



PHOTOACOUSTIC MULTI-GAS ANALYZER

GASERA ONE



Protecting life, health and security

GASERA
ONE

GASERA ONE concept

GASERA ONE is a photoacoustic multi-gas analyzer that serves a wide variety of research and industrial applications. It combines the best of both worlds in the detector and the light source sides. The unmatched performance of GASERA ONE is based on a photoacoustic infrared spectroscopy engine with a patented ultra-sensitive cantilever pressure sensor.

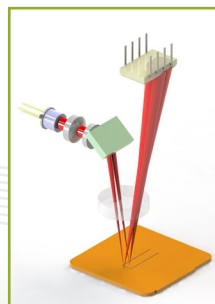
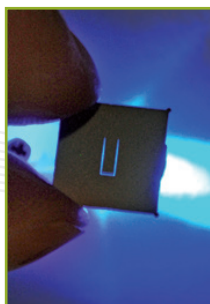
Many problems – one simple solution

GASERA ONE can be tailored to suit multiple applications by selecting optimal lasers and/or light sources.

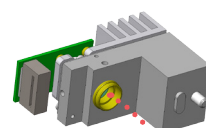
For even more complex measurement scenarios, several GASERA ONEs can be stacked and synchronized to provide an ultimate solution for your application.

Easy-to-use – one button operation

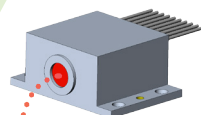
GASERA ONE provides the user with a simple and intuitive interface with high resolution display and a single rotating knob. In addition, the user can control the GASERA ONE wirelessly with smartphone, tablet or other devices.



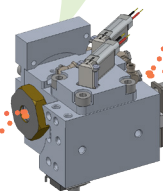
Ultra-sensitive
optical cantilever
microphone



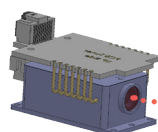
DFB diode laser



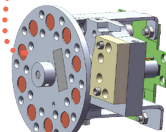
QCL or ICL



Photoacoustic
gas cell



External cavity QCL
or OPO



IR source with
bandpass filters

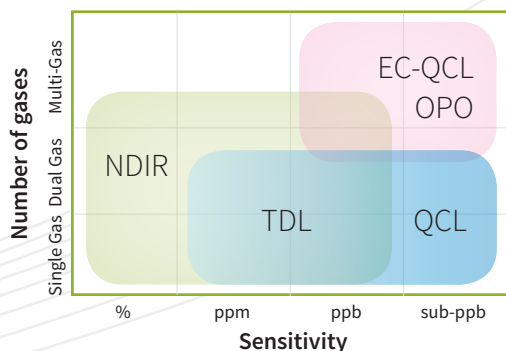


Features

- Multiple gases analyzed simultaneously
- Sub-ppm to sub-ppb detection limits
- Response time from 5 seconds to few minutes
- High dynamic range and stable operation
- No consumables
- Low sample volume (few ml)
- Built-in gas exchange system
- Long re-calibration interval (several months)
- User configurable monitoring tasks
- Intuitive user interface
- Built-in display presents results both numerically and graphically
- Remote operation via tablet, smartphone or another GASERA ONE

Measurable gases include

- Anesthetics: desflurane, enflurane, isoflurane, sevoflurane etc.
- CFCs and PFCs: CF₄, C₂F₆, R13, R-134a etc.
- Corrosives (at low levels): HCl, HCN, HF
- Hydrocarbons: CH₄, C₂H₂, C₂H₄, C₂H₆ etc.
- Inorganics: CO, CO₂, H₂O, H₂S, NO, NO₂, N₂O, NF₃, NH₃, SF₆, SO₂
- VOCs: acetone, benzene, ethanol, formaldehyde, methanol, toluene, xylenes etc.



Application examples

Animal husbandry

Monitoring emissions of methane, carbon dioxide, acetone etc. both from livestock and from individual cows. Monitoring air quality in animal shelters.

Border security

Finding trace levels of illegal substances and marker volatile organic compounds (VOCs) such as MDMA, cocaine and amphetamine, drug precursors such as safrole, BMK and ephedrine, as well as explosives such as nitrotoluene and nitroglycerin.

Cargo container safety

Detecting harmful chemicals, fumigants and VOCs inside sealed cargo containers.

Fenceline monitoring

Monitoring of ambient background levels of gases such as HF, ammonia and formaldehyde.

Indoor air quality and occupational safety

Real-time monitoring of harmful VOCs present in indoor air including formaldehyde, toluene, benzene, xylene, perchloroethylene.

Ship emissions monitoring

Detecting and analyzing SO₂ and CO₂ levels from ship emissions in order to determine the sulphur content in the fuel used by the ship.

Soil analysis

Identifying GHG emissions of soil in situ in order to evaluate the climatic effects. Evaluating the need for fertilization by measuring the ratio of N₂O and ammonia in the soil.

Waste anesthetic gases

Monitoring the levels of anesthetic gases such as fluranes and N₂O as well as common cleaning solvents in hospital operating theatres.

GASERA

ONE

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 based on application requirements e.g. sensitivity and number of gas components
- Suitable light sources include tunable diode laser (TDLS), quantum cascade laser (QCL), external cavity quantum cascade laser (EC-QCL), interband cascade laser (ICL), optical parametric oscillator (OPO), broadband IR-source with bandpass filters (NDIR)
- Gas cell stabilized up to 50°C temperature

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 (model dependent)
- Built-in computer with a 7" WSVGA display
- Data storage capacity sufficient for at least 1 year of continuous monitoring of a full set of gases with the shortest sampling interval
- Total internal gas volume 10–30 ml (model dependent)
- 3–4 gas connections in the rear including 1–2 sample input connections equipped with user changeable filters for dust and small particles
- Electrical connections:
Input voltage: 110-240 VAC, 50-60 Hz
Input power: 100-200 W (model dependent)
- Interface: Ethernet, USB
- GASERA ONE can be remotely operated via smartphone, tablet, laptop or another GASERA ONE. (coming soon)

Environment

- Operational conditions:
Temperature range: 0 °C – +40 °C
Humidity: below 90% RH, non-condensing
Pressure range: ambient level
Dust/water resistance: IP20 (IEC 529)
- Storage conditions:
Temperature range: -20 °C – +60 °C
- Sample gas conditions:
Temperature: 0 – +49 °C
Humidity: non-condensing
Pressure: 930 mbar – 1100 mbar
Gas flow: approx 1 liters/minute
Particulates < 1 µm

Measurement specifications

- Response time: dependent on user configurable channel integration time (C.I.T.) and gas exchange routine. Typically from 5 seconds to few minutes (model dependent)
- Detection limit: gas and light source dependent. Typically from sub-ppb to sub-ppm
- Dynamic range: typically 5 orders of magnitude (i.e. 100 000 times the detection limit)
- Repeatability: less than 1 % of measured value in operational conditions at the calibration concentration
- Accuracy: limited by the calibration gas accuracy at the calibration concentration. Typically 2–5 %
- 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

Standards

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

Gasera Ltd. reserves the right to change specifications without notice.