



MIRO



N₂O ISOTOPIC GAS ANALYZER

MGAⁱ-N₂O

High-precision all-in-one gas analyzers to combat climate change and air pollution

Innovation with Integrity

The MIRO MGAⁱ-N₂O simplifies monitoring of the N₂O isotopic composition by enabling simultaneous online measurements of 4 main isotopologues of N₂O at high measurement rates, while offering excellent stability and precision.

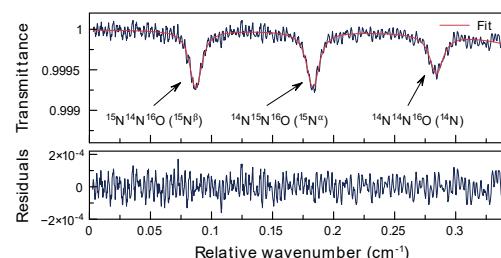
MIRO's MGAⁱ-N₂O analyzer directly measures N₂O isotopic concentrations using mid-infrared laser absorption spectroscopy with **Quantum Cascade Lasers** as light sources. This allows for highly specific and accurate gas detection along with maximum measurement sensitivity without the need for bulky and expensive laboratory installations. Our analyzers are typically free of measurement interferences from other gas species. The intuitive touch display enables fast and easy control. The analyzer is suitable for isotopic N₂O monitoring in a laboratory or in combination with MIRO's Field enclosure-outdoors in the field.

MIRO's products are made in Switzerland and undergo strict quality control before shipping.

Highlights

- Measures 4 N₂O isotopologues simultaneously: ¹⁴N¹⁴N¹⁶O, ¹⁵N¹⁴N¹⁶O, ¹⁴N¹⁵N¹⁶O, ¹⁴N¹⁴N¹⁸O
- Direct site-specific measurement
- Suitable for measurement in ambient air or with flux chambers
- Fraction of the cost of an IR-MS system

Sample Spectrum

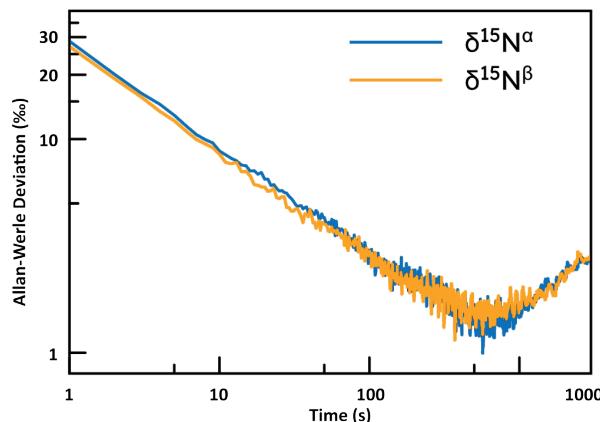
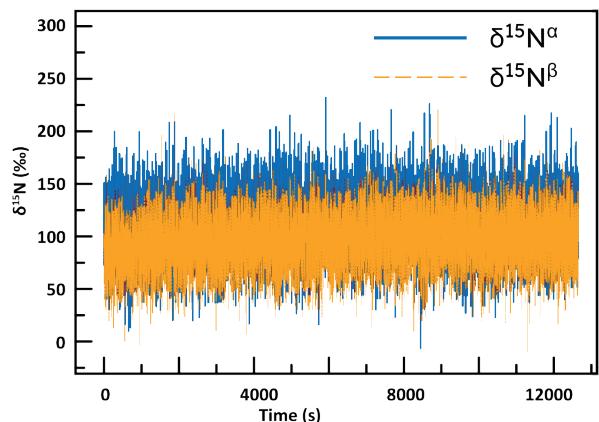


Precision

	Precision @1s	Best Precision
N ₂ O	0.5 ppb	0.05 ppb
δ ¹⁵ N ^α	28.7 ‰	1.3 ‰
δ ¹⁵ N ^β	27.1 ‰	1.3 ‰
δ ¹⁸ O*	34 ‰	1.7 ‰

*estimated values, ¹⁸O denotes ¹⁴N¹⁴N¹⁸O

$\delta^{15}\text{N}$ and Allan-Werle Deviation (Example)



Technical Specifications

Parameters	10 Hz
Measurement Rate	1 Hz
Ambient Temperature	15–30 °C
Ambient Humidity	< 90% RH, non-condensing
Sample Pressure	700–1050 mbar
Sample Flow Rate	0.5 to 1.5 slpm
Sample Inlet Fittings	6 mm-Swagelok
Dimensions	48 w x 18 h x 70 d (cm)
Accessories required	Chiller unit, Vacuum pump
Weight	20 kg (Analyzer), 11 kg (Chiller unit), 9 kg (Vacuum pump)
Power	110–230 VAC / 50–60 Hz; <100 W Analyzer, <230 W (Pump + Chiller)
Installation	19" Rack mountable or benchtop
Digital ports	RS232 (for data output), USB, Ethernet
Connectivity	The instrument provides remote access and control of its main functionalities. It contains a PC which is running the instrument software. If a network access is provided, the instrument's full functionality can be accessed via a remote control software.
Electrical and Laser Safety	CE-Mark (EN IEC 61326-1: 2021, EN IEC 61000-3-2: 2019, EN 61000-3-3:2013/ A2:2021, EN 61010-1:2010/ Al:2019/AC:2019, EN 60825-1:2014/ Al:2021/AC:2022, EN IEC 63000:2018)
Service Interval	The instrument is suitable for operation without on-site interventions for a period of at least three weeks.

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