ABB MEASUREMENT & ANALYTICS | DATA SHEET

OA-ICOS™ GLA431-TIWA

Triple isotopic water analyzer

Fast and accurate analyzer for measurement of δ^2H, $\delta^{18}O$, $\delta^{17}O$, ^{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 δ^2H, $\delta^{18}O$, $\delta^{17}O$, 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 (1σ):
High Throughput Mode
δ^2H: 0.4 ‰ (400 per meg)
$\delta^{17}O$: 0.1 ‰ (200 per meg)
$\delta^{18}O$: 0.1 ‰ (100 per meg)

High Performance Mode
δ^2H: 0.2 ‰ (200 per meg)
$\delta^{17}O$: 0.03 ‰ (30 per meg)
O^{17}-Excess: (20 per meg)
$\delta^{18}O$: 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):
δ^2H: 0.5‰ / 0.2‰
$\delta^{17}O$: 0.15‰ / 0.05‰
$\delta^{18}O$: 0.15‰ / 0.05‰
$[H_2O]$: 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)
δ^2H: 0.8‰
$\delta^{17}O$: 0.2‰
$\delta^{18}O$: 0.2‰
$[H_2O]$: 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

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