ABB MEASUREMENT & ANALYTICS | DATA SHEET

# LGR-ICOS™ GLA351-CCIA3

## $CO_2$ isotopic analyzer – EP QC benchtop


Highly sensitive, accurate and fast analyzer for reliable measurement of $\delta^{13}C$, $\delta^{17}O$, $\delta^{18}O$ and $CO_2$.

### Measurement made easy

LGR-ICOS™ GLA351 Series Enhanced Performance quantum cascade benchtop analyzer

## Features and benefits

- Simultaneous measurements of $\delta^{13}C$, $\delta^{17}O$, $\delta^{18}O$ and $CO_2$
- Unprecedented stability, precision and low drift
- Measurement rates selectable up to 1 Hz
- Installed and operational in minutes
- Batch operation via syringe injection option
- Insensitive to hydrocarbons or $H_2S$
- Extremely high dynamic range
- Unsurpassed reliability
- Real-time diagnostics

## Overview

The ABB LGR-ICOS gas analyzers build on the heritage and extensive track record of Los Gatos Research analyzers, using patented Off-Axis Integrated Cavity Output Spectroscopy (OA-ICOS) technology, the latest evolution in tunable diode laser absorption spectroscopy (TDLAS).

Isotopic measurements of carbon dioxide allow determination of transport, uptake, residence time, sequestration, and depletion modes of carbon dioxide throughout the atmosphere and biosphere. Carbon dioxide is a particularly useful gas for this type of analysis because of its presence in the metabolic processes of living organisms as well as being a by-product of combustion processes.

When making isotopic carbon dioxide measurements,scientists require:
(1) accurate measurements over a wide range of mole fractions, (2) high precision, (3) ability to report reliable values even if mixing ratios are rapidly changing, (4) user-friendly interface, (5) low drift, (6) insensivity to $H_2O$, $H_2S$, $NH_3$, as well as methane and other hydrocarbons.

## … Overview

ABB's Carbon Dioxide Isotope Analyzers meet all of these requirements. In addition, the availability of many value-added options extends the abilities of these units to include discrete samples (collected in bags or vials) and to automatically handle multiple inlet sources.

ABB's Enhanced Performance (EP) series incorporates proprietary internal thermal control for ultra-stable measurements with unsurpassed precision, accuracy and drift. Moreover, only ABB analyzers provide reliable guaranteed measurements at mole fractions more than 20 times ambient levels.

ABB's patented OA-ICOS technology, a fourth-generation cavity enhanced absorption technique, has many advantages over conventional Cavity Ringdown Spectroscopy (CRDS) techniques such as being alignment insensitive, having a much shorter measurement time, not requiring tight control of cavity pressure and temperature, and not requiring expensive and power-consuming auxiliary elements.

The analyzer includes an internal computer that can store data practically indefinitely on its internal hard drive (for applications requiring unattended longer term operation), and send real-time data to a data logger through its analog and digital (RS232) outputs. Several optional features are available which improve the flow time response, allow multiple inlet sources, or provide for remote access and control of the analyzer via the Internet.

## Accessories

| | |
|---|---|
| MIU-16 | **Multiport Inlet Unit**<br>Automated control of up to 16 inlet ports |
| MIU-8 | **Multiport Inlet Unit**<br>Automated control of up to 8 inlet ports |
| ACC-DP3H | **3-head Diaphragm External Pump**<br>Provides flow-through response (1/e) time of 1.2 seconds |
| ACC-DP4H | **4-head Diaphragm External Pump**<br>Provides flow-through response (1/e) time of 0.5 seconds |
| EDDS | **External Dynamic Dilution System**<br>Allows measurements of high concentration samples by automatic dilution of sample with zero air. |
| OPT-DATALOG | **Digital Data Logging Capability**<br>Multi-channel data logging option records and synchronizes serial (RS-232) outputs from multiple ABB analyzers and other devices (GPS, anemometers) |

## Ordering information

- **LGR-ICOS™ GLA351-CCIA3** (EP QC Rackmount)

## Specification (air background)

**Precision (1σ, 1 second / 10 seconds / 100 seconds):**
$\delta^{13}C$: 0.7‰ / 0.25‰ / 0.07‰
$\delta^{18}O$: 0.7‰ / 0.25‰ / 0.07‰
$\delta^{17}O$: 1.5‰ / 0.5‰ / 0.2‰
$^{12}CO_2$: 200 ppb / 70 ppb / 25 ppb
$^{13}CO_2$: 2 ppb / 0.75 ppb / 0.3 ppb

**Maximum Drift**
(peak-to-peak, 15 min. average, over 24 hours):
$\delta^{13}C$: < 0.5‰

**Measurement Range (meets all specs):**
$CO_2$: 350 – 2,000 ppm
$H_2O$: Up to 6,000 ppm

**Measurement Rates:**
User-selectable rates up to 1 Hz

**Response time to register 95% of a step change:**
10 seconds (flow response < 5 sec requires external pump)

**Sampling Conditions:**
Sample Temperature: -20 – 50 °C
Operating Temperature: 0 – 45 °C
Ambient Humidity: non-condensing (<99.9% RH)

**Fittings:**
Inlet: 3/8 in.
Outlet (internal pump): ¼ in.
Outlet (optional external vacuum pump): ½ in.

**Outputs:**
Digital (RS-232), Ethernet, USB

**Power Requirements:**
115/230 VAC, 50/60 Hz
350 W steady state

**Dimensions (H x D x W):**
50 x 86 x 48 cm
19.5 x 34 x 19 in

**Weight:**
68 kg (150 lbs)

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