AIEQS
Arka Behbood Farayand (LLC)
Process Devlopment

TDLAS GAS ANALYZER

GA9282

CO, CO2, NH3, H2S, CH4, H2O, HCL, HF
& Etc.

Wall Mount

Highlights:

- Designed based on Tunable Diode Laser Absorption Spectroscopy (TDLAS) technology
- Utilizes semiconductor lasers with extremely narrow linewidth and tunable frequency
- Enables highly accurate and selective gas measurements
- Laser frequency adjustable through working current control
- Lock-in amplifier for precise signal processing
- High-precision gas concentration calculation
- Employs single-line laser spectroscopy with compact, no moving parts or chopper, ensuring durability
- High mechanical stability and fast response
- Minimal maintenance required
- Automatic temperature and pressure compensation for accurate measurements in varying industrial and environmental conditions
- Allows real-time, accurate monitoring of process gas composition
- Supports combustion optimization and energy savings
- Prevents temperature drop in furnaces
- Eliminates risk of gas accumulation during startup and reduces explosion hazards
- Contributes to reducing environmental emissions

ویژگیها :

- طراحی شده بر پایه فناوری TDLAS
- Tunable Diode Laser Absorption Spectroscopy
- استفاده از لیزرهایی با پهنای طیفی بسیار باریک و قابلیت تنظیم فرکانس
- امکان اندازه‌گیری دقیق و گزینشی گازها
- تنظیم فرکانس لیزر از طریق کنترل جریان کاری
- استفاده از تقویت‌کننده قفل فاز (Lock-in Amplifier) برای پردازش سیگنال
- محاسبه غلظت گاز با دقت بالا
- بهره‌گیری از طیف‌سنجی تک‌خطی لیزری و بدون قطعه متحرک یا موتور چاپر
- پایداری مکانیکی بالا و پاسخ سریع
- نیاز حداقلی به سرویس و نگهداری
- سیستم تصحیح خودکار دما و فشار برای حفظ دقت اندازه‌گیری در شرایط صنعتی و محیطی
- امکان پایش برخط و دقیق ترکیب گازهای فرآیندی
- نقش مؤثر در بهینه‌سازی احتراق و کاهش مصرف انرژی
- جلوگیری از افت حرارتی کوره‌ها
- حذف احتمال انباشت گازهای خطرناک در هنگام راه‌اندازی و کاهش خطر انفجار
- کمک به کاهش انتشار آلاینده‌های زیست‌محیطی

Product Details:

Gas	min. range	max. range	Type of Sensor
CO	0 – 5000 ppm 0 – 10000 ppm	0-100 Vol%	**TDLAS**
CO2	0 – 1000ppm	0 – 100 Vol%	**TDLAS**
CH4	0 – 100 ppm 0-1000ppm	0 – 30 Vol% Customizable	**TDLAS**
H2S	0-1000ppm	0-100%Vol	**TDLAS**
H2O	Customizable	0-100%Vol	**TDLAS**
NH3	0-10000 ppm	Customizable	**TDLAS**
HF	0-100 ppm	Customizable	**TDLAS**
HCl	Customizable	Customizable	**TDLAS**
O2	0 – 5 Vol%	0 – 100 Vol%	**Paramagnetic**
H2		0 – 100 Vol%	**TCD**

Notes:

1. The 0–100% range can be fully customized according to the application requirements.
2. The measurement of other gases is also customizable.

کاربردها :

- نصب در سیستم های آنالایزر برخط گاز در صنایع سیمان و فولاد
- پایش گازهای فرآیندی در دهانه کوره دوار
- بهینه سازی احتراق ثانویه در کلساینر
- پایش فرآیند و محافظت از فیلتر الکتروستاتیکی در پیش گرم کن
- کنترل فرآیند کارخانجات احیا مستقیم آهن
- اندازه گیری گاز در صنعت متالوژی و کنترل کیفیت محصول نهایی فولادی (نورد، قطعه سازی ، عملیات حرارتی)

Applications:

- Suitable to install in gas analyzer system of Cement, Steel plants
- Kiln inlet combustion control
- Calcination combustion control
- Prevent explosion of Electrostatic filters
- Process control DRI steel plans
- Metallurgy gas measurements (heat treatments of parts by gas)
- Any other application by request

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Technical Information for GA9282

1 Technical Data of TDLAS sensor

measuring principle	Tunable Diode Laser Absorption Spectroscopy (TDLAS)
Range	Customizable
Resolution	0.1ppm/0.01%
accuracy	±1%F.S.
response time	≤30 s
Flow Rate	0.5–3 L/min
Working / Operating Temp.	-10~50°C
Humidity	0–98%RH
Voltage / Power	12V±10%, 24V DC
Constant Temp.	50°C ±0.5°C
Linearity Error	≤±1%F.S
Repeatability	≤1%
Span drift	≤±1%F.S.
Zero drift	≤±1%F.S.
Maintenance cycle	≤2 times/year
warm-up time	20 s quick start < 10 min full specification
Output / Interface	RS-485 / RS-232/4-20mA
Storage Conditions	-40~85°C; 0–98%RH

2 Technical Data of Other Sensors

Cubic

Tunable diode laser absorption spectroscopy (TDLAS) for measure of gases CO, CO2, CH4, O2, H2S

Manufacturer
Cubic Instruments (Wuhan) Ltd.

Zetian

Tunable diode laser absorption spectroscopy (TDLAS) for measure of multiple gases (Customizable)

Manufacturer
Zetian Process and Environmental

Para. M

Paramagnetic Sensor Oxygen Measuring (PAROX 1200)

Range
0-100 Vol%, 0-25 Vol%, other ranges on request

min Range
0-50 % O2

Repeatability
< ± 0,03 % O2

Manufacturer
Angst + Pfister

optional

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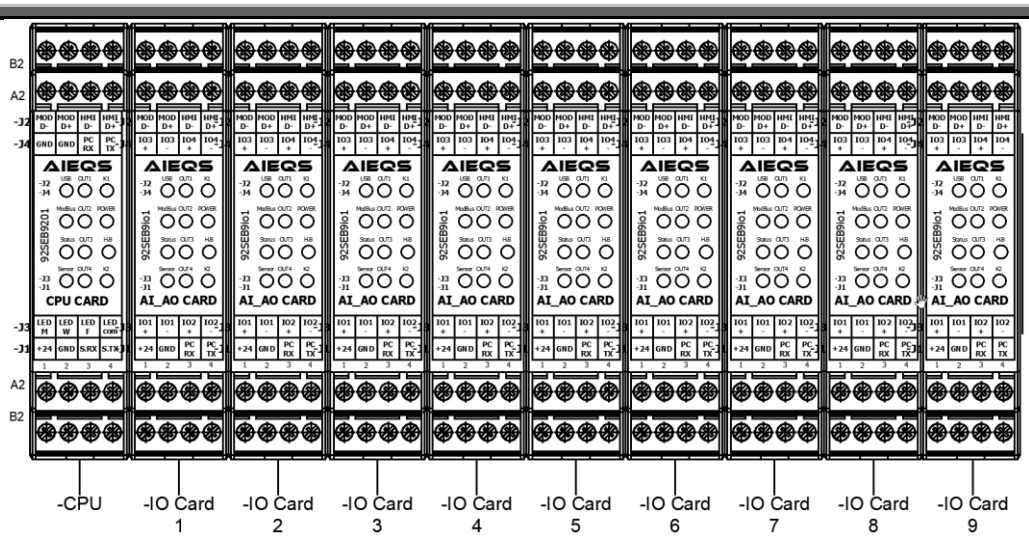
3 Power & I/O card Details



Standard IO Block configuration:
CPU Card
Depends on the gas measuring add
-IO Card 1: 1st, 4...20 mA output
-IO Card 2: 2nd, 4...20 mA output

Maximum IO Block configuration (as order):

CPU Card
-IO Card 1: 1st, 4...20 mA output
-IO Card 2: 2nd, 4...20 mA output
-IO Card 3: 1st, Relay Card
-IO Card 4: 2nd, Relay Card
-IO Card 5: 1st, Opto-coupler output
-IO Card 6: 2nd, Opto-coupler output
-IO Card 7: 1st, Opto-coupler input
-IO Card 8: 2nd, Opto-coupler input
-IO Card 9: 1st, 4...20 mA input

Analyzer Supply Voltage
90 to 260 VAC (+10 %, –15 %), switchable, 48 ... 62 Hz

Ambient temperature
+5 ... +45 °C

Storage temperature
–20 ... +70 °C

interface
RS-485 for Modbus
USB

CPU Card
Power Supply: 24 VDC
Serial Port 1: RS232 / 485 to sensor
Serial Port 2: 485 to HMI
Serial Port 3: USB to Laptop
LED indicators

2nd, 4...20 mA output Card
4 channels mA output 4 … 20 mA, 500 Ω
Potential-free (electrically isolated)
Signal range: 0 … 24 mA
Resolution/precision: 0.1 % (20 µA)

2nd, Relay output Card
4 relay outputs: 30 V AC/48 V DC
0,5 A; 1-pole changeover switch
3 connections
Max. switching current: 30 W (at 48 V DC/500 mA)

2nd, Opto-coupler output Card
4 Opto-coupler input
Switching range: 14 … 42 V
Highest allowable voltage: ±50 V DC

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Gas connection
Swagelok 6 mm
Swagelok ¼"

Purge Gas connection
Swagelok 8 mm

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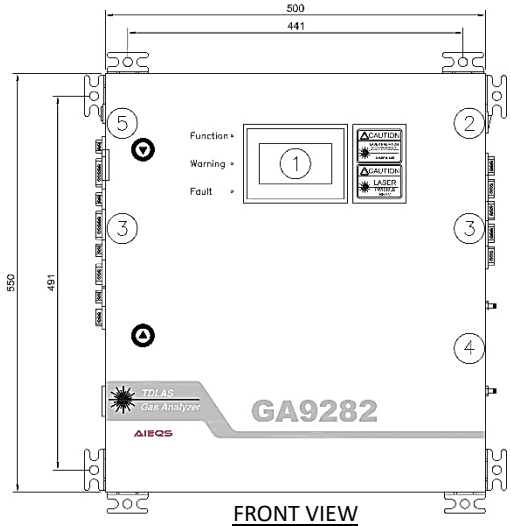
Highest allowable voltage: ±50 V DC

4…20 mA input
4 channels mA input 4 … 20 mA
Potential-free (electrically isolated)
Highest allowable input signal 30 mA
Overload protection ±1000 mA
Input load 50 Ω

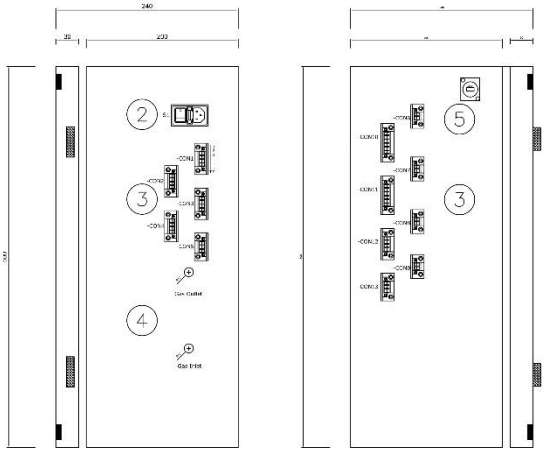
Wall mount enclosure Dimension
500x 500 x 240 mm

Wall mount enclosure weight
30-40 Kg

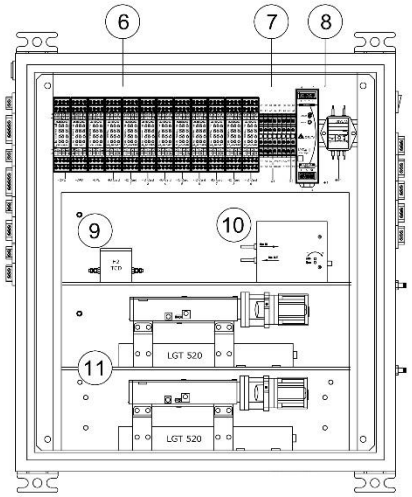
4 Dimensions



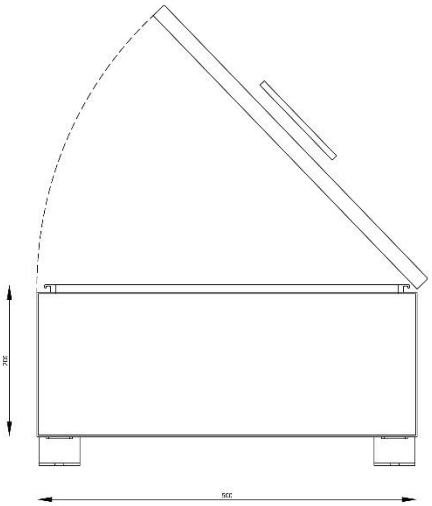
FRONT VIEW



SIDE VIEW



INSIDE VIEW



TOP VIEW

1. Touch screen Display and LEDs for Status
2. Power Supply
3. Terminals
4. CPU Cards
5. TDLAS Sensors
6. Paramagnetic sensor(optional)
7. Gas inlet / outlet connections
8. Power Cable & Fuse
9. I/O cards Block
10. Signal socket
11. USB connection

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