

OA-ICOS™ GLA431-TIWA

Triple isotopic water analyzer



Fast and accurate analyzer for measurement of $\delta^2\text{H}$, $\delta^{18}\text{O}$, $\delta^{17}\text{O}$, ^{17}O -excess and d-excess in water vapor

Measurement made easy

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OA-ICOS™ GLA431 Triple
isotopic water analyzer

Features and benefits

- Unsurpassed precision and unmatched accuracy
- Simple to operate - no need for factory return for service
- High precision and unmatched accuracy
- Easy switch between high throughput and high performance mode – no extra hardware required
- Compatible with “LIMS for Lasers”
- High-resolution absorption spectra are viewable continuously for real-time diagnostics
- Post-Analysis Software simplifies analyses and enables highest performance
- Spectral Contamination Identification

Overview

The ABB OA-ICOS 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).

ABB's GLA431-TIWA water isotopic analyzer provides measurements of $\delta^2\text{H}$, $\delta^{18}\text{O}$, $\delta^{17}\text{O}$, O^{17} -excess and d-excess of water vapor with unsurpassed precision and speed. ABB's GLA431 series incorporates proprietary thermal control for ultra-stable measurements with unsurpassed precision, accuracy and drift as validated at leading labs throughout the world.

Fast, high-frequency isotopic water measurements provide detailed time-resolved information on the eco-physiological performance of plants and enable improved understanding of water fluxes and evapo-transpiration at ecosystem scales. These applications require rapid measurements with high accuracy and precision over a wide range of water-vapor mole fractions.

... Overview

ABB's patented OA-ICOS technology, a fourth-generation cavity enhanced absorption technique, has many advantages over older conventional and delicate cavity ringdown spectroscopy and direct absorption techniques. OA-ICOS analyzers are simpler, easier to operate and more rugged. As a result, ABB analyzers provide higher performance and reliability with minimal operational cost.

Equipped with the optional ACC-AUTOINJECT, the GLA431's are capable of unattended operation with automated injection of liquid samples.

Liquid Water Performances

Liquid Precision (1 σ):

High Throughput Mode

$\delta^2\text{H}$: 0.4 ‰ (400 per meg)

$\delta^{17}\text{O}$: 0.1 ‰ (200 per meg)

$\delta^{18}\text{O}$: 0.1 ‰ (100 per meg)

High Performance Mode

$\delta^2\text{H}$: 0.2 ‰ (200 per meg)

$\delta^{17}\text{O}$: 0.03 ‰ (30 per meg)

O^{17} -Excess: (20 per meg)

$\delta^{18}\text{O}$: 0.03 ‰ (30 per meg)

Salinity:

<4% (Total dissolved solids < 40 parts per thousand)

Temperature/Humidity:

Sample Temperature: 0 to 50 °C

Throughput:

800 injections per day (with autoinjector)

Sample Volume:

1 μL per injection

Water Vapor Performances

Precision (12,000 ppm, 10 sec / 100 sec):

$\delta^2\text{H}$: 0.5‰ / 0.2‰

$\delta^{17}\text{O}$: 0.15‰ / 0.05‰

$\delta^{18}\text{O}$: 0.15‰ / 0.05‰

$[\text{H}_2\text{O}]$: 0.2% / 0.07%

Measurement Rates:

Up to 2 Hz - 1/e flow time of < 6 seconds

... Water Vapor Performances

Maximum Drift:

(15 min average at STP over 24 hrs)

$\delta^2\text{H}$: 0.8‰

$\delta^{17}\text{O}$: 0.2‰

$\delta^{18}\text{O}$: 0.2‰

$[\text{H}_2\text{O}]$: 0.1%

Range:

Measurement Range: 4000 to 60 000ppm (non-condensing)

Operating range: 0 to 70 000 ppm

Sampling Conditions:

Sample Temperature: -20 – 50 °C

Ambient Humidity: 0-100% RH (non-condensing)

General Specifications

Operating temperature:

0 to 45°C

Outputs:

Digital (RS-232), Ethernet, USB

Power Requirements:

115/230 VAC, 50/60 Hz

180 watts total (steady state)

Dimensions:

28cm (11") H × 97cm (38") W × 56cm (22") D, Analyzer only

Weight :

50 kg, Analyzer only

Accessories

ACC-AUTOINJECT	Autoinjector w/ heated injection module Automated injection of liquid water samples Holds 162 vials. Includes startup kit.
WVISS	Water Vapor Isotope Standard Source Provides controllable flow of water vapor at known humidity and isotope ratios for automated calibration
Included	ACC-DP4H 4-head external diaphragm pump
Included	Heater and power supply
Included	Spectral Contamination Identifier Identifies and flags contaminants
Included	Post-Analysis software Advanced software simplifies analytical procedure to enable high precision measurements quickly