

Dissolved greenhouse gas and isotope measurements
at depths to 2500 meters?

LGR can do it



Deep Water Gas Analyzer

Features and Benefits

- *In situ* measurements of dissolved gases at depth
- Measures methane, methane isotopes, or carbon dioxide concentration
- Data reported every 5 minutes (approximately)
- Usable in oceans, lakes and rivers

The Deep Water Gas Analyzer combines membrane separation technology with Los Gatos Research's cavity enhanced laser absorption spectroscopy technology to provide *in situ* measurements of methane and carbon dioxide at depths to 2500 meters. Designed for applications such as ocean acidification, carbon sequestration, methane hydrate and hydrothermal vent studies, these novel analyzers provide real-time measurements of dissolved gases in oceans and lakes.

The analyzer is designed to be lowered to the desired depth or carried by submarine. Power is supplied from the surface via cable. The analyzer includes an internal computer that can store data practically indefinitely on its internal hard drive and can be read from the instrument in real time during operation through a connecting cable. Power and interface cables are not included with analyzer.

The analyzer uses LGR's patented Off-axis ICOS technology, a fourth-generation cavity ringdown spectroscopy (CRDS) technique, which employs an optical cavity to greatly enhance absorption and enable extremely precise measurements of trace gases. LGR's patented technology has many proven advantages over conventional techniques to yield measurements with higher sensitivity, accuracy and speed.

The analyzer uses a "membrane injector" to separate dissolved gases from the water for analysis by the system. The membrane efficiency will, in general, will be a function of water temperature, pressure, salinity, and perhaps other parameters. Thus, the measurement performance given in this datasheet represents the capability to measure the gas in the measurement cell not necessarily the dissolved gas in the water.

Deep Water Gas Analyzer

Performance Specifications

Gases Measured (one configuration per instrument):

- Configuration 1: Methane concentration
- Configuration 2: Carbon dioxide concentration
- Configuration 3: $\delta^{13}\text{C}$ in methane ($\delta^{13}\text{CH}_4$)

Precision (1σ):

- Configuration 1: $[\text{CH}_4]$: 1 ppbv
- Configuration 2: $[\text{CO}_2]$: 1 ppmv
- Configuration 3: $\delta^{13}\text{CH}_4$: 1‰
 $[\text{CH}_4]$: 1 ppmv

Measurement Range (meets all specs):

- Configuration 1: $[\text{CH}_4]$: 1– 500 ppmv
- Configuration 2: $[\text{CO}_2]$: 300 – 25000 ppmv
- Configuration 3: $[\text{CH}_4]$: 400 – 20000 ppmv

Operational Range

(external calibration may be required):

- Configuration 1: $[\text{CH}_4]$: 0.5 – 1000 ppmv
- Configuration 2: $[\text{CO}_2]$: 150 – 50000 ppmv
- Configuration 3: $[\text{CH}_4]$: 200 – 40000 ppmv

Measurement Rate:

5 minutes

Maximum Depth:

2500 meters

Sampling conditions:

- Sample Temperature: 0 – 50 °C
- Operating Temperature: 5 – 45 °C

Outputs:

Digital (RS232), Ethernet

Power Requirements:

115/230 VAC, 50/60 Hz
80 watts

Dimensions:

20 cm diameter
122 cm length

Weight:

100 pounds (45 kg)



Ordering Information

910-0001-0000: CH_4 concentration

910-0002-0000: CO_2 concentration

910-0005-0000: carbon isotope ratio in CH_4 ($\delta^{13}\text{CH}_4$)