

$\delta^{13}\text{C}_{\text{CH}_4}$ for methane ranging
from 1 ppm to 100%

LGR delivers.



Methane Carbon Isotope Analyzer

Features and Benefits

- Measurements of $\delta^{13}\text{C}$ and CH_4
- Data rates as fast as 1 Hz
- Requires only 150 W (Standard package): ideal for field applications
- $\delta^{13}\text{C}$ measurements over a wide range of concentrations
- New -EP model reports over large ranges with negligible drift
- New model (Range 3) provides $\delta^{13}\text{C}_{\text{CH}_4}$ in ambient air with only 1 ppm methane and without cross sensitivity to higher hydrocarbons

LGR's Methane Carbon Isotope Analyzer (MCIA) reports measurements of $\delta^{13}\text{C}_{\text{CH}_4}$ and methane concentration (mole fraction) directly, continuously and without sample preparation. LGR offers three models to span the entire range of methane levels in landfills, mudlogging studies, biogas reactors, and ambient air. For measurements of methane concentrations expected in ambient air near landfills and natural gas leaks, LGR's MCIA Range 1 provides measurements from 10 to 500 ppm. For applications in which higher levels of methane may be encountered, such as biogas, mud logging and oil/gas exploration, LGR's MCIA Range 2 provides measurements to >1% (10,000 ppm) methane. For applications requiring the highest sensitivity and lowest sample volume, LGR's new Range 3, which employs a quantum cascade laser, provides measurements with as little as 1 ppm methane in air. Moreover, LGR's Range 3 is insensitive to ethane and other 'higher' hydrocarbons. All models may be operated in both continuous flow and batch injection modes (with batch injection option).

A suite of options and accessories expands the usability for just about any application. The Dynamic Dilution System effectively extends the upper measurement range of the analyzer by a factor of 100x. In addition, the Multiport Inlet Unit enables the instrument to automatically sample

multiple inlet sources for measurements at various locations using a single analyzer.

The MCIA uses LGR's patented Off-axis ICOS technology, a fourth-generation cavity enhanced absorption technique. Off-axis ICOS has many advantages over conventional cavity ringdown spectroscopy (CRDS) techniques such as being alignment insensitive, having a much shorter measurement time, and not requiring expensive and power consuming auxiliary components. The MCIA has an internal computer (Linux OS) that can store data practically indefinitely on its hard disk drive and send real time data to a data logger via the digital (RS232), or Ethernet outputs.

As with all LGR analyzers, the MCIA may be controlled remotely via the Internet. This capability allows the user to operate the analyzer using a web browser anywhere Internet access is available. Furthermore, remote access allows bios-level control and provides the opportunity to obtain data and to diagnose the instrument operation without being on site.

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Performance Specifications

Precision (1 σ , 300 seconds):

$\delta^{13}\text{C}$: better than 1‰ (over entire range)
[CH₄]: better than 0.2‰ (over entire range)

Max Drift at STP

(peak-to-peak, 1 hr average over 24 hours):

$\delta^{13}\text{C}$: 2‰ (Enhanced Performance)

Measurement Range:

Range 1: 10 – 500 ppm (Standard)
1.7 – 500 ppm (Enhanced Performance)

Range 2: 500 – 10000 ppm

Range 3: 1 – 100 ppm

(optional Dynamic Dilution System extends upper range by 100×)

Sampling Conditions:

Sample Temperature: -20 – 50 °C
Operating Temperature: 0 – 45 °C (EP model)
Operating Temperature: 5 – 45 °C (Standard)
Ambient humidity: 0-100%, non-condensing

Outputs:

digital (RS232), Ethernet, USB

Power Requirements:

115/230 VAC, 50/60 Hz
150 W (Standard package)
165 W (Range 1 or 2, EP package, steady state)
400 W (Range 3, EP package, steady state)

Dimensions:

Benchtop (Enhanced Performance):
11"×38"×22" (Range 1)

Rackmount (Standard):
14"×19"×24" (Range 2)

Rackmount (Enhanced Performance):
14"×45"×19" (Range 3)

Weight:

30 kg (Standard package)
40 kg (Enhanced Performance package: Range 1 or 2)
68 kg (Enhanced Performance package: Range 3)

Ordering Information

908-0005: Benchtop package (Ranges 1 or 2)

907-0005: Rackmount package (Range 2 only)

912-0023: Benchtop package (Enhanced Performance) for Range 1 or Range 2

914-0031: Rackmount (Enhanced Performance) package for Range 3 (includes LN₂-cooled photodetector in dewar (24-hr hold time. 0.5L capacity)

914-1031: Rackmount (Enhanced Performance) package for Range 3 (includes TEC-cooled photodetector in dewar

914-2031: Rackmount (Enhanced Performance) package for Range 3 (includes Stirling cycle-cooled photodetector)

Accessories

908-0003-9001: Multiport Inlet Unit – 16-inlet port multiplexer

908-0003-9002: Multiport Inlet Unit – 8-inlet port multiplexer

907-0005-9002: Dynamic Dilution System – Extends upper measurement range by a factor of 100 through automated sample dilution with zero air

908-0005-9002: Syringe Injection – Allows measurements of discrete samples via manual injection

Options

Please specify Range (1, 2, or 3) when ordering



Instrument complies with 21 CFR 1040.10 and 1040.11