

## 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 measure 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

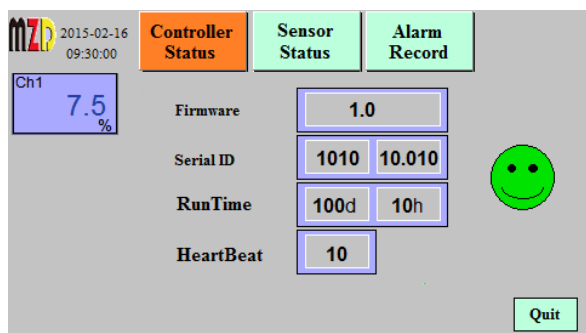
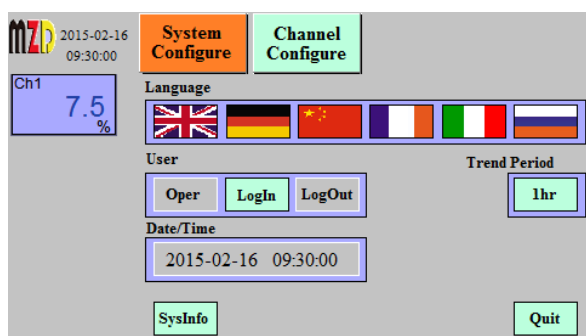
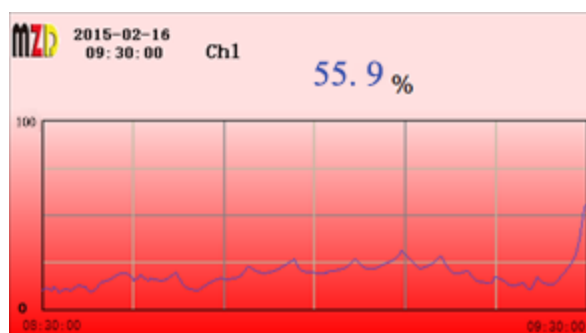
- ASU(Air separation unit)
- Chemical, Pharmaceutical Industry
- Petroleum and Petrochemical Industry
- Metallurgical Industry
- Glass manufacturing
- Semiconductor Industry
- Food and beverage Industry
- Flare monitoring
- Nuclear heat treatment, welding protection
- Environmental area monitoring
-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



### Advantage

- Quick response
- High accuracy and repeatability
- Almost no cross-sensitivity to other gases
- Rugged and durable design
- **Back Pressure regulator**
- **Pressure compensation**
- Comfortable and friendly operation
- Long-life paramagnetic sensor

## Paramagnetic Oxygen Analyzer



### 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.



## Paramagnetic Oxygen Analyzer

### Parameters

|                               |                                                                                                     |                           |                 |                 |
|-------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------|-----------------|-----------------|
| Measuring principle           | Paramagnetic Oxygen Analyzer                                                                        |                           |                 |                 |
| Display                       | 4.3" or 7" industrial color touch screen<br>(ATEX 1.8" industrial color LCD, Magnetic keypad)       |                           |                 |                 |
| Language                      | Multi-Language (English, German, Chinese, French, Italian, Russian or Customized)<br>(ATEX English) |                           |                 |                 |
| 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.-% O <sub>2</sub> / 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                                                           |                           |                 |                 |
| 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°C                                                                                            |                           |                 |                 |
| Storage&transport temperature | -25~70°C                                                                                            |                           |                 |                 |
| Ambient Humidity              | 0~90%RH                                                                                             |                           |                 |                 |
| Diameter of connecting pipe   | 6mm                                                                                                 |                           |                 |                 |
| Wall-mounted                  | 4.3" touchscreen                                                                                    | Steel, Gray               | 300*300*220mm   | IP65            |
|                               | 1.8" color LCD                                                                                      | Aluminum, Gray            | 300*280*195 mm* | IP65, Exd IICT4 |
| Laboratory Desktop            | 7" touchscreen                                                                                      | Aluminum, Black           | 250*144*184mm*  | IP40            |
| Portable                      | 7" touchscreen                                                                                      | ABS, Yellow               | 420*325*180mm   | IP67            |
| 19" Rack(1~6Channels)         | 7" touchscreen                                                                                      | Aluminu, natural-coloured | 483*133*238mm   | IP40            |

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**Note:**

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