Datasheet

pH Glass Electrode

SUP-ASP2065

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Datasheet

pH Glass Electrode
SUP-ASP2065

A pH glass electrode is a combination electrode composed of a glass indicator electrode and a silver/silver chloride (Ag/AgCl) reference electrode integrated into a single sensor. It is widely used as a pH sensing element for measuring the pH value of aqueous solutions.

Applications

- Drinking water
- Surface water
- Nickel-containing Wastewater
- Chromium-containing Wastewater
- Other aqueous solutions

Principle

A pH electrode is an electrochemical sensor used to measure the acidity or alkalinity (pH value) of a solution. Its fundamental principle is based on electrochemical measurement, whereby the pH value is indirectly determined by detecting the activity of hydrogen ions (H^+) in the solution.
The pH electrode consists of a measuring electrode (glass electrode) and a reference electrode, which are typically integrated into a single combination electrode.

Measuring electrode (glass electrode):
The sensing tip is made of a special pH-sensitive glass membrane (e.g., lithium glass) that is selectively permeable to H^+ ions. When the glass membrane is immersed in a solution, a hydrated gel layer forms on its surface. Exchange of H^+ ions between the solution and the glass membrane generates a potential difference across the membrane.

Reference electrode:
Provides a stable reference potential, typically based on an Ag/AgCl reference system. The reference electrode is filled with saturated potassium chloride (KCl) solution and isolated from the measured solution by a porous ceramic junction, ensuring that the reference potential remains unaffected by changes in the sample composition.

According to the Nernst equation, the electrode potential (E) is related to the hydrogen ion activity (a_{H^+}) in the solution as follows:

$$E = E_0 + (2.303RT / F) \times \log(a_{H^+})$$

Where:

E_0 = constant potential

R = gas constant

T = absolute temperature (K)

F = Faraday constant

Since pH is defined as $pH = -\log(a_{H^+})$, the measured potential difference between the measuring electrode and the reference electrode is linearly proportional to the pH value. By measuring this potential difference, the pH value of the solution can be accurately calculated.

Parameters	
Measured Variables	pH Range
Measuring Range	（0~14）pH
Accuracy	0.1 pH
Zero Potential pH Value	（7 ± 0.1）pH
Temperature Range	（0~90）℃
Temperature Accuracy	0.5℃
Temperature Sensor	Pt1000 / Pt100 / NTC 2.252K / NTC 10K / NTC 22K / NTC 30K
Maximum Pressure	0.3Pa
Membrane Impedance	＜350MΩ
Reference System	Ag/AgClKCl
Electrolyte	Gel Electrolyte
Liquid Junction	Pin-Type Ceramic Junction
Electrode Shaft Material	Glass

Wiring

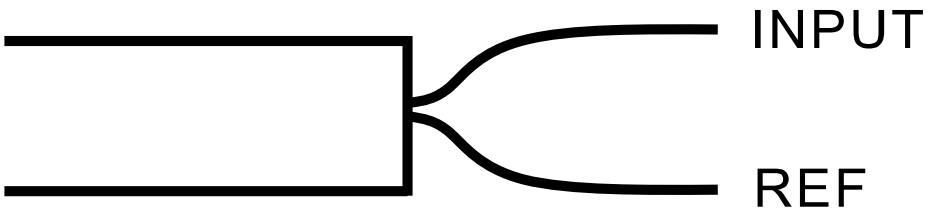

Figure 1 Electrode Cable without Temperature Compensation

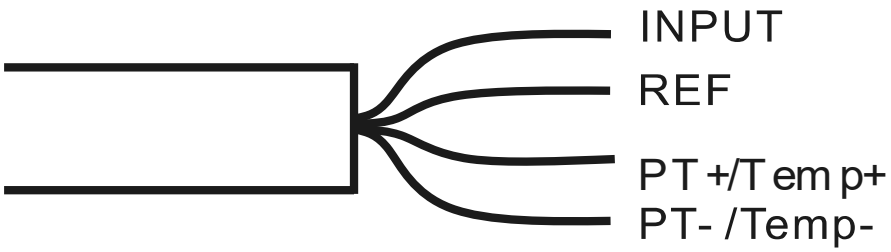

Figure 2 Electrode Cable with Temperature Compensation

Dimension

Ordering Code

SUP-ASP2065 -HZ-ZY-A-G-0-05-SP								Description
SUP-ASP2065	-	-	-	-	-	-	-	
Measuring Range	HZ							（2-12）pH
	HW							（0-14）pH
Electrode Connector		ZY						Direct Lead Wire
		XX						Others
Salt Bridge Type			A					Single-Point Ceramic Junction
			H					PTFE Salt Bridge Junction
Sealing O-Ring Material				G				Silicone Rubber
Temperature Compensation Type					0			None
					1			NTC 10K
					3			NTC 30K
					4			PT1000
					5			PT100
					2			NTC 22K
Cable Length						05		5m
						10		10m
						15		15m
						20		20m
						30		30m
						XX		Others
Housing Material and Process Connection							SP	Glass, PG13.5