

# Installation Instructions and Owner's Manual

## SCS1 Series

### Backwashing Multi-Layer Carbon Filter System



---

---

#### Franklin Water Treatment, LLC

12630 US Highway 33 N  
Churubusco, IN 46723

Phone (260) 693-1972 Fax (260) 693-0602

# Table of Contents

<b>Pre-installation Instructions</b>	<b>Page 2</b>
<b>General Installation</b>	<b>Page 4</b>
<b>Bypass Valve</b>	<b>Page 5</b>
<b>Installation Instructions</b>	<b>Page 6</b>
<b>General Operation</b>	<b>Page 10</b>
<b>Maintenance</b>	<b>Page 11</b>
<b>Troubleshooting Guide</b>	<b>Page 13</b>
<b>Specifications</b>	<b>Page 16</b>
<b>Component Parts Breakdown</b>	<b>Page 17</b>
<b>Component Parts List</b>	<b>Page 18</b>
<b>Control Valve Breakdown</b>	<b>Page 19</b>
<b>Control Valve Parts List</b>	<b>Page 20</b>
<b>Installation Fittings</b>	<b>Page 21</b>
<b>Ten Year Limited Warranty</b>	<b>Page 24</b>

# Pre-installation Instructions

## Description of the water filter system

This filter system includes a media tank that has been preloaded with filter sand, a blend of catalytic and coconut shell carbon and a backwashing control valve. Incoming water flows into the control valve and is directed down through the media. This media uses adsorption to remove objectionable tastes and odors as well as providing sediment filtration of the water. The filtered water then returns to the control valve where it is directed into the service lines.

Periodically the control valve will go through a backwash cycle. The frequency of this backwash process will depend on the incoming water quality and amount of water used. This backwash cycle is factory preset to occur every third day. This cycle will typically begin at 1:00 A.M.

## Water Quality

The water should be tested to determine the concentration, or levels of the items listed below:

**Hardness** - Hardness in drinking water is defined as those minerals that dissolve in water having a positive electrical charge (cat ions). The primary components of hardness are calcium (Ca++) and magnesium (Mg++) ions. But dissolved iron (Fe++) and manganese (Mn++) also contribute to total "adjusted" hardness. Hardness produces scale, soap scum and white mineral deposits which shorten the life of water using appliances, plumbing and fixtures. Water that has less than 1 grain of hardness is considered to be "soft" water. If soft water is desired, install a softener following the SCS1 filter.

**pH** - A measurement of the acidity of the water. pH is reported on a scale from 0 to 14. Neutral water has a pH of 7.0, lower values indicate acidic water. If your pH is below 6.8 you may consider installing an acid neutralizer before the water softener to elevate the pH.

**Iron** - A naturally occurring metallic element. Iron levels in excess of 0.3 milligrams/liter (mg/l) combine with oxygen causing orange or red (rust) stains on plumbing fixtures. Iron exists in some water sources in clear water (ferrous) state, red water (ferric) state or bacterial form. If bacterial or ferric (red water) iron is present or iron level exceeds 4.0 mg/l, an iron filter should be installed ahead of the SCS1 filter.

**Manganese** - A naturally occurring metallic element. Manganese levels as low as 0.05 milligrams/liter (mg/l) can combine with oxygen to cause dark brown or black staining on fixtures. Additionally, manganese can cause an odor in the water similar to a "rotten egg" smell. This water softener may reduce manganese as well as iron; however, an iron filter may be required in some cases.

**Tannin** - A naturally occurring humic acid. Tannin is caused by water passing through decaying vegetation. Coffee and Tea are prime examples of tannin in water. Tannin levels as low as 0.5 milligrams per liter can cause a yellow discoloration in water. Consult your dealer for a system designed to remove both tannin and hardness.

**Hydrogen Sulfide** - A naturally occurring gas. Hydrogen sulfide, more commonly referred to as sulfur, causes a distinct odor similar to "rotten eggs." Due to its gaseous nature, hydrogen sulfide must be tested at the well site within 1 minute of drawing the sample. If sulfur is present additional equipment will be required. The SCS1 can reduce low levels of sulfur in drinking water.

# Pre-installation Instructions (cont.)

## Water Supply

This filter will function properly when the water supply is furnished by a jet pump, submersible pump, variable speed (constant pressure) pump or community water supply. As with all other filter systems, however, it is imperative that the well pump provides enough flow rate for the filter to adequately backwash. In order to ensure sufficient backwash flow rate the following pumping rate test should be performed prior to installing the SCS1.

1. Make certain no water is being drawn in the house.
2. Open spigot nearest pressure tank.
3. When well pump starts, close spigot and measure time (in seconds) to refill pressure tank (well pump turns back off). This is **Cycle Time**.
4. Using a container of known volume, draw water from pressure tank and measure how many gallons until the pump turns back on again. This is **Draw Down**.
5. Calculate pumping rate by dividing draw down by cycle time and multiplying by 60.

$$\frac{\text{Draw Down (gallons)}}{\text{Cycle Time (seconds)}} \times 60 = \text{Pumping Rate (gallons per minute)}$$

Example: Draw down is 8 gallons  
Cycle time is 65 seconds

$$\frac{8 \text{ gallons}}{65 \text{ seconds}} \times 60 = 7.4 \text{ gpm (gallons per minute)}$$

## Location Considerations

The proper location to install the SCS1 will ensure optimum filter performance and satisfactory water quality. The following factors should be considered in selecting the location of this system.

1. The SCS1 must be installed after the pressure tank (private well system) or water meter (municipal water or community well).
2. The system should be installed as close as possible (preferably within 15') to an adequate floor or laundry drain capable of handling the backwash cycle volume and flow rate (refer to unit specifications). An air gap should be provided between the SCS1 drain line and plumbing drain.
3. All water conditioning equipment should be installed at least 10' prior to the water heater. Water temperatures exceeding 100°F can damage the internal components of the control valve and filter tank. An expansion tank may need to be installed in the line to the water heater in order to allow for thermal expansion and comply with local plumbing codes.
4. Water pressure must not exceed the range of 25 - 100 psi.
5. The system must not be subject to freezing temperatures.
6. The control valve requires 115/120 V, 60 Hz electricity from an outlet that is not wired to a switch.
7. Never install a cartridge type filter prior to the SCS1. Any cartridge or in-line filter (if desired) may be installed after the SCS1 system. This will prevent restricting the water flow and pressure available for backwash.
8. Appliances requiring extended periods of continuous or high flow water use (i.e. geothermal heat pumps, swimming pools, lawn irrigation, outside hose bibs, etc.) should bypass the filter.

# General Installation

## GENERAL INSTALLATION & SERVICE WARNINGS

The water conditioner is not designed to support the weight of plumbing.

Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicone lubricant may be used on black "O" Rings. This will allow ease of installation and decrease chance of rolling from the bypass and tank connections. *Avoid any type of lubricants, including silicone, on red or clear lip seals.*

Do not use pipe dope or other sealants on threads. Teflon<sup>®</sup> tape must be used on the threads of the drain line connection. Teflon<sup>®</sup> tape is not used on any connection where "O" Ring seals are used

The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic Service Wrench, (V3193, not included). If necessary, pliers can be used to unscrew the nut or cap. Do not use a pipe wrench to tighten nuts or caps. *Do not place screwdriver in slots on caps and/or tap with a hammer.*

NOTE: If the plumbing system is used as the ground leg of the electric supply, continuity should be maintained by installing ground straps around any non-conductive plastic piping or bypass used in the installation.

Make sure the filter is not installed backwards. The filter will not function properly if installed backwards and filter media may be forced into the water lines. Arrows molded into the valve body and red handles of the bypass indicate the direction of flow.

The installer should consider installing a vacuum breaker to prevent damage to the mineral tank and flooding if a vacuum is drawn on the system due to a city water main break or faulty check valve in a private well.

## Typical Installation

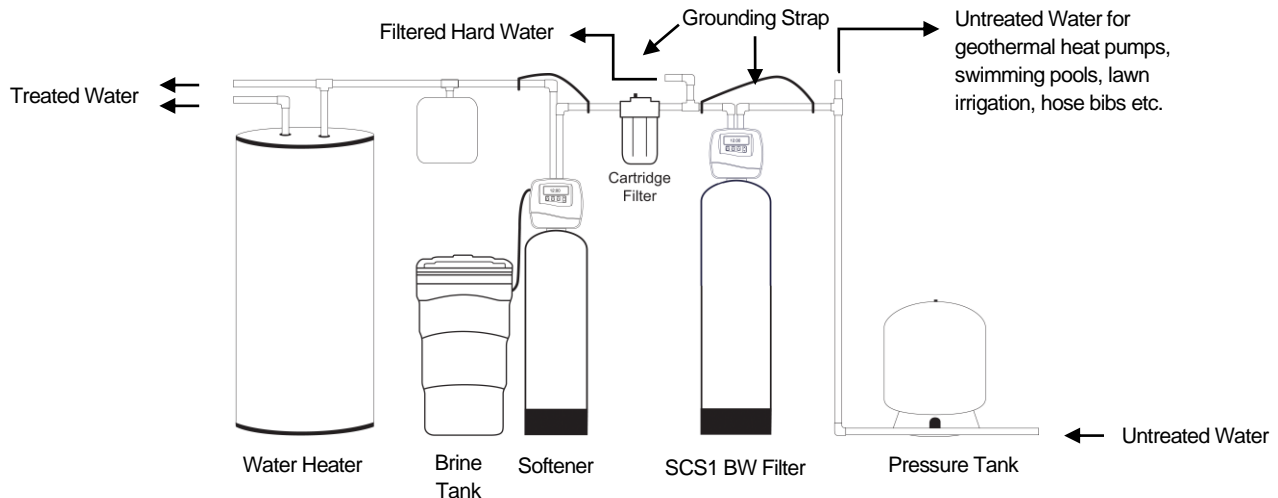


FIGURE 1: Typical Installation

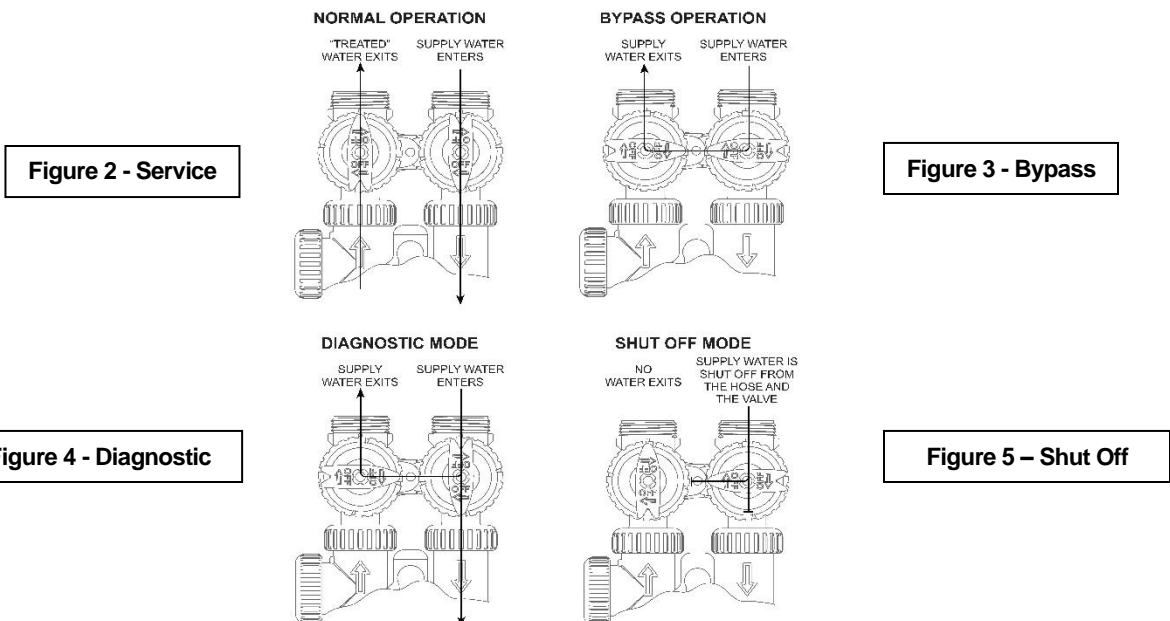
# Bypass Valve

The bypass valve is used to isolate the control valve from the plumbing system's water pressure in order to perform control valve repairs or maintenance. The 1" full flow bypass valve incorporates four positions including a diagnostic position that allows a service technician to have pressure to test a system while providing untreated bypass water to the building. Be sure to install bypass valve onto main control valve, before beginning plumbing or make provisions in the plumbing system for a bypass. The bypass body and rotors are glass filled Noryl® and the nuts and caps are glass filled polypropylene. All seals are self-lubricating EPDM to help prevent valve seizing after long periods of non-use. Internal "O" Rings can easily be replaced if service is required. The bypass consists of two interchangeable plug valves that are operated independently by red arrow shaped handles. The handles identify the direction of flow. The plug valves enable the bypass valve to operate in four positions.

1. **Normal Operation Position:** The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve. Water flows through the control valve for normal operation of a water softener or filter. During the regeneration cycle this position provides regeneration water to the unit, while also providing untreated water to the distribution system (**Fig. 2**).
2. **Bypass Position:** The inlet and outlet handles point to the center of the bypass. The system is isolated from the water pressure in the plumbing system. Untreated water is supplied to the building (**Fig. 3**).
3. **Diagnostic Position:** The inlet handle points toward the control valve and the outlet handle points to the center of bypass valve. Untreated supply water is allowed to flow to the system and to the building, while not allowing water to exit from the system to the building (**Fig. 4**). This allows the service technician to draw brine and perform other tests without the test water going to the building.

**NOTE:** The system must be run through a rinse cycle before returning the bypass valve to the normal position.

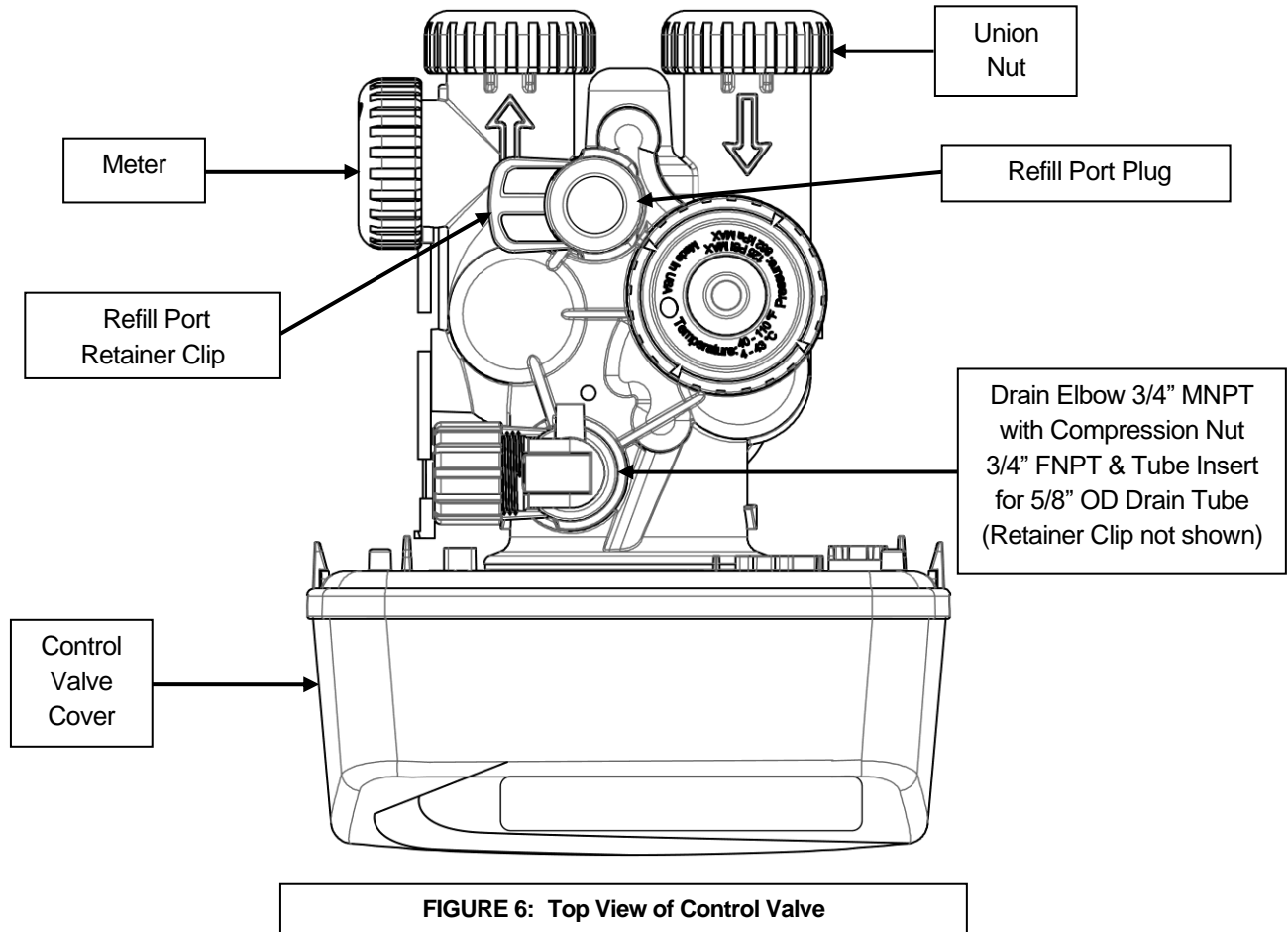
4. **Shut Off Position:** The inlet handle points to the center of the bypass valve and the outlet handle points away from the control valve. The water is shut off to the building. The water treatment system will depressurize upon opening a tap in the building. A negative pressure in the building combined with the unit being in regeneration could cause a siphoning of brine into the building. If water is available on the outlet side of the unit it is an indication of water bypassing the system (**Fig. 5**)



# Installation Instructions

- STEP 1:**       **Unpack filter unit**, making sure to remove entire contents of the shipping container prior to disposal. The SCS1 unit is pre-filled with all filter media and gravel that is required.
- STEP 2:**       **Place unit at desired installation position.** Be sure it is within 15 feet of a drain that is no higher than the control valve and near a non-switched electrical outlet. Be sure the tank is on a level and firm base. Install the unit with at least 10 feet of piping before the water heater to prevent hot water from backing into the filter or install a thermal expansion tank between the softener and water heater. **DO NOT plug into electrical outlet at this time.**
- STEP 3:**       **Shut off water at main supply.** Relieve pressure by opening nearest faucet. On private well systems, turn off power to pump and drain pressure tank. **SHUT OFF POWER OR FUEL SUPPLY TO WATER HEATER.**
- STEP 4:**       Cut main supply line as required to fit plumbing to inlet and outlet plumbing adapters of the bypass valve. **DO NOT PLUMB INLET AND OUTLET BACKWARDS.** Piping should be supported. Do not apply heat to any fitting attached to the bypass or control valve. Perform all plumbing according to local plumbing codes.
- STEP 5:**       **Plumb the water supply line** to the unit's bypass valve inlet side plumbing adapter, located at the right rear as you face the unit. There are a variety of installation fittings available. They are listed under Installation Fitting Assemblies, pages 21-23. When assembling the installation fitting package (inlet and outlet), connect the fitting to the plumbing system first and then attach the nut, split ring, and "O" Ring. Heat from soldering or solvent cements may damage the nut, split ring, or "O" Ring. Solder joints should be cool and solvent cements should be set before installing the nut, split ring, and "O" Ring. Avoid getting solder flux, primer, and solvent cement on any part of the "O" Rings, split rings, bypass valve, or control valve. If the building's electrical system is grounded to the plumbing, install a copper grounding strap from the inlet to the outlet pipe. **MAKE CERTAIN WATER ENTERS THROUGH INLET AND DISCHARGES THROUGH OUTLET.**
- STEP 6:**       **Apply thread tape to DLFC Assembly.** Remove drain line flow control (DLFC) retainer clip (Figure 6, Page 7) and remove the DLFC assembly from the valve body, (Figure 6, Page 7). Apply thread tape to threads. Slide drain fitting compression nut onto provided drain tubing and place the tube insert inside the end of the tubing. Insert tubing end with insert into drain elbow and tighten the compression nut onto the thread taped elbow. Reinsert DLFC assembly into the valve body, making certain it is FULLY inserted before replacing the retaining clip.
- STEP 7:**       **Install drain line.** Use the provided ½" I.D. polyethylene tubing (**DO NOT USE FLEXIBLE VINYL TUBING!**) to run drain line from control valve DLFC fitting (Figure 6, Page 7) to drain or sump pit capable of handling the backwash rate of the filter (refer to specifications and flow rate on page 16) or discard the compression fitting and use ¾" NPT fitting to connect a rigid pipe drain line (recommended). If backwash flow rate is greater than 7.5 gpm, use ¾" FNPT connector with rigid drain line. There must be an air gap at the end of the drain line to prevent siphoning of wastewater. Length of drain line should be 15' or less. **AVOID OVERHEAD DRAINS.**
- STEP 8:**       **With the bypass valve handles in the bypass position (Figure 3, Page 5), turn on water supply.** Turn the inlet bypass valve handle to the diagnostic position (Figure 4, Page 5) and allow the filter to pressurize. NOTE: the INLET and OUTLET knobs turn *clockwise* to close the port to the filter and *counter-clockwise* to open the port to the filter. Check for leaks and correct as needed. Return the inlet bypass valve handle to the bypass position and allow the filter media to soak for at least 2 hours prior to backwashing the unit.

## Installation Instructions (cont.)



**STEP 9:** **Program control valve.** Plug the transformer of the control valve into an uninterrupted electrical outlet (not wired to a switch) and use the buttons on the front of the control valve to adjust the initial settings.

### A) SET THE TIME OF DAY

**Step 1** - Press SET CLOCK.

**Step 2** - Current Time (hour): Set the hour of the day using "UP" or "DOWN" buttons. AM/PM toggles after 12. Press NEXT to go to step 3.

**Step 3** - Current Time (minutes): Set the minutes of day using "UP" or "DOWN" buttons. Press NEXT to exit SET CLOCK. Press REGEN to return to previous step.

**Power Loss** - Lithium battery on circuit board provides up to 8 hours of time clock backup during power outages. After 8 hours, only the time of day needs to be reset, all other values are stored in non-volatile memory. If a power loss last less than 8 hours and time of day is flashing, replace coin type 2032 battery. Do not forget to reset for daylight savings time.



## Installation Instructions (cont.)

**B) Enter Programming:** Press “NEXT” and “UP” (triangle pointing up) buttons simultaneously for 3 seconds.

**1. Days Between Regeneration:**

- a. The display will show “SET HARDNESS -nA-”
- b. Press “NEXT”
- c. The display will show “SET REGEN DAY”
- d. A number will flash (default 3)
- e. Using the “UP” or “DOWN” (triangle pointing up or down) buttons, set the number of days (default 3, recommended) between backwashes.

**2. Regeneration Time:** Press the “NEXT” button

- a. The display will show “SET TIME REGEN”
- b. The hour will flash (default 1)
- c. Regeneration Hour: Using the “UP” or “DOWN” buttons, set the combination of hour of day and “AM” or “PM”. Make sure the filter is not backwashing at the same time with any other water treatment equipment.
- d. Press the “NEXT” button
- e. The display will show “SET TIME REGEN”
- f. The minutes will flash (default 00)
- g. Regeneration Minutes: Using the “UP” or “DOWN” buttons, set the minutes portion of the time when regeneration should occur.

**3. Exit Programming:** Press the “NEXT” button to return to the main display

**STEP 10:** **Initiate Manual Regeneration (Backwash Cycle):** With the bypass valve in the bypass position, press and hold the “REGEN” button 3 seconds or until the word “BACKWASH” appears in the lower middle of the display. The drive motor will run briefly and count-down timer will appear in the lower right the display. There should be an audible release of pressure to the drain.

**STEP 11:** **Unplug the valve transformer from the electrical outlet** to keep the SCS1 in backwash for an extended time to purge any air and remove media “fines” (very small particles of media).

**STEP 12:** Slowly turn the INLET knob of the bypass, counter-clockwise, to a point approximately 1/3 of the way between “Bypass” and “Service” positions (Figure 2, Page 5) or until the remaining air is released from the tank.

**STEP 13:** Once the air is purged, gradually turn the INLET knob of the bypass valve counter-clockwise until it is fully in “Service” position (Figure 2, Page 5). Then turn the OUTLET knob of the bypass valve counter-clockwise until it is fully in the “Service” position (Figure 2, Page 5). and **leave the control valve in “Backwash” position for at least 10 minutes or until water flowing from the drain line runs clear; whichever is longer.**

**STEP 14:** **Rinse Cycle:** **Plug the valve transformer into the electrical outlet.** Press the “REGEN” button to advance the control valve to the “RINSE” cycle. Another count-down timer will appear in the time-of-day position, “RINSE” will be shown in the lower right of the display.

**STEP 15:** **Exit Manual Regeneration:** Allow the rinse cycle to complete and the filter will return to service mode automatically.

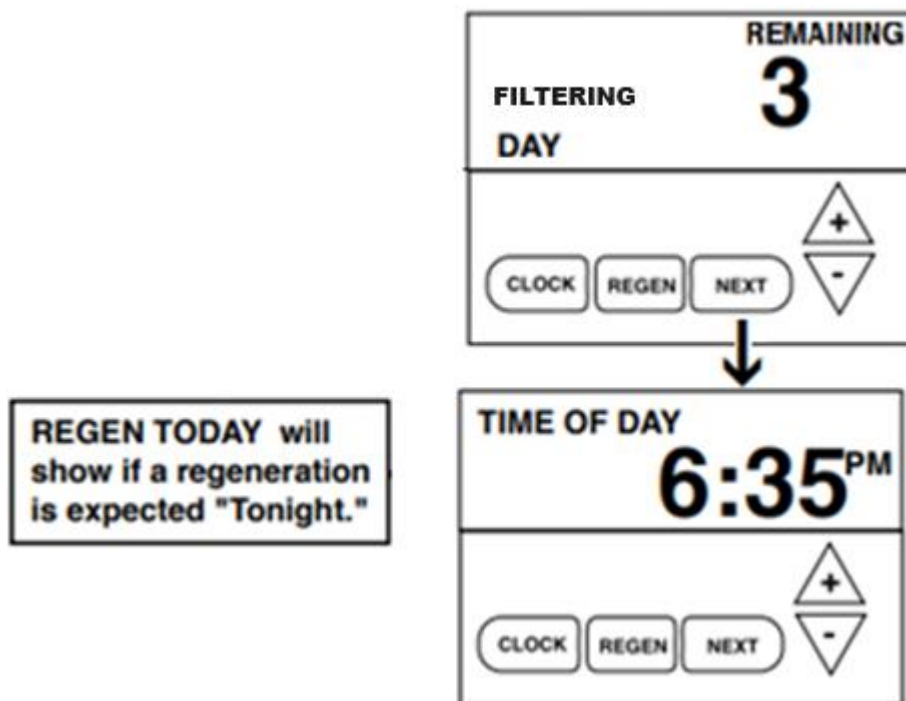
## Installation Instructions (cont.)

**STEP 16:      TURN ON FUEL / ELECTRICAL SUPPLY TO WATER HEATER.**

# General Operation

## USER DISPLAYS

When the system is operating one of two displays will be shown. Pressing NEXT will alternate between the displays. One of the displays is always the current time of day. The second display is gallons remaining. This is the number of gallons that will be treated before the system goes through a regeneration cycle. The user can scroll between the displays as desired. If softener is a time clock system, the number of days remaining until the next regeneration will be displayed instead of gallons remaining. If the system has called for a regeneration that will occur at the preset time of regeneration, the words "REGEN TODAY" will appear on the display. When water is being treated (i.e. water is flowing through the system) the word "FILTERING" flashes on the display.



## MANUAL REGENERATION

Sometimes there is a need to regenerate the system, sooner than when the system calls for it, usually referred to as manual regeneration. There may be a period of heavy water usage because of guests or a heavy laundry day. To initiate a manual regeneration at the preset delayed regeneration time, press and release "REGEN". The words "REGEN TODAY" will flash on the display to indicate that the system will regenerate at the preset delayed regeneration time. If you pressed the "REGEN" button in error, pressing the button again will cancel the request. To initiate a manual regeneration immediately, press and hold the "REGEN" button for three seconds. The system will begin to regenerate immediately. The request cannot be cancelled. You must cycle all the way through the cycles to make it stop. PLEASE NOTE: This will reset the meter. If back-to-back regenerations are desired, press and release "REGEN" button. "REGEN TODAY" will appear on screen. Push and hold REGEN button to initiate immediate regeneration. The softener will regenerate again at specified time. Back-to-back regenerations are recommended when salt is allowed to run out in brine tank.

# Maintenance

The SCS1 unit contains activated carbon, you should replace the filter media and gravel underbed at least every three years. Replacement may be required sooner if the taste and odor being removed begins to reappear in the treated water or you experience increasing pressure drop that is not resolved by increasing the frequency of backwashing.

## TO REPLENISH OR REBED MEDIA:

- 1) Pressure must be relieved on the system by placing the Bypass Valve in the "Bypass" position (Figure 3, Page 5) and initiating a manual regeneration (section 3, page 10).
- 2) Unplug the Control Valve from the electrical outlet to prevent it from advancing automatically.
- 3) Disconnect the Control Valve from the Bypass Valve.
- 4) Disconnect the Drain Line from the Control Valve.
- 5) Unscrew Control Valve from Mineral Tank and remove the distributor tube.
- 6) Siphon water from Mineral Tank and remove the filter media and gravel.
- 7) Rinse Mineral Tank and replace distributor, making certain that the distributor basket sits in the center of the tank bottom.
- 8) Cover the top of the distributor tube to prevent media entering the tube during filling. Using a funnel, pour gravel and filter media into the mineral tank. **Begin loading the tank with the gravel underbed. Filling the Mineral Tank 1/3 with water before loading gravel will cushion the fall and ensure even distribution of the gravel and media.** At least 14" of space MUST be left empty at the top of the mineral tank to allow for media bed expansion during backwash and to prevent filter media from being discharged to the drain.
- 9) Use a garden hose or bucket to fill the media tank with water.
- 10) Clean mineral tank or dome hole threads to remove any filter media. Remove the cover from the distributor tube and **reinstall control valve** by threading it securely onto the mineral tank. (O-ring seal: HAND TIGHTEN ONLY!)
- 11) Attach bypass valve to control valve body.
- 12) Reattach Drain Line to Control Valve (Figure 6, Page 6).
- 13) **IMPORTANT! Activated Carbon must be soaked for at least 2 hours prior to submitting it to full backwash flow rate to prevent loss of media to drain.**
- 14) Gradually turn the INLET side knob of the bypass valve counter-clockwise not more than 1/3 way to the "Service" position (Figure 2, Page 5) allowing air to purge gently. Any air trapped in the media bed should begin purging to the drain and water should begin flowing to the drain slowly.

## Maintenance (cont.)

- 15) Once the air is purged, gradually turn the INLET knob of the bypass valve counter-clockwise until it is fully in "Service" position (Figure 2, Page 5). Then turn the OUTLET knob of the bypass valve counter-clockwise until it is fully in the "Service" position (Figure 2, Page 5). and **leave the control valve in "Backwash" position for at least 10 minutes or until water flowing from the drain line runs clear; whichever is longer.**
  
- 16) Plug the transformer into the electrical outlet. Press the "REGEN" button to advance the control valve to the "RINSE" cycle. Another count-down timer will appear in the time-of-day position, "RINSE" will be shown in the lower middle of the display and "REGEN" appears in the middle left of the display. Allow the rinse cycle to complete and the filter will return to service mode automatically.

# Troubleshooting

PROBLEM	CAUSES	SOLUTIONS
Excessive pressure drop through filter	<ul style="list-style-type: none"> <li>A) Filter not backwashing</li> <li>B) Filter not backwashing frequently enough for water condition</li> <li>C) Filter bed loaded with sand</li> <li>D) "Cementing" or "Channeling"</li> <li>E) Drain Line restricted</li> <li>F) Top Screen Fouled</li> <li>G) Control Valve plugged with debris</li> </ul>	<ul style="list-style-type: none"> <li>1) Check if display is blank, see "Blank Display" section of Page 14.</li> <li>2) Check if display has an error message, see "Error Code" section of Page 15.</li> <li>3) Verify drive motor is connected to circuit board connector J1 (labeled "MOTOR") and is not faulty</li> <li>4) Ensure uninterrupted power supply</li> <li>5) Increase Backwash frequency</li> <li>6) Verify sediment being removed is less dense than the filter media and install a "Spin-Down" type sediment filter ahead of the SCS1 to remove well sand</li> <li>7) Verify adequate pumping rate for backwash</li> <li>8) Probe media bed to check for "Cementing"</li> <li>9) Check drain line for restriction: frozen, plugged, kinked, exceeds 15', overhead installation, flexible drain line, drain line diameter too small</li> <li>10) Clean top screen</li> <li>11) Disassemble and clean control valve</li> </ul>
Contaminant not being properly removed	<ul style="list-style-type: none"> <li>A) Leaking bypass valve</li> <li>B) Internal valve leak</li> <li>C) Distributor tube not seated properly in control valve</li> <li>D) Water usage flow rate exceeds filter specifications</li> </ul>	<ul style="list-style-type: none"> <li>1) Verify bypass valve is in service position</li> <li>2) Replace piston and seal assemblies</li> <li>3) Verify distributor tube seated securely in control valve body</li> <li>4) Verify actual water usage flow rates against system specifications</li> <li>5) Increase length of backwash and rinse cycles</li> </ul>
Neutralizer media raises pH too high	<ul style="list-style-type: none"> <li>A) Filter is brand new</li> <li>B) Wrong media used</li> </ul>	<ul style="list-style-type: none"> <li>1) Turn bypass valve very slightly to the "Bypass" position allowing a small amount of untreated water to bleed into the treated water (only if iron &lt; 0.3 ppm, otherwise staining will occur)</li> <li>2) Rebed the unit with a less aggressive media</li> </ul>
Neutralizer media fails to raise pH sufficiently	<ul style="list-style-type: none"> <li>A) Water usage flow rate is too high to provide adequate contact time</li> <li>B) Media bed is "Cemented" or "Channeled"</li> </ul>	<ul style="list-style-type: none"> <li>1) Verify actual water usage flow rates against system specifications</li> <li>2) Verify adequate pumping rate for backwash</li> <li>3) Check drain line for restriction: frozen, plugged, kinked, exceeds 15', overhead installation, flexible drain line, drain line diameter too small</li> </ul>
Birm Filter fails to remove iron	<ul style="list-style-type: none"> <li>A) pH too low</li> <li>B) Dissolved oxygen level too low</li> </ul>	<ul style="list-style-type: none"> <li>1) pH of untreated water must be 6.8 or higher – adjust with proper equipment such as soda ash injection system</li> <li>2) Aerator may be installed prior to the filter</li> </ul>

## Troubleshooting (cont.)

PROBLEM	CAUSES	SOLUTIONS
Loss of media to drain	<ul style="list-style-type: none"> <li>A) Air in system</li> <li>B) Insufficient soak time before first backwash after installing media</li> </ul>	<ul style="list-style-type: none"> <li>1) Ensure well system has proper air elimination control</li> <li>2) Check media level and adjust if necessary</li> </ul>
Media in service lines	<ul style="list-style-type: none"> <li>A) Unit is installed backwards</li> <li>B) Distributor basket is broken</li> <li>C) Insufficient gravel under bed</li> </ul>	<ul style="list-style-type: none"> <li>1) Re-plumb the water lines so that the supply side of the line is connected to the inlet of the bypass and the service side is connected to the outlet.</li> <li>2) Replace distributor.</li> <li>3) Add gravel to tank, manually backwash</li> </ul>
Howling or whistling noise during regeneration	<ul style="list-style-type: none"> <li>A) Inadequate drain line diameter or drain line restricted</li> </ul>	<ul style="list-style-type: none"> <li>1) Reconfigure or replace drain line</li> </ul>
Continuous flow of water to drain	<ul style="list-style-type: none"> <li>A) Loss of electrical power during regeneration</li> <li>B) Debris in control valve</li> <li>C) Internal leak in control valve</li> </ul>	<ul style="list-style-type: none"> <li>1) Ensure electrical outlet is functioning</li> <li>2) Disassemble and clean control valve</li> <li>3) Replace seals and/or piston</li> </ul>
Filter backwashes at wrong time of day	<ul style="list-style-type: none"> <li>A) Clock is not set properly</li> <li>B) Power outage</li> <li>C) Incorrect control valve programming</li> </ul>	<ul style="list-style-type: none"> <li>1) Reset the clock (page 8)</li> <li>2) Verify control valve programming (page 8)</li> </ul>
Display is blank	<ul style="list-style-type: none"> <li>A) Control valve circuit board needs reset</li> <li>B) Transformer is unpowered, unplugged or defective</li> <li>C) Defective circuit board</li> </ul>	<ul style="list-style-type: none"> <li>1) Hold "NEXT" and "REGEN" buttons for 3 seconds</li> <li>2) Remove battery, unplug power for 5 seconds, plug back in, replace dead battery.</li> <li>3) Verify transformer is plugged into an electrical outlet that has power and transformer cable (black, 4 pins) is plugged into control valve connector J4 (labeled "POWER")</li> <li>4) With transformer plugged into electrical outlet, use a volt meter to test the 2 outer pins (furthest left and furthest right) of connector J4 on the control valve circuit board. Should be approximately 15 volts DC. Replace transformer if defective.</li> <li>5) Replace circuit board if needed</li> </ul>

## Troubleshooting (cont.)

ERROR CODE:	CAUSES	SOLUTIONS
<b>1001</b> – unable to sense motor movement	<ul style="list-style-type: none"> <li>A) Drive motor not inserted fully to engage pinion or is defective</li> <li>B) Circuit board not properly snapped into drive bracket</li> <li>C) Center reduction gear reflector dirty</li> </ul>	<ul style="list-style-type: none"> <li>1) Re-insert motor, check for broken wires, verify motor plugged into connector J1 (labeled “MOTOR”) on control valve circuit board and reset control valve (hold “NEXT” and “REGEN” buttons for 3 seconds)</li> <li>2) Re-seat circuit board into drive bracket and reset control valve</li> <li>3) Clean reduction gear reflectors (page 19)</li> </ul>
<b>1002</b> – unexpected motor stall	<ul style="list-style-type: none"> <li>A) Obstruction in control valve</li> <li>B) Main drive gear too tight</li> <li>C) Improper voltage delivered to circuit board</li> </ul>	<ul style="list-style-type: none"> <li>1) Remove piston and seal assemblies for inspection and repair or replacement and reset control valve (hold “NEXT” and “REGEN” buttons for 3 seconds)</li> <li>2) Loosen main drive gear and reset control valve</li> <li>3) Verify proper voltage is being supplied to circuit board (see Solution 4 under “Display is Blank” section, page 14)</li> </ul>
<b>1003</b> – motor ran too long, cannot find next cycle position	<ul style="list-style-type: none"> <li>A) Motor failure during regeneration</li> <li>B) Obstruction in control valve</li> <li>C) Drive bracket not snapped in place properly</li> </ul>	<ul style="list-style-type: none"> <li>1) Re-insert motor, check for broken wires, verify motor plugged into connector J1 (labeled “MOTOR”) on control valve circuit board and reset control valve (hold “NEXT” and “REGEN” buttons for 3 seconds)</li> <li>2) Remove piston and seal assemblies for inspection and repair or replacement and reset control valve</li> <li>3) Re-seat drive bracket assembly and reset control valve</li> </ul>
<b>1004</b> – motor ran too long, timed out trying to reach home position	<ul style="list-style-type: none"> <li>A) Drive bracket not snapped in place properly</li> <li>B) Center reduction gear reflector dirty</li> </ul>	<ul style="list-style-type: none"> <li>1) Re-seat drive bracket assembly and reset control valve (hold “NEXT” and “REGEN” buttons for 3 seconds)</li> <li>2) Clean reduction gear reflectors (page 19)</li> </ul>
<b>1006</b> – MAV/SEPS/NHBP/AUX MAV motor ran too long, looking for park position	<ul style="list-style-type: none"> <li>A) Control valve not programmed for ALT OFF</li> <li>B) Obstruction in control valve</li> </ul>	<ul style="list-style-type: none"> <li>1) Enter cycle programming level and verify second parameter is set to ALT OFF</li> <li>2) Remove piston and seal assemblies for inspection and repair or replacement and reset control valve (hold “NEXT” and “REGEN” buttons for 3 seconds)</li> </ul>
<b>1007</b> – MAV/SEPS/NHBP/AUX MAV motor ran too short looking for park position	<ul style="list-style-type: none"> <li>A) Control valve not programmed for ALT OFF</li> <li>B) Obstruction in control valve</li> </ul>	<ul style="list-style-type: none"> <li>1) Enter cycle programming level and verify second parameter is set to ALT OFF</li> <li>2) Remove piston and seal assemblies for inspection and repair or replacement and reset control valve (hold “NEXT” and “REGEN” buttons for 3 seconds)</li> </ul>



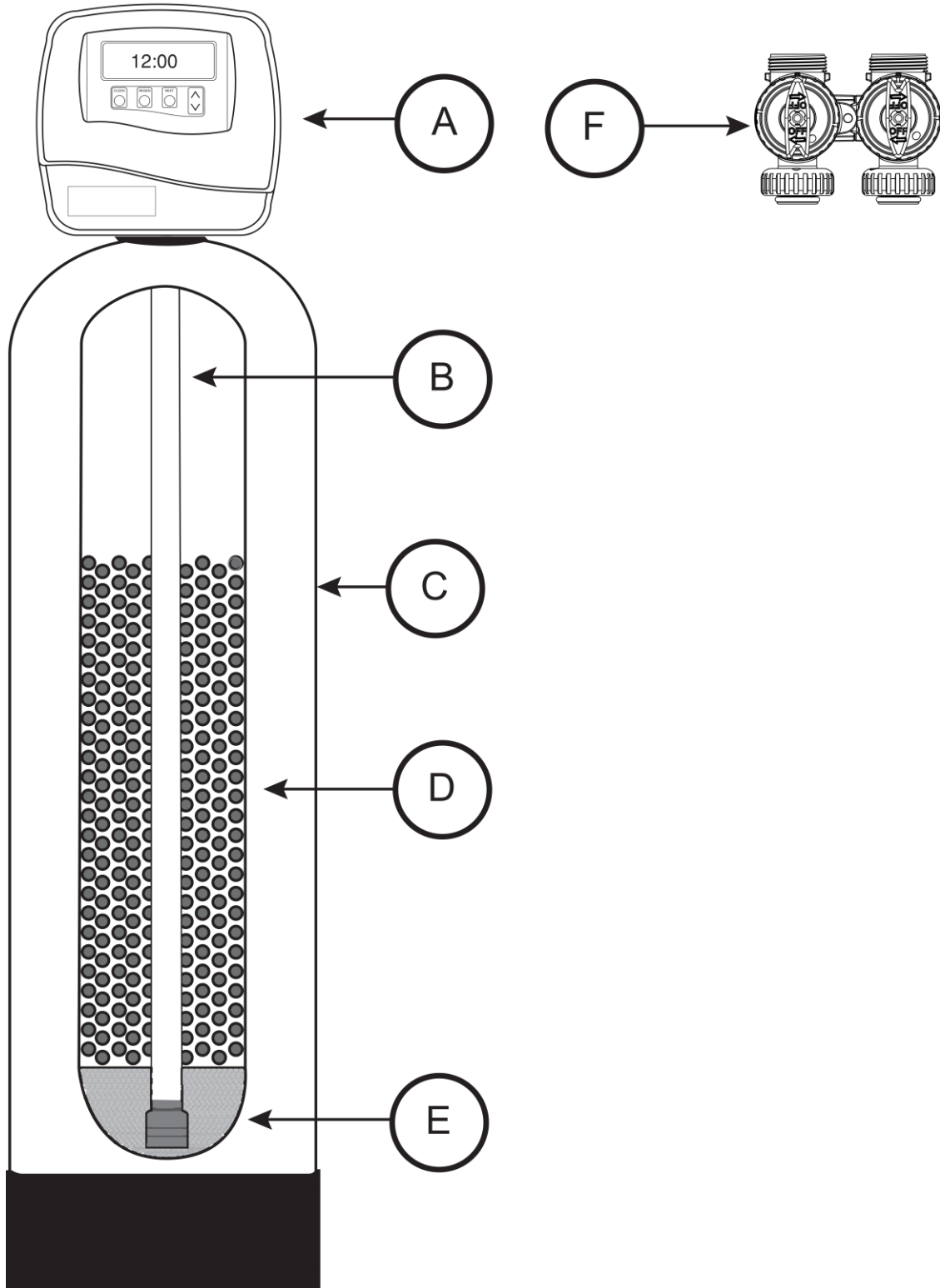
# SPECIFICATIONS

Description	SCS1-10	SCS1-15	SCS1-20	SCS1-25	SCS1-30
<b>Filter Media Volume, cu. ft.</b>	1.0	1.5	2.0	2.5	3.0
<b>Gravel Underbed, lbs.</b>	20	20	25	25	30
<b>Operating Flow Rate, gpm</b>					
<b>Continuous</b> @ 5 gpm/ft <sup>2</sup> of media surface area	3	3	4	5	5
<b>Service</b> @ 10 gpm/ft <sup>2</sup> of media surface area	5	5	8	9	11
<b>Peak</b> @ 18 gpm/ft <sup>2</sup> of media surface area	10	10	14	17	19
<b>Backwash</b> @ 10 gpm/ft <sup>2</sup> of media surface area	5.3	5.3	7.5	9	11
<b>Water Usage</b>					
Gallons	85	85	120	144	176
<b>Service Pipe Size, in.</b>					
Standard	1	1	1	1	1
<b>Tank Diameter x Height, in.</b>	10 x 44	10 x 54	12 x 48	13 x 54	14 x 65
<b>Minimum Space Required, in.</b>					
Width	11	11	13	14	15
Depth	16	16	17	18	18
Height	52	62	56	62	74
<b>Approximate Ship Wt., lbs.</b>	106	134	156	183	217

Factory default settings: Filter mode, P-Code 80, Single 8 minute backwash, single 8 minute rinse, 3 days between regeneration.

All models include: V3007 – 1” MNPT elbow adapters and QFNCR4-2 – ¾” compression fittings for PEX, CPVC and copper.

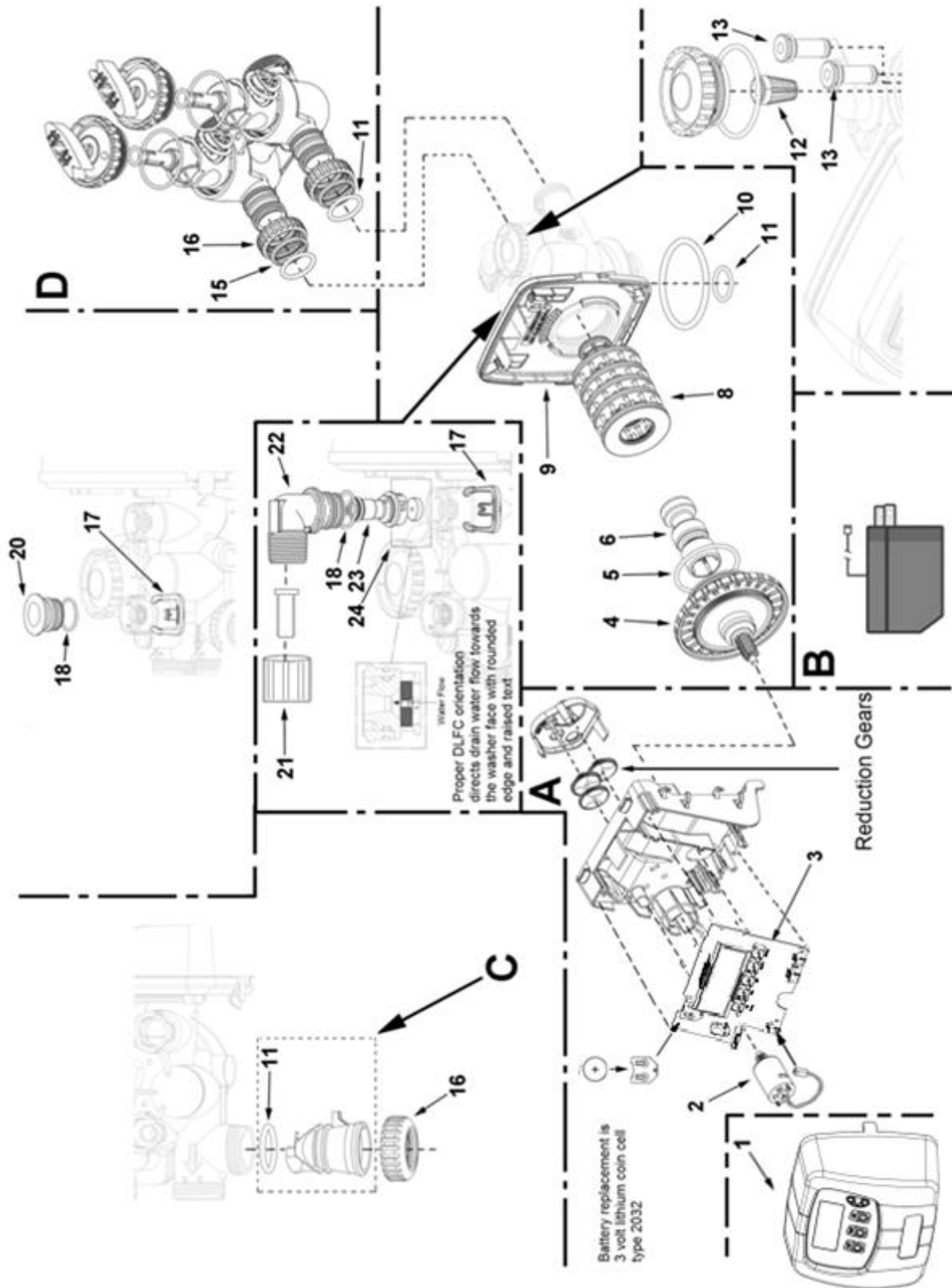
# Component Parts Breakdown



# Component Parts List

Ref #	Part Number	Description
A	SCS1-10-VLV-L-BP	Control valve, cover, 5.3 GPM DLFC, less bypass for model SCS1-10
	SCS1-15-VLV-L-BP	Control valve, cover, 5.3 GPM DLFC, less bypass for models SCS1-15
	SCS1-20-VLV-L-BP	Control valve, cover, 7.5 GPM DLFC, less bypass for model SCS1-20
	SCS1-25-VLV-L-BP	Control valve, cover, 9.0 GPM DLFC, less bypass for model SCS1-25
	SCS1-30-VLV-L-BP	Control valve, cover, 11.0 GPM DLFC, less bypass for model SCS1-30
B	D100S-48	Distributor tube, 1" x 48" for models SCS1-10, SCS1-20
	D100S-54	Distributor tube, 1" x 54" for models SCS1-15, SCS1-25
	D100S-65	Distributor tube, 1" x 65" for model SCS1-30
C	MTP1044N	10 x 44 mineral tank, natural, base, 2.5" top opening for model SCS1-10
	MTP1054N	10 x 54 mineral tank, natural, base, 2.5" top opening for model SCS1-15
	MTP1248N	12 x 48 mineral tank, natural, base, 2.5" top opening for model SCS1-20
	MTP1354N	13 x 54 mineral tank, natural, base, 2.5" top opening for model SCS1-25
	MTP1465N	14 x 65 mineral tank, natural, base, 2.5" top opening for model SCS1-30
D	qty 2 - CS05P	Clean Stream mixed bed filter media, 0.5 cu ft pail, SCS1-10
	qty 3 - CS05P	Clean Stream mixed bed filter media, 0.5 cu ft pail, SCS1-15
	qty 4 - CS05P	Clean Stream mixed bed filter media, 0.5 cu ft pail, SCS1-20
	qty 5 - CS05P	Clean Stream mixed bed filter media, 0.5 cu ft pail, SCS1-25
	qty 6 - CS05P	Clean Stream mixed bed filter media, 0.5 cu ft pail, SCS1-30
E	QC20	1/4" x 1/8" Gravel, 20 lb pail for models SCS1-10, SCS1-15
	qty 1.25 - QC20	1/4" x 1/8" Gravel, 20 lb Pail for models SCS1-20, SCS1-25
	qty 1.5 - QC20	1/4" x 1/8" Gravel, 20 lb Pail for models SCS1-30
F	V3006	Bypass valve

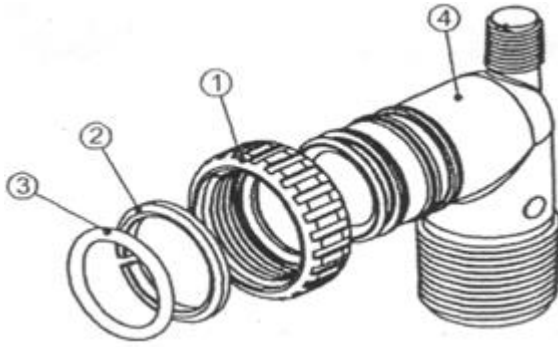
# Control Valve Breakdown



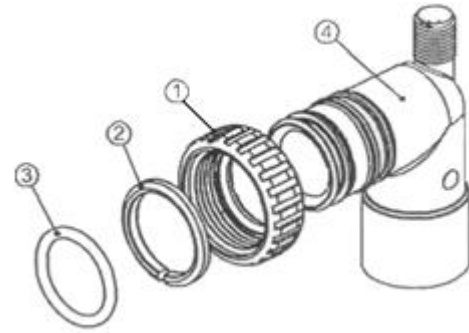
# Control Valve Parts List

REF #	Part Number	Description
A	CV3002SWS1	Drive Assembly, SWS1 Series with PCB & Motor
B	V3186-06	Power Cord with Transformer, 15 VDC
C	V3003	Meter and Cable Assembly
D	V3006	Bypass Valve, Less Fittings
1	V3992-01	Front Cover, Black, SWS Series
2	V3107-01	Drive Motor
3	V3940HC-02BOARD	Circuit Board, SWS Series
4	V3004	Drive Cap Assembly
5	V3135	O-ring, -228
6	V3011	Piston Assembly
8	V3005-02	Seal Cartridge Assembly
9	V3178	Back Plate
10	V3180	Base O-ring, -337
11	V3105	O-ring, -215
12	V3177-01	Injector Screen
13	V3010-1Z	Plug, Injector Assembly
15	V3150	Retainer, Split Ring
16	V3151	Nut, 1" Quick Connect
17	H4615	Clip, Elbow Locking
18	V3163	O-ring, -019
20	V3195-01	Plug, Brine Refill
21	V3192 PKP10TS8-BULK	Compression nut, 3/4" FNPT, for drain elbow Insert, for 5/8" OD poly tube
22 Not Shown	V3158-02 V3008-05	Elbow, Drain, 3/4" Male 1" NPT Straight Drain Housing, less DLFC
23	V3159-01	Retainer, Drain Line Flow Control
24	V3162-053 V3162-075 V3162-090 *V3190-110	<b>Drain Line Flow Control Button:</b> Flow Control Washer, 5.3 GPM (SCS1-10, SCS1-15) Flow Control Washer, 7.5 GPM (SCS1-20) Flow Control Washer, 9.0 GPM (SCS1-25) *Flow Control Washer, 11.0 GPM (SCS1-30)  * requires 1" drain housing V3008-05
Not Shown	18280-02	Top Screen, Bayonet Style

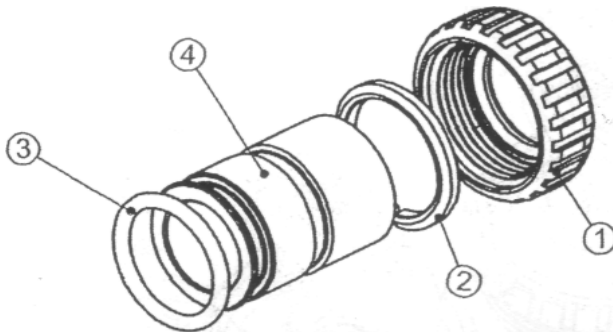
# Installation Fitting Assemblies



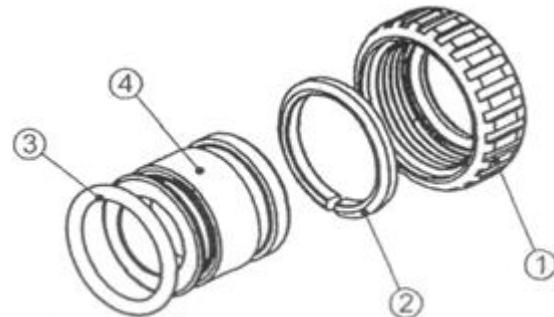
1" PVC MALE NPT ELBOW			
Ref	Part #	Description	Qty
	V3007	1" PVC male NPT elbow assy	2
1	V3151	Nut, 1" quick connect	2
2	V3150	Split ring	2
3	V3105	O-ring 215	2
4	V3149	Fitting	2



3/4" & 1" PVC SOLVENT ELBOW			
Ref	Part #	Description	Qty
	V3007-01	3/4" & 1" PVC solvent elbow assy	2
1	V3151	Nut, 1" quick connect	2
2	V3150	Split ring	2
3	V3105	O-ring 215	2
4	V3189	Fitting	2

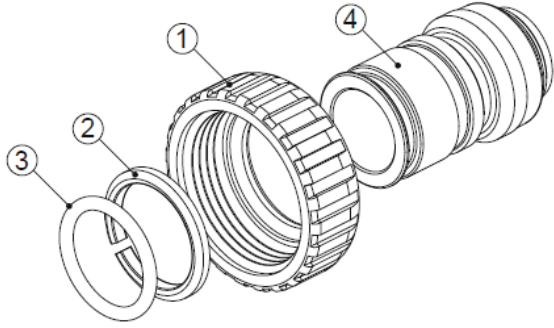


1" BRASS SWEAT			
Ref	Part #	Description	Qty
	V3007-02	1" brass sweat assembly	2
1	V3151	Nut, 1" quick connect	2
2	V3150	Split ring	2
3	V3105	O-ring 215	2
4	V3188	Fitting	2

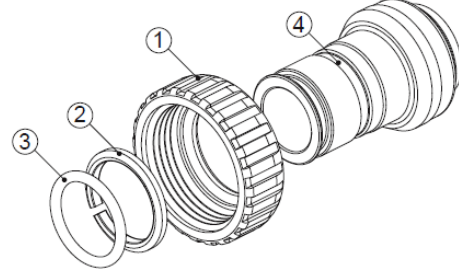


3/4" BRASS SWEAT			
Ref	Part #	Description	Qty
	V3007-03	3/4" brass sweat assembly	2
1	V3151	Nut, 1" quick connect	2
2	V3150	Split ring	2
3	V3105	O-ring 215	2
4	V3188-01	Fitting	2

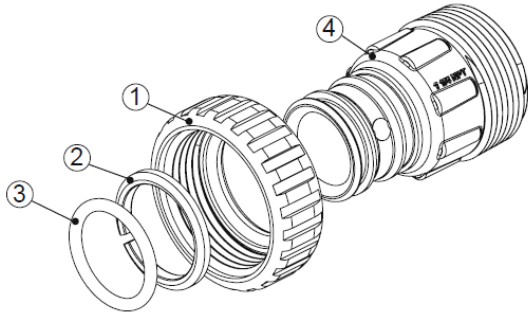
## Installation Fitting Assemblies (cont.)



3/4" BRASS SHARK BITE			
Ref	Part #	Description	Qty
	V3007-12	3/4" brass shark bite assembly	2
1	V3151	Nut, 1" quick connect	2
2	V3150	Split ring	2
3	V3105	O-ring 215	2
4	V3628	Fitting	2

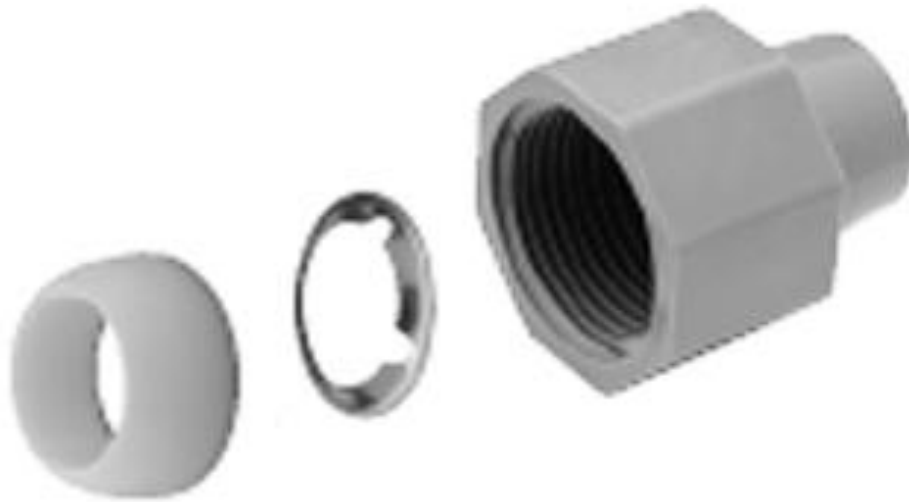


1" BRASS SHARK BITE			
Ref	Part #	Description	Qty
	V3007-13	1" brass shark bite assembly	2
1	V3151	Nut, 1" quick connect	2
2	V3150	Split ring	2
3	V3105	O-ring 215	2
4	V3629	Fitting	2



1-1/4" PLASTIC MALE NPT			
Ref	Part #	Description	Qty
	V3007-05	1-1/4" plastic male NPT assembly	2
1	V3151	Nut, 1" quick connect	2
2	V3150	Split ring	2
3	V3105	O-ring 215	2
4	V3317	Fitting	2

## Installation Fitting Assemblies (cont.)



3/4" QUICK CONNECT			
Ref	Part #	Description	Qty
K	QFNCR4	3/4" QUICK CONNECT	1*

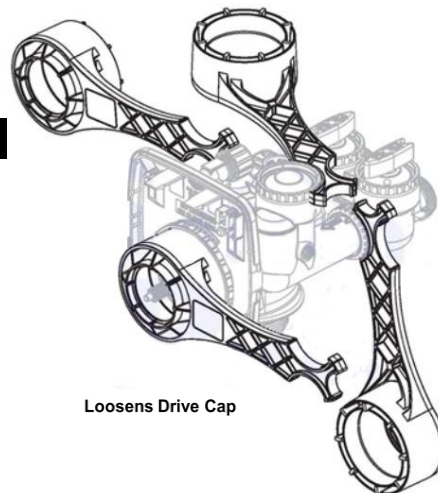
(\*2 required)

### SERVICE WRENCH - V3193

Although no tools are necessary to assemble or disassemble the valve, the *Service Wrench*, (shown in various positions on the valve) is available to aid in assembly or disassembly.

Loosens Drain Nut In  
Polytube Applications

Loosens Injector and  
Bypass Caps



Loosens Quick  
Connect Nuts

Loosens Drive Cap



# TEN YEAR LIMITED WARRANTY

**WARRANTY – Franklin Water Treatment, LLC warrants this water conditioner against any defects that are due to faulty material or workmanship during the warranty period. This warranty does not include damage to the product resulting from accident, neglect, misuse, misapplication, alteration, installation or operation contrary to printed instructions, or damage caused by freezing, fire, flood, or Acts of God. From the original date of consumer purchase, we will repair or replace, at our discretion, any part found to be defective within the warranty period described below. Purchaser is responsible for any shipping cost to our facility and any local labor charges.**

- One year on the entire water conditioner
- Five years on the control valve, except the seal & spacer assembly (1 year)
- Ten years on the mineral tank

**GENERAL CONDITIONS – Should a defect or malfunction occur, contact the dealer that you purchased the product from. If you are unable to contact the dealer, contact Franklin Water Treatment, LLC @ (260)693-1972. We will require a full description of the problem, model number, date of purchase, and selling dealer’s business name and address.**

**We assume no warranty liability in connection with this water conditioner other than specified herein. This warranty is in lieu of all other warranties, express, implied, or statutory including any warranty of merchantability, warranty of fitness for a particular purpose, and any implied warranties otherwise arising from course of dealing or usage of trade. We do not authorize any person or representative to assume for us any other obligations on the sale of this water conditioner.**

### FILL IN AND KEEP FOR YOUR RECORDS

<b>Original Purchaser</b>	<b>Date of Purchase</b>	<b>Model #</b>	
<b>Address of Original Installation</b>		<b>City</b>	<b>State</b>
<b>Dealer Purchased From</b>	<b>Dealer Address</b>	<b>City</b>	<b>State</b>

Franklin Water Treatment, LLC  
 12630 U.S. 33 North, Churubusco, IN 46723  
 Phone: (260)693-1972 Fax: (260)693-0602