
# Datasheet

# pH Electrodes/ORP Electrodes

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# pH Electrodes/ORP Electrodes

The principle of pH/ORP sensor measurement is electrochemical 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 is connected to the measuring instrument.
The potential difference produced by the galvanic interaction inside the sensor is transmitted to the pH controller, and the corresponding algorithm is transmitted to display the pH value.

## Applications

- Wastewater
- Wet Wells
- Oil tanks
- Sumps
- Reservoirs
- Industrial wastewater
- Electroplating plants
- Paper industry
- Drinking water

pH Electrodes/ORP Electrodes

## Features

- Adopt international advanced solid dielectric and large area PTFE liquid junction, easy maintenance.
- Long distance reference diffusion path, extends electrode life greatly in harsh environments.
- Electrode is made of high quality low-noise cable, make signal output length greater than 40 meters or more, without interference.
- High accuracy, fast response, good repeat-ability.
- With silver ions Ag / Ag-Cl reference electrode.
- Side or vertically installation to the reaction tank or pipe.
- Electrode can be used interchangeably with similar

electrodes.

| Electrode model | Designation | pH and ORP range | Temperature range |
|---|---|---|---|
| SIN-pH5013A | PTFE pH electrode | 0-14pH | 0-60℃ |
| SIN-pH5014 | Glass pH electrode | 0-14pH | 0-130℃ |
| SIN-pH5015 | High Temperature Glass | 0-14pH | 0-130℃ |
| SIN-pH5016 | pH electrode | 2-12pH | 0-80℃ |
| SIN-pH5018 | Glass pH electrode | 0-14pH | 0-100℃ |
| SIN-pH5019 | Glass pH electrode | 2-12pH | 0-80℃ for general cables |
| SIN-pH5100 | Glass Electrode for Pure Water | 0-14pH | 0-130℃ |
| SIN-pH6001 | Plastic pH electrode | 2-12pH | 0-80℃ |
| SIN-pH6002 | Glass pH electrode | 0-14pH | 0-100℃ |
| SIN-pH7001 | Desulfurization electrode | 2-12pH | 5-80℃ |
| SIN-pH7002 | Plastic pH electrode | 2-12pH | 5-80℃ |
| SIN-pH7003 | Plastic pH electrode | 2-12pH | 5-80℃ |
| SIN-ASP2110 | Plastic pH Electrode | 2-12pH | 0-60℃ |
| SIN-ASP2210 | Plastic pH Electrode | 2-12pH | 0-60℃ |
| SIN-pH8001 | Digital Electrode | 0-14pH | 0-60℃ |
| SIN-ORP6042 | PTFE pH Electrode | 245mV-270mV | 5-70℃ |
| SIN-ORP6050 | Plastic ORP electrode | -2000mV-2000mV | 0-80℃ |

## SIN-pH5013A

### Introduction

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 linearity.

### Technical parameters

Zero potential point: 7±0.25
Conversion coefficient: ≥95%
Membrane resistance: ＜500Ω
Practical response time: < 1 min
Measurement range: (0~14) pH
Temperature compensation: Pt100/Pt1000/NTC10K/ NTC22K/NTC30K
Temperature: (0~80)℃
Reference: Ag/AgCl
Pressure resistance: 0.3MPa
Thread Connection: 3/4NPT
Salt bridge: Ring Teflon junction
Material: PTFE

## SIN-pH5014

### Introduction

The pH-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 containing 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.

### Technical parameters

Sensor interface: VP,S8M,K2, etc.
Conversion coefficient: > 98%
Measurement range: (0~14) pH
Salt Bridge: Single Ceramic Junction
Temperature: (0~130)℃
Pressure resistance: 0.25MPa
Temperature compensation: Pt100/Pt1000/NTC10K/ NTC22K/NTC30K
Hydrofluoric acid concentration range: ≤4000ppm
Mounting thread: PG13.5
Shell material: Glass
Reference type: Ag/AgCl

## SIN-pH5015

### Introduction

pH-5015 sensor has large sensitive areas and is resistant to mechanical shock; it is widely used in various chemical processes including microbial technology, pHarmaceuticals, food and beverages, sugar manufacturing, chlor-alkali, mining and smelting, paper pulp, textiles, petrochemical industry and semiconductor electronic industry as well as fields such as waste water treatment.

### Technical parameters

Connector: VP, S8M, K2, etc.
Zero potential point: 7 ±0.5 pH
Conversion coefficient: > 98%
Membrane resistance: general: <250MΩ
Practical response time: < 1 min
Measurement range: (0~14) pH
Salt bridge: single ceramic junction
Temperature compensation:
Pt100/Pt1000/NTC10K/
NTC22K/NTC30K
Temperature: (0~130) ℃
Pressure resistance: 0.3MPa
Thread Connection: PG13.5
Reference type: Ag/AgCl
Salt Bridge: Single Point Ceramic Salt Bridge
Shell material: glass

## SIN-pH5016

### Introduction

The electrode can resist strong acid and alkali erosion. It is widely used in wastewater treatment and fields including mining and smelting, papermaking, pulp, textiles, petrochemicals, semiconductor electronic industrial processes, and biotechnology downstream engineering.

### Technical parameters

Measuring range: (2~12) pH
Temperature range: (0~80)℃
Pressure resistance: 0.1MPa~0.3MPa
Zero potential point: 7±0.5pH
Conversion factor: > 98 %
Membrane resistance: < 250MΩ
Response time: < 1min
Salt Bridge: Porous Teflon
Thread Connection：NPT 3/4
Shell material：PPS

## SIN-pH5018

### Introduction

The pH-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.

### Technical parameters

Connector: VP, S8M, K2, etc.
Zero potential point: 7 ± 0.5 pH
Conversion coefficient: > 98%
Membrane resistance: general: <250MΩ
Practical response time: < 1 min
Measurement range: (0~14) pH
Salt bridge: Porous ceramic / porous Teflon
Temperature compensation: Pt100/Pt1000/NTC10K
Temperature: (0~100)℃
Pressure resistance: 0.3MPa
Thread Connection: PG13.5
Shell material: glass

## SIN-pH5019

### Introduction

The pH-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.

### Technical parameters

Temperature compensation:10KΩ/2.252KΩ/Pt100/Pt1000
Zero potential point: 7 ± 0.5 pH
Conversion coefficient: > 98%
Membrane resistance: <250MΩ
Practical response time: < 1 min
Measurement range: (2~12) pH
Salt bridge: single ceramic junction
Temperature: (0~80) ℃ for general cables
Pressure resistance: 0.2Mpa
Thread Connection: 3/4NPT

## SIN-pH5100

### Introduction

The pH-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.

### Technical parameters

Measurement range: (0~14) pH
Temperature: (0~130) ℃
Pressure: 0.3MPa
Reference: Ag/AgCl
Connector: VP,S8M,K2, etc.
Conversion coefficient: > 98%
Membrane resistance: <250MΩ
Practical response time: < 1 min
Salt bridge: OPEN junction
Temperature compensation: Pt100/Pt1000/NTC10K/ NTC22K/NTC30K

## SIN-pH6001

### Introduction

The sensor can be directly used with a variety of domestic or imported pH meter.

### Technical parameters

Measurement range: (2~12) pH
Temperature: (0~80) ℃
Pressure range: 0.4MPa
Temperature compensation: NTC10K/PT100/PT1000
Thread Connection: 3/4NPT
Application range:Environmental protection,water treatment, aquaculture, dosing equipment SINport
Installation: Submersible installation, pipe installation,thread installation, flange installation
Reference: Ag/AgCl
Salt bridge: Annular Teflon junction
Shell material: ABS
Wire: 5m (customizable)
sensor: Φ25*165mm

## SIN-pH6002

### Introduction

The electrode can be used directly with various domestic or imported pH meters.

### Technical parameters

Measuring range: (0~14) pH
Temperature range: (0~100)℃
Pressure resistance: 0.6MPa
Zero potential: Eo=7pH;
Electrode dimensions: φ12x120, 225 or other dimensions
Mounting thread: PG13.5
Electrode outer tube material: glass
Cable length: 5m(standard),Others can be Customized
Reference: Ag/AgCl
Salt bridge: Annular Teflon junction
Temperature compensation: Pt100, Pt1000, 2.252K,10K, 22K, etc.
Application scope: General industrial occasions, general wastewater occasions such as environmental wastewater occasions

## SIN-pH7001

### Introduction

7001 industrial planar pH sensor is made of ring-type polytetrafluoro-reference liquid interface, solid electrolyte and special glass sensitive film, so that the reaction speed and anti-pollution ability of the sensor are enhanced and its performance reaches the level of similar sensors in the world.

### Technical parameters

Measurement range: (2~12) pH
Temperature: (5~80)℃
Pressure resistance: 0.3MPa
Temperature compensation: NTC10K/PT100/PT1000
Salt bridge: annular Teflon junction
Thread connection: 3/4NPT
Shell material: PPS
Reference type: Ag/AgCl
Slope: (PTS values) ≧95% (25℃)
Resistance: ≦ 250 mΩ

## SIN-pH7002

### Introduction

The 7002 industrial pH sensor uses the ring-type polytetrafluoro-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.

### Technical parameters

Measurement range: (2~12) pH
Temperature: (5~80) ℃
Pressure resistance: 0.3MPa
Temperature compensation: NTC10K/PT100/PT1000
Thread Connection: 3/4NPT
Shell material: PPS
Reference type: Ag/AgCl
Slope: (PTS values) ≧95% (25℃)
Resistance: ≦ 250 mΩ
Salt bridge: annular Teflon junction.

## SIN-pH7003

### Introduction

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.

### Technical parameters

Measurement range: (2~12) pH
Temperature: (5~80) ℃
Zero potential: 7±0.5pH (25℃)
Slope: (PTS) ≥95% (25℃)
Resistance: ≦ 250 m Ω
Pressure resistance: ≤ 0.3MPa
Temperature compensation: NTC10K, PT100, PT1000
Reference: Ag/AgCl
Salt bridge: Annular Teflon junction
Mounting thread: upper and lower 3/4NPT pipe thread
Shell material: PPS

## SIN-ASP2110

### Introduction

ASP2110 pH sensor adopts ring type PTFE reference liquid boundary, single liquid junction,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.

### Technical parameters

Measurement range:（2~12）pH
Temperature: （0～60）℃
Pressure resistance: 0.3MPa
Temperature compensation type: NTC10K
Reference: Ag/AgCl
Salt bridge: Annular Teflon junction
Thread Connection:3/4NPT
Shell material:Nylon 66 mixed with fiberglass

## SIN-ASP2210

### Introduction

ASP2210 pH sensor adopts ring type PTFE reference liquid boundary, double liquid junction,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.

### Technical parameters

Measurement range:（2~12）pH
Temperature: （0～60）℃
Pressure resistance: 0.3MPa
Temperature compensation type: NTC10K
Reference: Ag/AgCl
Salt bridge: Annular Teflon junction
Thread Connection:3/4NPT
Shell material:Nylon 66 mixed with fiberglass

## SIN-pH 8001

### Introduction

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 water quality testing.

### Technical parameters

Measurement range: (0~14) pH, ±1000.0mV
Temperature: (0~60) ℃
Resolution: 0.01pH,0.1mV
Accuracy: 0.02pH, 0.5℃, 0.2mV
Output: RS485
Communication: Modbus-RTU
Power supply: 12VDC

## SIN-ORP-6042

### Introduction

The ORP 6042 sensor is composed of PT-Ag indicating electrode and AgCL reference electrode. It is used for the detection of REDOX potential in circuit board and chrome-containing sewage treatment.During the measurement of the sensor, the test part and the reference part must be immersed simultaneously.

### Technical parameters

Measurement range: (245~270) mV
Temperature: (5~70) ℃
Resistance: ≦ 10kΩ
Stability: ±8mv/24h
Storage in standard liquid solution: 48 hours

**SIN-ORP-6050**

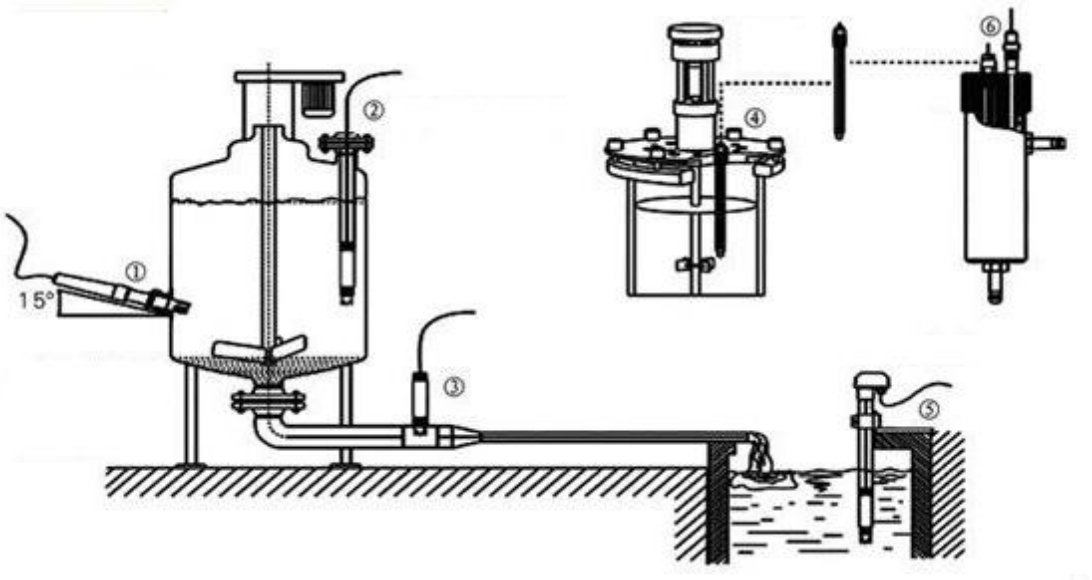
## Introduction

The industrial 6050 sensor USES the ring-type polytetrafluoroethylene reference liquid interface, solid electrolyte and ring-type platinum ring, which makes the reaction speed and anti-pollution ability of the sensor strengthened, and the performance is perfect, reaching the level of the international similar sensor.

## Technical parameters

Measurement range: -2000mV~2000mV
sensor unit: (245~270)mV (15~30℃,256mV calibration fluid)
Temperature compensation: NTC10K/PT100/PT1000
Pressure range: ≤0.3Mpa
sensor stability: ± 4mV /24h
Measurement range: 2~12pH
Temperature: (0~80)℃
Thread Connection: 3/4NPT
Shell material: PPS
Slope: (PTS values) ≧95% (25℃)
Resistance: ≦ 250 m Ω

## Installation of electrode




Schematic diagram of common installation method

① Side wall installation

② Flange mounted at the top

③ Pipe installation

④ Top installation

⑤ Submersible installation

⑥ Flow-through installation

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.

## pH Calibration

(1) It is recommended to calibrate the sensor by three-point method. The pH 4.00 buffer solution is usually used for positioning first, then the pH 6.86 and pH 9.18 buffer solutions are used sequentially to determine the slope,calibration points are selectable in the meter.

(2) After the sensor is connected to the instrument, please connect the instrument to the power supply to preheat it for 30 minutes before performing the calibration.

(3) When performing the calibration of calibration sensor, it shall be noted that the sensor can not be placed flat, but shall be placed vertically (please put the sensor sensitive membrane downward) to prevent deviation of the sensor mV data.

(4) For sensors with temperature compensation, switch the controller to automatic temperature compensation.

Electrode slope: The slope of the glass electrode is 59.16 mV at 25 ℃ theoretically, i.e. potential change of 59.16 mV for each pH change in the solution. But in fact, neither glass electrode can reach the theoretical value 100%; in general, the electrode slope is more than 98% of the theoretical value (percentage slope). In addition, the mV difference corresponding to each unit pH value varies under different temperatures. The conversion of temperature to electric potential difference is as follows:

$$\triangle E=59.16*[（273+T）/298]*\triangle pH$$

Corresponding relationship between pH and millivolt at 25℃

| Potentiometer(mV) | pH | Potentiometer(mV) | pH |
|---|---|---|---|
| 414.12 | 0.00 | -414.12 | 14.00 |
| 354.96 | 1.00 | -354.96 | 13.00 |
| 295.80 | 2.00 | -295.80 | 12.00 |
| 236.64 | 3.00 | -236.64 | 11.00 |
| 177.48 | 4.00 | -177.48 | 10.00 |
| 118.32 | 5.00 | -118.32 | 9.00 |
| 59.16 | 6.00 | -59.16 | 8.00 |
| 0.00 | 7.00 | 0.00 | 7.00 |

## Related Product

The shell of the glass electrode is relatively fragile. To prevent accidental damage, it is recommended to use a high temperature resistant sheath. (See the picture below for each optional accessory)

PTFE electrode case

SS316L electrode case

Flange

Mounting bracket

Flow cup

Flow cell

Electronic controlled box