APURE Water Quality Analysis

PHK-202 Online PH Sensor

User Manual

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Catalog

1. Equipment Application Environment

For acid / alkali / salt solution, chemical reaction process, industrial production process, to meet the majority of industrial applications on-line PH measurement of the harsh requirements.

- Signal output: RS485 (Modbus / RTU protocol).
- Easy to connect to PLC, DCS, industrial control computer, general controller, paperless recording instrument or touch screen and other third party equipment.
- Dual high impedance differential amplifier, strong anti-interference, fast response.
- Patented pH probe, the internal reference solution at least 100KPa (1Bar) pressure, very slowly from the porous salt bridge exudation, the positive osmosis for more than 20 months. Such a reference system is very stable, the electrode life than ordinary industrial electrodes multiply.
- Easy to install: 3/4-inch NPT thread (pipe thread), easy to install in the pipeline and tank. The probe and display section can be separated and connected by accurate.
- IP68 degree of protection.

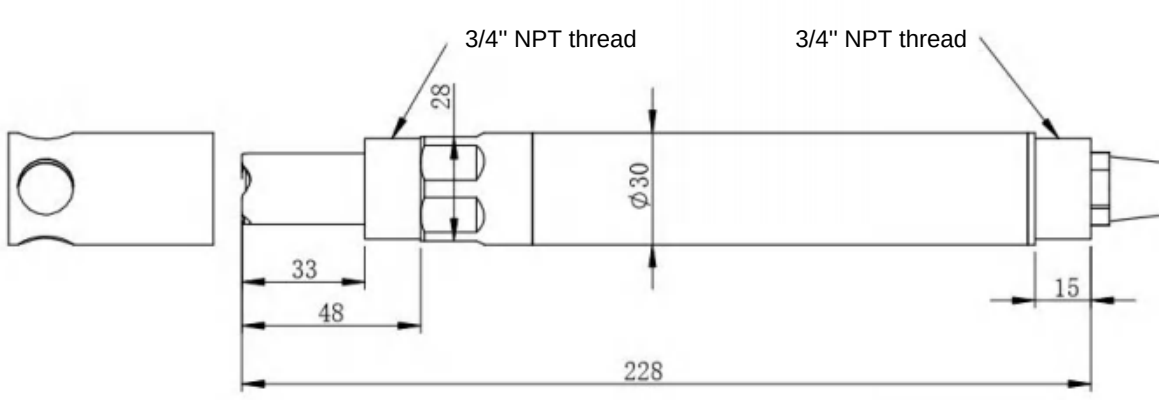
2. Technical Parameters, Functions, Specifications

2.1. Technical Parameters

Model	PHK-202
Measurement Range	0～14pH
Resolution	0.01pH
Accuracy	±0.01pH
Operating temperature	0～65℃
Working pressure	＜0.2MPa
Temperature compensation	Automatic temperature compensation (PT1000)

Power Supply	12VDC～24VDC ±10%
Output Mode	RS485(Modbus/RTU)/4-20mA
Wetted material	PPR
Installation Method	3/4 "NPT thread, immersion mounting
Cable Length	5m, other length can be customized
Calibration method	Two-point calibration
Enclosure Rating	IP68

2.2. Dimension



2.3. Data Communication

2.3.1. Data format

Default data format: 9600,N, 8, 1 (baud rate 9600 bps, 1 start bit, 8 data bits, no parity, 1 stop bit).

The baud rate can be customized.

2.3.2. Message frame format

a) Data read instruction

06	03	xx xx	xx xx	xx xx
Device	Function code	Register address	Register count	CRC code (low byte first)

b) Data read response

06	03	xx	xx……xx	xx xx
Device	Function code	Data bytes count	Data bytes	CRC code (low byte first)

c) Data write instruction

06	06	xx xx	xx xx	xx xx
Device	Function code	Register address	Data to write	CRC code (low byte first)

d) Data write response(same with data write instruction)

06	06	xx xx	xx xx	xx xx
Device	Function code	Register address	Data to write	CRC code (low byte first)

2.3.3. Register address

Register address	Name	Instruction	Number of registers	Access method
40001 (0x0000)	Measured value + temperature	4 double-byte integers, which are PH value, PH value decimal digits, temperature value, temperature value decimal digits.	4（8 bytes）	Read
44097 (0x1000)	Zero calibration	In the standard solution PH 6.86 in the calibration data iswritten to zero.	1（2 bytes）	Write

44099 (0x1002)	Slope calibration (4PH)	Calibrate with a standard pH of 4.00 and write data to zero.	1（2 bytes）	Write
44101 (0x1004)	Slope calibration (9PH)	Calibrate with a standard pH of 9.18 and write data to zero.	1（2 bytes）	Write
44103 (0x1006)	Zero calibration value	Returns the zero calibration value.	1（2 bytes）	Read
44105 (0x1008)	Slope calibration value	The slope calibration value is multiplied by 1000.	1（2 bytes）	Read
48195 (0x2002)	Device address	Default address is 6, data range is 1-64.	1（2 bytes）	Write/ Read
48225 (0x2020)	factory reset	Restore calibration values to factory settings, write data to 0.	1（2 bytes）	Write

Note：

a) The register address defined here is the register address with the type of the register.

(The actual register address is represented in the bracket).

b) When address of the device is changed, the response to the data write instruction

would contain the new changed address.

c) The data definition of the read response value:

XX XX	XX XX	XX XX	XX XX
2 bytes test value	2 bytes decimal digits*	2 bytes temp value	2 bytes decimal digits

The default data type is double-byte integer (high byte first), other data format such as floating point type is optional.

2.3.4. Command sample

a) set the device address

Function: setting the Modbus device address of the sensor meter;

Change the device address 06 to 01, and the example is as follows:

Request frame：06 06 20 02 00 01 E3 BD

Response frame：01 06 20 02 00 01 E2 0A

b) read data instruction

Function: Obtain the pH and temperature of the measuring probe; the pH unit is pH; the unit of temperature is Celsius.

Request frame：06 03 00 00 00 04 45 BE；

Response frame：06 03 08 00 62 00 02 01 01 00 01 24 59

Reading sample:

pH	Temperature
00 62 00 02	01 01 00 01

Such as:

pH: 00 62 hexadecimal reading pH, 00 02 PH value with 2 decimal places;

Temperature value: 01 01 indicates the hexadecimal reading temperature value, 00 01 indicates the temperature value with 1 decimal place.

c) calibration instruction

Zero calibration:

Function: Set the zero calibration value of the electrode, the zero value to 6.86PH standard solution for the calibration standard, an example see below;

Request frame：06 06 10 00 00 00 8C BD

Response frame：06 06 10 00 00 00 8C BD

Slope calibration：

Function: Set the electrode pH slope calibration value; Slope calibration is divided into high and low point calibration, the measured alkaline solution is calibrated at the high point; measured acid solution at the low point calibration, where the standard solution height Point 9.18pH, the standard low 4.00pH reference for the calibration, examples are as follows:

High standard solution 9.18pH Calibration:

Request frame：06 06 10 04 00 00 CD 7C

Response frame：06 06 10 04 00 00 CD 7C

Low Standard 4.00 pH Calibration:

Request frame：06 06 10 02 00 00 2D 7D

Response frame：06 06 10 02 00 00 2D 7D

2.3.5. Error response

If the sensor does not correctly execute the host command, it will return the following format information:

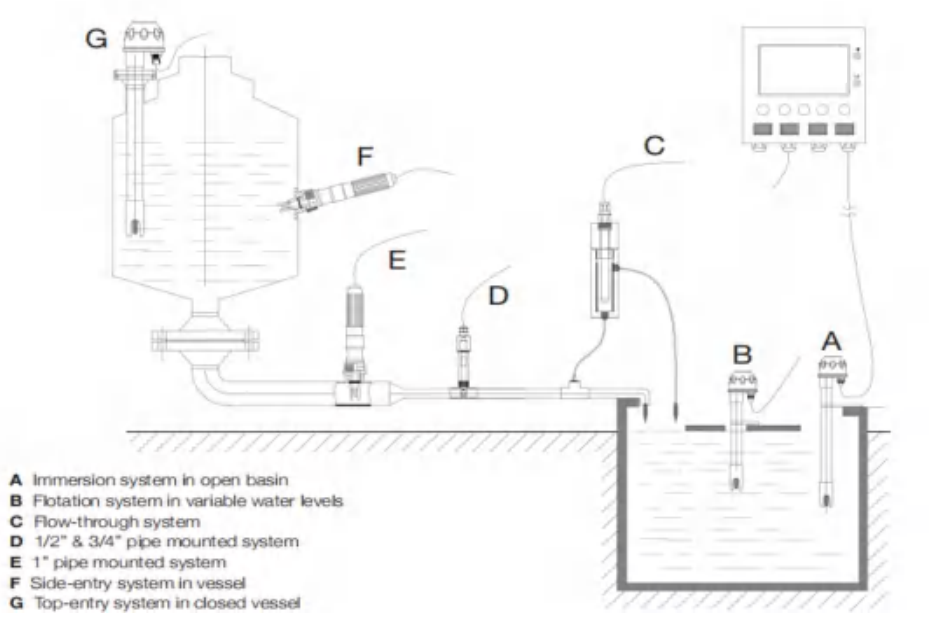
definition	address	Function code	CODE	CRC check
data	ADDR	COM+80H	xx	CRC 16
Number of bytes	1	1	1	2

a) CODE: 01 – Function code error

03 – Data is wrong

b) COM: The received function code

2.4. Installation



2.5. Wiring

2.5.1. Cable information

The cable defined as：

a) red line - power cord (12 ~ 24V)

b) black line - ground wire (GND)

c) blue line - 485A

d) white line - 485B

e) bare wire - shielded wire f) yellow line - 4-20mA

2.5.2. Cable specifications

Taking into account the cable long-term immersion in water (including water) or exposed to air, the cable has a certain ability to prevent corrosion. The cable outer diameter of 6 mm, all the interfaces are required to do waterproof processing.

2.6. Quality Assurance

The company provides sales from the date of the play within one year of the machine warranty, but do not cover damage caused by improper use. If you need to repair or adjustment, please return, but the freight to be conceited, sent back to determine the fine packing to avoid damage during transport, the company will repair it free of charge damage to the instrument.

2.7. Parts And Spare Parts

This product includes:

- Transmitter
- Electrolyte 3 packs
- Specification
- certificate

2.8. PH electrode maintenance

PH electrode in the measurement, you should first in distilled water (or deionized water) clean and dry with a filter paper to prevent impurities into the measured liquid, the electrode should be inserted into the measured solution.

The electrode should be cleaned when not in use, insert the protective sleeve with 3.5mol / L potassium chloride solution, or insert the electrode into the container with 3.5mol / L potassium chloride solution.

Check the terminal is dry, if contaminated, please use anhydrous alcohol wipe, dry after use. Avoid prolonged immersion in distilled water or protein solutions and from contact with silicone grease. The longer the electrode, its glass film may become translucent or with sediment, this time with dilute hydrochloric acid wash, and rinse with water. Electrode used for a long time, there is a measurement error, the calibration must be carried out with the instrument calibration.

If the electrode can not be calibrated and measured when the electrode is maintained and maintained in the above manner, the electrode has failed. Replace the electrode.

Standard Buffer pH Reference Table

TEMP℃	4.00	4.01	6.86	7.00	9.18	10.01
0	4.00	4.00	6.98	7.12	9.46	10.32
5	4.00	4.00	6.95	7.09	9.39	10.25
10	4.00	4.00	6.92	7.06	9.33	10.18
15	4.00	4.00	6.90	7.04	9.28	10.12
20	4.00	4.00	6.88	7.02	9.23	10.06
25	4.00	4.01	6.86	7.00	9.18	10.01
30	4.01	4.02	6.85	6.99	9.14	9.97
35	4.02	4.02	6.84	6.98	9.17	9.93
40	4.03	4.04	6.84	6.97	9.07	9.89
45	4.04	4.05	6.83	6.97	9.04	9.86
50	4.06	4.06	6.83	6.97	9.02	9.83

The actual value of the instrument and the standard sometimes ± 1 word error

2.9. After-sales Service Commitment

- Supplier quality inspection departments should establish standard inspection procedures have advanced and perfect testing equipment and tools, and strictly in accordance with the rules for the inspection, to the product do 72 hours aging test, stability test, do not let a substandard products factory.

- The consignee of the failure rate of 2% batches of products directly to all costs incurred by the supplier's account. Consider the standard reference supplier to provide product description. The consignee require the supplier to ensure supply quantity, delivery speed.