

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 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



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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 20NI/h or 100NI/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.

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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

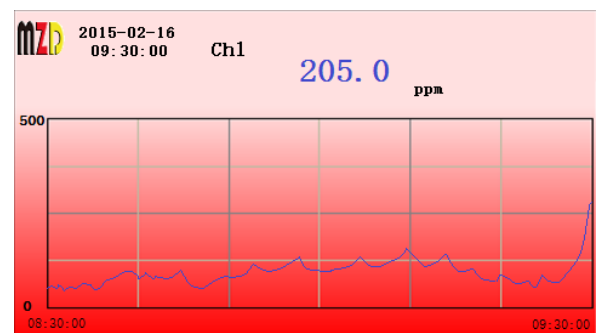
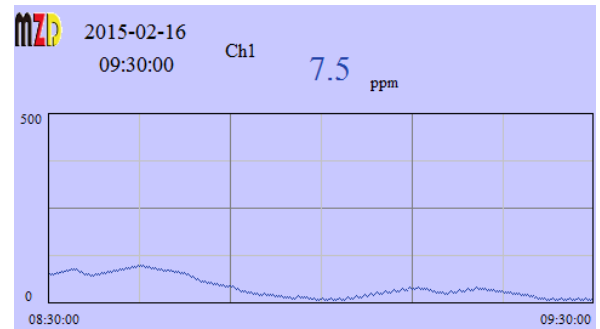
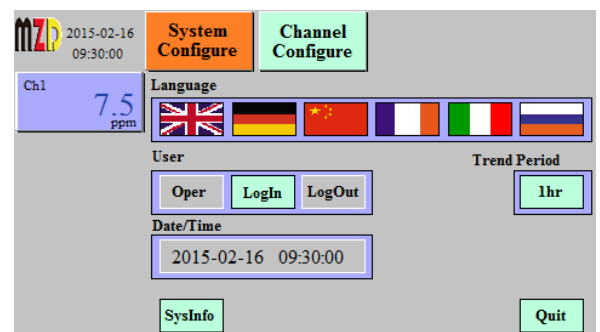
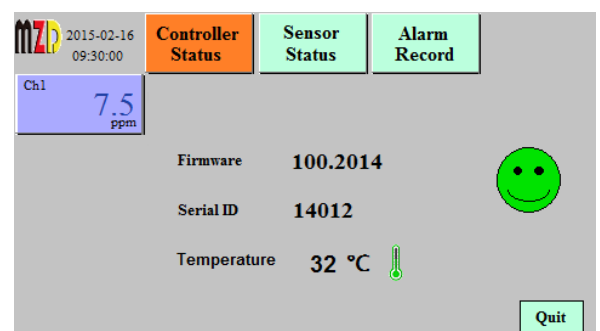
Optional: Timer control(automatic cleaning) function

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.


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Parameters

Sensor Material	Glass pillar with platinum wires or Platinum coated ceramic pillar			
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	0~1 to 500ppm (*Maximum 2500ppm, free setting)			
Sensitivity	1ppb			
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			
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°C			
Storage and transport temperature	-25 ~ 70°C			
Gas Flow	20NI/h or 100NI/h			
Process Pressure(Max.)	3Bar(PVDF) or 10Bar(Stainless Steel)			
Sample gas temperature	5~65°C			
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	213x185x84mm	IP65
	1.8" color LCD	Aluminum,Gray	180x160x135mm	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

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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



Sensor Material	Platinum coated ceramic pillar
Display	1.8" color LCD, 160*128Pixel, English Menu, Status LED (NAMUR NE107)
Operation	Magnetic button
Range	0~1 to 500ppm (*Maximum 2500ppm, free setting) Or -100 ~ -20°C(Dew point)
Accuracy	2% of measuring value or 0.4ppm (0~500ppm range) 10% of measuring value (0~1ppm range)
Sensitivity	1ppb
Lowest detection limit	1ppb
Response Time	Less than 1s
Action time T90 (up)	Less than 5s
Action time T90 (down)	Less than 30 min
Diagnosis function	Self-diagnosis, heart beat monitoring
Analog Output	4~20mA, Maximum load 500 ohms
Relay Output	2 Relays (2A, 230V AC/DC freely set alarm), 1 Relay (System alarm)
Communication	RS485 MODBUS RTU Slave
Power	19 ~ 28V DC,0.5A
Ambient Temperature	5 ~ 65°C
Process Pressure (Max.)	20Bar
Gas Flow	20NI/h (Recommend)
Process connection	NPT1/2" screw or KF40 flange
Housing Material	Aluminum alloy, Stainless steel
Size	Φ110*240*107 mm
Weight	1.5Kg
Explosion-proof	Ex d IICT4 optional

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