

pH electrode/ORP electrode

Committed to process automation solutions

Datasheet



SUP-pH

Supmea pH electrode is a high-quality sensor for the analysis and measurement of liquid components during industrial automation. These electrodes are known for their use of top-quality materials and components. They are designed as combined electrodes (the measuring electrode and the reference electrode are combined in one shaft). The temperature probe can also be integrated as an option.

According to different environments to provide electrodes to meet the requirements

- For industrial sewage engineering measurements
- For high-alkaline liquid measurements
- For high acidic liquid measurements
- For high-temperature sterilization processes measurements
- For desulfurization process liquid analysis
- For measurements in low-ion media

Signal parameters

Electrode slope: The slope of the glass electrode is 59.16 mV at 25 °C 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:

$$\Delta E = 59.16 \cdot \left[\frac{273 + T}{298} \right] \cdot \Delta \text{pH}$$

Type of pH electrode

Electrode model	Designation	pH and ORP range	Temperature range
SUP-pH5011	Plastic pH electrode	0-14pH	0-60℃
SUP-pH5013A	PTFE pH electrode	0-14pH	0-60℃
SUP-pH5014	Glass pH electrode	0-14pH	0-130℃
SUP-pH5015	High Temperature Glass pH electrode	0-14pH	0-130℃
SUP-pH5016	Plastic pH electrode	0-14pH	0-80/>100℃
SUP-pH5017	Glass pH electrode	0-14pH	0-130℃
SUP-pH5018	Glass pH electrode	0-14pH	0-100℃
SUP-pH5019	Plastic pH electrode	0-14pH	0-60℃
SUP-pH5041	Glass pH electrode	0-14pH	0-90℃
SUP-pH5100	Glass ORP electrode	0-14pH	0-130℃

Features of pH electrode

- 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 parameters



SUP-pH5014

▪ Technical parameters

Measure range: 0-14pH
Temperature range: 0-130°C
Temperature compensation: Pt100/Pt1000/NTC10K
Pressure resistant: 0 ~ 6 Bar at 0 ~ 100°C; ≥ 10 Bar at 25 °C
Electrode interface: S8, VP, K2, etc.
Zero potential point: 7 ± 0.5 pH
Conversion coefficient: > 98%
Membrane resistance: <50, 250MΩ
Practical response time: < 1 min
Salt bridge: OPEN salt bridge without liquid junction
Thread Connection: PG13.5

▪ Application

In the dilution control of hydrofluoric acid in semiconductor wafer fabrication and chip production; determination of pH value in petrochemical industry, iron and steel production wastewater and other strong corrosive systems.



SUP-pH5015

▪ Technical parameters

Measure range: 0-14pH
Temperature range: 0-130°C
Temperature compensation: Pt100/Pt1000/NTC10K
Connector: VP, S8M, K2, etc.
Zero potential point: 7 ±0.5 pH
Conversion coefficient: > 98%
Membrane resistance: general: <250MΩ
Practical response time: < 1 min
Salt bridge: Porous ceramic core; porous Teflon
Pressure resistance: up to 6 Bar at 25 °C
Thread Connection: PG13.5

▪ Application

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 wastewater treatment.



SUP-pH5016

▪ **Technical parameters**

Measure range: 0-14pH

Temperature range: 0--80 °C for general cables

>100 °C for high temperature cable
(or cable not immersed in solution)

Temperature compensation: Pt100/Pt1000/NTC10K

Zero potential point: 7 ± 0.5 pH

Conversion coefficient: > 98%

Membrane resistance: <250M Ω

Practical response time: < 1 min

Salt bridge: salt bridge porous Teflon

Pressure resistance: 1 ~ 6 Bar at 25 °C

Thread Connection: 3/4NPT

▪ **Application**

In wastewater treatment and in the fields including mining and smelting, papermaking, paper pulp, textiles, petrochemical industry, process of semiconductor electronic industry, and downstream engineering of biotechnology.



SUP-pH5017

▪ **Technical parameters**

Measure range: 0-14pH

Temperature range: 0-130 °C

Temperature compensation: Pt100/Pt1000/NTC10K

Connector: VP, S8M, K2, etc.

Zero potential point: 7 ± 0.25 pH

Conversion coefficient: > 98%

Membrane resistance: <600M Ω

Practical response time: < 1 min

Pressure resistance: up to 6 Bar at 25 °C

Thread Connection: PG13.5

▪ **Application**

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.



SUP-pH5018

▪ **Technical parameters**

Measure range: 0-14pH
Temperature range: 0-100°C
Temperature compensation: Pt100/Pt1000/NTC10K
Connector: VP, S8M, K2, etc.
Zero potential point: 7 ± 0.5 pH
Conversion coefficient: > 98%
Membrane resistance: general: <250MΩ
Practical response time: < 1 min
Salt bridge: Porous ceramic core/ porous Teflon
Pressure resistance: up to 4 Bar at 25 °C
Thread Connection: PG13.5

▪ **Application**

In various chemical processes including microbial technology, pharmaceuticals, food and beverages, sugar manufacturing, chlor-alkali, mining and smelting, papermaking, paper pulp, textiles, petrochemical industry and semiconductor electronic industry as well as fields such as sewage treatment.



SUP-pH5019

▪ **Technical parameters**

Measure range: 0-14pH
Temperature range: 0--60°C for general cables
Temperature compensation: 10
KΩ/2.252KΩ/Pt100/Pt1000
Zero potential point: 7 ± 0.5 pH
Conversion coefficient: > 98%
Membrane resistance: <250MΩ
Practical response time: < 1 min
Salt bridge: Porous Teflon
Pressure resistance: 1 ~ 3 Bar at 25 °C
Thread Connection: 3/4NPT

▪ **Application**

In sewage treatment and fields including mining and smelting, papermaking, paper pulp, textiles, petrochemical industry, process of semiconductor electronic industry and downstream engineering of biotechnology.



SUP-pH5100

▪ **Technical parameters**

Measure range: 0-14pH

Temperature range: 0-130°C

Temperature compensation: Pt100/Pt1000/NTC10K

Connector: K2, VP, etc.

Zero potential point: 7 ± 0.25 pH

Conversion coefficient: > 98%

Membrane resistance: <250MΩ

Practical response time: < 1 min

Salt bridge: special porous ceramic core

Pressure resistance: up to 1 Bar at 25 °C

Thread Connection: PG13.5

▪ **Application**

In pure water and high purity water as well as complex chemical processes.



SUP-pH5011

▪ **Technical parameters**

Measure range: 0--14 pH

Temperature range: 0-60°C

Temperature compensation: Pt100/Pt1000/NTC10K

Zero potential point: 7 ± 0.25

Conversion coefficient: $\geq 95\%$

Membrane resistance: <500Ω

Practical response time: < 1 min

Reference: Ag/AgCl

Pressure resistance: 4 bar at 25 °C

Thread Connection: 3/4NPT

Material: PPS/PC

▪ **Application**

Suitable for general industrial waste water and discharge solutions



SUP-pH5041

▪ **Technical parameters**

Measure range: 0--14 pH
Temperature range: 0~90℃
Temperature compensation: Pt100/Pt1000/NTC10K
Zero potential point: 7 ± 0.25
Conversion coefficient: $\geq 95\%$
Membrane resistance: $< 500\Omega$
Practical response time: < 1 min
Reference: Ag/AgCl
Pressure resistance: 1 bar at 25 ℃
Thread Connection: PG13.5

▪ **Application**

Suitable for pH measurement of industrial field solutions with relatively poor working conditions and corrosive plastics.



SUP-pH5013A

▪ **Technical parameters**

Measure range: 0-14pH
Temperature range: 0~60℃
Temperature compensation: Pt100/Pt1000/NTC10K
Zero potential point: 7 ± 0.25
Conversion coefficient: $\geq 95\%$
Membrane resistance: $< 500\Omega$
Practical response time: < 1 min
Reference: Ag/AgCl
Pressure resistance: 4 bar at 25 ℃
Thread Connection: 3/4NPT
Material: PTFE

▪ **Application**

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.



PTFE pH sheath



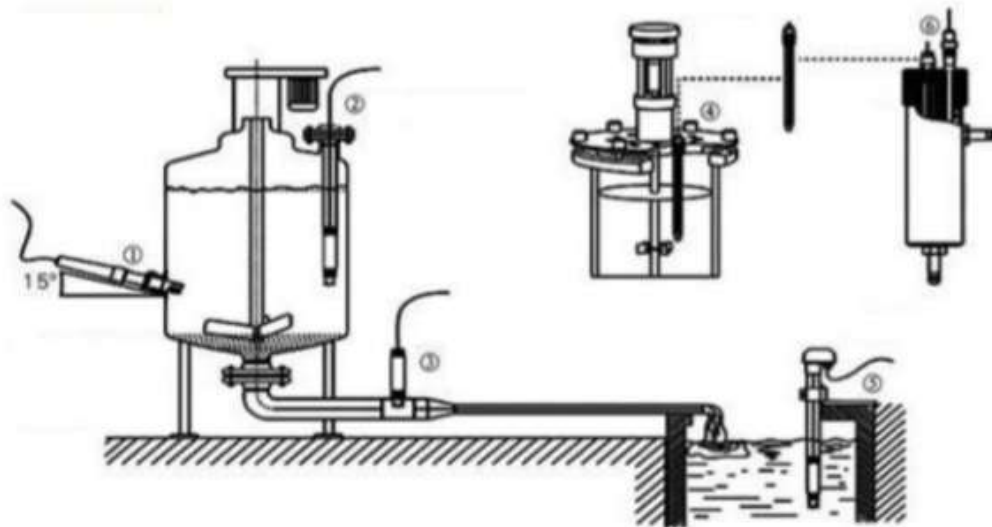
Stainless steel pH sheath



Flow cup



Electronic controlled box



Schematic diagram of common installation method

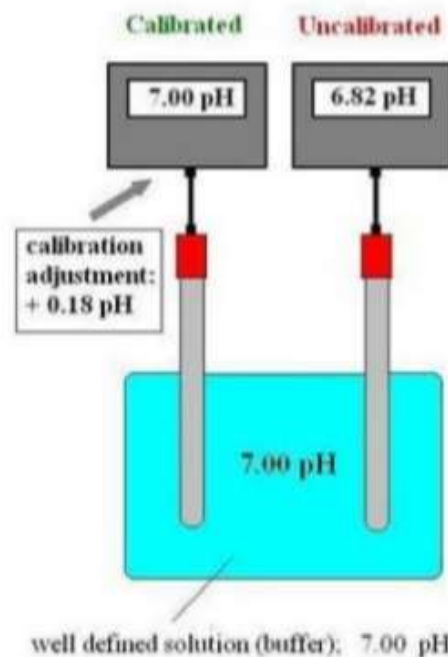
- ① Side wall installation
- ② Flange mounted at the top
- ③ Pipe installation
- ④ Top installation
- ⑤ Submersible installation
- ⑥ Flow-through installation

The interface must be in 15° oblique angle, or it will affect the normal test and use of the electrode. We won't be responsible for any results due to this.

A pH calibration is the procedure of adjusting the pH meter by measuring solutions of known pH values.

The characteristic of a pH electrode will change with time due to electrode coating and aging. And even a pH electrode would be stable over time, pH electrodes cannot be produced with identical characteristics.

In practice the response of a real pH sensor does not exactly follow the Nernst equation. This difference between the theoretical and actual behavior of a pH electrode must be compensated for. A calibration is required to match the pH meter to the current characteristics of the used pH sensor.



To achieve the best possible accuracy, the calibration should cover the range of the desired measurement values. If the readings go beyond the calibrated range, the pH meter assumes linearity and simply extrapolates the value to be displayed. The true value may be slightly different.

More advanced pH meters will let the user calibrate at three, four or five and even higher numbers of pH values. A multi-point calibration mean, in comparison to a two-point calibration, that you can calibrate your pH tester on both sides of the zero point (pH 7.00). This will expand your pH measurement range without the need of recalibrating.

Example) Three-point calibration at pH 4.00 , 7.0 and 9.21.

