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

MZD Analytik GmbH supply products as follows：

Moisture in Gas	0~20,000ppb or 2,000ppm	**Dewpoint**	-100~20°C or 0~23,000 ppm(Gas),0~1,000ppm(Liquid)
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**	0~1a.w. or1,000 ppm, 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.

MZD Analytik GmbH
Radeberger Str. 21
D-01900 Großröhrsdorf
Tel: 0049-35952-289-78
Fax: 0049-35952-4294-57
Email: info@mzdd.de

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

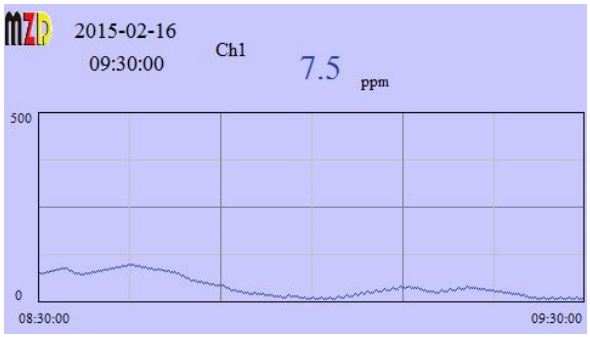
Optional: Timer control(automatic cleaning) function

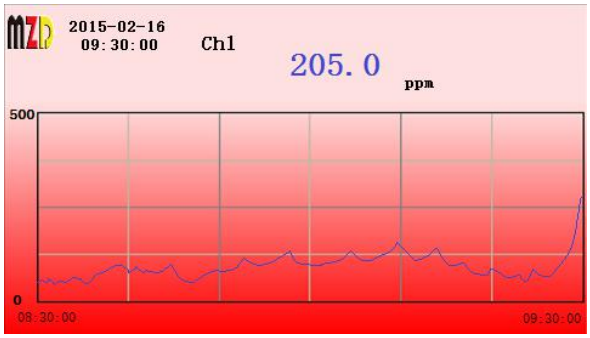
Optional: analog PID control function

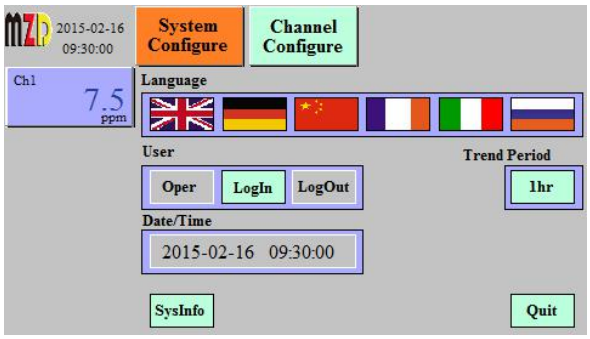
Optional: PWM control function

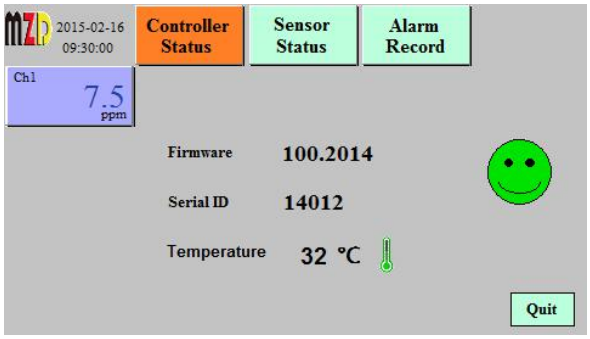
❖ **Flexible fieldbus communication functions for IOT4.0**

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









Modbus PROFIBUS® Fieldbus Foundation HART COMMUNICATION PROTOCOL WirelessHART

The people for Process Analytics

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 transmitter 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

DewPoint Transmitter and Controller

Overview

Dewpoint transmitter is suitable for continuous measurement of moisture in industrial process gas or liquids and convert it to dew point, or ppm(v).

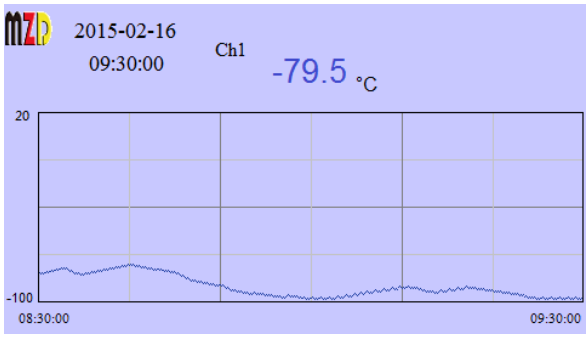
Principle

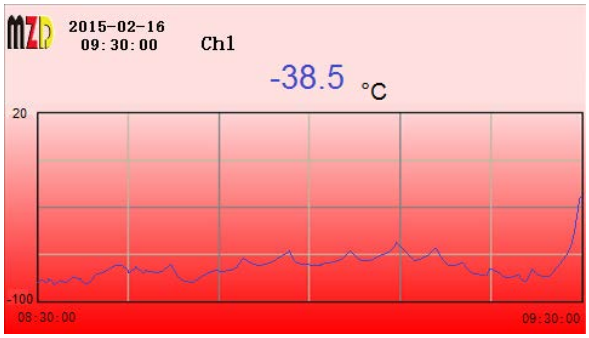
MZD dew point analyzer uses a dual ceramic film capacitive sensor based on nanotechnology. The sensor is composed of two specially developed Low Temperature Cofired Ceramics (LTCC), the isolation layer and the moisture absorption layer. Its characteristic is that the response is very fast and very stable. The ceramic isolation layer is 10 nanometers thick and the DC impedance exceeds 2 megohms, forming an electrical isolation layer, which can effectively prevent the sensor from short-circuiting. The ultra-thin ceramic hygroscopic layer is only 24nm thick and sintered with the ceramic isolation layer. It has strong hygroscopicity and quickly responds to changes in the partial pressure of water vapor, and reacts to changes in its capacitance. The use of ceramic isolation layer allows us to minimize the thickness of the response layer, thereby obtaining a faster response speed than similar products.

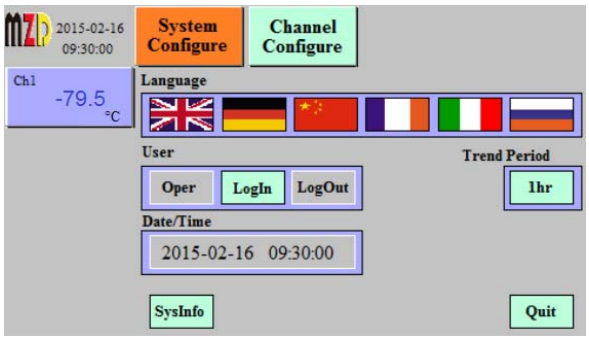
Advantages

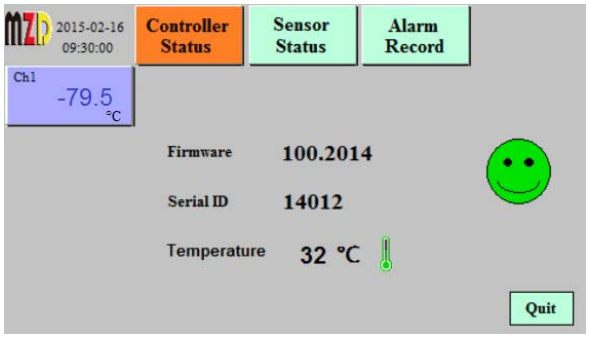
- Fast response
- Nano-based dual ceramic film capacitive sensor
- Wide pressure range (vacuum to 300 bar)
- Not sensitive to flow rate
- Built-in self-diagnostic system
- Robust mechanical construction
- Automatic calibration system, according to international standards (NPL)

DewPoint Transmitter and Controller









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.

DewPoint Transmitter and Controller

Parameters

Measuring range	DewPoint -100 to +20°C, 0-23000 ppm(v), Liquid 0~1000ppm			
Accuracy	±2°C (DewPoint)			
Repeatability	0.5°C (DewPoint)			
Sensor Calibration	Traceable 7 point calibration certificate			
Response Time(T95)	1minute (From dry to wet)			
Gas Flow	0 to 10 m/s(Pipe), 0.2 to 5 l/M(Measuring Cell)			
Process Pressure(Max.)	300Bar			
Sample gas temperature	-40~60°C (Temperature compensated)			
Process Connection	5/8"~18 UNF Thread			
Filter	Optional stainless steel sintering 5μm			
Transmitter Power	8 - 36 VDC			
Analog Output	2Wire, 4~20mA, maximum load 500Ω			
Ingress Protection	IP65			
Explosion-proof	Option Ex ia			
Display	4.3" or 7" industrial color touch screen			
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)			
Diagnosis function	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			
Storage and transport temperature	-25 ~ 70℃			
Ambient Temperature	-15 ~ 60℃			
Ambient Humidit	0~100%RH			
Wall-mounted(1~2Channels)	4.3" color touchscreen	ABS,Gray RAL7045	213*185*84mm	IP65,Ex d IICT4 optional
	7" color touchscreen		323x237x172mm	
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

MZD dew point analyzer can be used in some corrosive gases. The following table gives some guidelines in this regard. A certain amount of corrosive gas is allowed in the dry gas, but it cannot be used in some samples with high moisture content. It can be applied to all samples with water content if it is marked "no limit".

Corrosive gases		Maximum allowable content ppm	Maximum allowable DewPoint temperature °C	Explosion limit in air (%LEL)
	exhaust	no limit	no limit	
	Freon	no limit	no limit	
	natural gas	no limit	no limit	
	Aromatic alcohols	no limit	no limit	
	petroleum	no limit	no limit	
Br_2	Bromine gas	no limit	-12°C	
CCl_2F_2	Dichlorodifluoromethane	no limit	-12°C	
CCl_4	Carbon tetrachloride	no limit	no limit	N/A
CF_4	Carbon tetrafluoride	no limit	-12°C	
Cl_2	Chlorine gas	Prohibited		
CH_4	Methane	no limit	no limit	5,0-15,0%
C_2H_2	Acetylene	^	0°C	
C_2H_6	Ethane	no limit	no limit	3,0-12,5%
C_3H_8	Propane	no limit	no limit	2,2-9,5%
$(CH_2)_2O$	Ethylene oxide	Prohibited		
CH_3OH	Methanol	20 ppm	no limit	
$C_4H_{11}O$	Ethylene glycol	no limit	no limit	
C_6H	Benzene	no limit	no limit	1,4-7,1%
$C_6H_5CH_3$	Toluene	no limit	no limit	1,3-6,8%
$C_6H_5(CH_3)_2$	Xylene	no limit	no limit	1,0-6,0%
CO	Carbon monoxide	no limit	no limit	12,5-76,2%
CO_2	Carbon dioxide	no limit	no limit	N/A
$COCl_2$	Carbonyl dichloride	no limit	-20°C	
CS_2	Carbon disulfide	no limit	no limit	
F_2	Fluorine	10 ppm	-20°C	
HBr	Hydrobromic acid	Prohibited		
HCl	Hydrochloric acid	Prohibited		
HCOOH	Formic acid	Prohibited		

DewPoint Transmitter and Controller

Corrosive gases	Maximum allowable content ppm	Maximum allowable DewPoint temperature °C		Explosion limit in air (%LEL)
HF	Hydrofluoric acid	500 ppm	-20°C	
Hg	Mercury	Prohibited		
HNO_3	Nitric acid	10 ppm	^	
$HClO_4$	Perchloric Acid	Prohibited		
$HOCH_2CH_2OH$	Ethylene glycol	no limit	no limit	
H2O2	Hydrogen peroxide	Prohibited		
H_2S	Hydrogen sulfide	no limit	no limit	4,3-45,5%
H_2SO_4	Sulfuric acid	10 ppm	-20°C	
NaOH	Sodium hydroxide	Prohibited		
NH_3	Ammonia	1400 ppm	-10°C	16,0-25,0%
NO_2	Nitrogen Dioxide	no limit	^	
N_2O	Nitrous oxide	no limit	^	
O_2	Oxygen	no limit	no limit	
O3	Ozone	Prohibited		
SO_2	Sulfur dioxide	no limit	no limit	N/A
SF_6	Sulfur hexafluoride	no limit	no limit	
SO_3	Sulphur trioxide	no limit	-20°C	

According to Henry's Law, at constant temperature, the mass of a gas dissolved in a given volume of liquid is proportional to the partial pressure of the gas in the system. It can be said that ppmw of water in hydrocarbon liquids is equal to the partial pressure of water vapor in the system times a constant.
ppmw = K × ew (K, Henry"s Law constant; ew, water vapor pressure at the measured dew point.)

Note:

*The data above might change with the deepening of research and experiment of the MZD laboratory and user experience.

MZD reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail.

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

MZD Analytik GmbH
Radeberger Str. 21
D-01900 Großröhrsdorf
Tel: 0049-35952-289-78
Fax: 0049-35952-4294-57
Email: info@mzdd.de

Moisture in oil

Overview

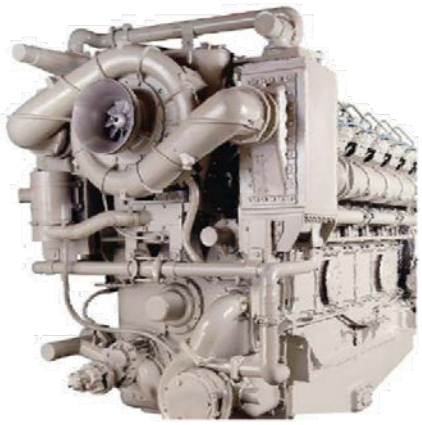
The degree of water solubility in oil varies greatly depending on the oil type, additives, degree of oxidation, temperature, and other factors. Therefore, the sensor needs to be fully calibrated to ensure the correct measurement of water content. MZD Sensors offer the highest quality and highest accuracy in the industry, using sophisticated oil calibration and measurement methods.
The sensor provides continuous monitoring of the entire oil lubrication system, and at the same time alarms the high moisture content that may cause damage. In addition to providing alarms, it can also be used to ensure that separators, filters, and dryers operate on demand. The sensor can transmit the signal to any external monitoring system, sends out alarm signals, and provide on-site display at the same time.

Type of oil

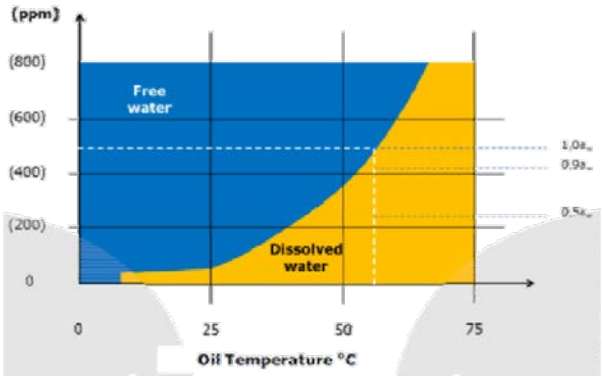
- ◆ Lubricantion oil
- ◆ Gearbox oil
- ◆ Turbine oil
- ◆ Diesel oil
- ◆ Hydraulic oi
- ◆ Transformer oil

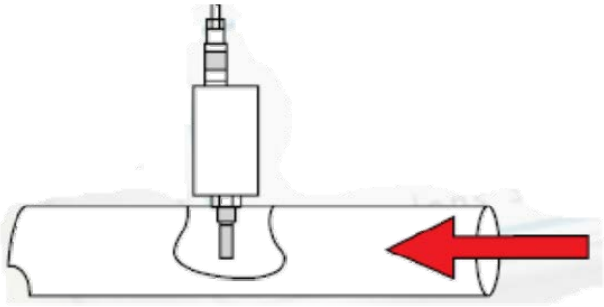
Advantage

- ◆ 24/7 monitoring and early warnings
- ◆ Increase the lifetime of engine parts, cylinders, bearings, etc.
- ◆ Saved damages and downtime costs
- ◆ Longer oil lifetime
- ◆ Saved oil sample costs (and administration)
- ◆ Potential savings on water filters, separators, etc. (only running when needed)
- ◆ Avoided commercial costs and negative customer impact (from downtime and delays)
- ◆ Higher accuracy than most oil sample tests and real time answers
- ◆ Higher accuracy and real-time measurement than most sampling tests



Moisture in oil





Measuring range

- a.w.(Water activity)

The sensor is easy to install and connect. Measurement range of 0.01-1.00aw, accuracy ± 0.03aw, resolution> 0.004aw. The default alarm values are 0.5aw and 0.9aw (changeable on the controller). Under the condition of installation with a ball valve, the maximum working pressure of the sensor in oil is 10 bar. For threaded installation, the maximum pressure is 20bar, with the working temperature between 0℃ and 90℃.

- ppm

The typical measurement range is 10~20,000 ppm (the upper limit is only due to oil saturation), the maximum pressure is 300bar, and the working temperature is −20℃ to +70℃.

Installation

◆ Easy to install, directly on the tank or pipeline.

◆ The installation location requires a certain flow rate.

◆ The sensor should be installed where the water content in the oil can best reflect the problem. E.g:

✓ The leakage of the cooler due to incorrect operation, the measurement point should be selected behind the pipeline close to the output of the cooler.

✓ If you want to monitor the new oil added to the system, the measurement point should be selected on the siphon line of the pump.

✓ When the sensor is installed on the pipeline, the sensor must always be immersed in the oil. The location of the sensor must not have precipitation.

Moisture in oil

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

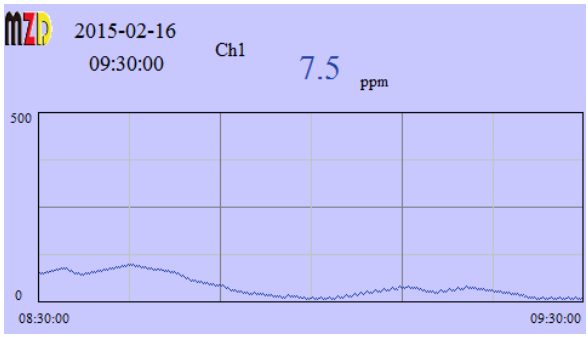
Optional: Timer control(automatic cleaning) function

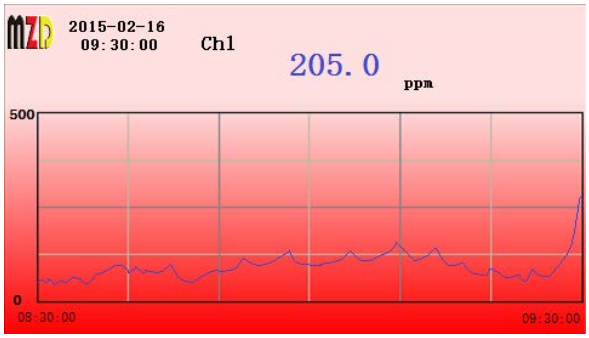
Optional: analog PID control function

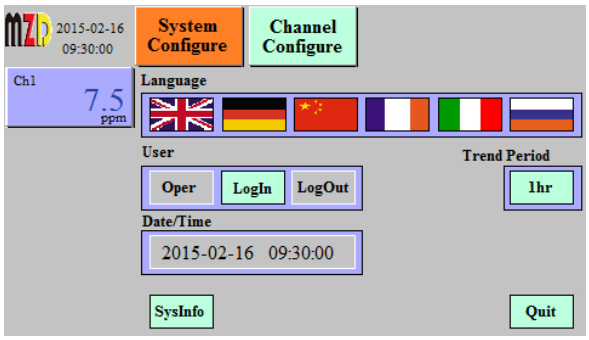
Optional: PWM control function

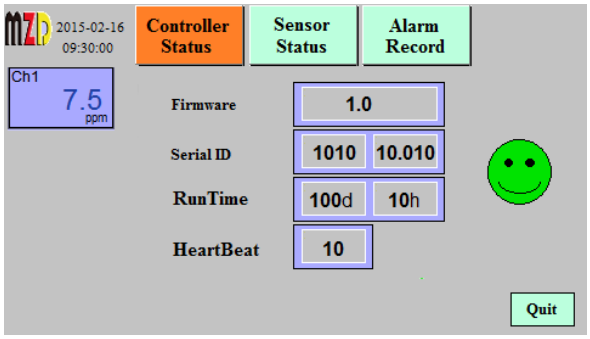
❖ **Flexible fieldbus communication functions for IOT4.0**

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









Moisture in oil

Parameters

Measuring principle	capacitance	capacitance
Range	0.00~1.00 a.w.	20,000ppm
Accuracy	0.03 a.w.(0.05 ~ 0.95 a.w.) or ppm 30%	<10%*limit of measurement range accessible
Resolution	< 0,004 a.w. or 1ppm	1ppm
Start Up Time	<30s(First use after installation,10minute)	<30s(First use after installation,10minute)
Working temperature	0 ~ 90℃	-20 ~ 70℃
Temperature compensation	Automatic internal temperature compensation	Automatic internal temperature compensation
Working pressure	Max. 20bar(Ball valve mounted,10 Bar)	300bar
Calibration	a.w.(Water Activity)	ppm, Karl Fischer titration(ASTM D1533)
Calibration period	<3years(recommend)	<3years(recommend)
Process connection	ISO 228-1 1/2"NPT or 3/4"NPT thread	5/8-18 UNF
Ambient Temperature	-30 ~ 90℃	-20 ~ 60℃
Storage/transport temperature	-30 ~ 95℃	-20 ~ 80℃
Ambient humidity	10 ~ 90%RH	10 ~ 90%RH
Ingress Protection	IP66	IP65

Display	4.3" or 7" industrial color touch screen
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)
Diagnosis function	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	Can store 6 calibration curves of different materials, 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℃
Ambient humidity	0~90%RH

Wall-mounted(1~2Channels)	4.3" color touchscreen	ABS,Gray RAL7045	213*185*84mm	IP65,Ex d IICT4 optional
	7" color touchscreen		323x237x172mm	

Bulk Moisture Analyzer

Online bulk material internal moisture measurement

Overview

SMART series intelligent bulk moisture analyzer can be applied to measure the moisture content in most solids, which helps to control product quality and cost (dryer, water, energy, weight, etc.) according to material moisture.

Principle

The capacitance field sensor generates electromagnetic waves (frequency of about 30 MHz), which can penetrate about 15 cm inside the material. Because the change of the moisture content causes the change of the dielectric constant, which makes the electromagnetic field change, the moisture inside the material can be detected.

Application

★Food: grains, flour, soybeans, malt, rapeseed, corn, lentils, noodles, bean products, sugar, beet saccharification, beet flakes, candy, grain starch, coffee raw materials, food processing materials, fish meal, dry food, potato products , Potato flour, crumbs, flakes, seasoning powder, milk powder, spices, nuts, etc.

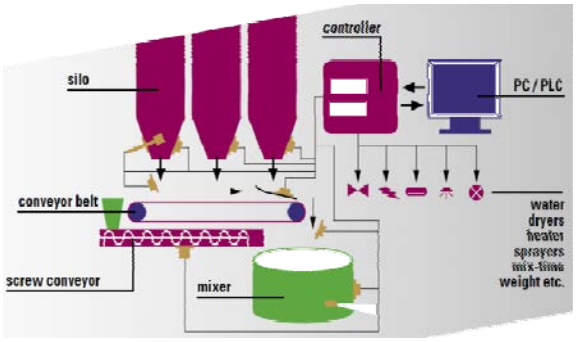
★Building materials: sand/gravel quartz powder, sand, bricks (raw materials), ceramics (raw materials), mortar, etc.

★Chemicals and pharmaceuticals: powder, granule, tablet, pill, flake fertilizer, phosphate, salt, potash, washing powder, polystyrene, foam plastic, synthetic material, PVC, acrylic paint, etc.

★Recycling: biomass, sludge, compost, etc.

★Others: wood shavings, sawdust, wood powder, calcium carbide slag, coal(pieces/powder), tobacco(shag/leaf), cast sand, glass, ceramics, coke, etc.

Bulk Moisture Analyzer



Features

★Can store 6 calibration curves of different materials.

★Detect the average moisture inside the material

★Insensitive to the color and PH value of the material

★ Very high repeatability.

★High sensor protection level

★Maintenance-free sensor

★Optional high temperature (up to 130℃) sensor or explosion-proof sensor

Installation

All Smart series smart bulk moisture sensors are dustproof, waterproof, shockproof and knockproof, and optional explosion-proof. The most typical installation positions of the sensor are inside the silo, on the silo wall, on the material conveying ramp, the upper or lower part of the conveyor belt, on the screw conveyor, and mixers and dryers.

Some application case:

★ Sludge water treatment, drying, wastewater and sludge process

★ Food (cereals, rice, flour, starch)

★ Salt products, mines

★ Potassium Chloride

★ Bulk Cargo Drying Plant

★ Ore processing

★ Energy/Coal

★ Sawdust, wood chips (granule products)

★ Porcelain products (granules and semi-finished products)

★ Clay processing

★ Kaolinit processing

★ REA-Gypsum products

★ Concrete mixing plant

Bulk Moisture Analyzer

Online bulk material internal moisture measurement

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**

Can store 6 calibration curves of different materials

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

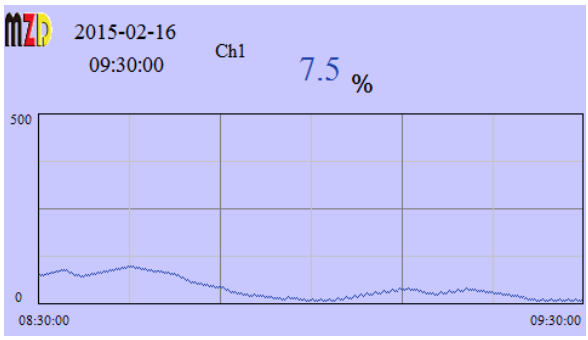
Optional: Timer control(automatic cleaning) function

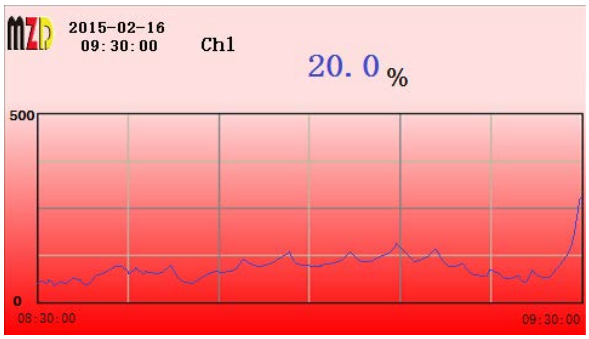
Optional: analog PID control function

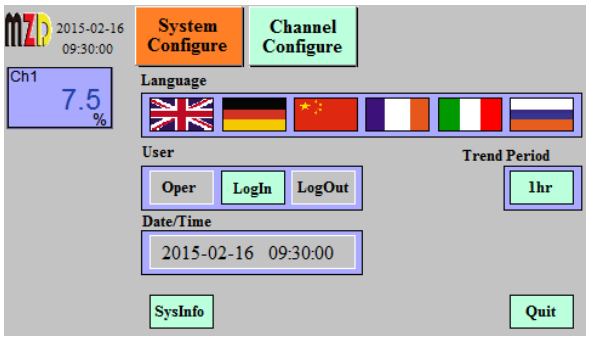
Optional: PWM control function

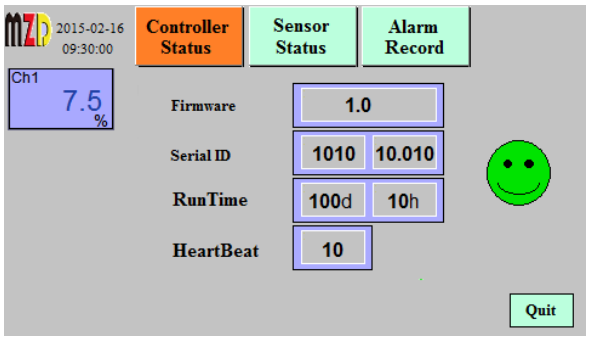
❖ **Flexible fieldbus communication functions for IOT4.0**

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









Modbus PROFIBUS Fieldbus HART COMMUNICATION PROTOCOL WirelessHART

Bulk Moisture Analyzer

Parameters

Measuring principle	Capacitive field sensor			
Range	0~100%			
Accuracy	0.1%*			
Sensitivity	150mm			
Response Time	<1s			
Action time T90 (up)	<3s			
Working temperature	4~70℃			
Temperature compensation	Automatic internal temperature compensation			
Ambient Temperature	-35~80℃			
Sensor surface material	Wear-resistant plastic/ceramic/Teflon/rubber			
Material of sensor house	stainless steel			
Distance to material	Contact, or non-contact (maximum 1mm)			
Installation	Clamping flange			
Size	Φ76mm*70mm			
Ingress Protection	IP67			
Explosion-proof	Sensor Ex-Zone 20/22， Ex-Zone 0/1， ATEX Ex II 1/2， EExd ia IIC T6			
*Depends on materials and measurement installation conditions				
Display	4.3" or 7" industrial color touch screen			
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)			
Diagnosis function	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	Can store 6 calibration curves of different materials, 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℃			
Ambient humidity	0~90%RH			
Wall-mounted(1~2Channels)	4.3" color touchscreen 7" color touchscreen	ABS,Gray RAL7045	213*185*84mm 323x237x172mm	IP65,Ex d IICT4 optional