The people for Process Analytics

MZD Analytik GmbH is located near Dresden, Europe's Silicon Valley, the capital of Saxony, Germany. It has set itself the goal of offering modern measuring and automation technology in process analytics. The leading employees of **MZD** have a Doctorate or Master's degree in technical discipline and, thanks to many years of experience, are able to competently solve the problems of measurement and automation technology that are pending in the industry. We place great value on certified quality standards for the products we developed and produced. **MZD** has a well-developed network in Europe and Asia(China) in order to be able to respond competently to all questions of our industrial customers.

Our engineers work in partnership with OEM/ODM's (and customers) from the initial design stage through post-production to ensure customer satisfaction throughout all phases of product development.

MZD offers for you both in Europe and Asia

- Project planning, construction and commissioning of measuring equipment, which we plan and act according to your task
- Coordination of all services, including our cooperation partners in some more complex tasks (general contractor)
- Calibration and adjustment of our measuring instruments

Modbus PROFIBUS Fieldbus Foundation HART COMMUNICATION PROTOCOL WirelessHART

The people for Process Analytics

MZD Analytik GmbH supply products as follows：

Moisture in Gas	0~20,000ppb or 2,000ppm		
H2S Gas Analyzer	0~100ppm up to 5000ppm	**Cl2 Gas Analyzer**	0~500ppm up to 30%
HCl Gas Analyzer	0~50ppm up to 500ppm	**NH3 Gas Analyzer**	0~15ppm up to 500ppm
O2 Gas Analyzer	0~10ppm up to 100%	**O3 Gas Analyzer**	0~10ppm up to 5000ppm
H2 Gas Analyzer	0~100%	**CH4 Gas Analyzer**	0~500ppm up to 100%
C2H2 Gas Analyzer	0~500ppm up to 100%	**CmHn Gas Analyzer**	0~500ppm up to 100%
CO Gas Analyzer	0~200ppm up to 100%	**CO2 Gas Analyzer**	0~50ppm up to 100%
SO2 Gas Analyzer	0~50ppm up to 100%	**NOx Gas Analyzer**	0~50ppm up to 100%
He/Ne/Kr/D2/SF6/R125 Gas	0~100%		
Thermal Conductivity analyzer		two-component gas (%)	
Infrared photometry analyzer		CO,CO2,CmHn,N2O,SO2	
Ultraviolet photometry analyzer		SO2,NO,NO2,O3,Cl2,H2S	
Laser analyzer		H2O2,NH3,H2O,CO,CH2O...	
Medical Oxygen Analyzer		H2O,O2,CO,CO2	
Mutigas Analyzer	Up to six gases components		
Bulk Moisture	0~100%	**Moisture in Oil**	0~100%
Water quality analyzer			
Fouling Monitoring	0~1000μm	**Turbidity**	0~4000NTU/FNU
Dissolved Oxygen	0~20mg/L or 200ppm or 200%SAT	**PH**	0~14pH
ORP	-1000~1000mv	**Conductivity**	0~700ms/cm
Salinity	0~133000ppm	**Total dissolved solids**	0~78g/Kg
SS/MLSS	0~50g/L	**Chlorine/Dioxide Chlorine**	0~2/5/10ppm
COD	0~50mg/L or 1300mg/L	**BOD**	0~15mg/L or 350mg/L
TOC	0~20mg/L or 500mg/L		

If you have any demand for different measuring applications, please contact us. We can develop and customize the measuring system to fit your applications and wishes, for your private labeled products!

The basis of our work is the mutual trust between the partners in a long-term successful cooperation. Our service goal is to uncompromisingly achieve the satisfaction of our customers and to be the most important partner concerning industrial measurement technology in the world.

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Moisture Analyzer

Continuous Measurement of trace moisture in Corrosive Gases

Overview

Electrolysis principle for trace moisture measurement in gas was successfully tested and applied to trace moisture measurement by Keide in 1959. This method provides a continuous industrial measurement solution for trace moisture in non-alkaline gases, which can continuously, online and real-time monitor the trace moisture in various industrial processes.

Principle

The sensor are plated with parallel platinum layers or wound parallel platinum wires, the platinum wires are coated with a hydrated phosphorus pentoxide film. When the gas passes through the electrolytic cell, all of the water is absorbed and and generates phosphoric acid. At the same time, the DC voltage between the platinum wires causes the phosphoric acid to produce an electrolytic reaction to decompose oxygen, hydrogen and phosphorus pentoxide. When the absorption and electrolysis reach a balance, the water entering the electrolytic cell is all absorbed by the phosphorus pentoxide film and then electrolyzed completely. According to Faraday's law of electrolysis and the gas law, the absolute value of moisture in a gas sample can be directly measured according to the electrolysis current.

Application

- Chemicals (Especially for technologies with aggressive gases , PVC / Chlor-Alkali / Fluorine / Polysilicon / Silicone)
- Oil and gas
- Energy/Power Plant
- Air Separation Unit
- Microelectronics(OLED/capacitor/HID)
- Lithium battery
- University and research
- Glove Boxes

Trace Moisture Analyzer

Sensor features

Zirconia ceramic or glass material is optional. The movable construction of electrolytic cell is easy to disassemble and do maintenance.

Installation

▲Corrosive gas: PVDF electrolytic cell, Non-corrosive gas: PVDF or SS stainless steel electrolytic cell

▲The sample gas pressure can reach 3Bar(PVDF)/10Bar(SS)

▲Stable sample gas flow rate 20Nl/h or 100Nl/h

▲Three-way valve and four-way valve operation, convenient for sensor maintenance and recoating

▲Slight positive pressure protection of compressed air in the sampling unit

▲Filter can be used for unclean gases

▲Electric heating regulator can be used for liquid chlorine evaporation

▲Vacuum pump can be used for the vacuum sample gas

▲The sample gas outlet is recommended to be discharged into the exhaust gas treatment equipment

Some application case:

▲Trace moisture measurement in chlorine at the inlet of the chlorine compressor for protection.

▲Trace moisture measurement in chlorine at the outlet and the final outlet of the chlorine compressor for protection.

▲ Monitor the leakage of the precooler to protect the chlorine compressor.

▲ Monitor the accuracy of the dew point analyzer at the outlet of the freezer.

Moisture Analyzer

Continuous Measurement of trace moisture in Corrosive Gases

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 flow monitoring

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

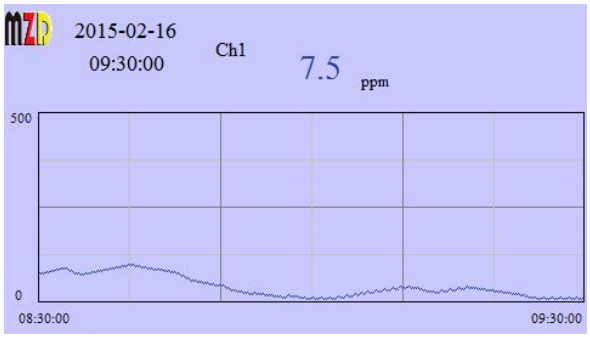
Optional: Timer control(automatic cleaning) function

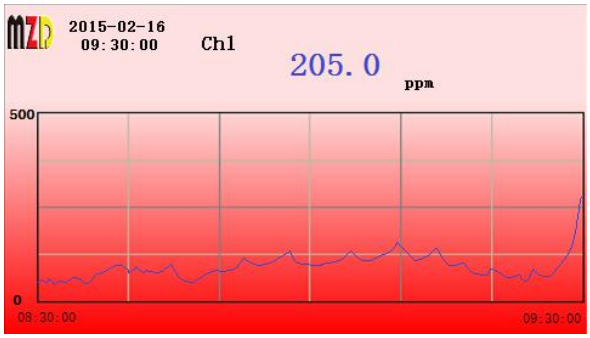
Optional: analog PID control function

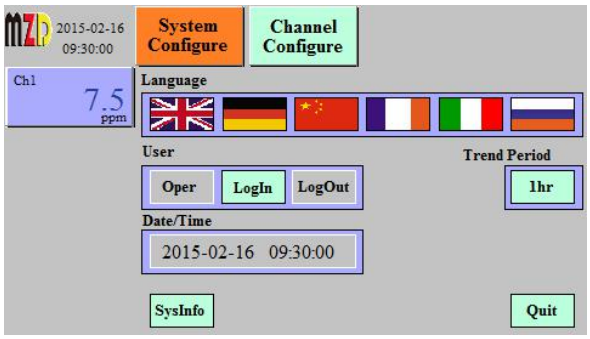
Optional: PWM control function

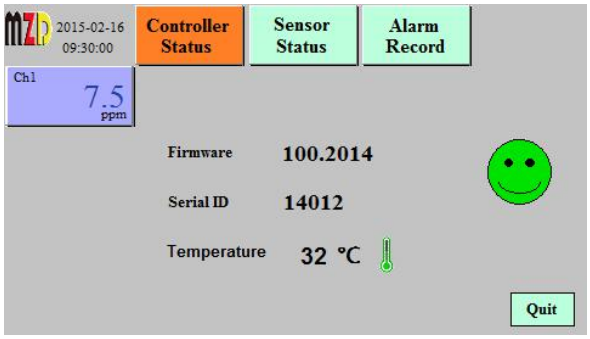
❖ **Flexible fieldbus communication functions for IOT4.0**

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









Modbus PROFIBUS Fieldbus Foundation HART COMMUNICATION PROTOCOL WirelessHART

Trace Moisture Analyzer

Parameters

Sensor Material	Ceramics pillar with Platinum Layer or glass pillar with platinum wires			
Measuring Cell Material	PVDF or Stainless Steel			
Display	4.3" or 7" industrial color touch screen			
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)			
Range	0~2,000ppm(Max.6000ppm) or 500ppm or 0~20,000ppb			
Display range	0~6,000ppm			
Accuracy	0.4ppm or 5% of measuring value(0~2,000ppm) 0.4ppm or 2% of measuring value(0~500ppm) 10% of measuring value(0~20,000ppb)			
Sensitivity	1ppb(ppb range) or 0.01ppm(500ppm range) or 0.1ppm(2000ppm range)			
Response Time	Less than 1 s			
Action time T90 (up)	Less than 5 s			
Action time T90 (down)	Less than 15 min			
Diagnosis function	Flow monitoring, Sensor and controller self-diagnosis,Heartbeat monitoring			
Event Logger	Internal Flash,up to 6,000 alarm records			
Analog Output(Galvanic)	4~20mA, maximum load 500Ω			
Relay Output(Galvanic)	Relay(2A, 230V AC freely set alarm), System alarm			
Control function	Optional Timer controller,PID analog controller,PWM controller			
Calibration	Expert calibration function,Multi-point calibration function up to 9 point			
Communication	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc			
Power	80~264V AC,1A or 19~28V DC,3A			
Electrical protection	EMI / RFI CEI-EN55011 – 05/99			
Ambient Temperature	-15 ~ 60℃			
Storage and transport temperature	-25 ~ 70℃			
Gas Flow	20Nl/h or 100Nl/h			
Process Pressure(Max.)	3Bar(PVDF) or 10Bar(Stainless Steel)			
Sample gas temperature	5~65℃			
Process Connection	1/4"NPT thread or KF40 flange			
Diameter of connecting pipe	6mm			
Leakage Level	< $5x10^{-8}$ mbar x l / s^{-1}			
Wire Connections	5Pin			
Sensor Cable	3 ~ 150 meters			
Explosion-proof	Sensor Intrinsic Safety Ex ia optional, Exd IICT4 Controller optional			
Wall-mounted(1~2Channels)	4.3" color touchscreen	ABS,Gray RAL7045	213*185*84mm	IP65
	4.3" color touchscreen	Aluminum,Gray	320*x430x208mm	IP65, Exd IICT4
Laboratory Desktop(1~2Channels)	7" color touchscreen	Aluminum,Black	250x144x184mm	IP40
Portable(1~2Channels)	7" color touchscreen	ABS,Yellow	420x325x180mm	IP67
19" Rack(1~6Channels)	7" color touchscreen	Aluminu,natural-coloured	483x133x238mm	IP40

Moisture Analyzer

Continuous Measurement of trace moisture in Corrosive Gases

Overview

Trace moisture analyzer is cost-effective and suitable for stable and continuous measurement of trace moisture of most gases.

Application

- Microelectronics(OLED/capacitor/HID)
- Lithium battery
- University and research
- Glove Boxes
- Metal heat treatment/welding
- Chemicals/Pharmaceuticals
- Air Separation Unit

Parameters

Sensor Material	Ceramics pillar with Platinum Layer or glass pillar with platinum wires
Accuracy	0.4ppm or 2% of measuring value(0~500ppm) 10% of measuring value(0~20,000ppb)
Sensitivity	0.01ppm(ppm range) or 1ppb(ppb range)
Lowest detection limit	5ppb
Response Time	Less than 1 s
Action time T90 (up)	Less than 5 s
Action time T90 (down)	Less than 15 min
Range	0~500ppm or 0~20,000ppb
Power	D—19 ~ 28V DC Power
Analog Output	4~20mA
Electric Connections	4Pin
Display	Optional 128*64Pixel
LED Light	Status LED Light
Process Pressure(Max.)	3Bar
Ambient Temperature	5 ~ 60℃
Process Connection	KF40 flange, Or measuring cell
Housing Material	Stainless steel
Size	Φ75 x 140 mm,Insertion depth60 mm
Weight	0.7Kg
Explosion-proof	Sensor Intrinsic Safety Ex ia optional, Exd IICT4 Controller optional

Thermal Conductivity Analyzer

Overview

Thermal conductivity gas analyzer is an effective method to measure one of two components in a gas mixture (the thermal conductivities differ a lot). Mainly used to measure the content of hydrogen (H2), carbon dioxide (CO2), argon (Ar), etc.

Principle

When the sample gas enters the thermal conductivity cell which is heated at a constant temperature of 63° C, and a thermistor is used above the film to maintain a constant temperature of 135° C. In this way, a small cavity is formed below and above the membrane. The measurement gas can diffuse into it. Hense, the heat loss caused by the thermal conductivity of the sample gas is compensated by heating, and the voltage required to maintain a constant temperature of the membrane is a measurement of the thermal conductivity of the measured gas.

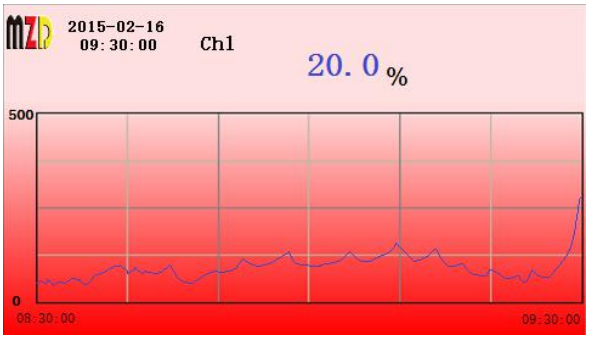
Application

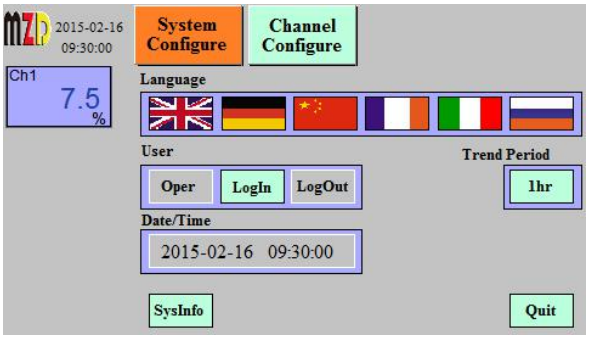
- Measurement of hydrogen (H2) content in synthesis gas of ammonia plant
- Purity measurement of hydrogen (H2) in hydrogenation unit
- Measurement of oxygen (O2) in pure hydrogen (H2) and hydrogen (H2) in pure oxygen (O2) in the process of producing hydrogen by electrolysis of water and oxygen
- Hydrogen (H2) content measurement in hydrocarbon gas
- Monitoring of hydrogen (H2) and carbon dioxide (CO2) content in hydrogen-cooled generator sets
- Measurement of hydrogen (H2) in chlorine (Cl2) in the chlorine production process
- Measurement of chlorine (Cl2) in the chlorine production process
- Measurement of carbon dioxide (CO2) content in flue gas of furnace combustion
- Argon (Ar) content measurement in air separation plant
- Monitoring in the production of pure gases, such as helium (He) in nitrogen (N2) and argon (Ar) in oxygen (O2)
- Sulfur dioxide (SO2) content measurement in the production process of sulfuric acid and phosphate fertilizer

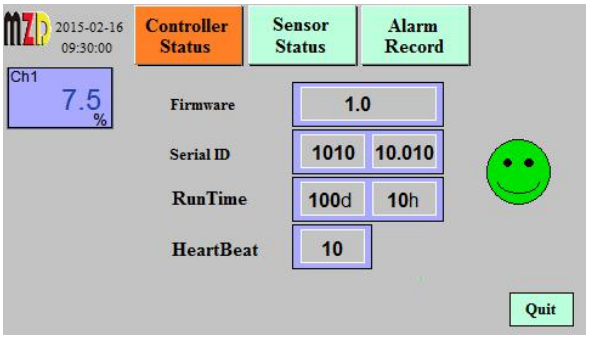
Features

- **Corrosion protection**
  Sensor surface is coated with Polymer layer(4μm) which will not affect the excellent measurement performance of the sensor unit.
- **Condensation and dust protection**
  The sintered glass with μm-sized holes is used to protect the sensor so that gas molecules can pass through, but liquid water molecules are not permeable.
- **Multiple gas measurement modes**
  The analyzer has 16 built-in binary mixed gas measurement modes and calibration curve.
- **High corrosion resistance Optional**
  Sensor is made from Al2O3, glass and SiO2 coated Pt filaments, and Gas connections in PTFE, PFA
- **High temperature Optional**
  Sensor is be used at higher temperatures up to 180°C

Thermal Conductivity Analyzer







Features

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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**

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

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❖ **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.

Thermal Conductivity Analyzer

Measurement components and ranges

Measuring Gas	Carrier Gas	Basis Range	Smallest Range	Smallest Suppressed Zero Range
Hydrogen (H2)	Nitrogen (N2) or Air	0% – 100%	0% – 0.5%	98% – 100%
Oxygen (O2)	Nitrogen (N2)	0% – 100%	0% – 15%	85% – 100%
Helium (He)	Nitrogen (N2) or Air	0% – 100%	0% – 0.8%	97% – 100%
Carbon dioxide (CO2)	Nitrogen (N2) or Air	0% – 100%	0% – 3%	96% – 100%
Nitrogen (N2)	Argon (Ar)	0% – 100%	0% – 3%	97% – 100%
Oxygen (O2)	Argon (Ar)	0% – 100%	0% – 2%	97% – 100%
Hydrogen (H2)	Argon (Ar)	0% – 100%	0% – 0.4%	99% – 100%
Helium (He)	Argon (Ar)	0% – 100%	0% – 0.5%	98% – 100%
Carbon dioxide (CO2)	Argon (Ar)	0% – 60%	0% – 10%	—
Argon (Ar)	Carbon dioxide (CO2)	40% – 100%	—	80% – 100%
Methane (CH4)	Nitrogen (N2) or Air	0% – 100%	0% – 2%	96% – 100%
Methane (CH4)	Argon (Ar)	0% – 100%	0% – 1.5%	97% – 100%
Argon (Ar)	Oxygen (O2)	0% – 100%	0% – 3%	96% – 100%
Nitrogen (N2)	Hydrogen (H2)	0% – 100%	0% – 2%	99.5% – 100%
Oxygen (O2)	Carbon dioxide (CO2)	0% – 100%	0% – 3%	96% – 100%
Hydrogen (H2)	Helium (He)	20% – 100%	20% – 40%	85% – 100%
Hydrogen (H2)	Methane (CH4)	0% – 100%	0% – 0.5%	98% – 100%
Hydrogen (H2)	Carbon dioxide (CO2)	0% – 100%	0% – 0.5%	98% – 100%
Sulfur hexafluoride (SF6)	Nitrogen (N2) or Air	0% – 100%	0% – 2%	96% – 100%
Nitrogen dioxide (NO2)	Nitrogen (N2) or Air	0% – 100%	0% – 5%	96% – 100%
Hydrogen (H2)	Oxygen (O2)	0% – 100%	0% – 0.8%	97% – 100%
Argon (Ar)	Xenon (Xe)	0% – 100%	0% – 3%	99% – 100%
Neon (Ne)	Argon (Ar)	0% – 100%	0% – 1.5%	99% – 100%
Krypton (Kr)	Argon (Ar)	0% – 100%	0% – 2%	96% – 100%
Extinguishing gas (R125)	Nitrogen (N2) or Air	0% – 100%	0% – 5%	98% – 100%
Deuterium (D2)	Nitrogen (N2) or Air	0% – 100%	0% – 0.7%	96% – 100%
Deuterium (D2)	Helium (He)	0% – 100%	0% – 5%	70% – 100%

Thermal Conductivity Analyzer

Parameters

Measuring principle	Thermal conductivity (TCD)		
Display	4.3” or 7" industrial color touch screen		
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)		
Linearity	< 1% of range		
Repeatability	< 1% of range		
Warm up time	About 30min; 1h for small ranges		
Sensitivity	0.01%		
Response Time	Less than 1 s(depending on flow rate)		
T90-time	<1sec at flow rate higher 60l/h		
Noise	< 1% of smallest range		
Drift at zero point per week	< 2% of smallest range		
Flow rate	40l/h to 150l/h; 60l/h -80l/h recommended		
Flow influence between 60l/h and 90l/h per 10l/h	< 1% of smallest range		
Measuring error with ambient temperature change per 10°K	< 1% of smallest range		
Gas pressure	Max. 2MPa (20bar)		
Fault with measurement gas change (Pabs > 800 hPa) per 10 hPa	< 1% of smallest range		
Analog Output(Galvanic)	4~20mA, maximum load 500Ω		
Relay Output(Galvanic)	Relay(2A, 230V AC freely set alarm), System alarm		
Diagnosis function	Flow monitoring, Sensor and analyzer self-diagnosis,Heartbeat monitoring		
Event Logger	Internal Flash,up to 6,000 alarm records		
Control function	Optional Timer control function,PID,PWM		
Calibration	Expert calibration function,Multi-point calibration function up to 9 point		
Communication	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc		
Power	80~264V AC,1A or 19~28V DC,3A		
Electrical protection	EMI / RFI CEI-EN55011 – 05/99		
Ambient Temperature	-15 ~ 50℃		
Storage and transport temperature	-25 ~ 70℃		
Process Connection	6mm Pipe		
Wall-mounted(1~2Channels)	ABS,Gray RAL7045	213*185*84mm	IP65
	Aluminum,Gray	320*x430x208mm	IP65, Exd IICT4
Laboratory Desktop(1~2Channels)	Aluminum,Black	250x144x184mm	IP40
Portable(1~2Channels)	ABS,Yellow	420x325x180mm	IP67
19" Rack(1~6Channels)	Aluminu,natural-coloured	483x133x238mm	IP40

Ultraviolet photometry analyzer

Overview

Ultraviolet photometry analyzer has 2 measuring ranges as ppm or Vol.-%, and can also realize high-precision up to ppb range. It can measure 2 gas components simultaneously by using 2 UV-LEDs. Nitrogen oxides (NO+NO2), aromatic hydrocarbons, hydrogen sulphide, ozone, sulphur dioxide and chlorine can be measured.

Principle

UV-LED radiation is divided into measurement and reference paths by a beam splitter. The reference beam directly reaches the detector, which converts it into a reference voltage value. Using this reference signal, the aging effect of UV-LED can be almost completely compensated. The measuring beam enters the sample cell, and the gas in the sample cell is absorbed by the radiation in it. The absorption behavior is recorded by the measuring detector and used to calculate the gas concentration in the measuring cuvette.

Application

- Environmental and Process Measurement Technology (CEM)
- Engine development
- Elemental analysis
- Industrial gas analysis
- Natural gas/biogas analysis
- Process measurement technology
- Biogas research

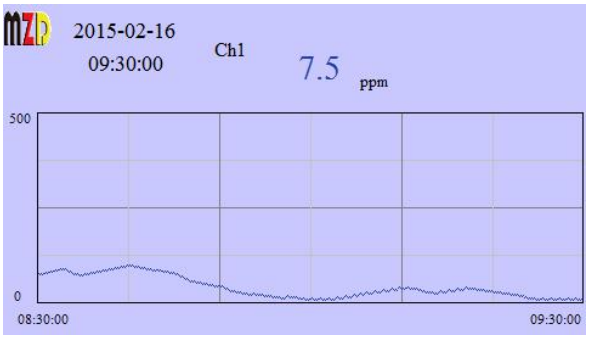
Measurement components and ranges

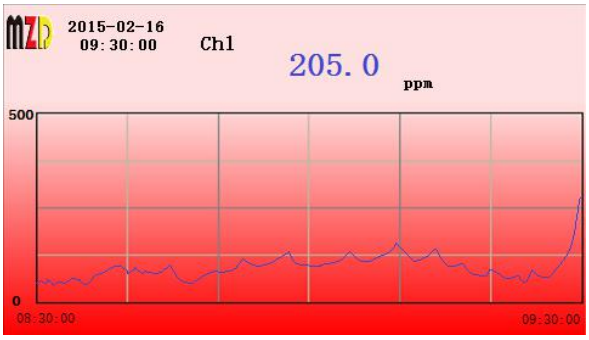
- ❖ SO2: 0~10ppm up to 10%（Vol）
- ❖ NO: 0~300ppm up to 5,000ppm
- ❖ NO2: 0~10ppm up to 5,000ppm
- ❖ O3: 0~1ppm up to 5,000ppm
- ❖ Cl2: 0~100ppm up to 30%（Vol）
- ❖ H2S: 0~100ppm up to 1%

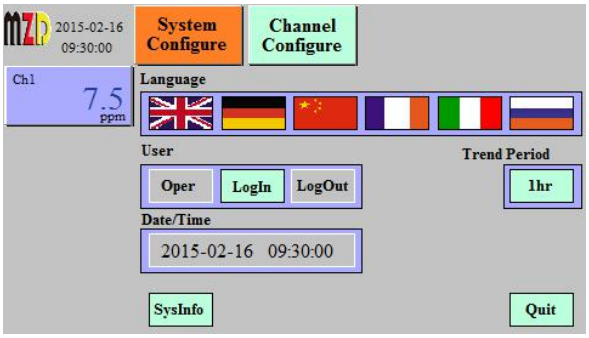
Features

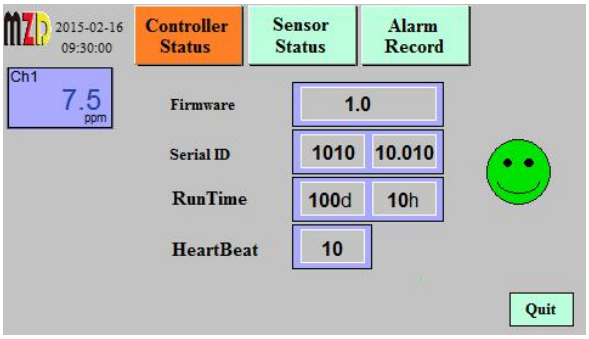
- ❖ Linearity error: ±0.5%FS or 1 % F.S
- ❖ Sensor sample cell: stainless steel with inert coating (inside and outside)
- ❖ PEEK cell for corrosive gases (H2S, chlorine) on request
- ❖ High dynamic range, 1:100
- ❖ Fast response time, t90 < 1 s possible
- ❖ No water vapour cross sensitivity different to NDIR gas sensors

Ultraviolet photometry analyzer









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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.

Ultraviolet photometry analyzer

Parameters

Measuring principle	NDUV(Non-dispersive UV method) or UVRAS(Ultraviolet Resonance Absorption Spectrometer)		
Display	4.3” or 7" industrial color touch screen		
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)		
Linearity error	< 0.5%FS or 1%F.S		
Sensitivity	0.1ppm or 0.01%		
Warmup time	1-30 Minutes		
Response Time	Less than 1 s		
Zero point stability	2% of span		
T90-time	<1sec at flow rate higher 60l/h		
Detection limit (4·STDW)	< 1% of span		
Lifetime of the UV Radiation source	> 20 000h		
Gas pressure	800-1200 hPa (mbar)		
max. Pressure	4bar		
Analog Output(Galvanic)	4~20mA, maximum load 500Ω		
Relay Output(Galvanic)	Relay(2A, 230V AC freely set alarm), System alarm		
Diagnosis function	Flow monitoring, Sensor and analyzer self-diagnosis,Heartbeat monitoring		
Event Logger	Internal Flash,up to 6,000 alarm records		
Control function	Optional Timer control function,PID,PWM		
Calibration	Expert calibration function,Multi-point calibration function up to 9 point		
Communication	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc		
Power	80~264V AC,1A or 19~28V DC,3A		
Electrical protection	EMI / RFI CEI-EN55011 – 05/99		
Ambient Temperature	5 ~ 50℃		
Storage and transport temperature	-20 ~ 70℃		
Process Connection	6mm Pipe		
Wall-mounted(1~2Channels)	ABS,Gray RAL7045	213*185*84mm	IP65
	Aluminum,Gray	320*x430x208mm	IP65, Exd IICT4
Laboratory Desktop(1~2Channels)	Aluminum,Black	250x144x184mm	IP40
Portable(1~2Channels)	ABS,Yellow	420x325x180mm	IP67
19" Rack(1~6Channels)	Aluminu,natural-coloured	483x133x238mm	IP40

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

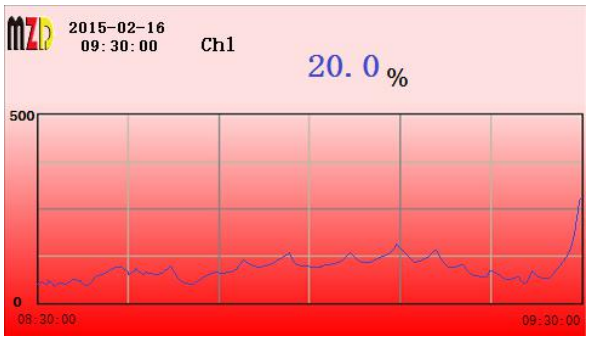
- ASU(Air separation unit)
- Chemical, Pharmaceutical Industry
- Petroleum and Petrochemical Industry
- Metallurgical Industry
- Glass manufacturing
- Semiconductor Industry
- Food and beverage Industry
- Flare monitoring
- Nuclear,heat treatment, welding protection
- Environmental area monitoring
-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

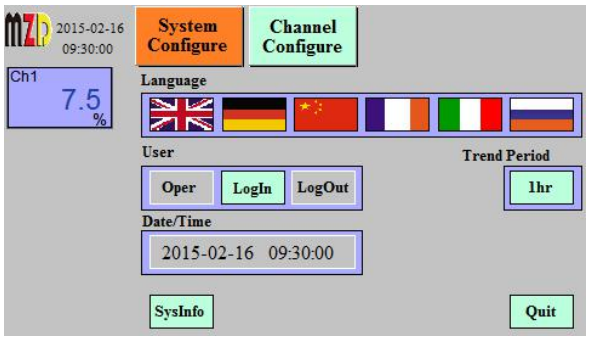
Advantage

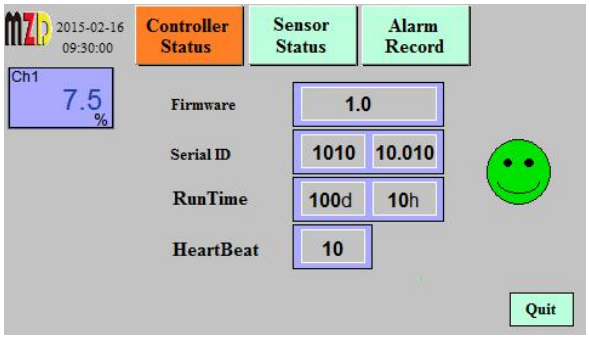
- Quick response
- High accuracy and repeatability
- No drift, maintenance-free, no calibration required*
- Rugged and durable design
- Easy installation
- Comfortable and friendly operation
- Long-life zirconia sensor

*For vacuum application, need calibration

Trace/Percent Oxygen Analyzer







Features

❖ **Quick and convenient**

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

❖ **Process safety**

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

Measuring principle	Zirconia		
Display	4.3” or 7" industrial color touch screen		
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)		
Range	0 ~ 10/100/1000ppm or 0 ~ 1%/10%/30%		
Linearity	<3% of measuring value		
Sensitivity	0.1ppm or 0.01%		
Sample gas temperature	<300°C		
Working temperature	700°C		
Gas pressure	<2bar(Available for vacuum)		
Gas Flow	5~10Nl/h, Max.10m/s		
Warm up time	5mintue		
Analog Output(Galvanic)	4~20mA, maximum load 500Ω		
Relay Output(Galvanic)	Relay(2A, 230V AC freely set alarm), System alarm		
Diagnosis function	Flow monitoring, Sensor and analyzer self-diagnosis,Heartbeat monitoring		
Event Logger	Internal Flash,up to 6,000 alarm records		
Control function	Optional Timer control function,PID,PWM		
Calibration	Expert calibration function,Multi-point calibration function up to 9 point		
Communication	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc		
Power	80~264V AC,1A or 19~28V DC,3A		
Electrical protection	EMI / RFI CEI-EN55011 – 05/99		
Ambient Temperature	-20~50℃		
Storage and transport temperature	-25~70℃		
Ambient Humidity	0~80%RH		
Diameter of connecting pipe	6mm		
Wall-mounted(1~2Channels)	ABS,Gray RAL7045	213*185*84mm	IP65
	Aluminum,Gray	320*x430x208mm	IP65, Exd IICT4
Laboratory Desktop(1~2Channels)	Aluminum,Black	250x144x184mm	IP40
Portable(1~2Channels)	ABS,Yellow	420x325x180mm	IP67
19" Rack(1~6Channels)	Aluminu,natural-coloured	483x133x238mm	IP40

Infrared photometry analyzer

Overview

Infrared photometry analyzer uses high-performance light emitting diodes (IR-LED) and thermal micro radiators which are suitable to gas measurement technology. It has high stability and a low detection limit. In the spectral range from 2 µm to 12 µm, carbon dioxide, carbon monoxide, hydrocarbons and nitrous oxide can be measured.

Principle

Infrared photometry analyzer uses broadband radiation sources (thermal emitters). This radiation immediately reaches the measuring cuvette. There, specific spectral ranges are absorbed from the broadband spectrum of the radiation source. The measuring detector which contains at least 2 separate channels, is located at the end of the measuring cuvette. In the simplest case the measuring channel has an interference filter placed in front of the detector. The reference detector also has an interference filter in front of the detector, but with a spectral transmission range (approx. 4 µm) where no absorption takes place. Afterwards a detector measures the specific radiation absorption. The evaluation electronics use the two signals to calculate the gas concentration in the measuring cuvette. Alternatively, a detector with several measuring channels can be placed at the end of the measuring cuvette, so that 3 components can be recorded simultaneously.

Application

- Environmental and Process Measurement Technology (CEM)
- Engine development
- Elemental analysis
- Industrial gas analysis
- Natural gas/biogas analysis
- Process measurement technology
- Biogas research

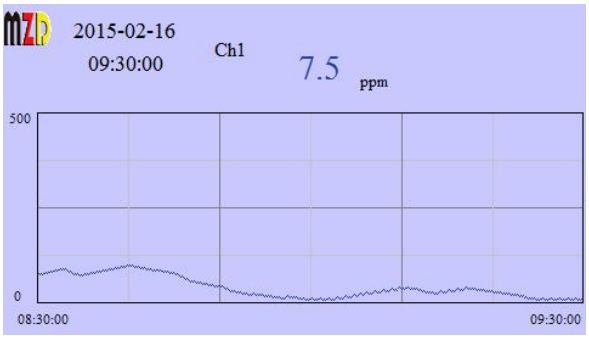
Features

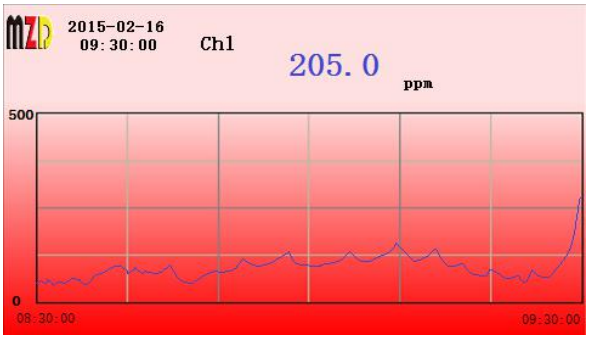
- Linearity error: ±0.5%FS or 1 % F.S
- Sensor sample cell: aluminium/gold
- High dynamic range, 1:100
- Fast response time, t90 is about 3 s

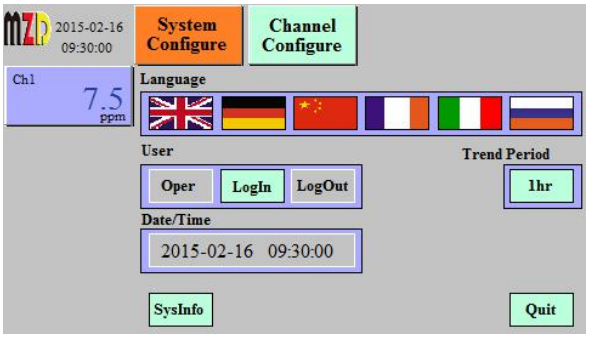
Measurement components and ranges

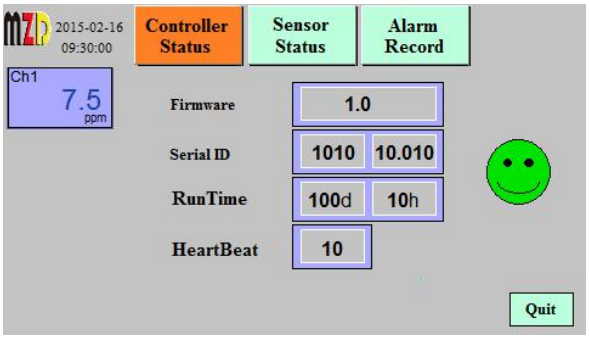
- CO: 0 ~ 500ppm up to 100%(Vol)
- CO2: 0 ~ 50ppm up to 100%(Vol)
- HCs: 0 ~ 1000ppm up to 100%(Vol)
- CH4: 0 ~ 1000ppm up to 100%(Vol)
- N2O: 0 ~ 100ppm up to 100%(Vol)
- SF6: 0 ~ 50ppm up to 100%(Vol)
- CF4: 0 ~ 100%(Vol)

Infrared photometry analyzer









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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.

Infrared photometry analyzer

Parameters

Measuring principle	NDIR(Non-dispersive IR method)		
Display	4.3” or 7" industrial color touch screen		
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)		
Linearity error	< 0.5%FS or 1%F.S		
Sensitivity	0.1ppm or 0.01%		
Warmup time	1-30 Minutes		
Response Time	Less than 1 s		
Zero point stability	2% of span		
T90-time	<1sec at flow rate higher 60l/h		
Detection limit (4·STDW)	< 1% of span		
Lifetime of the UV Radiation source	> 20,000h		
Gas pressure	800-1200 hPa (mbar)		
max. Pressure	4bar		
Analog Output(Galvanic)	4~20mA, maximum load 500Ω		
Relay Output(Galvanic)	Relay(2A, 230V AC freely set alarm), System alarm		
Diagnosis function	Flow monitoring, Sensor and analyzer self-diagnosis,Heartbeat monitoring		
Event Logger	Internal Flash,up to 6,000 alarm records		
Control function	Optional Timer control function,PID,PWM		
Calibration	Expert calibration function,Multi-point calibration function up to 9 point		
Communication	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc		
Power	80~264V AC,1A or 19~28V DC,3A		
Electrical protection	EMI / RFI CEI-EN55011 – 05/99		
Ambient Temperature	5 ~ 50℃		
Storage and transport temperature	-20 ~ 70℃		
Process Connection	6mm Pipe		
Wall-mounted(1~2Channels)	ABS,Gray RAL7045	213*185*84mm	IP65
	Aluminum,Gray	320*x430x208mm	IP65, Exd IICT4
Laboratory Desktop(1~2Channels)	Aluminum,Black	250x144x184mm	IP40
Portable(1~2Channels)	ABS,Yellow	420x325x180mm	IP67
19" Rack(1~6Channels)	Aluminu,natural-coloured	483x133x238mm	IP40

Paramagnetic Oxygen Analyzer

Overview

SMART-OXM Paramagnetic Oxygen Analyzer uses high-stability paramagnetic oxygen technology to achieve high-precision and high-repeatability oxygen measurement. Optional in 98%~100% high purity oxygen mesure range.

Principle

Oxygen is a paramagnetic substance and the volume magnetic susceptibility of other gases is much smaller than that of oxygen (except NO). The oxygen sensor is a pair of quartz glass dumbbell balls filled with nitrogen. The dumbbell balls are wrapped with platinum wires to form an electric feedback loop. The dumbbell balls are suspended in a magnetic field. When oxygen molecules are around the dumbbell balls, the oxygen molecules migrate under the action of the magnetic field, pushing the dumbbell sphere to deflect. The higher the oxygen concentration, the greater the deflection angle. This deflection will generate an electrical signal, which will be amplified by the amplifier and then form a loop through the feedback circuit. Under the action of the magnetic field, the dumbbell will be pushed back to the main equilibrium position. The current in this loop is proportional to the oxygen content. The oxygen content in the sample can be obtained by measuring the current value.

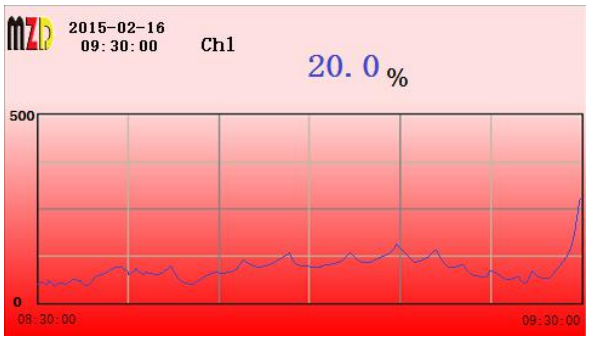
Application

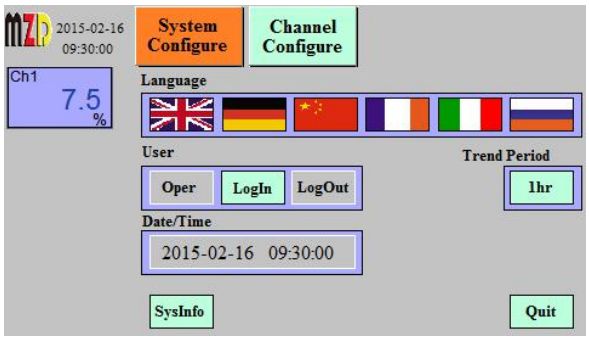
- ASU(Air separation unit)
- Chemical, Pharmaceutical Industry
- Petroleum and Petrochemical Industry
- Metallurgical Industry
- Glass manufacturing
- Semiconductor Industry
- Food and beverage Industry
- Flare monitoring
- Nuclear,heat treatment, welding protection
- Environmental area monitoring
-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

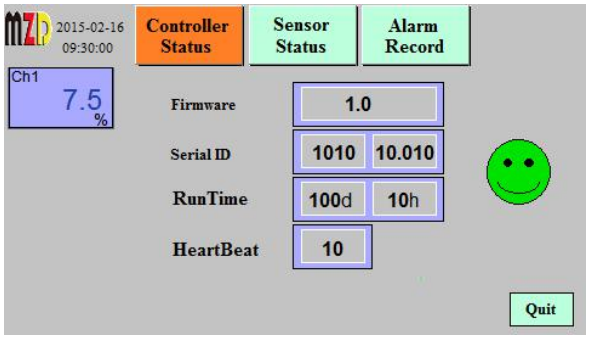
Advantage

- Quick response
- High accuracy and repeatability
- Almost no cross-sensitivity to other gases
- Rugged and durable design
- Easy installation
- Comfortable and friendly operation
- Long-life paramagnetic sensor

Paramagnetic Oxygen Analyzer







Features

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

❖ **Process safety**

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.

Paramagnetic Oxygen Analyzer

Parameters

Measuring principle	Paramagnetic Oxygen Analyzer		
Display	4.3” or 7" industrial color touch screen		
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)		
Range	0~100%		
Linearity	<1%FS		
Sensitivity	<±0.03%		
Zero point drift	<±0.1%/week		
Sample gas temperature	5 ~ 45°C		
Working temperature	55°C		
Temperature influence at zero	<±0.05%/°C		
Temperature influence span	<±0.2%*measure value/°C		
Pressure influence on zero	None		
Pressure influence span	<1%* measure value/1%pressure change		
Flow	10-90 l/h		
Flow error	< 0.1 % with in-build fix bypass (option)		
Tilt	Zero change <= 0,02 Vol.-% O2 / 1° deviation from the horizontal position		
T90 Response time	< 3 s with 150 ml/min flow and gas change from nitrogen to air		
Warm up time	45mintue		
Analog Output(Galvanic)	4~20mA, maximum load 500Ω		
Relay Output(Galvanic)	Relay(2A, 230V AC freely set alarm), System alarm		
Diagnosis function	Flow monitoring, Sensor and analyzer self-diagnosis,Heartbeat monitoring		
Event Logger	Internal Flash,up to 6,000 alarm records		
Control function	Optional Timer control function,PID,PWM		
Calibration	Expert calibration function,Multi-point calibration function up to 9 point		
Communication	RS485 MODBUS RTU,HART,Foundation Fieldbus FF,PROFIBUS PA,PROFIBUS DP,MODBUS TCP/IP,etc		
Power	80~264V AC,1A or 19~28V DC,3A		
Electrical protection	EMI/RFI CEI-EN55011–05/99		
Ambient Temperature	-15~50℃		
Storage and transport	-25~70℃		
Ambient Humidity	0~90%RH		
Diameter of connecting pipe	6mm		
Wall-mounted(1~2Channels)	ABS,Gray RAL7045	213*185*84mm	IP65
	Aluminum,Gray	320*x430x208mm	IP65, Exd IICT4
Laboratory	Aluminum,Black	250x144x184mm	IP40
Portable(1~2Channels)	ABS,Yellow	420x325x180mm	IP67
19" Rack(1~6Channels)	Aluminu,natural-coloured	483x133x238mm	IP40

The people for Process Analytics

Multigas Analyzer

Overview

SMART multigas analyzer is based on the modular design, for continuous measurement of gases in gas compounds, offers eight different type sensors for measurement depending on the requirements, and can measure up to six gases components.

Sensors are based on the Electrolysis(P2O5), capacitive, paramagnetic, zirconium oxide, electrochemical, Thermal Conductivity Detector, Infrared photometry, Ultraviolet photometry measuring principle.

Application

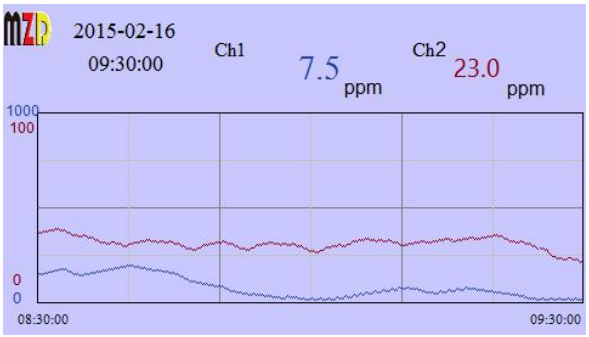
- ASU(Air Separation Unit)
- Chemical, Pharmaceutical industry
- Petroleum and Petrochemical industry
- Metallurgical Industry
- Glass manufacturing
- Semiconductor industry
- Food and beverage industry
- Flare monitoring
- Nuclear,heat treatment, welding protection
- Environmental area monitoring
- Anesthesia, breathing and prenatal care
- Environmental and Process Measurement Technology (CEM)
- Engine development

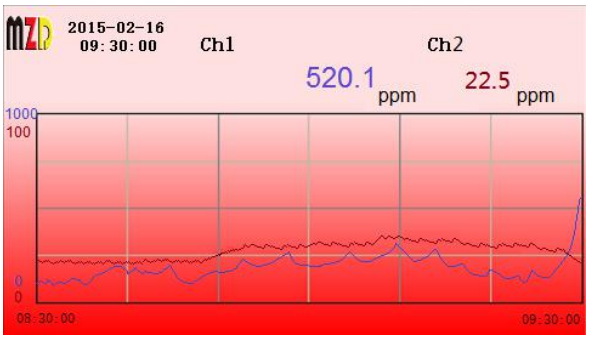
Measurement components and ranges

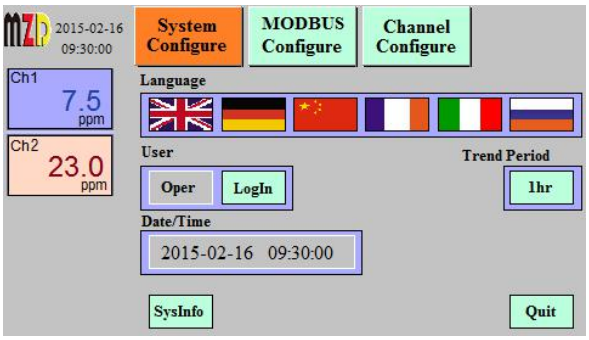
H2O:	0 ~ 20,000ppb up to 2000ppm
O2:	0 ~ 10ppm up to 100%
H2:	0 ~ 0.5 up to 100%
He:	0 ~ 0.8 up to 100%
CO2:	0 ~ 3 up to 100%
N2:	0 ~ 3 up to 100%
Ar:	0 ~ 3 up to 100%
SF6:	0 ~ 2 up to 100%
Ne:	0 ~ 1.5 up to 100%
Kr:	0 ~ 2 up to 100%
D2:	0 ~ 0.7 up to 100%
CO:	0 ~ 200ppm up to 100%
CO2:	0 ~ 50ppm up to 100%
CH4:	0 ~ 500ppm up to 100%
CnHm:	0 ~ 500ppm up to 100%
N2O:	0 ~ 500ppm up to 100%
SO2:	0 ~ 50ppm up to 10%
NO:	0~ 300ppm up to 5,000ppm
NO2:	0 ~ 50ppm up to 5,000ppm 0 ~ 5 up to 100%
O3:	0 ~ 10ppm up to 5,000ppm
Cl2:	0 ~ 500ppm up to 30%
H2S:	0 ~ 100ppm up to 5,000ppm
Extinguishing gas (R125):	0% ~ 5 up to 100%
Other gases: on requirement	

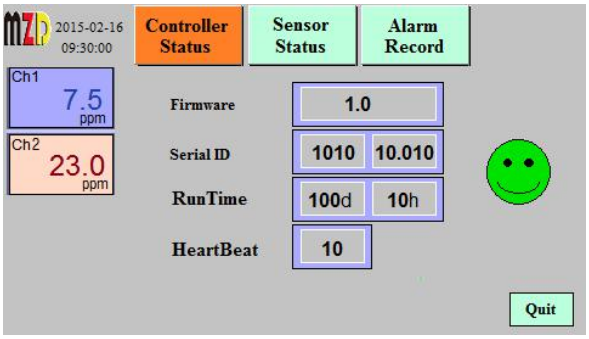
The people for Process Analytics

Multigas Analyzer









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Modbus PROFIBUS Fieldbus Foundation HART COMMUNICATION PROTOCOL WirelessHART

Multigas Analyzer

Parameters

Measuring principle	Electrolysis(P2O5), Capacitive, Paramagnetic, Zirconium oxide, Electrochemical, Thermal Conductivity Detector, Infrared photometry, Ultraviolet photometry		
Display	4.3” or 7" industrial color touch screen		
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)		
Analog Output(Galvanic)	4~20mA, maximum load 500Ω		
Relay Output(Galvanic)	Relay(2A, 230V AC freely set alarm), System alarm		
Diagnosis function	Flow monitoring, Sensor and analyzer self-diagnosis,Heartbeat monitoring		
Event Logger	Internal Flash,up to 6,000 alarm records		
Control function	Optional Timer control function,PID,PWM		
Calibration	Expert calibration function,Multi-point calibration function up to 9 point		
Communication	RS485 MODBUS RTU,HART,Foundation Fieldbus FF,PROFIBUS PA,PROFIBUS DP,MODBUS TCP/IP,etc		
Power	80~264V AC,1A or 19~28V DC,3A		
Electrical protection	EMI/RFI CEI-EN55011–05/99		
Ambient Temperature	-15~50℃		
Storage and transport	-25~70℃		
Ambient Humidity	0~90%RH		
Diameter of connecting pipe	6mm		
Wall-mounted(1~2Channels)	ABS,Gray RAL7045	213*185*84mm	IP65
	Aluminum,Gray	320*x430x208mm	IP65, Exd IICT4
Laboratory	Aluminum,Black	250x144x184mm	IP40
Portable(1~2Channels)	ABS,Yellow	420x325x180mm	IP67
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