

Nitrate (NO₃⁻) Analyzer series 3S-NO₃ METER

Measurement Principle

The measurement principle is based on the strong absorption of UV light by the chromophore N-O according to the Beer-Lambert law:

$$[C] = k \log (I_{in} / I_{out})$$

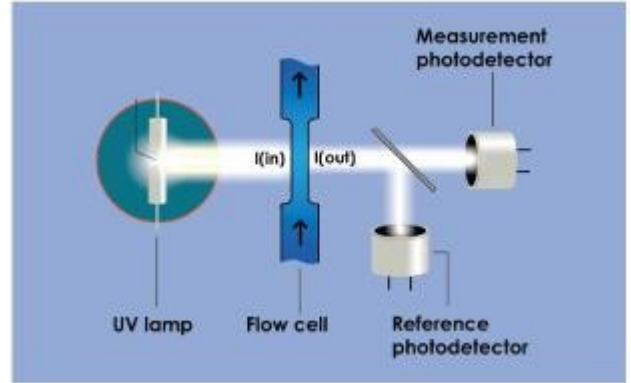
where:

[C]: sample concentration

k: absorption coefficient (specific to each compound)

I_{in}: light intensity at the input of the sample

I_{out}: light intensity at the output of the sample



An automatic internal linearisation compensates for the inherent non-linearity of the Beer-Lambert law for high concentrations.

The measurement is the weighted sum of the NO₂ and NO₃ concentration, but in most applications the NO₂ concentration is negligible.

Turbidity, organic matter, suspended solids or dirt on the flow cell is automatically compensated for by a differential measurement with a second detector at a reference wavelength.

Chlorates and chlorites at high concentration are the only inorganic causes of interference, but these are usually not encountered with drinking water or urban wastewater.

Automatic Cleaning System

Once a day, a low-cost cleaning solution (10% Sulphuric Acid) is automatically injected into the flow cell to clean it. An auto-zero is performed at the same time.

The autonomy is about 2 weeks with the built-in 2-Litre tank.

An alarm is generated if the cleaning solution tank is empty.

Operating Cost

The operating cost is limited to the refilling of the 2-Litre tank of cleaning solution every 2 weeks with 10% Sulphuric Acid on distilled water.

We estimate it to be about Euro 150 per year including labour.



Application to River Water

Monitoring of rivers for environmental studies and nitrate flow evaluation are the main applications. Only UV spectroscopy can achieve the stability, reliability and low maintenance that are the major concerns with these remote measurements.

An optional peristaltic pump can take water directly from the river.

Application to Drinking Water

Major water companies and municipalities today largely use the UV method for on-line measurements on drinking water, especially to automatically control the mixing of several waters or for nitrate removal plants.

The UV method shows very close correlation with laboratory measurements according to standard methods often required periodically by local regulations.

Application to Waste Water

Only UV spectroscopy can provide **nitrate removal plants** with the fast and reliable nitrate measurements required for continuous process control.

There is no drift as with electrode-based systems, and the absence of any reagents means that operating costs are very low.

The analyzer comes with turbidity compensation and large bore tubing, eliminating the need for any filtering system and thus reducing significantly the initial cost and subsequent maintenance. The flow cell is maintained by an automatic cleaning system.

RANGE
0-30 mg/l
0-100 mg/l
0-250 mg/l



3S Analyzers S.r.l. Via Molino Nuovo 12 16036 Avegno (GE) – Italy

Tel. +39 0185 799024 Fax. +39 0185 799207 E-mail: info@3s-analyzers.eu Web site: www.3s-analyzers.eu