

Description

BECSys5 water chemistry controls provide continuous monitoring and control of sanitizers, oxidizers, pH, conductivity, turbidity, enzyme feed, system flow rate, system pressures, chemical inventory levels, and surge tank levels. Patent-pending VFD control technology and Total Dynamic Head monitoring assures optimal and efficient circulation pump operation.

Email and Text Message Alarm Notifications are supported by the standard integral 100BaseT Ethernet connection. All inputs and system events are recorded in on-board data logs, accessible with *BECSys for Windows Vista*-compatible PC software, which is included with every BECSys5.

Advanced safety features and multi-level security are standard, and every BECSys5 comes complete with pH, ORP, temperature sensors, flow switch, machined flow cell, and factory-trained start-up and support provided by local distribution.

BECSys5 Water Chemistry Controller



Features

System Inputs

- All system inputs feature high/low alarm settings, and are recorded in integral data logs.
- BECSys pH sensor featuring inorganic electrolyte for extended sensor life
- BECSys ORP sensor featuring inorganic electrolyte and solid platinum (or gold) sensing element
- RTD temperature sensor
- Optional flow rate sensor
- Optional free chlorine or bromine amperometric sensor
- Optional conductivity sensor used to measure Total Dissolved Solids (TDS)
- Up to four configurable 4-20mA inputs (or two with conductivity sensor) used for measuring:
 - Turbidity
 - Liquid Chemical Inventories (pH, Sanitizer)
 - Vacuums
 - Pressures
 - Surge Tank Level

User Interface

- 14 line x 40 character backlit LCD, with front-panel contrast adjustment and automatic temperature compensation
- Single-touch access to Set Points, Relay Modes, Calibrations, Menu access, and Reset Fail/Safes.
- Optional BECSys Control Supervisor 8.4" color touch-screen display

Water Chemistry Control Functions

- **pH:** Configurable for feed-up, feed-down, or dual feed, and either ON/OFF or Time-Based Proportional feed.
- **Sanitizer:** Based on ORP input, free chlorine/bromine input, or bracketed combination of the two
- **Sanitizer Booster:** Selectable trigger setpoint and separate ending set point.
- **Ozone/UV Control:** Feed-up based upon ORP and/or ppm set points, with Fireman Cycle feature and Energy Conservation mode.
- **Superchlorination:** Manually-triggered feed-up superchlorination set point, based upon ORP or ppm.
- **Dechlorination:** Feed-down control of dechlorination agent, either manually-triggered or automatic upon superchlorination completion
- **LSI & RSI:** Langelier Saturation Index and Ryzner Saturation Index, computed based upon current inputs and Ca Hardness and Alkalinity entered by operator.

Energy Conservation Control Functions

- **Alternate Setpoints:** Run the pool at less demanding levels during periods of low usage.
- **Energy Conservation Mode:** Program a "Sleep" mode which disable all mechanical and chemical functions during off-hours, waking periodically to keep water quality in check.

Expanded Control Functions

- **Flow:** Display and log System Flow, maintaining Total Flow Volume; Low Flow alarm can disable chemical feeds.
- **Heater:** On/off control of heater with Fireman Cycle feature and Energy Conservation mode.
- **TDS:** Feed-down control of drain valve, with programmable fail-safe timer.
- **Enzyme:** Programmable daily timed feed with start and end time, feed duration, and multiple feeds per day.
- **Turbidity:** Feed-down control of polymer to maintain programmable turbidity set point.
- **Liquid Chemical Inventory:** monitor, display and data log chemical inventories with low alarm settings
- **Surge Tank monitoring:** monitor, display and data log surge tank level
- **Autofill:** control water makeup valve to maintain pool level setpoint based upon surge tank (or equivalent) level, with an overflow delay feature and programmable alternate set point.
- **Sensor wash:** programmable sensor wash with start and end time, feed duration, and multiple cycles per day.

Main Recirculation Pump Control Functions

- **On/Off Control:** Based upon various sensors and settings such as Low surge tank level, strainer high vacuum, Energy Conservation mode, Emergency Off, and Fireman Switch settings.
- **TDH:** Monitor pump Total Dynamic Head (TDH) with user settable high/low alarm settings.
- **VFD:** Variable Frequency Drive interface to control recirculation pump drive level to maintain flow rate, effluent pressure, or fixed setting. Four Manually-triggered and Four Scheduled alternate profiles are user programmable.

Control Outputs

- **Solid-State Relays:** Four (4) standard solid-state relay outputs
- **Additional Relays:** Fifteen (15) solid-state relay outputs with up to 3 BECSys SRX relay expansion modules
- **4-20mA Outputs:** Four (4) optional separately isolated 4-20mA analog outputs, which can be configured to record any enabled input, or for VFD control of recirculation pump.

Safety Features

- **Manual-On Limit:** built-in limits automatically return manual overrides to automatic control, to prevent accidentally leaving relays activated following service/troubleshooting efforts.
- **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 fail-safes to prevent overfeeds due to equipment or systems failures.
- **Emergency Off:** Front-panel Emergency Off button immediately halts all chemical feeds and control outputs; can be password protected.
- **Internal Safety Shield:** Prevents access to high voltage circuitry or wiring during fuse replacement.

Regulatory Approvals (Safety)

- 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

System Security

- Three levels of security access codes – Operator (6), Manager (2), and Rep (1).
- Data logs record history of access identified by user.

Data-Logging

- Data logs maintained in battery protected RAM
- Log up to 10 to 56 days of input level history (every 2 to 10 minutes)
- Log up to 1100 system events over a maximum of 14 days (for example, feed cycles or alarms)
- Download logs to USB flash drive for upload into BECSys for Windows using optional BECSysRCM

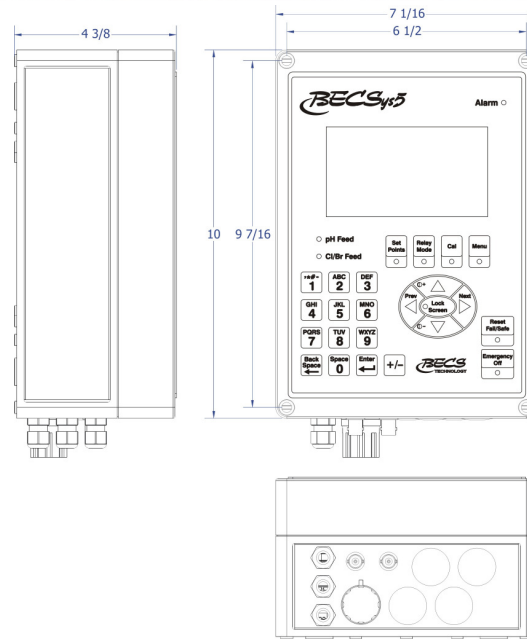
Remote Access and Alarm Notification

- BECSys for Windows Vista-compatible PC software package included
- 100 BaseT Ethernet (standard): supports **Email** and **Text message** alarm notifications
- Optional 56k data/fax modem: supports Fax and Numeric Pager alarm notifications

Warranty

- 5 years electronics; 2 years pH, ORP and temperature sensors; 1 year optional sensors and flow cell

Specifications	
Part Numbers	
BECSys5 Part Number	1100223
Firmware version	v1.26
Physical	
Enclosure Material	Glass Reinforced Polycarbonate, NEMA 4X (IP66)
Overlay Material	UV Stabilized Polyester
Display	14 Row, 40 Character, Blue/White Backlit Alpha/Numeric LCD
pH and ORP Sensor Connection Type	BNC
Input Sensor/Low Voltage Connection Type	Three (3) Liquid Tight PG-7 Cord Grips
Serial Data Port	External IP68 Panel Mount Connector
Conduit Openings	Four (4) ½" holes with Nylon Dome Plugs
Enclosure Dimensions	Width: 7.09" Height: 10.00" Depth: 4.37"
Environmental	
Storage Temperature	-30 to 70 °C
Ambient Operating Temperature	-18 to 50 °C
Ambient Humidity	95% non condensing maximum
Electrical	
Voltage	115/230 VAC, 50/60 Hz
Phase	Single
Current	
115 VAC Input:	12.25 Amps Full Load (0.25 Amps – Controller) (12 Amps – Relay Outputs, 3A x 4)
230 VAC Input	12.125 Amps Full Load (0.125 Amps – Controller) (12 Amps – Relay Outputs, 3A x 4)
Performance	
pH Range / Resolution	0 to 14 pH / User Selectable: 0.1 pH units or 0.01 pH units
ORP Range / Resolution	-1000 to +1000 mV / 1mV
Temperature Range / Resolution	32 to 150 °F (0 to 66 °C) / 1 °F or °C
Free Chlorine/Bromine (optional) Range/Res	0 to 20 ppm / User Selectable: 0.1 ppm or 0.01 ppm
Conductivity/TDS (optional) Range/Resolution	0 to 20,000 micro-mhos (conductivity) / 1 micro-mho 0 to 10,000 ppm (TDS) / 1 ppm
Flow Rate (optional) Range/Resolution	0 to 8800 gpm (0 to 33265 liter/min) / 0.1 gpm or lpm
Flow Volume	Records up to 999 trillion gallons or liters
Turbidity (optional) Range/Resolution	0 to 20 NTU / 0.01 NTU
Pressure (optional) Input Range	0 to 100 psi (0 to 689 kPa)
Compound Pressure/Vacuum (optional) Input Range	-15 to +85 psi (-103) to 586 kPa -31 to 173 in. Hg (-78 to 440 cm Hg)
4-20 mA Inputs (4 standard)	Resolved with 16 bit Analog to Digital Converter
4-20 mA Outputs (4 optional)	13 bit Digital to Analog Conversion, Load Capacity 440 Ω per output channel
Failsafe Overfeed Timers	Programmable in 1 minute increments, up to 18 hours
RS-485	9600 bps at distances up to 4000 ft.
Ethernet (standard)	100BaseT (10/100 Mbit/s)
Modem Type (optional)	56k bps V.92 fax/data
Solid State Relay Outputs	Jumper Selectable to: 1.) "Line" Setting: Same as Controller Input Voltage: 115 VAC or 230 VAC 2.) "Common" Setting: Supports 24 to 280 VAC; a single Common position is provided to bring in Solid State Relay output voltage for relays 1 & 2 for circ pump interlock of chemical feeds, independent Common position for relay 3, and an independent Common position for relay 4.



Related Documents		
Included in standard configuration	Part Number(s)	Data Sheet
BECSys pH Sensor	9660010, 9660013	ENG-4321-DOC
BECSys ORP Sensor	9660022, 9660023 9660038, 9660040	ENG-4317-DOC
RTD Temperature Sensor	9660003, 9660016	ENG-4327-DOC
Round PVC flow cell assembly with clear acrylic window, and stainless steel hardware	1210147	ENG-4315-DOC
Flow Cell connecting kit includes reed flow switch, oil-filled pressure gauge, sample tap, isolation valves, and connecting PVC hardware	1210148	ENG-4315-DOC
Reed flow switch	9660006	ENG-4328-DOC
Operator's Manual	8620007	n/a
Installation & Technical Manual	8620013	n/a
Laminated Quick Reference Card	8620036	ENG-4292-CDR
BECSys for Windows PC Communications Software	1230089	ENG-4377-DOC
Options	Part Number	Data Sheet
Flow Rate Sensor	9660008, 9660009 9660004	ENG-4320-DOC
Amperometric PPM Sensor	1210253	ENG-4349-DOC
Conductivity/TDS Sensor	9660022	ENG-4313-DOC
Turbidity Sensor	1210261	ENG-4350-DOC
Pressure Transducer	8660030, 8660031	ENG-4314-DOC
Compound Vacuum/Pressure Transducer	8660034, 8660035	ENG-4319-DOC
BECSysLS Liquid Level Sensor	1100212, 1100213	ENG-4318-DOC
4-20mA Output Board (adds four 4-20mA outputs)	1200453	ENG-4365-DOC
BECSys Control Supervisor color touch-screen interface	1100254	ENG-4657-DOC
BECSys SRX Solid-state relay expansion module (adds 5 solid-state relays)	1100185, 1100219	ENG-4351-DOC
Feed-through Teflon flow cell with clear acrylic window, and stainless steel hardware	1210137	ENG-4337-DOC
Rotary flow switch w/ check valve (replaces Reed flow switch)	9660007	ENG-4329-DOC
BECSys RCM Remote Communications Module	1100236	ENG-4380-DOC
Reference Information	Format(s)	Document #
BECSys VFD Application Note	.pdf	ENG-4424-DOC
Ethernet Application Note	.pdf	ENG-4604-DOC
Advanced Alarm Notification Application Note	.pdf	ENG-4588-DOC
BECSys5 Bid Specification	.doc, .pdf	ENG-4267-DOC
BECSys5 Wiring Diagrams	.dxf, .pdf	ENG-4323-IDW
BECSys5 Line Drawing	.dxf, .jpg	ENG-4348-CDR
BECSys5 Sales Brochure	.pdf	SLS-4333-DOC
BECSys Family Sales Brochure	.pdf	SLS-4336-DOC