



bbe

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■ Continuous visual analysis of Fish and Daphnia behaviour

The combined bbe Fish and Daphnia Toximeter

The advanced bbe Fish and Daphnia Toximeter observes young living zebra fish and Daphnia under the influence of a "sample" water stream. bbe has developed a sensitive instrument for the detection of toxic compounds in water bodies such as rivers, water treatment plant intakes and sewers. This instrument is based on the bbe Daphnia Toximeter, a proven instrument used in many countries. Continuous biological monitoring with the combined bbe Fish and Daphnia Toximeter enables rapid detection of toxic substances in water and provides an online real-time warning system. This unique instrument allows managers to rapidly detect, record and respond to incidents of toxic contamination. The combined Fish and Daphnia Toximeter is well suited to the detection of wilful or negligent damage to water systems. The bbe Fish and Daphnia Toximeter can also be used for long-term monitoring for the "strategic" evaluation of water quality.

Technology for water quality monitoring

The toximeter's continuous visual analysis of fish and daphnia movement enables rapid assessment of the fish's and daphnia's behaviour and health. Toxicity computations and assessments

- speed observation
- altitude
- turns
- circling movements
- growth observation
- number of living daphnia and fish

The incorporation of two simultaneous online test systems not only improves the quality of analysis statistically, but also the



The new bbe Toximeter, an instrument with a wide detection range

are based on the measurement of the following surrogate behavioural parameters:

instrument's sensitivity to different harmful compounds.

Observe your water quality by rapid online evaluation

Live video camera images are recorded and the signals are analysed online by an integrated PC. Any change in the behaviour of the fish or daphnia is examined and analysed and a parameter called the "toxicity index" is continuously calculated.

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THE ECOLOGICAL WATERSHED



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■ A two-in-one instrument for water toxicity assessment

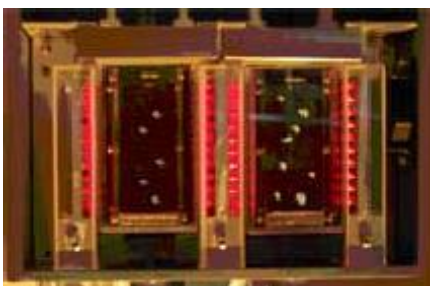
High sensitivity – low maintenance costs

The bbe Software

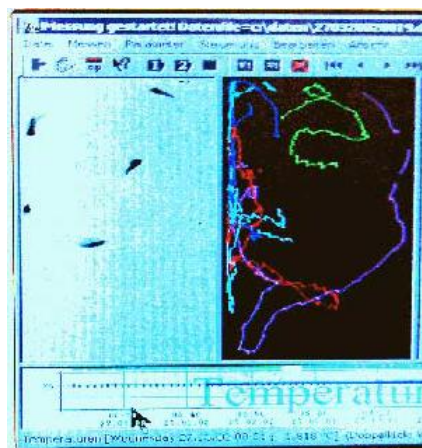
The bbe integrated Software recognizes significant changes in the behavioural data obtained from the live observation and recording of the fish's movement. Toxic events are clearly indicated as "alarms". A statistical approach enables alarm recognition even under difficult real-world conditions such as "noisy" or slow drift of the measured behavioural curve(s). The sensitivity of the alarm can be preselected and adjusted by the user based on the specific application. The bbe Software is compatible with other online toxicity assessment systems.

Simple to Operate

The integrated PC, running on Windows 2000, comes with a keyboard, an integrated mouse and a graphic display monitor. The bbe Software contains all the visual components of the bbe Toximeter. It provides a graphic presentation of the measured results with live, real-time pictures, offline viewing and an intuitive user interface.



Two-chamber system for simultaneous observation



Screen of the bbe Fish Toximeter:
left - digitized live picture
right - tracks of the fish

Options

The use of standard components for control and analysis in the bbe Toximeter allows for a number of options which can be included if required: connection to a local area network with permanent access to data remote maintenance of the computer system, remote or local automatic audio/visual alarm indicators via fax or pager.



Zebra fish and Daphnia Magna

Brief Technical Data

Two-chamber system

Easy maintenance for changing the testorganisms and cleaning

Chamber: temperature controlled

Feeding of fish / Daphnia via integrated continuously operating algae fermenter

Sample water filtration with integrated cross-flow-filter

Compact housing protection class IP54, steel varnished

Security separate compartment for flow through and electrical components

Weight 60 kg / 133 lbs

Size 600 x 600 x 500 mm / 23 2/3" x 23 2/3" x 19 "

Voltage 110-120V 60Hz or 220-240V 50Hz version

Power consumption 500 W

Measuring cycle 1-30 min

Analogue output 2 x 4-20 mA

Datalink 1 x RS 232

Network interface 10 / 100Mb Ethernet

Alarm (optional) 1 x dry contact

Data capacity 20 Gb HD

Modem 56 k

Sample temperature 0 – 30 °C

Maintenance interval > 7 days

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