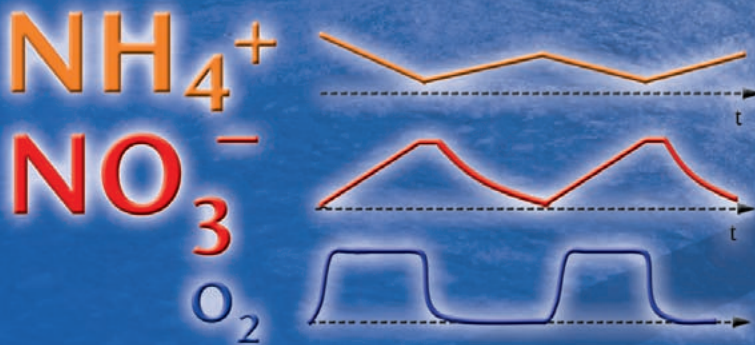


VARiON^{Plus} – calibration free

To measure ammonium and nitrate ion-selective –
with automatic and dynamic compensation

NEW
calibration free
cost effective
precise



Ion-selective measurements directly in the process – reliable in long-term measurements

No calibration needed

Calibration free – instead of that, factory calibration and long-term stability of the electrodes.

Low investment and operating costs

Highest stability doubles the life-time of the VARiON^{Plus} electrodes and thereby the operating costs are minimised. Additionally, the amount of work for calibration and costs of calibration standards are omitted.

Accurate measurement as obligation

Improved selectivity of the membrane guarantees highly accurate measurements, insensitive for colour-effects and variability of solids.



Improved performance by individually customisable VARiON^{Plus}



- *The continuous measurement of ammonium and nitrate is dynamically compensated – therefore the VARiON^{Plus} sensor can be equipped with compensation-electrodes for potassium and chloride.*
- *One further slot for an additional electrode allows for simultaneous measurements of ammonium and nitrate by using one probe only.*
- *The factory calibrated probe is ready to go after adaptation to the medium. In the IQ-display already the compensated readings are shown.*
- *With the help of the matrix adjustment, the sensor can be adapted to special features of the sewage without removing the probe out of the basin.*
- *For quality assurance WTW provides two control standards.*

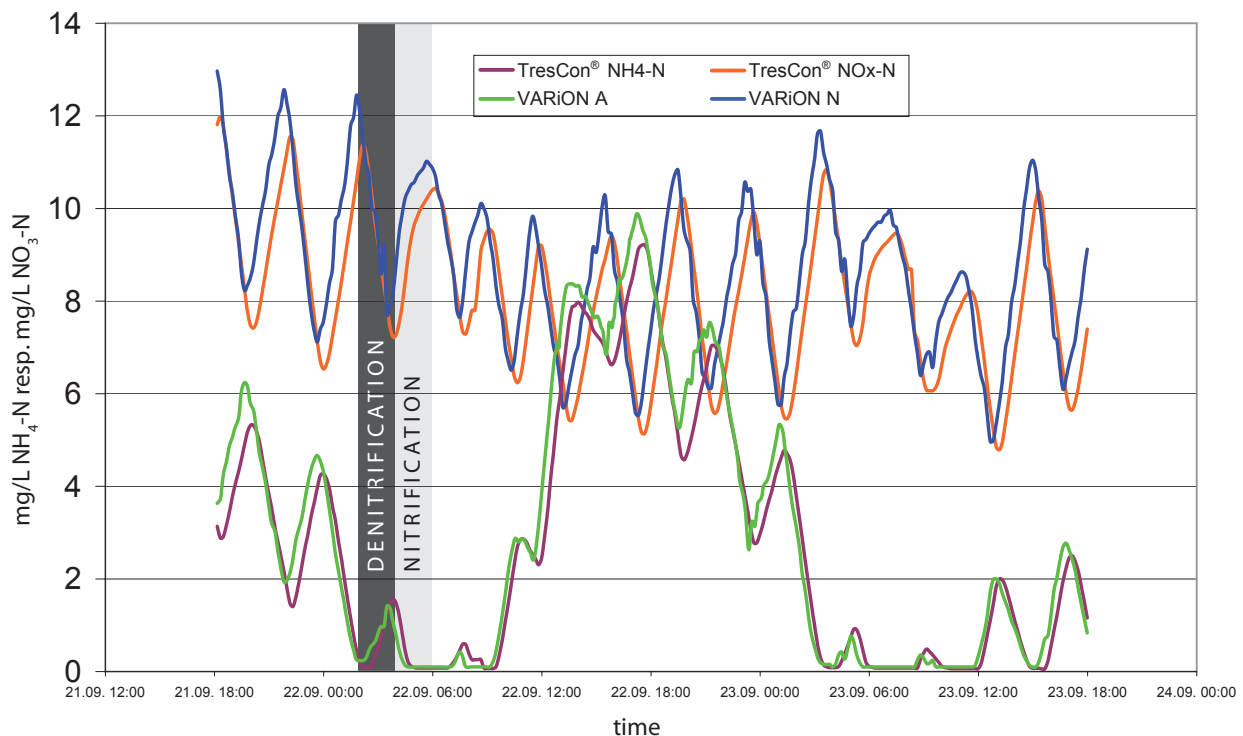
The VARiON^{Plus} system approves in practice

Especially for small- and medium-size sewage treatment plants continuous ion-selective measurements for control and adjustment purpose are of special interest. It offers by small investment- and operating costs the basis for well directed process management, which was not possible like this before.

The following data are from sewage treatment plants, which up to now control and adjust only on the bases of oxygen concentration measurements.

- Measuring results from practice, from municipal sewage plants with approx. 30.000 inhabitants.
- The ammonium- and nitrate values were evaluated with the help of the in-situ probe VARiON^{Plus} 700 IQ directly measured in the aeration basin, or after sampling and sample preparation with a TresCon[®] analyser, respectively.
- VARiON^{Plus} probe was equipped with an ammonium and potassium electrode (for automatic compensation) as well as an additional nitrate electrode.
- The analyser-system was provided with a sample, which was taken approx. 1 m from the measuring position of the VARiON^{Plus} probe.

Comparison of the VARiON^{Plus} mit TresCon[®] Analyser within the aeration basin
(VARiON^{Plus}: after matrix adjustment)



After initiation the VARiON^{Plus} 700 IQ probe is adjusted to the medium by a laboratory based reference measurement. Thereby the matrix effect of the sewage is detected and automatically used for further measurements. The temporally successive occurring processes of nitrification/denitrification with their anticyclical patterns of ammonium and nitrate concentration dynamics can be easily tracked. The measuring data of the probe and the analyser correlate excellent. The much faster response of the probe is visible.

Technical Data VARiON^{Plus} system

Maximum configuration	Common reference electrode, two measuring electrodes, one compensation electrode	
	Ammonium measurement	Nitrate measurement
Integrable Electrodes: Reference Electrode	VARiON Ref	
Measuring Electrode Compensation Electrode	VARiON ^{Plus} NH ₄ VARiON ^{Plus} K	VARiON ^{Plus} NO ₃ VARiON ^{Plus} Cl
Measuring Ranges/ Resolution	NH ₄ -N: 1 ... 1000 mg/l / 1 mg/l; 0,1 ... 100 mg/l / 0,1 mg/l NH ₄ ⁺ : 1 ... 1290 mg/l / 1 mg/l; 0,1 ... 129,0 mg/l / 0,1 mg/l	NO ₃ -N: 1 ... 1000 mg/l / 1 mg/l; 0,1 ... 100 mg/l / 0,1 mg/l NO ₃ ⁻ : 1 ... 4500 mg/l / 5 mg/l; 0,5 ... 450,0 mg/l / 0,5 mg/l
Compensation Ranges	K ⁺ : 1 ... 1000 mg/l / 1 mg/l	Cl ⁻ : 1 ... 1000 mg/l / 1 mg/l
Temperature Measurement	Integrated NTC thermistor, Range 32°F ... 104°F (0°C ... +40°C), Accuracy ±0,5 K, Resolution 0,1 K	
Temperature Compensation	0 °C ... +40 °C	
Matrix Adjustment	yes (adjustment against photometric measurement or other measuring method)	
Sensor Check	Possible, but not necessarily required	
Ambient Conditions	Operating temperature: 32°F ... 104°F (0°C ... +40°C), storing temperature: 32°F ... 104°F (0°C ... +40°C)	
pH Range	pH 4 ... pH 8,5	pH 4 ... pH 11
Measuring Accuracy in Standard Solutions	± 5 % of measured value ± 0,5 mg/l	
Working life	Reference electrode: 12 months, measuring and compensation electrode: 12 months in typical applications (communal waste water plant)	
Mechanical	Sensor body: V4A stainless steel 1.4571 Temperature sensor: V4A stainless steel 1.4571 Electrode connector: POM	Protective cup: POM, Protection rating: IP 68 (0,2 bar, with installed electrodes)
Max. Pressure	Maximum 0,2 bar (incl. SACIQ sensor connection cable, with installed electrodes)	
Power Consumption	0,2 Watt	
Dimensions	15,39 x 1,57 in. (392 x 40 mm, length x diameter), including SACIQ sensor connection cable	
Weight	Approx. 1.76 lb (800 g), without electrodes, without SACIQ sensor connection cable.	
Warranty	VARiON ^{Plus} 700 IQ: 2 years	

Ordering Information

VARiON^{Plus} SETs

Consisting of probe, reference electrode, measuring and compensation electrodes

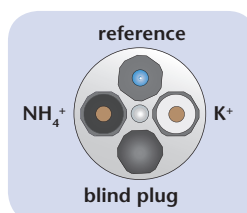
		Bestell-Nr.
VARiON ^{Plus} A comp SET	Ammonium measurement, compensated	107060
VARiON ^{Plus} N comp SET	Nitrate measurement, compensated	107062
VARiON ^{Plus} AN/A comp SET	Ammonium measurement, compensated; plus nitrate measurement	107066
VARiON ^{Plus} AN/N comp SET	Nitrate measurement, compensated; plus ammonium measurement	107068

Standard Solutions

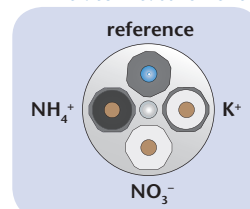
for testing of any VARiON^{Plus}

VARiON/ES-1	Combined standard 1 (low concentration), 1000 ml	107050
VARiON/ES-2	Combined standard 2 (low concentration), 1000 ml	107052

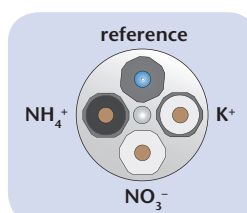
Ammonium measurement, compensated



Ammonium measurement, compensated, + Nitrate measurement



Nitrate measurement, compensated



Nitrate measurement, compensated, + Ammonium measurement

