Ammonia (NH_3) Gas Concentration Analyzer

PICARRO

- Fast, continuous, real-time measurements
- Long-term stability for infrequent calibration
- Water measurement and correction for NH_3 dry-basis mole fraction reports
- Small footprint, field or lab deployable with no consumables required
- Fast and easy installation for immediate opperation

The **Picarro G2103 gas concentration analyzer** delivers ultra-precise and stable measurements of ammonia gas. The analyzer also features ultra-high sensitivity with a parts-per-trillion (ppt) low-detection limit. And drift is equally impressive at ±0.5 parts-per-billion (ppb) over a full month of continuous operation. This combination adds up to long-term, continuous measurement of ammonia gas with infrequent calibration.

The G2103 analyzer incorporates coated components in the critical gas pathway. This reduces the propensity of NH_3 molecules to adhere to pathway surfaces, which improves measurement response time. The analyzer is an ideal solution for sensitive trace and ambient ammonia research and monitoring applications, such as livestock emissions on farms and formation of particle matters from ammonia in urban areas.

In addition, the G2103 analyzer measures and corrects for H_2O concentration, which enables NH_3 to be reported in dry-basis mole fractions. The analyzer features a small footprint, rugged construction, and relatively lightweight for easy transport from site to site, whether a laboratory or in the field. The analyzer can be unpacked, installed, and placed in operation within minutes. And the analyzer can operate unattended and without calibration for months.

Patented Picarro cavity ring-down spectroscopy (CRDS) technology enables an effective measurement path length of up to 20 kilometers in a compact cavity, which results in exceptional precision and sensitivity in a small-footprint analyzer. A meticulously designed small optical cavity incorporates precise temperature and pressure control. As a result, the analyzer delivers a best-in-class combination of precision, accuracy, low drift, and ease-of-use.

Ammonia Analyzer ppt Sensitivity

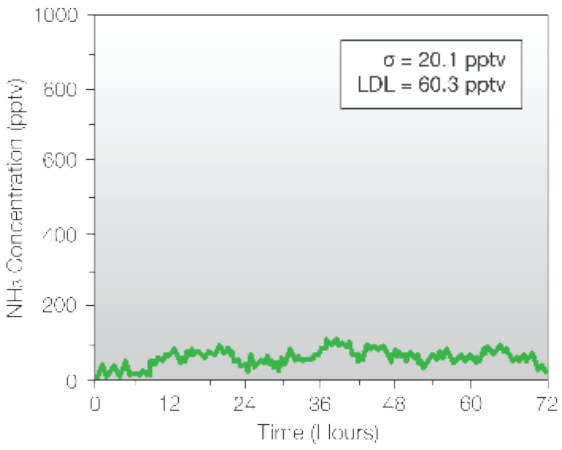

Figure 1. Typical noise zero drift of the G2103 analyzer over 72 hours. Changes of 0.1 ppbv would be clearly visible on this baseline. Ammonia-free air was plumbed into the instrument for these measurements.

G2103 Performance Specifications	
Specifications	**NH_3 (in air-like matrix)**
Lower Detection Limit (3σ, 300 sec)	<0.09 ppb
Zero Drift (72 hrs/1 month) *(peak-to-peak, 50-minute average)*	±0.15/±0.5 ppb
Precision (1σ, 1 sec) **Precision** (1σ, 10 sec) **Precision** (1σ, 300 sec)	0.5 ppb + 0.1% of reading 0.17 ppb + 0.1% of reading 0.03 ppb + 0.1% of reading
Measurement Interval	1 sec over guaranteed range
Accuracy	±(5% of reading + 0.5 ppb)
Response Time	Fall time 90–10% : <2 min for 20 ppb NH_3 challenge Rise time 10–90% : <2 min for 20 ppb NH_3 challenge
Measurement Range	Guaranteed range 0–500 ppb Operational range 0–10 ppm Optional expanded range 0–50 ppm

G2103 System Specifications	
Measurement Technique	Cavity Ring-Down Spectroscopy (CRDS)
Measurement Cell Temperature Control	±0.005°C
Measurement Cell Pressure Control	±0.0002 atm
Sample Temperature	-10 to 45°C
Sample Flow Rate	>1.5 slm at 760 Torr
Sample Pressure	600 to 900 Torr (80 to 120 kPa)
Sample Humidity	<99% R.H. non-condensing @40°C, no drying required
Ambient Temperature Range	10 to 35°C (operating); -10 to 50°C (storage)
Ambient Humidity	<99% R.H. non-condensing
Other Gases Measured	H_2O, CO_2
Accessories	Pump (external, included), keyboard (included), mouse (included), LCD monitor (optional)
Outputs	RS–232, Ethernet, USB, analog (optional) 0–10 V
Fittings	¼” Swagelok® PFA fittings
Dimensions	Analyzer: 17” w x 7” h x 17.5” d (43.2 x 17.9 x 44.6 cm), not including 0.5” feet External Pump: 7.5” w x 4” h x 11” d (19 x 10.2 x 28 cm)
Installation	Benchtop or 19” rack mount chassis
Weight	59.3 lbs (26.9 kg) including pump
Power Requirements	100–240 VAC, 47–63 Hz (auto-sensing), <260 W start-up (total): 110 W (analyzer), 80 W (pump) at steady state

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3105 Patrick Henry Drive, Santa Clara, CA 95054 | 408-962-3900 | sales@picarro.com | picarro.com