

# Zirconia Oxygen Analyzer

## Overview

SMART-OXZ Oxygen Analyzer uses a unique reference built-in zirconia technology, has higher accuracy and repeatability for oxygen measurement, with no need to provide standard air or calibration.

## Principle

The zirconia sensor is tubular, separated by a zirconia material in the middle, and porous metal layer are sintered on the two parts of the zirconia as electrodes (usually use platinum Pt as the electrode material). At a certain temperature (600°C~1400°C), oxygen molecules with higher oxygen content are adsorbed on the electrode, making this side electrode positively charged, which is the positive electrode or anode of the oxygen concentration battery. Under the catalysis of platinum, a reduction reaction takes place, get electrons to form oxygen ions. Oxygen ions migrate through a large amount of zirconia crystals to the other side where the oxygen content is low, making the electrode negatively charged, which is the negative electrode or cathode of the oxygen concentration battery. Lose electrons on the platinum electrode, forming oxygen molecules. In this way, a certain potential is formed on the two electrodes due to the accumulation of positive and negative charges. This potential is related to the difference in oxygen concentration between the two measured gases of zirconia. It conforms to the Nernst equation and then the oxygen partial pressure (P1) in the gas can be calculated, and the oxygen concentration in the gas to be measured is obtained.

## Application

- ASU(Air separation unit)
- Chemical, Pharmaceutical Industry
- Petroleum and Petrochemical Industry
- Metallurgical Industry
- Glass manufacturing
- Semiconductor Industry
- Food and beverage Industry
- Flare monitoring
- Nuclear,heat treatment, welding protection
- Environmental area monitoring
- Anesthesia, breathing and prenatal care

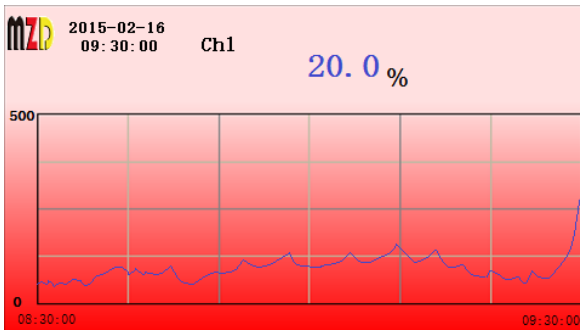
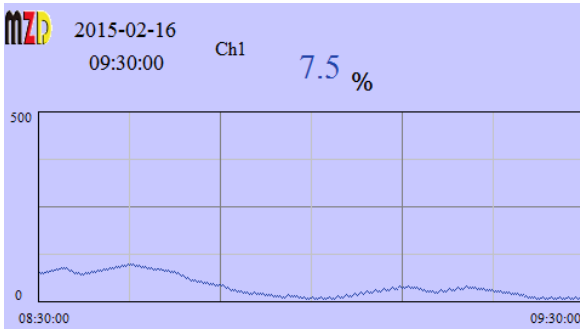
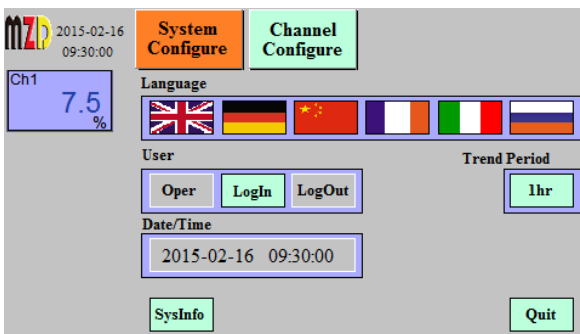


## Advantage

- Quick response
- High accuracy and repeatability
- No drift, maintenance-free, no calibration required\*
- Rugged and durable design
- Easy installation
- Comfortable and friendly operation
- Long-life zirconia sensor

\*For vacuum application, need calibration

## Trace/Percent Oxygen Analyzer

2015-02-16  
09:30:00  
Ch1  
7.5 %

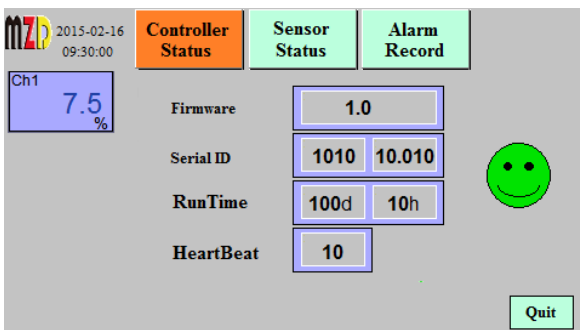
**System Configure** | Channel Configure

Language: [UK] [DE] [CN] [FR] [IT] [RU]

User: [Oper] [LogIn] [LogOut] | Trend Period: [1hr]

Date/Time: 2015-02-16 09:30:00

[SysInfo] [Quit]



2015-02-16  
09:30:00  
Ch1  
7.5 %

**Controller Status** | Sensor Status | Alarm Record

Firmware: 1.0

Serial ID: 1010 | 10.010

RunTime: 100d | 10h

HeartBeat: 10

[Quit]

### Features

#### ❖ Quick and convenient

The navigation menu contains 6 languages, which can be operated easily.

#### ❖ Process safety

4.3" or 7" large size color LCD touch screen, convenient and safe touch operation and debugging

Large size screen with red flashing alarm, clearly visible from long distances and in dark areas

Alarm immediately, safe the process

#### ❖ Alarm event record

Real-time data curve display

Record function for up to 6,000 alarms

#### ❖ Expert calibration function

Multi-point calibration function up to 9 point

#### ❖ Powerful self-diagnosis function

Built-in heartbeat monitoring function and watchdog

Monitor the status of analyzer and sensors, and promptly remind customers to take necessary maintenance

High-standard hardware and software security and password protection

#### ❖ Powerful control function

High(low) limit control function

Optional: Timer control(automatic cleaning) function

Optional: analog PID control function

Optional: PWM control function

#### ❖ Flexible fieldbus communication functions for IOT4.0

Optional fieldbus MODBUS, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, etc.



# Zirconia Oxygen Analyzer

## Parameters

<b>Measuring principle</b>	Zirconia		
<b>Display</b>	4.3" or 7" industrial color touch screen		
<b>Language</b>	Multi-Language (English, German, Chinese, French, Italian, Russian or Customized)		
<b>Range</b>	0 ~ 10/100/1000ppm or 0 ~ 1%/10%/30%		
<b>Linearity</b>	<3% of measuring value		
<b>Sensitivity</b>	0.1ppm or 0.01%		
<b>Sample gas temperature</b>	<300°C		
<b>Working temperature</b>	700°C		
<b>Gas pressure</b>	<2bar(Available for vacuum)		
<b>Gas Flow</b>	5~10NI/h, Max. 10m/s		
<b>Warm up time</b>	5mintue		
<b>Analog Output(Galvanic)</b>	4~20mA, maximum load 500Ω		
<b>Relay Output(Galvanic)</b>	Relay(2A, 230V AC freely set alarm), System alarm		
<b>Diagnosis function</b>	Flow monitoring, Sensor and analyzer self-diagnosis, Heartbeat monitoring		
<b>Event Logger</b>	Internal Flash, up to 6,000 alarm records		
<b>Control function</b>	Optional Timer control function, PID, PWM		
<b>Calibration</b>	Expert calibration function, Multi-point calibration function up to 9 point		
<b>Communication</b>	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc		
<b>Power</b>	80~264V AC, 1A or 19~28V DC, 3A		
<b>Electrical protection</b>	EMI / RFI CEI-EN55011 – 05/99		
<b>Ambient Temperature</b>	-20~50°C		
<b>Storage and transport temperature</b>	-25~70°C		
<b>Ambient Humidity</b>	0~80%RH		
<b>Diameter of connecting pipe</b>	6mm		
<b>Wall-mounted(1~2Channels)</b>	ABS, Gray RAL7045	213x185x84mm	IP65
	Aluminum, Gray	230x200x157mm	IP65, Exd IICT4
<b>Laboratory Desktop(1~2Channels)</b>	Aluminum, Black	250x144x184mm	IP40
<b>Portable(1~2Channels)</b>	ABS, Yellow	420x325x180mm	IP67
<b>19" Rack(1~6Channels)</b>	Aluminu, natural-coloured	483x133x238mm	IP40



## Trace/Percent Oxygen Analyzer



<b>Measuring principle</b>	Zirconia
<b>Display</b>	1.8" industrial color LCD, 160*128Pixel
<b>Language</b>	English Menu
<b>LED Light</b>	Status LED Light(NAMUR NE107)
<b>Keypad</b>	Magnetic keypad
<b>Range</b>	0~1~1000ppm, 0~100% O <sub>2</sub>
<b>Accuracy</b>	< 2% F.S.
<b>Repeatability</b>	< 0.1% F.S.
<b>Sensitivity</b>	1ppb or 0.01%
<b>Response Time</b>	<1s
<b>T90-time</b>	<2 sec at flow rate 10l/h
<b>Warm up time</b>	5minute
<b>Diagnosis function</b>	Self-diagnosis, heart beat monitoring
<b>Analog Output</b>	4~20mA
<b>Relay Output</b>	3 Relays, NO, 5A 250VAC/30VDC
<b>Communication</b>	RS485, MODBUS RTU
<b>Power</b>	19 ~ 28V DC Power,1A
<b>Flow rate</b>	5l/h to 10l/h, Max.10m/s
<b>Process Pressure(Max.)</b>	2Bar (Available for vacuum)
<b>Process Gas Temperature</b>	<300°C(Optional,700~1400°C)
<b>Working temperature</b>	700°C
<b>Process Connection</b>	NPT1/2" thread or KF40 flange
<b>Ambient Temperature</b>	-20 ~ 50°C
<b>Ambient Humidity</b>	0~80%RH
<b>Electrical protection</b>	EMI / RFI CEI-EN55011 – 05/99
<b>Housing Material</b>	Aluminum and Stainless steel
<b>Explosion-proof</b>	Exd IICT4 Controller optional



## Zirconia Oxygen Analyzer

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Note:

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MZD does not accept responsibility for potential errors or possible lack of information in this document.



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