

# N<sub>2</sub>O and CO Atmospheric Concentration Trace Gas Analyzer

# PICARRO



- Simultaneously measure N<sub>2</sub>O and CO gas concentrations down to 20 ppt precision
- Excellent long term stability and low drift
- Measure H<sub>2</sub>O vapor and report dry mole fractions
- Outstanding pressure and temperature stability
- Meet the requirements of WMO GHG compatibility goals and ICOS atmospheric stations specifications

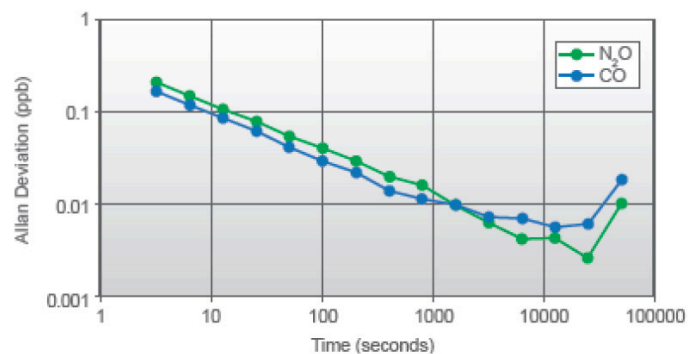
The **Picarro G5310 gas concentration analyzer** is designed for high-precision measurements of atmospheric nitrous oxide (N<sub>2</sub>O) and carbon monoxide (CO). Mid-infrared (IR) cavity ring-down spectroscopy (CRDS) produces parts-per-trillion (ppt) precision over a 1 to 1,500 parts-per-billion (ppb) measurement range at less than 5 second intervals. Drift is less than 0.1 ppb, for infrequent analyzer calibration and maintenance. And water (H<sub>2</sub>O) vapor is measured at parts-per-million (ppm) precision to correct and report N<sub>2</sub>O and CO concentrations in dry mole fractions.

Nitrous oxide is a naturally occurring greenhouse gas that plays a critical role in the nitrogen cycle. Atmospheric concentrations, stable prior to the industrial revolution, have risen dramatically due to agricultural practices and fossil fuel combustion. Precisely measuring atmospheric N<sub>2</sub>O is important to understanding anthropogenic forces affecting the Earth's climate.

Carbon monoxide is also a naturally occurring compound formed by incomplete combustion.

Like greenhouse gases, atmospheric concentrations have increased with industrialization, primarily from fossil fuel use. Because of carbon monoxide's role in radiative forcing, precisely measuring it is vital to atmospheric monitoring. Like other Picarro greenhouse gas (GHG) analyzers, the G5310 is ideal for long-term atmospheric measurements required by the most demanding GHG monitoring networks, such as the World Meteorological Organization (WMO) and the Integrated Carbon Observation System (ICOS).

## Allan Deviation Plot



## G5310 Performance Specifications

Specifications	N <sub>2</sub> O	CO	H <sub>2</sub> O
Precision (1σ, 5 sec)	<0.2 (N <sub>2</sub> O <500 ppb) Typical = 0.10 ppb*	<0.2 (CO <400 ppb) Typical = 0.13 ppb*	<40 ppm
Precision (1σ, 5 min)	<0.04 ppb (N <sub>2</sub> O <500 ppb) Typical = 0.015 ppb*	<0.04 ppb (CO <400 ppb) Typical = 0.019 ppb*	<6 ppm
Precision (1σ, 1 hr)	<0.02 ppb (N <sub>2</sub> O <500 ppb)	<0.02 ppb (CO <400 ppb)	-
Precision (1σ, 5 min)	0.03% of N <sub>2</sub> O reading (N <sub>2</sub> O >500 ppb)	0.02% of CO reading (CO >400 ppb)	<6 ppm
Drift (24 hour)	<0.1 ppb Typical = 0.036 ppb*	<0.1 ppb Typical = 0.046 ppb*	-
Measurement Range	1–1,500 ppb	1–1,500 ppb	0–3%
Measurement Interval	<5 sec Typical = 2.7 sec*		

\* Typical performance is defined as the median of testing results from 41 sequentially built G5310 analyzers. Results available upon request.

## G5310 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 Pressure	300 to 1000 Torr (40 to 133 kPa)
Sample Flow Rate	100 sccm
Sample Humidity	<99% RH non-condensing @40°C, no drying required
Ambient Temperature Range	15 to 35°C (operating) -10 to 50°C (storage)
Ambient Humidity	<85% R.H. non-condensing
Accessories	Keyboard, mouse, LCD monitor (optional)
Data Outputs	RS-232, Ethernet, USB
Fittings	¼" Swagelok®
Dimensions	17" w x 12.5" h x 20.5" d (43.2 x 31.7 x 52.1 cm), not including 0.5" feet
Installation	Benchtop
Weight	95 lbs (43 kg), includes internal pump
Power Requirements	100–240 VAC; 47–63 Hz (auto-sensing); < 375 W at start-up; Steady-state operation: 200 W

Compatible Peripheral: 16-port Distribution Manifold (A0311)

Note on deployability: The G5310 analyzer is designed for use in static installations only. Not for use in mobile platforms.

Check with Picarro for DC power source setup in case of field deployment.

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