

Orion 8010cX Ammonia Analyzer

Why do I need to measure ammonia online?

Ammonia contaminates bodies of water and levels as low as 0.1 mg/L can have adverse effects on marine creatures. It is regulated in some countries and states to meet environmental regulation limits, such as 0.15-2 mg/L for various types of surface water bodies and 15-25 mg/L for wastewater discharge in China. The recommended limit of ammonia nitrogen by the US EPA is 17 mg total ammonia nitrogen (TAN) per liter at pH 7 and 20°C for a one-hour average duration based on acute toxicity, not to be exceeded more than once every three years on average. U.S. EPA recommends a chronic criterion magnitude of 1.9 mg TAN/L at pH 7 and 20°C for a 30-day average duration, not to be exceeded more than once every three years on average. In the US each state has a different ammonia discharge or monitoring limits based on their permits and local regulations.

In order to measure the ammonia concentration rapidly and to determine if the levels meet regulatory requirements for discharge or if part of the water treatment process needs to be optimized, data can be used to confirm compliance or the appropriate water treatment process.

What are the benefits of online measurements?

In addition to raising responsibility by comparing online measurement with the laboratory's results, the main advantage is the possibility of timely process management to ensure compliance when discharging treated water to the environment. The real-time data through online measurement can be used for compliance reporting or process diagnostics.



Thermo Scientific™ Orion™ 8010cX Online Ammonia Analyzer

Why do we measure ammonia?

Ammonia is measured in surface and wastewater applications. It is used to monitor levels of ammonia during wastewater treatment and for discharge applications to ensure regulatory compliance.

What is the principle of measurement?

Measurements are performed using the standard Salicylate/Bertholet chemistry method. This method uses a complexation reaction to form a green-colored solution. The ammonia is determined by the amount of light absorbed at a pre-selected wavelength.

Are reagents needed and how many are needed for the analyzer? What is the reagent consumption?

Yes, reagents are needed for measurement, three in total. Reagent costs are very low because the analyzer consumes 2 L of reagent over 100 days based on one analysis every two hours.

What is the measurement time interval?

The standard measurement cycle based on two successive measurements is 28 minutes (less than 15 minutes per measurement).

What is necessary for standard preventative maintenance of the analyzer? Is maintenance complicated?

Standard preventative maintenance on the ammonia analyzer is simple; consisting of weekly, monthly, and bi-monthly items for the user to perform. Any six or twelve month tasks will require a visit by a field service engineer. For details on standard maintenance, please refer to the manual.

How often is it necessary to perform the calibration of the analyzer and what is the recommended concentration of the standard?

Calibration is set up to be automatically performed every week by default to ensure accurate measurements that meet the specifications.

If you are not sure about the accuracy, we recommend a validation with a standard that is within the range of the calibration method being used. The analyzer has an auto-validation function that ensures the analyzer is providing ammonia readings within the specifications. If the validation standard result is outside the specifications, a calibration is required. There is an auto-validation process that can be run every week to check its calibration, and the analyzer will renew calibration if the validation results are out of specification.

The calibration standard will depend on the ammonia range of interest. Please refer to the accessories and consumables information in the manual.

What happens to the analyzer if the sample is not available?

The analyzer stops any analysis until sample flow is restored.

Is it complicated to operate the analyzer?

The analyzer is equipped with an intuitive 7-inch color touchscreen display that provides easy navigation of operations.

What communications are available on my analyzer?

Standard two 4-20mA analog outputs, RS485 and Modbus TCP/IP are available.

Optional communications include:

- Bluetooth
- WiFi
- HART protocol
- PROFIBUS

Can I access the analyzer remotely?

Yes, digital communication is available for remote access.

Is my analyzer cloud-enabled?

Yes, the analyzer is cloud-ready.

What is supplied with the analyzer?

The analyzer, pre-filter, all necessary internal tubing, cables, and fittings are provided with the analyzer. The reagents and calibration standard solutions must be ordered separately. Additional replacement tubing is available for purchase.

What is required to install the analyzer?

- Installation area: ideally inside of a room to avoid extreme temperatures; reagent will freeze below 32°F; reagent 2 will degrade quickly above 77°F (in this case a cooler to store reagent 2 is needed, which can be ordered as an accessory)
- Assistance to lift the analyzer into place
- Pressurized sample source and connection points
- Drain connection
- AC power source 110 or 220V
- 4-20mA wiring for transmitting signals to PLC / DCS if needed

Reference the manual for additional details.

Where can I install the analyzer?

The analyzer may be installed onto a horizontal flat surface or wall mounted.

Do I need a filter?

A sample pre-filter is supplied. Your sample connection is through the pre-filter. If the sample meets the requirements in the table below, no additional filtering is required.

Water sample requirements after filtration by pre-filter	Total dissolved solids (TDS)	≤600 mg/L
	Total suspended solids (TSS)	<30 mg/L
	pH	4-9
	Chroma (platinum-cobalt colorimetry)	< 180°

Are there special storage requirements for the reagents?

The reagent will freeze below 32°F; reagent 2 will degrade quickly above 77°F (a cooler to store reagent 2 is needed in this case; can be ordered as an accessory).

Do I have metric or imperial connections for my sample connections?

Metric connections are provided.

What is my analyzer enclosure rating?

The analyzer's enclosure rating is IP65.

How many sample streams does the analyzer have?

A single sample stream. For multiple streams, an optional multi-stream sequencer will be available that will allow up to 6 sample streams.

How much sample waste do I generate with this analyzer?

5 L per month based on measurements every hour.