

Technical Datasheet

LIQUID ANALYSIS MEASUREMENTS | DATA SHEETS | DS-WK100-EN- REV.A-23

PH - Sensor / Electrode WKP100



pH | ORP | TDS | CONDUCTIVITY | DO | TURBIDITY | TSS | BOD | COD

Measurement made easy

The low-power, high-performance transmitter

Modular design for strategic flexibility

- common universal design for analog pH, ORP, conductivity and digital
- plug-and-play sensor and communication modules minimize stock holding and maximize operation uptime
- wall-, panel- or pipe-mountable

Easy to use

- 'Easy Setup' sensor configuration menus provide step-by-step guidance
- multi-level security access prevents unauthorized modifications to transmitter configuration and calibration
- One-Button sensor calibration saves time and money spent on routine maintenance

Robust and reliable

- available in both corrosion-resistant polycarbonate or durable aluminium enclosures



Features

- Compact structure and easy installation
- Isolated power supply design, data stability, strong anti-interference ability
- automatic/manual temperature compensation
- Automatically detect whether the temperature probe is disconnected or faulty, then switch to manual temperature compensation
- Support USA/NIST/custom pH calibration solution, and user-defined ORP standard solution
- Communication: RS485 interface*1 (Modbus RTU protocol)

WKP100 is a digital sensor with RS485 designed by our company for the aquaculture industry, which can be used to measure the change of pH/ORP value in an aqueous solution system within the range. The sensor with a standard RS485 MODBUS-RTU protocol interface, which can be connected with the host computer conducts remote communication. Each sensor is manufactured with our patented Axial Ion Path® reference technology, proprietary Low-Noise & HighTemp Signal Cable along with proprietary ruggedized, high temp and coat resistant glass formulations. A wide selection of sensor body styles and process fittings in a variety of corrosion resistant materials allow direct replacement of short-lived OEM pH/ORP sensors. WKP100 Performance Series sensors are compatible with all major manufacturers of pH analyzers and transmitters. Upgrade your analytical measurement without the hassle and expense of replacing costly field instruments.

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Industrial Mounting Options

- Mounting fittings for sample line installations
- Submersible cleaners and scrubbers
- Ball Valve “Hot Tap” retraction solutions
- Variety of materials for corrosive applications

Applications

- Aquaculture
- Water testing
- Information data collection
- Internet of Things water quality testing

Wellkonix designs, manufactures, and tests its Analytical products to meet many national and international standards. Because these instruments are sophisticated technical products, you must properly install, use, and maintain them to ensure they continue to operate within their normal specifications. safety program when installing, using, and maintaining Rosemount Analytical products.





ORP Measurement Basics For The Process Industry

The ability of a medium to oxidise or reduce another medium is measured by its “oxidation-reduction potential,” or ORP.

When an oxidizer takes an electron from another molecule, it is said to be oxidising, and when a reducer gives an electron to another molecule, it is said to be reducing. A single mV value, which can be positive or negative, can be monitored by an ORP sensor to identify whether oxidation or reduction is taking place. The mV value is positive when a medium is oxidising. The mV reading will be negative when it is displaying reduction. Additionally, an ORP measurement known as “Redox” is frequently used. Reduction and oxidation are combined to form the word redox.

Creating ORP Sensors

Both an ORP electrode and a reference electrode are parts of an ORP sensor. When considering the design of an ORP sensor, the transfer of electrons is crucial. Platinum, which is frequently used in ORP electrode fabrication, has low resistance. The electrode is able to exchange electrons with both oxidizers and reducers. Until a potential is formed, the electrode will continue to take or release electrons. After then, it produces millivolts. The reference electrode in an ORP sensor is commonly constructed of Ag/AgCl and submerged in a KCl reference substance, making it very similar to a pH reference electrode.

Using the ORP Measurement to Interpret

Chemical media that act as oxidizers or reducers come in a wide variety. Instead of receiving a precise indication of the chemical you are measuring when monitoring ORP, you instead receive a signal that an oxidizer or reducer is present. For instance, ORP sensors are frequently used in Pulp and Paper mills to regulate the injection of chlorine, which is employed as a disinfectant in the mill. A measurement of ORP is one that can only be inferred. However, when done appropriately and in conjunction with knowledge of the process medium being studied, ORP measurements can be a useful tool for detecting specific compounds in a processing environment.

Summary

In process applications across many sectors where managing chemical compositions is crucial, we deploy ORP sensors. You may control the process in an effective and efficient manner by grasping the fundamentals of ORP measures.





Technical specifications

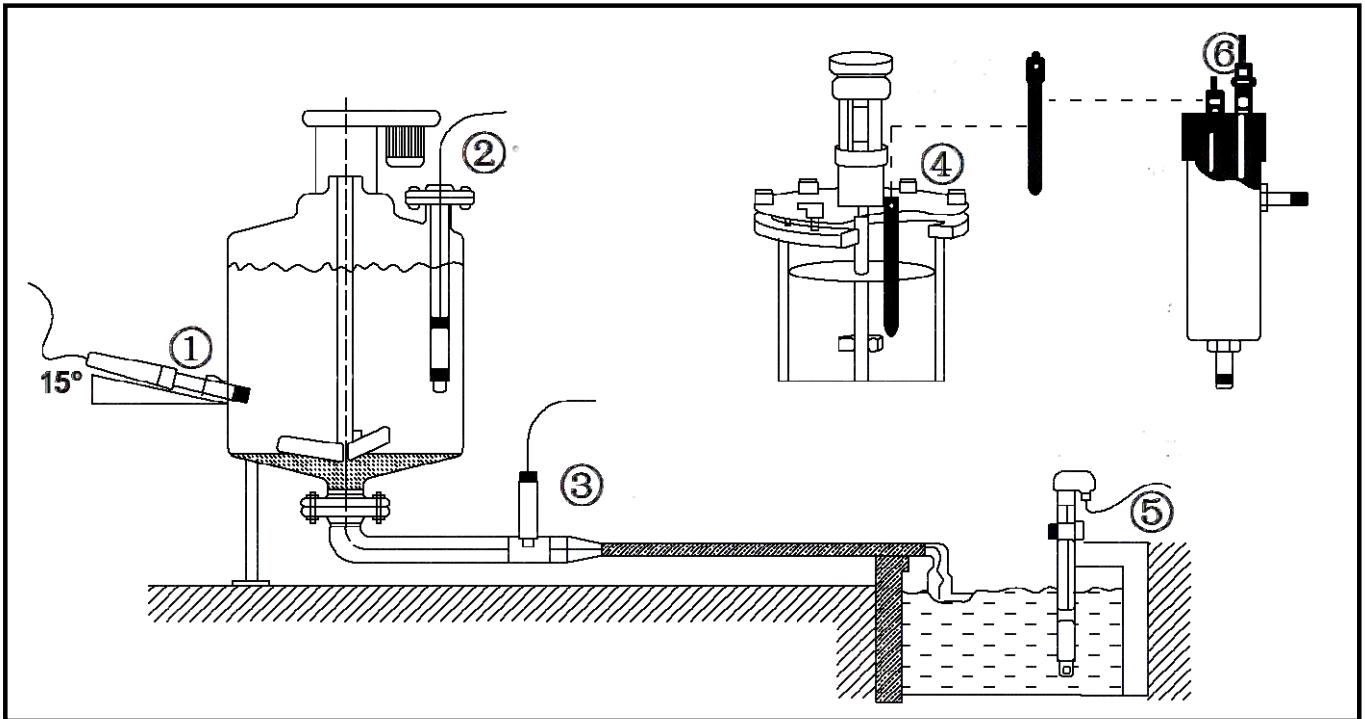
Measurement Performance

Measure Range	PH(0-14)
Resolution	PH: 0.01
Accuracy	PH: 0.02PH;
Temperature rang	0~60°C@0.1°C
Output type	Rs485 interface
Temperature compensation	NTC 10K or PT1000 -10-130 Deg.Cel.
Power Supply	(6~30) VDC
Power consumption	30mA@12VDC
Sensor type	Composite electrode/ORP electrode
Communication protocol	Standard MODBUS-RTU pro mA
ID	1-255
Setting method	Rs485 remote setting calibration and param

Wiring

Color	Red	Black	Green	White
Explanation	(6~30)V+ (default 12V+)	GND	485A	485B

Installation



The principle of pH/ORP sensor measurement is electro chemical method and galvanic battery principle. The primary battery is a system whose function is to turn chemical energy into electrical energy. The voltage of this battery is called electromotive force (EMF) which is made up of 2 half-cells, of which one is called a measuring cell whose potential is related to specific ionic activity; the other is a reference half-cell, commonly known as a reference sensor, which is generally interlinked with the measuring solution and disconnected to the measuring instrument. The potential difference produced by the galvanic in traction in side the sensor is transmitted to the pH controller, and the corresponding algorithm is transmitted. The interface must be in 15° oblique angle, or it will affect the normal test and use of the sensor. We won't be responsible for any results due to this.

- 1) Side wall installation**
- 2) Flange mounted at the top**
- 3) Pipe installation**
- 4) Top installation**
- 5) Submersible installation**
- 6) Flow-through installation**



Product Selector

Model: WPH100-5014

The WPH100-5014 sensor is made of pH sensitive glass film resistant to hydrofluoric acid. The application of this sensor is not only for the determination of pH value in water contain in hydrofluoric acid, but also in the dilution control of hydrofluoric acid in semiconductor wafer manufacturing and chip production. It can also be used in the petrochemical industry, iron and steel waste water and other corrosive systems in the determination of pH value.

sensor interface	VP,S8M,K2, etc.
Conversion coefficient	Conversion coefficient:
Membrane resistance	< 250 Ω
Practical response time	< 1 min
Measurement range	0-14 pH
Salt bridge	Special porous ceramic core
Temperature:	0-130°C
Pressure resistance	0.4MPa
Hydrofluoric acid concentration range:	4000ppm



WPH100-5014

Model: WPH100-5015

The WPH100-5015 sensor is composed of pressure- resistant hemispherical PH sensitive film, intermediate dielectric composed of GMT mixed with glue, Ag/AgCL/KCLexternal reference system, and salt-free bridge open liquid interface. Widely used in pure water and high purity water and complex chemical processes.

sensor interface	VP,S8M,K2, etc.
Conversion coefficient	98%
Membrane resistance	250M Ω
Practical response time	< 1 min
Measurement range	0-14 pH
Salt bridge	Porous ceramic core; porous Te
Temperature:	0-130°C
Pressure resistance	up to 6 Bar at 25 °C
Thread Connection	PG13.5
Temperature compensation:	Pt100/Pt1000/NTC10K



WPH100-5015

Product Selector

Model: WPH100-5017

The WPH-5017 sensor uses a cylindrical pH-sensitive membrane made of alkali-resistant glass by blowing. The external reference electrolyte system is composed of pre-charged gel PFT/GFT, which can withstand the osmotic pressure of up to 6 Bar. The sensor is widely used in various chemical processes including chlor-alkali, mining and smelting, papermaking, paper pulp, textiles, petrochemical industry and semiconductor electronic industry as well as fields such as biotechnology and wastewater treatment.

Connector	VP, S8M, K2, e
Zero potential point	7±0.25 p
Conversion coefficient:	> 98%
Membrane resistance	<600M Ω
Practical response time	< 1 min
Measurement range	0-14 pH
Temperature compensation	Pt100/Pt1000/NTC10K
Temperature	0-130°C
Pressure resistance	up to 6 Bar at 25
Thread Connection	Connection: PG 13.5



WPH100-5017

Model: WPH100-5018

The WPH-5018 sensor has large sensitive areas and strong mechanical shock resistance, which can be widely used in various chemical processes including microbial technology, pharmaceuticals, food and beverages, sugar manufacturing, chlor-alkali, mining and smelting, paper-making, paper pulp, textiles, petrochemical industry and semiconductor electronic industry as well as fields such as waste water treatment

sensor interface	VP, S8M, K2, etc.
Conversion coefficient	98%
Membrane resistance	250M Ω
Practical response time	< 1 min
Measurement range	0-14 pH
Salt bridge	Porous ceramic core; porous Teflon
Temperature:	0-130°C
Pressure resistance	up to 4 Bar at 25 °C
Thread Connection	PG13.5
Temperature compensation:	Pt100/Pt1000/NTC10K



WPH100-5018

Product Selector

Model: WPH100-5019

The WPH-5019 sensor consists of a pH-sensitive membrane, double-junction reference GPT medium electrolyte, and a porous large-area Teflon salt bridge. The plastic case is made of modified PON, which can withstand high temperature up to 80°C and resist strong acid and strong alkali corrosion. It is widely used in waste water treatment and fields including mining and smelting, paper-making, paper pulp, textiles, petrochemical industry, process of semiconductor electronic industry and downstream engineering of biotechnology.

Connector	VP, S8M, K2, e
Zero potential point	7 ± 0.5 PH
Conversion coefficient:	> 98%
Membrane resistance	<250M Ω
Practical response time	< 1 min
Measurement range	0-14 pH
Temperature compensation	10K Ω /2.252K Ω /Pt100/Pt1000
Temperature	0--60°C for general cable
Salt bridge	Porous Teflon
Thread Connection	3/4NPT



WPH100-5019

Model: WPH100-5100

The WPH-5100 sensor is composed of pressure-resistant hemispherical PH sensitive film, intermediate dielectric composed of GMT mixed with glue, Ag/AgCL/KCL external reference system, and salt-free bridge open liquid interface. Widely used in pure water and high purity water and complex chemical processes.

Connector	VP,S8M,K2, etc
Conversion coefficient	98%
Membrane resistance	250M Ω
Practical response time	< 1 min
Measurement range	0-14 pH
Salt bridge	OPEN aneroid junction salt bridge
Temperature:	0-130°C
Pressure resistance	0.4MPa
Thread Connection	PG13.5
Reference	Ag/AgCl



WPH100-5100

Product Selector

Model: WPH100-5011

Increasing the silver ion at the reference sensor part, to enhance the stability and accuracy, suitable for general industrial waste water and discharge solution

Material	PPS/PC
Zero potential point	7 ± 0.5 PH
Conversion coefficient:	> 95%
Membrane resistance	<500M Ω
Practical response time	< 1 min
Measurement range	0-14 pH
Temperature compensation	Pt100/Pt1000/NTC10K
Temperature	0--60°C
Reference	Ag/AgCl
Thread Connection	3/4NPT



WPH100-5011

Model: WPH100-5013A

Low-impedance glass sensitive film, wear-resistant, strong acid and alkali resistant, with protection ring in the the front to protect glass bulb and better precision and linearit

Connector	VP,S8M,K2, etc
Conversion coefficient	95%
Membrane resistance	500M Ω
Practical response time	< 1 min
Measurement range	0-14 pH
Salt bridge	OPEN aneroid junction salt bridge
Temperature:	0-130°C
Pressure resistance	4 bar at 25 c
Thread Connection	PG13.5
Reference	Ag/AgCl



WPH100-5013A

Product Selector

Model: WPH100-7002

The 7002 industrial PH sensor uses the ring-type poly tetra fluoro-reference liquid interface, solid electrolyte and special glass sensitive film, which enhances the reaction speed and anti-pollution ability of the sensor, and reaches the level of similar sensors in the world.

Material	0.4MPa
Resistance	250 mΩ
Measurement range	2~12pH
Temperature compensation	NTC10K/PT100/PT1000
Temperature	0~80°C
Wire	5m (customizable)
Slope	95% (25°C)
Shell material	PPS



WPH100-7002

Model: WPH100-7003

The 7003 pure water pH sensor adopts ring type PTFE reference liquid boundary, solid electrolyte and special glass sensitive film, so that the reaction speed and anti-pollution ability of the sensor are enhanced and the performance is perfect, reaching the level of similar sensors in the world. Please follow the following instructions carefully to obtain the best test results and prolong the service life of the sensor

Zero potential	7±0.5pH
Resistance	250M Ω
Slope	95%
Measurement range	0-14pH
Pressure range	0.6MPa
Temperature:	0-80°C



WPH100-7003

Product Selector

Model: WPH100-8001

The 8001 pH digital sensor designed for the aquaculture industry is equipped with numbers interface (RS485*1), can be used for measuring aqueous solution system within the range change in pH/ORP. The 8001 pH sensor is applied in different fields: Aquaculture, water quality testing, information data collection, Internet of Things

Power supply	12VDC
Resolution	0.01pH
Measurement range	0-14pH
Accuracy	0.02pH
Temperature	0-60°C
Output	RS485
Communication	MODBUS-RTU



WPH100-8001

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