Campbell SCIENTIFIC

TGA200A
Trace Gas Analyzer

High Speed, Low Maintenance, Field Rugged

Measures CO_2 isotopes, N_2O, or CH_4

Overview

The TGA200A Trace Gas Analyzer measures trace gas concentrations in an air sample using tunable-diode laser absorption spectroscopy (TDLAS). This technique provides high sensitivity, speed, and selectivity. Its simple design allows it to measure one of many gases by choosing an appropriate laser source. The TGA200A features a 1.5 m single-pass optical measurement system that uses a thermoelectrically cooled laser.

The TGA200A is housed in a rugged environmental enclosure designed for use in demanding climates ranging from high-latitude boreal forests, permafrost, and tundra to agriculturally intensive mid-latitude regions and equatorial rainforests.

Common applications include slow-gradient or high-speed eddy-covariance measurements of nitrous oxide fluxes or carbon fluxes in the form of methane, or isotopologs of carbon dioxide in all global ecosystems.

Campbell Scientific has been manufacturing TGAs since 1993, and the TGA200A is the result of over 20 years of research and development. Even though previous generations of the TGA (TGA100, TGA100A, and TGA200) have the same core technology, the TGA200A builds upon this succession with further improvements. For more information about the TGA200A, contact Campbell Scientific, Inc.

Benefits and Features

- Small sample cell volume that provides superior frequency response
- Thermoelectrically cooled laser; no cryogenic cooling required
- Laser upgrades available to existing TGA customers; contact Campbell Scientific for more information
- Choice of laser sources to measure CO_2 isotopes, N_2O, or CH_4
- Optically simple measurement system that does not require cleaning of the optical cell in the field
- 500 Hz measurement rate that supports excellent synchronization
- Rugged environmental enclosure that allows the TGA200A to be placed outside on the ground
- Simple Windows user interface for setup, configuration, and real-time monitoring
- Complete greenhouse gas measurement flux solution provided by combining one or more TGA200As with Campbell Scientific's sonic anemometers, data loggers, gas analyzers, closed-path gas analyzers, or eddy-covariance system
- Advanced sampling systems also available for low-flow applications such as profile, gradient, or user-supplied chamber measurements

Specifications

Measurement Rate	500 Hz
Sample Cell Volume	200 mL
Dimensions	211 x 47 x 55 cm (83 x 18.5 x 21.5 in.)
Weight	❱ 62.8 kg (138.5 lb) for TGA200A ❱ 5.4 kg (12.0 lb) for power module with cable

Typical Measurement Noise

-NOTE-	*Preliminary Results* *Allan deviation with 100 ms averaging time.*
Nitrous Oxide (N_2O) - Laser pn 30478	1.5 nmol mol^{-1}
Methane (CH_4) - Laser pn 30477	7.0 nmol mol^{-1}
Nitrous Oxide (N_2O) - Laser pn 31121	1.8 nmol mol^{-1}
Carbon Dioxide (CO_2) - Laser pn 31121	0.3 µmol mol^{-1} (based on the $^{13}C^{16}O^{16}O$ isotopolog)
Carbon Dioxide (CO_2) - Laser pn 31119	0.15 µmol mol^{-1}
$\delta^{13}C$ - Laser pn 31119	0.5 ‰
Carbon Dioxide (CO_2) - Laser pn 30877	0.5 µmol mol^{-1}
$\delta^{13}C$ - Laser pn 30877	2.0 ‰
$\delta^{18}O$ - Laser pn 30877	2.0 ‰

Power Requirements

Analyzer (TE-cooled laser)	90 to 264 Vac, 47 to 63 Hz, 34 W (max) 22 W (typical)
Heater	90 to 264 Vac, 47 to 63 Hz, 150 W (max) 50 W (typical)

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