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*Tox*Protect64

ToxProtect 64
Guard your water source

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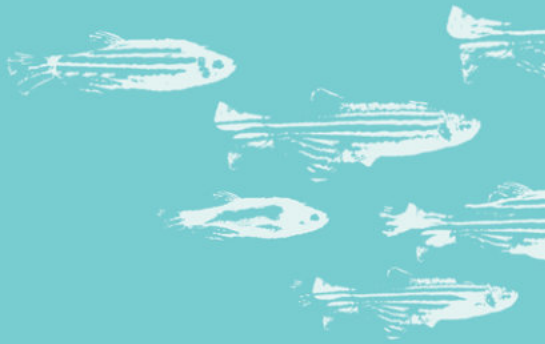
Quick and reliable
drinking water protection

the water watchdog

ENVITECH

www.envitech.co.uk   www.bbe-moldaenke.de

Aquarium of the *Tox*Protect64

Automated online surveillance

The *Tox*Protect64 is an automated monitoring system for the protection of a drinking water supply against accidental or malicious contamination due to harmful substances. The characteristics of such threats are a relatively high concentration of dangerous substances that occurs suddenly. This challenging task requires a number of important criteria to be met. Such a system MUST be sensitive to a wide range of toxins. The detection of toxins using fish is a well-established method, with sensitivity data for nearly every combination of fish and toxin readily available.

The test organisms must react to substances harmful to humans. The use of fish gives the closest practical comparison available in the expected scenario. False alarms MUST be reduced to an absolute minimum in order to increase user-confidence and avoid unnecessary expense. The *Tox*Protect64 uses an integrated alarm verification system to fulfil this requirement. It is easy to operate at affordable costs since for a high level of security, it may be necessary to employ multiple monitoring locations.

The *Tox*Protect64 is a low-price, low-maintenance device which can be installed at various sites within a water company.

Operation

The *Tox*Protect64 user interface allows easy control of the instrument. All readings are shown as numbers or as charts. The parameters of the *Tox*Protect64 measuring process can either be entered via the control panel or via the web interface.

Control panel

On the left, a parameter settings menu to select the relevant submenu, in the center a summary of parameter readings and on the right an LED test displaying the number of interruptions for each light barrier during the last 60s.

Control Panel of the *Tox*Protect 64

Detection Method

The *Tox*Protect64 monitors the swimming activity of up to 20 fish by measuring the frequency of interruptions of an array of light barriers. The result is given in inter- rupts per minute and fish. In the event of values falling below a given threshold for a certain time, the alarm verification process is initiated.

Additionally, immobile fish at the bottom and in the upper region of the aquarium are registered.

The fish species employed is user-select- able, with recommendations given in the specifications. Best results are obtained using agile fish of 4-6 cm in length.

Alarm Verification

Due to natural random variations of fish behaviour, any alarm criterion may be reached from time to time just by accident. Hence, to prevent false alarms, a veri- fication system is required. This is achieved by increasing the illumination inside the aquarium during verification.

Normally, this leads to a dramatic increase in the activity of the fish. Under toxic conditions, this may not occur. The in- strument thus accepts or rejects the alarm automatically.

Alarm Indication

The alarm indicator (traffic light) shows the current operating mode:

Red: alarm
Yellow: alarm verification
Green: normal operation
No light :   stand-by
Flashing green: start-up
Flashing yellow: failure

Instrument Malfunction Surveillance

The *Tox*Protect64 is equipped with internal sensors to monitor and report on instrument malfunction including:

D inadequate sample flow
D drain blockage
D temperature excursion
D accidental/unauthorised exposure of test chamber to ambient light
D high chlorine concentration
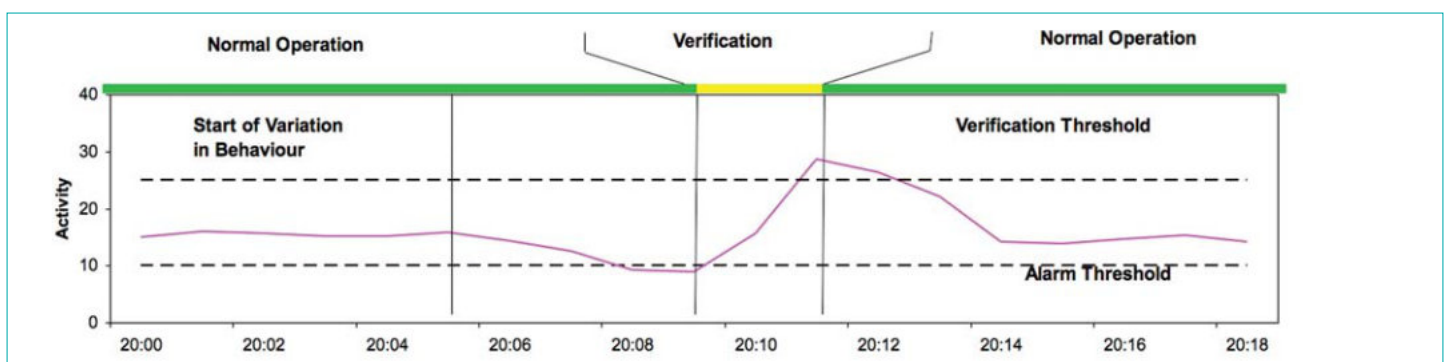D loss of dechlorination reagent

Optional Dechlorination System

For chlorinated drinking water the *Tox*Protect64 can be equipped with a dechlorination unit with integrated level control, a peristaltic pump and a total chlorophyll electrode.

Verified Alarm of the *Tox*Protect64
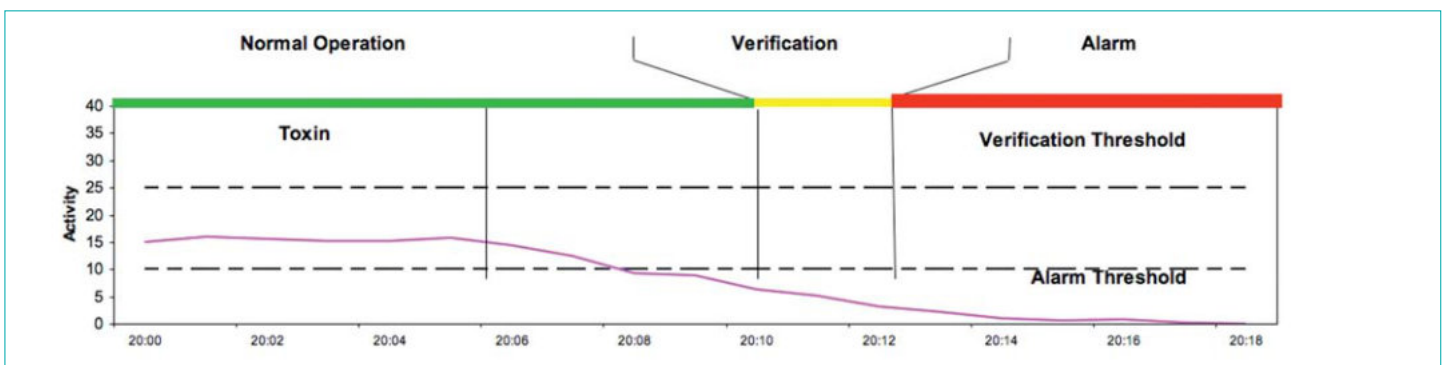
Discarded Alarm of the *Tox*Protect64

Applications

D municipal drinking water uptakes and distribution

D hotels and leisure centres

D hospitals, medical facilities

D apartment blocks, palaces and public buildings

D wells

Features

D array of 64 light barriers to detect fish movements

D 30 light barriers to detect immobile fish

D alarm verification system

D flow control

D temperature control

D overflow detector

D access via LAN, Internet or GSM

D PC data-evaluation software

D dechlorination option

Benefits

D continuous registration of movements all over the aquarium

D alarm-relevant signals

D reduction of false alarms

D low maintenance

D easy service

D reliable data evaluation

D add-ons

Specifications

*Tox*Protect64 (basic instrument without options)

Weight of the instrument	50 kg
Size (H x W x D)	800 x 790 x 444 mm^3
Power supply	110/230V @50/60 Hz
Power consumption	200 W
Sample temperature	5 - 28 °C
Sample flow	50 -150 l/h
Turbidity	< 40 FTU
Aquarium volume	9 l
Housing protection class	IP54
Relay outputs	4 x 24V 1 A contacts
Interface	LAN
Maintenance interval	7 days; 1 h
Recommended fish species	zebrafish, tiger barb, minnow, goldfish, bitterling – depending on the temperature; tests for other local fish on request
Feeding of the fish	automatic feeder with selectable intervals
Number of fish	15-20
Length of fish	4-6 cm
Recommended tank time of fish	4 weeks
Optional features	dechlorination system, visual alarm indicator, support stand for desktop operation, pressure reducer/strainer
Optional interfaces	4-20mA (2x), RS232, RS485, GSM, SCADA
Additional sensors	oxygen, pH, redox, conductivity, absorption; others available on request

Subject to alteration!