

TDLAS GAS ANALYZER

GA9272_O₂



Specialized for high-precision O₂ measurement using TDLAS Technology.

19" Rack Mount

Highlights:

- Designed based on TDLAS (Tunable Diode Laser Absorption Spectroscopy) technology for high-precision oxygen (O₂) measurement
- Narrow-linewidth semiconductor diode laser for selective O₂ detection
- Highly accurate and selective oxygen measurement without cross-gas interference
- Laser frequency tuning via drive current control aligned with the O₂ absorption line
- Lock-in amplifier for enhanced signal-to-noise ratio
- High-accuracy and long-term stable O₂ concentration calculation
- Single-Line TDLAS technology with no moving parts
- High mechanical stability with fast response time
- Minimal maintenance due to solid-state design
- Automatic temperature and pressure compensation for measurement stability
- Continuous, real-time monitoring of O₂ in combustion processes
- Improved combustion efficiency and reduced energy consumption
- Prevention of furnace heat losses through optimized air-to-fuel ratio
- Enhanced operational safety by preventing unsafe oxygen conditions during startup
- Reduced environmental emissions through precise oxygen control in combustion processes

ویژگیها :

- طراحی شده بر پایه فناوری ویژه اندازه گیری گاز اکسیژن (O₂) TDLAS (Tunable Diode Laser Absorption Spectroscopy)
- لیزر دیودی نیمههادی با پهنای طیفی باریک برای آشکارسازی اختصاصی O₂
- اندازه‌گیری دقیق و انتخابی غلظت اکسیژن بدون تداخل گازهای دیگر
- تنظیم فرکانس لیزر از طریق کنترل جریان برای تطبیق با خط جذب O₂
- استفاده از تقویت‌کننده Lock-in برای افزایش نسبت سیگنال به نویز
- محاسبه دقیق و پایدار غلظت اکسیژن
- فناوری Single-Line TDLAS بدون قطعات متحرک
- پایداری مکانیکی بالا و پاسخ‌دهی سریع
- نیاز حداقلی به سرویس و نگهداری (Solid-State)
- جبران‌سازی خودکار دما و فشار برای حفظ دقت اندازه‌گیری
- پایش پیوسته و برخط اکسیژن در فرآیندهای احتراقی
- بهینه‌سازی احتراق و کاهش مصرف انرژی
- جلوگیری از اتلاف حرارتی با تنظیم صحیح نسبت هوا به سوخت
- افزایش ایمنی و کاهش خطر انفجار هنگام راه‌اندازی
- کاهش انتشار آلاینده‌های زیست‌محیطی

Product Details:

Gas	min. range	max. range	Type of Sensor
O ₂	0-1000ppm	0-5%Vol	TDLAS ¹
		0-25%Vol	
		0-100%Vol	

Notes:

- Tunable Diode Laser Absorption Spectroscopy
- The 0-100% range can be fully customized according to the application requirements.
- The measurement of other gases is also customizable.

Applications:

- Suitable to install in gas analyzer system of Cement, Steel plants
- Online O₂ gas monitoring in cement, steel and metallurgical plants
- Kiln inlet and calciner O₂ control for combustion optimization and energy savings

کاربردها :

- نصب در سیستم‌های آنالایزر برخط گاز در منابع سیمان و فولاد
- نصب در سیستم‌های آنالایزر برخط گاز در منابع سیمان فولاد و متالورژی برای پایش O₂
- پایش O₂ در دهانه کوره دوار و کلساینر جهت کنترل احتراق و کاهش مصرف انرژی
- پایش O₂ در ناحیه پیش‌گرم‌کن و ESP برای کاهش خطر انفجار
- کنترل فرآیند در کارخانجات احیا مستقیم آهن (DRI) با مانیتورینگ O₂ در گازهای فرآیندی
- اندازه‌گیری O₂ در کوره‌های عملیات حرارتی و نورد برای حفظ کیفیت محصول فولادی
- O₂ monitoring in preheater and ESP areas to reduce explosion risk
- Process control in DRI plants via O₂ measurement in process gases
- O₂ measurement in heat treatment and reheating furnaces for steel quality control



Technical Information for GA92 V2

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Technical Data
of
TDLAS sensor

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

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Technical Data
of
Other
Sensors



Tunable diode laser absorption spectroscopy (TDLAS), Customized for measuring O₂

Manufacturer
Cubic Instruments (Wuhan) Ltd.

Cubic



Zetian

Tunable diode laser absorption spectroscopy (TDLAS) Customized for measuring O₂

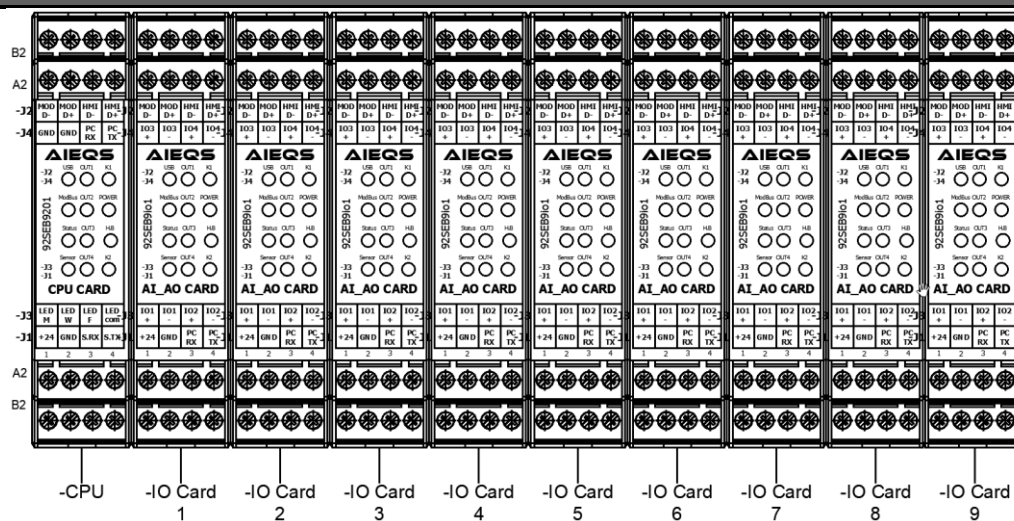
Manufacturer
Zetian Process and Environmental





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Power & I/O card Details



Standard IO Block configuration:

CPU Card1

CPU Card2

CPU Card3

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

2nd, 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

1st, 4...20 mA output Card

4 channels mA output 4 ... 20 mA, 500 Ω

Live Zero 0/2/4 mA Configurable

Potential-free (electrically isolated)

Signal range: 0 ... 24 mA

Resolution/precision: 0.1 % (20 µA)

1st Relay output Card

4 relay outputs: 30 V AC/48 V DC

0,5 A; 1-pole changeover switch

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1st, 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

19" Rack mount enclosure Dimension

۴۲۰ × ۴۲۰ × ۱۷۰ mm, 4 unit of rack

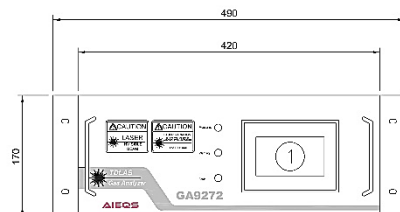
19" Rack mount enclosure weight

15-25 Kg

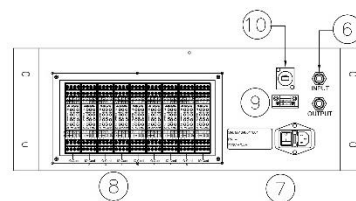


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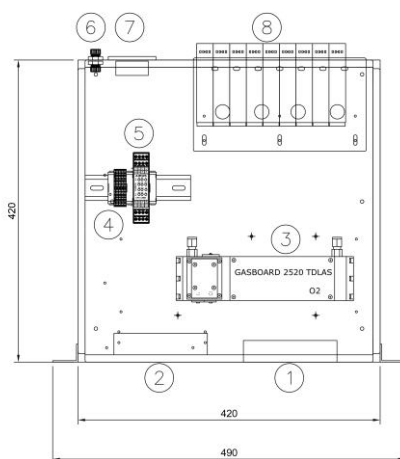
Dimensions



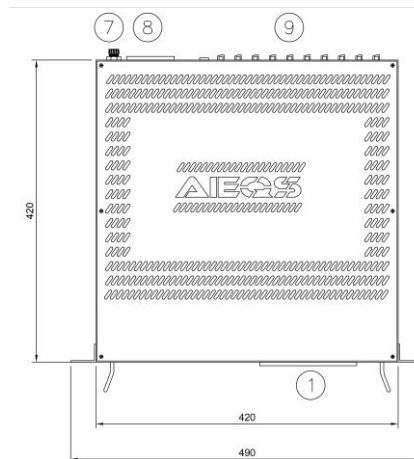
FRONT VIEW



BACK VIEW



INSIDE VIEW



TOP VIEW

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

