

Laser Gas Analyzer

LGT series



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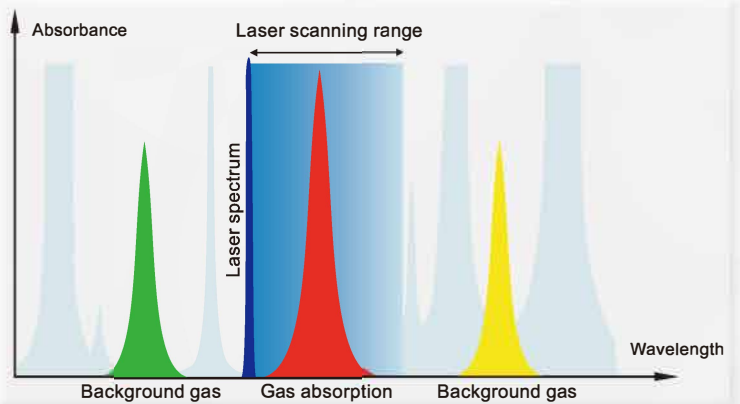
Hangzhou Zetian Technology Co.,Ltd.

▶▶ TDLAS Tunable Diode Laser Absorption Spectroscopy

■ TDLAS Technology

TDLAS (Tunable Diode Laser Absorption Spectroscopy) mainly uses the character that tunable laser's narrow band and wavelength change with the current. By periodically modulating the current, the laser wavelength can be periodically changed within a small range, and the "single-line absorption spectrum" data of the measured gas can be obtained in each cycle. At present, the TDLAS technology has developed into a kind of high sensitivity, high resolution, fast response and high selectivity of gas detection technology, widely used in the molecular spectroscopy, industrial process monitoring control and diagnosis analysis, the engine combustion process efficiency and motor vehicle exhaust measuring trace, explosive detection, the atmosphere pollution monitoring, etc..

By using a tunable semiconductor laser, LGT series laser gas analyzer scans the specific absorption lines of the measured gas(no background gas) to get the second harmonic of the gas. Through processing and analyzing the second harmonic and the broadening information of the gas, the concentration of the gas is obtained.



■ Technical Characteristics

■ High selectivity

TDLAS is high resolution spectrum technology, due to the "fingerprint" characteristics of the molecular spectrum, it is not affected by the interference of other gases. This feature has obvious advantages compared with other methods .

■ High versatility

TDLAS is an effective general technology to all activist with infrared absorption. Only need to change laser and standard gas, the same instruments can be convenient to measure the other components. Based on this characteristic, it can be easily changed to multi-component measurement instrument.

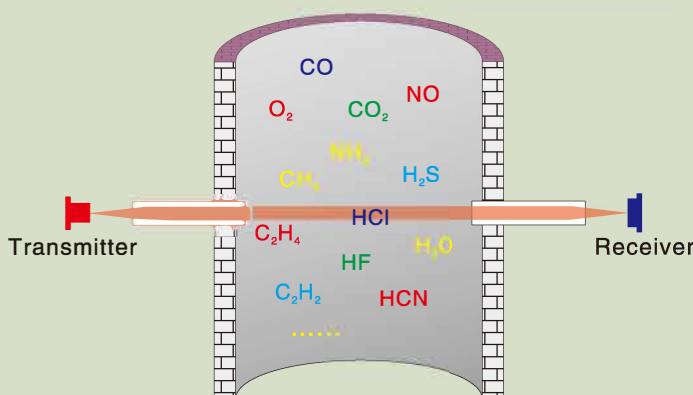
■ High sensitivity

TDLAS has the advantages of rapid response speed and high sensitivity. In the case of not losing sensitivity, its time resolution can be found in ms level.

Gas Detection Parameters

Gas	Detection Limit	Range
O ₂	0.01%Vol.	0 ~ 1%Vol., 0 ~ 25%Vol.
CO	0.5ppm	0 ~ 100ppm, 0 ~ 100%Vol.
CO ₂	1.5ppm	0 ~ 200ppm, 0 ~ 100%Vol.
H ₂ O	0.1ppm	0 ~ 30ppm, 0 ~ 100%Vol.
H ₂ S	2ppm	0 ~ 200ppm, 0 ~ 30%Vol.
HCl	0.01ppm	0 ~ 100ppm, 0 ~ 50%Vol.
HF	0.02ppm	0 ~ 20ppm, 0 ~ 50%Vol.
HCN	0.2ppm	0 ~ 50ppm, 0 ~ 1%Vol.
NH ₃	0.2ppm	0 ~ 10ppm, 0 ~ 100%Vol.
CH ₄	10ppm	0 ~ 200ppm, 0 ~ 100%Vol.
C ₂ H ₂	0.1ppm	0 ~ 50ppm, 0 ~ 100%Vol.
C ₂ H ₄	0.5ppm	0 ~ 100ppm, 0 ~ 100%Vol.

I : Test conditions of 1m optical path, 1bar gas pressure, 300k gas temperature
II : By increasing optical path, it is proportional to the decline in detection limit



Solutions

Laser Pr

Product Introduction

Based on unique tunable diode laser absorption spectrum technology, Hangzhou Zetian Technology Co., Ltd. has designed and developed LGT series laser gas analyzer for industrial online analysis and environmental online monitoring with different types including in-situ probe type, bypass type, multi-channel type, panel mounted type and flameproof type, etc. Laser gas analyzers are used in a wide variety of applications to measure O₂, CO, NH₃, CO₂, CH₄, H₂O, HCl and HF, etc. Measuring concentration ranges from constant to trace.

Product Characteristics

LGT-100(in-situ)



- In-situ installation, real-time measurement.
- Integrated flameproof structure design, high reliability.
- Modular design, laser module is replaceable on site, convenient maintenance.
- Easy optical path adjusting, XY direction non-coupling adjusting (patented technology).

LGT-106(by-pass)



- Auto calibration, auto backblow.
- Support laser module replacement on site, convenient maintenance.
- Suitable for extreme conditions (high temperature, high humidity, high pressure, high dust etc.) and small pipes.
- Integrated flameproof structure design, no moving parts, high reliability.

LGT-150(multi-channel)



- Central station control, support up to 8 channels.
- High price performance ratio, reduce cost effectively.
- Support up to 1000 meters from probe to the central unit.
- Distributed computing, any failure of a probe does not affect the normal operation of central unit or other probe.

LGT-180(panel mounted)



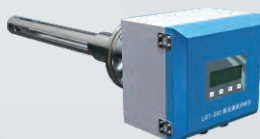
- Reflected light range can be adjusted, measurement ranges from constant to trace.
- Adopting white pool allows folded optical path up to 25 meters, low detection limit.
- The chassis can provide two colors of white and black to choose.
- 19"3U panel chassis, convenient to integrate with cabinet.

LGT-200(flameproof)



- Optical non-contact measurement, small drift.
- Flameproof design, hall button operation.
- Flameproof chassis is separable from back board, easy maintenance.
- Combine TDLAS technology and long optical path technology to improve detection limit.

LGT-350(single-ended)



- Single - end measurement, light path need not complex adjustment.
- Online calibration without disassembly.
- Optical non-contact measurement, small drift, long life.
- "Single line spectrum" technique, high measurement accuracy.

LGT-510(module)



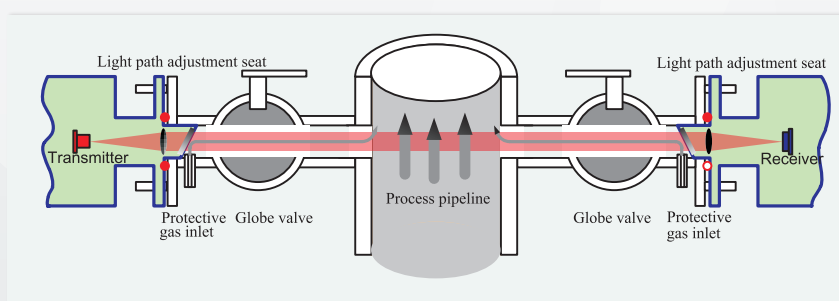
- Small size, light weight, easy to carry.
- Modular design for easy integration.
- Multipath reflection absorption pool, low detection limit.
- No moving parts, compact structure and high reliability.

▶▶▶ LGT-100 Laser Gas Analyzer

LGT-100 is a flameproof tunable laser gas analyzer based on TDLAS technology, which can in-situ analyze O_2 , CO , NH_3 , CO_2 , CH_4 , H_2O , HCl , HF and other gases in various complex conditions. It consists of transmitter, receiver and connection box. The transmitter drives the tunable diode to emit laser of certain wavelengths, which passes through the environment to be measured, then reaches the receiver. The receiver performs photoelectricity conversion, signal processing and spectrum data analysis to obtain the measuring result. The connection box contains I/O interface, making the connection of power cable and signal cable convenient.



System Composition

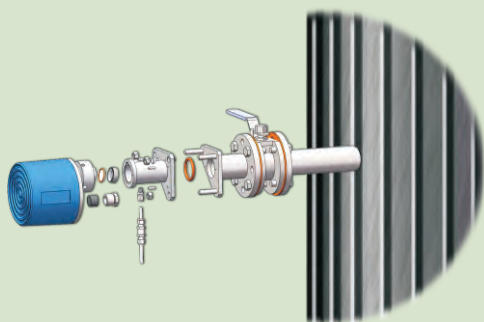


Features

- Easy optical path adjusting, XY direction non-coupling adjusting.
- Small drift, long maintenance period, drift $\leq \pm 1\%F.S./half\ year$.
- "Single line" spectrum technology, free from interference of background gas.
- Integrated structure design, high stability and reliability.
- Integrated flameproof structure, consuming less purge gas compared with positive-pressure mode.
- In-situ measurement without pretreatment system avoids adsorption, blockage and damage, reduces cost.

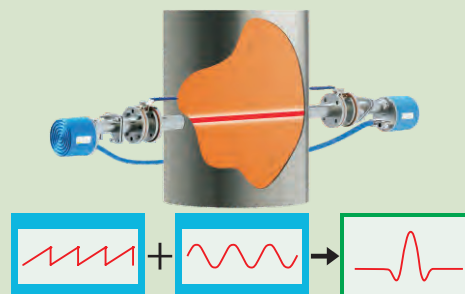
Easy Maintenance

Modular design, laser module and detector module field replaceable, easy maintenance



Strong Anti-Interference Capability

Adopting wavelength-modulation-spectroscopy allows better signal/noise ratio & anti-interference capability of dust and background gas.

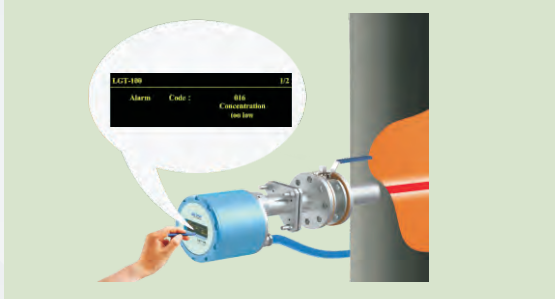


Solutions

Laser Pro

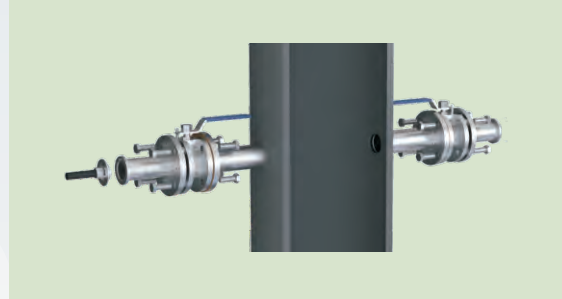
Self Diagnose Function

Comprehensive self diagnose function, records and saves alarm information, easy to check



Easy Optical Path Adjusting

XY direction non-coupling adjusting, easy adjusting



Specification Parameter

Technical Indicators

Optical Channel Length	$\leq 20\text{m}$
Linearity Error	$\leq \pm 1\% \text{F.S.}$
Repeatability	$\leq 1\%$
Span Drift	$\leq \pm 1\% \text{F.S./half year}$
Zero Drift	$\leq \pm 1\% \text{F.S./half year}$
Maintenance Cycle	$\leq 2\text{times/year}$, clean optical window
Calibration Cycle	$\leq 2\text{times/year}$
Type of Protection	ExdIICT6 Gb
Enclosure Rating	IP66
Response Time(T_{90})	$\leq 1\text{s}$

Interface Signal

Analog Output	$2 \times 4-20\text{mA}$ output(Isolation, max load 750Ω)
Analog Input	$2 \times 4-20\text{mA}$ input(temp. and press. compensation)
Digital Output	RS485/RS232/GPRS
Relay Output	2 (24V, 1A)

Operating Conditions

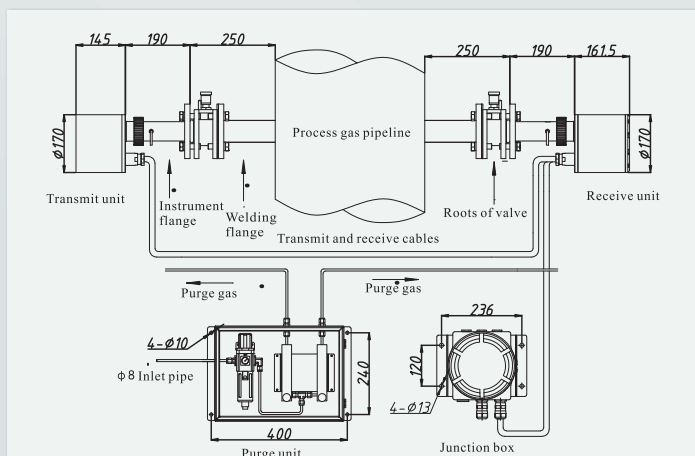
Power Supply	24VDC, < 20W
Purge Gas	0.3MPa ~ 0.8MPa industrial nitrogen, purification instrument air, etc.
Ambient Temperature	$-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$

Installation

Installation Way	In-situ installation
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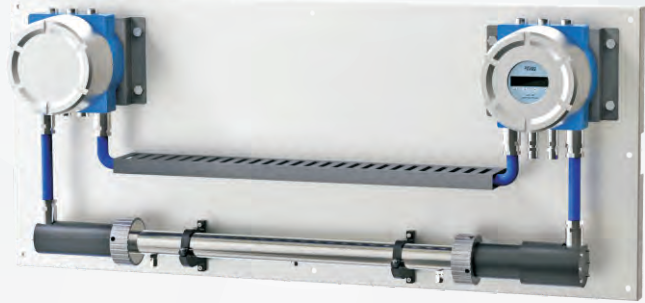
Installation Dimensions

- Purging unit consists of filter and device to stabilize flow, provides stable purge flow to avoid glass contamination.
- Receiver is equipped with OLED screen, operated by magnetic pen.
- Transmitter and receiver is installed on each side of the flue gas pipe through connection flange.
- The connection box contains I/O interface, making the connection of power cable and signal cable convenient.



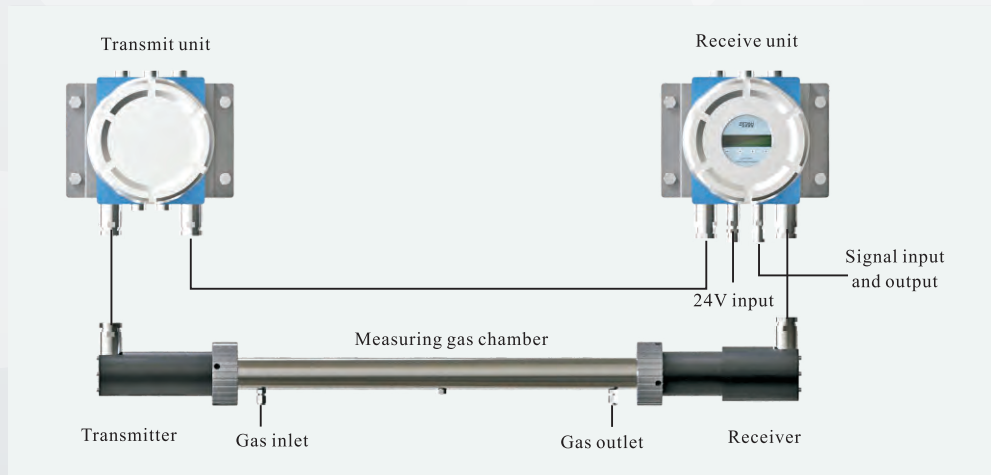
▶▶▶ LGT-106 Laser Gas Analyzer

LGT-106 is a flameproof bypass type tunable laser gas analyzer based on TDLAS technology, especially suitable for harsh working conditions such as high temperature, high humidity, high dust, high pressure, and for small pipes where in-situ analyzer is not applicable. The transmitter and receiver are installed on a back board. Flameproof explosion protection. It can be applied to explosive areas in Zone 1 and Zone 2. In the field installation, it is installed by bypass sampling. The analyzer contains auto purge function which greatly reduces maintenance cost.



System Composition

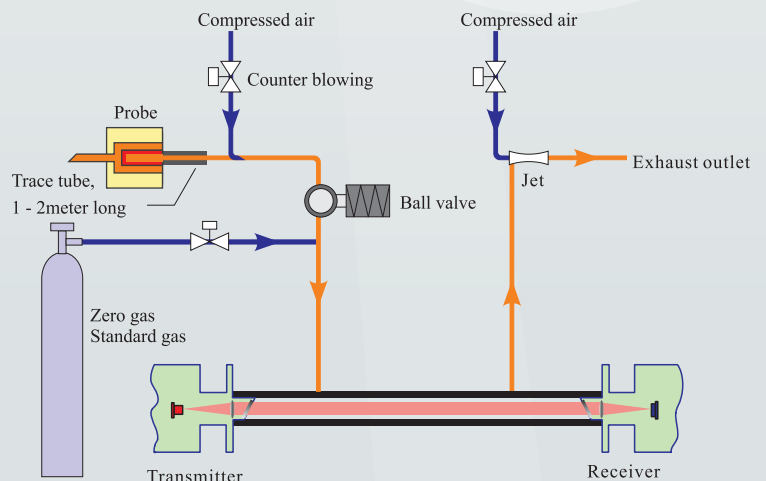
LGT-106 laser gas analyzer consists of transmitter, receiver and gas cell. The transmitter drives the tunable diode to emit laser of certain wavelengths, which passes through the gas cell, then reaches the receiver. The receiver performs signal processing to obtain second harmonic signal, then calculates the concentration according to the relationship between the second harmonic signal and the gas concentration.



Gas Path

Extracted by a jet pump, the sample gas is filtered (get rid of dust), heated (avoid condensation), cooled (for high temperature condition), then reaches analyze module to be measured. Shutting off ball valve and analyze module, the analyzer carries out a calibration to ensure accuracy. Shutting off ball valve and opening back-flush valve ensures gas path unblocked.

Configurations of LGT-106 is different in different situations. For example, for high pressure situation, a relief valve is added and air pump is removed. For high temperature situation, the heat tracing temperature is higher.



Features

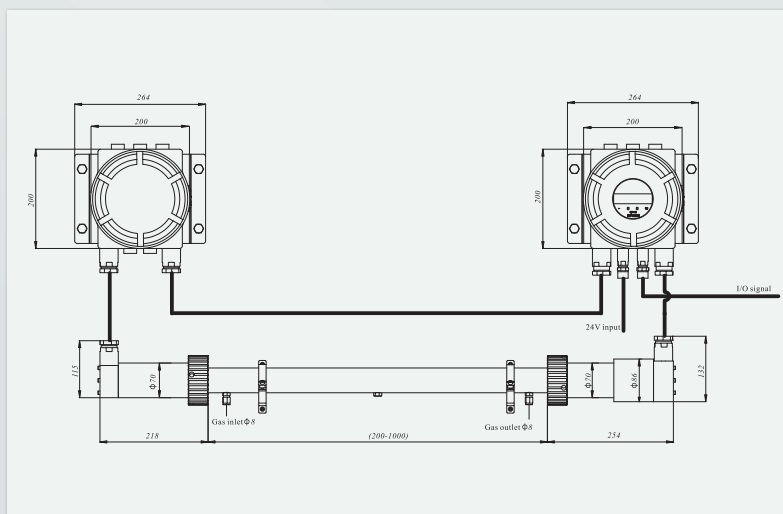
- Suitable for harsh working conditions such as high temperature, high humidity, high dust, high pressure, and for small pipes where are not suitable for in situ measurement occasions.
- Integrated structure design, high reliability and stability.
- "Single line spectrum" technology, free from interference of background gas.
- Innovative Hall button design, high sensitivity, easy operation.
- Automatic calibration, automatic backblow.
- Adopts imported TO encapsulate semiconductor lasers, optical noises are restrained with antireflective coating end cap.

Specification Parameter

Technical Indicators	
Linearity Error	$\leq \pm 1\% \text{F.S.}$
Repeatability	$\leq 1\%$
Span Drift	$\leq \pm 1\% \text{F.S./half year}$
Zero Drift	$\leq \pm 1\% \text{F.S./half year}$
Calibration Cycle	$\leq 2 \text{times/year}$
Type of Protection	ExdIICT6 Gb
Enclosure Rating	IP66
Preheating Time	$\leq 15 \text{ minutes}$
Response Time(T_{90})	$\leq 30 \text{s}$ (related to the working condition)
Interface Signal	
Analog Output	$2 \times 4\text{-}20 \text{mA}$ output(isolation, max load 750Ω)
Analog Input	$2 \times 4\text{-}20 \text{mA}$ input(temp. and press. compensation)
Digital Output	RS485/RS232/GPRS
Relay Output	3 (24V,1A)
Operating Conditions	
Power Supply	24VDC, < 20W (without pretreatment system components)
Purge Gas	0.3MPa ~ 0.8MPa industrial nitrogen, purification instrument air, etc.
Ambient Temperature	$-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$
Installation	
Installation Way	By-pass type installation

Installation Dimensions

- Support analog input/output and switch input/output function.
- Transmitter, receiver and pretreatment device are installed on the backboard, can be placed in the cabinet.
- Through the OLED screen on the receiver, parameters can be displayed and set conveniently.
- Support explosion-proof probe, applicable to zone 1 and zone 2.
- Support automatic backblow for situations where sample gas is dirty.
- Pumps and valves for pretreatment can be controlled by instrument internal relay , no additional PLC.



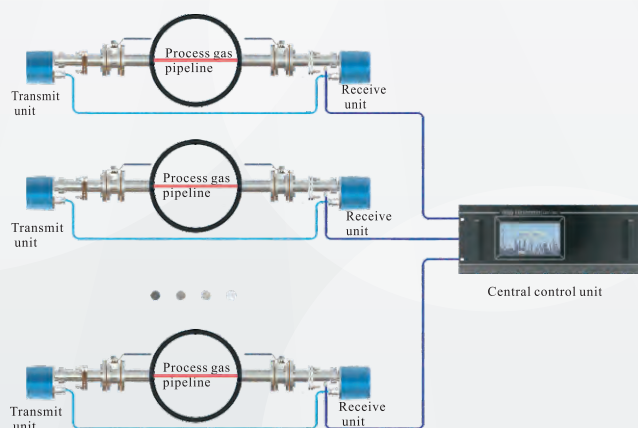
▶▶▶ LGT-150 Laser Gas Analyzer

LGT-150 is a multi-channel type tunable laser gas analyzer based on TDLAS technology. It consists of central control unit and measuring probe. Supporting up to 8 measuring probe, a central control unit controls each measuring probe, processes data received and communicates through network. It supports 19" panel mounted and wall mounted installation.



System Composition

Figure below shows LGT-150 multi-channel distributed measurement. The central control unit realizes human-machine interaction and loading and setting of the parameter in each measuring probe. Measuring probe consists of transmitter, receiver, connection box and purge unit, it measures gas concentration and sends data to the central control unit. For calorific value applications, the central control unit can automatically calculate high calorific value and low calorific value according to the measuring probe data.

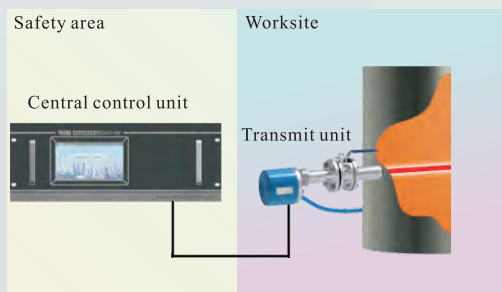


Features

- High price performance ratio, reduce cost effectively.
- Parameters of multiple analyzers can be read on touch screen directly.
- Touch screen on the central control unit allows easy operation.
- Centralized control, up to 8 channels supported, intelligent management.
- The maximum transmission distance from probe to the central unit is up to 1000 meters.
- Distributed computing, any failure of the central unit or a probe does not affect the normal operation of other probe.

High Safety

Measuring probe is operated remotely from the central control unit locating in safe area.



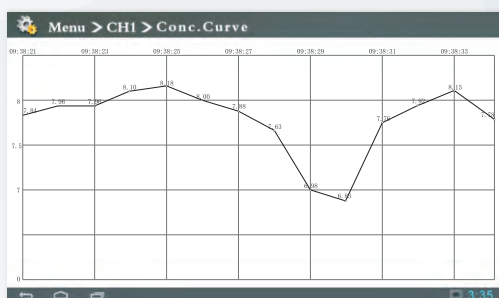
HMI

Graphic touch screen on the central control unit allows easy operation



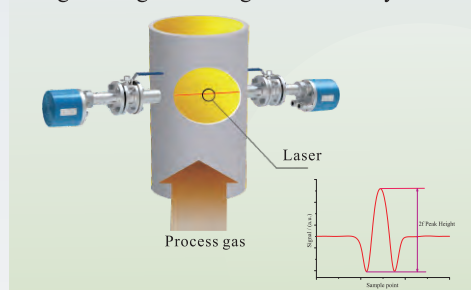
Intuitive

Real-time concentration profile available, good intuition



Strong Anti-Interference Capability

Adopting wavelength-modulation-spectroscopy allows better anti-interference capability of background gas and higher reliability.



Specification Parameter

Technical Indicators

Linearity Error	$\leq \pm 1\% \text{F.S.}$
Repeatability	$\leq 1\%$
Span Drift	$\leq \pm 1\% \text{F.S./half year}$
Zero Drift	$\leq \pm 1\% \text{F.S./half year}$
Maintenance Cycle	$\leq 2 \text{ times/year, clean optical window}$
Calibration Cycle	$\leq 2 \text{ times/year}$
Probe Type of Protection	ExdIICT6 Gb
Probe Enclosure Rating	IP66
Central Unit Enclosure Rating	IP54
Response Time(T_{90})	$\leq 1 \text{ s}$

Interface Signal

Analog Output	2 × 4-20mA output (a single measurement probe) 8 × 4-20mA output (central unit , optional)
Analog Input	2 × 4-20mA input(temp. and press. compensation)
Digital Output	RS485/RS232/GPRS
Relay Output	2 (a single measurement probe) 8 (central unit, optional)

Operating Conditions

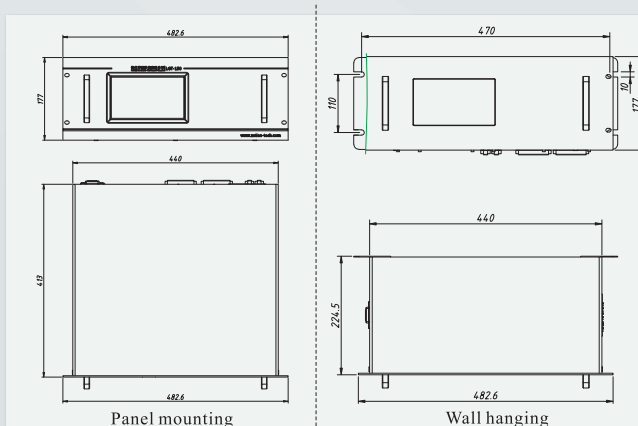
Measurement Unit Power Supply	24VDC, < 20W
Central Unit Power Supply	100VAC ~ 240VAC
Purge Gas	0.3MPa ~ 0.8MPa industrial nitrogen, purification instrument air, etc.
Ambient Temperature	-20°C ~ +60°C

Installation

Measurement Unit Installation	In-situ installation
Central Unit Installation	Wall or plate mounted

Installation Dimensions

- Central control unit supports panel mounted and wall mounted installation.
- Measuring probe adopts in-situ installation.
- Central control unit supports analog output and binary output.
- Measuring probe supports analog input/output and binary input/output.
- Parameters of multiple measuring probes can be set by the control unit.



▶▶▶ LGT-180 Laser Gas Analyzer

LGT-180 is a 19" panel mounted type tunable laser gas analyzer for industrial online analysis and environmental on-line monitoring. The analyzers combine TDLAS technology and multiple reflection long optical path technology that can analysis a variety of gas including O₂, CO, NH₃, H₂S, CO₂, CH₄, H₂O. Reflected light can be customized according to the working condition demand, the measured gas concentration ranges from constants to the trace.



System Composition

Transmitter, receiver and gas cell are integrated into a 19" 3U chassis. Analyzer can be panel mounted in a 19" cabinet. Sample gas is filtered and dewatered through probe. Then in the gas cell, it is exposed to laser emitted from the transmitter. The receiver calculates the gas concentration from the spectrum received.



Features

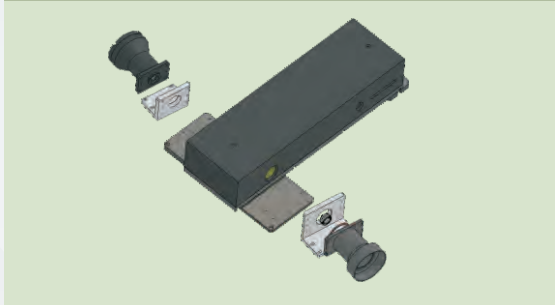
- Compact structure, easy integration
19" standard 3U panel chassis, modular design, easy integration with other instruments.
- Strong anti-interference capability, high precision, small drift
With high stability, low noise semiconductor laser as the light source. Single - line spectroscopy and laser wavelength scanning. The influence of background gas composition and light source change is overcome. It allows better anti-interference capability of background gas and higher precision and unique advantages such as small drift and good stability.
- Low detection limit, high sensitivity
Multi-reflection technology and TDLAS technology achieves optical path up to 25m, improving detection limit greatly. The sensitivity can reach ppm level or even ppb level for some components.
- Excellent adaptability
Strong adaptability of system environment. For applications in corrosive environment, all parts of LGT-180 exposed to sample gas are made of corrosion-resistant material. System adopts the sampling measurement method. It can be directly installed in the process pipe to sample, process and analyze, no moving parts, high reliability.

Solutions

Laser Pro

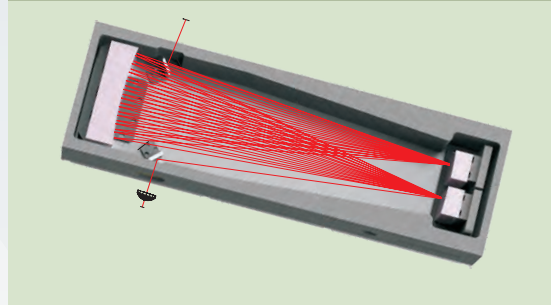
Easy Maintenance

Modular design, easy installation and maintenance



Low Detection Limit

Multi-reflection gas cell greatly improves detection limit



Specification Parameter

Technical Indicators

Linearity Error	$\leq \pm 1\% \text{F.S.}$
Repeatability	$\leq 1\%$
Span Drift	$\leq \pm 1\% \text{F.S./half year}$
Zero Drift	$\leq \pm 1\% \text{F.S./half year}$
Maintenance Cycle	$\leq 2 \text{ times/year (related to the working condition)}$
Calibration Cycle	$\leq 2 \text{ times/year (or automatic calibration)}$
Enclosure Rating	IP54
Response Time (T_{90})	$\leq 30 \text{ s (related to the working condition)}$

Interface Signal

Analog Output	2 × 4-20mA output (isolation, max load 750Ω)
Analog Input	2 × 4-20mA input (temp. and press. compensation)
Digital Output	RS485/RS232/GPRS
Relay Output	3 (24V, 1A)

Operating Conditions

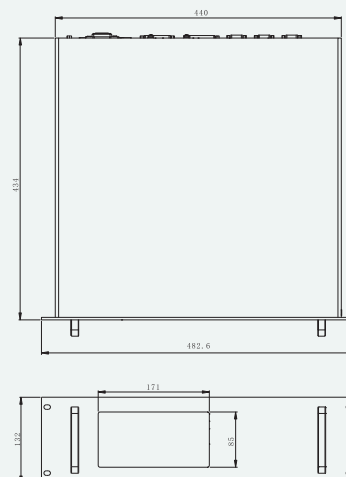
Power Supply	100VAC ~ 240VAC
Purge Gas	0.3MPa ~ 0.8MPa industrial nitrogen, purification instrument air, etc.
Ambient Temperature	-20°C ~ +60°C

Installation

Installation Way	Sampling installation
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Installation Dimensions

- Analyzer is panel mounted in cabinets.
- Analyzer supports auto purge and auto calibration.
- Black or white chassis color is available to fit the cabinet.
- 5.5" OLED display, mechanical buttons operation.
- Analog and binary signal output from the back-panel.
- Analyzer contains power conversion module, the product power is supplied directly through the rear power interface.



▶▶▶ LGT-200 Laser Gas Analyzer

LGT-200 laser gas analyzer is a Flameproof multiple reflection laser gas analyzer uses TDLAS technology and long-path reflection technology, which greatly improves the detection limit. It can analyze trace H_2O , CO , H_2S , etc.. The product is simple to operate without expensive calibration and complex settings. Because the gas is not directly exposed to the sensor part, the sensor is not affected by contaminants and corrosion, and the measurement drift is small.



System Composition

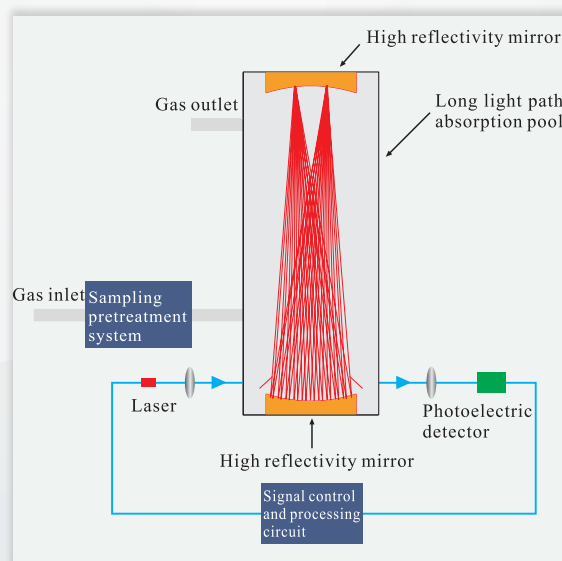
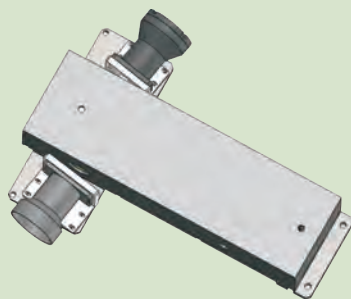
LGT-200 consists of transmitter, receiver and display panel. The transmitter drives the tunable diode to emit laser of certain wavelengths, which passes through the long optical length gas cell containing measured gases. The photoelectric conversion, signal processing and spectral data are analyzed by the receiver to obtain the measurement results. The display unit not only shows the measuring results, but also realizes loading and setting of parameters with magnetic pen.

Features

- "Single line spectrum" technology, free from interference of background gas.
- White pool multi-reflection technology is used to increase the measurement of optical path and lower the detection limit.
- Integrated flame-proof design, high reliability and stability.
- Innovative Hall button design, better than infrared key way.
- Optical path length can be adjusted, measurement range covers constant to trace.
- Optical non-contact measurement, small drift.

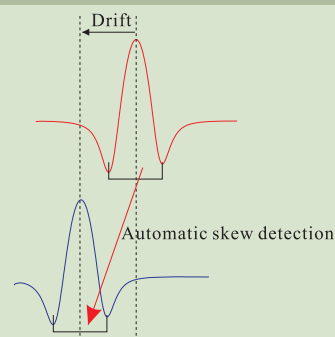
Low Detection Limit

The TDLAS technology combined with long optical path technology, improve the level of detection limit



Auto Rectification

Second harmonic auto rectification function improves accuracy



Solutions

Laser Pro

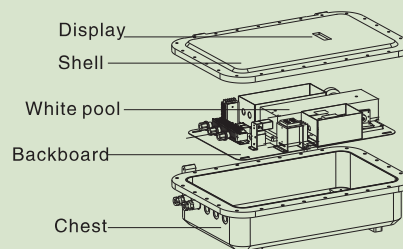
■ Good Intuitive

3.12" OLED display, easy loading and setting of parameters

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CO 0.05 %	Normal	T	321.0 K
	State M	P	111.0 bar
	TR Normal	L	1.00 m

■ Easy Maintenance

Chassis separable from back board makes maintenance easy



■ Specification Parameter

Technical Indicators

Linearity Error	$\leq \pm 1\% \text{F.S.}$
Repeatability	$\leq 1\%$
Span Drift	$\leq \pm 1\% \text{F.S./half year}$
Zero Drift	$\leq \pm 1\% \text{F.S./half year}$
Maintenance Cycle	$\leq 2 \text{ times/year, clean optical window}$
Calibration Cycle	$\leq 2 \text{ times/year (or automatic calibration)}$
Type of Protection	ExdIIB+H ₂ T5 Gb
Enclosure Rating	IP65
Preheating Time	$\leq 15 \text{ minutes}$
Response Time(T_{90})	$\leq 30 \text{ s (related to the working condition)}$

Interface Signal

Analog Output	2× 4-20mA output(isolation, max load 750Ω)
Analog Input	2× 4-20mA input(temp. and press. compensation)
Digital Output	RS485/RS232/GPRS
Relay Output	3 (24V, 1A)

Operating Conditions

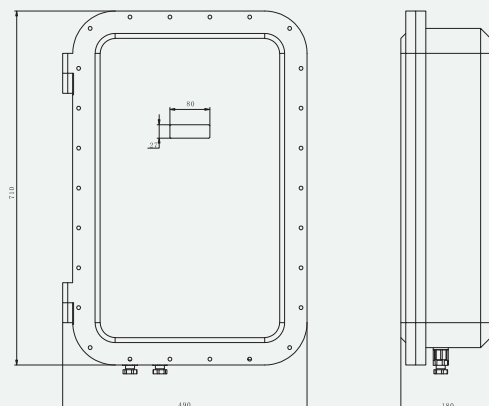
Power Supply	100VAC ~ 240VAC
Ambient Temperature	-20℃ ~ +55℃

Installation

Installation Way	Sampling installation
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■ Installation Dimensions

- Auto backblow and auto calibration.
- Pre-treatment unit can be integrated inside chassis.
- Support explosion-proof probe, applicable to zone 1 and zone 2.
- 3.12" OLED display, operated by magnetic pen.
- Support analog input/output and binary input/output function.



▶▶▶ LGT-350 Laser Humidity Analyzer

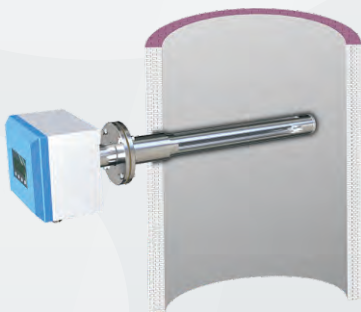
LGT-350 laser humidity analyzer is a high precise analyzer for humidity measurement, developed based on tunable diode laser absorption spectroscopy. One-side mounting installation is much easier than cross-stack.

By using a tunable semiconductor laser, LGT series laser gas analyzer scans the specific absorption lines of the measured gas (no background gas) to get the second harmonic of the gas. Through processing and analyzing the second harmonic and the broadening information of the gas, the concentration of the gas is obtained.



System Composition

Main functional modules of LGT-350 includes transmitter, receiver, reference unit and measurement unit. The transmitter drives the tunable diode to emit laser of certain wavelengths, which passes through the gas cell, then reaches the receiver. The receiver performs signal processing to obtain second harmonic signal, then calculates the concentration according to the relationship between the second harmonic signal and the gas concentration.



Specification Parameter

Technical Indicators		Interface Signal	
Linearity Error	$\leq 2 \pm \% \text{F.S.}$	Analog Output	2× 4-20mA output(isolation, max load750Ω)
Repeatability	$\leq 1\%$	Analog Input	2× 4-20mA input(temp. and press. compensation)
Span Drift	$\leq \pm 2\% \text{F.S./half year}$	Digital Output	RS485/RS232/GPRS
Zero Drift	$\leq \pm 2\% \text{F.S./half year}$	Relay Output	2 (24V,1A)
Maintenance Cycle	$\leq 2 \text{times/year}$, clean optical window	Operating Conditions	
Calibration Cycle	$\leq 2 \text{times/year}$	Power Supply	24VDC or 220VAC
Response Time(T_{90})	$\leq 30 \text{s}$ (related to the working condition)	Ambient Temperature	$-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$
Enclosure Rating	IP54	Purge gas	0.3MPa ~ 0.8MPa industrial nitrogen, purifying instrument air, etc.
Installation			
Installation Way	Sampling installation		

Features

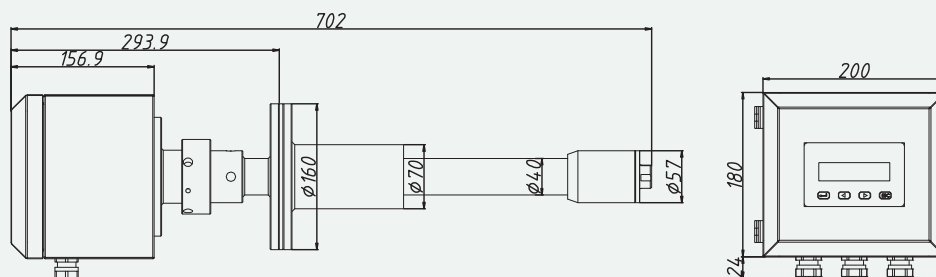
- Non-contact optical measurement, low drift and with long service life
- One-side installation, no complex optical path adjustment required
- Reference gas cell adopted; online calibration; no disassemble needed
- "Single line spectrum" technology, free from interference of background gas
- Adopt alternative calibration technique, to solve the problem of water standard gas production. High calibration accuracy
- In-situ measurement, no sample conditioning required and avoiding the problems that sample is absorbed during conditioning process, blocking, unit damage and etc..Low maintenance cost

Technical Comparison

TDLAS	Capacitance method	Dry-and-wet oxygen method	Dry-and-wet bulb method
Direct measurement	Indirect measurement, measuring relative humidity, conversion to absolute humidity	Indirect measurement, measure dry oxygen, wet oxygen content and calculate to get humidity.	Indirect measurement, measure dry bulb, wet bulb content and calculate to get humidity.
Strong environmental adaptability, can be used in bad conditions	Sensitive to certain pollutants, do not work in corrosive or high dust environment	Cannot be used in such occasions as high temperature change, high water vapor content and high temperature flue gas containing reducing gas	High environmental requirements must be in a ventilated state
High measurement accuracy, $\pm 1\%F.S.$	Low measurement accuracy, temperature and pressure dependence	Can not provide standard dry oxygen at the same test point , large measurement accuracy	Low measurement accuracy, depends on the accuracy of the two thermometers, dry and wet.
High application temperature limit, $\leq 1000^{\circ}C$	Low application temperature limit, $\leq 200^{\circ}C$	Low application temperature limit, $\leq 200^{\circ}C$	Low application temperature limit, $\leq 200^{\circ}C$
Almost no span drift and zero drift	Big span drift	Big span drift	Big span drift
Alternative calibration, no water mark	Calibration in air, large error	Through the calibration of zirconia and oxygen sensors, large error	Indirect calibration thermometer, large error
Optical non-contact measurement, long life	Contact measurement, short life	Contact measurement, short life	Contact measurement, short life

Installation Dimensions

- 3.12 inch OLED display
- Support analog input/output and digital input/output
- One-side installation: only one hole required to be mounted
- Built-in power supply converter: 220VAC or 24VDC is optional
- Purge unit is installed nearby, providing stable purge flow and avoiding lens being polluted



▶▶▶ LGT-510 Laser Gas Analyzer Module (CO)

LGT-510 laser gas analyzer module is based on the TDLAS (Tunable Diode Laser Absorption Spectroscopy) technology. It is a freestanding gas detection product suitable for system integration, widely used in gas analysis and monitoring under various working conditions. The CO gas can be analyzed and adjusted according to the requirements of the working conditions, and the concentration of the measured gas is constant to trace. With high precision and low cost, it is convenient for OEM integration.



Specification Parameter

Technical Indicators

Linearity Error	$\leq \pm 1\% \text{F.S.}$
Repeatability	$\leq 1\%$
Span Drift	$\leq \pm 1\% \text{F.S./half year}$
Zero Drift	$\leq \pm 1\% \text{F.S./half year}$
Response Time(T_{90})	$\leq 2\text{s}$ (no pretreatment)
Calibration Cycle	$\leq 2\text{times/year}$
Maintenance Cycle	$\leq 2\text{times/year}$ (be related to working condition)

Interface Signal

Gas Chamber Interface	$\Phi 6$
Power Supply	24VDC
Signal Output	Rs485, 4-20mA

Operating Conditions

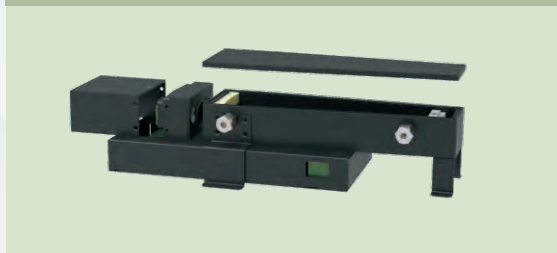
Operating Temperature	$-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$
Power Dissipation	$\leq 15\text{W}$
Measuring Range	The minimum range is $0\sim 200\text{mg/m}^3$ The maximum range is $0\sim 100\%$
Rate of Flow	$0.5\text{L/min}\sim 3\text{L/min}$

Features

- Multipath reflection absorption pool is adopted, low detection limit
- No moving parts, compact structure and high reliability
- Small size, light weight, easy to carry
- Single line spectrum absorption, high measurement accuracy
- Low maintenance cost without regular replacement parts
- Modular design for easy integration

Easy Maintenance

Modular design, easy installation and maintenance



Low Detection Limit

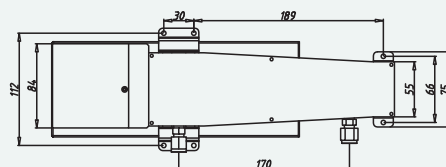
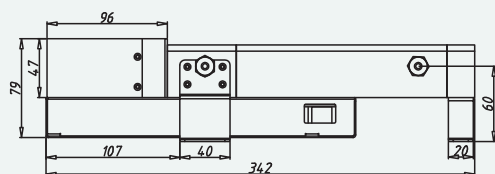
Multi-reflection gas cell greatly improves detection limit



Technical Comparison

Operating Principle	TDLAS	NDIR	Electrochemistry
Response Time	Short response time, $\leq 2s$	Long response time, $\geq 15s$	Long response time, $\geq 10s$
Measurement Linearity	Narrow band absorption, high measurement linearity	Broadband absorption, little high measurement linearity	Bad measurement linearity
Working Condition Adaptability	The change of dust and transmittance has no effect on the measurement	The change of dust and transmittance has an effect on the measurement	Sensitive to pollutants, can not be used in high dust and corrosive environment
Anti-interference	No background gas interference	Easy to be disturbed by background gas	Easy to be disturbed by background gas
Stability	Little drift	A little zero drift, span drift	Large zero drift, span drift
Calibration and cycle	Long zero maintenance cycle	Short zero maintenance cycle	Short zero maintenance cycle
Maintainability	Simple gas chamber, easy to maintain	Complex gas chamber, cumbersome to maintain	Overall replacement, high maintenance costs
Reliability	No moving part, high reliability	Moving parts, low reliability	Low reliability
Service life	Foreign imported semiconductor lasers, long life	Continuous light source, long life	Contact measurement, short life

Installation Dimensions



Product Comparison

	ZeTian Products	Domestic Competitive Products	International Competitive Products
Integration Level	High, laser integrated in transmit unit, algorithm is directly realized within the receive unit, no additional central unit	High, no additional central unit	Low, laser installed to the central unit (not explosion-proof), coupled to the transmission unit through the optical fiber
Design Theory	Modular design, can replace laser module and detector module at the scene, don't need to adjust the light path	Integrated design. If component damages, the whole analyzer have to be replaced	Integration design, have to replace the machine if component damaged
Explosion-Proof Type	Flame-proof, only positive pressure purge gas is needed	Positive pressure explosion-proof, positive pressure purging gas and protecting gas is needed	Transmit unit and receiving unit are explosion-proof design, the central unit is not explosion-proof
On-Site Installation	Support the X and Y direction coupling optical path adjustment technology (patent technology), convenient installation	The light path adjustment is complex	The light path adjustment is complex
Deployment Way	Single channel in situ type, bypass type, multichannel distributed, 19" plate mounted (high temperature and normal temperature)	Single channel in situ type, multichannel distributed, bypass type	Single channel in situ type, fiber distributed

Application

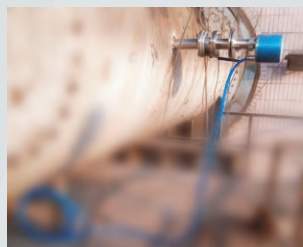
LGT series laser gas analyzer can be widely used in industrial process and environmental monitoring. At present, LGT laser gas analyzer has achieved successful application in blast furnace gas, converter gas recovery, gas calorific value analysis, electric catching focal safe control, coal injection monitoring, garbage incineration flue gas denitration monitoring and control, etc. Our company also can according to customer's demand to provide the laser which adapt to the diversified needs of different application fields.

	Application Environment	Monitoring Gas
Metallurgy	Blast furnace ironmaking	CO, CO ₂ , O ₂ , CH ₄
	Converter steelmaking	CO, CO ₂ , O ₂
	Coking production	CO, CO ₂ , O ₂ , H ₂ S, NH ₃
	Other	CO, CH ₄ , O ₂
Petrochemical Chemical	Oil refining	CO, CO ₂ , O ₂ , CH ₄
	Ethylene cracking	CO, CO ₂ , etc.
	EO/EG、PE/PP	O ₂ , C ₂ H ₄ , etc.
	Ethyl benzene/styrene monomer/PS	O ₂ , CO/CO ₂ , Trace water in the benzene
	PTA	CO, CO ₂ , O ₂
	Coal gasification	O ₂
	Methanol/ammonia/urea	O ₂ , CO, CO ₂ , NH ₃ , etc.
	Chlor-alkali/PVC	H ₂ O, O ₂ , CO ₂ , C ₂ H ₄ , etc.
	Hydrogen peroxide	O ₂
	Sulphuric acid	O ₂
	TDI	O ₂
Environmental Protection	Flue gas emissions	HCl, HF, CO, CO ₂ , O ₂ , NH ₃
Cement Production	Cement production	O ₂ , CO, CO ₂
Thermal Power	Thermal power	O ₂ , CO

▶▶▶ Selection Guide

Product Model	LGT-100	LGT-106	LGT-150	LGT-180	LGT-200	LGT-350	LGT-510
Measuring Principle	TDLAS	TDLAS	TDLAS	TDLAS	TDLAS	TDLAS	TDLAS
Measuring Way	In-situ	By-pass	Multi-channel	Plate mounted	Flameproof	Single-ended	Module
Analysis Composition And Measurement Range ^{Note}							
O ₂ 0 ~ 1% 0 ~ 21%	✓	✓	✓	✓	✓		✓
CO 0 ~ 1000ppm 0 ~ 100%	✓	✓	✓	✓	✓		✓
CO ₂ 0 ~ 1000ppm 0 ~ 100%	✓	✓	✓	✓	✓		✓
CH ₄ 0 ~ 1000ppm	✓	✓	✓	✓	✓		✓
HF 0 ~ 20ppm	✓	✓	✓	✓	✓		✓
HCL 0 ~ 200ppm	✓	✓	✓	✓	✓		✓
H ₂ S 0 ~ 200ppm				✓	✓		
NH ₃ 0 ~ 10ppm	✓		✓	✓			
CO ₂ &CO 0 ~ 100%	✓	✓	✓	✓	✓		✓
H ₂ O 0 ~ 200ppm		✓		✓	✓	0~40%	✓
Repeatability	1%	1%	1%	1%	1%	1%	1%
Linearity	± 1%F.S.	± 1%F.S.	± 1%F.S.	± 1%F.S.	± 1%F.S.	± 2%F.S.	± 1%F.S.
Response Time	≤ 1s	≤ 30s	≤ 1s	≤ 30s	≤ 30s	≤ 1s	≤ 2s
Zero Drift	± 1%F.S./half year	± 1%F.S./half year	± 1%F.S./half year	± 1%F.S./half year	± 1%F.S./half year	± 2%F.S./half year	± 1%F.S./half year
Span Drift	± 1%F.S./half year	± 1%F.S./half year	± 1%F.S./half year	± 1%F.S./half year	± 1%F.S./half year	± 2%F.S./half year	± 1%F.S./half year
4~20mA Analog Input Load	2	2	2	2	2	2	0
4~20mA Analog Output Load	2	2	2/8	2	2	2	1
Switch Input Load	2	2	2	2	2	2	0
Switch Output Load	2	3	2/8	3	3	2	0
RS232	✓	✓	✓	✓	✓	✓	
RS485	✓	✓	✓	✓	✓	✓	✓
Ambient Temperature	-20℃ ~ +60℃	-20℃ ~ +60℃	-20℃ ~ +60℃	-20℃ ~ +60℃	-20℃ ~ +55℃	-20℃ ~ +60℃	-20℃ ~ +60℃
Power Supply	24VDC	24VDC	24VDC/ 100VAC ~ 240VAC	100VAC ~ 240VAC	100VAC ~ 240VAC	24VDC/220VAC	24vdc
Type of Protection	ExdIICt6 Gb	ExdIICt6 Gb	ExdIICt6 Gb/ Not explosion proof	Not explosion proof	ExdIIB+H ₂ T5 Gb	Not explosion proof	Not explosion proof
Enclosure Rating	IP66	IP66	IP66/IP54	IP54	IP65	IP54	IP54
CMC Certification	✓	-	✓	-	-	-	✓
CE Certification	✓	-	-	-	-	-	-

Note: more measuring range can be customized, please contact the company



Process Gas Analysis System

If you want to know more details, please log in: <http://en.zetian-tech.com>

Hangzhou Zetian Technology Co.,Ltd.

Phone: 86-13588711905

86-571-28322780

Fax: 86-571-87851772

Email: export@zetian-tech.com

Post Code: 310053

Add: Taiheng Mansion, 22 Zhiren Street, Binjiang District, Hangzhou, Zhejiang
Province, China.



Please visit Zetian Technology's
official website for more information

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