

Measure NH₄: Analyzer or sensor?

THE RIGHT TECHNOLOGY FOR YOUR CHALLENGE

There are different methods for the continuous measurement of ammonium - sensors with ion-selective electrodes or wet-chemical analyzers.

This document provides an overview depending on the application and requirement.

Product selection

Application	Product	Main requirement
Wastewater treatment plant	<ul style="list-style-type: none"> • Biological Treatment • Deammonification 	AmmoLyt® PLUS 700 IQ <ul style="list-style-type: none"> • Good accuracy and continuous measurement • Process control
		VARiON®PLUS 700 IQ <ul style="list-style-type: none"> • like AmmoLyt® PLUS 700 IQ • additional measurement of NO₃
	Outlet	Alyza IQ NH ₄ <ul style="list-style-type: none"> • High accuracy even at low concentrations
Surface waters	Alyza IQ NH ₄	<ul style="list-style-type: none"> • Monitoring

Due to its high accuracy even in the lower measuring range, the **Alyza IQ NH₄** analyzer is particularly suitable for monitoring the outlet of wastewater treatment plants or surface waters.

However, it can also be used in the nitrification process, provided that very accurate measurements are required there and a measuring interval of ten minutes or longer can be accepted.

The ion-selective sensors **AmmoLyt® PLUS 700 IQ** and **VARiON® PLUS 700 IQ**, are ideal for regulating or controlling biological treatment processes due to their continuous measurement and high speed. The good accuracy is perfectly adequate for this application. The use in the outlet is possible depending on the required accuracy.



Alyza IQ NH₄



VARiON® 700 IQ

Product comparison

	Wet-chemical analyzer	Sensor with ion-selective electrodes
Measuring principle	<p>The measurement is carried out according to the indophenol method of DIN 38 406. As the name suggests, the Indophenol method results in a blue coloration of the sample. The color is generated by the reaction of ammonium ions from the sample with hypochlorite ions and carbolic acid or a carbolic acid derivative under alkaline conditions (pH approx. 12.6). For acceleration of the reaction, a catalyst is used. The reaction can be sped up further by increasing the temperature of the reaction solution.</p> <p>The colored sample then is analyzed photometrically in the red spectral range. The higher the ammonium concentration, the more intense the blue coloration.</p>	<p>Ion-selective (ISE) on-line measurements of ammonium have been applied in the analytics of modern sewage systems. Xylem provides ISE measurements of ammonium for more than the past 20 years. Same as the pH measuring, the ISE measuring is based on the selectivity of membranes towards special material and is accordingly easy with the handling. A tension ΔE is caused due to the selectivity between the work and reference electrode. This tension can be read as measuring value by using a controller. In typical applications, Xylem ISE electrodes</p> <div> </div> <p>$\Delta E = E_{(ISE)} - E_{(Ref)}$</p> <p>are characterized by highest stability for their entire lifetime. The continuous measurement that works without sample preparations using ISE electrodes enables an optimization of the plant in respect to the cleaning performance and energy consumption. This investment can quickly pay for itself through reduced effluent values.</p>
Products	<ul style="list-style-type: none"> Alyza IQ NH₄ 	<ul style="list-style-type: none"> AmmoLyt® PLUS 700 IQ VARiON® PLUS 700 IQ (incl. NO₃)
Maintenance	<ul style="list-style-type: none"> Tubing in contact with sample less than once per year Chemical bags depending on parameter and measuring range MPV depending on parameter and measuring range; service life of six months possible 	<ul style="list-style-type: none"> Matrix adjustment during installation and then as required Electrode replacement after 12-18 months Cleaning with supernatant and soft toothbrush No detergent, no distilled water
Calibration	Automatically, daily, 1- or 2-point	No calibration, matrix adjustment see maintenance
Interference	Negligible	Potassium, can be compensated

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Do you have further questions?
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