



BLU-SENTINEL PRO

AQUATICS ANALYZERS/CONTROLLERS

The Blu-Sentinel Pro pool water controller has been designed to optimize pool and spa water disinfection to help in ensuring a safe and enjoyable bather experience. The controller measures not only the pH and ORP (oxidation reduction potential) with the time proven reliability of the Strantrol pH and ORP sensing technology but also incorporates an amperometric bare electrode for a free chlorine measurement. The bare electrode surface of the free chlorine measurement are kept clean via a hydro-mechanical cleaning process by continuously circulating a cleaning grit past the free chlorine bare electrodes. This is essential for accurate free chlorine measurements in a pool water environment where lotions and oils can quickly foul other types of free chlorine measurements. The electrode cleaning process can easily be confirmed in the clear lit flow cell. The LED that serves as a light source for the flow cell can also be programmed to change color in the event of a warning or alarm condition.

The instrument can also measure pool water combined and total chlorine via an optional sensor and provides a control output for this measurement. A conductivity measurement is also an option and can be utilized in salt water pools to ensure a constant salinity is maintained via an available control output. The instrument has eight standard fully programmable relays that can be expanded to 12 relays with an optional four relay card. The controller set-up is very flexible as none of the relays are pre-assigned.

DESIGN AND FUNCTION

The Pool Management System consists of the flow cell module and the electronic module. Each component is configured based on the customer's requirements. The intelligent measurement module is housed in a non corrosive enclosure. The sensors are easily observed through the clear flow cell that can be illuminated as an option. The measurement module not only houses four of the five sensors but it also processes all pertinent sensor data and sends this data via a single cable to the 700 P electronics. The digital CAN bus cable is the only connection between the measurement module and the electronics. Connecting sensors is therefore even easier than before. As an available option, the working status of the sensors is additionally visible from a distance away. Red, yellow and white LED's alert the operator of the sensor status.

Benefits

- 7" color touch panel ensures intuitive operation
- Remote access via Smartphone, tablet or PC when connected to a local area network
- LED lit flow cell that can be programmed as a system status check
- Trend diagrams are available for all measured parameters
- External USB for data download, configuration download and upload & firmware uploads
- CEDOX control mode: free chlorine control mode within ORP brackets

As with the current Strantrol® Pool measurement module the measurement module ensures stable measurements via:

- pH compensated free chlorine measurement with rugged 3-electrode chlorine sensor
- Temperature compensation
- Constant sample water flow controlled by a flow valve
- Quartz grit hydromechanical cleaning of the chlorine sensor's measuring electrodes
- Optimized sample water flow to each sensor

The integrated multi-sensor provides accurate sample water temperature measurement, sample flow switch and large earth ground for the flow cell.

Sensor inputs

1 x free chlorine, 1 x pH, 1 x ORP (oxidation reduction potential), 1 x temperature Pt 1000, 1 x flow switch
1 x total chlorine/combined chlorine (separate flow cell)
1 x conductivity

The electronic module incorporates several communication interfaces including RS 485, USB as well as Ethernet. These interfaces ensure connection to additional processes as well as plant logical controls.

The control output for chemical feed devices such as Wallace & Tiernan® chlorinators, dose or pulse pumps as well as relays is easily configured in the start-up menus that are intuitively accessed via touch screen operation. Milli-amp outputs are also available for control or monitoring of process variables.

The 8 alarm/relay outputs (expandable to 12) are freely configurable. This also allows for the configuration of a system alarm that is triggered by different configured alarm conditions such as all min and max measurement values and low sample flow alarm as an example.

INTEGRAL SAFETY FUNCTIONS:

- Safety shutdown in the case of circulating pump failure and/or supply-tank-empty-alarm (external stop), sample water failure
- Feed time monitoring, feed time delay
- Controller stop at sensor failor

DIN CONTACT

This function is carried over from the German DIN, the German pool water quality guidelines. When the chlorine, ORP and pH values are within user specified limits, the controller can be programmed to send a digital output to a circulation pump to reduce flow. This function can allow the facility to save energy and chemicals when the pool is not in use – if permissible by local health codes.

ECONOMIC MODE

When the recirculation flow is reduced during night time operation, the electronics receives a digital or milli-amp input and triggers a second control mode, namely the economic mode. The economic mode ensures that the control parameters are optimized for this lower recirculation flow – for example the chlorine residual setpoint can be reduced.

CEDOX CONTROL

The CEDOX control mode can be summarized as: "as little chlorine as possible but as much as necessary" – optimized chlorine control mode by changing the chlorine feed setpoint to maintain the pool water within ORP brackets.

ADDITIONAL INTEGRATED POOL CONTROLS

The Blu-Sentinel Pro system operates according to specially developed algorithms for the control of metering equipment. For systems to reduce combined chlorine there's a limit contact as remote release provided. If combined chlorine exceeds the adjusted limit systems like UV can be enabled. An automatic adaptation routine ensures a simple and quick adjustment of the controller parameters. So the optimized control performance is provided without time-consuming manual adjustment.

The controller can be programmed for automatic, manual and off mode as required.

Additional controls are also integrated:

- Start-stop control of UV or activated carbon slurry feed systems
- Controlling the salt concentration in a salt water pool when the controller is fitted with an optional conductivity sensor

The "adaption" mode is utilized during the initial commissioning of the controller and ensures that the chemical feed is optimized for the pool hydraulics and the chemical feed system employed.

SUPER CHLORINATION

The process of super chlorination can be automated with this function by operation's personnel with little effort.

FLOCCULATION CONTROL

The integrated flocculation control is easy to operate. It regulates the flocculant dosing pump and automatically adjusts it to the ECO operating mode.

CHEMICAL FEED RATE INDICATION

Real time chemical feed rates are noted and can be graphically displayed – if desired the chemical feed can be stopped if maximum thresholds are surpassed.

COMMUNICATION INTERFACES

The operation and initial set-up of the controller is intuitive with use of an industrial grade 7 '' touch panel. The instrument incorporates several up to date communication options:

- When the instrument is connected to local area network or indeed an inexpensive router replication of the touch panel is possible with a smartphone, tablet or PC.
- When the instrument is connected to our optional field bus modules, communication via Modbus TCP, Profinet I/O or Profibus DP protocols to building management systems is possible.
- Evoqua Water Technologies also offers an optional 0/4 – 20 mA output for measurement data transfer of up to four variables.
- The instrument includes an externally mounted USB connection for data download, configuration setup downloading and uploading and uploading of firmware updates.
- Connection to the Process Monitoring System (optional) is also possible and is desirable when a facility wishes to simplify the process of monitoring pool water quality of multiple pools.

DISPLAY

The 7" color touch screen allows for intuitive operation of the Pool Management System. All disinfection control parameters and their respective control and alarm set points can be displayed via a trend graph.

Access to the controller can be limited via password set up for different access levels.



MAIN DISPLAY ON SMARTPHONE



DISPLAY WITH TREND VIEW

TECHNICAL DATA

FLOW CELL MODULE

Flow control valve:

- Controlled sample water flow: 33 l/h
- Control range 0.2 – 3.0 bar at valve inlet (3 – 43 psig)
- Maximum back pressure: From pressureless up to 1.5 bar at valve outlet (0 to 22 psig)
- Maximum sample water temperature: 50 °C
- LED alert (white, yellow and red)

Multi-sensor:

- Monitoring of correct sample water flow switching point: 18 l/h ± 3 l/h hysteresis: 2 l/h
- Measurement of sample water temperature by Pt 1000 sensor
- Protection against external electrical noise by a stainless steel sleeve (earthing of sample water)

Additional features:

- Sample water valve
- Isolating valves at sample water inlet and outlet of the flow block module in pressurized design
- Ball check valve at sample water inlet
- Simple cell drain assembly
- Integrated fitting to hold sensor during calibration

Sample water connections:

PVC hose 6 x 3 mm or PE hose 6 x 1 mm
Hose connectors on 1/2 " union

Weight (incl. packing): approx. 2 kg (5.5 lbs)
Dimensions (W x H x D):
253 x 375 x 163 mm (8.5 x 15 x 6 inches)

Voltage supply:

24 V DC from the electronic module via CAN connection

SENSORS

Free chlorine:

Rugged 3-electrode Strantrol® Pool chlorine sensor with sealed electrolyte KCl supply. Potentiostatic 3-electrode amperometric design; Measuring range 0 to max 20 mg/l, scale freely selectable; Resolution up to 10 mg/l: 0.01 mg/l; up to 20 mg/l: 0.1 mg/l; Temperature compensation 0 – 50 °C; Sensor plug connection IP 67

Total chlorine (optional):

Potentiostatic 3-electrode amperometric membrane design, pressureless, sample flow only
Measuring range 0 to max 20 mg/l, scale freely selectable; Resolution up to 10 mg/l: 0.01 mg/l; up to 20 mg/l: 0.1 mg/l; Temperature compensation 0 – 45 °C; Sensor plug connection IP 67
Applicable for salt water pools with up to 4 % salt concentration

Combined chlorine (optional):

The measured value of combined chlorine (chloramine) is calculated and displayed as the difference between total chlorine and free chlorine. Range displayed 0 to max 20 mg/l, scale freely selectable; Resolution up to 10 mg/l: 0.01 mg/l; up to 20 mg/l: 0.1 mg/l

pH value:

Measuring range 0 to 14 pH, start 0 to 5, end 9 to 14 pH, Scale freely selectable in 1 pH steps; Resolution 0.01 pH; Temperature compensation 0 – 50 °C
Sensor plug connection IP 67

ORP:

Measuring range 0 to 400 mV or 500 to 1000 mV, Scale freely selectable in 100 mV steps; Resolution 1 mV; Sensor plug connection IP 67

Conductivity (optional):

Measuring 10, 20, 50, 100 mS/cm; Resolution 0.1 mS/cm; Can be switched over to NaCl display in mg/l and %; Temperature compensation 0 – 50 °C

Temperature:

With the integral Pt 1000 sensor the temperature of the sample water is measured and used for the compensation of the chlorine and pH value measurement. Measuring range 0 to 50 °C, Resolution 0.1 °C

ELECTRONIC MODULE

Touchpanel:

7 inch graphic display with backlight
Resistive touch screen
Resolution 800 x 480 Pixel

Supported sensors:

CAN-Sensor interface for flow module with all sensors; digital sensors (total/combined chlorine, conductivity)

Analog inputs:

1 x feed rate display (feedback signal of positioner gas feed system)

Digital inputs:

3 x freely selectable, e.g. controller stop, mode change-over, second set point of parameter (ECO mode)

Output (relay) contacts (max. 12):

8 freely assignable alarm contacts/general alarms signal as well as controller outputs for free chlorine, pH value, combined chlorine and conductivity

Pool water temperature can also be assigned a high and/or low alarm contact.

Expandable to 12 output contacts with installation of the optional 4 output contact card.

Relay status is depicted on the display

Max. 6A/250 V AC, 0.2 A/220 V DC

Analog outputs (optional):

4 x 0/4 – 20 mA, freely configurable
Load protected ≤ 500 Ohm, Accuracy < 0.5 % FS
Galvanically isolated up to 50 V relative to earth

Power supply:

100 – 240 V ± 10% or 24 V DC, 50/60 Hz

Ambient temperature: 0 – 50 °C (32 – 122 °F)

Enclosure. IP 66

Certification: Conform to CE (89/336/EEC), CSA

Dimensions (W x H x D): 320 x 311 x 153 mm
12.5" x 12" x 12.9"

Weight with packaging:

approx. 4.5 kg (10 lbs)

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