Supmea

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Supmea Automation Co.,Ltd.

User's Manual

Supmea

PH Electrodes

Foreword

Thanks for buying our products!

This Manual is an instruction book for the functions, settings, wiring methods, operation methods and fault handling methods, etc. of the instrument. Please read it carefully before operation for correct use.

After reading it, please preserve it in a suitable place where it is convenient to browse at any time for reference in operation.

Note

The contents of this Manual may be changed due to functional upgrading without notice.

We strive to ensure that the contents of this Manual are correct. If you find anything incorrect, please contact us.

Edition

U-JPH-MYEN2 Second edition May 2019

Packaging contents

Please confirm the product and information after unpacking. Please contact us if the product is wrong, or the quantity is incorrect or the appearance is damaged.

Product list

Table 1

S/N	Item Name	Qty
1	Industrial online pH electrode	1 set
2	Instruction Book	1 pc
3	Certificate of Compliance	1 copy

Description of symbols

Table 2

Symbol	Name	Meaning
	Danger	Serious personal injuries, instrument damage or major property losses and other accidents will be caused if proper preventive measures are not taken.
	Warning	Remind you to pay special attention to important information about products or special parts of this manual.

Contents

1 Brief Introduction

The principle of pH electrode 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 electrode, 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 electrode is transmitted to the pH controller, and the corresponding algorithm is transmitted to display the pH value.

2 Precautions

（1）The conventional lead wire of the electrode is a 2-core or 4-core shielded wire. Customers are forbidden to cut or connect lead wires privately; otherwise, we are not liable for the consequences.

（2）It shall avoid soaking in distilled water or protein solutions for a long time and prevent contact with silicone oil.

（3）When the electrode is used for a long time, its glass film may become transparent or be attached with sediment. At this time, it can be washed with dilute hydrochloric acid and flushed with water.

（4）When you still can not carry out the correction program and normal measurement after you maintain the electrode, it indicates that the electrode has been unable to restore response, and you should replace the electrode.

（5）The pH electrode wire is not waterproof, so it shall be avoided to be contact with water as far as possible.

（6）The service life of electrodes is one year of normal use, which will be shortened because of bad environment or improper maintenance.

3 Maintenance

（1）An appropriate amount of 3.3 mol/LKCL solution is contained in the protective cover at the front part of the electrode, in which the electrode head is immersed so as to maintain the activation of the sensitive membrane and the liquid junction.

（2）When the electrode is used, the front transparent protective cover needs to be removed, and the glass bubble and the liquid junction be immersed in the solution for use.

（3）Before installation, make sure to use Thread seal tape (at 3/4 threads) for waterproofing and sealing to avoid water into the pH electrode, resulting in short circuit of the pH electrode cable.

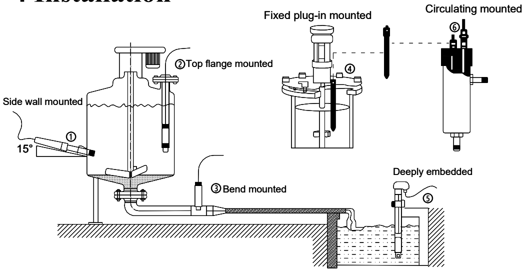
（4）When measuring, it shall be washed in distilled water (or deionized water) and dried with filter paper to prevent impurities from entering the measured liquid. The electrode sensitive membrane and the liquid junction shall be completely immersed in the measured liquid.

（5）Check whether the connecting terminal is dry. If there is contamination, please wipe it with anhydrous alcohol and blow dry it for use.

（6）It is suggested that users clean the sensitive membrane and liquid junction in front of the electrode periodically and coordinate with the instrument correction regularly.

（7）When the electrode is not used, it shall be washed and inserted into the protective cover with saturated KCl solution.

4 Installation



The interface must be at anangle of 15 degrees, otherwiseit will affect the normal test anduse of the electrode, and we arenot responsible for the consequences.

Fig. 1

5 Calibration

（1）It is recommended to calibrate the electrode 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 electrode 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 electrode, it shall be noted that the electrode can not be placed flat, but shall be placed vertically (please put the electrode sensitive membrane downward) to prevent deviation of the electrode mV data.

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

6 Signal Parameters

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:

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

7 Parameters

7.1 PH-5014

The PH-5014 electrode consists of a pressure-resistant hemispherical pH-sensitive membrane, an intermediate dielectric composed of complex gum GMT, an Ag/AgCL/KCL external reference system, and an OPEN liquid junction without salt bridge, which is widely used in pure water and high purity water as well as complex chemical processes.

Fig. 2

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

Measurement range: 0--14 pH

Salt bridge: OPEN salt bridge without liquid junction

Temperature compensation ：Pt100/Pt1000/NTC10K

Temperature: 0--130℃

Thread Connection: PG13.5

Pressure resistance: 0 ~ 6 Bar at 0 ~ 100℃; ≥ 10 Bar at 25 ℃

7.2 PH-5015

PH-5015 electrode 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 wastewater treatment.

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 core; porous Teflon

Temperature compensation ：Pt100/Pt1000/NTC10K

Temperature: 0--130℃

Pressure resistance: up to 6 Bar at 25 ℃

Thread Connection: PG13.5

Fig. 3

7.3 PH-5016

The PH-5016 electrode can withstand high temperature above 150 ℃and can withstand strong acid and alkali corrosion, which is widely used 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.

Zero potential point: 7 ± 0.5 pH

Conversion coefficient: > 98%

Membrane resistance: <250MΩ

Practical response time: < 1 min

Measurement range: 0--14 pH

Salt bridge: salt bridge porous Teflon

Temperature compensation ：Pt100/Pt1000/NTC10K

Temperature:

0--80℃ for general cables

＞100℃for high temperature cable

(or cable not immersed in solution)

Fig. 4

Pressure resistance: 1 ~ 6 Bar at 25 ℃

Thread Connection: 3/4NPT

7.4 PH-5017

The PH-5017 electrode 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 electrode 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, etc.

Zero potential point: 7 ± 0.25 pH

Conversion coefficient: > 98%

Membrane resistance: <600MΩ

Practical response time: < 1 min

Measurement range: 0--14 pH

Temperature compensation ：Pt100/Pt1000/NTC10K

Temperature: 0—130℃

Pressure resistance: up to 6 Bar at 25 ℃

Thread Connection: PG13.5

Fig. 5

7.5 PH-5018

The PH-5018 electrode 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, papermaking, paper pulp, textiles, petrochemical industry and semiconductor electronic industry as well as fields such as wastewater treatment.

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 core/ porous Teflon

Temperature compensation ：Pt100/Pt1000/NTC10K

Temperature: 0--100℃

Pressure resistance: up to 4 Bar at 25 ℃

Thread Connection: PG13.5

Fig. 6

7.6 PH-5019

The PH-5019 electrode consists of a pH-sensitive membrane, double-junction reference GPT medium electrolyte, and a porous large-area Teflon salt bridge. The plastic case of the electrode 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 wastewater treatment and fields including mining and smelting, papermaking, paper pulp, textiles, petrochemical industry, process of semiconductor electronic industry and downstream engineering of biotechnology.

Zero potential point: 7 ± 0.5 pH

Conversion coefficient: > 98%

Membrane resistance: <250MΩ

Practical response time: < 1 min

Measurement range: 0--14 pH

Salt bridge: Porous Teflon

Temperature compensation ： 10 KΩ/2.252KΩ/Pt100/Pt1000

Temperature: 0--60℃ for general cables

Fig. 7

Pressure resistance: 1 ~ 3 Bar at 25 ℃

Thread Connection: 3/4NPT

7.7 PH-5100

PH-5100 electrode is made of pH-sensitive glass film resistant to hydrofluoric acid and can be applied to the determination of the pH value in water containing hydrofluoric acid. It is widely used 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.

Connector: K2, VP, etc.

Zero potential point: 7 ±0.25 pH

Conversion coefficient: > 98%

Membrane resistance: <250MΩ

Practical response time: < 1 min

Measurement range: 0--14 pH

Salt bridge: special porous ceramic core

Temperature compensation ：Pt100/Pt1000/NTC10K

Temperature: 0--130 ℃

Pressure resistance: up to 1 Bar at 25 ℃

Thread Connection: PG13.5

Fig. 8

7.8 PH-5011

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

Fig. 9

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

Temperature: 0~60℃

Reference: Ag/AgCl

Pressure resistance: 4 bar at 25 ℃

Thread Connection: 3/4NPT

Material: PPS/PC

7.9 PH-5041

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

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

Temperature: 0~90℃

Reference: Ag/AgCl

Pressure resistance: 1 bar at 25 ℃

Thread Connection: PG13.5

Fig. 10

7.10 PH-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 linearity.

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

Temperature: 0~60℃

Reference: Ag/AgCl

Pressure resistance: 4 bar at 25 ℃

Thread Connection: 3/4NPT

Material: PTFE

Fig. 11