O_2 Gas Concentration and $\delta^{18}O$ Analyzer

PICARRO

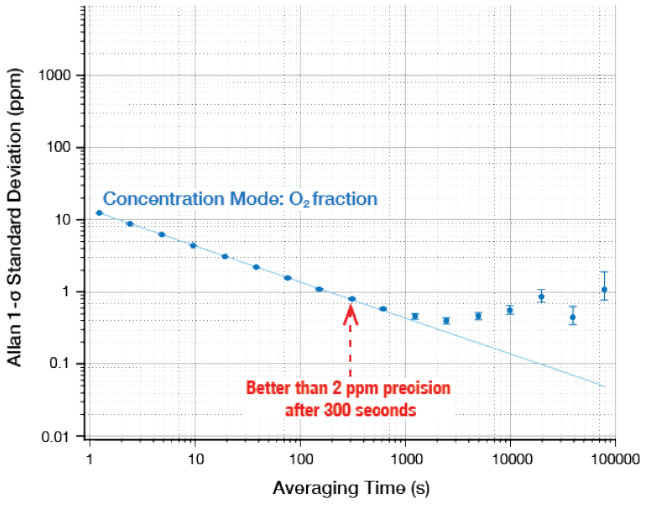
- Measures O_2 gas concentration and $\delta^{18}O$ in air
- Two measurement modes: O_2 concentration only and $\delta^{18}O$ plus O_2 concentration
- <2 parts-per-million (ppm) precision in O_2 concentration
- Maximum drift is 6 ppm peak-to-peak at standard temperature and pressure
- Includes water measurement and correction

The **Picarro G2207-*i* gas concentration and isotope analyzer** combines high precision and low drift O_2 concentration measurement with $\delta^{18}O$ analysis in ambient air. This makes it ideal for challenging applications including atmospheric oxygen monitoring to identify the biogeochemical process involved in the carbon cycle.

The G2207-*i* incorporates two measurement modes: O_2 concentration only and $\delta^{18}O$ plus O_2 concentration. O_2-only mode provides the highest measurement performance of the atmospheric concentration: <2 parts-per-million (ppm) at a 5-minute average and a maximum drift of <6 ppm peak-to-peak (P-P) at standard temperature and pressure (STP) over 24 hours. Furthermore, the analyzer measures water vapor concentration to compensate and correct for dilution. It reports O_2 concentration in dry-mole fraction.

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 with 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.

Allan Deviation Plot – Concentration Mode



G2207-*i* Performance Specifications	
$[O_2]$ Mode	
Precision, dry $[O_2]$ at ambient concentration (1-σ, 5 sec/5 min, at 21% O_2)	<20 ppm/<2 ppm
Max Drift at STP O_2 (over 24 hrs, peak-to-peak, 1 hr interval average, at 21% O_2)	<6 ppm
$[O_2]$ Operating Range	5–25%
Precision $[H_2O]$ (1-σ, 5 sec)	5 ppm + 0.1% of reading
$[O_2]$ + $\delta^{18}O$ Mode	
Precision, $\delta^{18}O$ at ambient concentration (1-σ, 5 sec/5 min)	<8‰/<1‰
Precision, $[O_2]$ at ambient concentration (1-σ, 5 sec/ 5 min)	<300 ppm/<30 ppm
Max Drift at STP $\delta^{18}O$ (over 24 hrs, peak-to-peak, 1 hr interval average)	<2‰

G2207-*i* Analyzer Specifications	
Measurement Technique	Cavity Ring-Down Spectroscopy (CRDS)
Measurement Cell Temperature Control	±0.005°C
Measurement Cell Pressure Control	±0.0002 atm
Shock and Vibration Testing	Meets shock and vibration military MIL-STD 810F test standard
Sample Flow Rate	80–110 sccm at 760 Torr
Sample Temperature	-10 to +45°C
Sample Pressure	300 to 1000 Torr (40 to 133 kPa)
Sample Humidity	<99% RH non-condensing @40°C, no drying required
Ambient Temperature Range	+10 to +35°C (operating) -10 to +50°C (storage)
Ambient Humidity	<99% RH non-condensing
Accessories	Pump (external), keyboard, mouse, LCD monitor (optional)
Data Outputs	RS-232, Ethernet, USB, analog (optional) 0–10 V
Fittings	¼” Swagelok®
Dimensions	Analyzer: 17” w x 7” h x 17.55” d (43.18 x 17.78 x 44.57 cm) not including 0.5” ft External Pump: 5.6” w x 6.4” h x 11.9” d (14.3 x 16.3 x 30.3 cm)
Installation	Benchtop or 19” rack mount chassis
Weight	60.4 lbs (27.4 kg), includes external pump
Power Requirements	100–240 VAC, 47–63 Hz (auto-sensing), <260 W start-up (total); 125 W (analyzer), 80 W (pump) at steady state

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