling, FK9 4TZ
Scotland
T + 44 1786 447 721
F + 44 1786 475 822
QCL.CSC@Emerson.com

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