

# PLUG & PLAY AUTOMATION FOR BIOLOGICAL SEWAGE TREATMENT PLANTS

Proper management of the nitrogen and the carbon cycle is crucial to get the respect of the limits of the law and, at the same time, avoid wasting resources.

The market offers many dedicated solutions, with varying degrees of effectiveness, but mostly targeted -for the kind of the investment- to plants of important dimensions (>10Kae).

Chemitec worked hard to find a performing solution even where it's not possible to apply the usual systems of supervision and control.

## OXYSMART Chemitec

Oxysmart is a control algorithm. It is based on the assumption, verified in a first approximation, that it is possible, in a civil treatment plant, to monitor the incoming load by controlling the concentration of ammonia nitrogen.

Loaded on a 50 SERIES Controller, this algorithm transforms the control unit into a system capable to manage compressors, inverters and mixers, to optimize the process and adapt it to load variations.

The **50 SERIES OXYSMART** is installed at the poolside and is operative from the start. The logic is adaptable to any plant, regardless of the electromechanical equipment, but, however, optimizing the operation.

The oxygen setpoint is varied in a continuous manner according to the load detected by the ammonia-ion selective probe **Chemitec S470-NH<sub>4</sub>** and its abatement.

The **Chemitec S423 C OPT** oxygen probe is responsible for monitoring the achievement of the imposed target.



Plug & play multiparametric instrument

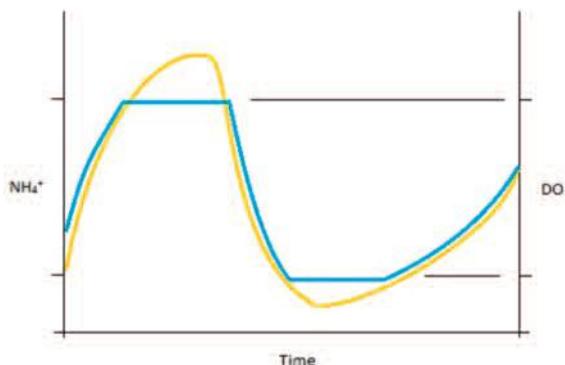


Process ISE probe

There are three logics, adaptable to any plant:

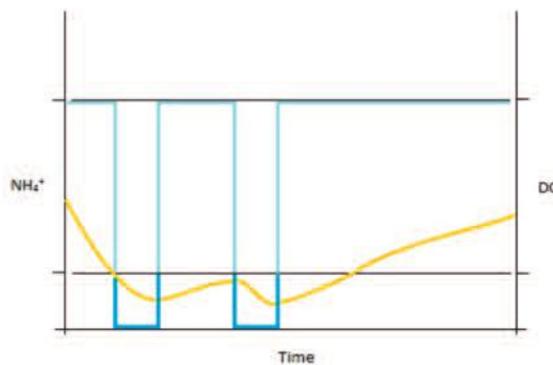
### Smart DO

In conditions of low load, the DO threshold is maintained at low levels, and then it grows when the load increases.



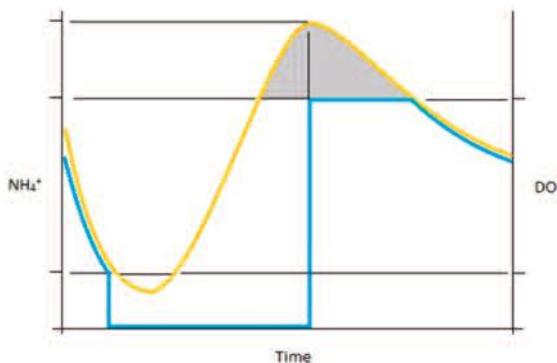
### Smart ON/OFF

In conditions of low load, the system goes in pause/work mode, ready to modulate the oxygen when the load increases.



### Smart N/DN

At the end of an oxidation cycle, the system activates the mixer, turns off the compressors and waits for a peak of ammonia nitrogen; when the peak is reached, the system reactivates oxidation



Oxysmart provides a series of safeties to protect the compressors and inverters, as well as to compensate the failure of the probes. Alarm functions are provided in case of malfunction of some component: the system automatically positions the adjustments of the safety values.

The benefits of Oxysmart system are::

**Economical:** reduced intervention costs

**Technical:** immediate start, ease of installation and management

**Managerial:** energy consumption optimization, stability of the effluent's parameters

Operating example (Smart N/DN logic, simulation of inverter failure, 4000ae)

