

# Technical Data Sheet

## BECSys3



BECSys3 water chemistry controls provide continuous monitoring and control of sanitizers and pH in a simple-to-use configuration. A large-character, backlit 2 line by 20 character LCD displays current status and alarms in a high-visibility, easy-to-read format.

The controller has an optional free chlorine sensor, which can be selected for sanitizer feed control rather than ORP. If using ORP, a derived chlorine ppm display is available, which provides an approximation of the residual chlorine level on a 0.2 to 16 ppm scale. The BECSys3 can also be configured without a PPM scale, displaying only the pH and ORP readings. Operational settings are password-protected for system security.

With the Communications option connectivity features include the BECSys *Live!* online web portal, Email and Text Message Alarm Notifications and BECSys for Windows PC software. The EZConnect™ system is also included with the Communications option, offering simple and secure remote access as an alternative to traditional IT-intensive remote access techniques, and EZMail™ provides email notification delivery without the need for local email server configuration.



Every controller comes complete with either pH and ORP sensors or pH, free chlorine and temperature sensors, flow switch, flow cell, and factory-trained start-up and support provided by local distribution in most regions.

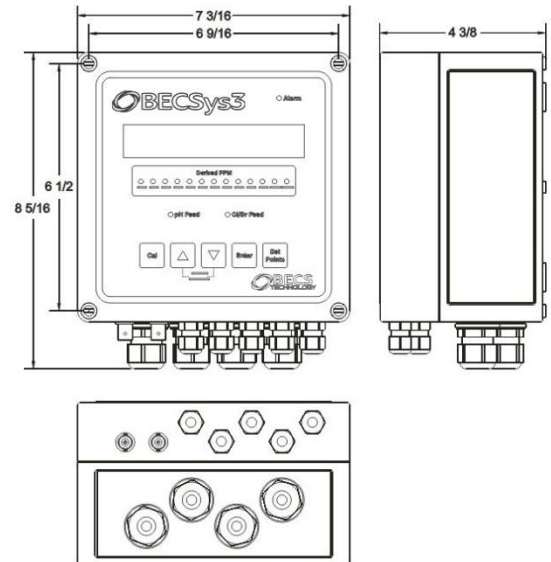
The BECSys3 flow cell can be pre-assembled at the factory and mounted with the controller on a back panel for convenient installation. In this configuration a lightweight PVC mounting frame is easily leveled and installed on the wall. The back panel assembly is then hung on the mounting frame through 4 teardrop holes. Tighten the four bolts, make plumbing and electrical connections and installation is complete.

### Warranty

- 5 years electronics
- 2 years pH and ORP sensors
- 1 year all other components

### Regulatory Approvals/Certifications

- NSF: NSF Certified and Listed to NSF/ANSI Standard 50
- USA: ETL Listed ANSI/UL 61010-1
- Canada: ETL Listed CAN/CSA C22.2 #61010-1
- Europe/CE: CENELEC EN 61010-1
  - European Community Low Voltage Directive 73/23/EEC
- Electromagnetic compatibility
  - FCC part 15 sub part B
  - EN 61326
  - European Community EMC Directive 89/336/EEC



## User Interface

- Large character 2 line x 20 character front panel backlit LCD display
- Front panel available with derived chlorine ppm level light bar
  - 0.2 to 16.0 ppm (with field-configurable high and low ppm Indicator LEDs)
  - No ppm scale
- Display language is field programmable (English, Spanish, French)
- pH feed and chlorine/bromine feed status indicator LEDs

## System Security

- Two levels of security access codes – Operator and Rep

## Control Features

- Suitable for gas chlorine, sodium and calcium hypochlorite, bromine, and ozone applications
- Dual Setpoint Booster Mode (DSBM) – Provides configurable alternate set point for a secondary sanitizer feed, especially useful in controlling salt-chlorine generation systems
- pH control output configurable as feed-up, feed-down, or dual control
- Feed outputs configurable as ON/OFF or Time-Based Proportional
- Free chlorine sensor technologies optionally available include:
  - CP-1
  - Membrane

## Safety Features

- **High/Low Alarm Settings & Control Lockouts:** Programmable high and low alarm settings for all inputs, and programmable lockout of sanitizer feed upon pH high or low alarm.
- **No Flow Alarm & Flow Restored Delay:** Assures sensors are monitoring an actively circulating water stream, with programmable control lockout following no-flow conditions.
- **Feed Limit Alarms:** Programmable failsafe timers to prevent overfeed due to equipment or systems failures.
- **Internal Safety Shield:** Prevents access to high voltage circuitry or wiring during fuse replacement.

## System Inputs

- BECSys pH and ORP sensors
- Optional free chlorine sensor
- Optional temperature sensor

## Remote Access and Alarm Notification (with Communications option)

- Ethernet with EZConnect
- Email and Text message alarm notifications via EZMail
- BECSys *Live!* Online web portal for BECSys controllers
- BECSys for Windows Windows™ 10 compatible PC software package
- Wi-Fi compatibility with optional BECSys Wi-Fi module

## Data-Logging (with Communications option)

- Input readings history, with 1 minute resolution
- System events (e.g. alarms, parameter changes, user logins and operational cycles)
- Data logs automatically uploaded/maintained by EZConnect Server
  - Available to users via BECSys *Live!* Online web portal
- Download logs to USB flash drive for upload into BECSys for Windows

Specification/Ordering Guide – ORP Configuration

BECSys3 (ORP) Specification/Ordering Guide							Selection				
1100256-	<b>Flow Switch Type</b>						<b>01</b>				
↓	<b>E</b>	Reed Flow Switch									
	<b>O</b>	Rotary Flow Switch (directional)									
	<b>X</b>	Flow Switch Integrated into Lighted Flow Cell (see Flow Cell Style selection)									
	↓	<b>Overlay Selection</b>					<b>02</b>				
		<b>N</b>	No PPM Scale								
		<b>P</b>	0.2 - 16.0 PPM Scale								
	↓	<b>Sensor Wire Length</b>					<b>03</b>				
		<b>S</b>	Short (36 inch) Sensor Wires								
		<b>L</b>	Long (10 foot) Sensor Wires								
	↓	<b>Input Voltage Selection</b>					<b>04</b>				
		<b>1</b>	115 VAC input power								
		<b>2</b>	230 VAC input power								
	↓	<b>Temperature Sensor</b>					<b>05</b>				
		<b>N</b>	No temperature sensor								
		<b>T</b>	Temperature Sensor								
	↓	<b>ORP Sensor</b>					<b>06</b>				
		<b>P</b>	Platinum Band								
		<b>S</b>	Solid Gold Band								
	↓	<b>Flow Cell Style</b>					<b>07</b>				
		<b>R</b>	Molded Flow Cell								
		<b>L</b>	Lighted Flow Cell (LFC)								
	↓	<b>Power/Pump Cords</b>					<b>08</b>				
		<b>I</b>	Include power/pump cords								
		<b>X</b>	Remove cords (for conduit installation)								
	↓	<b>Backpanel</b>					<b>09</b>				
		<b>B</b>	Preassembled on backpanel								
		<b>A</b>	LFC preassembled, no backpanel								
		<b>X</b>	Shipped as a kit								
	↓	<b>Communications/Data Logging</b>					<b>10</b>				
		<b>C</b>	Ethernet and USB								
		<b>X</b>	No communications								
<b>1100256 -</b>	<b>O</b>	<b>P</b>	<b>S</b>	<b>1</b>	<b>T</b>	<b>S</b>	<b>R</b>	<b>I</b>	<b>B</b>	<b>C</b>	<b>Example Part Number</b>
BECSys3 with rotary flow switch, 0.2-16.0 PPM Scale, 36" sensor wires, 115VAC input, temperature sensor, gold band ORP sensor, molded flow cell and power/pump cords included, pre-assembled on backpanel with communications/data logging.											

Specification/Ordering Guide – PPM Configuration

BECSys3 (PPM) Specification/Ordering Guide		Selection	
1100267-	<b>Flow Switch Type</b>	<b>01</b>	
↓	<b>E</b> Reed Flow Switch		
	<b>O</b> Rotary Flow Switch (directional)		
	<b>X</b> Flow Switch Integrated into Lighted Flow Cell (see Flow Cell Style selection)		
	<b>Sensor Wire Length</b>		<b>02</b>
	↓	<b>S</b> Short (36 inch) Sensor Wires	
		<b>L</b> Long (10 foot) Sensor Wires	
	<b>Input Voltage Selection</b>		<b>03</b>
	↓	<b>1</b> 115 VAC input power	
		<b>2</b> 230 VAC input power	
	<b>ORP Sensor</b>		<b>04</b>
	↓	<b>N</b> No ORP sensor	
		<b>P</b> Platinum Band ORP Sensor	
		<b>S</b> Solid Gold Band ORP Sensor	
	<b>Chlorine Sensor (sensor is included)</b>		<b>05</b>
	↓	<b>1</b> CP-1 Chlorine Sensor	
		<b>M</b> Membrane Chlorine Sensor	
	<b>Flow Cell Style</b>		<b>06</b>
	↓	<b>R</b> Molded Flow Cell with stand-alone chlorine sensor flow cell (version depends upon Chlorine Sensor selection)	
		<b>L</b> Lighted Flow Cell (pH, ORP, temperature) with stand-alone chlorine sensor flow cell	
		<b>P</b> Lighted Flow Cell (pH, ORP, temperature and integrated CP-1); must pick "1" for Chlorine Sensor	
	<b>Power/Pump Cords</b>		<b>07</b>
	↓	<b>I</b> Include power/pump cords	
		<b>X</b> Remove cords (for conduit installation)	
<b>Backpanel</b>		<b>08</b>	
↓	<b>B</b> Preamsembled on backpanel		
	<b>A</b> LFC preassembled, no backpanel		
	<b>X</b> Shipped as a kit		
<b>Communications/Data Logging</b>		<b>09</b>	
↓	<b>C</b> Ethernet and USB		
	<b>X</b> No communications		
<b>1100267 -</b>	<b>O S 1 S M R I B C</b>	<b>Example Part Number</b>	
BECSys3 with pH and temperature sensors, membrane PPM sensor assembly, with rotary flow switch, 36" sensor wires, 115VAC input, gold band ORP sensor, molded flow cell, power/pump pig-tails included, preassembled on backpanel with communications/data logging.			

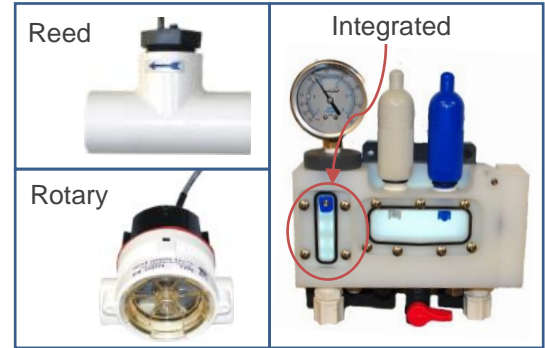
## Specification/Ordering Guide Selections

### Flow Switch Type (Selection 01)

The flow switch is a vital safety component, which assures that water is flowing through the sample stream. When there is no water flowing through the sample stream, the sensor readings are not reliable.

There are three flow switch options

- Reed flow switch
- Rotary flow Switch, which only senses flow in the forward direction, so no check valve is required.
- Integrated into Lighted Flow Cell; this option requires that the Lighted Flow Cell be selected in the Flow Cell section (see below).



### Overlay Selection (ORP Selection 02)

BECSys3 controllers have the option to display a calculated PPM value on the front panel. This is only an option in the ORP configuration; in the PPM configuration the value from the PPM sensor is shown on the LCD display.

### Sensor Wire Length (ORP Selection 03, PPM Selection 02)

pH, ORP and temperature sensors can have two sensor length: 36" and 10'. The only reason to need 10' cable length is in situations where the flow cell will be mounted more than 36" away from the controller. When ordering a controller pre-mounted on a back panel the short (36") sensor wire length should be selected/specified.

### Input Voltage Selection (ORP Selection 04, PPM Selection 03)

The BECSys3 can accept 115 VAC input power or 230 VAC input power. In either case, the BECSys3 can accept either 50 or 60 Hz.

### Temperature Sensor (ORP Selection 05)

In the ORP configuration, the BECSys3 can optionally accept a sensor to monitor and display water temperature. In the PPM configuration, the temperature sensor is included in the standard configuration.

### Chlorine Sensor (PPM Selection 05)

BECSys3 controllers are capable of monitoring free chlorine levels with an optional sensor. Two sensors are available:

- CP-1
- Membrane

For information on either of these PPM sensors, please request the applicable sensor data sheet.

### ORP Sensor (ORP Selection 06, PPM Selection 04)

The standard ORP sensor is constructed with a platinum band electrode. A gold band version of the ORP sensor is also available, and may be beneficial in systems with salt chlorine generators. In the PPM configuration the controller can control sanitizer with the PPM sensor, so an ORP sensor may not be necessary. BECS recommends including an ORP sensor even in the PPM configuration, as the ORP reading provides a valuable qualitative indication of the effectiveness of the chlorine present in the water.

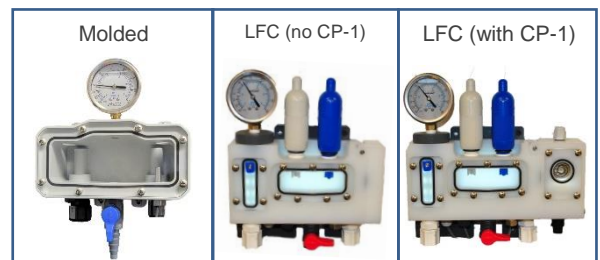
### Flow Cell Style (ORP Selection 07, PPM Selection 06)

Three flow cell options are available

- Molded Flow Cell
- Lighted Flow Cell (pH, ORP, temperature sensors)
- Lighted Flow Cell (pH, ORP, temperature and CP-1 sensors)

When specifying the Lighted Flow Cell (LFC), the Flow Switch Type (Selection 01) should be specified as "X" (Flow Switch Integrated into Lighted Flow Cell).

In all cases sample stream components such as pressure gauge, isolation ball valves, sample tap and associated PVC fittings are included.



### Power/Pump Cords (ORP Selection 08, PPM Selection 07)

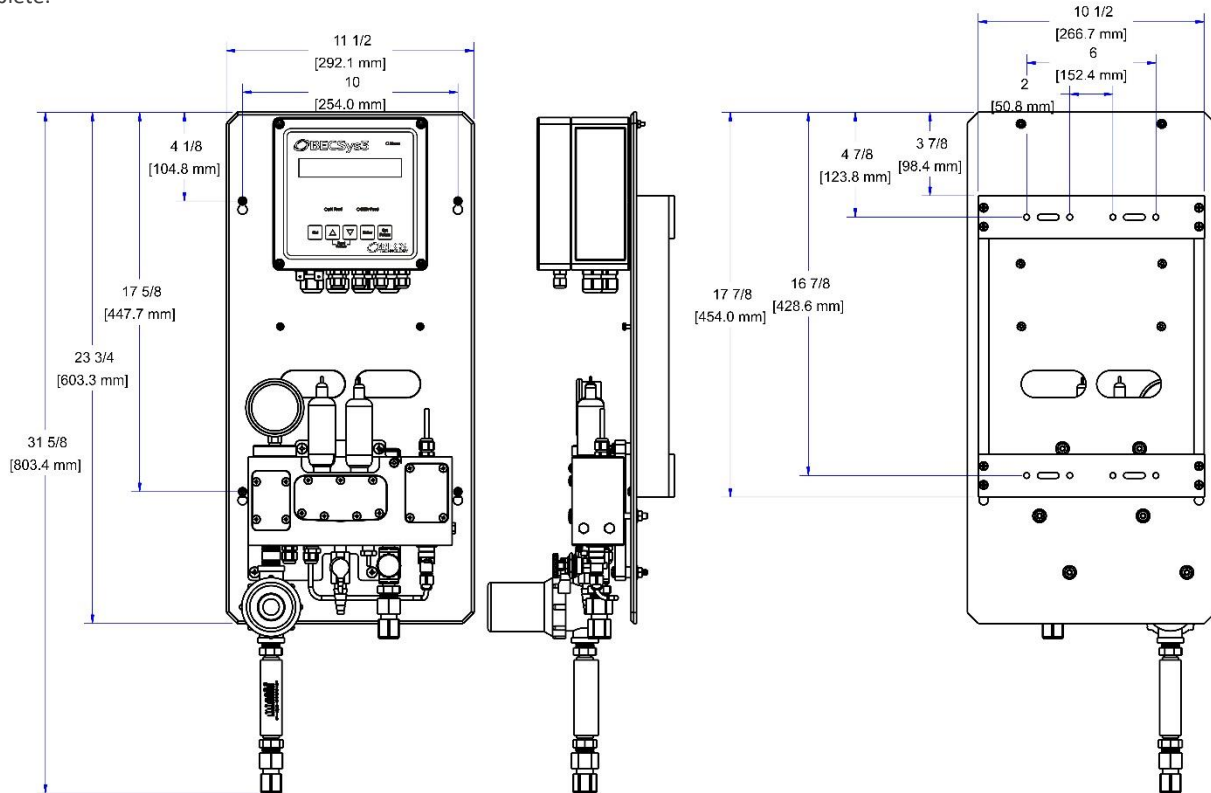
BECSys3 controllers are typically configured with a power cord and pump cords attached, which facilitate quick installation. For systems that will be hard wired with conduit, the BECSys3 can be supplied without these cords installed.

### Backpanel (ORP Selection 09, PPM Selection 07)

**Shipped as kit:** Flow cell will be delivered unassembled; installer will assemble flow cell per instructions provided in Installation Manual. No back panel will be included; controller and flow cell will be mounted directly to wall.

**LFC preassembled, no back panel:** The Lighted Flow Cell can be ordered preassembled at factory.

**Preassembled on back panel:** The flow cell is pre-assembled at the factory and mounted with the controller on a back panel for convenient installation. In this configuration a lightweight PVC mounting frame is easily leveled and installed on the wall. The back panel assembly is then hung on the mounting frame through 4 teardrop holes. Tighten the four bolts, make plumbing and electrical connections and installation is complete.



### Communications/Data Logging (ORP Selection 10, PPM Selection 09)

The BECSys3 can optionally be equipped with integral 100BaseT Ethernet communications, Data Logging and a USB connection. A single BECSys3 equipped with the Communications option provides remote access, historical data logs and email/text message alarm notification for itself and up to 30 additional BECSys3's connected via RS485 (limited to controllers in the same equipment room). The additional BECSys3's do not need the Communications option installed.

This Communications option supports EZConnect and EZMail, for simple and secure remote access as well as hassle-free email and text message alarm notifications.

Integration with Wi-Fi networks is supported with the optional BECSys Wi-Fi module.

Inputs and system events are recorded in data logs, accessible with BECSys Live online web portal and BECSys for Windows PC software. Both are included with every BECSys3 with communications.



## Specifications

### Part Numbers

BEC Sys3 (with ORP sensor)	1100256, See Specification/Ordering Guide for options
BEC Sys3 (with PPM sensor)	1100267, See Specification/Ordering Guide for options
Firmware version	v2.30 and higher

### Physical

Enclosure Material	Glass Reinforced Polycarbonate, NEMA 4X (IP66)
Overlay Material	UV Stabilized Polyester
Flow Cell Material (molded)	ABS, 30% Glass Filled, UV Stabilized Body, Clear Acrylic Window, Viton O-rings, Stainless Steel Hardware
Flow Cell Material (lighted)	UHMW, UV Stabilized Body, Clear Acrylic Window, Viton O-rings, Stainless Steel Hardware
Back Panel Material	PVC
Display	2 Line, 20 Character Back-Lit Alpha/Numeric LCD <ul style="list-style-type: none"> <li>Character size: 4.84mm x 9.22mm</li> <li>Field-programmable for English, French or Spanish</li> </ul> pH Feed, Cl/Br Feed and Alarm LEDs Derived PPM display scales: 0.2-16.0 ppm or No ppm display
pH and ORP Sensor Connection Type	BNC
PPM and Temperature Sensor Connection Type	Liquid Tight PG-7
RS-485 Communications Connection Type	Liquid Tight PG-7
Input Power & Relay Output Cords (115 VAC Controller)	SJTW Type Note: 230 VAC Controller is supplied without power cords
BEC Sys3 Enclosure Dimensions	Width: 7.17" Height: 7.09" Depth: 4.375" without Communications Depth: 6.5" with Communications
Backpanel Dimensions	Width: 11.5" Height: 23.75" Depth: 6.375" without Communications Depth: 8.5" with Communications

### Environmental<sup>1</sup>

Storage Temperature	-30 to 60 °C
Ambient Operating Temperature	-18 to 40 °C
Ambient Humidity	95% non-condensing maximum

### Electrical

Voltage	115/230 VAC, 50/60 Hz				
Phase	Single				
Current	<table border="0"> <tr> <td style="padding-right: 20px;">115 VAC Input:</td> <td>9.25 Amps Full Load (0.25 Amps – Controller) (9 Amps – Relay Outputs, 3A x 3)</td> </tr> <tr> <td>230 VAC Input:</td> <td>9.125 Amps Full Load (0.125 Amps – Controller) (9 Amps – Relay Outputs, 3A x 3)</td> </tr> </table>	115 VAC Input:	9.25 Amps Full Load (0.25 Amps – Controller) (9 Amps – Relay Outputs, 3A x 3)	230 VAC Input:	9.125 Amps Full Load (0.125 Amps – Controller) (9 Amps – Relay Outputs, 3A x 3)
115 VAC Input:	9.25 Amps Full Load (0.25 Amps – Controller) (9 Amps – Relay Outputs, 3A x 3)				
230 VAC Input:	9.125 Amps Full Load (0.125 Amps – Controller) (9 Amps – Relay Outputs, 3A x 3)				

### Performance

pH Range / Resolution	0 to 14 pH / 0.1 pH Units
ORP Range / Resolution	-1500 to +1500 mV / 1mV
PPM Range / Resolution	0 to 20.0 ppm / 0.1ppm
Temperature (optional) Range / Resolution	32 to 150 degrees F (0 to 66 degrees C) / 1 degree (F or C)
RS-485	9600 bps at distances up to 4000 ft.
Ethernet (optional)	100 BaseT
USB Flash Drive (optional)	FAT, FAT32 formats
Relay 1 Output (pH Control)	Jumper Selectable to: <ul style="list-style-type: none"> <li>Controller Input Voltage (115 VAC or 230 VAC), or</li> <li>Dry Contact (Supports 24 to 280 VAC)</li> </ul>
Relay 2 Output (Sanitizer Control)	Jumper Selectable to: <ul style="list-style-type: none"> <li>Controller Input Voltage (115 VAC or 230 VAC), or</li> <li>Dry Contact (Supports 24 to 280 VAC)</li> </ul>
Relay 3 Output (User Selectable as: Sensor Wash, Dual pH Feed, Alarm, or Cl/Br Booster Feed)	Jumper Selectable to: <ul style="list-style-type: none"> <li>Controller Input Voltage (115 VAC or 230 VAC), or</li> <li>Dry Contact (Supports 24 to 280 VAC)</li> </ul>

<sup>1</sup>Environmental specifications are for controller only; specifications for sensors and other components vary, and are available in respective Data Sheets.