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**Firmware Version**

This manual was written for firmware v1.26. If you received newer firmware but did not receive a copy of the manual covering that version of firmware, please contact your distributor.

**Environmental Conditions**

The BECSysBW is housed in a NEMA 4X (IP65) enclosure. It should not be used in explosive environments. The BECSysBW should be mounted so that adequate ventilation is provided around the enclosure, preventing general environmental specifications from being exceeded (see table below).

Environmental Specifications	
Specification	Rating
Storage Temperature	-40 to 85 Deg C
Ambient Operating Temperature	-18 to 50 Deg C
Ambient Humidity	95% non condensing maximum humidity

**Electrical Specifications**

The BECSysBW may be ordered in either a 115VAC model or a 230VAC model. Following are the electrical specifications for each model:

**115VAC Model:**

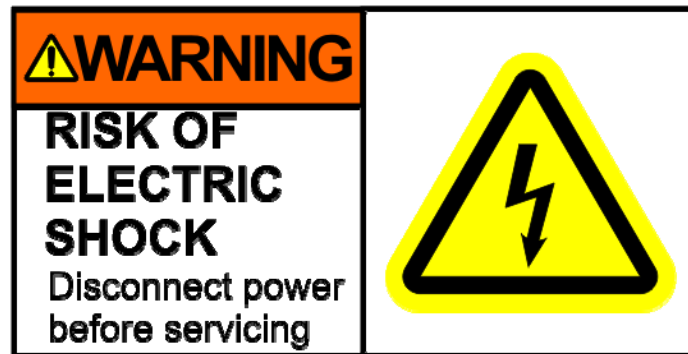
Voltage:	115VAC 60Hz
Phase:	Single
Current:	25.5 Amps Full Load
	(½ Amp – Controller)
	(25 Amps – Relay Outputs: 8A X 1, 5A X 1, 3A X 4)


**230VAC Model:**

Voltage:	230VAC 50Hz
Phase:	Single
Current:	25.25 Amps Full Load
	(¼ Amp – Controller)
	(25 Amps – Relay Outputs: 8A X 1, 5A X 1, 3A X 4)

Warnings

Pay particular attention to the following warnings encountered while utilizing your BECSysBW Filter Backwash Controller:



 Warning: Various other warnings may be found throughout the manual text.

## Section A: Programming the Controller

### A – 1: Adjusting the Display Contrast

You can adjust the display contrast by holding down either the up or down arrow keys for two seconds, then after the controller beeps three times, use the up and down keys to adjust the contrast.

### A – 2: Security Settings

To view what access level you were given, press the lock screen button while in any menu.

```
Operator Menu v1.26 | Use the up/down
1 Inputs | arrow keys to show
2 Control Out <=====> p text for
3 Control Opt | Operator 1 | election.
4 Calculation <=====>
5 System Conf | 1. Lock
6 4-20mA Outs | 2. Logoff
7 UFD Turnrow | 3. Cancel
8 Logon <=====>

02-25-2009 1:32 PM
```

The Main Menu will also display who is logged on along with the version of firmware.

You do not need to set all the access codes for each level if you do not wish to. Also, a disabled access code is not equivalent to 000, so entering 000 when it prompts for an access code will only work if you have specifically assigned an access code to be 000.

#### A – 2.1: Setting Access Codes

To set an access code, press the menu button, then:

- ▶ Select System Config
- ▶ Choose User Setup
- ▶ Then select the access level you want to set an access code for.

To set Operator 1's access code, you would select Oper. Access Codes, then select Operator 1.

```
Oper. Access Codes | Enter a three digit
Operator 1 | number.
Disabled
Change to:
000

Press & hold +/- to disable this code.
Down/up moves cursor left/right.
02-25-2009 1:27 PM
```

Pressing and holding the +/- button disables the access code, while pressing enter will enable and set the access code to the value on the screen.

Operators may only change their own access code. Managers may change their access code and any of the Operators.

#### A – 2.2: Controller Options

Depending on how a particular controller is configured, not all of the options listed in this manual may be available.

### A – 3: Navigating the menus

The controller's menus incorporate built in help text to aid in understanding the function of each parameter, item, and option.

#### A – 3.1: Common status messages

The very bottom line of the display contains the time and date on the left while the right is reserved for a number of status messages; the most common are as follows:

- ▶ "Busy..." - Indicates the controller is busy doing something critical and it cannot stop until it finishes. Until this message disappears, the controller will not respond to your key presses (although it does record them any will process them when done). Normally this message is only seen briefly after changing a setting, but it is also used for lengthier operations and in the extremely rare case where the internal diagnostics detect a memory problem and attempts to correct it.

**Warning: Interrupting the controller by turning the power off while it displays the busy message could result in the complete loss of all of its settings.**

- ▶ "(1 of 2) (More →)" - and the like indicate there are more options for you to choose from than the controller could show at one time. Press the right arrow key (Next) to view them. The left number indicates the current page, while the right number indicates the total number of pages.
- ▶ "Bad Value, Retry..." - Accompanied by an error beep, this indicates the value you just entered was not within the allowable range of values and was not stored.



### **A – 3.2: The Menu Screens**

Most of the features of the controller are configured via the Menu button's menus. The menu screens can be broken up into two types: entry screens and lists.

#### **A – 3.2.1: Entry Screens**

An entry screen is used to enter a value using the keypad.

```
Diff. Pressure      | Alarm is triggered
High Alarm         | when pressure
17 psi             | across the filters
Change to:         | reaches or rises
17                 | above this value

<0.0 to 1.4>

Press & hold +/- to disable this alarm.
Down/up moves cursor left/right.
02-25-2009 1:29 PM
```

The current value is usually displayed at the top while the cursor will be positioned under the current digit or character of the value you are entering in. The up and down arrows allow you to move the cursor right or left so you do not have to retype the existing digits if you only wish to change one.

Most numerical values will display the minimum and maximum values you can enter in at the bottom of the display in the format "< ### to ###>". These ranges many times will be dependant on other values you have set, such as alarm points or set points, while others are simply fixed to stay within a reasonable range.

Entering a value that is not within the acceptable range will result in an error beep and the message "Bad Value, Retry..." being displayed in the status area.

For some values, certain keys may take on special functions that are explained in the lower lines of the screen. The Down/up message in the example above is one of them.

#### **A – 3.2.2: List Screens**


The list screens are mainly composed of lists of menu items that you can choose from by either pressing an item's number or by using the up and down arrow keys to select it (indicated by the arrow) and then pressing enter to choose it.

Using the up and down arrow keys also allows you to view each item's help text. And if the item leads to an entry screen or a list screen that sets a setting (see below), the current value is displayed in the lower right side.

```
Pressure & Uac.     | Use the up/down
1 Influent Pressure | arrow keys to show
2 Effluent Pressure | the help text for
3 Diff. Pressure    | each selection.

02-25-2009 1:29 PM
```

Lists can also be used to change a setting. When a list is used this way, it will display the current setting followed by the words "Change to:". Because it is a list, you can select an item with the up/down buttons to see help information about that particular selection.

 There are a few list screens that use the entire width of the display for displaying values associated with each item and therefore do not have help. See Section C: Using the Quick Set Face Panel Keys for examples of these types of screens.



### A – 3.3: The Lock Screen Key

When not in a menu (i.e. viewing the normal display), pressing the lock screen key will prevent the controller from paging the screen to show more inputs, alarms, and other status information. See Section B: The Normal Display for more info about using the lock screen key in the normal display.

While within any menu, if the user does not press a key within sixty seconds of the last key press, the current user is logged out and the screen is returned to the normal display. To prevent the controller from timing out, you may lock the screen.

While within a menu, pressing the Lock Screen key will bring up a popup menu:

```
Operator Menu v1.26 | Use the up/down
1 Inputs | arrow keys to show
2 Control Out <=====> p text for
3 Control Opt | Operator 1 | election.
4 Calculation <=====>
5 System Conf | 1. Lock |
6 4-20mA Outs | 2. Logoff |
7 UFD Turnrow | 3. Cancel |
8 Logon <=====>

02-25-2009 1:32 PM
```

The first option on the popup will be either to lock or unlock the screen depending on the current lock state. While the screen is locked, key presses normally are ignored. However, in some instances certain keys are given special functions while the screen is locked, such as using the up and down arrows to scroll the help text if all of the help text cannot be displayed at once.

**?** You can also lock/unlock the screen without bringing up the popup menu by holding down the lock button for one second. The controller will acknowledge this action with a triple beep and the yellow Lock Screen light will turn on.

The Lock button popup menu also identifies who is currently logged on, and provides an option for the user to log off. You can also select cancel if you pressed the lock button in error.

### A – 4: Inputs

To enter the program menu, press the Menu button on the front face panel of your controller. This will allow the viewing of the Main Menu where the programming options are displayed.

Select Inputs from the menu.

### A – 4.1: Flow Rate Setup

If your controller is configured to monitor Flow Rate, you will have the following options:

- ▶ **Low Alarm (Operator):** This value sets the reading that the flow rate low alarm will be activated. Input the desired value and press enter. Disable this alarm by holding down the +/- key for 1 second. (The range is 0 to 3000.0 gpm or lpm)
- ▶ **Alarm Hysteresis (Manager):** This value sets the reading that the flow rate must rise above the low alarm before the alarm will shut off. Enter the desired number and press enter. (The range is 1 to 50.0 gpm or lpm)

### A – 4.2: Turbidity

Depending on the controller configuration, a Turbidimeter may or may not be installed. If there is a Turbidimeter installed on your particular controller, choose Turbidity from the menu. This will allow you to program the following for the Turbidity input:

- ▶ **High Alarm (Operator):** The high alarm will activate when the input rises above this setting. Enter the desired value and press enter. Disable this alarm by holding down the +/- key for 1 second. (The range is dependant on the input range.)
- ▶ **Alarm Hysteresis (Manager):** This value sets the level that the turbidity reading has to rise above the high alarm setting before the alarm will shut off. Input the desired level and press enter. (the range is 10% of the input range)

### A – 4.3: Surge Pit Level

Surge Pit Level can be set up several ways. Depending on the controller configuration the Surge Pit Level monitoring device may be a transducer (Level Sensor), contact switch (Proximity Switch), or not even installed. There are no settable options if the Surge Pit Level Input is set up for a contact switch.

#### A – 4.3.1: Level Sensor

- ▶ **High Alarm (Operator):** The high alarm will activate when the input rises above this setting. Enter the desired value and press enter. Disable this alarm by holding down the +/- key for 1 second. (the range is dependant on the input range)
- ▶ **Low Alarm (Operator):** The low alarm will activate when the input falls below this setting. Enter the desired value and press enter. Disable this alarm by holding down the +/- key for 1 second. (the range is dependant on the input range)

- ▶ **Alarm Hysteresis (Manager):** This value sets the amount that the surge pit level has to rise above the high alarm or fall below the low alarm before the alarm will shut off. Input the desired level and press enter.

**A – 4.4: Pressure & Vacuum Setup**

The Pressure and Vacuum inputs can be setup several ways. Depending on the controller configuration the Pressure and Vacuum inputs device may be a transducer, contact switch, or not even installed. There are no settable options if the Pressure and Vacuum inputs are setup for a contact switch.

**A – 4.4.1: Influent Pressure (Transducer)**

- ▶ **High Alarm: (Operator)** The high alarm will activate when the pressure rises above this setting. Input the desired pressure and press enter. Disable this alarm by holding down the +/- key for 1 second. (The range is dependant on the low alarm point.)
- ▶ **Low Alarm: (Operator)** The low alarm will activate when the pressure falls below this setting. Input the desired pressure and press enter. Disable this alarm by holding down the +/- key for 1 second. (The range is dependant on the high alarm point.)
- ▶ **Alarm Hysteresis: (Manager)** This value sets the amount that the pressure reading has to rise above the high alarm or fall below the low alarm before the alarm will shut off. Input the desired level and press enter. (The range is from 0 to 5)
- ▶ **Display Input (Operator):** This option enables/disables displaying the influent pressure on the normal display.

**A – 4.4.2: Effluent Pressure**

- ▶ **High Alarm (Operator):** The high alarm will activate when the pressure reaches or rises above this setting. Input the desired pressure and press enter. Disable this alarm by holding down the +/- key for 1 second. (The range is dependant on the low alarm point.)
- ▶ **Low Alarm (Operator):** The low alarm will activate when the pressure falls below this setting. Input the desired pressure and press enter. Disable this alarm by holding down the +/- key for 1 second. (The range is dependant on the high alarm point.)

- ▶ **Alarm Hysteresis (Manager):** This value sets the amount that the pressure reading has to rise above the high alarm or fall below the low alarm before the alarm will shut off. Input the desired level and press enter. (The range is from 0 to 5)

- ▶ **Display Input (Operator):** This option enables/disables displaying the Effluent pressure on the normal display.

**A – 4.4.3: Differential Pressure**

- ▶ **High Alarm (Operator):** The high alarm will activate when the pressure rises above this setting. Input the desired pressure and press enter. Disable this alarm by holding down the +/- key for 1 second. (the range is 0 to 40)
- ▶ **Alarm Hysteresis (Manager):** This value sets the amount that the pressure reading has to rise above the high alarm or fall below the low alarm before the alarm will shut off. Input the desired level and press enter. (the range is from 0 to 10)

**A – 4.4.4: Strainer Vacuum**

- ▶ **High Vac Alarm (Operator):** The high vacuum alarm will activate when the pressure falls below this setting. This is actually a low pressure alarm that operates in the negative pressure range, which is a vacuum. Input the desired pressure and press enter. Disable this alarm by holding down the +/- key for 1 second.
- ▶ **Alarm Hysteresis (Manager):** This value sets the level that the vacuum reading must fall below the high alarm setting before the alarm will shut off. Input the desired level and press enter. (The range is from 0 to 5)

**A – 4.4.5: Total Dynamic Head**

Depending on the controller configuration, the Total Dynamic Head of the pump may be calculated and able to be displayed:

- ▶ **Display TDH (Operator):** Will display the Total Dynamic Head on the normal display.
- ▶ **High Alarm (Operator):** The high alarm will activate when the Total Dynamic Head across the pump rises above this setting. Input the desired value and press enter. Disable this alarm by holding down the +/- key for 1 second.
- ▶ **Low Alarm (Operator):** The low alarm will activate when the Total Dynamic Head across the pump falls below this setting. Input the desired value and press enter. Disable this alarm by holding down the +/- key for 1 second.

- ▶ **Alarm Hysteresis (Manager):** This value sets the amount that the Total Dynamic Head has to rise above the high alarm or fall below the low alarm before the alarm will shut off. Input the desired level and press enter (The range is from 0 to 5).

### A – 5: Control Outputs

Press the Menu button on the front face panel of the Controller and select Control Outputs. Depending on the controller configuration, some control outputs may or may not be installed.

#### A – 5.1: Heater

Depending on the controller configuration, a Heater may or may not be installed. If a Heater is installed on your particular controller, choose Heater from the menu. This will allow you to program the following for the Heater:

- ▶ **Fireman Switch (Operator):** *This option is only shown if a relay is assigned to the recirculation pump.* This value sets the minimum amount of time to leave the recirculation pump on after the heater shuts off.

#### A – 5.2: Polymer

Depending on the controller configuration, Polymer may or may not be installed. If Polymer is installed on your particular controller, choose Polymer from the menu. This will allow you to program the following for Polymer:

- 7 The polymer control is controlled by the Turbidity 4-20 mA input and will not trigger until the turbidity reading remains above the High Set Point for the Trigger Delay Time. The control cycle time is fixed at 10 minutes, but the user sets the actual feed On Time. The control cycle will repeat every 10 minutes until Low set point is achieved.

- 7 The polymer feed will not trigger until 10 minutes after the last backwash cycle.

- ▶ **High Set Point (Operator):** When the turbidity reading rises above this value for the Trigger Delay Time, the controller will trigger the polymer control cycle.
- ▶ **Low Set Point (Operator):** At the end of each 10 minute control cycle, the controller checks to see if the turbidity reading is below this value. If it is, the control cycle ends, otherwise the controller starts a new control cycle.
- ▶ **On Time (Operator):** This value sets how long the controller will feed polymer during each 10 minute control cycle.
- ▶ **Trigger Delay Time (Operator):** This value sets how long the turbidity reading must remain above

the high set point before triggering the polymer control cycle.

- ▶ **Failsafe Timer (Operator):** This value sets the time that the control is allowed to stay active without reaching set point before the relay is locked out. If the polymer feed has been trying to achieve set point without success for the selected time, the controller will end the control cycle, flash the Reset Fail/Safe LED on the face panel and display a message to alert the operator. (the range is 0:00 to 18:00 hours)

- 7 An operator must reset the failsafe through the Reset Fail/safe button to re-enable normal control.

### A – 5.3: Filter Backwash

Most menus and options are the same for all of the filter/valve types, but a few are specific for either pressure or vacuum filter types. Features common to all types are listed in the next section. For Actuator, Pilot valve, Enhanced Pilot valve, or Standard solenoids specific settings, refer to the section on Pressure Filter Specific Settings. For Compak Vacuum filter specific settings refer to the Vacuum Filter Specific Settings section.

#### A – 5.3.1: Common Backwash Features

##### ▶ Timer Settings (Operator):

- ▶ **Enable Timer (Operator):** Enables or disables triggering backwash from the 4 Event 28 Day Timer.
- ▶ **4 Event 28 Day Timer (Operator):** *Only shown if the timer is enabled.* The 4 Event 28 Day Timer allows you to program a backwash based on a schedule.

Selecting Event 1 will allow you to select the weekly interval to trigger the backwash.

If the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, or 4<sup>th</sup> week is selected, the timer will only trigger on that week in the four-week cycle. The Odd Weeks selection will trigger on the 1<sup>st</sup> and 3<sup>rd</sup> weeks, the Even Weeks selection will trigger on the 2<sup>nd</sup> and 4<sup>th</sup> weeks, and the Every Week selection triggers every week.

- 7 The week number and day of week for the current date is displayed on the bottom right side of these screens.

- 7 The first week is fixed to be the week of Sunday, January 2<sup>nd</sup>, 2000 and every four weeks afterward.

After making your selection, you can select the day of the week (or every day) the backwash should be triggered on.

Once you make your selection, you will be returned to the 4 Event 28 Day Timer menu where you will have a new menu item: Event 1 Start Time.

Select the Event 1 Start Time from the 4 Event 28 Day Timer menu. This screen will allow you to set the time to trigger the event on the programmed week/days. The event will trigger at the start time if the controller is running at that time. To toggle AM/PM, press the +/- Key. Enter the desired time and press enter.

### ► Pressure Settings (Operator):

► **Start BW Enable (Operator):** Enables or disables triggering backwash from a high differential pressure. If enabled and the filter pressure type is set to transducer, the controller allows you to set the triggering differential set point. If the filter pressure sensor type is set to contact switch, then the controller will trigger a backwash when it sees a contact closure on the input for Filter 2.

► **Set Point (Operator):** *Only shown if the Start BW Enable is enabled and the pressure sensor type is set to transducer.* When the differential pressure rises above this value for the BW Start Delay, the controller will trigger a backwash.

► **BW Start Delay (Operator):** *Only shown if the Start BW Enable is enabled.* This is the amount of time the differential pressure must remain above the Set Point before it triggers a backwash.

### ► Flow Rate Settings (Operator):

► **Start BW Enable (Operator):** Enables or disables triggering a backwash from a low flow rate.

► **Set Point (Operator):** *Only shown if the Start BW Enable is enabled.* When the Flow Rate falls below this value for the BW Start Delay, the controller will trigger a backwash.

► **BW Start Delay (Operator):** *Only shown if the Start BW Enable is enabled.* This is the amount of time the flow rate must remain below the Set Point before it triggers a backwash.

### ► Flow Volume Settings (Operator):

► **Start BW Enable (Operator):** Enables or disables triggering a backwash from a flow volume.

► **Flow Vol Increment (Operator):** *Only shown if the Start BW Enable is enabled.* Enter the value the volume must increment by to trigger a backwash.

### ► BFFS Duration (Operator):

The BFFS Duration prevents a trigger (except manual start) from starting a backwash if triggered within this time period from the end of the previous backwash.

### ► Inhibit BW Start (Operator):

► **Enable/Disable (Operator):** Enables or disables locking out backwashes between the Start Time and End Time.

► **Start Time (Operator):** *Only shown if Enable/Disable is enabled.* Prevents a backwash from being triggered between this time and the End Time.

► **End Time (Operator):** *Only shown if Enable/Disable is enabled.* Prevents a backwash from being triggered between this time and the Start Time.

### ► Hi BW Pit Action (Operator):

*Only shown if the BW Pit Input has been enabled and if either the Recirculation Pump has been assigned a relay or if the valve type is set to Enhanced Pilot Valve and the isolation relay is assigned.* Choose what action you want the controller to take when a backwash pit high alarm occurs while backwashing. While the pit/tank drains, you may either switch the filter back to filter (the default setting), shut down the Recirculation Pump (if the Recirculation Pump has been assigned a relay), or isolate the filter from the system (if the valve type is set to Enhanced Pilot Valve) which prevents re-compacting the filter media.

### ► Hi BW Timeout (Operator):

This value sets the maximum time you wish the controller to hold a backwash while waiting for the backwash pit to drain. If the timeout is reached, the backwash will be canceled and the BW Duration Failsafe alarm will trigger.



### A – 5.3.2: Vacuum Filter Specific Settings

#### ► Timing (Operator):

- **Draw Down Timeout (Operator):**  
Maximum time to wait to reach the draw down level.
- **Backwash Duration (Operator):** Length of time to backwash filter.
- **Filtr To Waste Dur. (Operator):** Length of time to filter to waste.

### A – 5.4: Autofill

Depending on the controller configuration, Autofill may or may not be installed. If Autofill is installed on your particular controller, choose Autofill from the menu. This will allow you to program the following for the Autofill:


► **Set Point (Operator):** *Only shown if Autofill sensor type is set to Surge Pit Level.* This value sets the surge pit level that the controller will fill to. (the range is from the surge pit low alarm point to the surge pit high alarm point)


► **Alternate Set Point (Operator):** *Only shown if Autofill sensor type is set to Surge Pit Level.* The 4 Event 28 Day Timer allows you to program a schedule to define when to use alternate set point.

► **Alt Set Point 4 Event 28 Day Timer (Operator):** To program the 4 Event 28 Day Timer, perform the following:

- Select the Alt. Set point from the Autofill menu.
- Now select the 4Event 28Day Timer from the Alt. Set Point menu.
- Selecting Event1 will allow you to select the weekly interval to use the alternate set point.

If the 1st, 2nd, 3rd, or 4th week is selected, the timer will only trigger on that week in the four-week cycle. The Odd Weeks selection will trigger on the 1st and 3rd weeks, the Even Weeks selection will trigger on the 2nd and 4th weeks, and the Every Week selection triggers every week.


 The week number and day of week for the current date is displayed on the bottom right side of these screens.

 The first week is fixed to be the week of Sunday, January 2<sup>nd</sup>, 2000 and every four weeks afterwards.

The next set of screens will allow you to choose the actual day(s).

- Select what day of the week, or every day, the alternate set point should be used.
- Once you make your selection you will be returned to the 4Event 28Day Timer menu where you will have a new menu item: Event 1 Times.
- Select the Event1 Times from the 4Event 28Day Timer menu.

This screen allows you to set both the start time and the end time for the event's programmed weeks/days. To toggle AM/PM, press the +/- key while the cursor is on the time you wish to change.

 If your start time is before midnight (12:00 AM) and the end time is after midnight, the alternate set point will continue to be used the following day up to the end time even if that day did not fall within the week/day selection for that event.

Example:


Event1 Week/Day: Odd weeks/ Tuesday  
Event1 Times: 11:00 PM to 3:00 AM  
Event2 Week/Day: Even weeks/ Monday  
Event2 Times: 11:00 PM to 6:00 AM  
Current Week/Day: 2nd/Tuesday  
Current Time: 4:00 PM

The alternate set point last ran from 11:00 PM last night to 6:00AM this morning.

The next time the alternate set point will run will be from 11:00 PM next Tuesday to 3:00AM next Wednesday.

► **Overfill Delay (Operator):** This is a timer that sets how long the Autofill should continue filling after the set point has been reached (the input range is from 0 seconds to 1 hour). In order to disable this, set the timer to 0 seconds.

► **Failsafe Timer (Operator):** This value sets the time that the relay is allowed to stay on without reaching set point before the relay is locked out. If Autofill has been trying to achieve set point without success for the selected time, the controller will cut power to the relay, flash the Reset Fail/Safe LED on the face panel and display a message to alert the operator. (the range is 0:00 to 18:00 hours)

 An operator must reset the failsafe through the Reset Fail/safe button to re-enable normal control.

### A – 5.5: Sensor Wash

Depending on the controller configuration, Sensor Wash may or may not be installed. If Sensor Wash is installed on your particular controller, choose Sensor Wash from the menu. This will allow you to program the following for Sensor Wash:

► **4 Event 28 Day Timer (Operator):** To program when the Sensor Wash should trigger, select 4Event 28Day Timer from the Sensor Wash menu:

► Selecting Event1 will allow you to select the weekly interval to trigger the Sensor Wash. If the 1st, 2nd, 3rd, or 4th week is selected, the timer will only trigger on that week in the four-week cycle. The Odd Weeks selection will trigger on the 1st and 3rd weeks, the Even Weeks selection will trigger on the 2nd and 4th weeks, and the Every Week selection triggers every week.

⑦ The week number and day of week for the current date is displayed on the bottom right side of these screens.

⑦ The first week is fixed to be the week of Sunday, January 2<sup>nd</sup>, 2000 and every four weeks afterwards.

► Next you can select the day of the week (or every day) the event should be triggered on.

Once you make your selection, you will be returned to the 4Event 28Day Timer menu where you will have a new menu item: Event 1 Start Time.

► Select the Event1 Start Time from the 4Event 28Day Timer menu.

This screen allows you to set the time to trigger the event on the programmed weeks/days. The event will trigger at the start time if the controller is running at that time. To toggle AM/PM, press the +/- key. Enter the desired time and press enter.

► After setting the time, press the left arrow to return to Sensor Wash's main menu. Here you will notice the next scheduled Sensor Wash is displayed for you. The controller will also list the last Sensor Wash here once one has been completed.

► **Start/End Time (Operator):** Allows you to set what times the feed may be triggered during a day.

► **# Of Cycles (Operator):** Sets how many times the relay will trigger between the Start and End times.

► **Duration (Operator):** Sets how long the feed will run for each cycle.

## A – 5.6: Enzyme

Depending on the controller configuration, Enzyme feed may or may not be installed. If Enzyme feed is installed on your particular controller, choose Enzyme from the menu. This will allow you to program the following for the Enzyme feed:

► **Start/End Time (Operator):** Allows you to set what times the feed may be triggered during a day.

► **# Of Cycles (Operator):** Sets how many times the relay will trigger between the Start and End times.

► **Duration (Operator):** Sets how long the feed will run for each cycle.

► **Label (Operator):** Allows you to change the name of this control. There is a 12 character maximum.

## A – 5.7: Alarm Relay

Depending on the controller configuration, an Alarm Relay may or may not be installed.

There are no programmable options for the Alarm Relay. Whenever there is an alarm or Emergency Off is active, this relay will turn on.

## A – 5.8: Recirculation Pump

Depending on the controller configuration, the Recirculation Pump may or may not be under control of the controller. If the Recirculation Pump is controlled by your particular controller, choose Recirculation Pump from the menu. This will allow you to program the following for the Recirculation Pump:

► **Pres. Alarm Delay (Operator):** Delay pressure and vacuum alarms from triggering for this amount of time whenever the recirc pump starts up.

► **Heater Fireman Switch (Operator):** *This option is only shown if a relay is assigned to the Heater control.* This value sets the minimum amount of time to leave the recirculation pump on after the heater shuts off.

► **Ozone Fireman Switch (Operator):** *This option is only shown if a relay is assigned to the Ozone control.* This value sets the minimum amount of time to leave the recirculation pump on after the Ozone relay shuts off.

► **VFD Control (Operator):** Allows you to configure the VFD control settings for the Recirculation Pump. Once you have selected VFD Control you will have the following items to choose from:

► **Control Input (Operator):** Allows you to select the input to use for VFD control.

- ▶ **Turndowns (Operator):** Allows you to configure scheduled and manual turndowns.
- ▶ **OOR alarm delay (Operator):** *This option is only shown if the Control Input is set to Flow Meter.* If the output required to meet the set point exceeds 100%, the triggering of the Out Of Range (OOR) alarm will be delayed by this amount of time. Set to 0 to disable the alarm.
- ▶ **Set Point (Operator):** Allows you to set the value to control to. (in %, flow rate, or pressure units depending on what the control input is set to).
- ▶ **Dead Band (Operator):** *This option is only shown if the Control Input is set to Flow Meter.* The VFD output will not change until the input is this far away from the set point.

### A – 6: Control Options

Press Menu on the controller's face panel and select Control Options from the menu.

This will allow the programming of the following:

#### A – 6.1: Flow Restored

After you have entered the Control Options section, select Flow Restored from the menu. This will allow for the programming of the following:

- ▶ **Enable / Disable (Operator):** Once you have entered the Flow Restored option, select Enable / Disable from the menu. Here you will be able to select whether you want to delay the chemical feeders after flow is restored to the system.
- ▶ **Delay Duration (Operator):** *This option is only available if flow restored feed delay is enabled.* Once you have entered the Flow Restored option, and selected to enable this option, you can select Delay Duration and enter the desired time that the chemical feeders must wait to operate after flow is restored. (the range is from 0:00 to 60:00 minutes)

#### A – 6.2: Power Saver

Power Saver is a timer triggered function that saves energy by shutting down the recirculation pump for programmable periods of time while the pool is not in use.

When active, power saver has the following states:

- **CONTROLLING:** At least one control function is currently feeding. Once all feeds have finished, the system will enter the GOING TO SLEEP state.
- **GOING TO SLEEP:** All control functions must be satisfied (they don't turn their feeds on) for the Enter Sleep Delay duration before allowing system to enter the SLEEPING state.

- **SLEEPING:** Timed period (Sleep Duration) where the shutdown of recirculation pump is triggered and all feeds are disabled. After entering SLEEPING state, the recirculation pump will continue to run until the heater and ozone fireman switch timers run out. The sleep timer starts when all conditions have been met, not when controller shuts down the recirculation pump. Only a timer triggered backwash, the sleep timer expiring, or the Power Saver timer expiring will put the system into the WAKING UP state. No feeds or input alarms will operate while the system is asleep or waking up.
- **WAKING UP:** Timed period (Exit Sleep Delay) where the recirculation pump is ran before allowing feeds to operate. Once the wake up time expires, if the Power Saver timer expired, the system will remain awake even if all feeds are satisfied. Otherwise the system enters the CONTROLLING state, performing a backwash if triggered, and will reenter GOING TO SLEEP again once all feeds have been satisfied again.

- ▶ **Enable (Operator):** Enable or disable the Power Saver feature.
- ▶ **4 Event 28 Day Timer (Operator):** The 4 Event 28 Day Timer allows you to program power saver's schedule.
- ▶ **Sleep Duration (Operator):** Sets how long the controller will sleep.
- ▶ **Enter Sleep Delay (Operator):** Sets how long to wait after all of the feeds have been satisfied before entering SLEEP (i.e. the GOING TO SLEEP duration). If any feed starts feeding during this time, the controller goes back to the CONTROLLING state.
- ▶ **Exit Sleep Delay (Operator):** Sets how long to wait after coming out of sleep before allowing any feeds to run. (i.e. the WAKING UP duration).

### A – 7: System Configuration

Press Menu on the controller's face panel and select System Configuration from the menu.

This will allow you to configure the following for the system:

#### A – 7.1: SN

This shows the controller serial number. By selecting this menu, you are shown the System Info. This includes the System type and the Serial Number.



**A – 7.2: Communication**

Once you have entered System Configuration, select Communication from the menu. Under communication, you can select from the following.

**A – 7.2.1: Direct Baud Rate (Operator):**

*This option is only shown if a BECSys Ethernet card is NOT installed.* Here you can choose the desired direct connect baud rate for the system.

**A – 7.2.2 Modem type (Read Only):**

*This option is only shown if a BECSys Ethernet card is NOT installed.* Shows the type of modem installed in the controller.

**A – 7.2.3: Ethernet Setup (Operator):**

*This option is only shown if a BECSys Ethernet card is installed.* These parameters should be set to values provided by the network's administrators.

- ▶ **Enable DHCP** – Enables/disables using DHCP. If DHCP is enabled, the controller will retrieve its IP address information from a DHCP server on the network. If DHCP is disabled, the IP address information must be set manually via the remaining items listed here.
- ▶ **IP Address** - *This option is only shown if DHCP is disabled.* Sets the controllers IP address.
- ▶ **IP Netmask** - *This option is only shown if DHCP is disabled.* Sets the controllers IP netmask.
- ▶ **IP Default Route** - *This option is only shown if DHCP is disabled.* Sets the controllers IP default route/gateway.
- ▶ **SMTP Server Addr** - Sets the email SMTP server address used by alarm call-out to send email and text messages.
- ▶ **SMTP Server Port** - Sets the email SMTP TCP port. This value should be set to 25 unless otherwise instructed by a network administrator.
- ▶ **DNS Server 1** - Sets the IP address for the primary DNS server. Required for email call-outs.
- ▶ **DNS Server 2** - Sets the IP address for the secondary DNS server which is only used if DNS server 1 cannot be contacted.

**A – 7.2.4: Call Out Setup (Operator):**

*This option is only shown if a BECSys Ethernet card or modem is installed.* Here you can set the parameters for the alarm call-out functions.

- ▶ **Call Out Enable** – Here you can choose to enable call outs.
- ▶ **Call Start Time** – Here you can set the time the controller will start allowing call outs.
- ▶ **Call End Time** – Here you can set the time the controller will stop allowing call outs.

- ▶ **Ack. Page outs** – Allows the controller to determine if somebody is responding to the page. If somebody receives the page and calls the controller this stops the controller from calling the remaining page phone numbers.
- ▶ **Pre-Delay** – Here you can set the amount of time the controller will delay to allow for alarm to reset before calling out. (the range is from 1:00 to 60:00 minutes)
- ▶ **Recipients Setup** – Allows configuration of eight recipients which can individually be configured for fax, pager, email, or text message call-out.

**▶▶ Call-Out Type:**

- **Pager:** *Requires a BECSys Ethernet Modem card or a standard modem.* Calls a numeric pager and leaves a callback number. After dialing the pager's number, the controller will wait for five seconds of silence before sending the callback number.
- **Fax:** *Requires a BECSys Ethernet Modem card or a standard modem.* Calls a fax machine and sends a fax containing all active alarms and the times they were triggered.
- **Email:** *Requires a BECSys Ethernet card with functioning DNS and SMTP server settings.* Sends an email to the recipient's email address containing all active alarms and the times they were triggered.
- **Text Message:** *Requires BECSys Ethernet card with functioning DNS and SMTP server settings.* Sends a text message with a list of active alarms to a text pager or cell phone using email.
- **Disabled:** Disables the call-out recipient.

▶▶ **Pager Service # (pager)** - *This option is only shown if the call-out type is set to pager.* Enter the recipient's pager phone number to dial. You may use commas to add two second delays in the dialing of the number. Example 9,1234567 will dial 9, wait two seconds, then dial 1234567.

▶▶ **Callback # (pager)** - *This option is only shown if the call-out type is set to pager.* Enter a number to leave as the callback number displayed on the pager.

▶▶ **Fax Number (fax)** – *This option is only shown if the call-out type is set to fax.* Enter the phone number of the recipient's fax machine. You may use commas to add two second delays in the dialing of the number. Example 9,1234567 will dial 9, wait two seconds, then dial 1234567.

- ▶ **Email address (Email)** – *This option is only shown if the call-out type is set to email.* Enter the recipients email address. Enter the local part of the email address (the part before the @) into the first screen, then enter the domain part of the email address (the part after the @) into the second screen.
- ▶ **Email address (text message)** – *This option is only shown if the call-out type is set to text message.* The recipients email address for text messaging is usually in the form of the pager's or cell's ten-digit-number@domain.com or the like. (2223334444@txt.att.net). Enter the phone number into the first screen, then enter the domain part of the email address (the part after the @) into the second screen. Check with the recipient's wireless carrier for the correct email address to use.
- ▶ **Post-Delay** – The time to delay starting the next recipient call-out after this recipient call-out is triggered.
- ▶ **Test** – Triggers a test call-out of the current recipient only. Note you may only test one recipient at a time.
- ▶ **Current State** – Shows the current state of the recipient's call-out when a call-out is in progress.
- ▶ **Last Status** – Shows the status of the previous call-out for the selected recipient. This is only updated when a call-out has been completed. Some of the possible results are: success, no dial tone, busy, no answer, and no carrier.

### A – 7.2.5: Installed Options:

This screen lists the currently supported notification hardware (modem and email) and their current status.

### A – 7.3: Datalog Frequency

Once you have entered System Configuration, select Datalog Frequency (Operator) from the menu. Here you can choose how often the controller collects data. By setting the Datalog Frequency longer, the more information the controller can store, but the less detailed the information is.

### A – 7.4: Date, Time & Units

Once you have entered System Configuration, select Date, Time & Units from the menu. Here you can enter the values for the following:

- ▶ **Units (Operator):** Here you can choose from U.S. or Metric measurements.

- ▶ **Date Format (Operator):** Here you can choose the format for the date.
- ▶ **Current Date (Operator):** Here you can set the current date.
- ▶ **Current Time (Operator):** Here you can set the current time. Use the + / - key to toggle between AM and PM.

### A – 7.5: User Setup

Once you have entered System Configuration, select User Setup from the menu. Operators can only change their own access code. Managers can change their own access code and any of the Operators.

See the section on Access Codes for more information.

### A – 7.6: Display Options

Once you have entered System Configuration, select Display Options from the menu.

- ▶ **Page Delay (Operator):** Here you can set the delay for scrolling to the next page in the normal display. These screens will only scroll when not in a menu screen.
- ▶ **Info Screens (Operator):** If this option is enabled, pressing the number keys while in the normal display will bring up detailed info about different features.
- ▶ **Toggle LCD Mode (Operator):** Toggles the LCD display between negative and positive modes.

### A – 8: VFD Turndowns

VFD Turndowns allow you to trigger or cancel manual turndowns (must have a manual turndown enabled for this menu to appear). This will also display the next scheduled turndown.

**A – 9: Access Menu**

The controller will require users to enter their access code before allowing them to enter the menus or set any values under the quick set keys. The controller automatically displays the access screen whenever a user does not have a high enough access level to enter a specific screen.

Access Menu	Select the level of
1 Logon as Operator	access you require.
2 Logon as Manager	
02-25-2009 1:26 PM	

To enter an Operator access code, press 1.

To enter a Manager access code, press 2.

If at anytime you wish to logon as another access level, you may do so by pressing the Menu key and selecting Logon from the main menu.

## Section B: The Normal Display




The normal display refers to the screens that display all of your inputs, current alarms, and status messages. These are read only and do not offer any selections to choose from.

### B – 1: Inputs and Feeds

When no alarms or status messages are present, the entire screen will be used to display all of the enabled inputs. If a particular input is used by a control output and the control output is feeding based off of that input, the controller will display a message next to that input indicating so.

Other information such as Customer/Location/Rep information may also be displayed.

If there are more items to show than there is room for, the controller will page through them until they all have been displayed, then start over.

-  Pressing the right arrow key (Next) will display the next page.
-  Pressing the Lock Screen button will prevent the controller from paging the screen to show more inputs, alarms, and other status information.
-  You can adjust the rate at which the controller pages by pressing the up and/or down arrow keys.

### B – 2: Alarms & Status messages

When one or more alarms are active, the bottom three lines are used to list them. If more than three alarms are active, the controller will page through

them three at a time until they all have been displayed, then start over.

Sensor wash, backwash, and power saver all display status information in this area as well. If there are any active alarms while one or more of these control functions' are active, the alarms will be shown every other page while the control functions will alternate with each other.

02-25-2009 1:45 PM

Filter Differential 25 psi  
BW Pit Level 3.00 ft  
Filter Flow 250.0 gpm

-----  
Filter Diff High ALARM!

02-25-2009 1:45 PM

Filter Differential 10 psi  
BW Pit Level 3.00 ft  
Filter Flow 250.0 gpm  
Last Backwash 02-25-2007 at 10:46 AM  
Backwash started by: Manual  
Backwash ended by: Timer Cycle

02-25-2009 1:46 PM

## Section C: Using the Face Panel Quick Keys

### C – 1: The Set Points Key

The Set Points Key on the front face panel, when pressed, allows you to quickly change desired feed set points for the various control outputs that are enabled.

```
<===== Feed Set Points =====>
Press Set Point button again for alarms
1+Polymer High          5.00 NTU
2 Polymer Low           2.00 NTU

02-25-2009  1:48 PM
```

To change the existing feed set point, first select the desired option, input the new value, and then press enter.

Pressing the Set Points key a second time will display the alarm set points for all of the enabled inputs.

```
<===== Alarm Set Points =====>
1+Flow Rate Low Alarm    50.0 gpm
2 Diff Pressr High Alarm  17 psi
3 BW Pit High Alarm      4.00 ft

02-25-2009  1:49 PM
```

To change the existing alarm set point, first select the desired option, input the new value, and then press enter.

### C – 2: The Relay Mode Key

```
<===== Local relays =====>
Press Relay Mode button again for more
1+r1 BW Filter 1        AUTO    Filter
2+r2 BW Filter 2        AUTO    Filter
3+r3 BW Filter 3        AUTO    Filter
4+r4 BW Filter 4        AUTO    Filter
5+r5 Recirc Pump        AUTO    On
6+r6 BW Iso. Relay      AUTO    On

02-25-2009  1:49 PM
```

Pressing the Relay Mode key on the front face panel shows you which options have been assigned relays, and each of the relays' current mode (AUTO/MANUAL OFF/MANUAL ON) and its state (Off or On).

If your controller was ordered with any Relay Modules, pressing the Relay Mode key again will cycle through any Relay Modules connected to the controller, showing what is assigned to those relays and their current state.

```
<===== Expansion Relays 1 =====>
Press Relay Mode button again for more
1+rir1 BW Filter 5      AUTO    Filter
2+rir2 BW Filter 6      AUTO    Filter
3+rir3 BW Filter 7      AUTO    Filter
4+rir4 BW Filter 8      AUTO    Filter
5+rir5 BW Filter 9      AUTO    Filter

02-25-2009  1:50 PM
```

By selecting one of the assigned relays, you are allowed to choose between automatic, manual on or manual off. Unused relays and the alarm relay cannot be manually overridden, but their current state is always displayed.

If Manual On is selected, you will be prompted to enter how long the relay can stay in Manual On before returning to Auto (the maximum on time is 30 minutes).



To test a relay or to prime a pump (on the local relay screen), lock the screen while in the main Relay Mode menu, then press the relay's numeric key (i.e., for relay 3, press the 3 key). This will turn the relay on for as long as you are pressing that key. If the relay is already on, this will have no affect.



The Relay Expansion modules have a button to test the relays.

If you have the controller set up to control a VFD, pressing the Relay Mode Key again will display the 4-20mA Control Outputs.

```
<===== 4-20mA Control Outputs =====>
Press Relay Mode button again for more
1+VFD Output            AUTO    0.0 %

02-25-2009  1:46 PM
```



From here you can switch between auto and manual on. There are two different manual on options:

- ▶ Manual % Out and Manual Flow Rate.
- ▶ Manual % Out sets the VFD output at a specified value.

Manual Flow Rate changes the VFD output to maintain a specified flow rate.

### C – 3: The Cal Key (calibration)

The Cal (calibration) key on the front face panel, when pressed shows you the inputs you can perform a single point calibration. Any inputs you have enabled can be calibrated from this Menu screen. Select the input you wish to calibrate and enter the proper value.

-  Perform a single point calibration if the reading is off by a consistent amount throughout the input range.
-  If the readings are accurate at one reading, but are off by an increasing amount the farther away you go from that reading, contact your distributor.

### C – 4: The Backwash Key

When all of the necessary components needed for backwash have been assigned and configured, and if there are no conditions preventing a backwash, the Backwash Key allows you to start a manual backwash.

```
Backwash Operation
1-View Active Triggers
2-Manual Start

02-25-2009 2:00 PM
```

```
Backwash Operation
Manual Start
1-Start
2 Cancel

02-25-2009 2:00 PM
```

If any automated backwash triggers have been enabled, you may also view them along with their associated input if applicable by selecting the View Active Triggers.

```
Backwash Operation
1-View Active Triggers
2 Manual Start

02-25-2009 2:00 PM
```

```
Active Backwash Triggers
Probe          Set
Turbidity      0.00 NTU 10.00 NTU
Diff Pressure  0 psi 15 psi
Flow Rate      0.0 gpm 110.0 gpm
Flow Volume    100.000 Kgal

Timers:
Event 1      Every/Sun 11:00 PM
Next Sched. 03-01-2009 11:00 PM

02-25-2009 2:05 PM
```

The Backwash Key's main screen will also list anything preventing a backwash from occurring such as an Emergency Off, configuration problems, and the Backwash Inhibit Timer.

```
Backwash Operation
1-View Active Triggers

Backwash Disabled until: 5:00 PM
BW inhibit: 8:00 AM 5:00 PM

02-25-2009 2:00 PM
```

During a backwash, the Backwash Key displays the progress of each filter and allows you to restart, switch to, or cancel a particular filter as well as cancel the backwash entirely.

```
Backwash Operation
1-Manual Stop

2 Filter 1      0:00 m:s Next to Wash
3 Filter 2      0:00 m:s Ready
4 Filter 3      0:28 m:s Backwashing

Backwashing Filter 3
Wash Time Remaining: 1:32

02-25-2009 2:03 PM
```

```
Backwash Operation
Filter 1 Details
1-Start this filter now
2 Skip this filter
Total wash time      0:00 m:s

02-25-2009 2:03 PM
```

### C – 5: The Reset Fail / Safe Key

```
Failsafe Operation  
BW Freq Failsafe (BFFS)  
1-Reset
```

02-25-2009 2:05 PM

The Reset Fail/Safe key on the front face panel, when pressed, lists any active failsafe alarms and allows you to reset them. A failsafe alarm is generally triggered when one of the relays has remained on past the set time the function has been given to reach its set point. By choosing to reset the failsafe, the control that triggered the failsafe will be able to resume operating normally once again.



**Warning: Before resetting the Failsafe Alarm, ensure that all functions of the controller are working properly.**

### C – 6: The Emergency Off Key





When the Emergency Off button is pressed, all relays are automatically shut off except for the alarm relay which will turn on. All the other relays will remain off until the emergency off button is pressed again.







Section D: Tables

D – 1: Flow Meter K-Factors

D – 1.1 Schedule 40 PVC Pipe

	Pipe Size (in)	+GF+Signet 515 (red)		+GF+Signet 2536 (blue)	
		U.S. GAL	LITERS	U.S. GAL	LITERS
SCH 80 PVC SADDLE ON SCH 40 PVC PIPE					
	2	27.350	7.226	54.700	14.452
	2-1/2	18.874	4.987	37.159	9.818
	3	12.638	3.339	23.697	6.261
	4	6.728	1.778	13.456	3.555
	6	3.730	0.985	7.459	1.971
	8	2.153	0.569	4.529	1.197
	10	1.350	0.357	2.800	0.740
	12	0.960	0.254	1.980	0.523
PP CLAMP-ON SADDLE ON SCH 40 PP PIPE					
	10	1.350	0.357	2.800	0.740
	12	0.960	0.254	1.980	0.523
SCH 80 IRON SADDLE ON SCH 40 PIPE					
	2	26.820	7.086	53.640	14.172
	2-1/2	18.800	4.967	37.600	9.934
	3	11.990	3.168	23.220	6.135
	4	6.850	1.810	13.260	3.503
	5	5.330	1.408	11.040	2.917
	6	3.760	0.993	7.240	1.913
	8	2.130	0.563	4.400	1.162
	10	1.350	0.357	2.800	0.740
	12	0.960	0.254	1.980	0.523
WELDOLETS ON SCH 40 PIPE					
	2-1/2	18.800	4.967	37.600	9.934
	3	12.170	3.215	24.340	6.431
	4	6.960	1.839	13.920	3.678
	5	5.260	1.390	10.860	2.869
	6	3.690	0.975	7.520	1.987
	8	2.130	0.563	4.340	1.147
	10	1.350	0.357	2.760	0.729
	12	0.960	0.254	1.940	0.513

D – 1.2 Schedule 80 PVC Pipe

	Pipe Size (in)	+GF+Signet 515 (red)		+GF+Signet 2536 (blue)	
		U.S. GAL	LITERS	U.S. GAL	LITERS
SCH 80 PVC TEES FOR SCH 80 PVC PIPE					
	1	174.670	46.148	352.440	93.114
	1-1/4	83.390	22.032	177.180	46.812
	1-1/2	58.580	15.477	117.850	31.137
	2	32.480	8.581	66.739	17.633
	2-1/2	21.833	5.768	42.994	11.359
	3	13.541	3.578	26.652	7.041
	4	7.626	2.015	15.006	3.965
SCH 80 PVC SADDLES FOR SCH 80 PVC PIPE					
	2	32.480	8.581	66.739	17.633
	2-1/2	21.833	5.768	42.994	11.359
	3	13.541	3.578	26.652	7.041
	4	7.626	2.015	15.006	3.965
	6	4.162	1.100	8.325	2.199
	8	2.371	0.626	5.016	1.325
	10	1.530	0.404	3.060	0.808
	12	1.060	0.280	2.160	0.571
PP CLAMP-ON SADDLE ON SCH 80 PP PIPE					
	10	1.530	0.404	3.060	0.808
	12	1.060	0.280	2.160	0.571
SCH 80 IRON SADDLES ON SCH 80 PIPE					
	2	32.360	8.550	64.720	17.099
	2-1/2	22.220	5.871	42.480	11.223
	3	13.420	3.546	26.420	6.980
	4	7.660	2.024	14.700	3.884
	5	5.860	1.548	12.180	3.218
	6	4.090	1.081	8.440	2.230
	8	2.330	0.616	4.900	1.295
	10	1.530	0.404	3.060	0.808
	12	1.060	0.280	2.160	0.571

**Section E: Warranty****LIMITED WARRANTY**

BECS warrants the controller electronics against any defect in workmanship or materials for a period of five years from the date of shipment. In the event of a component failure due to any defect in workmanship or materials, BECS will repair, or if repair is not possible, replace the defective part or parts of the BECSys controller.

BECS will have the sole right to determine whether to repair or replace a product. BECS will not be responsible for any expense associated with installation of repaired or replacement parts.

**LIMITATIONS AND EXCLUSIONS**

This is a LIMITED WARRANTY. BECS makes NO WARRANTIES other than those contained herein. The LIMITED WARRANTY replaces and is in lieu of any WARRANTIES of MERCHANTABILITY or of FITNESS FOR A PARTICULAR PURPOSE which are expressly DISCLAIMED. All GENERAL, SPECIAL, INDIRECT, INCIDENTAL AND/OR CONSEQUENTIAL DAMAGES ARE EXCLUDED AND DISCLAIMED.

This Limited Warranty is governed by Missouri Law and all disputes related to or arising from this transaction or Limited Warranty shall be resolved in Circuit Court of St. Louis County, Missouri.

Any claims under this Limited Warranty must be brought within ONE YEAR after the cause of action accrued.



TECHNOLOGY Inc. has been designing and manufacturing the industry's most reliable water chemistry controller for over 15 years. Our 24,000 ft<sup>2</sup> facility in Saint Louis, Missouri is home to an exceptional design team, and all manufacturing is performed onsite at this facility where we can personally assure the quality of our products. The BECS commitment to excellence drives the most innovative new products and unparalleled customer service.