UNISENSE ENVIRONMENT

WORLD'S ONLY SENSOR FOR DISSOLVED N_2O

N_2O Wastewater System

Solution for direct measuring, minimizing, and reporting of N_2O from wastewater treatment

The N_2O Wastewater System is the world's only sensor for direct and real-time measurement of dissolved nitrous oxide (N_2O) in wastewater. Together with new control and process strategies, it enables reduction of total carbon footprint.

Large impact of N_2O on carbon footprint

N_2O is a product of both nitrification and denitrification during the biological treatment of wastewater. Through aeration it is subsequently striped and released into the atmosphere. N_2O is a highly disregarded greenhouse gas with a global warming potential 320 times higher than CO_2. Traditionally, N_2O emission from wastewater treatment plants has been estimated by use of the IPCC emission factor of 3.2 g/PE/year N_2O-N. This factor is an underestimate and studies in the Netherlands, France, USA, and Australia have shown, that for some wastewater treatment plants, the N_2O emission can account for up to 90% of their total carbon footprint.

Real-time emission estimation

Long term studies have documented a high level of performance, sensitivity, and durability of the N_2O Wastewater Sensor qualifying it as the perfect and reliable tool for continuous online measurements of dissolved N_2O. Moreover, direct comparison with well-controlled off-gas data has proven and validated the real-time emission data based on our N_2O sensor output.

N_2O wastewater system

- **Measuring and assessing the amounts of N_2O being produced during wastewater treatment**
- **Minimizing the large climate effect of N_2O by implementing new process strategies**
- **Reporting of greenhouse gas emissions from N_2O**

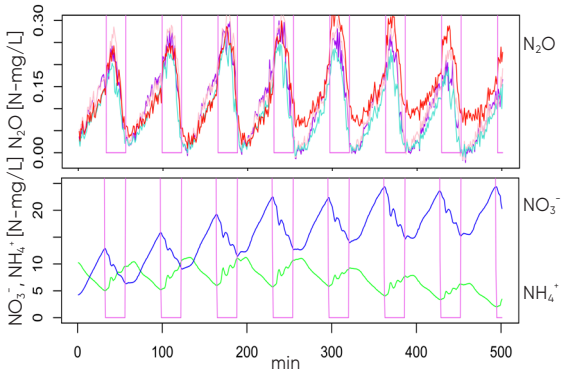
True carbon footprint

In modern wastewater treatment the primary focus on energy savings and energy production has resulted in an increase in the production of N_2O leading to an increase in CO_2 equivalent emission. Therefore it is essential to look at the whole process to document the true carbon footprint.

Breakthrough bioprocess control with N_2O sensor

Combining today's wastewater bioprocess control know-how with the new industrial sensor for N_2O provides a significant potential in reducing the environmental load caused by this potent greenhouse gas. New state-of-the-art bioprocess controls can be developed, using input from the N_2O Wastewater System, yielding a clear environmental advantage over standard control regimes.

- **Cost effective compared to off-gas equipment**
- **Robust sensor for 24/7 operation**
- **Fast responding in less than one minute**
- **Independent of airflow during denitrification**



	N_2O Wastewater Controller		N_2O Wastewater Sensor
Controller	TFT-touch screen controller	Size	Robust design in 44 mm aluminium alloy casing (6063-T6) and black POM acetyl copolymer
Box size	301.5 x 283.2 x 120.5mm 3.2 kg	Response time	< 45 sec
Housing	Surface-mounted case made of plastic (ABC) IP67	Build-in temperature sensor	yes, N_2O signal temperature compensated
Mounting	Multiple holes for surface or pipe mounting - mounting plates and weather protection canopy available	Detection limit	Standard Range: 0,005 N_2O-N mg/L Medium Range: 0,03 N_2O-N mg/L High Range: 0,4 N_2O-N mg/L
Sensor inputs	2 x N_2O Wastewater Sensor with build-in temperature sensor	Working range	Standard Range: 0-1,5 N_2O-N mg/L Medium Range: 0-9 N_2O-N mg/L High Range: 0-110 N_2O-N mg/L
Analog sensor inputs	Optional: Air flow (m^3/h), 4..20 mA Optional: 2 x Air flow ON/OFF (Binary input - potential-free contact)	Calibration	2-point calibration, every second month
Analog sensor output	2 x temperature compensated N_2O value (N_2O-N [mg/L]), 4..20 mA	Guaranteed lifetime	4 months
Analog sensor emission output	2 x Emission calculations (N_2O-N [$g/m^3/d$]) with standard fixed model parameters Optional: Dynamic input parameters	Expected lifetime	>6 months
Digital outputs	Internet, ModBus (serial or TCP) Optional: 2 x N_2O Wastewater temp. sensor Optional: PROFIBUS-DP Optional: USB datalogging - software required	N_2O Sensor head for either 10-30°C or 30-40°C	Replaceable
Electrical safety	According to EN 61010, part 1 overvoltage category III, pollution degree 2	Cable length	5 meter standard Optional: Extension up to 100 m
Power supply	AC 110 to 240 V +10 /-15 %; 48 to 63 Hz, 55 VA	Known relevant interferences	None

FOR MORE INFORMATION

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