Y560-A Ammonium ISE Sensor

User Manual

Yosemite Technologies Ltd.

V 1.0

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Thanks for choosing Yosemite Technologies' instrument！

Please read this manual carefully before using this product, and keep this manual in safe place for future reference.

Please follow the instructions and procedures stated in this manual.

To ensure after sales warranty coverage, please follow the user instructions and maintenance procedures stated in this manual.

Any damage and lost caused by improper use of this product will not be covered by factory warranty. Please keep all documents, and if you have any questions, please do not hesitate to contact Yosemite Technologies' customer services.

Remove the instrument from package material and examine it to make sure that there is no damage occurred during shipment. If there is any damage, please contact Yosemite Technologies Customer Service immediately. Save all materials until you are sure that the instrument functions properly.

Any damage or defective items must be returned in their original packaging material.

Overview

Yosemitech NH4-N ISE sensor measures the concentration of dissolved ammonium as nitrogen (NH4-N) in water. The sensor uses pH, Ammonium Ion electrodes, and an optional potassium ion electrode to determine the NH4+-N concentration. It is designed for use in all kind of natural water, such as lakes, streams, rivers, as well as wastewater plants. The online sensor measures ammonium electron concentration without using any chemicals. With automatic wiper to clean up the electrode sensing surface and easy electrode replacement, Y560-A provides a quick, simple, and economical solution for ammonium concentration measurement.

Features

- RS-485; MODBUS protocol compatible
- No reagent, no pollutants, more economic and environmentally friendly
- Automatic compensation for $NH4^+$, pH and temperature in water
- With a self-cleaning wiper, prevent biofouling to guarantee accurate measurement

Designed use

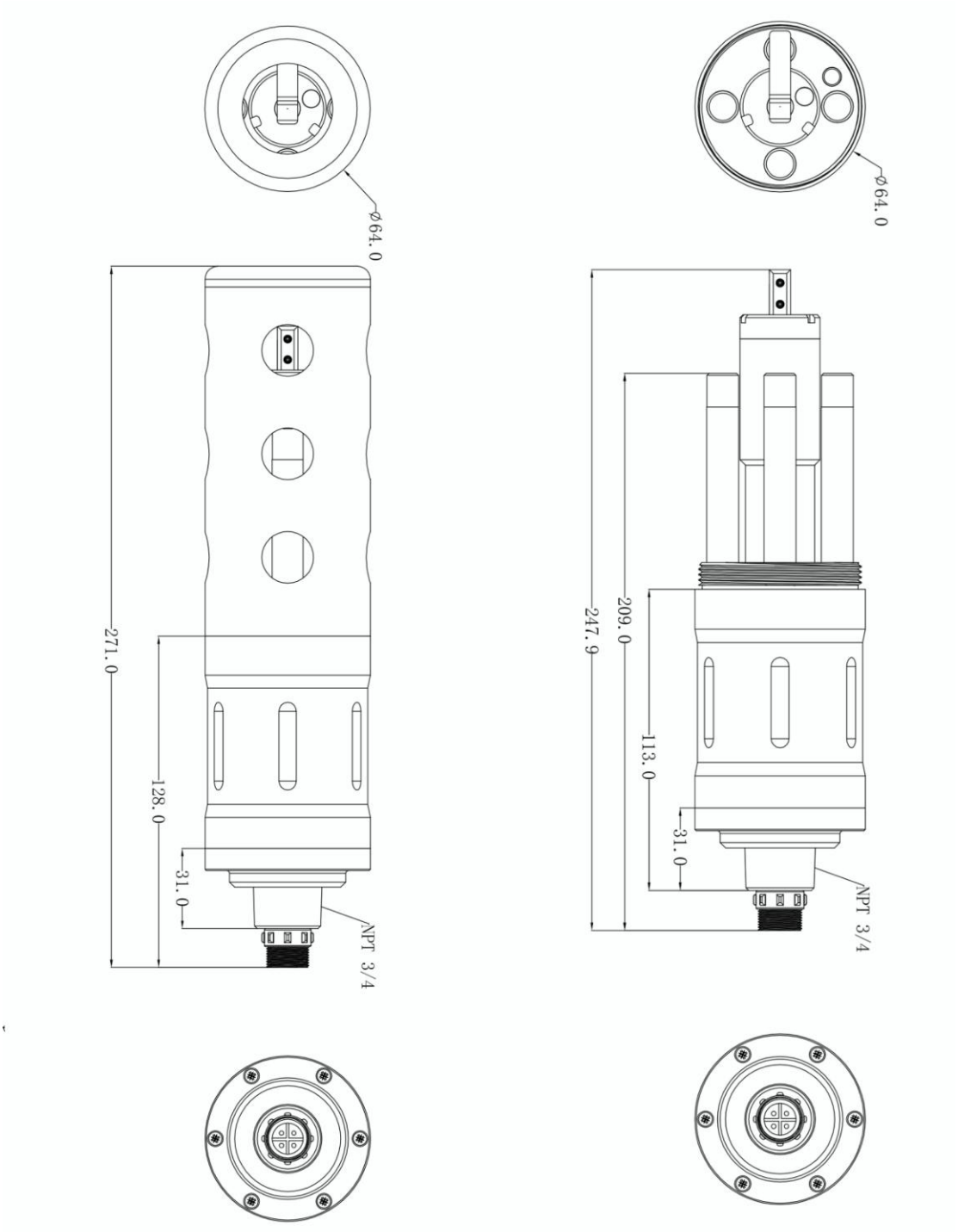
Y560-A is designed for online measuring ammonium concentration of surface water, (such as lakes, streams, rivers), municipal sewage and wastewater treatment plant sludge, as well as fish ponds.
Please note due to the sensitive membrane of the electrodes, the electrode lifetime may be affected due to the unknown composition.
Use of the sensor for any purpose other than that described, poses a threat to the measurement system and is therefore not permitted.
The manufacturer is not liable for damage caused by improper or non-designed use.

Electrodes

- The NH4+ electrode is an ion selective electrode with a pH measurement range of 4-10
- pH is a single electrode with a measurement range 0-12
- The reference electrode is a double salt bridge electrode
- Potassium ion selective electrode (to compensate ammonium)

Sensor Dimensions

64 x271 mm (Φ xL)



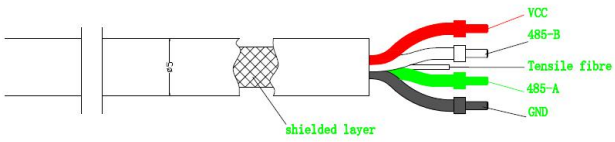
Cable Definition

1、 Power Supply Requirements

Power Supply DC 8-26V ±10%， Current <50mA

2、 Sensor Cable

4 wire AWG-24 or AWG-26 shielding wire. OD=5mm



1, Red—Power (VCC)
2, White—485 Date_B (485_B)
3, Green ---485 Date_A (485_A)
4, Black --- Ground (GND)
5, Bare wire ---- shield

Technical Specifications

Name	Parameter	
Model	Y560-A	
NH4_N Range	0-10mg/L NH4-N	0-100mg/L NH4-N
NH4_N Accuracy	±（5%+0.2mg/l)	
NH4_N Resolution	0.1 mg/L	
pH Range	4-10	
pH Accuracy	±0.1pH	
pH Resolution	0.01	
Housing IP Rating	IP68	
Deepest Depth	10m underwater	
Temperature Range	0 ~ 50℃	
Interface	Support RS-485， MODBUS protocols	
IP Rating	IP68	
Power	DC8~26VDC±10%，current<50mA	
Cable Length	10m standard, Custom length available	
Body Materials	POM	

Note
The above technical specifications are tested under standard solution in laboratory environment.

Installation

Part List

Item	Number	Note
Y560-A Sensor	1	
Cable	1	10m
Fitting adapter	1	
NH4CL solution	1	1000mgL
pH electrode buffer solution	1	20ml
reference electrode buffer solution	1	20ml
Rubber protective Cap	1	

Before use

1) Take off the protect cap: Please take off the protect cap of NH4, pH and reference electrode before installation and keep them properly for future use.

2) Cleaning and activation:

- First use DI water to wash the electrodes (DO NOT USE WIPER, IT WILL DAMAGE THE ELECTRODE SENSING FILM).
- The electrodes are all stored in buffer solution before shipping (NH4+ buffer solution is a 1ppm NH4CL solution), so the new product does not need to be activated for the first time.
- If the electrode is dried for more than 4 hours, it needs to be re-activated before use. Activation method: soak the electrode in 1ppm NH4CL solution for more than 4 hours (see standard solution preparation for details).

Sensor Installation

1) Wiring and power supply:

- The female and male connector of sensor cable should be screwed tightly to avoid moisture incursion
- Do not use the sensor cable to pull the sensor! It is required to install sensor in a secure and stable mounting bracket.
- Make sure power supply voltage is correct before power on.

2) Sensor installation:

- It is recommended to install the sensor vertically with electrodes facing down.
- Considering water level change, the sensor should be installed 30cm below water level. The sensor should not be installed no more than 2m below water surface for maintenance purpose.
- The sensor must be securely installed to avoid damage caused by water flow and other things.

Calibration

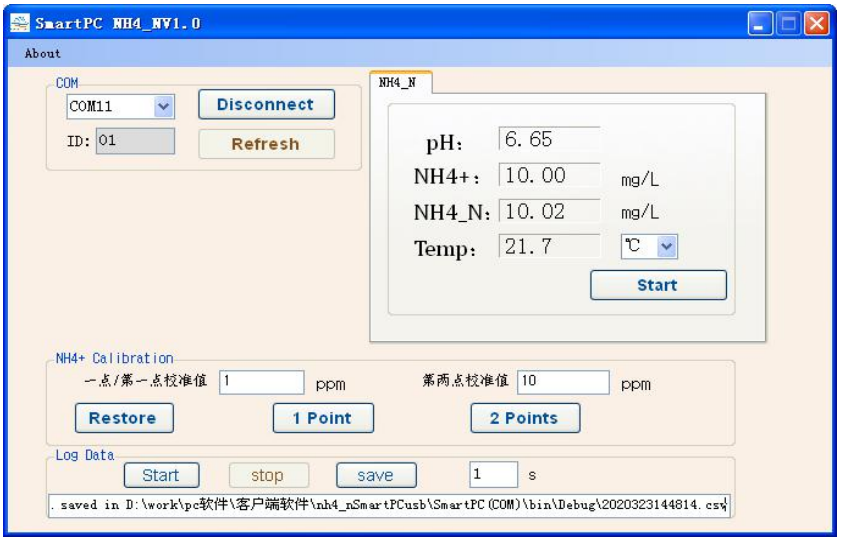
Sketch

PC tool name: SmartPC(nh4).exe. (**Please scan the QR code on the right to download the application software).**

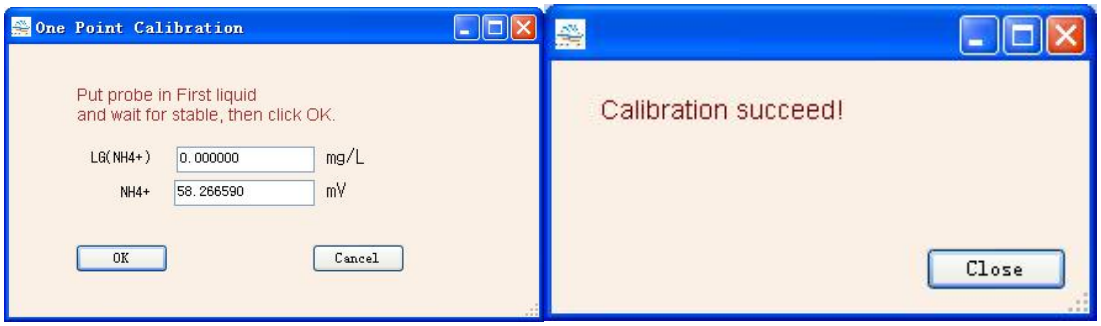
Note: If custom development is needed, please contact Yosemitech Customer Service.

The PC tool offers the NH4+ one- point and two- points calibration procedures.

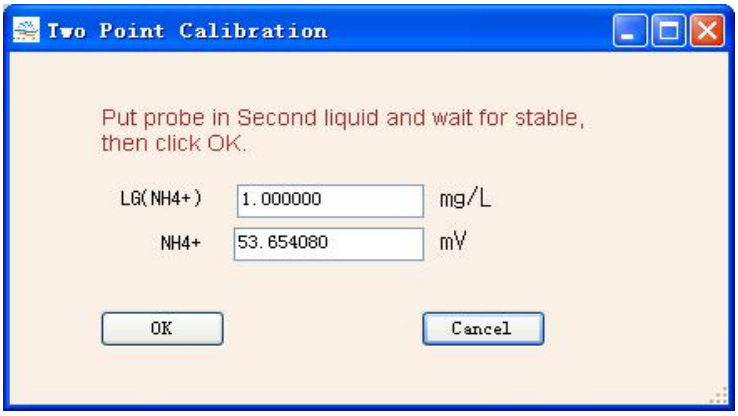
1. At first, chose COM and click “Connect” to access to measurement, calibration and logging. Click “Start” to get measurements.



2. The concentration values of standard solutions can be customized. To start one-point calibration, input the standard solution value and click “1 point”. Normally 1mg/L NH4+ is chosen for single-point calibration. Put the NH4_N sensor into the solution you choose. Wait for few minutes to stabilize the data and click “OK”.（1mg/L=1ppm）



3. Choose “2points” to enter into two-points calibration. The procedure is similar to one-point calibration. Follow the instructions to perform 1 mg/L (usually as a first point) and 10 mg/L (as a second point). We strongly recommend that the two standard solutions should have a gradient of 10 times.



The prompt "succeed" or "failed" indicates calibration result.

4. Click “Restore” to restore the factory user calibration values.
5. The measurements can be recorded. The exported document format is. CSV. The path is displayed in the bottom prompt box.

Calibration Solution Preparation

1) pH solution: The solutions 4.00, 6.86 and 9.18 can be purchased easily.

2) NH4+ solution:

- Accurately weigh 3.819g of NH4CL and transfer to a 1000 mL volumetric flask. Then fill the flask to the top graduation with DI water. Mix well to obtain a solution, which is 1000ppm NH4+ solution.
- Accurately transfer 1.0 mL of the solution prepared in the first step to a 1000 mL volumetric flask and then fills the flask to the top graduation with DI water. Mix well to obtain a solution, which is 1ppm NH4+ solution.
- Accurately transfer 10.0 mL of the solution prepared in the first step to a 1000 mL volumetric flask and then fill the flask to the top graduation with DI water. Mix well to obtain a solution, which is 10ppm NH4+ solution.
- Accurately transfer 100.0 mL of the solution prepared in the first step to a 1000 mL volumetric flask and then fill the flask to the top graduation with DI water. Mix well to obtain a solution, which is 100ppm NH4+ solution.

3) K+ solution:

- Accurately weigh 1.9067g of KCL and transfer to a 1000 mL volumetric flask. Then fill the flask to the top graduation with DI water. Mix well to obtain a solution, which is 1000ppm K+ solution.
- Accurately transfer 1.0 mL of the solution prepared in the first step to a 1000 mL volumetric flask and then fills the flask to the top graduation with DI water. Mix well to obtain a solution, which is 1ppm K+ solution.
- Accurately transfer 10.0 mL of the solution prepared in the first step to a 1000 mL volumetric flask and then fills the flask to the top graduation with DI water. Mix well to obtain a solution, which is 10ppm K+ solution.
- Accurately transfer 100.0 mL of the solution prepared in the first step to a 1000 mL volumetric flask and then fill the flask to the top graduation with DI water. Mix well to obtain a solution, which is 100ppm K+ solution.

Maintenance

Maintenance Schedule

Cleanliness is very important for maintaining accurate readings. The frequency is according to the use environment.

Environment	Maintenance frequency
Surface water	Every 30 days
Aquaculture	Every 30 days
Sewage disposal	Every 2~3 weeks
Industrial sewage (non chemical)	Every 2~3 weeks
Chemical sewage	Depends on actual conditions

Maintenance

1) Clean the sensor surface：Wash the outer surface of sensor with tap water, if there is still residue, using soft brush, for some stubborn dirt, household detergent can be added in tap water to clean.

2) Check the cable： inspect the sensor cable if there is damage.

3) Electrode Cleaning：

- Wash the outer surface of electrode with soft brush. Note that do not touch sensitive membrane of NH4+ electrode.
- Use clean water to wash the pH and reference electrode. Then gently wipe off with a lint free cloth or a soft brush.
- Do not use anything to wipe sensitive membrane of NH4+ electrode. Only rinse it with clean water (DI water is best).
- If the sensor needs calibration after cleaning, use a lint free cloth to dry the surface sensor case excluding sensitive membrane. It is recommended to dry by blowing or gently wiping with absorbent paper!
- During calibration, electrode cleaning with DI water shall be repeated for each step to avoid polluting the standard solution.

4) Store the sensor: Regular electrode maintenance requires pH and reference electrode to be stored in protected solutions which equipped with sensor. Please keep NH4+ electrode in 1ppm NH4+ solution.

Note: If the membrane is kept in a dirty or dry state for a long time, it will lead to electrode failure and is not within the warranty scope.

5) Replace the electrode:

- NH4+, reference and pH electrode are all consumable parts. Please replace them in time according to the actual situation.
- Change cleaning wiper every 3 months.
- The seal ring of cleaning wiper is guaranteed for one year. It is recommended to send it back to our company for replacement every year.

Trouble Shooting

Table 5-1 lists the symptoms, possible causes, and recommended solutions for common problems encountered with the Y560-A sensor. If your symptom is not listed, or if none of the solutions solves your problem, please contact us.

Table 5-1 Troubleshooting

ERROR	POSSIBLE CAUSE	SOLUTION
No data	Power supply error	Check the output voltage of power supply
	Connection error	Reconnect and check Modbus address
	Sensor error	Contact customer service
Inaccurate Measurement	Electrode drift	Cleaning and Re-Calibrate
Measured value is too high	Electrolyte depleted	Replace electrode and re-Calibrate
	Hardware failure	Contact customer service
Measured value is unstable	Dirty electrode	Wash the surface or contact customer service if necessary

Quality Assurance

Warranty period:
Sensor warranty period is 1 year
Electrode warranty period is 4 months (Non-chemical environment, Non industrial wastewater).

If there are defects found during the warranty period, Yosemite technologies promises to repair or replace the defective products, or return the payment of product except the charge for the first time for transport and related formalities. In the warranty period, repair or replacement of any product will only enjoy the rest of the original warranty.
After receiving feedback for the product quality problems from the customer, Yosemite technologies will confirm whether the product need repair within two weeks; It can't be returned without approval to repair the product.

This warranty does not include the following：

- Damage caused due to force majeure, natural disasters, social unrest, war (published or unpublished), terrorism, civil war or any government forced.
- Damage caused due to improper use, negligence, accident, or caused by the improper application and installation.
- Freight for the product shipped back to Yosemite technologies.
- Freight for parts or products express or express delivery within the warranty.
- Travel expense for repair in local in warranty

The quality assurance includes all content of products provided by Yosemite technologies.
It constitutes the final, complete and exclusive statement about the quality guarantee, no person or agent is authorized in the name of Yosemite technologies to develop other warranty.
As described above, the remedial measures such as repair, replacement or return the payment for product is not in violation of the warranty, and it aim at our own products only. Based on the strict liability or other legal theory, Yosemite technologies is not responsible for defects or any other damage due to careless operation, including the subsequent damage with a causal connection between these situations.

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