



# NH<sub>4</sub><sup>+</sup> Sensor

User Manual ■

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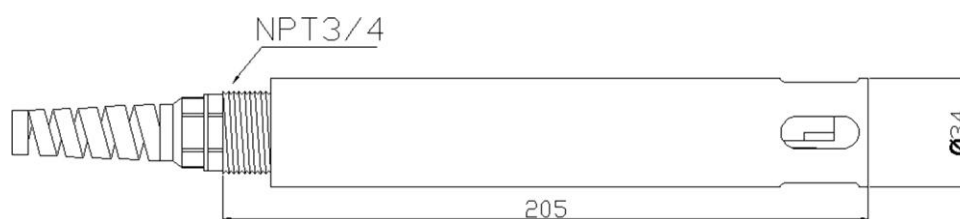
## 1. Overview

NH<sub>4</sub><sup>+</sup> sensor is an intelligent electrode, which adopts RS485 communication interface and standard Modbus protocol. With corrosion-resistant shell, it is applicable in all kinds of poor environments. The product adopts industrial online ion-selective electrode with high stability and there is no need for reagent, thus it has no secondary pollution, less maintenance and low maintenance cost. With the help of built-in PT100 temperature sensor and compensation algorithm, the accuracy can reach  $\pm 0.1\text{ }^{\circ}\text{C}$ . RS485 and standard Modbus protocol make it easy to integrate.

## 2. Performance Parameter

Working principle	Ion-selective electrode method
Measuring range	0.1~1000 mg/L
Resolution ratio	0.01 mg/L
Sensitivity	55~58 mV/pNH <sub>4</sub> @ 25℃
Accuracy	≤10% of measured value or 0.1mg/L(take the larger value)
Response time	<30s
Communication interface	RS485, standard Modbus protocol
Dimension and specification	D34mm, L205mm, cable 3 m (customizable)
Working environment	0~60℃, 0~1 bar
Working voltage	12V~24V DC

## 3. Dimension & Wiring



**Fig.3.1 Dimension diagram of NH<sub>4</sub><sup>+</sup> sensor**

There are four signal lines in total: connect brown line to 12V~24VDC; connect black line to GND; connect orange line to 485A; connect blue line to 485B. The default communication parameter setting is: ID-7, 19200, 8, None, 1.

#### 4. Maintenance

1. Storage: the NH<sub>4</sub><sup>+</sup> electrode shall be kept in dry place and please avoid scratching membrane head of the electrode.
2. Usage: in initial use, the ion-selective electrode needs to adapt to water sample for a certain time; the maximum velocity limit of water sample is 3m/s.
3. Cleaning and maintenance: if there is filth attached to membrane head, it will affect the accuracy of measurement. Use clean water to flush it. Chemical reagent is not allowed. The membrane head can be replaced. Generally, the service life is one year or above. When sensitivity of electrode reduces, please replace the membrane head.

#### 5. Communication Protocol

Item	Register address	Data	R/W	Remark
Electrode status mark	0000H	UINT	R	0-OK, 1~4 for CAL Buff
Electrode model mark	0001H	UINT	R	7-NH <sub>4</sub> N
NH <sub>4</sub> <sup>+</sup> measured value	0002H	Float	R	mg/L
Temperature measured value	0004H	Float	R	°C
pH measured value	0006H	Float	R	pH
NH <sub>4</sub> <sup>+</sup> signal value	0008H	Float	R	mV
pH signal value	000AH	Float	R	mV
NH <sub>4</sub> <sup>+</sup> offset correction value	000CH	Float	R/W	±50.00mg/L
Temperature offset correction value	000EH	Float	R/W	±10 °C
Manual temperature compensation value	0010H	Float	R/W	0~100°C only for MTC
NH <sub>4</sub> <sup>+</sup> electrode zero point	0012H	Float	R	mV
NH <sub>4</sub> <sup>+</sup> electrode slope	0014H	Float	R	%
pH electrode zero point	0016H	Float	R	mV
pH electrode slope	0018H	Float	R	%
pH offset correction value	001AH	Float	R/W	±5.00
Command register	0026H	UINT	W	21H Factory Reset

Item	Register address	Data	R/W	Remark
Digital filtering setting	0027H	UINT	R/W	1-60, Default: 5
Temperature mode	0028H	UINT	R/W	0-ATC,1-MTC
Production batch	0029H	UINT	R	1801
Electrode serial number	002AH	UINT	R	1001
Serial port address	002BH	UINT	R/W	1-31, Default: 1
Baud rate of serial port	002CH	UINT	R/W	0-9600,1-19200,2-115200
Parity bit of serial port	002DH	UINT	R/W	0-NONE,1-ODD,2-EVEN
Stop bit of serial port	002EH	UINT	R/W	0-1bit,1-2bit
Point 1 correction command	002FH	UINT	W	Command 11H-NH <sub>4</sub> N,12H-pH
Point 1 standard value	0030H	Float	R/W	Default: 1.00mg/L
Point 2 correction command	0032H	UINT	W	Command 21H-NH <sub>4</sub> N,22H-pH
Point 2 standard value	0033H	Float	R/W	Default: 10.00mg/L

**“Float” transmission adopts “Little-endian” mode, low address bit in the front while high address bit in the back.**