# ENVIRONMENTAL **EMISSIONS** AND **INDUSTRIAL GAS** ANALYSIS **SOLUTIONS**

ENVIRO

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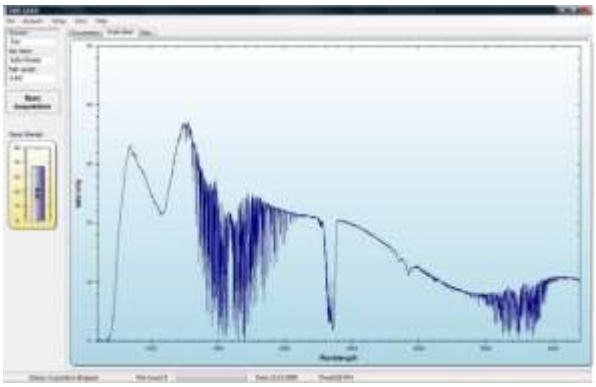
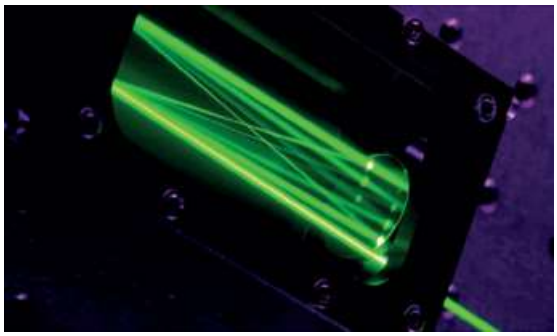
Based on TDLAS technology ESE-LASER series laser gas analyzers adopt a number of innovative key technologyapplications to provide high-performance instrument solutions for customers with different testing needs.

## Multi-line Scanning Technology

On the basis of the traditional laser light sourcewavelength modulation (WMS) technology.according to the spectral absorption characteristics of different test objects, selectthe appropriate type of laser type, and adoptthe multi-line scanning processing method tominimize the interference of background gas.water vapor and dust change.



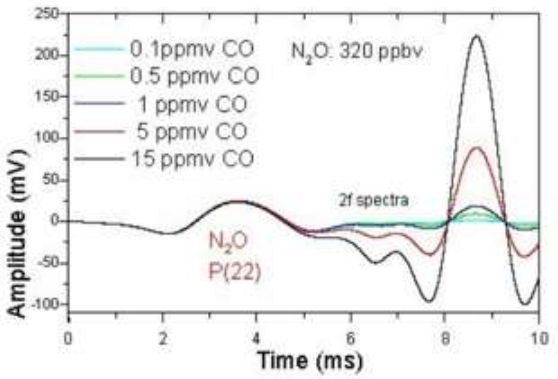
## Long Optical Path Gas Cell Technology



When measuring low concentrations, there isa higher requirement for the absorption pathlength of the gas. The specially designedHeliott cell is generally used in the extractiontest instrument, which can realize themeasurement optical path of 3-30 meters. Theoptimally designed compact structure ensuresgood thermal stability and minimum emptyingvolume of the air chamber.

## Harmonic Detection Technology

A fully digital lock-in amplifier is used tocollect and amplify the second harmonic ofthe test signal, effectively suppressing thelow-frequency noise in the measurementand improving the anti-interference and testsensitivity




Laser Gas Analyzer

## Typical Application

We can provide TDL gas analyzer adopts the in-situ (In-Suit) structure design, which can meet the requirements of extreme conditions such as high temperature, high dust, and explosive environment. The extractive TDL gas analyzer adopts the extractable structure design, providing the best low-concentration and high-precision measurement solution.

SCR Denitrifcation Process
Fugitive ammonia NH3
Flue gas humidity H20

Industrial Process
Electric focus O2
Process gases CH4,CO.CO2

GHG Greenhouse Gas Monitoring
Emission gas CH4, CO2
Atmospheric CH4,CO2, N20

Emission Gas Monitoring
Chemical plant H2S, NH3
Waste incineration HF. HCL

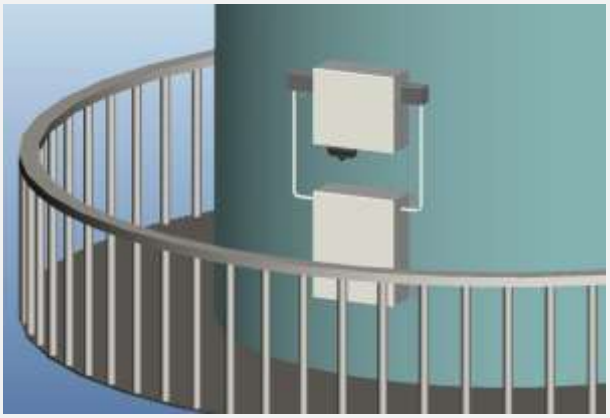
Laser Gas Analyzer

Analyzer using TDLAS (Tunable diode laser absorption spectroscopy), to measure specific process gas like NH3, HCL/HF/HF, HF, H2S, etc. The instrument has high sensitivity, fast response speed, no interference of background gas, and real-time accurately reflects changes in HCL/HF to provide a reliable guarantee.

## Measurement Principle Of Laser Gas Analyzer

A basic TDLAS setup consists of a tunable diode laser light source, transmitting (i.e. beam shaping) optics, optically accessible absorbing medium, receiving optics, and detector/s. The emission wavelength of the tunable diode laser, viz. VCSEL, DFB, etc., is tuned over the characteristic absorption lines of a species in the gas in the path of the laser beam. This causes a reduction of the measured signal intensity, which can be detected by a photodiode, and then used to determine the gas concentration and other properties as described later

## Wall Mounted Laser Gas Analysis System
## HCL/HF/CO/CO2/CH4/O2/NH3



ESE-LASER-100 wall-mounted laser gas analysis system using high temperature with heat extraction technology, continuous online monitoring of the system including sampling and transmission unit, pre conditioning and control unit, analysis unit mainly used in many areas of industrial gas emissions monitoring and process control, for example: coal-fired power plant, waste incineration power plant, chemical plant and so on .

Analyzer using TDLAS (Tunable diode laser absorption spectroscopy)to measure specific process gas like NH3,HCL,HF,H2S,O2,COetc. The instrument has high sensitivity, fast response speed, no interference of background gas, real-time accurately reflect changes of the gas to provide a reliable guarantee.

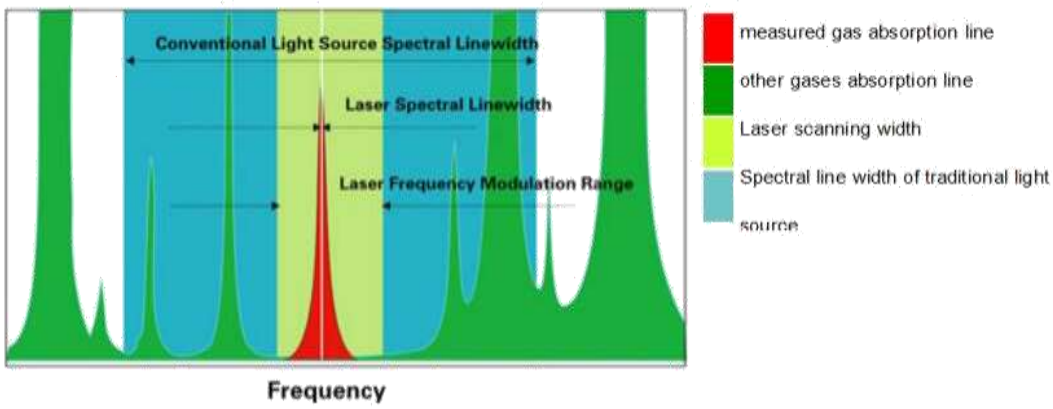
## Typical Application

- Safety monitoring of pulverized coal silo and coal mill
- Calorific value detection of mixed gas
- Optimization of boiler combustion efficiency

Laser Gas Analyzer

## Measurement Principle Of Laser Gas Analyzer

A basic TDLAS setup consists of tunable diode laser light source, transmitting (i.e. beam shaping) optics, optically accessible absorbing medium, receiving optics and detector/s. The emission wavelength of the tunable diode laser, viz. VCSEL, DFB, etc., is tuned over the characteristic absorption lines of a species in the gas in the path of the laser beam. This causes a reduction of the measured signal intensity, which can be detected by a photodiode, and then used to determine the gas concentration and other properties as described later




## System Installation

1. The selection of sampling points depends on the requirements of industrial processes:
   - The sampling point can refer to the selection method of CEMS sampling points.
   - As far as possible, it should be selected in straight sections, and should not be selected at elbow or variable diameter.

2. The welding of the preinstalled flange of the probe box:
   - In the process pipe, opening the hole size 80mm, welding the preinstalled flange kit on the process pipe, when welding the flange fixed hole direction, should be consistent with the following figure.
   - The probe box is installed on the side wall of the pipeline, and the pre assembled flange kit should slightly tilt up to 0-5 degrees to avoid the liquid entering the flue.
   - The installation method is as shown in the following figure.

Laser Gas Analyzer

# Laser Gas Analyzer

## Features

- The high resolution of TDLAS technology can effectively reduce the interference of dust or other background gas.
- In situ extraction installation method which has the advantages of fast response and high sensitivity. In practical application, the resolution can reach 0.1 ppm, which can meet the requirements of on-line monitoring.
- The measuring instrument has small drift, simple maintenance and stable and reliable operation for a long time.

## Specifications

| Parameters | | | | | | | |
|---|---|---|---|---|---|---|---|
| Gas | Principle | Range | Resolutions | Repeatability | linearity | response time | Drift |
| NH3 | TDLAS | 0-20PPM | 1 ppm/0.1% | ≤1%FS | ≤1%FS | ≤10S | ≤1%FS |
| HF/HCL | TDLAS | 0-20PPM | 1 ppm/0.1% | ≤1%FS | ≤1%FS | ≤10S | ≤1%FS |
| CO | TDLAS | 0-1000PPM | 1 ppm/0.1% | ≤1%FS | ≤1%FS | ≤10S | ≤1%FS |

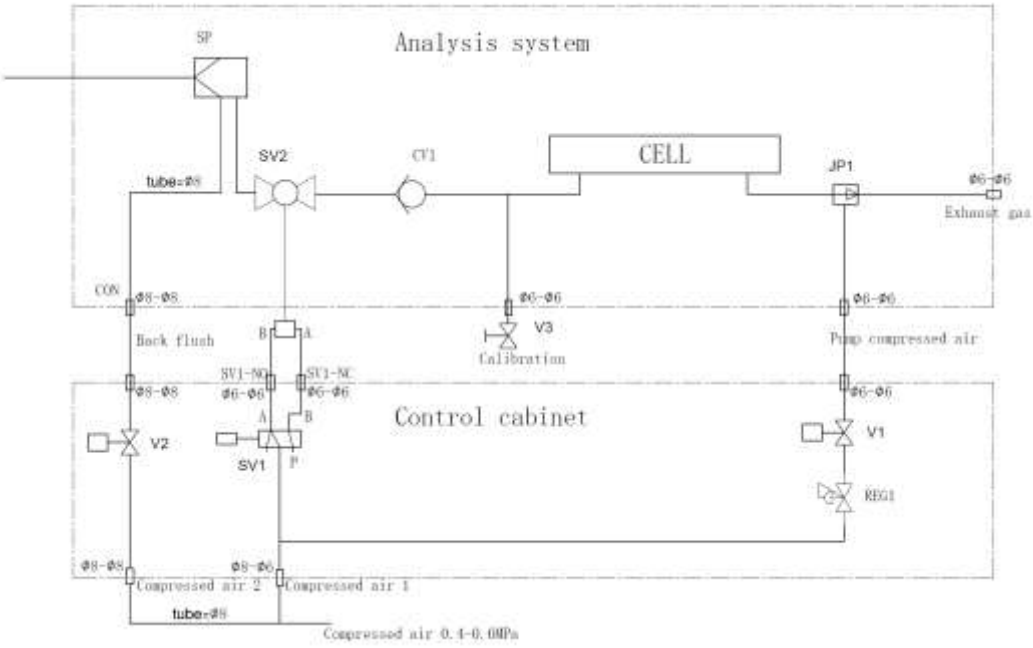
| Function Parameters | | | | | |
|---|---|---|---|---|---|
| Warm-up | 60min | Digital output | RS232/485 | Analog Output | 4-20mA ,Max load is750Ω |
| Power Supply | AC100-240V/50Hz 1.5kVA | Relay output | Load capacity: AC/DC 24V/1A; concentration overrun alarm, transmittance and laser temperature abnormal alarm (customized) | | |

| Environmental Parameters | | | | | |
|---|---|---|---|---|---|
| Light Path | 1-3meters | Gas Temperature | ≤800℃ | Pressure | atmospheric pressure±5kPa |
| Gas Flow | 1-3L/min | Ambient Temperature | -10~55℃ | Ambient Pressure | 70kPa-120kPa |
| Blowing gas source | 0.4~0.6MPa compressed air | | | IP grade | IP65 |
| Dimension | 831（L）*475(W)*223(H)mm (analysis cabinet) 614（L）*510(W)*268(H）mm(control cabinet) | | Weight | 46kgs (analysis cabinet) 39kgs (control cabinet) | |

## Technical parameters

- Cabinet : cabinet protection grade IP65;
- Material: adopt 2mm thickness stainless steel 316L;
- Control system: the time relay, automatic sampling, purging, fault alarm etc.;
- Jet Pump: Using 0.2-0.6MPa compressed air pre heater into the jet pump to generate dynamic sampling, sampling rate of 8L/min, SS316L material, corrosion resistance, no mechanical parts, ensure stable operation for a long time,;
- Filter: dust filter after sampling probe to ensure long-term stable operation of the gas analyzer, analyzer;
- Temperature: all kind of gas flowing through the heating element and the pipeline are arranged in the heating box, heating control temperature of 160 degree
- Power supply: AC220V, 1.5kVA.

## Flow chart of Gas Sampling



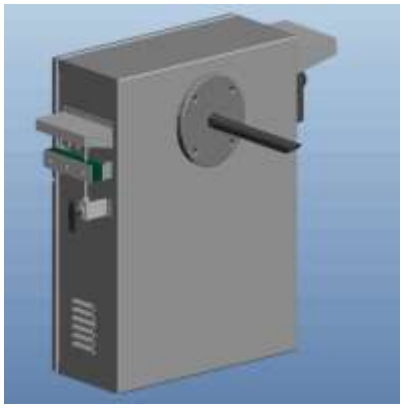

Laser Gas Analyzer

# Sampling Probe

**Introduction**

Sampling probe for the gas sampling, with dust filtering and heating function, condensation can effectively prevent the acquisition of sample gas, unique structure design makes the system more reliable sampling rate, less loss of sample gas, to ensure the stability of the system and real analysis. The characteristics of the product are as follows:

1. The material is 316L stainless steel, and the anti-corrosion ability is very strong at high temperature. The preparation of rainproof cover is fully competent for outdoor working environment.
2. The isothermal heating body is adopted in the design, the structure is compact and the heating temperature is stable.
3. The filter cartridge is made of stainless steel sintered filter, which has the characteristics of large filtration area and high filtration precision. It can be pulled out of the device as a whole when it is replaced. It is easy to operate, no tools are needed, greatly shortens maintenance and replacement time, and reduces labor intensity.
4. The operation is simple, with low temperature alarm.



**The main technical parameters of the probe:**

1. Maximum sampling temperature: 800 C
2. Maximum working pressure: 5bar
3. The sampling chamber heating temperature: 180 degrees (factory setting, temperature adjustable)
4. Power: 220VAC 50/60Hz 400W
5. Ambient temperature: 20~80 C
6. Maximum dust concentration: 100g/m3
7. Filter core filtering precision: 0.2 um(other precision, 1-10 um)
8. Size: 150*40/20mm filter
9. Anti blowing interface: OD8/6 adapter.
10. Sampling gas exports: OD8/6 connector
11. Length: ¢25×1200mm/ with sampling pipe ,length is optional
12. Installation accessories: installation flange, flange plate, bolt, flange plate sealed flat cushion

## Laser Trace Gas Analyzer ESE-LASER-U50

Based on the principle of tunable laser absorption spectroscopy (TDLAS), laser gas analyzer scans and analyzes the gas absorption spectrum lines of specific wavelength, and realizes the gas concentration measurement by combining the digital lock-in amplifier and the advanced technology such as long path gas chamber. ESE-LASER-U50 series can realize high resolution, high precision, stable and reliable measurement of trace gases, and meet the requirements of process analysis and environmental detection.it can measure gas concentration (including O2 , CO, NH3 , H2S, HCl, HF, HCN, CO2 , CH4 , H2O and etc.)

## Features

- Adopt disc-mounted method to install in cabinet
- Support auto purging and auto calibration function.
- The color of analyzer appearance can be selected between blackand white.
- Display via 7-inch LCD, operation can be conducted manually through mechanical keys.
- The analog signal and switch signal of analyzer can be connected through rear side on backboard.
- Contain power conversation module and the product can bepowered on via power interface in the back.

## Specifications

| Measuring Principle | | Tunable Diode Laser Absorption Spectroscopy (TDLAS) Technology |
|---|---|---|
| Technical Index | Linearity error | ⩽ ± 1%F.S. |
| | Repeatability | ⩽1% |
| | Span drift | ⩽ ± 1%F.S./half a year |
| | Zero drift | ⩽ ± 1%F.S./half a year |
| | Maintenance period | ⩽2 times/year (relate to working condition) |
| | Calibration period | ⩽2 times/year (or auto calibration) |
| | Response time ($T_{90}$) | ⩽30s (relate to working condition) |
| Interface Signal | Analog output | 4×4-20mA output (isolation, maximum load 750Ω) |
| | Relay output | 4×output (24V, 1A) |
| | Digital communication | RS485/RS232/GPRS |
| Working Condition | Power | 100VAC ~ 240VAC |
| | Ambient temp | −20℃ ~ +60℃ |
| | Purging gas | 0.3MPa ~ 0.8MPa industrial $N_2$ or air of purification instrument |
| Installation | Method | Sampling installation |

Laser Gas Analyzer

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Process & Emission Gas Analysis Solutions


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