

# OPUS (aero)

**in biological waste  
water treatment**



Biological wastewater treatment serves to break down excess nutrients such as nitrogen, carbon and phosphorus with the help of micro-organisms (activated sludge), thereby protecting water bodies from pollution. The nitrogen contained in the wastewater is eliminated in a multi-stage process.

## **Nitrate and Nitrite - important online parameter**

Nitrate plays an important role in the targeted control of processes – whether for regulating aeration, managing sludge and water flows or dosing carbon sources – and enables:

- guaranteed N degradation performance under optimal conditions
- while maximising energy and resource savings






**“Nitrite is produced during nitrification and denitrification as an intermediate stage and is usually broken down quickly.”**

**Online monitoring of nitrite is essential:**

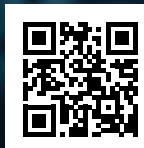
- as an indicator of possible disruptions to biological treatment
- to prevent toxic nitrite in sewage treatment plant effluent and the resulting environmental damage (e.g. fish mortality)
- to minimise emissions of climate-damaging nitrous oxide, which, according to current research, is primarily formed via nitrite

TriOS OPUS and OPUS (aero) are powerful spectral probes for the online measurement of **Nitrate and Nitrite** in aeration tanks.

By analysing the entire UV spectrum, they provide reliable measurements – depending on the calibration – for  $\text{NO}_3\text{-N}$  alone or combined for  $\text{NO}_3\text{-N}$  and  $\text{NO}_2\text{-N}$ .

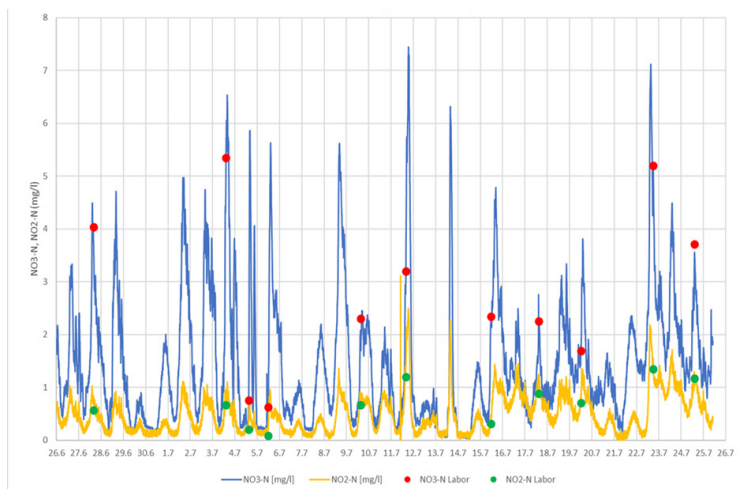


**Stop speculating  
about water  
quality!  
OPUS has  
the answer.**



## Applications:

- Waste water treatment plants
- Environmental monitoring
- Drinking water monitoring
- Industrial waste water



## Additional parameter OPUS

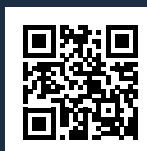


**COD<sub>eq</sub>**  
**BOD<sub>eq</sub>**  
**COD<sub>eq</sub> / SAC<sub>eq</sub>**  
**TSS<sub>eq</sub>**  
**SAC<sub>254</sub>**  
**and others**

Neither conventional electrochemical ISE probes nor optical NOX-N probes can detect nitrite. This means that it is not possible to reliably determine the total N load or differentiate between nitrate and nitrite.

**OPUS (aero) offers an easy-to-implement, reliable and purely optical online solution.**

As a hyperspectral UV probe, it uses a special mathematical evaluation of the entire UV spectrum, enabling simultaneous and selective online measurement of NO<sub>3</sub>-N and NO<sub>2</sub>-N. The fast, stable and reproducible measurement results are determined completely without reagent.



## Installation and operation of OPUS (aero)

TriOS OPUS (aero) can be operated directly as an immersion sensor in the process – e.g. on a chain, mounting rod or float. Alternatively, it can be installed in a flow cell after filtration. The optional automatic wiper cleaning ensures permanently stable and drift-free measurement results.

The intuitive TriBox3 controller provides on-site display of all measured values as well as control of measurement, cleaning and data transmission.



## Conclusion - Hyperspectral online-sensors:

- Linear spectral analysis (LSA)
- High spectral resolution
- Direct online measurement without sampling and sample preparation
- Delay-free results in real time
- Reagent-free and therefore low-maintenance
- Nano-coated optical windows for long-term stable measurements
- Pre-installed application calibrations for quick commissioning

