

bbe

MOLDAENKE

Wildrosenweg 3 · D-24119 Kiel-Kronshagen

Fon (+49) 431 38040-0

E-Mail info@bbe-moldaenke.de

www.bbe-moldaenke.de

The bbe Algae Online Analyser

Chlorophyll, Algae class and Photosynthetic Activity Continuous Determination in Real-Time

The bbe Algae Online Analyser measures continuously the chlorophyll fluorescence of micro algae in real-time. The measurement corresponds to the wet-chemical chlorophyll analysis (DIN/ISO). In contrast to time consuming sample preparations and counting the fluorometric assay provides rapid determination of the chlorophyll content in its natural environment. The Algae Online Analyser is adapted to HPLC pigment analysis.

The bbe software for algae class differentiation determines the distribution of algae classes relating to the total 'chlorophyll a' content. With this technique the 'chlorophyll a' content of green algae, blue green algae, cryptophyceae and brown algae (i.e. diatoms, dinoflagellates) is analysed. The system is adaptable to new (customised) algae classes added to the measuring system.

Different patterns of fluorescence excitation reflect the photosynthetic efficiency of the algae. The fluorescence



Measuring station in Hamburg



Algae Online Analyser with sensor (left), sample pump (left), IP 54 housing, industrial PC, touch pad, USB socket for memory stick

signals f_0 , f , f_m are used to calculate the Genty-Parameter as the most accepted measure for the algae activity. The activity is closely related to the oxygen evolution.

To compensate the influence of turbidity on the fluorescence transmission measurement is a useful tool for correction. The measurement of Gelbstoff (CDOM) accounts for an additional source of fluorescence. The automatised correction improves the chlorophyll determination especially at low concentrations.

Environments

- Lakes
- Reservoirs
- Rivers
- Estuaries
- Ocean
- Wetlands

Application

- Regulatory control
- Environmental control
- Limnological work
- Research
- Education
- Supervision Aquaculture

biological · biophysical · engineering

THE ECOLOGICAL WATERSHED

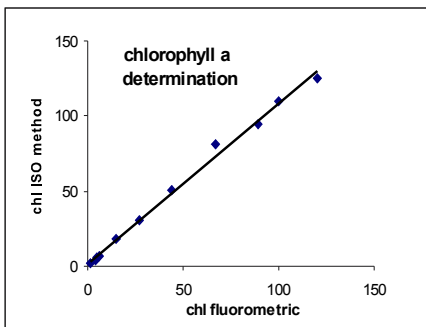


Operation

Easy operation with intuitive user guide. With **Measurement Start** an algae sample is pumped into the measuring chamber by an external pump. Following a dark adaption pulsed light of the spectrofluorometer excites algae pigments. Fluorescence signals are collected by a sensitive photomultiplier and used for calculation of algae classes. Normspectra with individual fingerprints for each algae class provide optimised evaluation of the results. Optionally the photosynthetic activity of the algae is determined. All relevant data are recorded on HD and shown on the graphic LCD display.

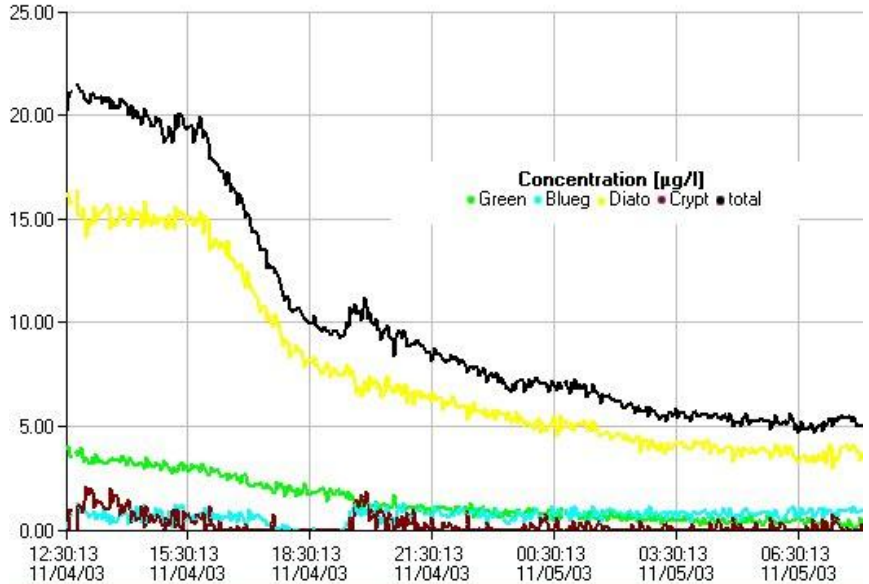
After draining an automatic cleaning device periodically cleans the measuring cell and removes any particles or biofilms. This procedure guarantees well defined optical properties of the cell and extends the maintenance-free period.

Combined with modem and PC Anywhere software the Algae Online Analyser enables remote access for instrument control/data transfer.



Comparison of 'chlorophyll a' concentration [$\mu\text{g/L}$] performed with wet chemical approach (ISO) and fluorometric *in vivo* assay

The Algae Online Analyser - a well established instrument in monitoring stations - is used in many countries. Ask for references.



Time course of algae class determination with the Algae Online Analyser at PalDang river (S.-Korea), 2003

Technical data

Measuring range	0 - 200 μg Chl a/l
Resolution Chl determination	0,1 μg Chl a/L
Resolution Genty Parameter	3 μg Chl a/L
Weight of complete equipment	19 kg
Size (H x W x D)	420 x 600 x 200 mm ³
Power supply	230 V / 50 Hz or 110 V / 60 Hz
Power input	100 W
Sample temperature	0 - 30° C
Sample volume	30 ml
Protection class housing	IP54
Interface	RS232 (optional), LAN
Analogue output (optional)	2 x 4-20 mA
Maintenance interval	> 7 days

Equipment

AOA Model	Algae differentiation	Activity	Industrial PC	IP 54 housing
BG82000	+	+	+	+
BG83000	+	-	+	+
BG80000*	+	+	-	+
BG81000*	+	-	-	+
BG84000*	+	+	-	-
BG85000*	+	-	-	-

*for operation and calculation external PC and Win 95, 98, 2000 or XP is required