

## Comprehensive Multi-Dimensional Gas Emission Monitoring Solution For the Oil and Gas Industry

Complete gas emission and leakage quantification solutions from source to endpoint

To continuously enhance safety and improve energy efficiency for customers from production, supply, storage, and sales



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All products are in continuous development and therefore specifications may be subject to change without prior notice.

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# Industry Challenges

With the signing of the United Nations 'Global Methane Pledge' in 2021, the release of top-level action plans for methane emission management and control from China, the U.S., and Europe, along with the revision of related regulations indicates a clear development direction for methane monitoring: shifting from theoretical calculations to precise measurement of actual gas emissions, to gradually improve data granularity and accuracy, and encourage the application of advanced technology for site-level emission monitoring as an inevitable trend.

## Gas Quality Measurement

The composition of raw natural gas varies. Fluctuations in processing and environmental conditions pose challenges to the efficient operation of natural gas processing, liquefaction, and refining. Energy companies need higher measurement accuracy and enhanced control over all processes in the natural gas value chain to maintain competitiveness.

## Production Optimization

The process of converting natural gas into liquefied natural gas (LNG) in liquefaction plants typically involves four key steps: pretreatment, acidic gas removal, dehydration, and distillation to remove heavy hydrocarbons and liquefy. Each step of these operations requires reliable and precise measurement and strict process control to ensure continuous and uninterrupted loading and transportation.

## Safety Monitoring

Safety cannot be overlooked, as the complex infrastructure and processes within the natural gas value chain present numerous potential dangers. The rapid growth of natural gas trade and the development of global market integration have posed significant challenges to the industry, requiring energy companies to balance value growth, productivity improvement, and enhanced safety maintenance.



## Environmental Protection & Emission Control

Cubic adopts independently developed cutting-edge high-precision sensor modules with ultra-low detection limits to meet the advanced monitoring needs at the site-level and source-level. The solution integrates various technical methods for precise quantitative analysis of methane emissions and provides high-quality data through on-site measurements. Moreover, Cubic introduces dispersion point monitoring and vehicle/unmanned aerial vehicle (UAV) inspection devices to achieve comprehensive and three-dimensional monitoring of methane emission concentrations, enabling rapid and precise identification of leakage sources. Cubic continuous monitoring system provides strong support for methane emission monitoring and quantification in the oil and gas industry, which assists operators achieve environmental protection goals and further to promote global environmental conservation efforts.



## Quality Control and Production Optimization

Cubic gas sensing solution integrates various monitoring technologies including Laser Raman technology (LRD), Tunable Diode Laser Absorption Spectroscopy technology (TDLAS), Non-Dispersive Infrared technology (NDIR), and Ultrasonic technology, providing both online and portable dual measurement methods. We obtain precise monitoring data on composition and flow throughout the gas pre-treatment to liquefaction process, achieving reliable process control. Cubic high-precision measurement technology penetrates the entire natural gas value chain process monitoring, meeting the high industrial standards for process control and productivity enhancement, allowing operators to maintain efficient operations amidst market fluctuations, improve competitiveness, and ensure the stability of energy supply and reliability of combustion utilisation.



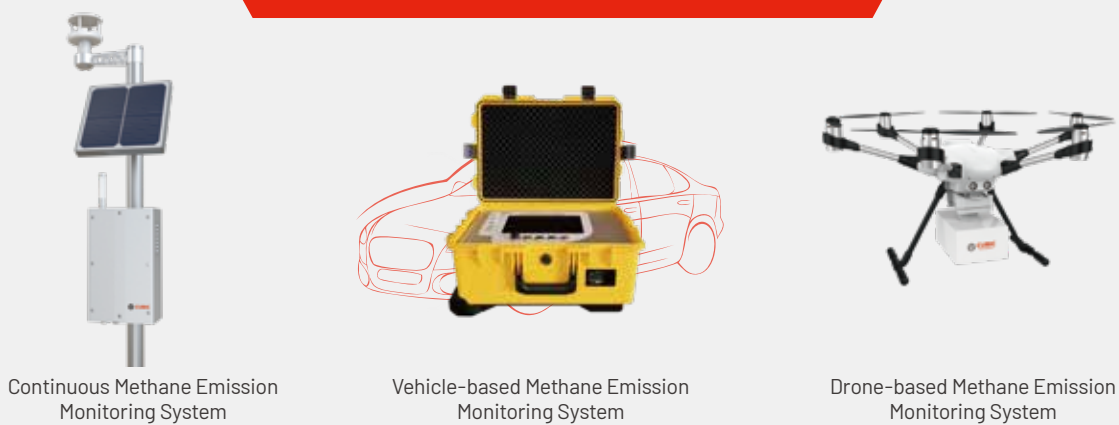
## Ensuring Gas Safety

From Cubic independently developed core high-performance gas sensors to the design and production of highly sensitive, long-lifespan gas alarm detectors, Cubic diversified product series covers both industrial and residential monitoring devices, with outstanding performance in eliminating complex environmental interference and avoiding false alarms.

Cubic is committed to helping solve various safety challenges for customers, providing reliable monitoring for critical points in gas utilisation, ensuring the safe and efficient operation of the entire natural gas value chain, and providing customers with solid safety guarantees.

# Methane Emission Monitoring and Quantification Solutions For the Oil and Gas Industry

## Site-Level Methane Quantitative Monitoring



Continuous Methane Emission Monitoring System

Vehicle-based Methane Emission Monitoring System

Drone-based Methane Emission Monitoring System

## Source-Level Methane Quantitative Monitoring



Optical Gas Imaging (OGI) Camera

Portable Methane High-Flow Sampler

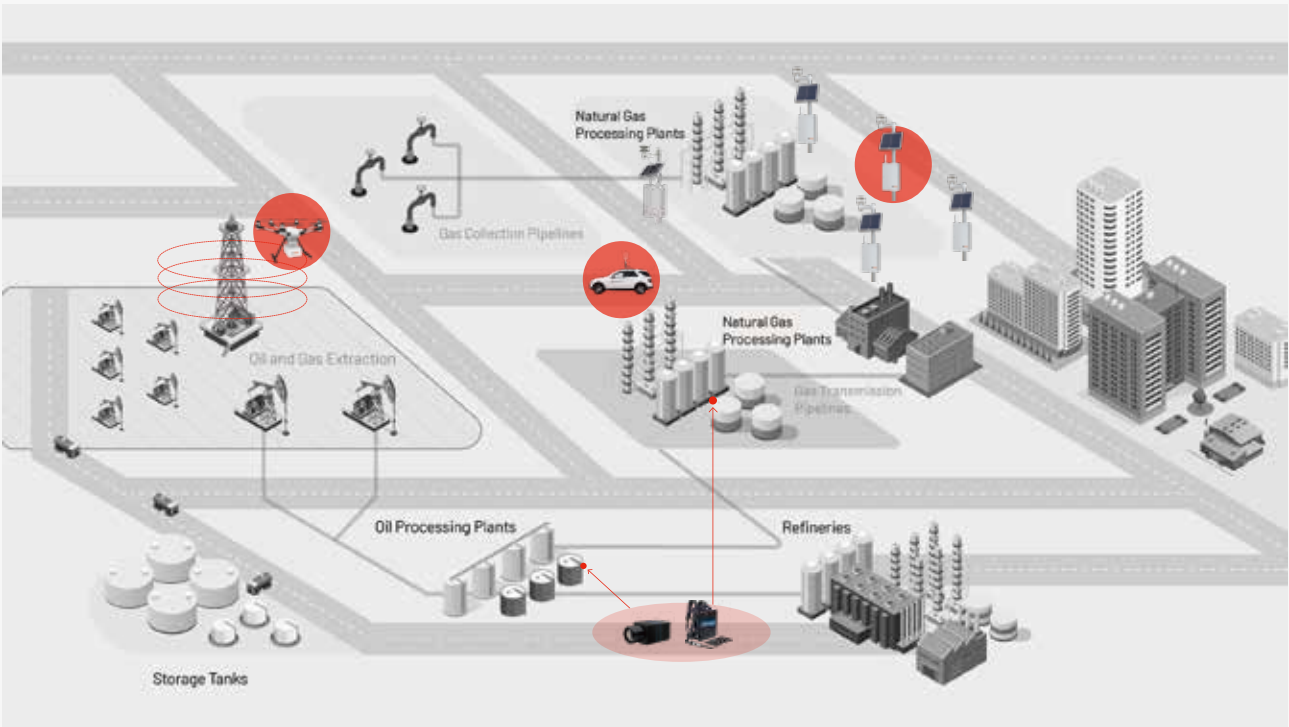
## Methane Emission Detection Sensor



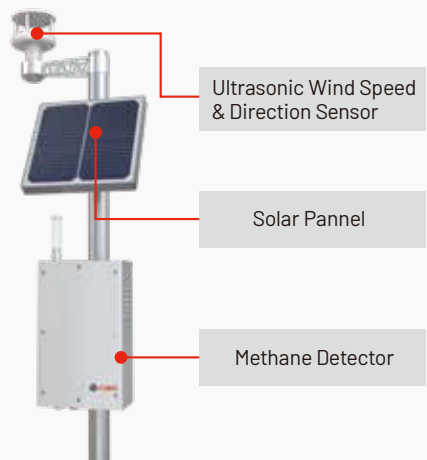
TDLAS Methane Sensor

TDLAS Methane Sensor

Small Size TDLAS Methane Sensor



# Methane Continuous Emission Monitoring System



Ultrasonic Wind Speed & Direction Sensor

Solar Panel

Methane Detector

## Introduction

Cubic methane emission continuous monitoring system is developed based on Tunable Diode Laser Absorption Spectroscopy (TDLAS) technology. It adopts narrowband laser spectral absorption technology, which has unique selectivity for methane and is unaffected by other gases, water vapor, dust, and other interferences, allowing it to operate stably in harsh field conditions and complex gas environments. The system is equipped with a high-performance probe and a specially treated gas chamber, enhancing detection accuracy and sensitivity while ensuring performance stability and a longer lifespan.

It adopts a LoRaWAN/NB-IoT module, enabling integration into the Internet of Things (IoT) for remote communication and supporting remote data transmission. It is also equipped with both rechargeable lithium batteries and solar power options, allowing for autonomous power supply during field monitoring.

## Features

- High-precision continuous quantitative measurement.
- Excellent outdoor weather resistance.
- Sensitive response and quick reaction.
- Integrated ultrasonic wind speed and direction monitoring.

## Specifications

### Basic Parameters

Gas Type	CH <sub>4</sub>
Measurement Range	0~1000ppm
Measurement Accuracy	±5ppm+2%reading
Lowest Detection Limit	1ppm
Resolution	0.1ppm
Response Time	T <sub>90</sub> <10s
Measurement Cycle	30s
Data Upload Cycle	2min
Communication	LoRaWAN/NB-IoT
Dust and Waterproof Rating	IP66
Product Lifespan	>10 years
Product Dimensions (LWH)	186mm*144mm*417mm
Product Weight	6.5kg

### Environmental Conditions

Operating Conditions	"Temperature:-20°C~60°C ; Humidity:0~95%RH(non-condensing)"
Operating Atmospheric Pressure	86kPa~106kPa
Applicable Locations	Outdoor

### Electrical Parameters

Power Supply	Li-battery+Solar energy
Max Power	2W

\* For details of technical parameters, please refer to the specification sheet. For more technical information, please contact: 86 27-8162 8829 or sales@gasalyzer.com.cn



# Vehicle-based Methane Emission Monitoring System



## Introduction

The high-precision vehicle-based methane emission detection system, independently developed by Cubic Instruments, consists of a high-precision natural gas leak detector, a high-precision Beidou positioning system, an ultrasonic anemometer, and a software platform. The system can be installed on a motor vehicle, to continuously measure the concentration of methane and low-concentration ethane in the ambient air, as well as the latitude and longitude, vehicle speed, wind direction, and wind speed in real-time while the vehicle is in motion. It enables rapid detection, identification, quantification, and assessment of methane emissions and gas leaks, as well as the identification of potential leak points, with convenient and efficient operation.

## Features

- High accuracy and fast response.
- Ultra-low drift, no need for on-site calibration.
- Domestic software to ensure data security.
- Multiple communication interfaces for seamless data transmission.

## Specifications

Gas Type	CH <sub>4</sub> ,C <sub>2</sub> H <sub>6</sub>
Measurement Principle	Mid-infrared TDLAS
Optical Path Type	Sealed
Data Acquisition Rate	10~20Hz
Sensitivity	<100ppb
Weight	<20kg
Accessories	Positioning system, anemometer
Software	Leak identification and quantification analysis capabilities, deep learning capabilities
Ethane Detection	Data acquisition rate: 10~20Hz ; Sensitivity: <15ppb

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# Drone-based Methane Emission Monitoring System



## Introduction

The high-precision UAV methane emission detection system adopts a lightweight hexacopter all-electric vertical take-off and landing UAV. It is equipped with Cubic Instruments' independently developed UAV-mounted greenhouse gas analyzer. The entire system weighs no more than 3kg, making it compact, portable, energy-efficient, and durable. Based on Tunable Diode Laser Absorption Spectroscopy (TDLAS) technology, the system features fast response and high sensitivity. The casing is made of high-corrosion-resistant materials, suitable for use in various spatial sizes and different weather conditions. It ensures successful inspection operations in complex terrains such as mountains, hills, forests, as well as in confined areas like underground pipelines or densely built-up areas.

## Features

- TDLAS Techonlogy.
- High accuracy and low detection limit.
- Strong anti-interference capability.
- Long lifetime and high corrosion resistance.
- Modular design for easy integration.

## Specifications

Gas Type	CH <sub>4</sub>
Measurement Principle	Mid-infrared TDLAS
Optical path type	Open path
Data Acquisition Rate	10~20Hz
Sensitivity	<100ppb
Weight	<3kg
Software	Leak identification and quantification analysis capabilities, deep learning capabilities
Ethane detection:	Data acquisition rate: 10~20Hz ; Sensitivity: <15ppb

\* For details of technical parameters, please refer to the specification sheet. For more technical information, please contact: 86 27-8162 8829 or sales@gasalyzer.com.cn

# Optical Gas Imaging (OGI) Camera

## Introduction

The OGI camera is a non-contact methane gas detection device. It adopts infrared imaging technology to quickly detect methane leaks in inaccessible or high-risk areas, presenting the leaks in image form for precise localization of the leak or emission source. It helps inspection personnel to rapidly identify leaks from a safe distance and take timely remedial measures, ensuring the safety of operational personnel and minimizing potential losses from leaks.

It is designed with explosion-proof rating Ex ic nc op is IIC T4 Gc and protection rating IP54, ensuring reliable performance. It is suitable for applications in various fields including petrochemical plants, refineries, well sites, oil and gas gathering stations, gas stations, natural gas pipelines, offshore oil platforms, Leak Detection and Repair (LDAR), and environmental law enforcement departments.

## Features

- OGI technology for superior gas visualization.
- Real-time methane leak localization.
- Clear imaging in low-light conditions.
- Meet Title 40 CFR Part 60 AppendixK requirement.
- User-friendly design for easy operation.



## Specifications

Resolution	320*256
Wavelength Range	3.2-3.5μm
Temperature Measurement Range	-20~350°C
Temperature Measurement Accuracy	±1°C(0~100°C), ±2%(>100°C), ±2°C(-20~0°C)
Storage	SD card,64G
Transmission Interface	US,HDMI,SD card,Wi-Fi

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# Portable Methane High-Flow Sampler

## Introduction

Cubic portable methane high-flow sampler is applied to collect the leaking gas and ambient air at high flow rates (with a maximum sampling flow rate of approximately 400 L/min) from the leaking components. By accurately measuring the sampling flow rate and the concentration of methane leaks, it calculates the amount of methane leaked. The sampler also plays a crucial role in Leak Detection and Repair (LDAR) technologies in the oil and gas sector, as well as in compiling greenhouse gas emission inventories and accounting for greenhouse gases.It can be applied to measure methane leaks in various components such as pipelines, valves, packaging, and compressor seals during the transportation, storage, and production processes of oil and natural gas

## Features

- High sensitivity, low detection limit.
- Direct measurement of methane emission rates (g/min).
- Fast and accurate quantification of methane, providing data support for carbon trading.
- Applied in upstream oil and gas fields, long-distance natural gas pipeline networks, urban gas stations,ect.



## Specifications

Gas Type	CH <sub>4</sub>
Measurement Principle	TDLAS
Leak Detection Range	0.01~13kg/h
Measurement Range	0.01%~100%
Measurement Accuracy	5% (of reading)
Charging Time	10h (operation:>8h)

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## PPM Level TDLAS Methane Sensor



### Introduction

Cubic TDLAS methane sensor is independently developed based on tunable laser absorption spectroscopy technology. It adopts narrow-band laser spectral absorption method, which has unique selectivity for methane and is not interfered by other gases, water vapor, dust, etc. It is equipped with a high-performance probe and a special process-treated gas chamber. It has the characteristics of high precision, high sensitivity, long life, and stable performance. Designed with a temperature compensation algorithm, it effectively avoids interference from the complex environment and can work stably in harsh working conditions. It can be calibrated and calibrated through the TTL communication interface. The low-power modular design is easy to install, maintain and integrate

### Features

- High accuracy, low detection limit.
- Long lifespan, strong anti-interference ability.
- High selectivity for target gas.
- Modular design, easy installation and integration.
- No need to replace parts and calibrate regularly.

### Specifications

Gas Type	CH <sub>4</sub>
Measurement Principle	TDLAS
Measurement Range	0~1000ppm
Resolution	0.1ppm
Measurement Accuracy	±5ppm+2% reading
Warm-up time	<10s
Working Conditions	-20~60°C, 0~98%RH
Working Pressure	80~120kPa
Working Voltage	3.2V~5.5V
Working Current	<100mA(@25°C,3.3V)
Communication	TTL (3.3V)
Storage	-40~85°C, 0~98%RH(non-condensing)
Dimensions (L*W*H)	278mm*97mm*84mm

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## LEL Level TDLAS Methane Sensor



### Introduction

Gasboard-2501 methane sensor is high-performance gas sensor based on tunable laser absorption spectroscopy technology (TDLAS).

Adopting a narrow-band tunable laser source, special gas chambers and optical path design, Gasboard-2501 TDLAS CH<sub>4</sub> sensor has features of great stability, high precision, enhanced fast response, humidity interference-free, low maintenance and long lifetime.

Gasboard-2501 series could measure CH<sub>4</sub> up to 100%Vol, are designed for scenarios with harsh working conditions. Suitable applications include Oil & Gas industry, energy sector, landfill monitoring, LNG transportation, gas leak detection, emission quantification, etc.

### Features

- Narrow absorbing spectrum determines great selectivity to CH<sub>4</sub>
- Laser technology to ensure superior accuracy with low drift
- Great anti-cross interference to other gases and high humidity
- Fast response time
- Low power consumption
- Long lifetime over 10 years
- ATEX & IECEx Ex ia IIC T4 Ga certified

### Specifications

Principle	TDLAS
Measurement Gas	CH <sub>4</sub>
Model	Gasboard-2501-05F;Gasboard-2501-100F
Measurement Range	Gasboard-2501-05F: 0-100%LEL (0~5%Vol);Gasboard-2501-100F: 0-100%Vol
Accuracy	Gasboard-2501-05F: ±5%LEL;Gasboard-2501-100F: ±(0.25%Vol or 5% of reading, take whichever is greater)
Resolution	Gasboard-2501-05F: 0.1% LEL;Gasboard-2501-100F: 0.01%Vol
Response Time	T90<20s
Output	UART_TTL (3V)
Working Condition	-25 ~ 55 °C , 0~98%RH (non-condensing)
Storage Condition	-40 ~ 85 °C , 0~98%RH (non-condensing)
Power Supply	3.2~5.5V DC
Working Current	<30mA (@25 °C , 3.3V DC)
Dimension	Φ35mm*H57.5mm

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# Small Size TDLAS Methane Sensor



## Introduction

Cubic Small Size TDLAS CH<sub>4</sub> Sensor is developed based on Tunable Laser Absorption Spectroscopy (TDLAS) technology, which is a high-precision optical measurement technology that achieves ultra-low detection limit and high resolution through multiple reflections in a long optical path. Aiming at low-concentration methane leakage in the atmospheric background, Cubic Small Size TDLAS CH<sub>4</sub> Sensor can achieve highly selective and accurate methane leakage detection, with a high resolution of 0.1ppm. Furthermore, it boasts fast response times with a warm-up time of less than 10 seconds. Based on the temperature compensation algorithm and self-diagnosis function, it ensures stable performance even in harsh working conditions and complex environments. In addition to its core performance features, Cubic Small Size TDLAS CH<sub>4</sub> Sensor also has an intelligent power consumption design and a long lifespan of more than 10 years. Due to its small size of  $\Phi 50 \times 162\text{mm}$ , it is easy to integrate into drones that can be applied in oil and gas industry for methane emission monitoring.

## Features

- Narrowband laser absorption spectroscopy technology.
- Measurement range from 0 to 1000 ppm.
- Fast response speed, high measurement accuracy, and long lifespan.
- High selectivity for methane, unaffected by other gases, water vapor, or dust.
- Low power consumption, modular design, easy to integration.

## Specifications

Test Gas	Methane (CH <sub>4</sub> )
Principle	Tunable Diode Laser Absorption Spectroscopy (TDLAS)
Measurement Range	0 ~ 1000 ppm
Measurement Accuracy	± (5 ppm + 2% reading) @ 10°C ~ 40°C; ± (10 ppm + 2% reading) @ -10°C ~ 10°C & 40°C ~ 50°C
Resolution	0.1 ppm
Warm-up	<10s
Response Time	T <sub>90</sub> <5s@1L/min
Operating Temperature	-10°C ~ 50°C
Operating Humidity	0 ~ 98% RH (non-condensing)
Operating Voltage	5 V±5%
Operating Current	< 200 mA (@ 25°C, 5 V)
Output	TTL (3.3 V)
Dimensions	$\Phi 50 \times 162\text{ mm}$
Weight	480 g

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# Natural Gas Composition and Calorific Value Solutions

## Laser Raman Technology-Based Products



Laser Raman Gas Analyzer  
LRGA-6000



In-Situ Laser Raman Gas Analyzer  
LRGA-3200EX

## Expanded Monitoring Applications



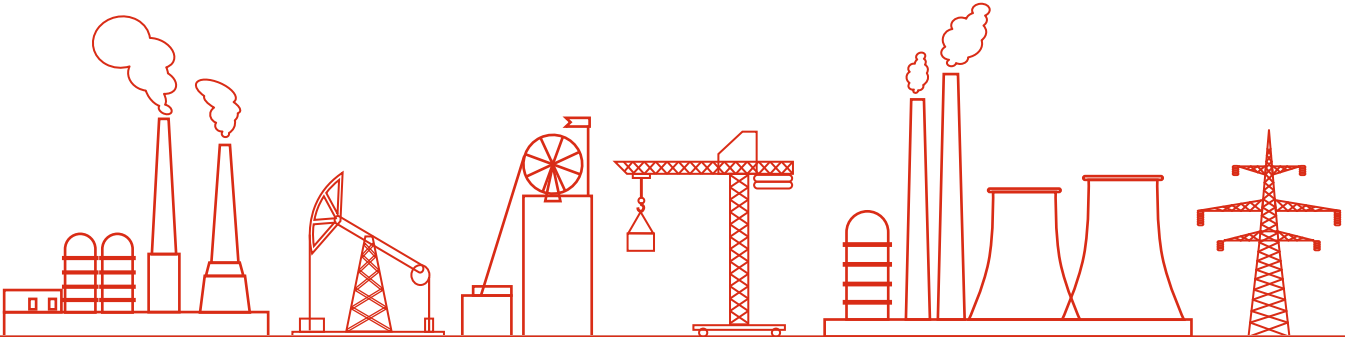
Portable Infrared  
Natural Gas Calorimeter



Ultrasonic Natural Gas Flow Meter



TDLAS Moisture Analyzer



# Laser Raman Gas Analyzer



## Introduction

Cubic Laser Raman gas analyzer is based on the principle of laser Raman scattering. It can simultaneously detect multiple gas components and calorific values online and in real time by enhancing, collecting, processing and identifying the characteristic Raman scattering spectrum of the gas to be tested and quantitatively calculating the content. It is suitable for various fields such as natural gas trading energy pricing, natural gas exploration logging, LNG metering, and natural gas distributed energy.

## Features

- Replacement of gas chromatography, mass spectrometry.
- Non-destructive analysis of gases like CO, CO<sub>2</sub>, CH<sub>4</sub>, C<sub>2</sub>H<sub>2</sub>, C<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>6</sub>, C<sub>3</sub>H<sub>8</sub>, H<sub>2</sub>O, H<sub>2</sub>S, NH<sub>3</sub>, iC<sub>4</sub>, nC<sub>4</sub> etc. including homonuclear diatomics (H<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>).
- Ultra-fast response time, second by second.
- Wide detection range with high resolution and accuracy.
- Automatic compensation to temperature and pressure for maximum stability.
- Rugged with minimal utility requirements, no sample transport, and no consumables.

## Specifications

Gas Type	CH <sub>4</sub> , C <sub>2</sub> H <sub>6</sub> , C <sub>3</sub> H <sub>8</sub> , iC <sub>4</sub> , nC <sub>4</sub> , C <sub>5</sub> +, H <sub>2</sub> S, H <sub>2</sub> , N <sub>2</sub> , O <sub>2</sub> , CO, CO <sub>2</sub>
Measurement Range	"Min range: (0-10)% ; Max Range: (0-100)%"
Linearity Error	≤2%F.S.
Resolution	0.01%
Response Time	≤90s
Drift	≤2%F.S./24h

\* For details of technical parameters, please refer to the specification sheet. For more technical information, please contact: 86 27-8162 8829 or sales@gasanalyzer.com.cn

# In-Situ Laser Raman Gas Analyzer



## Introduction

LRGA-3200EX is an advanced analysis system suitable for various complex and hazardous conditions. Based on Laser Raman, it excites, collects, processes, and identifies the characteristic Raman Scattering spectra of target gases to achieve qualitative and quantitative analysis. With in-situ installation and measurement, it can perform non-destructive gas analysis of nearly 20 components continuously. It can be equipped with up to 4 explosion-proof probes operating simultaneously, eliminating the manual switching in conventional multi-channel sampling systems. With fast response and data refresh times, it enables efficient process monitoring, enhanced production efficiency, and superior safety standards. Unlike GC systems, it requires no consumables, such as valves, ovens, columns, or carrier gases, significantly reduced maintenance costs. It supports multiple communication protocols including RS-232/RS-485, TCP/IP, USB, and 4-20mA, for remote control and centralized management.

## Features

- Non-destructive continuously analysis of gases like CO, CO<sub>2</sub>, CH<sub>4</sub>, C<sub>2</sub>H<sub>2</sub>, C<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>6</sub>, C<sub>3</sub>H<sub>8</sub>, H<sub>2</sub>O, H<sub>2</sub>S, NH<sub>3</sub>, iC<sub>4</sub>, nC<sub>4</sub>, etc., including homonuclear diatomics like H<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>.
- Strong anti-interference based on Laser Raman gas characteristic fingerprint spectrum technology.
- Simultaneous monitoring of multiple points gas monitoring for comprehensive process control.
- In-situ Raman probes installation at sampling points, suitable for long-distance and harsh conditions.
- Positive pressure explosion-proof design prevents toxic and flammable gas entry.
- Low maintenance, no consumables required.

## Specifications

Measurement Components	H <sub>2</sub> , N <sub>2</sub> , O <sub>2</sub> , CO, CO <sub>2</sub> , H <sub>2</sub> S, CH <sub>4</sub> , C <sub>2</sub> H <sub>2</sub> , C <sub>2</sub> H <sub>4</sub> , C <sub>3</sub> H <sub>8</sub> , iC <sub>4</sub> , nC <sub>4</sub> , Calorific Value, etc.
Measurement Range	0-100% (can be customized)
Accuracy	±1%F.S.
Repeatability	1%F.S.
Power Supply	100~240VAC, 50~60Hz (standard)
Maximum Powe	<200W
Communication	RS-232/RS-485, TCP/IP, USB, 4~20mA
User Interface	Exproof Touch Screen
Dimension	540*300*900 (mm)
Weight	75kg
Probes	Up to 4 pcs
IP Degree	IP65
Ex-proof Degree	ExdIICT4Gb
Operating Temperature	(Probe/Sample gas): -20~600°C; (Analyzer): -35~40°C
Opetating Humidity	95%RH (non-condensed)
Max working pressure	4MPa
Optic Fiber Cable Length	5m (can be customized)

\* For details of technical parameters, please refer to the specification sheet. For more technical information, please contact: 86 27-8162 8829 or sales@gasanalyzer.com.cn



# Portable Infrared Natural Gas Calorimeter

## Introduction

Cubic portable infrared natural gas calorimeter is powered by Li-ion battery and can be used without AC power supply. It is used for measurement of the concentration of CO ,CO2 and O2 in sample gases simultaneously, calculating combustion efficiency and Lambda. It is based on the single source two beams non-dispersion infrared (NDIR) method for CO ,CO2,fuel cell method (ECD) for O2.

## Features

- Based on Innovative NDIR technology.
- Able to measure CO, CO2 and O2 gases, and gas temperature simultaneously.
- Real time calculate excess air coefficient.
- Built-in sampling pump.
- Auto air zeroing.
- Touch Screen.
- USB and RS232 output.
- Optional extensible to measure pressure difference, calculating combustion efficiency, gas velocity, gas flow.
- Data logging software available.
- Simple pretreatment device(optional).



## Specifications

Gas Type	CH4, CO2, CnHm*, calorific value
Principle	NDIR
Measurement Range	CH4, CO2:0~100%; CnHm:0~10%
Linear Error	±1%F.S.
Resolution	0.01%
Repeatability	<1%
Response Time	T90<10S(NDIR)
Optimal Flow Rate	0.7~1.2L/min
Inlet Pressure	2~50kPa
Sample Gas Requirements	No dust, no water, no oil

### Electrical Parameters

Communication	RS-232
Power Supply	Built-in rechargeable lithium battery power supply, external 12.6V charger
Display	LCD Display
Functional Configuration	Built-in imported sampling air pump with self-diagnosis function, status online check

\* For details of technical parameters, please refer to the specification sheet. For more technical information, please contact: 86 27-8162 8829 or sales@gasanalyzer.com.cn

# Ultrasonic Natural Gas Flow Meter

## Introduction

Cubic high-performance intelligent flow meter series is designed specifically for urban gas distribution measurement. It is primarily used for the cumulative measurement of flammable gas flow. It employs the ultrasonic technology to measure the flow rate, featuring an ultra-low starting flow and extremely high sensitivity and measurement efficiency. It has a wide flow range ratio, allowing for accurate measurements across a large flow range, fully covering urban pipelines. Through multi-channel measurement, it can detect multiple profiles of the fluid, effectively eliminating the influence of vortices and asymmetric flow fields on measurement results, and providing necessary redundancy capabilities, with a measurement accuracy level of Class 1.0.

## Features

- Ultrasonic technology for high precision and long lifespan, no special maintenance during long-term operation.
- Multi-channel design effectively eliminates challenges related to unstable flow field monitoring.
- Equipped with temperature and pressure sensors, enabling accurate measurements through compensation.
- No moving parts, resistant to corrosion, minimal pressure loss.
- Digital design with full functionality and an intuitive display.
- Highly integrated, easy to install.



## Specifications

Product	DN50	DN80	DN100	DN150	DN200	DN250
Measurement Principle	Ultrasonic					
Number of Channels	2	2	2	3	4	4
Measurement Range (m³/h)	2.5~150	6~360	10~600	26~1300	40~2000	75~3000
Accuracy Class	1.0 Class					
Transition Flow (m³/h)	15	36	60	130	200	300
Indication Error	Qmin≤Q<Qt, ≤±2.0%      Qt≤Q≤Qmax, ≤±1.0%					
Fluid Medium	Single-phase Gases: Natural gas, liquefied petroleum gas (LPG), air, etc.					
Medium Temperature	-20~60°C					
Nominal Pressure	≤1.6MPa					
Operating Pressure	≤0.6MPa					
Ambient Temperature	-25~55°C					
Power Supply	External power supply: 24VDC, built-in lithium battery: 3.6V					
Signal Output	RS-485, 4~20mA, Modbus					
Wireless Communication	GPRS					
LCD Display	Cumulative total (standard conditions), standard instantaneous flow, working instantaneous flow, temperature, pressure, battery level, etc.					
Installation	Flange connection installation					

\* For details of technical parameters, please refer to the specification sheet. For more technical information, please contact: 86 27-8162 8829 or sales@gasanalyzer.com.cn

# TDLAS Moisture Analyzer

## Introduction

Cubic TDLAS moisture analyzer is a high-performance optical device for measuring gas humidity. It features high measurement accuracy, fast response speed, high sensitivity, and reliable stability. It also includes alarm output, analog signal output, and a variety of communication interfaces. It supports both humidity volume ratio and dew point value display, making it suitable for dew point detection in low-temperature processes in natural gas liquids (NGL) recovery units and liquefied natural gas (LNG) production.

## Features

- Customizable measurement range.
- TDLAS principle, long lifespan, fast response.
- Accurate measurement, high sensitivity, stable and reliable.
- No need for cooling, unaffected by background gases.
- Multiple output methods available: analog/digital signals.
- High explosion-proof and protection rating.

## Specifications

Type	H2O
Measurement Principle	TDLAS
Measurement Range	0~50ppm~6000ppm
Measurement Accuracy	±2%F.S.
Resolution	0.1 ppm
Repeatability	<1.5%FS
Explosion-Proof Rating	Ex d IIC T6
Protection Rating	IP66
Ambient Temperature	-20°C~60°C
Working Humidity	0~98%RH(non-condensing)
Working Pressure	Inlet gas:140~310kPa; gas chamber:800~1200mbara
Power Supply	24 VDC±20%/100~240 VAC±10%, 50/60Hz, 10W
Communication Interface	RS-485, 4~20mA, Modbus, Ethernet

\* For details of technical parameters, please refer to the specification sheet.For more technical information, please contact: 86 27-8162 8829 or sales@gasanalyzer.com.cn

# Natural Gas Leakage Safety Monitoring Solutions

## Natural Gas Leakage Alarm Detector



Toxic and Harmful Gas Detector



NDIR Flammable Gas Detector



Residential NDIR Flammable Gas Detector



Residential TDLAS Flammable Gas Detector

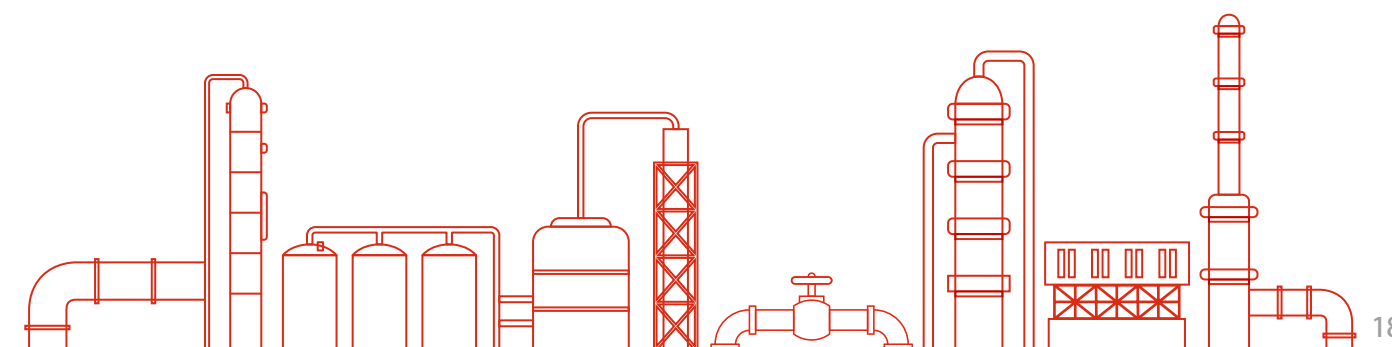
## Natural Gas Leakage Detection Sensor



TDLAS Methane Sensor



Miniature NDIR Methane/Propane/CO2 Sensor



# Toxic and Harmful Gas Detector

## Introduction

Cubic toxic and harmful gas alarm detector adopts electrochemical technology (ECD) and is mainly appliedd for H2S gas leakage detection and alarm in areas such as natural gas, coalbed methane, landfills, wastewater treatment, and anaerobic fermentation.

## Features

- Electrochemical technology for accurate measurement of H2S.
- Applicable in anaerobic environments.
- Temperature compensation and automatic zero-point calibration.
- Long lifetime with no sensor poisoning issues.
- Explosion-proof rating: Ex d IIC T6 Gb, meeting safety alarm requirements for gas leakage in multiple fields.



## Specifications

Gas Type	H2S
Principle	ECD
Measurement Range	0~100ppm
Measurement Accuracy	±2μmol/mol / ±10%
Resolution	1%LEL
Response Time	T90<30s
Warm-up	30s
Sampling	Diffusion
Explosion-proof Grade	Ex d IIC T6 Gb
Siganl Output	RS-485, 2 relay normally open contact, 1 4~20mA current output

Working Temperature	-20~60℃
Working Humidity	≤95%RH
Storage	-40~85℃

Power Supply	DC 12~24V
Display	LCD

\* For details of technical parameters, please refer to the specification sheet.For more technical information, please contact: 86 27-8162 8829 or sales@gasanalyzer.com.cn

# NDIR Flammable Gas Detector

## Introduction

Cubic NDIR fammable gas detector is mainly used for CH4 gas leakage detection and alarm in application scenarios including natural gas, coalbed methane, landfills, wastewater treatment, and anaerobic fermentation.

## Features

- NDIR technology ensures that CH4 measurements are not affected by interference from other gases.
- Applicable in anaerobic environments.
- Temperature compensation and automatic zero-point calibration.
- Long lifetime with no sensor poisoning issues.
- Explosion-proof rating: Ex d IIC T6 Gb, meeting safety alarm requirements for gas leakage in multiple fields.



## Specifications

Gas Type	CH4
Principle	NDIR
Measurement Range	0~100%LEL
Measurement Accuracy	±5%F.S.
Resolution	1%LEL
Response Time	T90<30s
Warm-up	30s
Sampling	Diffusion
Explosion-proof Grade	Ex d IIC T6 Gb
Siganl Output	RS-485, 2 relay normally open contact, 1 4~20mA current output

Working Temperature	-20~60℃
Working Humidity	≤95%RH
Storage	-40~85℃

Power Supply	DC 12~24V
Display	LCD

\* For details of technical parameters, please refer to the specification sheet.For more technical information, please contact: 86 27-8162 8829 or sales@gasanalyzer.com.cn



## Residential NDIR Flammable Gas Detector



### Introduction

Cubic residential gas alarm detector employs NDIR (Non-Dispersive Infrared) technology, for accurate measurement of CH<sub>4</sub> gas. When natural gas leakage reaches an alarm concentration, the detector emits an audible and visual alarm signal. The product has a long lifespan and requires no maintenance, effectively reducing user costs. It also boasts high accuracy and strong interference resistance, making it particularly suitable for the complex environments of Chinese kitchens, ensuring no false alarms or missed detections.

### Features

- Long lifespan for over 10 years.
- High precision, NDIR technology minimizes false alarms and missed detections.
- Strong interference resistance from acetic acid, ethanol, and silicon poisoning.
- Specifically designed for the complex environments of home kitchens, featuring oil smoke and water mist resistance.
- High reliability.
- Dual alarm with local and remote notifications to users in a timely manner.
- Compact design, easy to install.
- Customizable communication options, NB-IoT, Wi-Fi, and 4G.

### Specifications

Gas Type	CH <sub>4</sub>
Principle	NDIR
Measurement Range	0~100%LEL
Measurement Accuracy	±3%LEL
Alarm Concentration	10%LEL (5~25% LEL adjustable)
Response Time	≤30s (Diffusion)
Alarm Method	Audio and light alarm/mobile phone APP notification
Electromagnetic Valve Linkage	Yes
Dimensions	91.2mm*91.2mm*34.1mm
Communication	Wire/Wireless
Lifespan	10 years
Indicator Light Status	"Green light always on: normal operation
	Red light always on: gas alarm
	Yellow light always on: fault information
	Yellow light flashing: sensor expired
	Network distribution: Green light flashing"
Applicable Locations	Indoor

## Residential TDLAS Flammable Gas Detector



### Introduction

Cubic residential methane gas detector is developed based on TDLAS technology. It can be applied in areas like kitchens where gas (CH<sub>4</sub>) leaks may occur. It will trigger an audible and visual alarm When the methane gas concentration in the air exceeds a set threshold. It also can be connected to an alarm control panel and a monitoring center, to send networked alerts and shut off the gas pipeline valve. Additionally, real-time monitoring is available via a mobile app, which will display pop-up alarm notifications if the methane gas concentration exceeds the alarm threshold, ensuring the safety of life and property.

### Features

- High selectivity for methane, unaffected by other gases, water vapor, or dust.
- High accuracy across the full temperature and measurement range.
- Fast response.
- Plug-and-play operation, easy to use.
- Resistant to high concentrations of acetic acid and ethanol, preventing false alarms.
- High reliability and long lifespan (10 years), maintenance-free.
- Historical data recording and query, automatic recording of alarm events, automatic storage and update.

### Specifications

Principle	Tunable Diode Laser Absorption Spectroscopy (TDLAS)
Gas Type	Methane (CH <sub>4</sub> )
Measurement Range	0~100%LEL
Measurement Accuracy	±3%LEL
Alarm Concentration	10%LEL (5~25%LEL adjustable)
Response Time	<10s (diffusion type)
Alarm Method	Audio and light alarm/mobile phone APP notification
Alarm Reset	① Automatically clear when the ambient concentration is lower than the alarm threshold
	② Manually clear
Electromagnetic Valve Linkage	Yes
Indicator Light Status	Green light always on: normal operation
	Red light always on: gas alarm
	Yellow light always on: fault information
	Yellow light flashing: sensor expired
	Network distribution: Green light flashing
Dimensions	112*112*34(mm)
Product Weight	<300g
Communication	NB-IoT
Lifespan	10 years
Compliance	GB 15322.2-2019
Certification	Fire protection (voluntary) certification, RoHS2.0
Working Conditions	-10°C~+55°C; 0~93%RH(non-condensing)
Storage Conditions	-30°C~+70°C; 0~93%RH (non-condensing)
Working Pressure	80kPa~120kPa
Applicable Locations	Indoor
Input Voltage	AC100~240V(50/60Hz)
Rated Power	3W
Electromagnetic Valve Drive Method	12.5VDC 1s±0.1s instantaneous DC pulse

## Miniature NDIR Methane/Propane/CO2 Sensor



### Introduction

SJH-5BUL methane sensor is an ultra low power and dual beam gas sensor based on Non-Dispersive Infra-Red (NDIR) technology. Adopting ultra low power LED emitter, Cubic mature technology platform and standard industrial 4-series design, SJH-5BUL sensor has features of ultra low power consumption, super fast response time, superior signal stability, high precision, and long lifetime, etc. SJH-5BUL could measure CH<sub>4</sub> up to 100%LEL, are designed for hazardous areas that require for battery-powered portable or transportable detector, outdoor solar-powered IoT device and other low-power based wireless monitors. Suitable applications include Oil & Gas industry, LNG transportation, gas leak detection, underground utility vaults, sewers, industrial plants, etc.

### Features

- Dual-beam NDIR technology
- Average working current less than 1mA
- Superior fast T90 time < 15s
- Linearization and factory calibration for accurate digital output
- Matrix calibration to ensure high accuracy over full-temperature
- Embedded temperature and humidity compensation
- Long lifespan over 10 years
- Ex-proof grade Ex ia II C T4 Ga

### Specifications

Principle	NDIR
Measurement Gas	CH <sub>4</sub>
Model	SJH-5BUL
Measurement Range	0-100%LEL (0-5%Vol)
Accuracy	0~2.50%vol (0~50% LEL): ±0.15%vol (±3%LEL) 2.50%vol~5.00%vol (50%~100% LEL): ±0.25%vol (±5% LEL)
Resolution	0.01%Vol
Response Time	T90<15s
Output	UART-TTL (3V)
Working Condition	-40 ~ 70 °C, 0~98%RH (non-condensing)
Storage Condition	-40 ~ 70 °C, 0~98%RH (non-condensing)
Power Supply	3.3~5.5V DC
Working Current	0.8mA (@25 °C, 3.3V DC)
Dimension	Φ 20mm*H16.6mm

\* For details of technical parameters, please refer to the specification sheet. For more technical information, please contact: 86 27-8162 8829 or sales@gasalyzer.com.cn

## COMPANY PROFILE

Cubic Instruments (Wuhan) Ltd. (hereinafter referred to as "Cubic Instruments") is a wholly-owned subsidiary of Cubic Sensor and Instrument Co., Ltd. (stock code 688665). Established in 2010, Cubic Instruments is a high-tech enterprise specializing in providing gas composition and gas flow measurement solutions in the fields of environmental monitoring, process gas monitoring, and smart metering.

Based on the advantage of Cubic Sensor core gas sensing technology platform, Cubic Instruments developed a series of gas analyzers with advanced technical principles, such as non-dispersive infrared (NDIR) technology, ultraviolet differential absorption spectroscopy (UV-DOAS) technology, laser Raman (LRD) technology, ultrasonic (Ultrasonic) technology, thermal conductivity (TCD) technology, light scattering detection (LSD) technology and etc. Widely used in environmental monitoring, metallurgy, coal chemical, biomass energy and other industries and play an important role in energy saving and emission reduction. Cubic Instruments independently developed and produced portable infrared biogas analyzer, micro-flow infrared flue gas analyzer, and infrared gas analyzer have successively obtained the national key new product certificate, and the infrared gas analyzer has won the honor of the outstanding product award of the Chinese Instrument and Control Society, and its core technology Won the Hubei Province Invention Patent Gold Award. The "Research and Industrialization of Micro-flow Infrared Flue Gas Sensors" was awarded by the Ministry of Industry and Information Technology for the key "products and processes" one-stop application program demonstration project of the Ministry of Industry and Information Technology in 2019, and Cubic Instruments was awarded the "one-stop" application program demonstration enterprise.

With decade-long dedications in technical innovations, strict quality control and global business strategies, Cubic Instruments products have been exported to many countries and regions, besides, Cubic Instruments is moving towards a higher target to be the international brand in the field of high-end value-added applications of gas analysis instruments.



Cubic Headquarter



Cubic R&D Center/Cubic Instruments



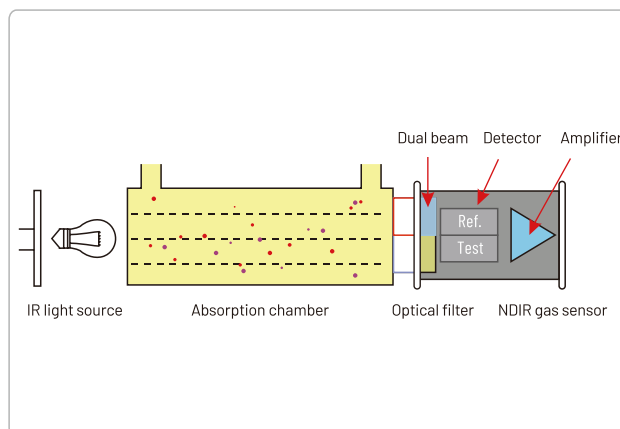
Cubic Jiashan Factory



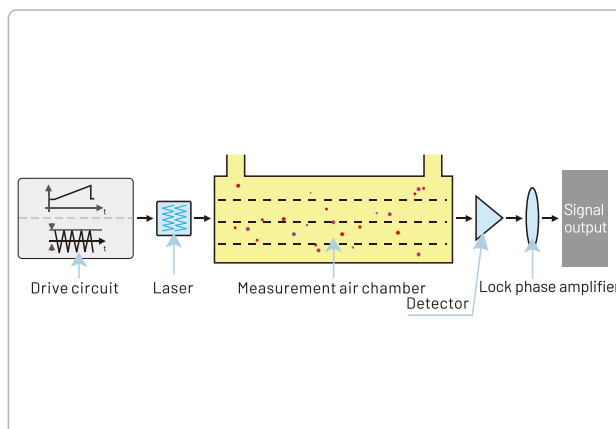
Cubic Hungary Factory

# Core Technologies

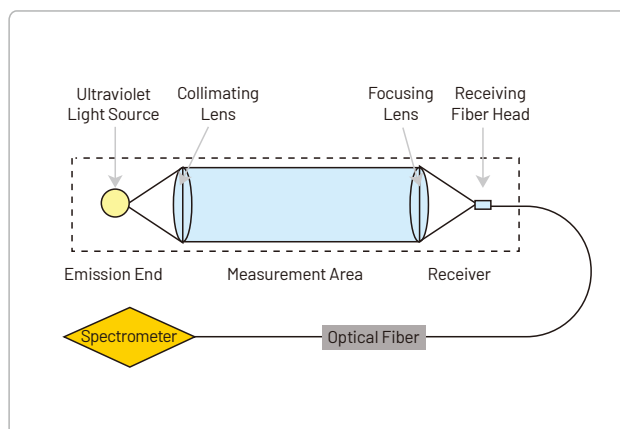
## NDIR Gas Sensor Technology



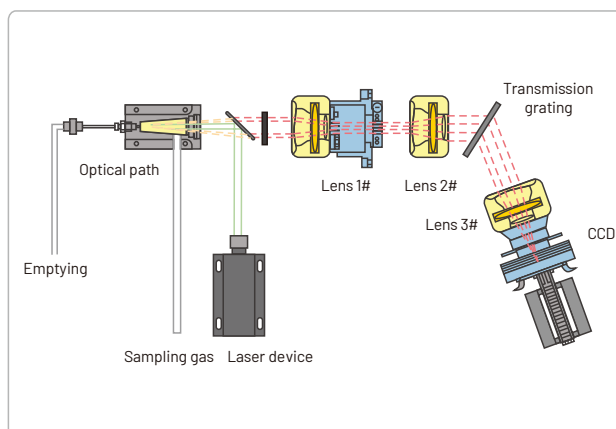
## TDLAS Gas Sensor Technology



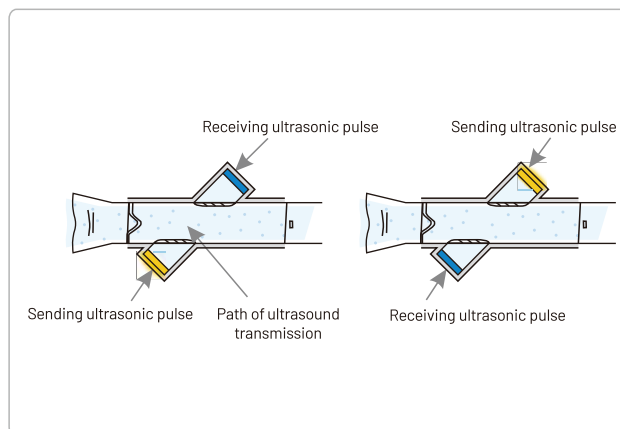
## UV-DOAS Gas Sensor Technology



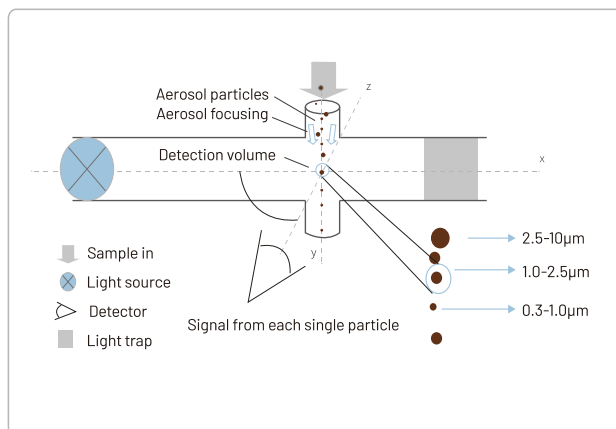
## Laser Raman Gas Sensor Technology



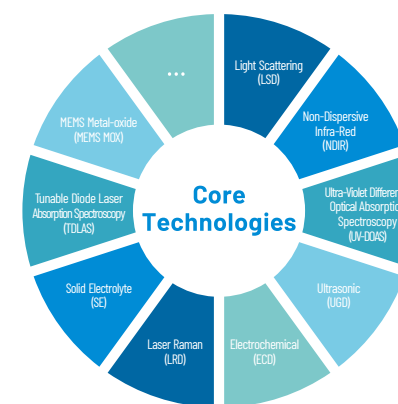
## Ultrasonic Gas Sensor Technology



## Light Scattering Particle Sensor Technology



# Core Technologies



**22 Years**  
NDIR and NDUV Technologies

**17 Years**  
Ultrasonic Technology

**15 Years**  
Laser Raman Technology

**10 Years**  
MEMS MOX Technology

# Research & Development Capabilities



300+ R&D engineers



5000+ m<sup>2</sup> gas sensor reliability testing center



Over 30 technology projects



CNAS certification



CMA certification



UL60335-2-40 certification



Intertek laboratory certification

# Patents

Total **233** patents obtained

