N_2O, CH_4 and H_2O Gas Concentration Analyzer

PICARRO

- Parts-per-billion precision of N_2O and CH_4 at ambient concentrations and beyond
- Integrates easily with chamber systems
- Operates with closed or open loop systems
- Automatically calculates and reports dry mole fraction
- Detects and flags data with potential interferences

The **Picarro G2308 gas concentration analyzer** radically simplifies soil flux studies by simultaneously measuring three important greenhouse gases—N_2O, CH_4 and H_2O—for soil emissions. Greenhouse gas exchange between soil and the atmosphere is a critical step in the global nitrogen and carbon cycles.

The G2308 easily integrates with soil chambers, in a closed or open loop configuration. There is no need to assemble and synchronize separate gas analyzers to observe the behavior of all the major greenhouse gases. The analyzer employs precise cavity ring-down spectroscopy (CRDS) technology to simultaneously measure in situ gas concentrations in real-time to parts-per-billion (ppb) sensitivity with negligible drift.

The G2308 features Picarro's unique software algorithms for automatic water correction. Water (H_2O) vapor is measured at parts-per-million (ppm) precision to correct and report N_2O and CH_4 concentrations in dry mole fraction.

G2308 Performance Specifications in Air			
Specification	N_2O	CH_4	H_2O
Precision Raw (1σ)	<25 ppb +0.05% of reading	<10 ppb +0.05% of reading	<500 ppm
Precision 1 min (1σ)	<10 ppb +0.05% of reading	<7 ppb +0.05% of reading	<250 ppm
Precision 5 min (1σ)	<3.5 ppb +0.008% of reading	<3 ppb +0.02% of reading	<100 ppm
Guaranteed Spec Range	0.3–200 ppm	1–15 ppm	0–3 %
Operating Range	0–400 ppm	0–20 ppm	0–7 %
Measurement Rate	<6 seconds	<10 seconds	<8 seconds
Typical Gas Response	<10 seconds	<10 seconds	-

Analyzer specificity: Picarro's CRDS technology utilizes extremely narrow spectral regions, which greatly reduces the likelihood of interference from other gas species when compared to other spectral measurement techniques. However, in real-world samples, interferences can happen. Picarro has included interference detection software and has tested and characterized the effects of the following species for this analyzer:

G2308 Trace Gases	N_2O Sensitivity
Carbon Dioxide	None - Automated correction good to 20,000 ppm CO_2
Methane	None - Automated correction good to 200 ppm CH_4
Ammonia	None - Automated correction good to 2 ppm NH_3
Ethane	0.2 ppb N_2O/ppm C_2H_6 tested up to 120 ppm
Ethylene	0.5 ppb N_2O/ppm C_2H_4 tested up to 16 ppm
Acetylene	Not for use with acetylene experiments
Background Gas	Designed for use in ambient air, not for use with highly varying or enriched N_2, O_2, H_2, or He
ChemDetect™ Software	Unique Picarro algorithms detect and flag data which may be inaccurate due to spectroscopic interference

G2308 System Operation Parameters	Specifications
Ambient Temperature	10–35°C
Ambient Humidity	<99% RH, non-condensing
Sample Pressure	300 to 1,000 Torr (40 to 133 kPa)
Sample Flow Rate	~230 sccm
Sample Humidity	<99% RH, non-condensing, Water correction tested to 25°C dew point
Sample Temperature	-10–45°C
Cavity Temperature Control	+/-0.005°C
Cavity Pressure Control	+/-0.0002 atm
Closed-loop/Recirculation Capability	Compatible with Picarro Closed System Pump A0702
Inlet Fittings	¼" Swagelok®
Dimensions	17" w x 7" h x 17.5" d (43.2 x 17.8 x 44.6 cm) not including 0.5" feet
Weight	50 lbs (22.6 kg)
Power	100–240 VAC, 47–63 Hz (auto-sensing), <260 W start-up; 110 W at steady state
Installation	Benchtop (standard) or 19" rack mount chassis (optional)
Accessories	Included: Keyboard, mouse. Optional: LCD monitor. Excluded: Vacuum pump
Options	A0702, Picarro Closed System Pump S0528, O_2 sensor for O_2 measurements and correction in varying O_2 environments S0517, Extended CH_4 operating range up to 800 ppm

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