



# 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	0-100 Vol%	TDLAS
	0 – 10000 ppm		
CO2	0 – 1000ppm	0 – 100 Vol%	TDLAS
CH4	0 – 100 ppm	0 – 30 Vol%	TDLAS
	0-1000ppm	Customizable	
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 سیستم‌های آنالایزر برخط گاز در صنایع سیمان و فولاد
- پایش گازهای فرآیندی در دهانه کوره دوار
- بهینه‌سازی احتراق ثانویه در کلساینر
- پایش فرآیند و محافظت از فیلتر الکتروستاتیکی در پایش گرم کن
- کنترل فرآیند کارخانجات احیا مستقیم آهن
- اندازه‌گیری گاز در صنعت متالورژی و کنترل کیفیت محصول نهایی فولادی (نورد، قطعه‌سازی، 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





## Technical Information for GA9282

1

Technical Data of TDLAS sensor

<b>measuring principle</b>	Tunable Diode Laser Absorption Spectroscopy (TDLAS)
<b>Range</b>	Customizable
<b>Resolution</b>	0.1ppm/0.01%
<b>accuracy</b>	±1%F.S.
<b>response time</b>	≤30 s
<b>Flow Rate</b>	0.5–3 L/min
<b>Working / Operating Temp.</b>	-10~50°C
<b>Humidity</b>	0–98%RH
<b>Voltage / Power</b>	12V±10%, 24V DC

<b>Constant Temp.</b>	50°C ±0.5°C
<b>Linearity Error</b>	≤±1%F.S
<b>Repeatability</b>	≤1%
<b>Span drift</b>	≤±1%F.S.
<b>Zero drift</b>	≤±1%F.S.
<b>Maintenance cycle</b>	≤2 times/year
<b>warm-up time</b>	20 s quick start < 10 min full specification
<b>Output / Interface</b>	RS-485 / RS-232/4-20mA
<b>Storage Conditions</b>	-40~85°C; 0–98%RH

2

Technical Data of Other Sensors



**Cubic**

**Tunable diode laser absorption spectroscopy (TDLAS)** for measure of gases CO, CO<sub>2</sub>, CH<sub>4</sub>, O<sub>2</sub>, H<sub>2</sub>S

**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 % O<sub>2</sub>

**Repeatability**  
< ± 0,03 % O<sub>2</sub>

**Manufacturer**  
Angst + Pfister

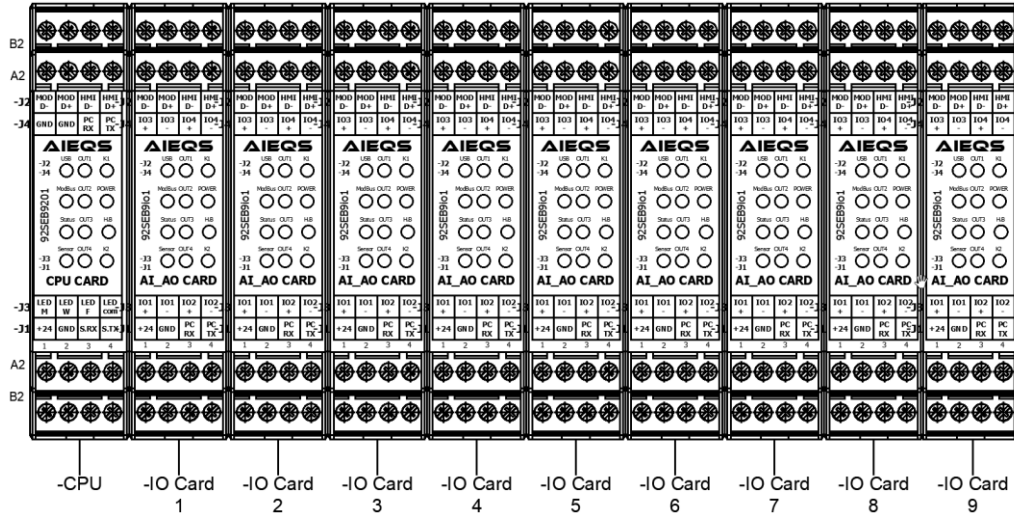
**optional**





### 3

### Power & I/O card Details



#### Standard IO Block configuration: CPU Card

- Depends on the gas measuring add
- IO Card 1: 1<sup>st</sup>, 4...20 mA output
- IO Card 2: 2<sup>nd</sup>, 4...20 mA output

#### Maximum IO Block configuration (as order):

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

#### 2<sup>nd</sup>, 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)

#### 2<sup>nd</sup>, 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)

#### 2<sup>nd</sup>, Opto-coupler output Card

4 Opto-coupler input  
Switching range: 14 ... 42 V  
Highest allowable voltage: ±50 V DC  
2<sup>nd</sup>, Opto-coupler input  
4 Opto-coupler input  
Switching range: 14 ... 42 V  
Highest allowable voltage: ±50 V DC

#### Gas connection

Swagelok 6 mm  
Swagelok ¼"

#### Purge Gas connection

Swagelok 8 mm

#### 1<sup>st</sup>, 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)

#### 1<sup>st</sup> 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)

#### 1<sup>st</sup>, Opto-coupler output Card

4 Opto-coupler input  
Switching range: 14 ... 42 V  
Highest allowable voltage: ±50 V DC

#### 1<sup>st</sup>, Opto-coupler input Card

4 Opto-coupler input  
Switching range: 14 ... 42 V  
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



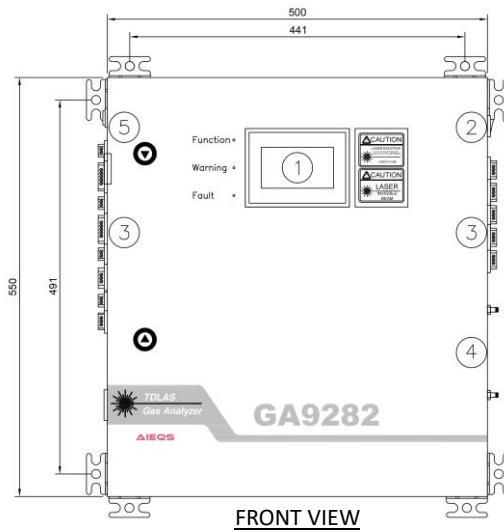


# AIEQS

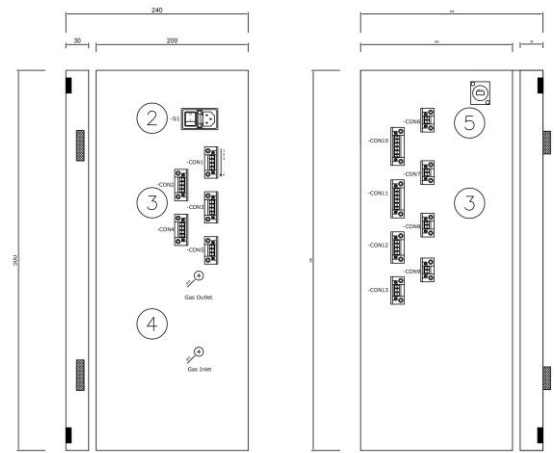
Arka Behbood Farayand (LLC)  
Process Development

## 4

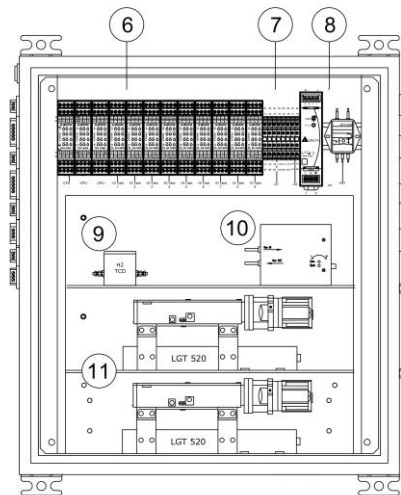
### Dimensions



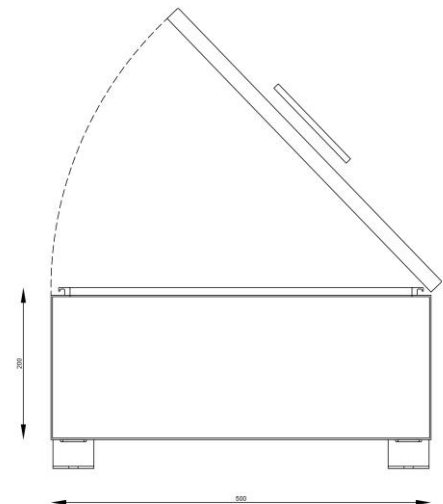
FRONT VIEW



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

Unit9, NO.10, East Taghdiri St. Valiasr St  
Ferdous BLV. 2nd Sadeghiyeh Sq. Tehran  
P Code:1481793968 021.44015428-9

www.aieqs.com

www.apds.ir

info@apds.ir

