bbe
moldaenke

- Innovative spectral fluorometers with integrated algal class determination
- Wide selection of measurement instruments for continuous toxicity monitoring
- bbe has been an expert in the field of fluorometry for more than 20 years

BIOMONITORS

CHLOROPHYLL Fluorometers

www.bbe-moldaenke.de

CHLOROPHYLL

CHLOROPHYLL

7

6

8

9

10

11

13

NEW!

14

15

TOXICITY

12

CONTENTS

ABOUT US

“Water is the source of all life!
Good water quality is a pre-requisite for our future
and is a great challenge. To be involved in this,
bbe has committed itself to water quality monitoring!”

WHO WE ARE AND WHAT WE DO

For more than 20 years bbe Moldaenke GmbH has been one of the leading manufacturers of outstanding environmental technology products. bbe develops and produces measuring instruments and software for the monitoring of water quality. Our instruments are used e.g. in oceanography and limnology, in the analysis of drinking and raw water, in the measurement of bathing water quality, in the monitoring of aquaculture systems and diverse environmental assessments.

bbe Moldaenke GmbH is specialised in the construction and development of spectral fluorometers for the measurement of the chlorophyll content of algal classes with different pigments. The company is also the market leader in the field of biological early warning systems, i.e. toximeters, for the detection of environmentally hazardous substances and compounds.

The employees of bbe Moldaenke GmbH form a well-trained and highly motivated team of experts with diverse professional backgrounds such as e.g. environmental technology, process technology, electronics, information technology, biology and physics.

Future-oriented projects at bbe Moldaenke GmbH are supported by cooperation with scientific institutions. Over the years, knowledge from several research projects and industrial partners has successfully fed into new product developments. bbe sees itself as a socially responsible company: water quality monitoring is becoming increasingly significant due to an increasing population and shrinking water reserves. This problem is being tackled internationally by the use of bbe know-how.

International cooperation requires a presence at many locations simultaneously outside Germany. Establishing a network of representative and distributors in more than 40 countries has gone a long way to meeting these requirements.

ABOUT

CHLOROPHYLL & TOXICITY

SOME FACTS ABOUT ALGAE DETECTION

Chlorophyll is a universal pigment in the process of photosynthesis. It is distributed in all micro-phytoplankton and can be easily used for the estimation of the amount of microalgae and cyanobacteria in sample water. Beside microscopic analysis, the extraction of pigments and with measurement of chlorophyll absorption or fluorescence are widely used. Both methods are laborious and are subjected to limitations in accuracy and sensitivity. Nevertheless, the microscopic picture allows a classification of phytoplankton due to shape and appearance. Another approach with high sensitivity uses *in vivo* fluorescence. This rapid method can be applied in the field and enables a distinction of up to 4 algae classes in one measurement. *In vivo* fluorometry is perfect for high-resolution profiling in lakes, rivers and reservoirs. This method finds its application in the uptake of water for the drinking water processing or in ecological monitoring.

You can find our bbe spectrofluorometers on page 6 to 11

SOME FACTS ABOUT TOXICITY

Toxicity describes harmful effects caused by contact with hazardous compounds. A distinction can be made between acute and chronic toxicity. Acute Toxicity comprises damaging effects which are visualised within a short time after exposure, while chronic toxicity includes long-term effects. bbe biomonitors focus on the assessment of acute toxicity in water to recognise and manage sudden events such as contamination, spills. All bbe biomonitors serve as EARLY WARNING SYSTEMS. Suitable test organisms react immediately to contamination with changes in their physiology. The main issue of effective biomonitors is the perfect interaction of hardware, test organism and advanced alarm-software. bbe develops these biomonitors on the basis of scientific knowledge about algae, daphnia and fish to span the broad variety of different compounds that may harm human being even at low levels. This information cannot be provided by chemical analysis.

You can find our bbe products on page 12 to 15

CHLOROPHYLL

AlgaeTorch

The user-friendly, handheld measuring instrument: switch on – dip in – read off!

The bbe AlgaeTorch is a light handheld measuring instrument for the simultaneous detection of the chlorophyll-a of blue-green algae (cyanobacteria) and the total chlorophyll-a content of all microalgae present in the water. The measurement of chlorophyll-a fluorescence can replace laboratory analysis. A complete measurement requires less than 15 seconds. Sample-taking and preparation are unnecessary. With capacitive keys on the housing the AlgaeTorch is simple and easy to use. The instrument is robust and waterproof and can be deployed down to depths of 10 m for short periods (AlgaeTorch 10). Using a modified plug system, the AlgaeTorch 100 can be deployed for long periods down to depths of 100 m. The AlgaeTorch uses the *in vivo* fluorescence of the algal cells. The algal pigments are excited selectively by LEDs and emit red fluorescence light as a natural phenomenon. The intensity of the chlorophyll fluorescence is used to determine the different algal classes, in this case blue-green algae or the total chlorophyll of microalgae.

Specifications

DESCRIPTION	VALUE
Measurands	Total chlorophyll [µg chl-a/l], blue-green algae [µg chl-a/l]
Measurement range	0 - 500 µg chl-a/l
Resolution	0.1 µg chl-a/l
Weight	1.3 kg
Dimensions (H x Ø)	500 x 60 mm
Protection	IP 68
Voltage	230 V / 50 Hz; 110 V / 60 Hz; or 12 V DC
Power consumption	10 W
Temperature	Sample: 0 to 35 °C / Environment: 0 to 40 °C
Maximum Depth	AlgaeTorch 10: 10 m AlgaeTorch 100: 100 m
Interface	USB
Options	10 m rope, telescopic rod, nylon shoulder bag, SDI-12 using the bbe converter

FEATURES

- Simultaneous determination of total chlorophyll and blue-green algae
- Automatic turbidity correction for reliable chlorophyll determination
- GPS for exact location of measuring site
- No sample-taking or preparation necessary
- Easy to use
- Result display on the instrument, internal data memory
- Built-in pressure sensor (AlgaeTorch 100)
- Underwater cable of 10 - 30 m (AlgaeTorch 100)

APPLICATIONS

- Detection of algal blooms and blue-green algae (cyanobacteria)Monitoring of water quality in seas and rivers
- Investigation according to the EU Water Framework Directive and Bathing Water Directive
- Warning of possible toxins
- Management of reservoirs and dams

AlgaeTorch measurement on site.

CHLOROPHYLL

BenthoTorch

In-situ measuring instrument for the rapid and simple determination of the chlorophyll of benthic algae

The bbe BenthoTorch is a reasonably priced instrument for the measurement of benthic algae concentrations in real time. It enables the immediate and reliable determination of algal growth for the estimation of primary production and for the analysis of ecological status (in accordance with the EU Water Framework Directive). The portable field instrument measures *in vivo* chlorophyll fluorescence *in situ* on different substrates such as stones or sediments without any sample preparation. The BenthoTorch calculates biomass on the basis of the chlorophyll-a content and determines the distribution of the different algal classes. An individual measurement takes approximately 20 seconds. The calculation is performed in the instrument by using an optimised algorithm. The results are displayed directly after the measurement on the display and stored internally. Data transfer to a PC is performed via the USB interface using the data cable supplied. The bbe++ software for subsequent evaluation and graphic representation of the data is supplied free of charge.

Specifications

DESCRIPTION	VALUE
Measurands	Green algae [µg chl-a/cm²], blue-green algae [µg chl-a/cm²], diatoms [µg chl-a/cm²]
Measuring range	0 - 15 µg chl-a/cm²
Resolution	0.1 µg chl-a/cm²
Weight	1.3 kg
Dimensions (H x Ø)	500 x 60 mm
Protection class	IP 68
Voltage	230 V / 50 Hz; 110 V / 60 Hz; or 12 V DC
Power consumption	10 W
Temperature	Sample: 0 to 35 °C / Environment: 0 to 40 °C
Maximum Depth	10 m
Interface	USB
Options	10 m rope, telescopic rod, nylon shoulder bag, SDI-12 using the bbe converter

FEATURES

- Simultaneous determination of benthic green and blue-green algae, and diatoms
- No sample-taking or preparation
- Easy to use
- Display for operation and measurement results
- Internal data storage
- GPS sensor
- Automatic measurement correction depending on substrate
- Cable-free operation due to internal rechargeable batteries
- USB-connection for data transfer to external PC

APPLICATIONS

- Estimation of primary production
- Determination of ecological status
- Rehabilitation/sanitation projects
- Environmental monitoring
- Limnological analysis
- Research and teaching

The BenthoTorch used to measure algal classes and their concentration on a stone surface.

CHLOROPHYLL

FluoroProbe III

The depth-profiling instrument for the rapid analysis of chlorophyll content and algal classes

The bbe FluoroProbe III is a highly sensitive measuring instrument for the *in vivo* analysis of chlorophyll in real microalgae and blue-green algae (cyanobacteria). Individual profiles for the different algal classes are created during the measurement. The algal content is determined by evaluating the chlorophyll fluorescence in real time. Without the necessity of using a laboratory, it is possible to completely analyse the occurrence and distribution of algae in different water bodies, if necessary at different depths. Interference from e.g. humic substances is compensated using the integrated yellow substances measurement. The optional, automatic turbidity correction is unique among fluorometers and makes chlorophyll determination with the bbe FluoroProbe even more reliable.

Specifications

DESCRIPTION	VALUE
Measurands	Total chlorophyll [µg chl-a/l], green algae [µg chl-a/l], blue-green algae [µg chl-a/l], diatoms [µg chl-a/l], cryptophyceae [µg chl-a/l], yellow substances correction, water temperature (optional), transmission (optional), depth
Measuring range	0 - 500 µg chl-a/l
Resolution	0.01 µg chl-a/l
Transmission	0 - 100 %
Weight	6.4 kg (7.2 kg incl. light screen, 4.2 kg in water)
Dimensions (H x Ø)	490 x 140 mm
Protection class	IP 68
Voltage	24 V
Battery capacity	3900 mAh
Operating time	continually < 10 hrs; interval < 30 days
Temperature	Sample: -2 to 40 °C / Environment: -2 to 40 °C
Interface	RS485 and USB
Maximum depth	0 - 100 m (standard), 0 - 200 m (extended range)
Options	Cuvette holder (Workstation 25), 3 - 100 m measuring cables, Hydro-Wiper, Bluetooth-Set

FEATURES

- Measurement of green algae, blue-green algae (cyanobacteria), diatoms, dinoflagellates and cryptophyceae
- Up to 4 additional algal classes can be calibrated
- Up to 4 measurements per second
- Yellow substances measurement and compensation of disturbances via UV-LED excitation
- Turbidity compensation (optional)
- Reduces the number of microscopic laboratory analyses
- Internal rechargeable batteries for independent measurement
- Internal data logger
- PC software for data analysis

APPLICATIONS

- Research in limnology and oceanography
- Reservoir monitoring
- General environmental assessment
- Monitoring of bathing water for blue-green algae
- Monitoring of blue-green algae in drinking water
- Aqua culture monitoring

Bluetooth set with handheld device (e.g. smartphone) for data display and control.

CHLOROPHYLL

AlgaeLabAnalyser

Determination of chlorophyll concentrations, algal classes and photosynthetic activity for science and routine analysis

The bbe AlgaeLabAnalyser offers the simultaneous determination of chlorophyll concentrations, transmission, and – as an option – the photosynthetic activity of microalgae in a 25 ml glass cuvette. The chlorophyll content is excited by coloured LEDs and allocated to the different algal classes. The AlgaeLabAnalyser enables direct measurement without sample preparation by filtration or solvent. The fluorescence signals f_0, f, f_m are used to calculate the photosynthetic activity using the Genty parameter method. A yellow substances (CDOM) correction is also used to correctly calculate the total chlorophyll content. The device is virtually maintenance-free and very simple to operate thus saving both time and money.

Specifications

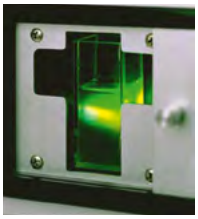
DESCRIPTION	VALUE
Measurands	Total chlorophyll [µg chl-a/l], green algae [µg chl-a/l], blue-green algae [µg chl-a/l], diatoms [µg chl-a/l], cryptophyceae [µg chl-a/l], yellow substances correction, transmission (at 5 wavelengths), photosynthetic activity (Genty) – optional
Measuring range	0 - 500 µg chl-a/l
Resolution	0.01 µg chl-a/l
Transmission	0 - 100 %
Weight	7.5 kg
Dimensions (H x B x T)	220 x 370 x 400 mm
Protection class	IP 54
Voltage	230 V / 50 Hz; 110 V / 60 Hz
Power consumption	10 W
Temperature	Sample: 0 to 35 °C / Environment: 0 to 40 °C
Sample volume	25 ml (cuvette)
Interface	RS232
Software	bbe++ database software
Options	Genty, battery pack, SDI-12 with bbe converter, 12V adapter, transport case

FEATURES

- Quick, simple chlorophyll measurement with algal class differentiation
- Maintenance-free
- Simple operation
- Direct measurement without sample preparation by filtration or dissolution
- Integrated stirrer
- PC operation with bbe software
- Simple data export
- Optional transport case
- Optional external rechargeable battery for mobile deployment

APPLICATIONS

- Monitoring and assessment of water quality
- Environmental monitoring
- Intake monitoring
- Chemical monitoring
- Toxicity tests
- Analysis of contaminated sites
- Monitoring of dams
- Limnological work
- Research and teaching
- Oceanography
- Laboratory tests



Measurement is performed in a 25ml glass cuvette and takes approx. 1 minute.

CHLOROPHYLL

AlgaeOnlineAnalyser

Online determination of chlorophyll concentrations, algal classes and photosynthetic activity

The bbe AlgaeOnlineAnalyser is deployed in measuring stations and laboratories in which online measurement of water quality is required for rivers, reservoirs, dams and lakes as well as in drinking water production. The instrument impresses due to its rapid analysis of chlorophyll concentrations. The chlorophyll concentration, the transmission and optionally the photosynthetic activity are determined simultaneously. The detection of different algal classes by excitation with coloured LEDs distinguishes this measuring instrument from its competitors. Part of the analysis is a yellow substances (CDOM) measurement to adjust the calculation of the total chlorophyll content. The integrated cleaning unit protects against growth problems during long-term measurement.

Specifications

DESCRIPTION	VALUE
Measurands	Total chlorophyll [µg chl-a/l], green algae [µg chl-a/l], blue-green algae [µg chl-a/l], diatoms [µg chl-a/l], cryptophyceae [µg chl-a/l], yellow substances correction, transmission (at 5 wavelengths), photosynthetic activity (Genty) – optional
Measuring range	0 - 500 µg chl-a/l
Resolution	0.01 µg chl-a/l
Transmission	0 - 100 %
Weight	19 kg
Dimensions (H x B x T)	420 x 600 x 200 mm
Protection class	IP 54
Voltage	230 V / 50 Hz; 110 V / 60 Hz
Power consumption	100 W
Temperature	Sample: 0 to 35 °C / Environment: 0 to 40 °C
Sample volume	30 ml
Maintenance	> 7 days
PC	PC with touchscreen, Windows
Options	Genty, modem, up to 16 4 - 20 mA and 16 digital outputs, SDI-12 with bbe converter, valve switch

FEATURES

- Quick, simple chlorophyll determination with algal class differentiation
- Monitoring of algae 24/7
- Determination of photo-synthetic activity (option)
- Little maintenance
- Simple operation
- Direct measurement without sample preparation by filtration or solvents
- Communication options in industrial fields
- RS232, LAN, USB
- Integrated cleaning unit for measuring chamber

APPLICATIONS

- Online water quality assessment
- Environmental monitoring
- Intake monitoring
- Chemical assessment
- Reservoir monitoring
- Cooling and production water monitoring
- Limnological work
- Research and teaching

Screenshot of the included and preinstalled bbe software for the analysis and display of the measured data.

IOcells

Simple, quick and highly sensitive – the first choice for ballast water assessment!

With the bbe 10cells device we have used our manufacturing experience of more than 2 decades of chlorophyll instrument production to venture into new measurement dimensions – the detection of single living algal cells. Microalgae are an ideal indicator in many applications since they make up the largest part of the biomass of small organisms. The 10cells is thus always the right choice when the smallest possible algal concentration has to be detected. The determination of the amount of algae is an ideal parameter for ballast water quality assessment. Using a modified PAM procedure (patent) the 10cells achieves a very low detection rate of only one living cell per ml. Thus, it is 10 times more sensitive than the limit required by the IMO (International Maritime Organization) and up to 100 times more sensitive than any other commercially available ballast water analysis instrument. Other typical applications are process control for drinking water production in waterworks or cooling water production in industrial plants. In daily use, the 10cells supports the controlled and efficient dosing of flocculants or biocides.

Specifications

IO cells

DESCRIPTION	VALUE
Measurands	Living algae cells
Measuring range	1 - 20,000 cells per ml
Detection limit	1 cell per ml (depending on filtrated volume)
Weight	2.5 kg
Dimensions (H x B x T)	258 x 243 x 117 mm
Protection class	IP65 with closed case IP22 with open case
Voltage	100 - 240 V / 50 - 60 Hz
Filter	8 µm standard (min. 0.2 µm)
Temperature	Sample: 5 to 35 °C / Environment: 5 to 35 °C (short-term)
Software	bbe I0cells-Software

FEATURES

- Field instrument with the highest sensitivity on the market
- Detection limit of one living algal cell/ml
- No use of chemicals
- Measuring time of less than one minute
- Robust
- Simple operation
- 4.3″ Display
- Data logger function
- Portable operation using batteries

APPLICATIONS

Harbour Authorities:

- Quick tests
- Conceived for portable use

BWT Plant Production:

- Helps to achieve correct dosing of Cl_2, ClO_2, O_3 and UV radiation
- Improves the efficiency of treatment plants

Ship Owners:

- Cost reduction due to detection of IMO-conform ballast water treatment

IOcells built into a robust case for mobile use.

AlgaeToximeter II

The online instrument for the detection of toxic substances and herbicides in water

The bbe AlgaeToximeter II continually monitors water for toxic substances and determines the algal classes present. Standardised algae are mixed with the sample water and their photosynthetic activity is determined fluorometrically. Damage to the algae – e.g. by herbicides – causes a reduction in photosynthesis and triggers an alarm above a user-defined threshold. Optionally, the sensitivity can be tested using a reference toxin. The results are comparable with the algae production test; they are however obtained within a significantly shorter time due to the measurement technology. The bbe AlgaeToximeter II works with a double sample loop for sample incubation and allows a short measuring cycle. The recorded data are synchronised and evaluated with an external PC.

Specifications

DESCRIPTION	VALUE
Measurands	Photosynthetic activity and inhibition, total chlorophyll, chlorophyll of 4 algal classes [µg chl-a/l], yellow substances, transmission
Chlorophyll	0-500 µg chl-a/l
Transmission	0-100 %
Chamber cleaning	Automatic cleaning piston
Weight	105 kg
Dimensions (H x B x T)	1100 x 600 x 680 mm
Protection class	IP54
Voltage || Power	110/240 V; 50/60 Hz || 600 W
Temperature	Sample: 0 to 30 °C / Environment: 0 to 28 °C
Sample volume	min. 100 ml
Maintenance interval	> 7 days
Sample inlet	free inlet / tube pump
PC (operating system)	Windows
Outputs	Modem, LAN, 2x analogue outputs 4-20 mA, 2x relay outputs, RS232

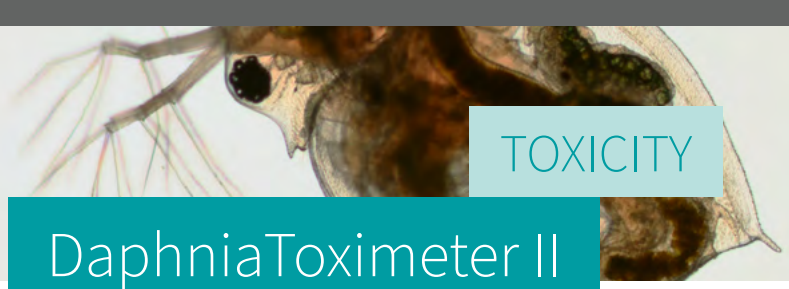
FEATURES

- Highest sensitivity in the detection of herbicides and their by-products
- Sensitive to a wide range of toxic compounds
- Controlled standardized algae growth
- Antifouling system due to automatic cleaning of chamber
- Auto-start after power failure
- Automatic turbidity correction
- Software settings according to customer's needs

APPLICATIONS

- Drinking water supply
- Reservoirs and intake monitoring
- Waterways monitoring and assessment
- Chemical and wastewater assessment
- Research and teaching

Sample water is mixed with the algae test solution and then analysed.



TOXICITY

DaphniaToximeter II

Biological early warning system with daphnia and computer-controlled video evaluation

The bbe DaphniaToximeter II observes daphnia (also known as water fleas – *Daphnia magna*) under the influence of a continuous flow of sample water and evaluates the occurrence of toxic substances using a sensitive alarm analysis. A CCD-camera records the behaviour of the daphnia, which are kept in a chamber fed with sample water (0.5-2 l/h). The live images are evaluated by the internal PC and investigated for changes in the swimming behaviour. Statistically significant changes in swimming behaviour trigger an alarm in the instrument. The control and monitoring of the instrument can also be carried out remotely.

Specifications

DESCRIPTION	VALUE
Measurands	Mean swimming speed, speed distribution, swim height, average distance, fractal dimension of the swim paths, swim paths, number of daphnia, distribution in the chamber, size of the daphnia
Chamber cleaning	Automatic cleaning piston
Camera	CCD-camera
Weight	60 kg
Dimensions (H x B x T)	800 x 800 x 500 mm
Protection class	IP54
Voltage || Power	110/240 V; 50/60 Hz || 600 W
Temperature	Sample: 0 to 30 °C / Environment: 0 to 35 °C
Sample volume	30 ml, 0.5-2 l/h, for filtration/ultrasonic 200l/h
Maintenance interval	> 7 days
Sample inlet	Free inlet / tube pump
Features	Integrated touchscreen PC, ultrasonic cleaning unit, algae feed syringe
Outputs	Modem, LAN, 2x analogue outputs 4-20 mA, 2x relay outputs, RS232
Options	2-chamber system, remote access

FEATURES

- 1- or 2-chamber system
- Simple operation
- Easy maintenance of daphnia, genetically defined daphnia stem
- Integrated, automatic feeding device
- Touchscreen PC with graphic display of measuring values, live images and intuitive user accounts
- Simple maintenance with easily accessible instrument module
- Sample preparation via ultrasonic filter
- Separate compartments for flow-through chamber and electronics
- Remote access (optional)

APPLICATIONS

- Drinking water production
- Process water surveillance
- Reservoir and intake monitoring
- Waterways monitoring and assessment
- Chemical assessment
- Research and teaching
- Monitoring of Waste Water Treatment Plant ef luent

The daphnia behaviour in sample water is observed in the measuring chamber by a CCD camera.

*Fish*Toximeter II

Real-Time Biomonitoring 2.0 NEW!

Continuous analysis of fish behavioural patterns for the detection of toxins in water. The bbe FishToximeter II observes the behaviour of fish in a tank under the influence of a stream of „sample“ water with the aid of a camera and continuous computer-assisted image analysis. This uncomplicated but highly sensitive instrument is designed to detect toxic substances in e.g. rivers, reservoirs, water supply systems, water treatment plant intakes and sewers. The instrument is based on the development of Extended Dynamic Daphnia Tests (EDDT), a tried and tested detection method in Europe and other parts of the world. This unique instrument enables the user to observe and analyse toxic contaminations, record them and react quickly to them. The bbe FishToximeter II is well-suited for the rapid detection of wilful or negligent damage to water systems. It is also conceived as a long-term monitor of water quality during „strategic“ analysis.

Specifications

DESCRIPTION	VALUE
Measurands	Average swim speed, speed distr., swin height, average distance, fractal dimension of swim paths: curviness, turns etc., number of fish, distribution in chamber
Easurement procedure	Video anaysis (USB-camera)
Weight	50 kg
Dimensions (H x B x T)	1125 x 858 x 600 mm
Protection class	IP54
Voltage || Power	110 / 240 V; 50/60 Hz || 200 W
Temperature	Sample: 5 to 28 °C dep. on fish / Environment: 5 to 30 °C
Sample volume	9 l
Maintenance interval	> 14 days
Fish feed	Automatic feeding unit
Numbers of fish	Up to 10 (4 - 6 cm length)
Sample inlet	Pressured tube 1 bar
Sample flow	50 - 150 l/h
Outputs	RS232, Ethernet, 3 USB, 2 relay outputs, 2 analog outputs 4 - 20 mA, HDMI, Modbus (optional)

FEATURES

- Physiologically fish are closely related to human beings compared to other organisms
- Low consumable costs
- User friendly
- Integrated automatic flowmeter
- Automatic feeder and aerator
- External heater for keeping the temperature suitable for fishes
- Dichlorination system for chlorinated water
- Broad range of output per request
- Easy to integrate with telecommunication system

APPLICATIONS

- Drinking water supply
- Dam monitoring
- Waterway quality analysis and assessment
- Intake surveillance
- Risk analysis

The behavior of the fish is permanently monitored with a USB camera

*Tox*Protect II

Rapid and reliable detection of toxins in the water supply

The bbe *Tox*Protect II is a fully automatic monitoring system to protect drinking water supplies from unintentional or intentional contamination by toxins. The characteristics of such threats are suddenly occurring, high concentrations of hazardous substances. Changes in water quality must be detected quickly and safely. One of the best organisms for this purpose is fish, which are kept in the flow-through aquarium of the *Tox*Protect II. The aquarium of the *Tox*Protect II is equipped with light barriers to measure the activity of the fish, thus determining their swimming behaviour by calculating the number of times they swim between the light sensors. This information is used to analyse their health status and therefore the water quality. If the behaviour of the fish changes due to contamination of the water, the instrument triggers an alarm. Error alarms in the *Tox*Protect II are reduced to an absolute minimum. This improves the confidence of operators and avoids unnecessary tasks.

Specifications

DESCRIPTION	VALUE
Measurands	Activity, position and length of stay at location
Sensors	78 light barriers to detect fish movements, 30 light barriers to detect immobilised fish
Weight	50 kg
Dimensions (H x B x T)	1125 x 858 x 600 mm
Protection class	IP54
Voltage || Power	110/240 V; 50/60 Hz || 200 W
Temperature	Sample: 5 to 28 °C dep. on fish / Environment: 5 to 30 °C
Sample volume	9 l
Maintenance interval	> 7 days
Fish feed	Automatic feeding unit
Numbers of fish	10 - 15 (4 - 6 cm length)
Sample inlet	Pressured tube 1 bar
Sample flow	50 - 150 l/h
Outputs	Ethernet, 2 USB, 2 relay outputs, 2 analog outputs 4 - 20 mA, Modbus TCP / IP (optional)

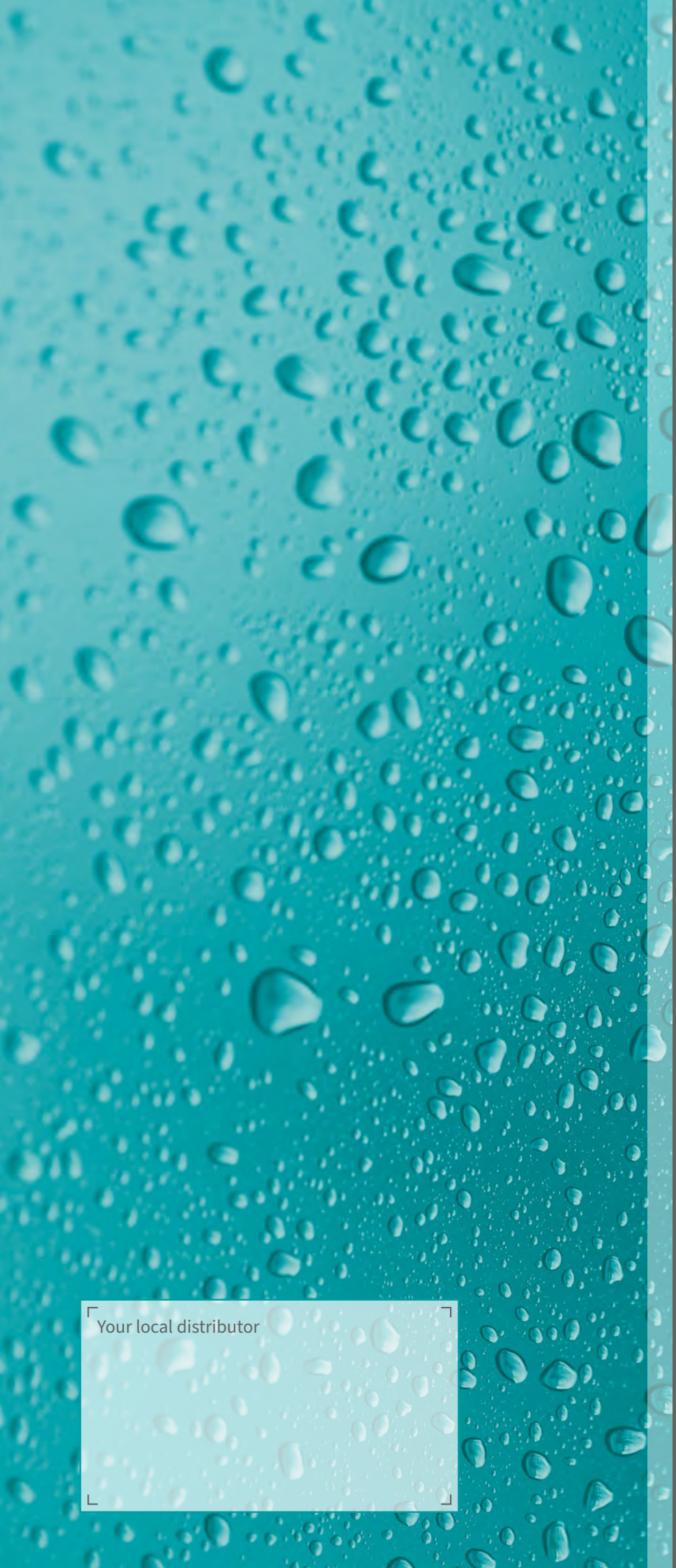
FEATURES

- Sensitive to a high number of toxins
- Reliable
- Easy to operate
- Low maintenance
- Low acquisition and operation costs
- Alarms possible via SMS or e-mail
- Threshold for alarm trigger individually adjustable
- Type of fish determined by the user
- Cyanide alarm within 10 min at 1 ppm
- Internal sensors indicate possible error functions

APPLICATIONS

- Waterworks
- Reservoir monitoring
- Surveillance of the drinking water distribution network
- Intake surveillance
- Chemical assessment

The ToxProtect II monitors the swimming activity of fish in an aquarium fed with drinking or mains water.



bbe
moldaenke

bbe Moldaenke GmbH
Preetzer Chaussee 177
24222 Schwentinental
Germany

Tel.: +49 (0) 431 - 380 40-0
Fax: +49 (0) 431 - 380 40-10

bbe@bbe-moldaenke.de
www.bbe-moldaenke.de

Your local distributor