

ALGcontrol



Fluorescence monitoring of algae classes and toxic algae

Preliminary version

Instrument Specifications:

- Total chlorophyll: 0-200 µg/l (Chl.-a, green algae + blue-green algae)
- Cyano chlorophyll: 0-200 µg/l (Chl.-a, blue-green algae)
- Precision: 0,2 µg/l
- Turbidity: 0-400 NTU
- 1 programmable pump (for sample or cleaning)
- 2 programmable valves.

Specifications Communication:

- Integrated PC with Linux-based operating system
- Graphical user interface with interactive touch screen operation
- Full network capability via direct LAN connection
- All standard communications interfaces are supported CAN-Bus, LAN, Modem and RS232 or RS485
- Protocols: Modbus TCP and Modbus serial, other on request
- Profibus with converter
- 2x output 4 - 20mA
- Available operating system languages: English, German, French and Spanish, other on request.

Specifications Options:

- Modem slot for UMTS, ISDN or analog (modem optional)
- Sensors: pH, DO, Turbidity, Redox, temp.
- Inputs: 4-20 mA, 2x digital in, leakage sensor
- PC Software (SQL Database)



Technical Details:

- Power supply 24V DC
- Protection classification: IP 54 (optional IP65)
- Dimensions (HxBxD): 450 x 450 x 260
- Cabinet material: Aluminum
- Sample pressure: 0 bar (max 0.05 bar overpressure)
- Sample temperature: 10 - 35°C
- Sample flow rate: 2 - 10 l/h
- Environmental temperature: 15 - 35°C
- Operating system: Embedded Linux
- Power consumption (average): 45W.

Automatic cleaning:

- User selectable cleaning cycles
- Cleaning solution (sodium hypochlorite solution < 0,05% active) prevents fouling and unattended usage for several weeks

ALGcontrol

Principle fluorescence technique

The ALGcontrol makes use of fluorescence excitation. This means that when chlorophyll molecules absorb light, a fraction of the energy absorbed is reemitted as fluorescence.

Due to the fact that algae of the same division contain a similar quantity and quality of pigments, their fluorescence excitation spectrum (with a fixed emission wavelength at 680nm) is significant. Thus, it is possible to differentiate divisions of algae by their fluorescence excitation spectrum.

In addition to this, other fluorescing matter (for example, DOM = dissolved organic matters measured with the 365nm wavelength and turbidity, measured with the 710nm wavelength) are detected to enhance the accuracy.

The ALGcontrol uses 7 Light Emitting Diodes or LEDs for fluorescence excitation. The LEDs emit light at 7 selected wavelengths (365nm, 450nm, 525nm, 570nm, 590nm, 615nm and 710nm).

The LEDs in the ALGcontrol are switched on, one after the other, at high frequency. The fluorescence signal for each LED is measured and averaged during a pre-defined time. The fluorescence values for each of the LEDs are given in "counts" after the measurement and shown as raw data. The concentration of the algae will be calculated from these values (counts) to $\mu\text{g/l}$ and the results are displayed in a graph. Correction for other fluorescing matters (DOM and turbidity) will also be calculated automatically

