GASERA

PHOTOACOUSTIC GAS ANALYZER

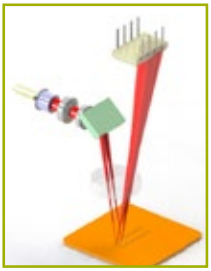
GASERA ONE GHG

Reliable and simultaneous analysis of CH4 and N2O greenhouse gases

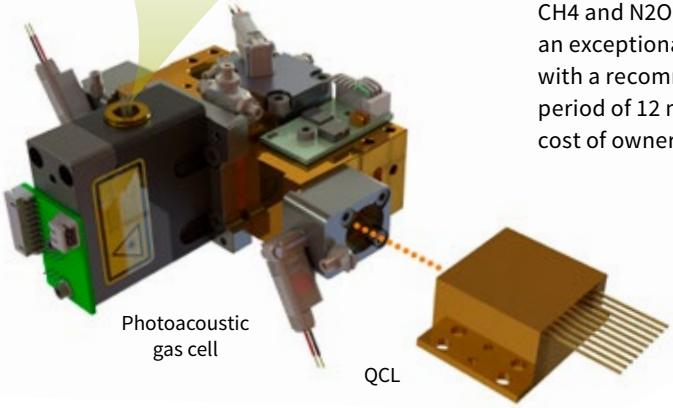
GASERA ONE GHG

Measurement need

The monitoring and reporting of greenhouse gas emissions is the basis for the global climate policy. A large amount of greenhouse gases released to the atmosphere is due to human activities such as farming. Emissions take place from the livestock and from soil and are a concern for both the environment and for the efficiency of food production. Monitoring of greenhouse gases can also be used to improve the living conditions of farm animals and to evaluate the need for fertilization of the soil and soil applications in general.



Ultra-sensitive patented optical cantilever microphone



Photoacoustic gas cell

QCL

Easy-to-use – one dial operation

GASERA ONE GHG provides the user with a simple and intuitive interface with high resolution display and a single rotating dial.

Technology

GASERA ONE GHG analyzer is based on combining ultra sensitive cantilever enhanced photoacoustic detection technology with Quantum Cascade Laser (QCL) source operating at a Mid-IR fundamental spectral absorption lines of CH4 and N2O. This combination provides an exceptionally high level of stability with a recommended re-calibration period of 12 months, offering a low total cost of ownership.

Benefits

- Low Total Cost of Ownership: no consumables or wet chemistry
- Portability that enables the field use
- Short optical path that provides industry leading dynamic range with single-point calibration
- Built in 2-point sampling, expandable up to 12 locations using optional Multipoint Samplers

Features

- Simultaneous analysis of CH4, N2O and H2O
- Optional CO2 sensor
- Low-ppb detection limits for CH4 and N2O
- Response time 60 seconds
- High dynamic range and stable operation
- Low sample volume (few ml)
- Built-in gas exchange system
- Recommended re-calibration interval of 12 months
- User configurable monitoring tasks
- Intuitive user interface
- Built-in display presents results both numerically and graphically
- Gas cell stabilized to 50 °C and 350 mbar to avoid drifts due to changes in environmental conditions
- Drift-free operation due to direct absorption measurement

Application examples

Animal husbandry

Monitoring emissions from livestock and individual cows. Monitoring air quality in animal shelters.

Ecology research

Monitoring emissions of gases from farm animals in order to develop genetic qualities and behavior, considered to be advantageous to humans.

Soil analysis

Evaluation of N2O emission from soil due to fertilization.

Greenhouse gases research

Identifying GHG emissions of soil in situ in order to evaluate the climatic effects.

Performance of GASERA ONE GHG

Gas	Detection limit
CH4	10 ppb
N2O	2 ppb
H2O	100 ppm
CO2 (optional)	0.2 ppm

Optional accessory

MULTIPOINT SAMPLER increases the number of sample inlets up to 12

GASERA ONE GHG

Technology

- Principle of operation: photoacoustic infrared spectroscopy
- Patented ultra-sensitive optical microphone based on MEMS cantilever sensor coupled with a laser interferometer to measure microscopic movement of the cantilever
- Light source configuration: Distributed Feedback Quantum Cascade Laser

General

- 19” 3U (unit) housing for both table top and rack mount operation
- Dimensions: 48,4 cm W x 13,9 cm H x 44 cm D (19.1 in W x 5.5 in H x 17.3 in D)
- Weight: approx 13 kg
- Built-in computer with a 7” WSVGA display
- Data storage capacity sufficient for at least 1 year of continuous monitoring with the shortest sampling interval
- Total internal gas volume 30 ml
- Electrical connections:
  Input voltage: 90…264 Vac, 47…63 Hz
  Input power: 75 W max.
- Interface: Ethernet, USB and optionally Serial over USB, current message or voltage message. Supports MODBUS and AK-protocol.

Standards

- Complies with the Low Voltage Directive 2014/35/EU, EMC Directive 2004/108/EC and ROHS 2 directive 2011/65/EU

Environment

- Operational conditions:
  Temperature range: 0°C…+40°C
  Humidity: non-condensing
  Pressure range: 750 mbar…1050 mbar
  Dust/water resistance: IP20 (IEC 529)
- Storage conditions:
  Temperature range: -20 °C – +60 °C
- Sample gas conditions:
  Temperature: 0 – +49 °C
  Humidity: non-condensing, maximum relative humidity 99% for temperatures up to 35°C, decreasing linearly to 50% relative humidity at 49°C
  Pressure: 750 mbar…1050 mbar
  Gas flow: approx 0.6 liters/minute during the gas exchange. Gas exchange parameters can be configured by the user.
  Particulates < 1 µm

Measurement specifications

- Response time: Fixed 60 seconds response time.
- Detection limits: 2 ppb for N2O, 10 ppb for CH4, 100 ppm for H2O, 0.2 ppm for CO2 (optional)
- Dynamic range: 0-100 ppm for N2O & CH4, 0-60 000 ppm for H2O, 0-20 000 ppm for CO2 (optional)
- Repeatability: less than 1 % of measured value in operational conditions at the calibration concentration
- Accuracy: 3% at the calibration concentration. Limited by the calibration gas accuracy.
- Temperature stability: ambient temperature change within the operational temperature range will not cause drift
- Pressure stability: Sample gas pressure change within the pressure range will not cause drift

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