NH4 On-line Ammonia Nitrogen Transmitter User Manual

Catalog

1. Equipment Application Environment

NHN-202 ammonia transmitter is an ammonium ion selective electrode of PVC film, which is used to test the content of ammonium in water. To be fast, simple, accurate and economical. In this manual, the communication protocol, electrode preparation, operation calibration, and so on are introduced in detail.

- Signal output： RS485（ Modbus/RTU agreement）。
- Easy to connect to the PLC, DCS, industrial control computer, universal controller, paperless recording instrument or a touch screen and three party equipment.
- The high impedance differential amplifier, strong anti-interference, fast response speed.
- The ammonium ion probe - patent, internal reference solution at least 100KPa (1Bar) under the pressure of extremely slow from micropore salt bridge in exudation, the positive effusion for 20 months or more. The reference system is very stable and the electrode life is longer than that of the common industrial electrode.
- Easy to install: 3/4 inch NPT thread (pipe thread), easy to install in the pipeline and tank. The probe and the display part can be separated and connected by a cable.
- The degree of protection IP68.

2. Technical Parameters, Functions, Specifications

2.1. The technical parameters

Model	NHN-202
Measurement Range	0～1000mg/l
PH Range	4～10pH
Resolution	0.1mg/l
Accuracy	±5%F.S
Working Temperature	0～50℃
Working pressure	＜0.1MPa
Temperature Compensation	Automatic Temperature Compensation (PT100)
Power Supply	12～24VDC ±10%
Signal Output	RS485(Modbus/RTU)
Liquid Material	PVC 或 POM
Mounting	3/4" NPT thread ， immersion

	installation
Cable Length	5m ， Other lengths can be customized
Calibration methods	Two-point calibration
Protection class	IP68

2.2. Communication protocol

2.2.1. The technical parameters

Modbus communication default data format: 9600, n, 8,1 (baud rate 9600bps, 1 start bit, 8 data bits, no parity, 1 stop bit). Baud rate and other parameters can be customized.

2.2.2. Data communication

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	03	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	03	xx xx	xx xx	xx xx
Device	Function code	Register address	Data to write	CRC code (low byte first)

2.2.3. Register address

Register address	Name	Instruction	Number of registers	Access method
40001 (0x0000)	DO value and temperature	4 double-byte integers, which are DO value, DO value decimal digits, temperature value, temperature value decimal digits.	4（8 bytes）	Read
44097 (0x1000)	Zero calibration	Calibration in deionized water, the write data is 0.	1（2 bytes）	Write
44101 (0x1004)	Slope calibration	In the full-scale calibration standard solution, data is written 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.

2.2.4.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：

Role: Get the measuring probe and temperature ammonia; ammonia units of mg / l; temperatures are in degrees 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：

Ammonia value	Temperature value
00 62 00 02	01 01 00 01

Such as:
Ammonia Value: 0062 represents a hexadecimal value reading ammonia, ammonia 0002 represents the value with two decimal places;
Temperature: 01 01 temperature readings indicate a hexadecimal value 0001 represents the temperature value with a decimal.

c) the calibration instructions:

Zero calibration. Role: Set ammonia electrode zero point calibration, the zero point value with deionized water as the calibration standard, see example below:

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

Slope calibration. Role: Set ammonia electrode calibration slope value; slope calibration carried out in a full-scale solution, for example:

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

2.2.5.Error response

If the sensor meter could not recognize the data received correctly, it will return the following information:

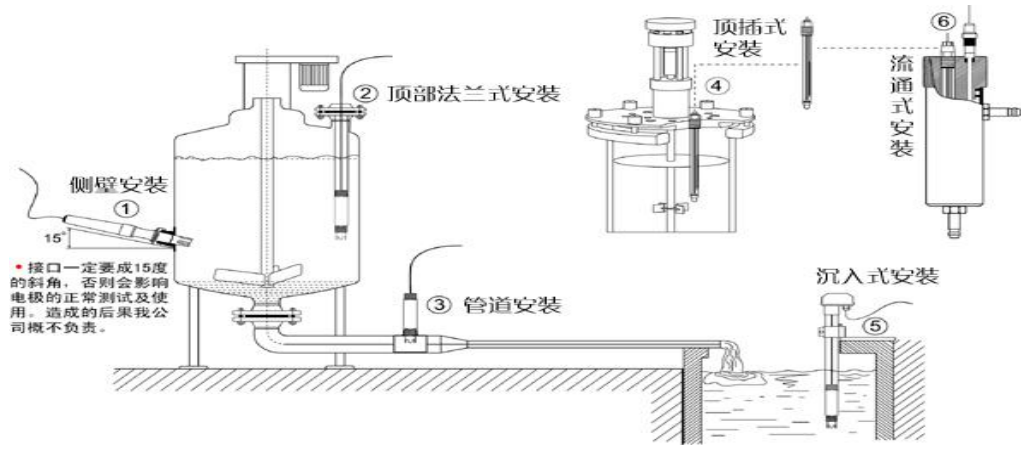
Definition	Address	Function code	CODE	CRC check
Data	ADDR	COM+80H	xx	CRC 16
Number of bytes	1	1	1	2

a) CODE: 01 – Functional code error

03 – Data error

b) COM: Received function code

2.3. Installation



2.4. Wiring

2.4.1. 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

2.5. 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
- Specification
- Certificate
- 1000ppm sodium standard solution 1 ounce
- reference electrode filling solution 1 ounce

2.8. Ammonium ion electrode maintenance

Rinse the electrode with distilled water (or deionized water), blotted dry. Do not dry. Electrodes placed on the electrode holder. Before use, the electrode tip immersed in distilled water (or deionized water) for 10 minutes, and then immersed in a dilute solution of ammonium ion in two hours.

To keep dry before using the electrode, the electrode sensing element should be set into the protection of the bottle. Before the test, the electrode can be diluted in a standard solution of an ammonium ion (e.g., 1mg / l) soaking. If stored overnight or longer, then the application electrode head deionized water and wipe dry, then put in the original packaging.

Check at the terminals is dry, if the stain, wipe with ethanol, dry after use. Avoid long-term immersion in distilled water or a protein solution, and prevent contact with silicone grease. Use longer electrodes, it may become translucent PVC film or with sediment, this time can be distilled water (or deionized water) rinse. The electrode using a longer time, measurement error, must be compatible with the instrument calibration, correction.

When the electrodes when maintenance and repair in the above manner can not be calibrated and measured, indicating electrode has expired, replace the electrode.

The main interfering ions: the table below

At different concentrations of ammonium ions can interfere with concentration of 10% error

Interferences (moles/liter)	10-4 M Ammonium	10-3 M Ammonium	10-2 M Ammonium
H+	< 2	< 1	< 1
Li+	0.2	0.5	0.5
Na+	0.005	0.08	0.8
K+	7*10-5	6*10-4	6*10-3
Cs+	0.003	0.05	0.5
Mg3+	> 0.5	> 1	> 1
Ca2+	> 0.2	> 1	> 1
Sr2+	> 0.2	> 1	> 1
Ba2+	> 0.1	> 0.5	> 0.5
Zn2+	0.001	0.01	0.1
N2H5+	> 0.1	> 0.1	> 0.1
Bu4N+	1*10-5	1*10-4	1*10-3

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.