



# Environmental Analytics and Solutions

**DEFINE ► MEASURE ► APPLY**

Powered by  
**LAB SYSTEMS AND BIOTECH INDIA PVT. LTD.**

[environmentalanalyticsandsolutions.com](http://environmentalanalyticsandsolutions.com)

**MBR UF ETP / STP WATER TREATMENT  
FOR REUSE WATER QUALITY**

**MR. REEPAL JOSHI  
DIRECTOR MARKETING**



Contributing to



एक कदम स्वच्छता की ओर

## ORGANIZATION INFORMATION

LAB SYSTEMS AND BIOTECH INDIA PVT. LTD. is more than 24 years rich in experience Organization in the field of Measurement Analytics. With couple of Business Units as Business Verticals, the Organization has always delivered Quality and Sustainable Solutions to their Customer Partners.

ENVIRONMENTAL ANALYTICS AND SOLUTIONS is one of the business units that is Powered by the rich technical expertise in the field of measurement analytics catering to WATER and AIR. With the Philosophy of DEFINE, MEASURE AND APPLY the company caters to solutions for precise measurement of polluting analytes and matrices in real time. The Organization also offers Quality Solutions that supports Water Treatment, Re Cycling and Re Use.

Our Products and Solutions for Process Control and Compliance:

1. Instrumentation for measurement of parameters like Level, Flow, Temperature, Pressure etc.
2. Reagent less Laboratory COD, BOD, TOC, TSS, NO<sub>3</sub>, NO<sub>2</sub> Analyzers for Drinking and Potable Water, River Water, ETP and STP Water (Full Spectrum High Resolution UV-VIS Spectrometer).
3. Reagent less Online COD, BOD, TOC, TSS, Nitrate, NO<sub>3</sub>, NO<sub>2</sub> Analyzers for Drinking and Potable Water, River Water, ETP and STP Water (Full Spectrum High Resolution UV-VIS Spectrometer)
4. Digital Sensors for Online Measurement of Parameters like pH, TDS /Conductivity, DO, Turbidity, TSS, NH<sub>3</sub>, Chlorine, etc.
5. Online Analyzer Solutions for Measurement of Colorimetric analytes like Chromate, Silica, Hardness, Chlorides, Color, Cyanide, Phosphate etc.
6. Online Analyzer Solutions for Measurement of Specialized Parameters in Water like Algae Species, Toxicity and Total Bacterial Count.
7. Treatment Solutions like Fine Bubble Disc Diffusers, Tube Diffusers, Plate Diffusers and Ultra Filtration based MBR Membranes, Vertical Cloth Disc Filter, Electro Coagulation Units and Complete ZLD Solutions.
8. USEPA Validated Medium Pressure UV Disinfection System that offer 6 Log deactivation of Microbes and 4 Log reduction of Adeno Virus as Tertiary Treatment for Process Water.
9. Solutions for Online Measurement of Parameters for Ambient Air and STACKS etc.

Directors and Team of Helm

- Mr. Jay Vakil (vakil@labsystems.in)
- Mr. Suhas Kulkarni (suhas@labsystems.in)
- Mr. Reepal Joshi (reepal@labsystems.in)

## MISSION

Through continuous update and innovation and introduction of new technologies and solutions for a more cleaner future,. We aim to meet the highest standards of accuracy, precision and sensitivity, from frontier market research. Our high end quality solutions and services cover the complete spectrum with long Term value for money that Complies all stringent regulatory compliance and also ready to comply the future changes.

We are committed to provide the highest level of customer satisfaction and continually contribute in improving the quality of our products and services. We therefore welcome any customer suggestions, which we would evaluate and subsequently implement for the benefits to assist you in our drive forward to enhance our future performance.

In all our interactions, we help you to identify such initiatives that would make your company a cutting edge and competitive organization implementing more professional and ethical business practices.

Lab Systems & Biotech India Pvt. Ltd has been following simple philosophies since more than 2 decades. To continuously keep Introducing innovation and new state of art technologies and solutions that will help in building more cleaner and vibrant tomorrow

To make Environmental Analytics and Solution, the product of choice for all its users and customers in the field of Environment. To provide the highest quality product deliverable and to narrow down on solution specifications, for the analytical users.

To utilize the most advanced technologies for promotion of our high end solutions. To be focused on meeting the needs of our customers on regular basis. Integrity in dealings, Innovativeness in approach, Excellence in results



## VISION

“To be a recognized Brand Image not only as Solution Providers but also as support partners to make Lab Systems and Biotech India Pvt. Ltd the product of choice for all its users and customers”

Let us all together take Lead to protect our today and to make a better and cleaner Environment for tomorrow.

## WATER AND WASTE WATER SOLUTIONS, TECHNOLOGY PARTNERS



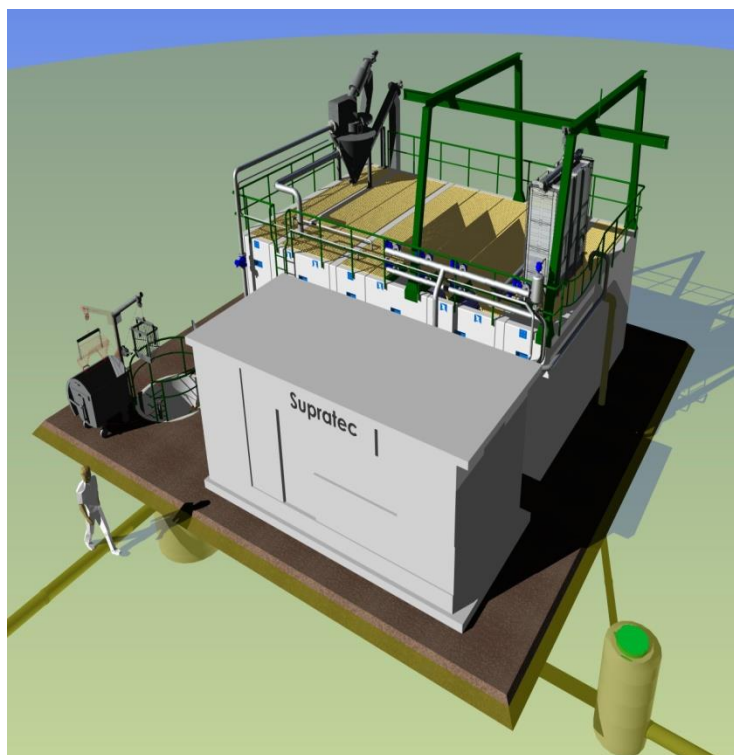
Power and productivity  
for a better world™



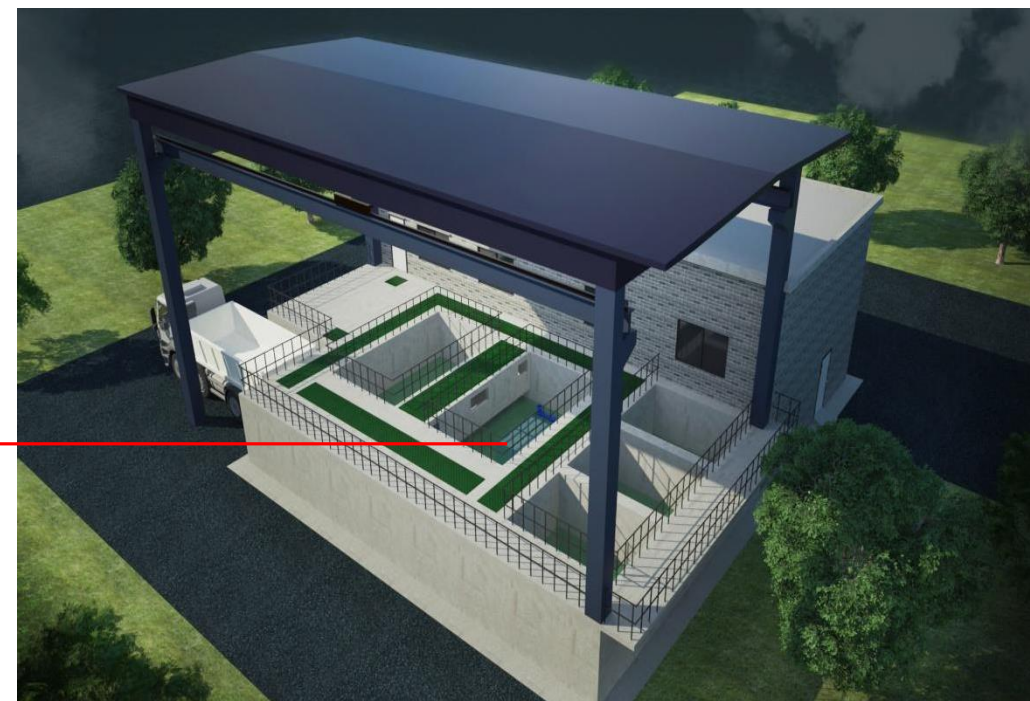
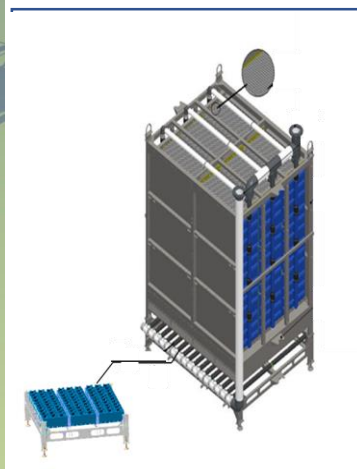
## AGENDA

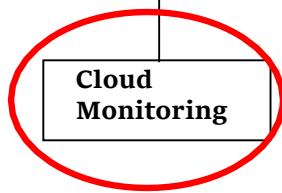
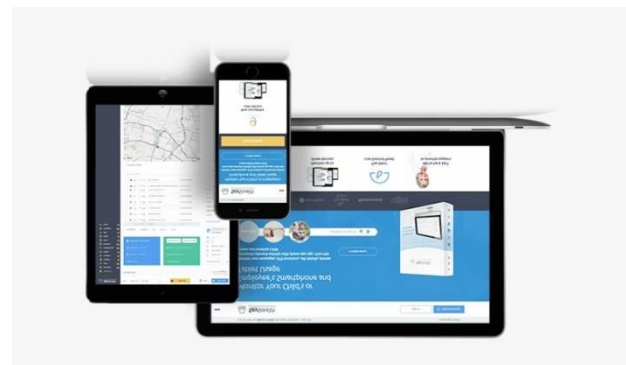
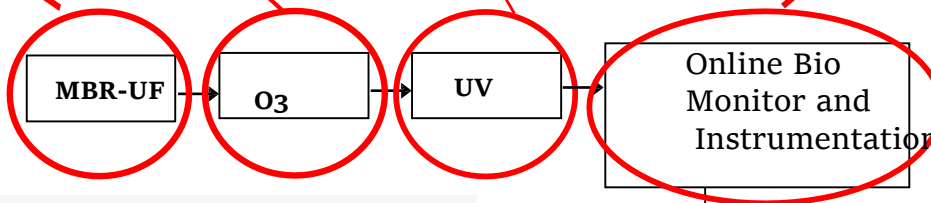
- Treatment Schematics for STP
- Treatment Technologies
- Online Instrumentation for Real Time Data
- MBR UF Detailed Presentation
- Treatment Technologies Brief Description
- Conclusion

## TREATMENT SCHEMATICS



Supratec FS 1200 UF  
Ultrafiltration Membrane  
Cassette





## TREATMENT TECHNOLOGIES



### **MBR (MEMBRANE BIO-REACTOR) WITH PVDF FLAT SHEET UF MEMBRANE WITH 0.03 MICRON PORE SIZE**

- No sludge accumulation
- Higher Anti-fibre capacity
- No fibre-broken phenomenon
- Permeate backflushable
- Minimized chemical cleaning demand
- Highest footprint density in flat sheet
- One of the biggest module membrane surface
- High flux for the whole life
- Innovative double module layers possible
- The most energy saving MBR in the world
- Low on opex



## TREATMENT TECHNOLOGIES



### OZONE GENERATOR FOR OZONATION

- Reduction of COD/BOD Parameters and Dissolved Mettalic Toxins
- Reduction in Microbial Activity
- Increase of DO from 0.8 mg/l to 5 mg/l

## TREATMENT TECHNOLOGIES



### HOD Medium Pressure UV Disinfection and Residual Ozone Decomposition

- Hydro Optic UV Disinfection System with Medium Pressure technology that offers no cell repair mechanism
- USEPA Validated for 4 log reduction of Adeno Virus
- USFDA Validated to offer Pasteurization Equivalent Water
- Integrated PLC that display UVT, FLOW, DOSAGE and LAMP LIFE
- Complete destruction of Ozone

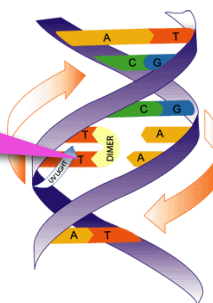
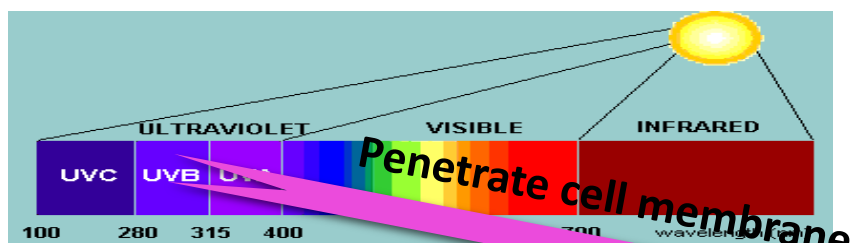
UV light inactivates cells by damaging their DNA

Medium Pressure (MP) UV lamps use entire germicidal spectrum (200 - 320nm) for much better efficiency

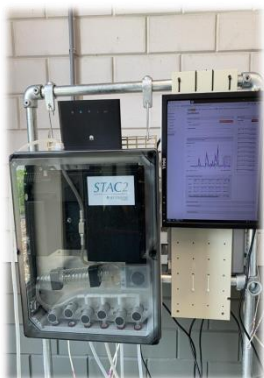
Creates Thymine Dimers to inhibit DNA replication

Medium Pressure totally inactivates cell repair mechanisms

Low pressure (LP) UV lamps use light at a single monochromatic wavelength of 253.7nm only



## ONLINE INSTRUMENTATION FOR REAL TIME DATA



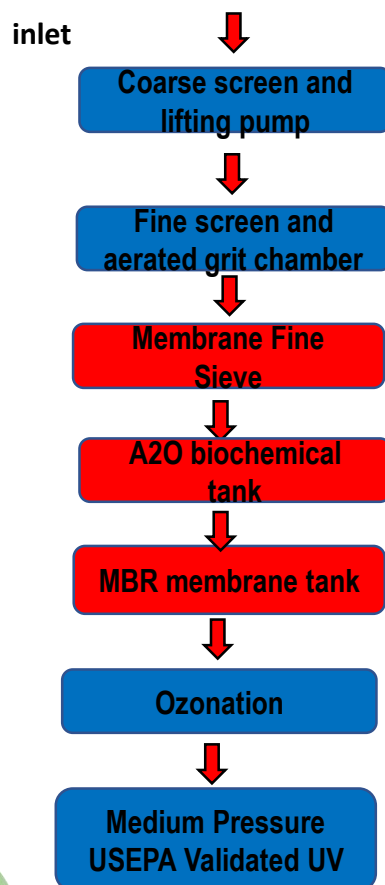
**Online Monitoring of Water Quality Parameters that can be used to monitor both inlet and outlet water quality with Cloud data monitoring**

- COD, BOD, TSS, NO<sub>3</sub> by Full Spectrum UV-VIS Spectroscopy as per CPCB Guideline
- pH, DO, Low Range Turbidity Sensors
- NO<sub>2</sub> (Nitrite), NH<sub>4</sub>-N and Phosphate
- Total Coliform Analyzer
- Chemical Toxicity Monitor



## MBR UF DETAILED PRESENTATION

### MBR process flow



BOD < 3 mg/l  
 COD < 50 mg/l  
 TSS < 3 mg/l  
 DO > 5 mg/l  
 COLIFORM < 5 LOG

Online Measurement channel

### MBR STP PROCESS

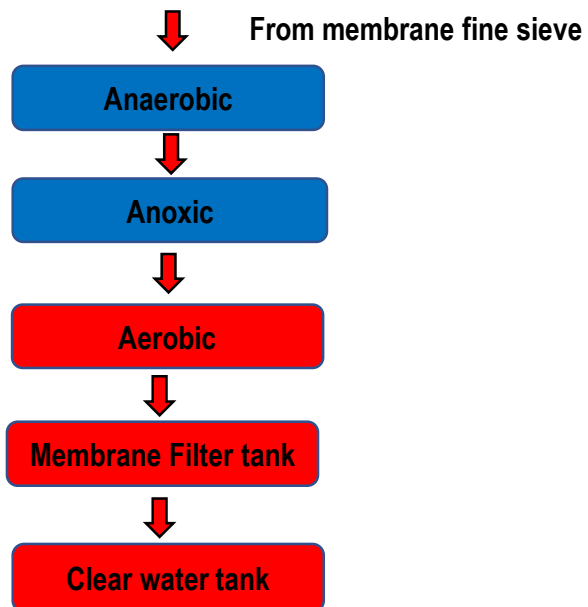
- PUMPS TO PUMP THE SEWAGE WATER FROM EQUILIZATION TANK TO ANAEROBIC CHAMBER
- COARSE GRID, FINE SCREEN AND MEMBRANE FINE SCREEN TO REMOVE FOREIGN PARTICLES AND HIGHER TSS PARTICLES FROM ENTERING THE A<sub>2</sub>O PROCESS
- ANAEROBIC COMBINED WITH ANOXIC (REMOVES NITROGEN AND PHOSPHOROUS COMPOUNDS)
- AEROBIC TREATMENT WITH DESIGNED AERATION SYSTEM TO ACHIEVE THE REQUIRED DO AND MLSS REDUCES COD/BOD TO REQUIRED LEVELS
- MEMBRANE TANK WITH 0.03 MICRON UF FILTRATION TO REDUCE TSS AND TBC (TOTAL BACTERIAL COUNT) TO REQUIRED LEVEL
- PLC UNIT FOR COMPLETE AUTOMATION

### ADD ON TREATMENTS FOR DO INCREASE AND MICROBIAL DEACTIVATION TO PASTEURIZATION QUALITY

- OZONATION
- MEDIUM PRESSURE UV DISINFECTION

## MBR UF DETAILED PRESENTATION

### A2O + MBR process flow



### A2O MBR PROCESS

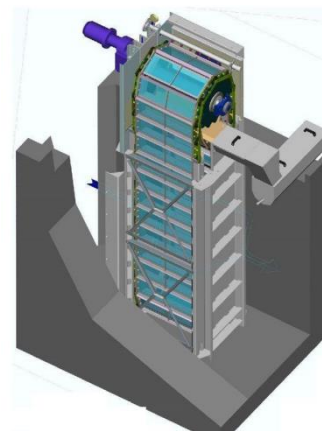
- ANAEROBIC COMBINED WITH ANOXIC (REMOVES NITROGEN AND PHOSPHOROUS COMPOUNDS)
- AEROBIC TREATMENT WITH DESIGNED AERATION SYSTEM TO ACHIEVE THE REQUIRED DO AND MLSS REDUCES COD/BOD TO REQUIRED LEVELS
- MEMBRANE TANK WITH 0.03 MICRON UF FILTRATION TO REDUCE TSS AND TBC (TOTAL BACTERIAL COUNT) TO REQUIRED LEVEL
- PLC UNIT FOR COMPLETE AUTOMATION
- OZONATION FOR DO INCREASE FROM 0.8 MG/L TO 5 MG/L
- MEDIUM PRESSURE USEPA VALIDATED UV TECHNOLOGY FOR 5 LOG REDUCTION OF MICROBES

# COARSE, FINE AND FINE MEMBRANE PREFILTRATION

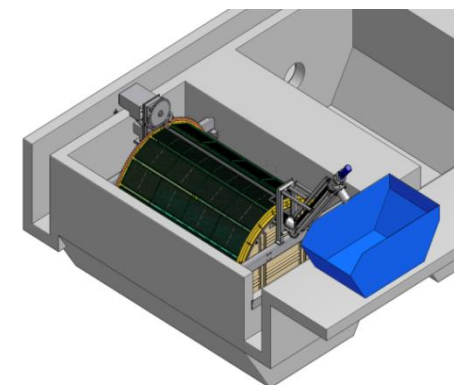
## PRETREATMENT SCREEN COMBINATION



**Coarse screen  
(15~25mm)**

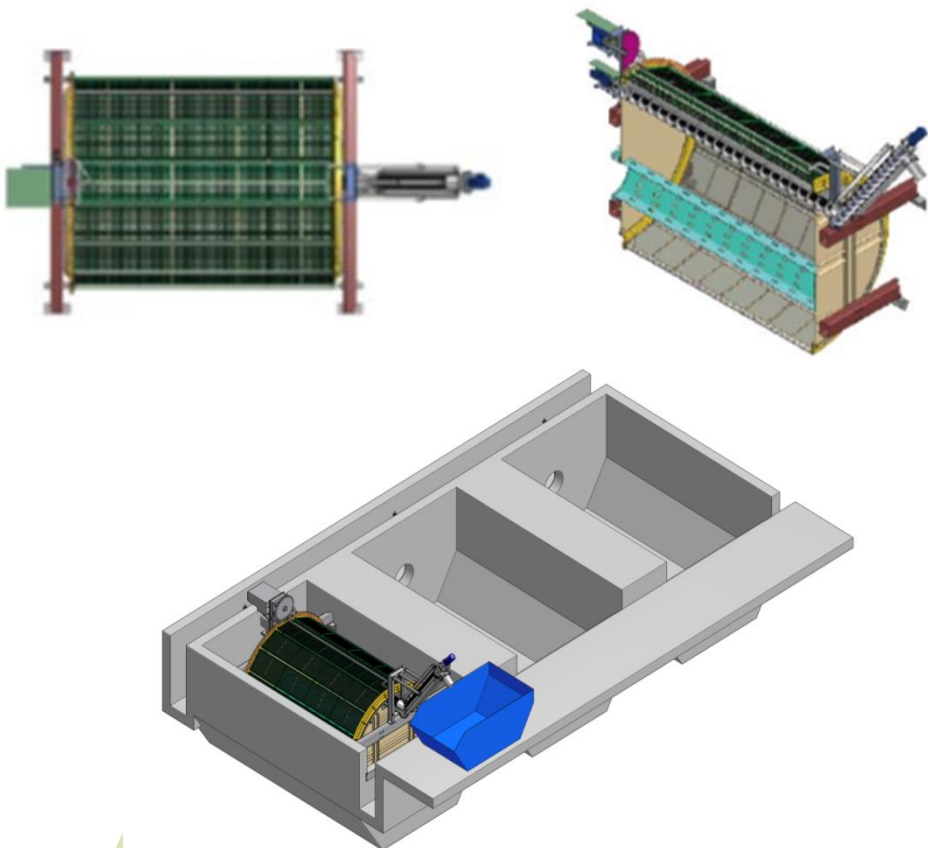


**Fine screen  
(3mm)**



**Membrane fine sieve  
(1mm)**

## MBR FINE SCREEN DETAILS

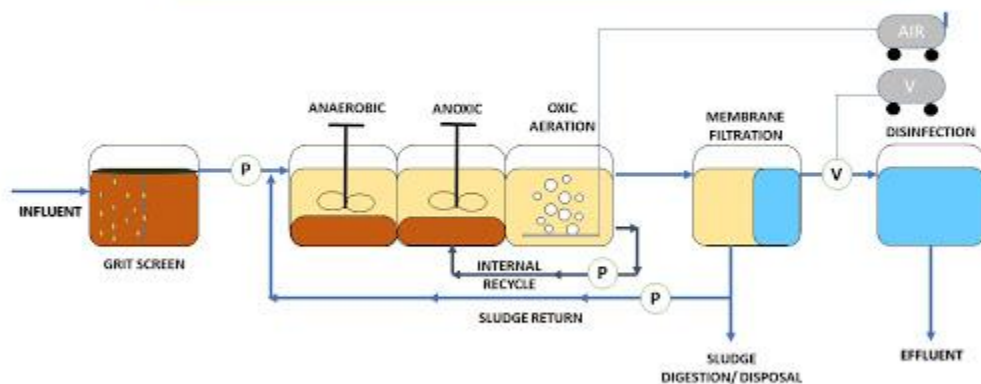


### MBR-RS Membrane Fine Sieve

- Large filtration area, small head loss
- Intelligent automatic operation, reliable performance, less maintenance workload
- All stainless steel production
- good anti-corrosion performance
- Easy to install

## MBR PROCESS SCHEMATICS

### Membrane Bio Reactor (MBR)



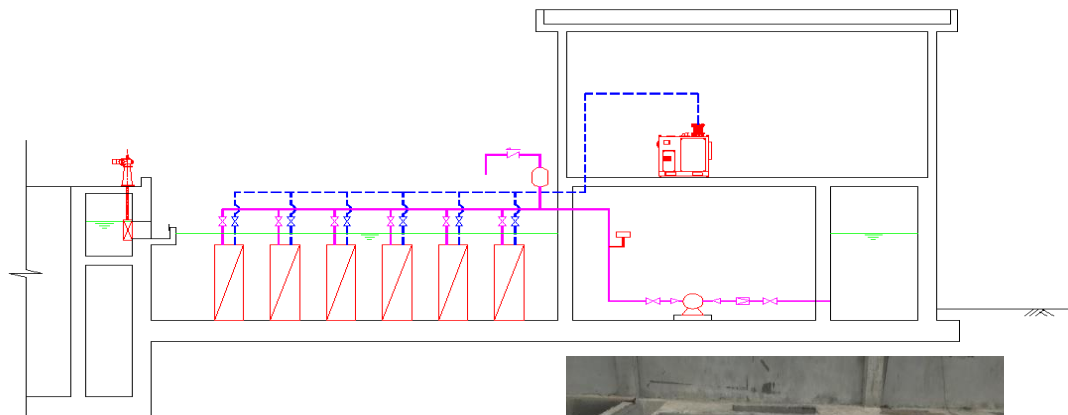
Membrane surface: 0,1 m<sup>2</sup>

### A2O MBR-PROCESS SCHEMATICS

- Anoxic and Anaerobic treatment for phosphorous and nitrogen removal
- Patented Plate Diffusers for highest Oxygen Transfer for COD/BOD reduction to Optimum level with highly Optimized MLSS between 8,000 mg/l to 12,000 mg/l and DO values.
- High Energy Savings due to high oxygen transfer ratio



## MBR PROCESS SCHEMATICS



### A2O MBR-FILTRATION SCHEMATICS

- Submerged Ultra Filtration Membranes with PVDF MOC offering 0.03 micron pore size for optimum removal of TSS, Microbes and TSS Carrying BOD and Microbes
- FLAT SHEET Membrane design with breading offering highest quality and very long service life
- **MADE IN GERMANY** in a fully automated plant.
- World leaders in FLAT SHEET manufacturing and supply

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### DIGITAL SMART PROBE SENSORS

#### ■ "DIGISENS" SENSORS

## ATLANTIUM HOD MEDIUM PRESSURE UV SYSTEM

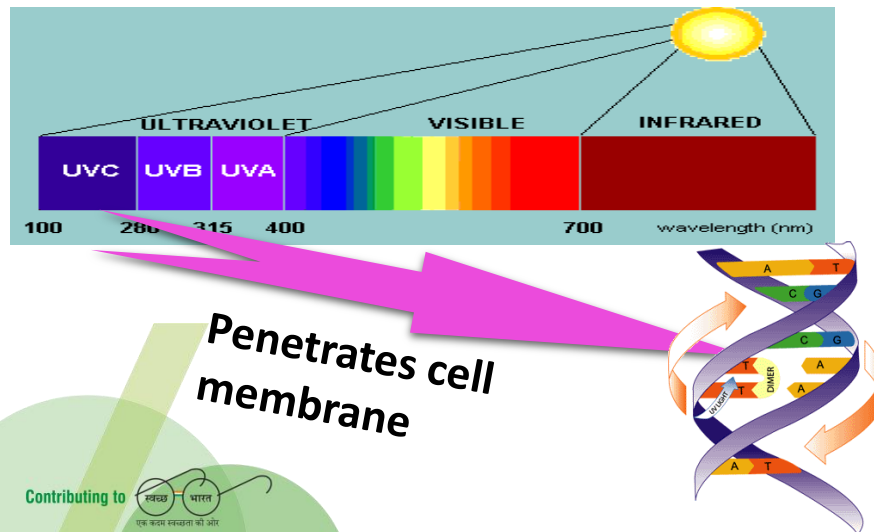
**DEACTIVATES EVEN COVID-19 nCOV2  
SARS CORONA VIRUS IN WATER TO  
4 LOG REDUCTION**

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION



### HYDROPTIC DISINFECTION SYSTEM (HOD)

- 62 Patents
- **USFDA VALIDATED** for **PATEURIZATION** equivalent water quality
- **USEPA VALIDATED** for **4 log reduction of ADENO VIRUS**
- Hydro Optic UV Disinfection System with Medium Pressure technology that offers no cell repair mechanism
- Integrated PLC that display UVT, FLOW, DOSAGE and LAMP LIFE
- UV light inactivates cells by damaging their DNA
- Medium Pressure (MP) UV lamps use entire germicidal spectrum (200 - 320nm) for much better efficiency
- Creates Thymine Dimers to inhibit DNA replication
- Medium Pressure totally inactivates cell repair mechanisms
- **Unlike Low pressure (LP) UV lamps that uses light at a single monochromatic wavelength of 253.7nm only**
- Low on opex



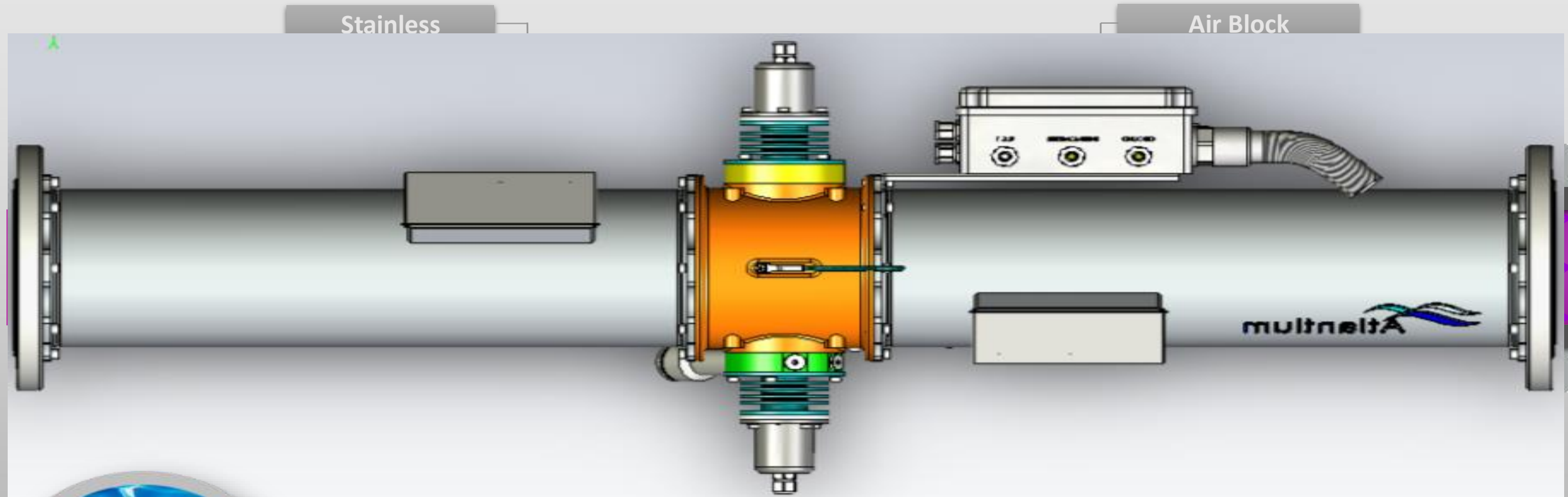
Atlantium's HOD uses "Total Internal Reflection", similar to the principle used in fiber optics, to deploy its UV light to ensure total destruction of bio-organisms



Hydro-Optic Disinfection (HOD) Technology



HOD system from Atlantium RZ series



Conventional



# USFDA and USEPA Validation Certification Compliance Examples



## ULTRAVIOLET DISINFECTION GUIDANCE MANUAL FOR THE FINAL LONG TERM 2 ENHANCED SURFACE WATER TREATMENT RULE

Office of Water (4601)  
EPA 815-R-06-007  
November 2006



Validated by third parties to meet the rigorous U.S. Environmental Protection Agency (EPA) protocols for full virus protection



## Grade "A" Pasteurized Milk Ordinance

Includes provisions from the Grade "A" Condensed and Dry Milk Products and Condensed Dry Whey Supplement to the Grade "A" PMO  
2009 Revision



PMO standards for pasteurized water equivalent



## Servicio Nacional de Pesca y Acuicultura



## Veterinærinstituttet Norwegian Veterinary Institute

Norway - in process

National regulations



Compliance with different standards authorities

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### DIGITAL SMART PROBE SENSORS

#### ■ "DIGISENS" SENSORS

**ONLINE pH/OPR, COND/TDS, DO,  
TURBIDITY, SALINITY, SLUDGE LEVEL,**

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### DIGITAL SMART PROBE SENSORS

#### ■ "DIGISENS" SENSORS



- pH/ORP, Cond/TDS, Turbidity, DO, Sludge Blanket, salinity, UV254 SAC (Spectral Absorption Coefficient), Multi channel Data Logger for Multi Parameters
- Probes based on over 50 years of PONSEL experience
- Applications for wastewater, sewerage networks, natural water, drinking water, etc.
- All calibration data (factory coefficients, offset, and slope) are recorded in the probe,
- Digital technology for extremely reliable data results
- Digital communication technology for Probe Sensors that offers direct 485 Modbus communication from Probe Sensors to any device. (straight to PLC/DCS and at times excluding the need of added local controller or display)**
- Available for both routine and applications demanding corrosion resistance



## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### DIGITAL SMART PROBE SENSORS

#### ■ "DIGISENS" TRANSMITTER – S 200



- The new S200 digital transmitter connects four PONSEL brand digital sensors to monitor the following parameters: pH, Redox, Temperature, dissolved Oxygen (by optical channel), conductivity, salinity, Turbidity (NTU), suspended material (g/L), Sludge Blanket (%), etc.
- The measured values are displayed and transferred by analog or digital means. The preconfigured regulatory functions also optimize process control.
- The S200 unit is related to a wide range of perturbation-resistant digital sensors: pre-amplification built into the sensor and digital processing of signals. All data regarding calibration, logs, users and measurements are processed directly in the sensor allowing for extremely reliable and traceable measurements.

Techno Commercially Feasible Intellectual S 200 Controller design that offers

- Four digital sensor inputs
- Two 4-20 mA outputs, 2 relay outputs
- Mobs RTU output

## Parameters and Instrumentation

### DIGITAL SMART PROBE SENSORS

#### ■ DIGISENS SENSORS - BREIF

# ONLINE $\text{NH}_4 - \text{N}$ AMMONIUM NITROGEN

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### DIGITAL SMART PROBE SENSORS

#### ■ "DIGISENS" SENSORS - Ammonium HYDRA®-DS - BREIF



- The Ammonium HYDRA®-DS Analyzer measures the concentraoon of dissolved ammonium as nitrogen ( $\text{NH}_4^+-\text{N}$ ) in water.
- The sensor uses three electrodes to determine the  $\text{NH}_4^+-\text{N}$  concentration, an Ammonium Ion Electrode, a Potassium Ion Electrode and a pH Electrode. It is designed for use in all kinds of water.
- Typical applications include monitoring environmental waters, lakes, streams and wells as well as wastewater treatment in aeration basins and effluent.

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### DIGITAL SMART PROBE SENSORS

#### ■ "DIGISENS" SENSORS - Ammonium HYDRA®-DS - BREIF

The Ammonium Ion Electrode provides the primary measurement. Any potassium ion in the sample generates a positive interference in the measurement, due to its similar size and charge to the ammonium ion. A Potassium Ion Electrode measures the amount of potassium ion present in the sample and T80 Transmitter subtracts the appropriate amount of signal from the Ammonium Measurement. The Ammonium Ion Electrode only measures the ammonium ion ( $\text{NH}_4^+$ ) not ammonia ( $\text{NH}_3$ ). Ammonium ion and ammonia coexist in a pH dependent ratio in solution. The more acidic pH values favor the  $\text{NH}_4^+$  and the more basic values favor dissolved ammonia gas,  $\text{NH}_3$ . The pH Electrode measures the pH and the T80 Universal Transmitter calculates the total  $\text{NH}_4^+ \text{-N}$  concentration based on the pH vs.  $\text{NH}_4^+$  concentration profile stored in the instrument. Temperature is measured and used to compensate each of the three electrode measurements. While the pH Electrode's response is well defined with respect to temperature, the ion electrodes,  $\text{NH}_4^+$  and  $\text{K}^+$ , tend to be less well behaved. For the best results, calibrate the sensors near the process temperature.

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### DIGITAL SMART PROBE SENSORS

#### ■ "DIGISENS" SENSORS - Ammonium HYDRA®-DS – BREIF

The Ammonium HYDRA®-DS Analyzer is configured to periodically actuate a cleaning cycle using the integral spray cleaner in the sensor. This minimizes the formation of biofilms or other coatings on the electrodes which keeps maintenance to a minimum. The period and duraoon of the cleaning cycles are user configurable. During the cleaning cycle the 4-20 mA output is held at either the last value or a preset value. The rugged HYDRA®-DS Sensor has 1 ¼” NPT rear facing threads for attaching an extension/immersion tube for easy installation from catwalks or handrails. The HYDRA sensor is submersible with an IP68 degree of ingress protection. The HYDRA sensor can not be supported by the cable and the cable must not be immersed in the water. A removable electrode guard facilitates easy electrode replacement when necessary. The HYDRA-DS is a digital sensor that allows any size length of cable.



## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

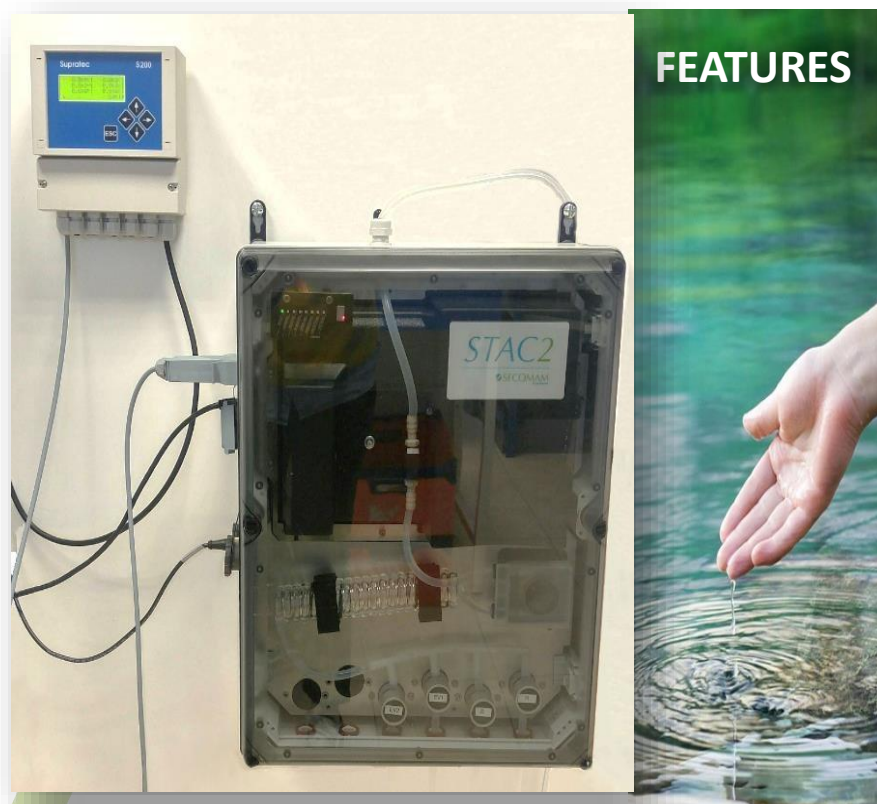
#### ■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER

**ONLINE COD, BOD, TSS, NO<sub>3</sub>, NO<sub>2</sub>**

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ STAC 2 FULL SPECTRUM SCANNING UV-VIS ANALYZER - FEATURES



Automatic sampling, Automatic dilution, Automatic cleaning  
**Complete Compliance as CPCB GUIDELINES for measurement of Water Quality Parameter for Changing Water Matrix**

Simultaneous Measurement of several parameters :

**COD, BOD, TOC, SS, NO<sub>3</sub>, NO<sub>2</sub>**

**1 to 4 channels -> 1 to 4 different sample Streams**

**Field replaceable path lengths 2 mm, 5 mm and 50 mm**

**Separate Algorithms for ETP, STP and Pure Water**

Quantitative & Quality information

1x Ethernet RJ45 port for MODBUS and/or HMI access

1x WIFI connection for HMI access

1x USB port for USB Key recorded data history backup

**S200 EXTERNAL DISPLAY**

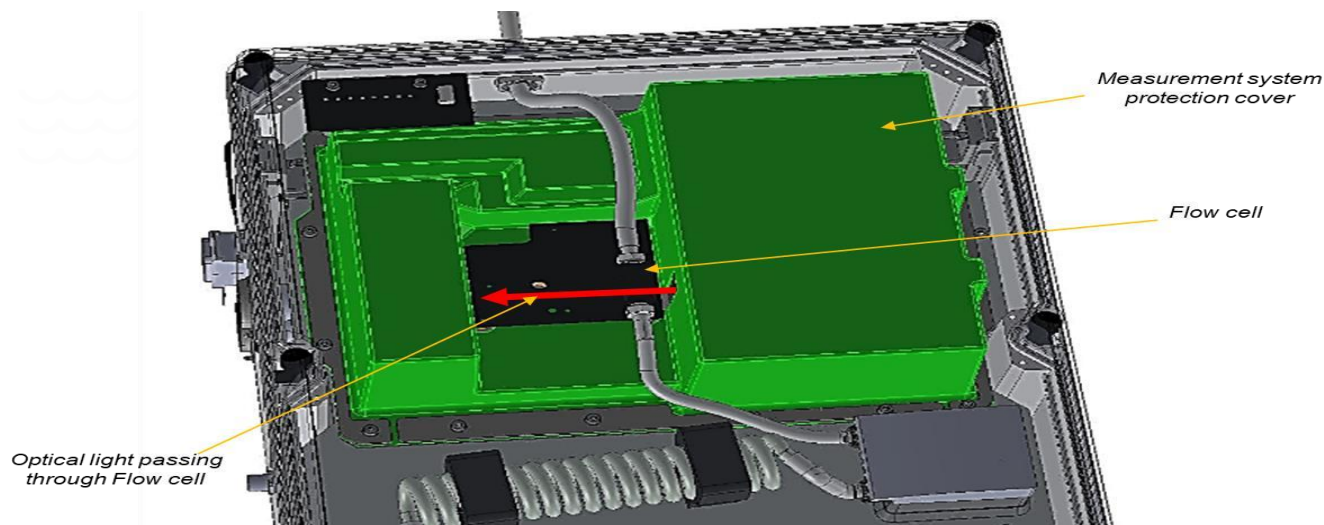
Connection via Modbus STAC2 output/Modbus S200 input

Display of mg/L concentrations and restitution in relation to UV models.

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – HARWARE WARRANTY



The optics (in green) parts includes **Hardware Warranty for 3 years by factory**

Optical system including **XENON lamp with more than 10 years expected life** and dedicated electronics & optics.

**Flow cell (2 mm, 5 mm and 50 mm optical path following the concentration to measure).**



## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER – KEY FEATURES

- 3 years Hardware Warranty on Entire Integrated Spectrometer
- Xenon Lamp source with more than 10 years life
- No running cost for Solvents or Chemical Kits needing measurements
- **Full Spectrum Scanning Spectrometer from 190 nm to 800 nm gives complete measurements of all carbon bands in the range from 190 nm to 400 nm and offers excellent turbidity and color compensation in the range from 400 nm to 800 nm.**
- The **Best in industry 1 nm resolution** and due to use of **Quartz Coated Optics** makes measurement possible for future upgrades for Parameters like Phenol, Nitrate, Nitrite, Aromatic Hydrocarbons, Total Pesticides, Organic Detergents, Humic Acid, Oxidizable Minerals, color measurements along with COD, BOD, TOC, TSS measurements with the same system.

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER - KEY FEATURES

- Ethernet, RS 485 MODBUS, WIFI protocols offered as standard with the system for two way communication
- Separate Algorithms for ETP, STP and Drinking Water
- **Field replaceable Pathlength upgrades Possible for 2 mm, 5 mm and 50 mm depending on lowest concentration and accuracy of measurement needed**
- Built-in USB Storage device makes possibility of storage of more than 1 year data.
- PC Software tools also available
- **Same System can be upgraded for measurement of up to 4 channel for 4 different process streams**
- Optionally 4..20 mA analogue signal outputs for multi channel measurements available
- **100% Field Serviceable unlike Dip type Sensors which either needs to be discarded or needs to be sent to factory for repairs which adds to expensive costing.**
- Data transfer to Validated servers of CPCB and SPCB via digitally interfaced protocols.
  - **TUV Certified as per requirement of CPCB Guidelines**

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ STAC SENSE DUAL WAVELENGTH UV-VIS SENSOR - FEATURES



- UV 254 spectral absorption without any reagents or consumables.
- Multi-parameter measurement: SAC254, CODEq, TOCeq & BODEq, Turbidity eq
- Modbus RS-485 digital communication.
- Automatic Turbidity compensation.
- **Digital communication technology for Probe Sensors that offers direct 485 Modbus communication from Probe Sensors to any device. (straight to PLC/DCS and at times excluding the need of added local controller or display)**

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ STAC SENSE DUAL WAELENGTH UV-VIS SENSOR - FEATURES

The Stac Sense probe uses UV absorption at 254 nm to measure organic compounds dissolved in water. This absorbance is correlated with the concentration of TOC, COD and BOD to provide a high-performance probe requiring no consumables.

A reference measurement at 530 nm is used to compensate for the presence of particles in the sample that also absorb UV light and to establish the Turbidity parameter.

The use of a state-of-the-art high-performance UV LED, combined with rigorous ignition management, offers an optimal variance of the signal.

The Spectral Absorption Coefficient (SAC) at 254 nm helps determine the Organic Content of a water sample but also the COD, TOC and BOD parameters by applying the appropriate correlation coefficients The Stac Sense sensor connects to any type of recorder, transmitter, remote management system or PLC using a Modbus RS-485 input. As a result of sensor indexing, more than 200 sensors can be connected to a recorder.

Interference-proofing: pre-amplification built into the sensor and digital signal processing.

All calibration, history, user and measurement data are processed directly in the Stac Sense

Probe and transmitted by a Modbus RS-485 or SDI-12 link.



## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

"INTELLACT" ONLINE ANALYZERS

■ CL<sub>2</sub> COLORIMETERS - PROGRAMMABLE ONLINE PHOTOMETERS

# ONLINE PHOSPHATE MONITORING.

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ CL<sub>2</sub> COLORIMETERS - PROGRAMMABLE ONLINE PHOTOMETERS - FEATURES



#### FEATURES



Automatic sampling, Automatic dilution, Oxydation Module  
Methods configurable for various analyte measurement

**1 to 2 channels -> 1 to 2 different sample Streams**

Cell Diameter: 16 mm or 26 mm

Lower range – bigger cell diameter

Number of Reagent Pumps (up to four – depending on the parameter)

Wavelength - depending on the parameter

#### ACCESSORIES

Sequencer Multi Stream (Upto 4 Streams)

Filtration Unit with Mounting set

Fast Loop Reservoir with level switch

Dilution Water Reservoir with level switch

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

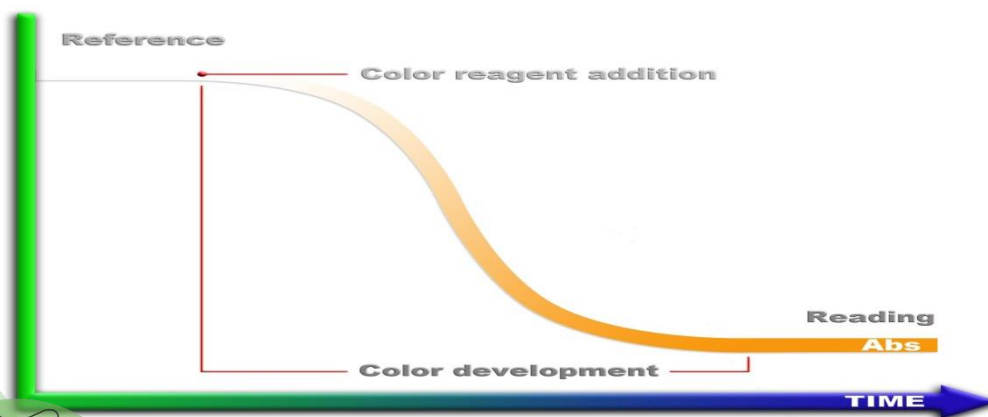
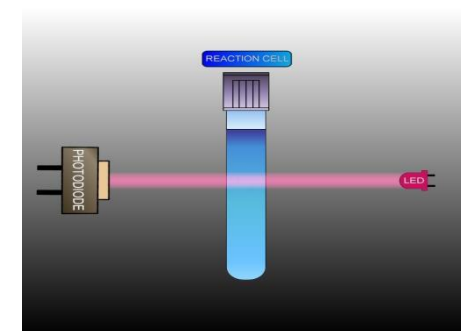
### "INTELLACT" ONLINE ANALYZERS

#### ■ CL<sub>2</sub> COLORIMETERS - PROGRAMMABLE ONLINE PHOTOMETERS – THEORY BREIF

**Analysis method: differential photometric absorbance**

3S Colorimeter makes two measurements during an analysis cycle:

The first step is the measurement of the raw sample and allow to compensate the colour and the turbidity of the sample and the fouling of the cell



The second step is the measurement of the sample after reagent addition and reaction time. The concentration is measured with the absorbance calculated with the difference between the two measurements and with the stored calibration parameters.

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ CL<sub>2</sub> COLORIMETERS - PROGRAMMABLE ONLINE PHOTOMETERS - KEY FEATURES

**Easy configuration** With our modular configuration we can automate your color laboratory method with up to four reagents.

**Dual compartment enclosure** To ensure complete separation between electronics and hydraulics.

**Touchscreen interface** Simple and user friendly menus and functions. Internal datalogger with USB data download

**Separate waste line for sample containing reagents**

**Long autonomy, low maintenance, low operating cost**

**Rugged and reliable**

Designed for industrial and environmental on-line applications, ensures the highest level of robustness in the electronics, mechanics and hydraulics components.

**Easy installation and operation**

To start measurement is enough to power the analyzer and connect reagents, sample and waste line.

**Low reagent level alarm**





## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ STAC 2 COMPLETE SPECTRUM UV-VIS ANALYZER - BREIF

**ONLINE OZONE, RESIDUAL CHLORINE,  
FREE CHLORINE, REACTIVE CHLORINE**

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ OZONE /CHLORINE WITH pH - ONLINE OZONE AND CHLORINE MONITORING SYSTEM - BREIF



#### FEATURES

The principle of measure is based on potentiostatic sensor, without reagent or consumable, on a closed-loop so reducing the costs of functioning and avoiding the loss of online water. The whole WCS for Ozone/ Chlorine includes all necessary for the measure of concentration : electrode potentiostatic indestructible for the measure of Ozone, chlorine electrode pH, and compensation in flow, room of opaque measure, closed loop. Function of automatic auto-cleaning by electrolysis allowing to dissolve the firm deposits: limestone or fats.

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ OZONE /CHLORINE WITH pH COMPENSATION - ONLINE OZONE AND CHLORINE MONITORING SYSTEM - KEY FEATURES

##### **Self cleaning of the system**

Accurate measurement of Ozone / Chlorine concentration with pH measurements

Measuring principle Free Chlorine/Ozone **Potentiostatic with one gold ring with excess of 4 years life**

Measuring principle pH, Reference used on the pH probe Combined electrode reference / measure

Temperature : -30.00 to +140.00 °C

Complete system plug and play.

Access to the menus of programming secured via password (3 user's levels).

Controller possessing numerous possibilities of piloting: 2 digital output for the control of the frequency of functioning of dosing pump, 3 relay output potential free NO contacts., 2 analog output 0/4-20 mA, 2 separately adjustable PI..controllers.

Temperature compensation manually or by using a Pt100 or Pt1000

Calibration of the pH with automatic detection of the value of the buffer solution

Calibration of Ozone / Chlorine with DPD method in single point



## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ BACT CONTROL – ONLINE BACTERIA MONITORING

# ONLINE BACTERIA MONITORING

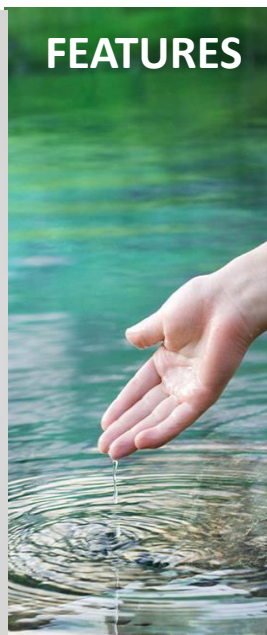
## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ BACT CONTROL - ONLINE BACTERIA MONITORING SYSTEM - FEATURES



#### FEATURES



US patent No.8,518,246 -US 2010/0193313

Based on Patented Fluorescent measurement

Automatic sampling

Methods configurable for four different types of Bacterial measurement

$\beta$ -Glucuronidase-> indicates *E.coli* activity

$\beta$ -Galactosidase-> indicates Coliform activity

Alkaline Phosphatase -> indicates Total Activity

$\beta$ -Glucosidase -> indicates Enterococci

1 to 2 different sample Streams

Online Real Time measurement every 90 mins compared to 3 days to 5 days by conventional methods

## TREATMENT TECHNOLOGIES BRIEF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ BACT CONTROL - ONLINE BACTERIA MONITORING SYSTEM - BRIEF

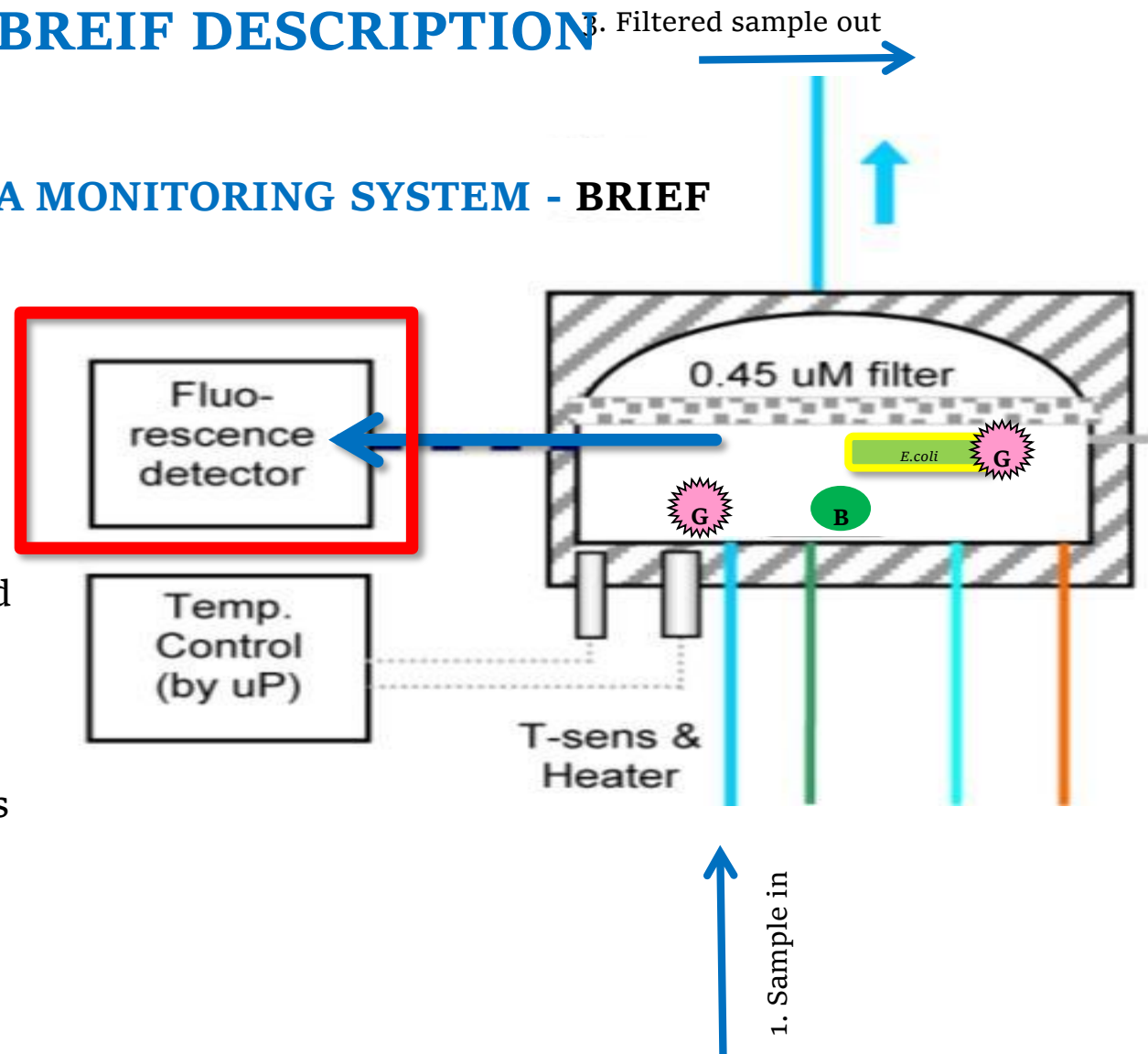
- The BACTcontrol is an “early warning system”, complementing the officially accepted methods for the detection of microbiological activity. The measurements are realized in a short period of time, 1-2 hours, depending on the sampling volume and cleaning procedures. This is in contrast to classical microbiological methods, which are labor-intensive and in which cultivation of the organisms is required, taking several days before obtaining reliable results (24-48 hours).
- The BACTcontrol is an online automated instrument for the detection of microbiological activity in water. It measures the specific enzymatic activities of  $\beta$ -galactosidase (coliforms),  $\beta$ -glucuronidase (E.coli) and alkaline phosphatase (total activity, biomass), as an indicator of the presence of bacterial contamination. The enzyme activity is detected by adding reagents (consumables) which contain a fluorescent indicator. The reagents are substrate-specific for the enzyme to be detected, meaning that there is an increase in fluorescence when the enzyme is present in the sample.

# TREATMENT TECHNOLOGIES BREIF DESCRIPTION

## "INTELLACT" ONLINE ANALYZERS

### ■ BACT CONTROL - ONLINE BACTERIA MONITORING SYSTEM - BRIEF

- Sample going into the reaction chamber
- Sample is filtered and E.coli stays in the reaction chamber
- Filtered sample goes to waste
- Buffer is added
- EC solution ( $\beta$ -Glucuronidase) is added and reacts with the enzyme in the bacteria
- A fluorescent compound (methylumbelliferone) is released which is measured by the FluMini (detector)



Excitation is at 366nm

## Parameters and Instrumentation

### "INTELLACT" ONLINE ANALYZERS

#### ■ BACT CONTROL - ONLINE BACTERIA MONITORING SYSTEM - KEY FEATURES

- Integrated PC with Windows
- Graphical user interface with touchscreen
- Full network capability via direct LAN
- 2 x USB 2.0 type A
- 2 x LAN 10/100/1000MB/s; RJ-45
- 2x digital input
- 2x relays output
- Protocols: Modbus TCP and Modbus serial, others on request
- 1 x 4 - 20mA outputs
- English operating system: German, French and Spanish, and others on request
- Modem slot for UMTS, ISDN or analog (modem optional)
- Second sample inlet / extra rinsing
- Air-conditioning unit (if higher than 30°C / 86F)



## Parameters and Instrumentation

### "INTELLACT" ONLINE ANALYZERS

#### ■ BACT CONTROL - ONLINE BACTERIA MONITORING SYSTEM - KEY FEATURES

- **Automatic cleaning**

- User selectable cleaning cycles
- Cleaning solution (sodium hypochlorite solution < 0,05% active) prevents fouling and enables unattended deployment for several weeks.
- Protection classification: IP 54
- Power consumption (average): <100W
- 1 programmable pump (sample).



## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

"INTELLACT" ONLINE ANALYZERS

■ TOX CONTROL – ONLINE CHEMICAL TOXICITY ANALYZER

# ONLINE CHEMICAL TOXICITY MONITORING

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ TOX CONTROL - ONLINE CHEMICAL TOXICITY MONITORING SYSTEM - FEATURES



The TOXcontrol measures by reacting to a broad range of toxic contaminants in water

Have been tested on > 5,000 chemical substances (Kaiser et al).

The test is sensitive to different substance groups within a relatively short time frame (5 to 15 minutes)

Robust, reproducible and verifiable

**Validated by US-EPA**

**Conform ISO Norm 11348 part 1 using freshly prepared bacteria**

Both positive and negative control samples

Blank for negative control

ZnSO<sub>4</sub> (10 mg/L) as positive control

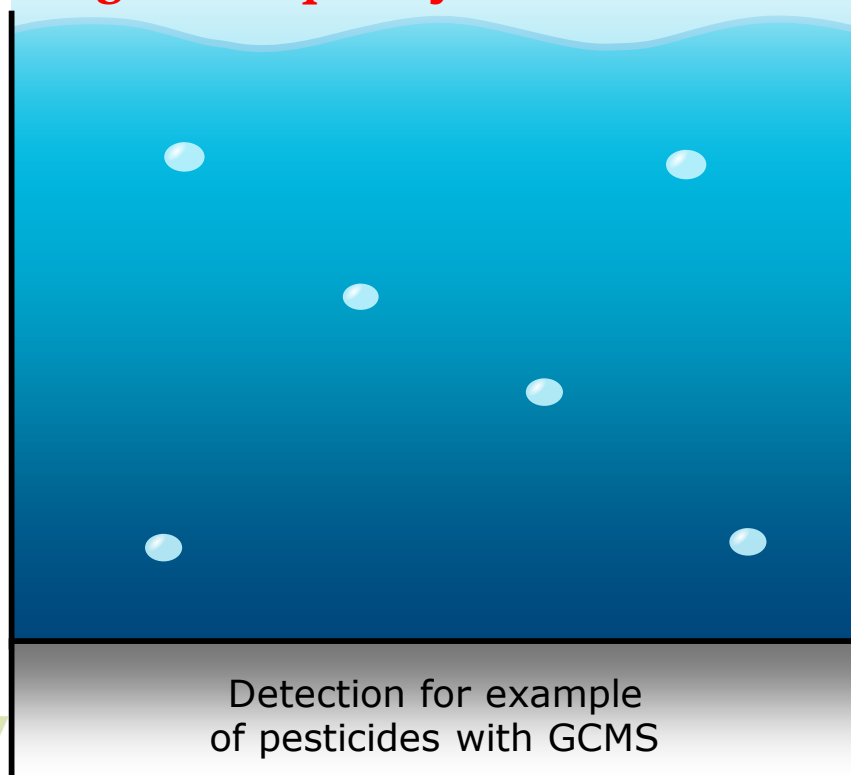
**Online Real Time measurement every 15 mins compared for any chemical complex contributing to toxicity in water**

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

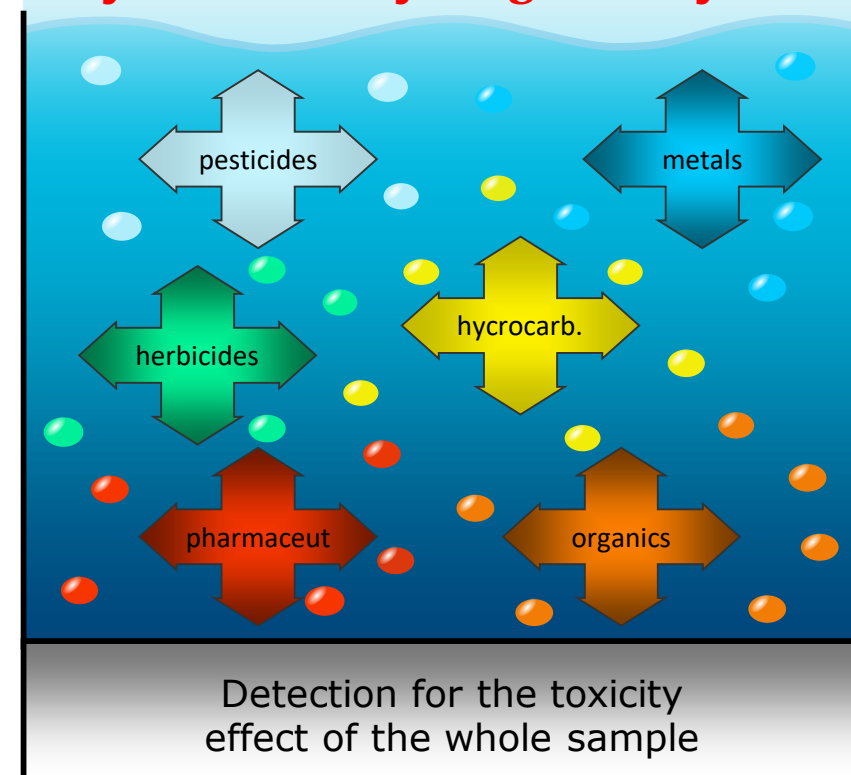
### "INTELLACT" ONLINE ANALYZERS

#### ■ TOX CONTROL - ONLINE TOXICITY MONITORING SYSTEM - BRIEF

Screening water quality for chemical toxicity induced for any chemical by single analysis method



Measures  
**% Toxicity**



Response in a GCMS is limited to the number of compounds that are known in the database and allow this type of analysis (e.g. compounds which are sufficiently volatile), and depending on the columns, eluates etc, etc.

# TREATMENT TECHNOLOGIES BREIF DESCRIPTION


## "INTELLACT" ONLINE ANALYZERS

### ■ TOX CONTROL - ONLINE TOXICITY MONITORING SYSTEM - BRIEF


**Screening water quality for chemical toxicity induced for any chemical by single analysis method**

It still is possible to analyse for traces for major of bio and chemical substances, which are brought into by nature or by man kind with the most advanced instruments it's only possible to detect them and take appropriate solutions

✓ Biomonitoring will show the possible dangerous effects of the total water sample !



Disinfection and Detection  
by other instruments



Disinfection and Detection  
by  
Biomonitoring

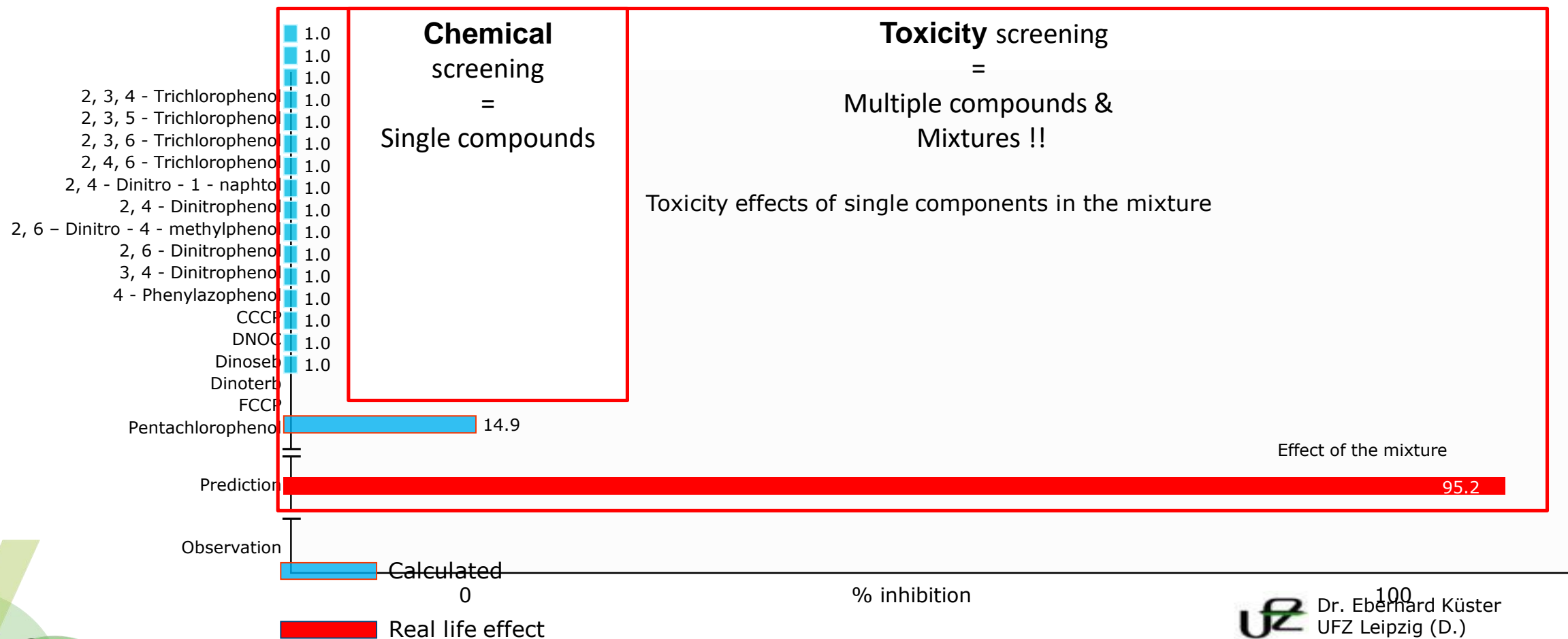


Detection of a total  
Water sample  
small portion!

# TREATMENT TECHNOLOGIES BREIF DESCRIPTION

## "INTELLACT" ONLINE ANALYZERS

### ■ TOX CONTROL - ONLINE TOXICITY MONITORING SYSTEM - BRIEF



## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ TOX CONTROL - ONLINE CHEMICAL TOXICITY MONITORING SYSTEM - KEY FEATURES

Sample temperature: 15 - 30 degrees C.

- Communication:

a. standard: TCP/IP, Analog output: 4 – 20 mA

b. optional: external USB modem 56k

c. optional: External COM port for MODBUS data communication.

- Cabinet: protection class IP 31.

- In-line, automatic dechlorination is possible - Connections:

a. Drain : waste and positive control: 20 mm (external)

b. Feed : sample and reference: 4 mm (external, for silicone tubing)

## TREATMENT TECHNOLOGIES BREIF DESCRIPTION

### "INTELLACT" ONLINE ANALYZERS

#### ■ TOX CONTROL - ONLINE CHEMICAL TOXICITY MONITORING SYSTEM - KEY FEATURES

- Smaller footprint: 50x50x 183 cm (D x W x H).
- Communication : integrated 4-20 mA signal, TCP/IP
- Optional: modem for telephone connection or additional RS232 connection.
- Very reliable, low running & maintenance cost.
- TOXview software for data acquisition & evaluation.
- Can be used with automatic, in-line dechlorination.
- Optional UV-Vis sensor (STAC Series) for TOC, BOD, turbidity, SAC254, NO<sub>3</sub>-N.



# TREATMENT TECHNOLOGIES BREIF DESCRIPTION

## "INTELLACT" ONLINE ANALYZERS

### ■ TOX CONTROL - ONLINE TOXICITY MONITORING SYSTEM - VALIDATION

#### TOX CONTROL USEPA VALIDATION 2005, CINCINNATI, USA

- TOX Control was tested in the Sentinel US EPA project




### Toxicity test results:


- 3,6 ppm toluene: 10%
- 5,6 ppm toluene: 25%
- 3,2 ppm atrazine: 10%
- 6,7 ppm atrazine: 25%
- 0,21 ppm copper: 10%
- 0,24 ppm copper: 25%
- 50 ppb cyanide 25% (30 min)
- 1,0 ppm cyanide: 10%
- 2,4 ppm cyanide: 25%
- 0,4 ppm diazinon: 10%
- 0,7 ppm diazinon: 25% (15min exposure)

## CONCLUSION

- It still is possible to disinfect to purest the highest log reductions and analyse for traces for major of bio and chemical substances, which are brought into by nature or by man kind
- with the most advanced instruments it's only possible to detect them and take appropriate solutions
- Atlantium Medium Pressure HOD UV technology will disinfect for major of bio contaminations and Biomonitors will show the possible dangerous effects of the total water :



Disinfection and  
Detection by other  
instruments



Disinfection and  
Detection by  
Biomonitors



## CONCLUSION

ATLANTIUM HOD UV DISINFECTION SYSTEM ALONG WITH ONLINE BIO MONITORING SYSTEMS WILL DELIVER HIGH WATER QUALITY FOR PATIENTS HOSPITALIZED WITH SEVERED CONDITIONS AND WHO AND UNDERGOING TREATEMENTS ENSURING NO SECONDARY INFECTIONS DURING THE TREATMENT

### WHY TRUST THIS DISINFECTION TECHNOLOGY AND ONLINE BIO MONITORS FOR HIGH RISK PATIENTS

USFDA VALIDATED FOR PASTEURIZATION EQUIVALENT WATER QUALITY  
USEPA VALIDATED FOR 4 LOG REDUCTION OF ADENO VIRUS  
ONLINE REAL TIME SCHEDULED DATA BIO MONITORING SYSTEMS VALIDATED TO USEPA  
25 YEARS OF PROVEN EXPERIENCE WITH GLOBALLY INSTALLED BASE

**Do you have any Questions and Queries??**

## CONCLUSION

With the State of art technology of MBR UF with Ozonation and Medium Pressure UV, Reuse Standards as per CPCB/NGT Guidelines can be very well achieved

### **FINAL WATER QUALITY AS PER CPCB/NGT GUIDELINES (INLET QUALITY SHOULD BE AS PER REQUIRED SPECIFICATIONS)**

BOD < 3 mg/l (FOR STANDARD STP TREATMENT WITH STANDARD INLET PARAMETERS)  
(AS PER NGT STANDARDS FOR BATHING WATER QUALITY / RIVER DISCHARGE QUALITY)

COD < 50 mg/l

TSS < 5 mg/l

DO > 5 mg/l

TOTAL COLIFORM 5 log reduction (Non detectable limit)

Also with the use of all Online Instrumentation, a close check on water quality parameters can be very well achieved to ensure optimum safety

Do you have any Questions and Queries??



# THANK YOU FOR YOUR KIND ATTENTION



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**DEFINE ▶ MEASURE ▶ APPLY**

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