



Portable Oxygen Gas Analyzer

T-GAS-P-O2



Features

- Suitable for all kinds of complex or harsh environments. It can detect high temperature, high humidity, dust and other harsh environment gases with pretreatment.
 - High precision, built-in electrical anti-interference, error compensation, sampling and filtering technology, high precision detection
 - Using a 32-bit arm low-power high-speed processor.
- Various display modes: digital and graphic display mode is adopted for gas concentration value.
 - Ultra wide viewing angle, bright 2.8-inch color LCD screen, long-distance visualization,
 - The optional wireless data transmission module can realize the wireless signal transmission in the area covered by the wireless signal
 - The Internet of things function can be selected: it can be connected to the health server to realize the remote monitoring of mobile phone and computer, alarm reminder and alarm value setting, etc;
 - It supports the replacement and combination of various gas sensors (1 ~ 8 parameters).
 - Built in long-life brushless air pump, high air flow stability.



- High and low alarm points can be set, two-level alarm
- Large capacity data storage, data can be exported
- Super long endurance, can work continuously for more than 48 hour.

Product Overview

Portable oxygen gas analyzer is a kind of high precision pump suction gas analyzer suitable for complex environment detection. Built in pretreatment, error compensation, anti-electrical interference, wireless signal output and other functions, the gas analyzer can be expanded to detect 8 kinds of gas at the same time. The portable gas analyzer can be equipped with a wireless transmission module, which can be connected to the server to realize remote monitoring, remote setting of alarm value and remote calibration. Main purpose and scope of use: mainly used in metallurgy, petroleum, chemical industry, underground engineering such as mine or underground pipeline, tunnel, detection and overrun alarm of combustible and toxic gases in surrounding air environment. It is applicable to all operators such as professional technicians, operators and leaders.

Technical Specifications

Parameter	Description
Model name Portable	O2 gas analyzer
Detect gas	O2
Range	100%VOL
Unit	%VOL
Resolution	0.1%VOL
Precision	$\leq \pm 2\%FS$
Repeatability	$\leq \pm 1\%$
Response time	30s
Recovery time	T90-T10
Display	320*240 color screen 2.8'
Language	Chinese and English
Sampling method	Pump type

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Shell material	ABS
Temperature measurement range	-40°C~+120°C ±0.2°C
Humidity measurement range	0~+100%RH ±3°C
Wireless output (optional)	WIFI, Zigbee, LORA, 433M, 800M, GPRS/3G/4G
communication interface	RS-232 USB
Alarm	LED; Display screen character flashing and information reminder; Buzzer alarm;
Lifetime	Above 5 years
Power supply	3.3V-4.5VDC, Typical power supply 3.7VDC
Power capacity	6000mA
Charging parameters	5V 1A
Dimension	283 MM * 332 MM * 148 MM (L*W*H)
Weight	4.0±0.1kg

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ONLINE OXYGEN ANALYZER FOR BOILER

Oxygen measurement at Boiler / Boiler stack



INTRODUCTION

Oxygen concentration measurements are used in a variety of applications including, energy conservation, pollution reduction and process quality control and accomplished using several different measurement principles. Even Governmental regulations to control CO₂ and NO_x emissions, affect even small municipal, private and commercial utility boilers and furnaces as they must be controlled or at least tested on a regular basis.

However, Zirconia-based Oxygen Analyzers are most commonly used for combustion control, burner optimization and to increase the efficiency of boilers and industrial heaters to achieve fuel conservation. Major end-users are found in the following industrial fields:

- Electrical Power Generation
- Chemical and Petrochemical
- Iron and Steel Manufacturing
- Petroleum Refinery
- Pulp & Paper
- Textiles



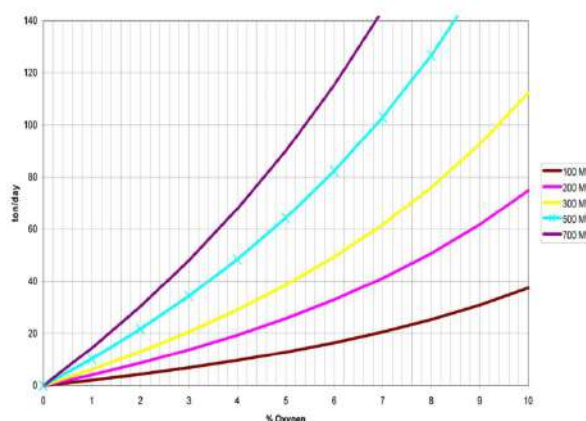
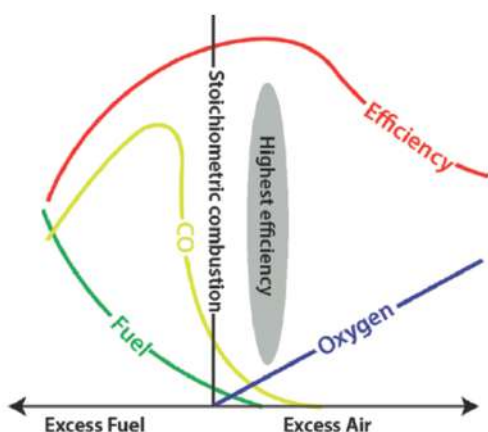
CHALLENGES

This system is for monitoring and controlling oxygen concentration in the combustion gasses of a large-size boiler or heating furnace. However, no matter the desired measurement some common difficulties that you will face are:

- A variety of established competitors
- Conservative end-users who are reluctant to switch from one supplier to another
- A growing number of government regulations

SOLUTION

Either the measurement of oxygen or carbon monoxide can be used to determine the level of excess air. However, measuring CO alone will not define which type of an environment, fuel rich or air rich, a burner is operating in. Therefore combustion control needs to be based on accurate and dependable Oxygen analysis. To ensure complete combustion chamber are supplied with excess air to increase the amount of oxygen and the probability of combustion of all fuel. The combustion efficiency will increase with increased excess air, until the heat loss in the excess air is larger than the heat provided by more efficient combustion.



“Air-fuel ratio” or “Excess air” refers to the amount of air theoretically required to achieve complete combustion of the fuel supplied to the furnace of the boiler. The “air-fuel ratio” or “excess air” is used to achieve the highest efficiency for a system based on each different fuel source. “Excess air” can be obtained by measuring the oxygen concentration in the exhaust gas and calculated by:

$$n = (1 / (21 - \text{Oxygen concentration})) \times 21$$

Data is available that shows the various fuel sources and an indication of their typical value for excess air; shown in the table below are just a few of the common fuel sources:

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Fuel	Excess of Air (%)
Coke oven gas	5-10
Natural gas	5-10
Coal pulverized	15-20
Coal stoker	20-30
Oil	10-20

Under actual operating conditions some amount of excess air is always necessary to bring the combustibles level close to zero. The challenge is to minimize these effects by achieving complete combustion with the lowest excess air levels possible. It is important to accurately measure and control oxygen analysis because:

- Insufficient air is a waste of fuel which is a waste of money. As a rule of thumb each 10% excess O₂ is equivalent to a 1% in wasted fuel.

FEATURES

- Strong resistance to electric field interference.
- No special ground wire required.
- High accuracy and wide range ratio.
- Easy to install and widely used.

TECHNICAL FEATURES

Unique probe design

To ensure safe working of an online Oxygen analyzer system we are providing a special probe design and probe protector to protect the zirconia sensor from harsh process conditions . Performance remains healthy and reduces regular maintenance jobs.

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Quick response

The generated flue gas content is quickly and accurately monitored and analyzed online to achieve low oxygen combustion control, achieve energy saving purposes and reduce environmental pollution .

Easy to install

The probe design is simple and easy to install at site.

SPECIFICATIONS

Parameter	Description
O ₂ range	0~5%O ₂ , 0~10%O ₂ , 0~20%O ₂ , 0~25%O ₂
Background correction	-20mV ~ +20mV
Measured flue gas temperature	OXT4000- below 700 Deg C , OXT5000- below 1200 Deg C
Resolution	0.01%
Measurement Accuracy	+/- 1% (0 - 5%) +/- 2% (0% - 25%)
Response time	90% about 3 seconds
Heating time of zirconia probe heater	About 20 min
Operating Temperature	0°C to 55°C
Relative Humidity	<95 %, non-condensing
Output signal	Expandable two way isolated output, 0~10mA DC and 4~20mA DC, Adopt photoelectric reasonable, directly connect with computer
Digital Output	RS485
Relay Output	2 Nos
Power Consumption	About 8W for transmitter, about 50W for heating furnace on average

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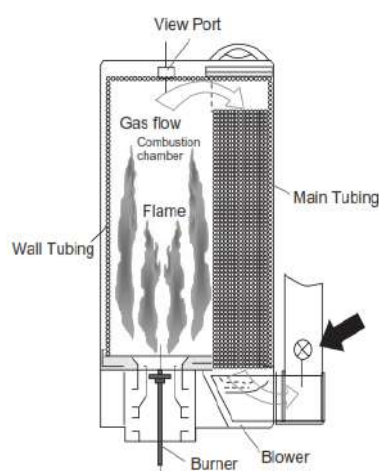
Power	220V +/-10%, 50 Hz
Supply includes	O2 probe with Controller

Application:

1) Package Boiler

This is the most common application. Although the system is generally used for combustion monitoring, there are also cases in which it will be used for VVVF or other such combustion control schemes.

Sample point : Boiler furnace outlet or economizer outlet



Package boiler

Gas temperature: 150 to 300°C
Gas pressure: ± 0.5 kPa
Dust: ≤ 1 g/Nm³
Fuel: Fuel oil, kerosene, or gas

2) Pulverized coal boiler

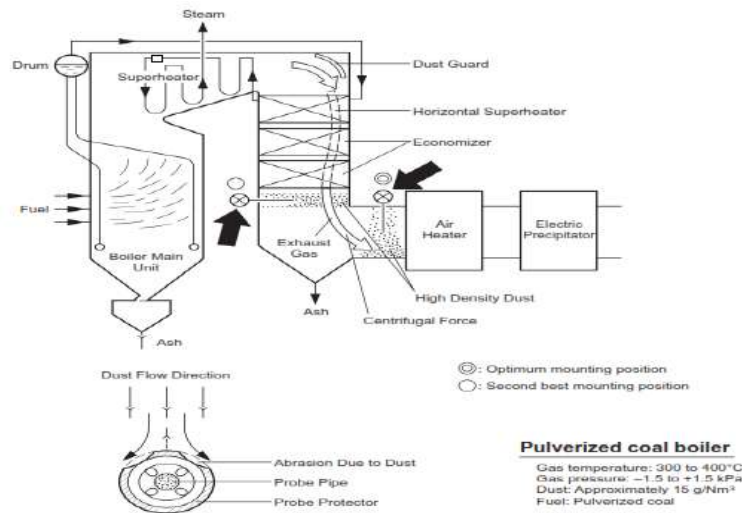
These are almost always large facilities such as power generation boilers; the zirconia oxygen analyzer is used for combustion monitoring and combustion control. Since the exhaust gas entrains a rather large amount of ash dust, a detector with dust protector will be used.

Sample Point: Economizer outlet (economizer, feedwater afterheater)

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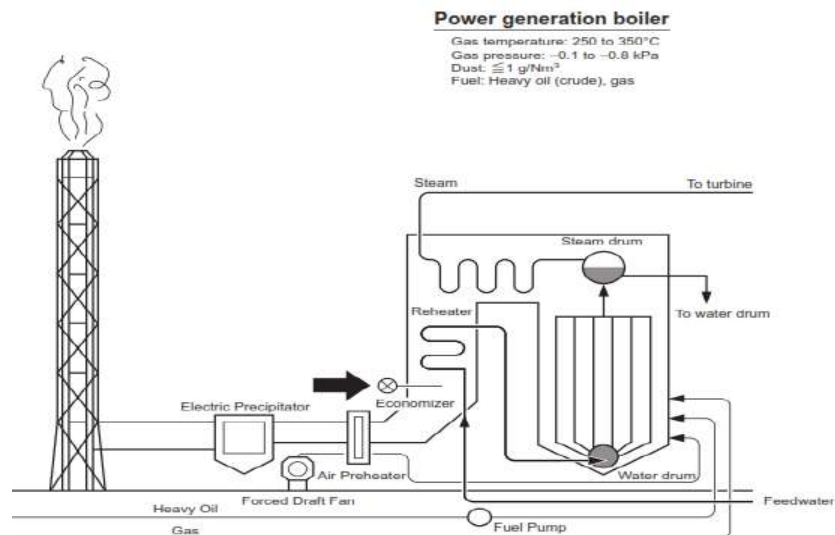


3) Power generation boiler (Heavy oil, Gas)

This is a large-scale facility in which use for combustion control is more common than for combustion monitoring.

In cogeneration, the majority of cases involve measurement at a single point. In electric power companies, measurements are performed at multiple points in a single flue.

Sample Point- Boiler furnace outlet or economizer outlet



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Zirconia Oxygen Analyser

ZOA-OXT-6000

Features

- The sensor adopts ion coating technology, which has strong anti-oxidation ability, long service life, extremely low oxygen potential long-term drift, high measurement accuracy and stable and reliable data; the sensor adopts unique welding process, which has high sealing performance and no leakage; **the unique thermal diffusion reference design does not need special reference air pump/Instrument Air, which is easy to use and small maintenance.**

- The wall mounted oxygen content converter adopts LCD liquid crystal display with rich display contents;

- Menu function selection and operation, easy to learn and understand, low difficulty in use;
- The instrument adopts imported industrial chip, which has strong anti-oxidation ability and ensures the calculation accuracy and stability;
- The shell adopts cast aluminum shell with **IP65/IP66** protection grade, which effectively protects the internal circuit from environmental pollution;
- The wall mounted converter is installed locally, the distance between the detector and the converter is relatively close, and the debugging is convenient.

Product Overview

Flue gas oxygen content is one of the important monitoring parameters for boiler/furnace operation and an important basis to reflect the degree of combustion equipment and boiler



operation perfection. Its value is related to the boiler structure, fuel type and nature, boiler load, operation and air distribution conditions, equipment sealing conditions and other factors. The smaller the oxygen content is, the smaller the excess air coefficient is, the higher the heat loss of chemical incomplete combustion and mechanical incomplete combustion is; the larger the oxygen content is, the greater the excess air coefficient is, the greater the air quantity is fed. Excessive air causes the furnace temperature to drop, which not only affects the combustion, but also takes a lot of heat and dust away, and increases the calculation results of pollution emission concentration. Meanwhile, large air volume also increases the power consumption of exhaust gas. It is very important to control the oxygen content of flue gas for controlling combustion process and realizing safe, efficient and low pollution emission.

Scope of Application

1. Including energy consumption industries, such as iron and steel metallurgy, thermal power plant, petrochemical industry, paper mill, food industry, textile industry, Cement industry.
2. The product industry also includes various combustion equipment, such as municipal solid waste incinerators, hazardous waste incinerators, small and medium-sized heating boilers, etc.

Technical Specifications

Parameter	Description	Parameter	Description
Process medium	Flue gas	Operating temperature	0-700 °C (Customizable)
Operating pressure	±20KPa	Ambient temperature	- 20 ~ + 65 °C
Detection type	Insert directly	Instrument Accuracy	0.5% FS or 0.1% of reading
Temperature control	±1°C	Range	0-25% (programmable)
Output signal	4-20mA	Insertion depth	200 mm ~2000mm (Customizable)
Display and	LCD, External	Response time	T90 < 5s

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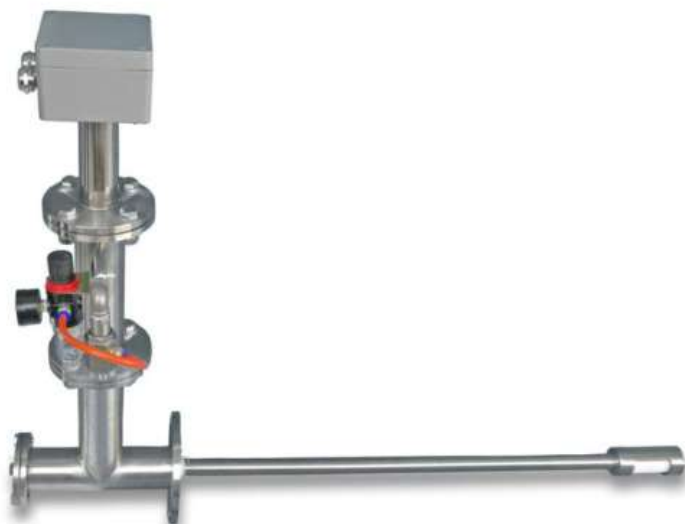
installation mode	display		
Flange standard	DN50,PN1.0 (Customizable)	Electronics Unit IP Grade	IP65/IP 66
Process connection	Flange	Probe Unit IP Grade	IP65/IP 66
O2 Probe material	SS316L	Filter material	Ceramics (As per dust load)
Electrical interface	M25 * 1.5	Power supply:	110/230VAC 50-60Hz
Accessories	Probe Protection tube,mounting spool piece and Interconnection cable	Probe Protection tube material	SS304/SS316/Inconel (Customizable)



ZOA-OXT-6000-01

High temperature cooling drainage tube

When the temperature of the flue gas is more than 650°C, It Should be adopted drainage type. The drainage type is used with a 200~300mm Oxygen probe only.



Flue gas temperature above 650 °C, flue gas flow rate less than 5m / s, flue gas pressure is negative pressure	Select air extraction sampling type (compressed air required, pressure 0.4-0.8mpa)
Flue gas temperature above 650 ° C, flue gas flow rate less than 5m / s, flue gas pressure is positive pressure	Select positive pressure self injection sampling type (no need of compressed air)

Principal

Equipped with a high temperature adapter, the high temperature flue gas is introduced into the adapter, and the actual temperature is reduced to below 600 ° C after capacity expansion, pressure reduction and temperature reduction, so as to realize the detection of high temperature gas.

Product feature

1. It can analyze flue gas at 0-1400 ° C directly, with high accuracy, and can install detector and sampler separately;

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2. The sensor is made of high temperature resistant and corrosion-resistant material with good reliability.

Scope application

It is mainly used for strong corrosive flue gas, such as furnaces ,Kiln , waste incineration power plant and industrial hazardous waste incinerator. The high temperature environment can be at the flue gas temperature of 600-1400 ° C

Technical parameters

Applicable flue gas temperature	0°C-1400°C	Applicable flue gas pressure	-20KPA-+20KPA
Probe material	SS304I/SS316L	Material of diversion pipe	2520 / GH3039 / silicon carbide
Flange specification	Standard configuration: 155mm od screw hole spacing 130mm other specifications are optional	Length of diversion pipe	500mm 800mm 1000mm 1200mm (other specifications can be customized)
Resistance value of heating furnace	Standard configuration: 60Ω (optional:80Ω,120Ω,160Ω)	response time	90% of standard gas within 5S
Degree of protection	IP65	service life	2-5 years according to actual working conditions
Analyzer weight	About 2kg	Instrument accuracy	0.5% FS or 0.1% of reading
Output	4-20mA	Range	0-25% (programmable)
Display and installation mode	LCD, External display	Temperature control	±1°C
Ambient temperature	- 20 ~ + 65 °C	Process medium	Flue gas

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Product Overview

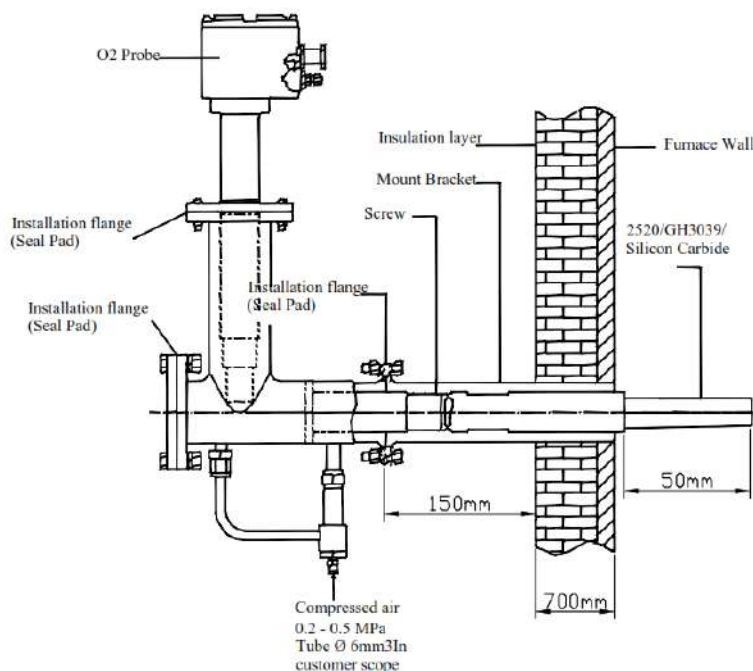
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Model: ZOA-OXT-6000-01

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- 1) MODEL NO. : ZOA-OXT-6000-01
- 2) ANALYSING MEASURING RANGE : 0- 25 %
- 3) PROCESS TEMPERATURE : 0-1400°C

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