

Installation Instructions and Owner's Manual

CTX Series Water Softening and Filter System



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Pre-installation Instructions

Description of the water treatment system

This combo filter / softener system includes a brine (salt) tank, a carbon filter media tank and a softener resin tank with a backwashing control valve. Incoming water flows into the control valve and is directed down through the carbon and then the ion exchange softening resin. The carbon absorbs chlorine to remove taste and odor and to protect the softener resin. The softener resin exchanges the hardness ions for softer ions. The softened water then returns to the control valve where it is directed into the service lines. The CTX Series carbon filter / water softener is designed to be installed on chlorinated water supplies.

Periodically the control valve will go through a regeneration cycle. The frequency of this regeneration process will depend on the size of water softener, incoming water quality and amount of water used. This cycle is factory preset to begin at 2:00 A.M. At this time the control valve will draw the brine solution out of the salt tank and flush both the accumulated hardness and excess salt to the drain. The control valve will then put fresh water back into the salt tank to make brine for the next regeneration cycle.

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.

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. Iron levels that exceed 2.0 mg/l require special ion exchange resin for reduction, or 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 this water softener.

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 gas, 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 OXY series iron filters can typically treat up to 2 milligrams per liter of sulfur gas if regenerated daily.

Pre-installation Instructions (cont.)

Location Considerations

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

1. The water softener and filter system should be installed after the water meter on municipal water. Operating pressure of the softener must be limited to within 30 – 100 psi range.
2. The water softener and filter 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).
3. All water conditioning equipment should be installed prior to the water heater. Water temperatures exceeding 100°F can damage the internal components of the control valve and filter tank. Install with at least 10' of pipe before the water heater to prevent thermal damage to the equipment. Otherwise, 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. The water softener should not be subject to freezing temperatures.
5. Ensure that any cartridge or in-line type filter installed prior to the water softener does not restrict the water flow and pressure available for backwash and interfere with normal operation.
6. 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 water softener.

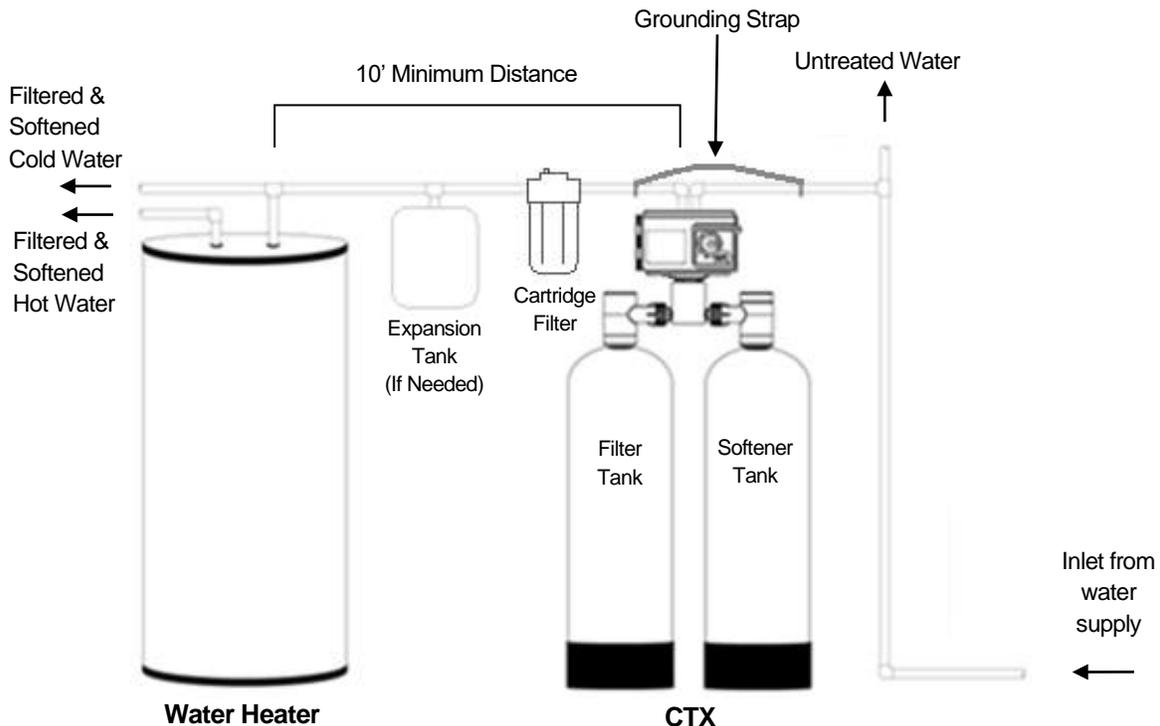


FIGURE 1: Typical Installation

Detailed Installation Instructions

- STEP 1:** Carefully remove all components from packaging. **DO NOT DISCARD PACKAGING** until all water softener and filter system components and fittings have been located.
- STEP 2:** Place filter tank (tank with media and fill port) on the **LEFT** side with the inlet and outlet pointing right. Place the softener tank on the **RIGHT** side with inlet and outlet pointing left (see Figure 1, Page 3).
- STEP 3:** Attach the control valve assembly to the front inlet/outlet openings of the filter and softener tanks. Ensure **FRONT** label on sump is facing forward. Attach straight pipe adapter to back inlet/outlet openings of the two tanks. Hand tighten union nuts. Do not over tighten. Attach bypass valve to the inlet / outlet of control valve and put in bypass position (Figure 2, Figure 4, Page 6).
- STEP 4:** Remove the fill port cap of the filter tank with the provided wrench and fill the tank with water through the fill port using a garden hose or bucket. Replace the fill port cap securely. Allow carbon media to soak for 2 hours prior to initiating backwash.
- STEP 5:** Add water to the brine tank slightly above the top level of the salt grid (approx. 6 gallons). **DO NOT ADD SALT TO THE BRINE TANK AT THIS TIME.**
- STEP 6:** Shut off water at main supply. Relieve pressure by opening nearest faucet. **SHUT OFF POWER OR FUEL SUPPLY TO WATER HEATER.**
- STEP 7:** Cut main supply line as required to fit plumbing to inlet and outlet of 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.

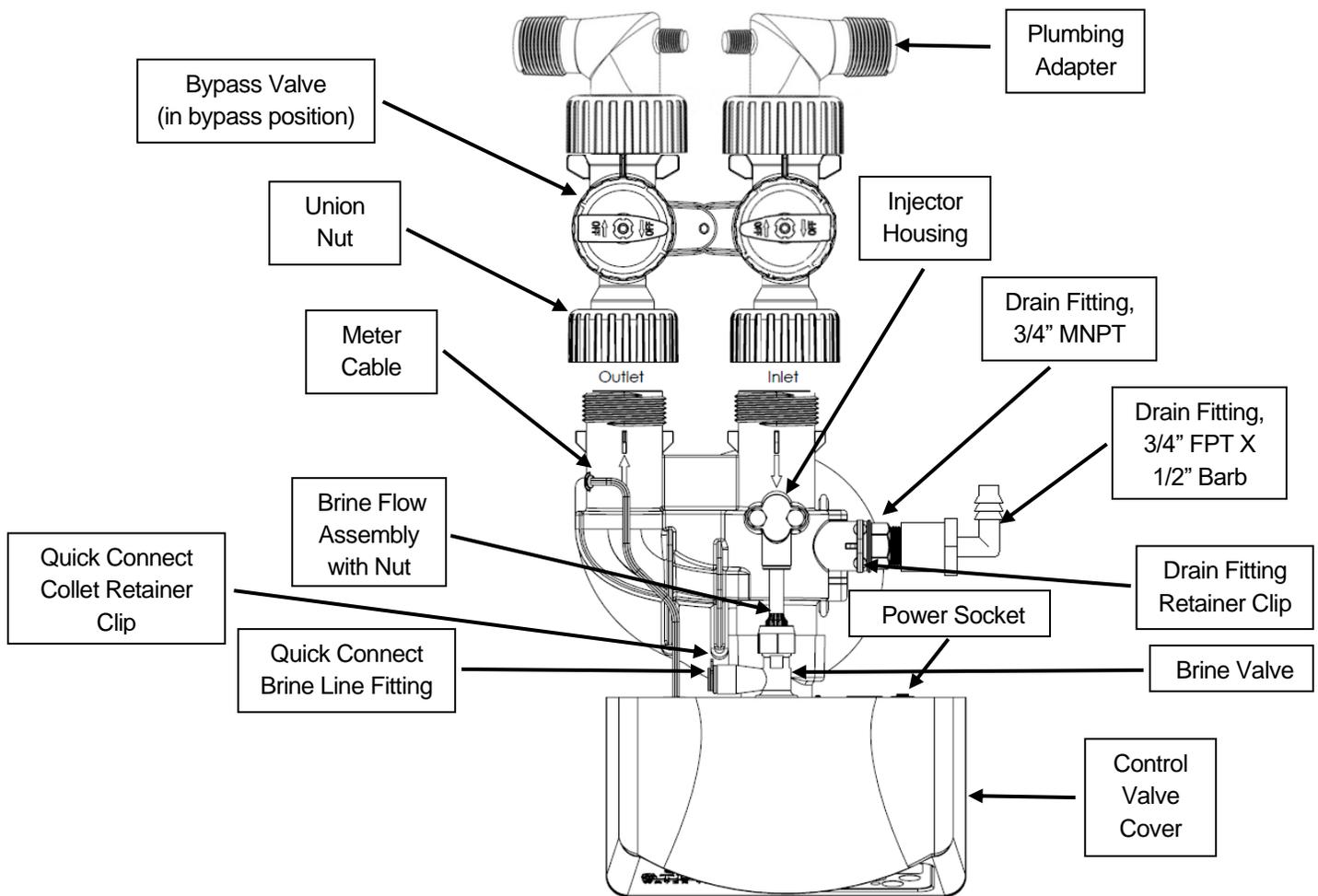


FIGURE 2: Top View of Control Valve

Detailed Installation Instructions (cont.)

STEP 8: Use the provided polyethylene tubing (**NO VINYL TUBING**) to run drain line from control valve barbed drain fitting (Figure 2, Page 4) to floor drain or sump pit capable of handling the backwash rate of the softener (refer to specifications and flow rate on Page 17). **THE DISCHARGE END OF THE DRAIN LINE MUST BE FIRMLY SECURED!** There must be an air gap at the end of the drain line to prevent siphoning of wastewater and meet plumbing code. Total length of drain line should be 15' or less. **AVOID OVERHEAD DRAINS.**

STEP 9: Connect one end of the 3/8" brine line to the control valve quick connect fitting (Figure 2, Page 4). Insert the other end of the brine line through the hole in the brine tank and into the quick connect fitting on the safety brine valve. Remove the quick connect collet retainer clip (if included, Figure 2, Page 4, Ref. # 30, Page 19) before inserting the brine line into each fitting, press the tube in very firmly and replace the retainer clip behind the collet. **NOTE: THE BRINE TUBING SHOULD BE INSERTED 5/8" INTO THE FITTING. DO NOT PUT SALT INTO THE BRINE TANK AT THIS TIME.**

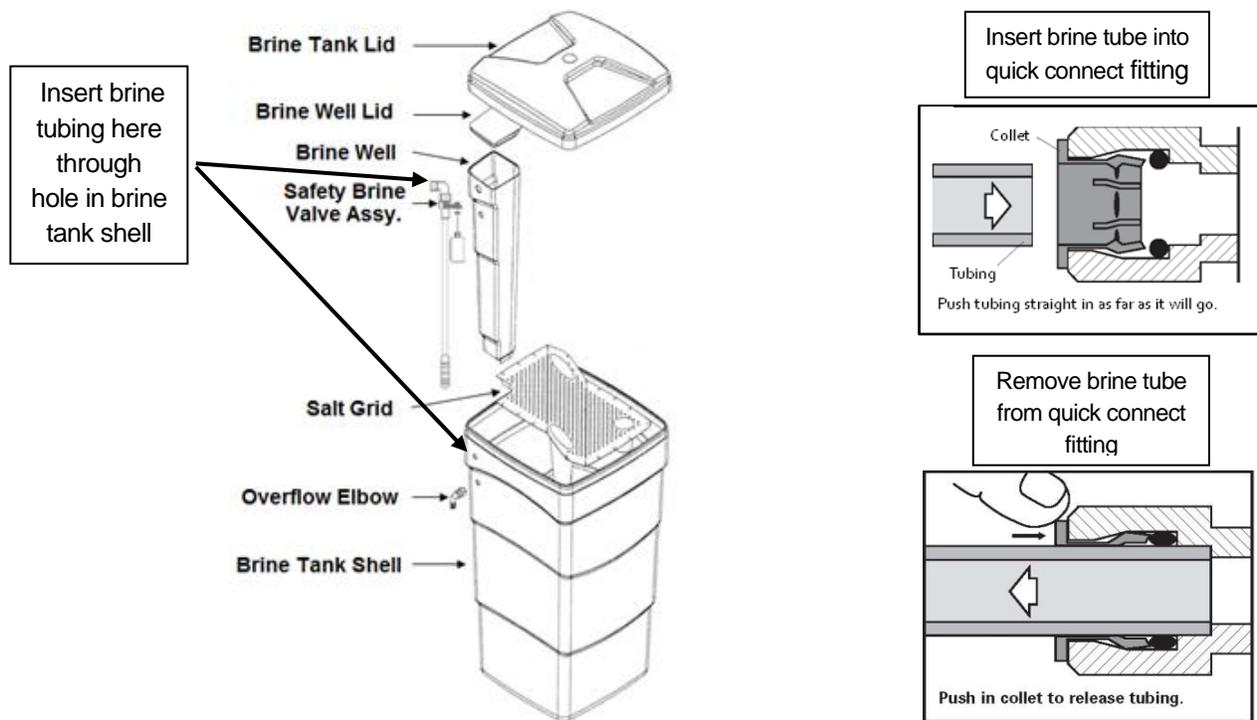


FIGURE 3: Brine Tank Components

STEP 10: If desired, install overflow tubing from overflow elbow on brine tank to floor drain. Tubing must be lower than overflow elbow at all times. **DO NOT CONNECT DRAIN LINE FROM SOFTENER CONTROL VALVE TO BRINE TANK OVERFLOW. DO NOT CONNECT BRINE TANK DRAIN LINE TO THE SOFTENER DRAIN LINE.**

STEP 11: Plug the transformer into an un-switched electrical outlet and insert the power cord plug into the power socket (Figure 2, Page 4) on the back of the control valve. Ensure control valve is in the "Service" position (time of day is displayed on the screen {refer to page 8 for Home Screen Display}).

Detailed Installation Instructions (cont.)

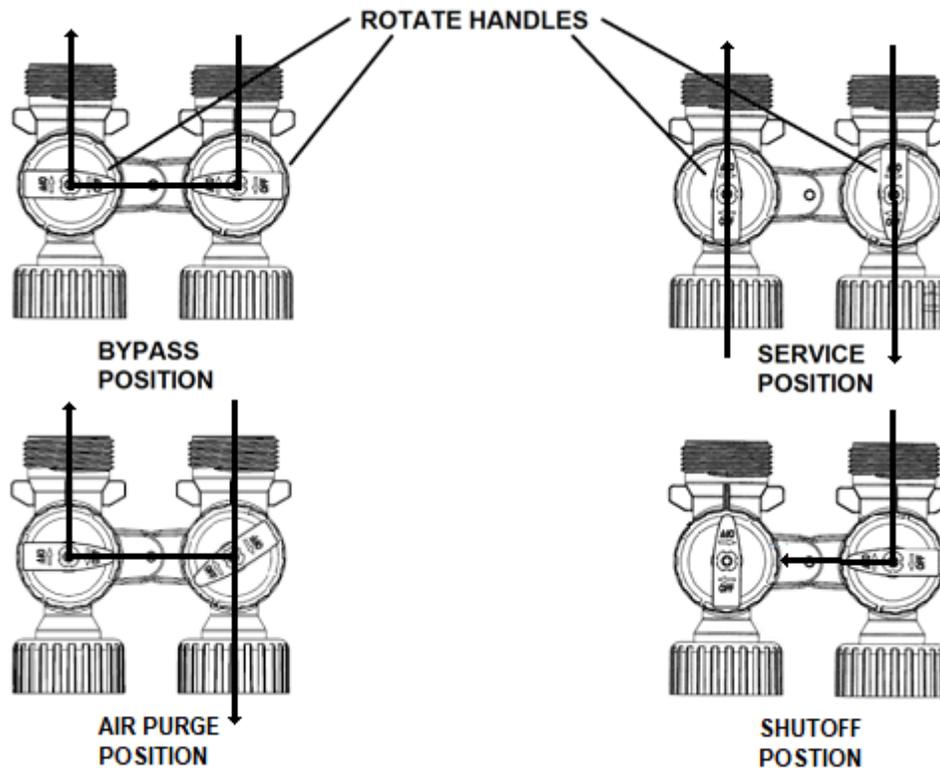


FIGURE 4: Bypass Valve Operation

- STEP 12:** Place bypass valve in the “Bypass” position (refer to Figure 4). Open main supply valve or turn on power to pump on private well systems.
- STEP 13:** Press and hold the REGEN button (4) until the motor starts. Then use the NEXT button (1) to advance the control valve to the backwash position (refer to pages 9 and 10 for details). When the backwash countdown begins, unplug power from the valve.
- STEP 14:** Refer to Figure 4 bypass valve operation. Rotate the INLET knob of the bypass valve slightly toward the Service position (just enough to hear water entering the tank) allowing the unit to fill slowly (be patient). Filling the mineral tank with the control valve in the backwash position will purge air from the mineral tank to the drain.
- STEP 15:** When all air has been purged from the system and only water is running to the drain, slowly rotate the inlet knob of the bypass valve to the “Service” position and do the same for the outlet knob.
- STEP 16:** Plug power back into the control valve. The display will return to the time of day. Then press and hold the REGEN button (4) until the motor starts and advance the control valve to the BRINE DRAW cycle using the NEXT button (1). Verify that the water level in the brine tank is dropping. Allow water level to drop below the top of the salt grid before continuing. If the water level does not drop, refer to page 25 for Troubleshooting. After verifying water level is dropping advance control valve to the time of day using the NEXT button (1).
- STEP 17:** Check for leaks and correct as necessary.
- STEP 18:** Turn power or fuel supply back on to water heater.

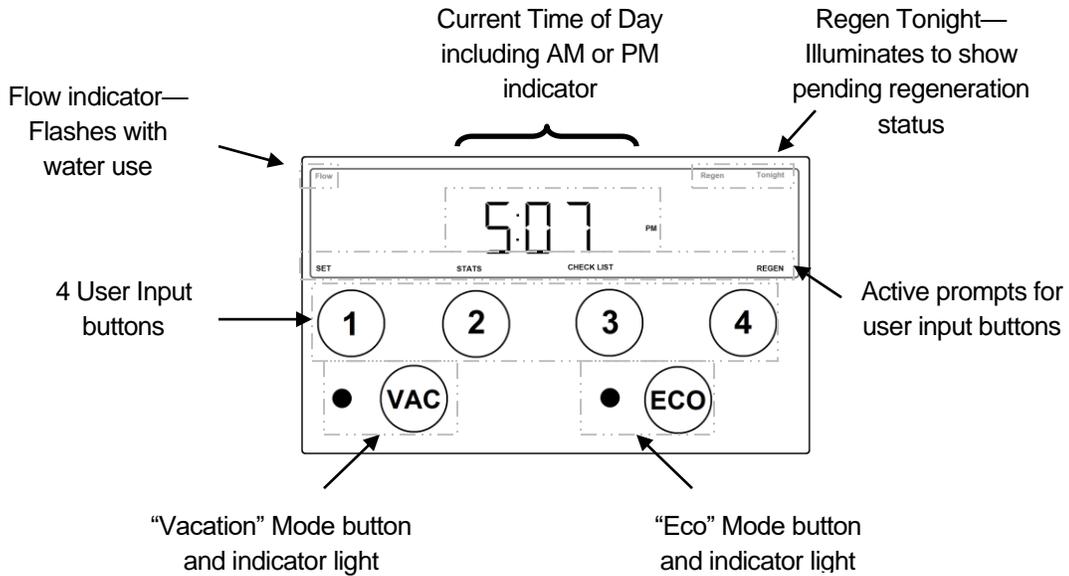
Detailed Installation Instructions (cont.)

- STEP 19:** Press and hold the CHECKLIST button (3) until the screen changes to set the hardness & iron concentrations on the control valve (refer to Installer Settings, Page 13, for details), then press DONE.
- STEP 20:** Press the SET button (1) to set the current time of day on the timer (Page 8, note AM and PM).
- STEP 21:** Add at least 40 lbs of water softener salt to the brine tank. Any type of water softening salt may be used.

Media Replacement

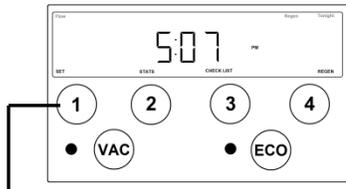
The activated carbon will eventually lose its adsorptive capacity and allow the chlorine taste and odor to return to the treated water. When this occurs, the exhausted carbon will have to be replaced. A wet/dry shop vacuum can be used to remove the exhausted carbon from the filter tank. **CAUTION:** There is a layer of gravel under the carbon. Make sure that only activated carbon is extracted. The exhausted carbon should be replaced with the appropriate amount of new activated carbon (refer to specifications and flow rate on Page 17). Ensure that there is a minimum of 18" from the carbon to the top of the tank to allow room for expansion during backwash cycle. The original start up and flushing procedure should be repeated with the new carbon.

Display and Operation - Home Screen



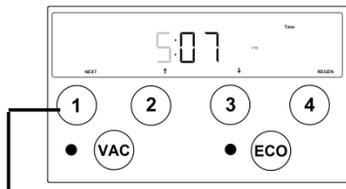
The active prompts displayed at the bottom of the circuit board indicate the function of each user button.

Display and Operation - Setting Time



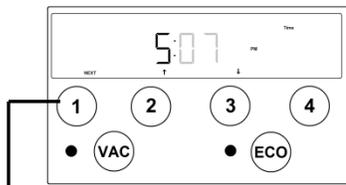
“Home” screen displays current time-of-day.

Press ‘SET’ button to access time set screen.



Using ‘↑’ and ‘↓’, set the current time-of day hours. Note the AM and PM indicator and set the time accordingly.

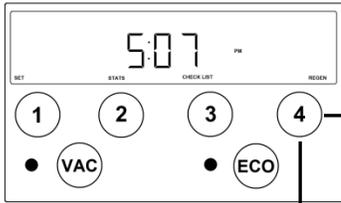
Press ‘NEXT’ button to set current minutes.



Using ‘↑’ and ‘↓’, set the current minutes.

Press ‘NEXT’ button to save changes and return to ‘Home’ screen.

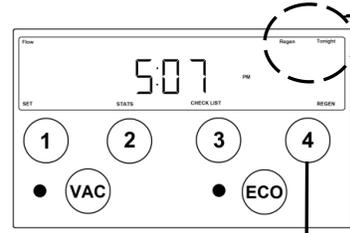
Regeneration Process



Momentarily pressing and releasing the 'REGEN' button will cause the Regen Tonight indicator to illuminate on the top right side of the display. The regeneration process will begin at the next programmed time-of-regeneration (factory preset for 2:00 AM)

Pressing and HOLDING the 'REGEN' button for approximately 3 seconds will initiate an immediate regeneration.

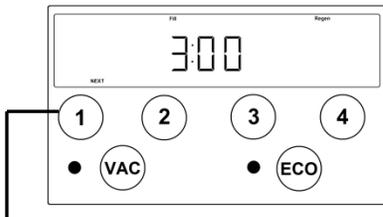
NOTE: The regeneration cycle will disable the 'Regen Tonight' indicator (if illuminated). The regeneration cycle will also reset the gallons remaining until next regeneration and the days override interval.



Momentarily pressing and releasing the 'REGEN' button again will cancel the delayed regeneration cycle.

The following regeneration cycles are listed in the factory programmed sequence. Each cycle in the regeneration process may be advanced without waiting for the programmed cycle duration, for installation, troubleshooting, or maintenance purposes.

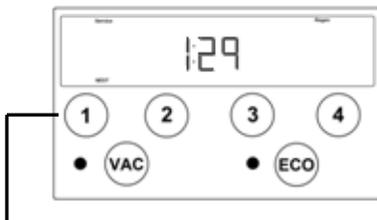
Cycle: **BRINE FILL**



Press 'NEXT' button to advance to Service Cycle.

1. The Fill and Regen indicators will be illuminated on the display.
2. The control valve will advance to the brine fill position and start adding water to the brine tank.
3. The cycle duration will begin to count down on the display once the control valve is in the proper position. The cycle duration is dictated by either the programmed salt dosage setting or the ECO calculated salt dosage (if activated).
4. This cycle occurs 90 minutes prior to the scheduled regeneration time. (Regeneration is factory preset at 2:00 AM, so Brine Fill cycle would occur at 12:30 AM)
5. Treated (soft) water is still available during this cycle.

Cycle: **SERVICE**

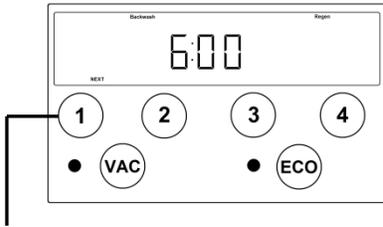


Press 'NEXT' button to advance to Backwash Cycle.

1. The Service and Regen indicators will be illuminated on the display.
2. The control valve will advance to the Service (Home) position.
3. The cycle duration will begin to count down on the display once the control valve is in the proper position.
4. This cycle allows the fresh water that has been added to the brine tank sufficient time to dissolve the salt to make saturated brine.
5. Treated (soft) water is still available during this cycle.

Regeneration Process (continued)

Cycle: BACKWASH

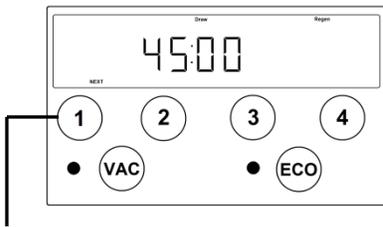


Press 'NEXT' button to advance to Brine Draw Cycle.

1. The Backwash and Regen indicators will be illuminated on the display.
2. The control valve will advance to the Backwash position.
3. The cycle duration will begin to count down on the display once the control valve is in the proper position.
4. Water will flow up through the resin and carbon then out the drain flushing accumulated solids and preparing the resin for the brine cycle.
5. Softening systems have an internal bypass to allow untreated (hard) water for service during this cycle.

NOTE: The initial fill process should be performed while the control is in the backwash position to prevent air from being trapped in the media tank.

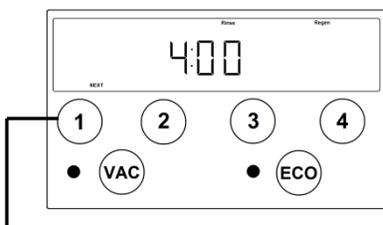
Cycle: DRAW



Press 'NEXT' button to advance to Rapid Rinse Cycle.

1. The Draw and Regen indicators will be illuminated on the display.
2. The control valve will advance to the Brine Draw position.
3. The cycle duration will begin to count down on the display once the control valve is in the proper position.
4. Water will flow through the injector causing suction to draw the brine solution out of the salt tank. The brine solution will flow down through the resin and out the drain.
5. Softening systems have an internal bypass to allow untreated (hard) water for service during this cycle.

Cycle: RINSE



Press 'NEXT' button to return control to the HOME position.

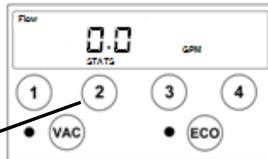
1. The Rinse and Regen indicators will be illuminated on the display.
2. The control valve will advance to the Rapid Rinse position.
3. The cycle duration will begin to count down on the display once the control valve is in the proper position.
4. Water will flow down through the resin and carbon then out the drain flushing the remaining salt from the brine cycle and preparing the resin for the softening process.
5. Softening systems have an internal bypass to allow untreated (hard) water for service during this cycle.

Statistics



“Home” screen displays current time-of-day.

Press ‘STATS’ button to advance to the STATS screen.



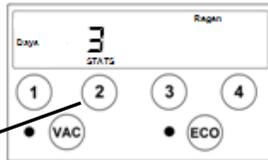
Current “Flow” screen displays current flow (gpm) through the softener.

Press ‘STATS’ button to advance to the REMAINING CAPACITY screen.



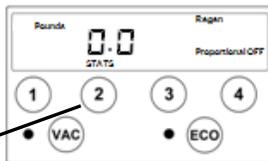
“Remaining Capacity” screen displays the number of gallons that can be treated by the softener before it needs to be regenerated.

Press ‘STATS’ button to advance to the DAYS REGEN screen.



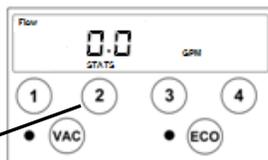
“Days Regen” screen displays the number of days since the last regeneration. ‘0’ indicates the softener regenerated within the current day (12:00 am is considered the beginning of the day).

Press ‘STATS’ button to advance to the LBS SALT screen.



“Lbs Salt” screen displays the number of lbs of salt used for the last regeneration.

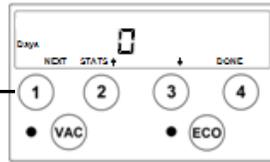
Press ‘STATS’ button to advance to the peak FLOW screen.



Peak ‘Flow’ screen displays the highest flow rate which occurred within the last number of days that equals $\frac{1}{2}$ of the “A” value for days of history to be retained. IE A 56 (default) \div 2 = 28 days.

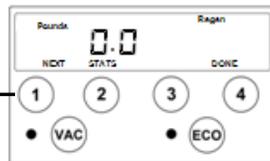
Press ‘STATS’ button to advance to the DAYS STATS history screen.

Statistics (continued)



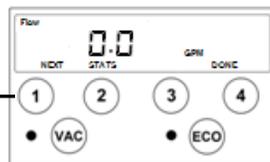
'Days Stats' history screen provides access to up to 56 days of historical data including: lbs of salt used (on any day that regeneration occurred), peak flow rate and gallons used for the day number that is selected using '↑' and '↓' (0 is today, 1 is yesterday, etc.).

Press 'NEXT' button to advance to the POUNDS REGEN screen for the currently selected day number.



'Pounds Regen' history screen displays lbs. of salt used (on any day that regeneration occurs). '0.0' indicates the unit did not regenerate on this day.

Press 'NEXT' button to advance to the peak FLOW screen for the currently selected day number.



Peak 'Flow' history screen displays the maximum flow rate that occurred on the selected day.

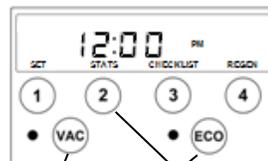
Press 'NEXT' button to advance to the GALLONS used screen for the currently selected day number.



'Gallons' used history screen displays the maximum flow rate that occurred on the selected day.

Press 'NEXT' button to advance to the DAYS STATS history screen for the day prior to the currently selected day number. Return to the top of this page and repeat the steps as desired or press 'DONE' to return to the 'Home' screen.

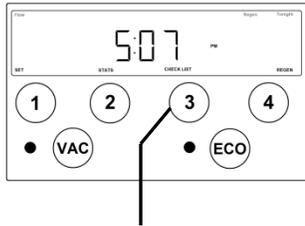
Purge History



History may be cleared by pressing and holding VAC, ECO and STATS simultaneously until the VAC and ECO lights turn off and the time of day is displayed, from the Home Screen.

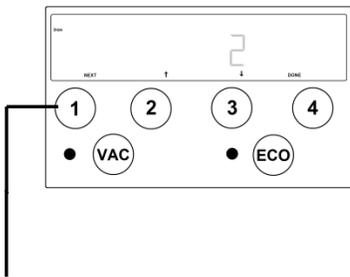
Installer Settings – Cycles

The installer settings provide access to the water softener cycle times. The factory settings have been programmed for maximum efficiency. Altering the factory programmed cycles will affect the softeners performance. **NOTE: Extreme caution must be taken when adjusting the water softener cycles. Decreasing a cycle time or completely deleting the cycle may cause the softener to stop functioning.**



“Home” screen displays current time-of-day.

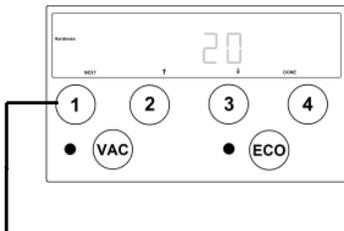
Press and HOLD ‘CHECKLIST’ button for approximately 3 seconds to access installer settings.



Ensure the **Iron** indicator is illuminated on the left side of the display and using the ‘↑’ and ‘↓’ buttons set the incoming iron concentration.

NOTE: While a water softener can be reasonably expected to remove small amounts of clear water iron, for best performance an iron filter should be considered.

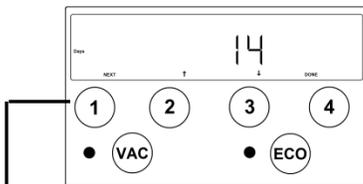
Press ‘NEXT’ button to set incoming **HARDNESS** level.



Ensure the **Hardness** indicator is illuminated on the left side of the display and using the ‘↑’ and ‘↓’ buttons set the incoming hardness level.

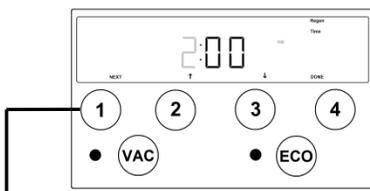
NOTE: This softener is set to calculate hardness as grains per gallon (gpg). If your water hardness is reported in milligrams per liter (mg/l) or parts per million (ppm) divide these results by 17.1 to convert to grains per gallon.

Press ‘NEXT’ button to set regeneration **DAYS** OVERRIDE interval



Using ‘↑’ and ‘↓’, set the desired day override interval. The regeneration day override function will cause the softener to regenerate after a designated period of no regeneration cycles. The override interval will reset after every regeneration cycle whether initiated manually or by volume. The day override function will be disabled if the VACATION mode is active.

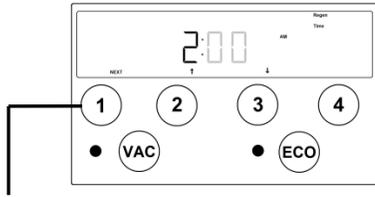
Press ‘NEXT’ button to set **REGENERATION TIME** hours.



Ensure the **Regen Time** indicator is illuminated. Using ‘↑’ and ‘↓’, set the desired time of regeneration hours. Note the AM and PM indicator and set the time accordingly.

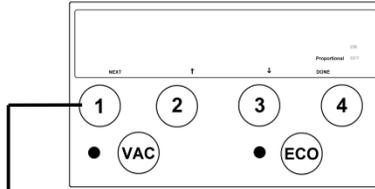
Press ‘NEXT’ button to set **REGENERATION TIME** minutes.

Installer Settings – Cycles (continued)



Ensure the **Regen Time** indicator is illuminated. Using '↑' and '↓', set the desired time of regeneration minutes.

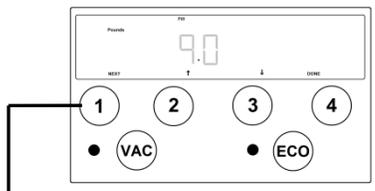
Press 'NEXT' button to set PROPORTIONAL BRINING.



Using '↑' and '↓', the Proportional Brining function can be set to ON or OFF. This feature can also be manually toggled on or off with the ECO button on the face of the front panel. (See additional information on Proportional Brining in the ECO section of the instruction manual.)

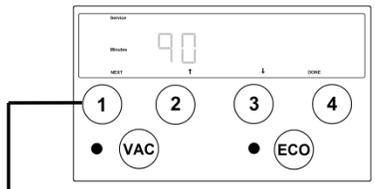
Press 'NEXT' button to set cycle #1 duration.

CAUTION: Changing the cycle durations will affect the water softener's performance and efficiency. The following settings should only be altered by a knowledgeable water treatment professional.



Ensure the **Pounds** and **Fill** indicators are illuminated. Using '↑' and '↓', set the desired amount of salt to be used during the regeneration cycle.

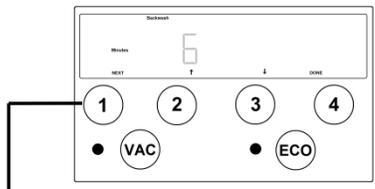
Press 'NEXT' button to set cycle #2 duration.



Ensure the **Service** and **Minutes** indicators are illuminated. Using '↑' and '↓', set the desired length of time to allow fresh water in brine tank to dissolve salt to make saturated brine.

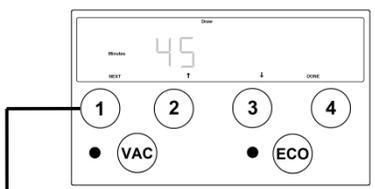
NOTE: Minimum recommended time is 90 minutes.

Press 'NEXT' button to set cycle #3 duration.



Ensure the **Backwash** and **Minutes** indicators are illuminated. Using '↑' and '↓', set the desired length of time for BACKWASH cycle

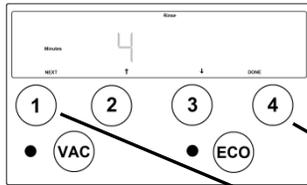
Press 'NEXT' button to set cycle #4 duration.



Ensure the **Draw** and **Minutes** indicators are illuminated. Using '↑' and '↓', set the desired length of time for BRINE DRAW cycle.

Press 'NEXT' button to set cycle #5 duration.

Installer Settings – Cycles (continued)

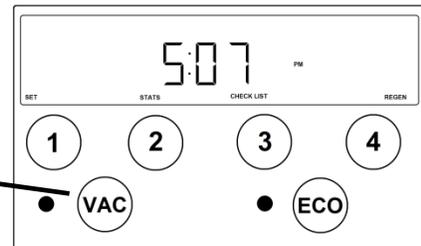


Ensure the **Rinse** and **Minutes** indicators are illuminated. Using '↑' and '↓', set the desired length of time for RINSE cycle.

After all cycles have been set press either 'NEXT' or 'DONE' button to return to Home Screen.

Vacation Mode

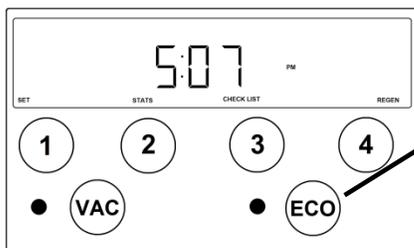
The VACATION mode may be activated or deactivated by pressing the VAC button on the front panel. The red LED light will be illuminated when the vacation mode is activated.



Once activated, the vacation mode will prevent the water softener from regenerating. This may be used if the house will not be occupied for an extended period of time. The vacation mode is initiated by pressing the VAC button on the front panel. There will be a 30 minute delay from the time the button is pressed until the vacation mode is active to allow time for last minute water use.

The vacation mode will automatically deactivate once the water softener detects normal water use.

ECO Mode



The ECO mode may be activated or deactivated by pressing the ECO button on the front panel. The green LED light will be illuminated when the ECO mode is activated.

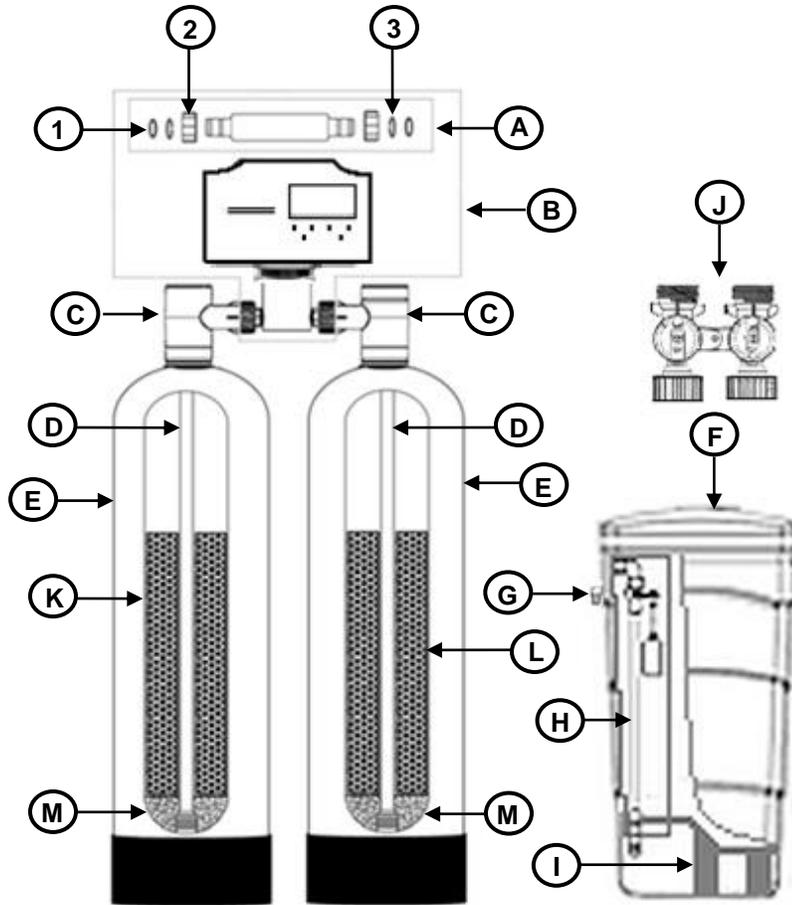
The revolutionary ECO mode is a forward-looking feature that uses water usage history and a process called proportional brining to ensure adequate softening capacity for future estimated water use. The water softener stores historical daily water use data. If the next day's anticipated water use requires more softening capacity than is currently available, the softener will initiate a regeneration process using a fractional portion of the programmed salt setting. This partial salt regeneration recovers only the depleted portion of the softening capacity. This proportional regeneration will save in both salt consumption and water use by using lower salt settings and fewer regeneration cycles.

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Specifications

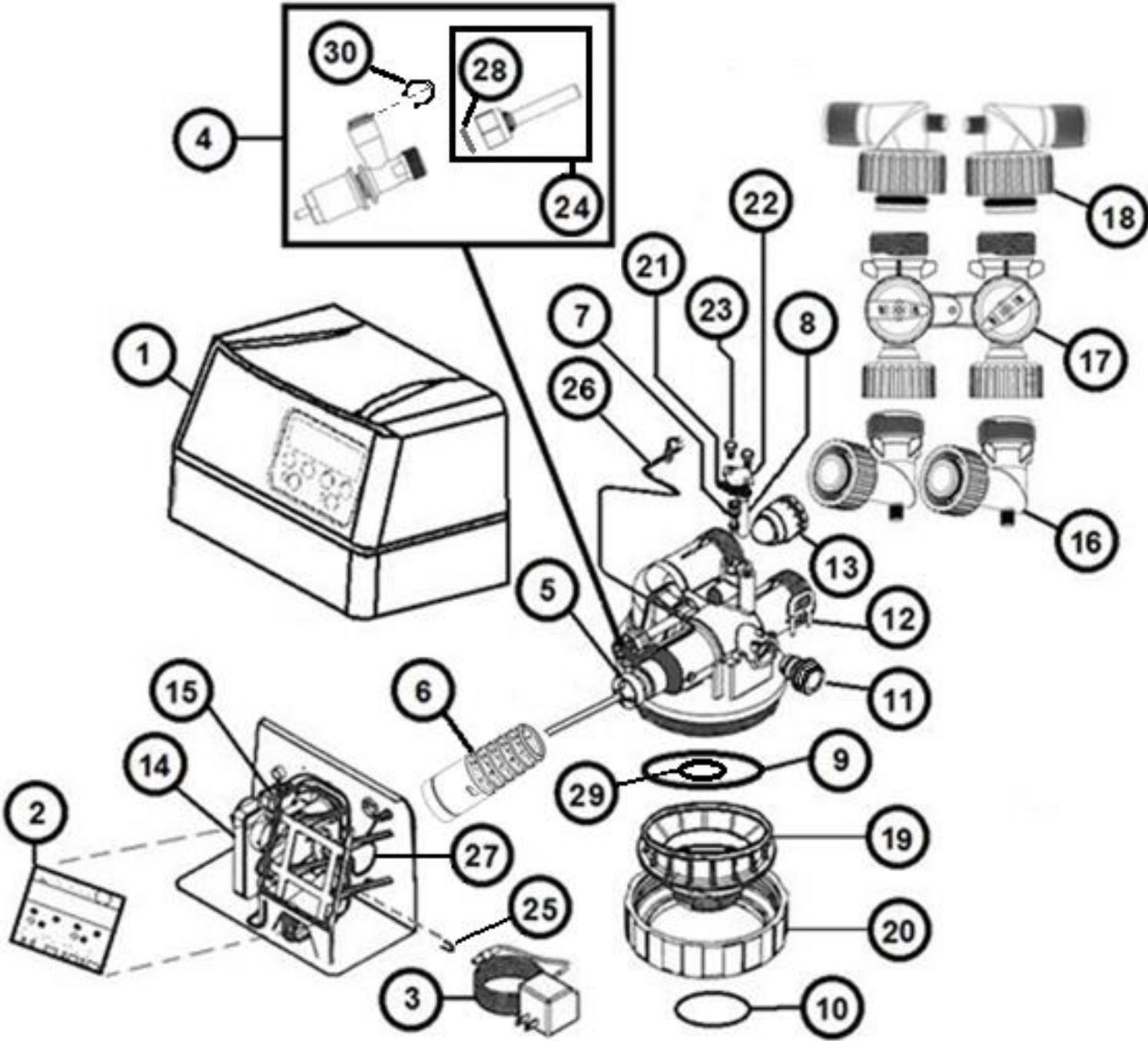
| Description | Model Number | | | |
|---|--|--|--|--|
| | CTX30 | CTX45 | CTX60 | CTX75 |
| Volume of media, cu. ft. | | | | |
| Granular Activated Carbon | 1.0 | 1.5 | 2.0 | 2.5 |
| Hi Capacity Softener Resin | 1.0 | 1.5 | 2.0 | 2.5 |
| Softener Grain Capacity (std. Max.) | 24,000 30,000 | 36,000 45,000 | 48,000 60,000 | 60,000 75,000 |
| Gravel Underbed (lbs. per tank) | 20 | 20 | 25 | 30 |
| Operating Flow Rate, gpm | | | | |
| Continuous (no duration limit) | 3 | 4 | 6 | 8 |
| Peak (10 mins. or less) | 10 | 12 | 13 | 14 |
| Regen. Flow Rates, gpm | | | | |
| Backwash & Rapid Rinse | 3.0 | 4.0 | 5.0 | 7.0 |
| Service Pipe Size, in. | 3/4" & 1" | 3/4" & 1" | 3/4" & 1" | 3/4" & 1" |
| Injector (# - color) | 2 – Blue | 2 – Blue | 2 – Blue | 2 – Blue |
| Draw – Slow Rinse, gpm | 0.42 – 0.72 | 0.42 – 0.72 | 0.42 – 0.72 | 0.42 – 0.72 |
| Factory Regeneration Settings | | | | |
| Regeneration Time | 2:00 AM | 2:00 AM | 2:00 AM | 2:00 AM |
| Brine Tank Fill (lbs salt, minutes of fill) | 9 lbs 3 min | 13.5 lbs 4.5 min | 18 lbs 6 min | 22.5 lbs 7.5 min |
| Softening (min. dissolving salt) | 90 | 90 | 90 | 90 |
| Backwash (minutes) | 8 | 9 | 9 | 8 |
| Brine Draw & Rinse (minutes) | 50 | 75 | 100 | 120 |
| Rapid Rinse (minutes) | 10 | 12 | 12 | 11 |
| Total Water Used, gallons | 87 | 134 | 171 | 212 |
| Dimensions, in. | | | | |
| Mineral Tank, dia.x hgt. | 9 x 48 | 10 x 54 | 12 x 48 | 13 x 54 |
| Overall, length x width x height | 42 x 18 x 68 | 43 x 18 x 68 | 48 x 18 x 66 | 49 x 18 72 |
| Approximate Ship Wt., lbs. | 175 | 250 | 300 | 325 |

Component Parts Breakdown



| Ref | Description | Model Number | | | |
|------|-------------------------------|---------------------|---------------------|---------------------|---------------------|
| | | CTX30 | CTX45 | CTX60 | CTX75 |
| 1 | O-ring, -323 | OR323 | OR323 | OR323 | OR323 |
| 2 | Connector Nut | C102 | C102 | C102 | C102 |
| 3 | Split Ring Retainer | C101 | C101 | C101 | C101 |
| A | Dual Tank Connector | DTC204-8 | DTC204-8 | DTC204-8 | DTC204-8 |
| B | Elect. Metered valve w/bypass | CTX30 Vlv Assy W/BP | CTX45 Vlv Assy W/BP | CTX60 Vlv Assy W/BP | CTX75 Vlv Assy W/BP |
| C | Distributor Head w/Fill Port | FP207 | FP207 | FP207 | FP207 |
| | Screen for Fill Port | FPS101 | FPS101 | FPS101 | FPS101 |
| D | Distributor | D100S-48 | D100S-54 | D100S-48 | D100S-54 |
| E | Media Tank | MTP0948GR | MTP1054GR | MTP1248GR | MTP1354GR |
| F | Brine Tank Assy. | BTSQ1833ASSY | BTSQ1833ASSY | BTSQ1833ASSY | BTSQ1833ASSY |
| G | Overflow Fitting | BT-OVERFLO | BT-OVERFLO | BT-OVERFLO | BT-OVERFLO |
| H | Safety Brine Valve | SBV14ASSY | SBV14ASSY | SBV14ASSY | SBV14ASSY |
| I | Salt Platform | BTSG18SQ | BTSG18SQ | BTSG18SQ | BTSG18SQ |
| J | Bypass | BP 213 | BP 213 | BP 213 | BP 213 |
| K | Carbon Media | A10 | (1)A10 (1) A05P | (2) A10 | (2) A10 (1) A05P |
| L | Resin | H10 | (1) H10 (1) H05P | (2) H10 | (2) H10 (1) H05P |
| M | ¼" x 1/8" Gravel | QC20 | QC20 | (1.25) QC20 | (1.5) QC20 |
| -NA- | Top Screen | FHS101 | FHS101 | FHS101 | FHS101 |
| -NA- | Distributor Adapter | SA900 | SA900 | SA900 | SA900 |

Control Valve Parts Breakdown

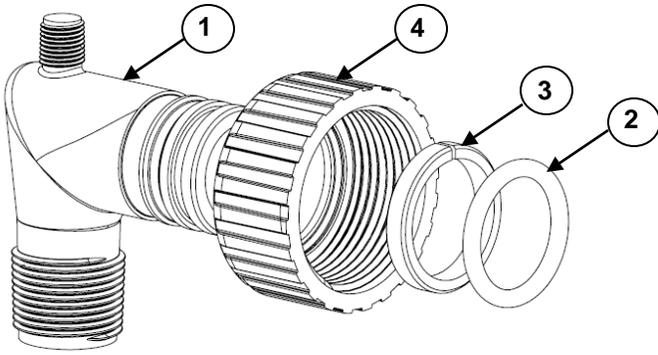


Control Valve Parts List

| REF # | Part Number | Description |
|-------|----------------|--|
| 1 | FCC-950 | Front Cover |
| 2 | PCB-3486 | Circuit Board (specify unit model) |
| 3 | DC-12 | DC Adaptor with cord |
| 4 | BV910 | Brine Valve Assembly |
| 5 | CAB945 | Piston and Rod Assembly |
| 6 | TSS900 | Seal Cartridge Assembly |
| 7 | RVS932 | Injector Assembly w/o-rings |
| 8 | FS165 | Injector Filter Screen |
| 9 | OR342 | Valve to Tank Adaptor O-Ring (replaces OR344) |
| 10 | OR337 | Tank O-ring |
| 11 | FC902 | Drain Fitting, 3/4" MNPT (NEW) |
| | FC901 | Drain Fitting, 1/2" FPT (OLD) |
| 12 | FC103 | Drain Fitting Retainer Clip |
| 13 | FM205 | Turbine Flow Meter |
| 14 | MCA945 | Motor and Cam Assembly (includes nut micro switches) |
| 15 | 7779K420-MICRO | Micro Switch (2 required) |
| 16 | EBA910 | Optional 90° Close Install Adapter (2 required) |
| 17 | BP-213 | Bypass Valve |
| 18 | EBA975 | 3/4" NPT Elbow Assembly (2 req'd) |
| | EBA900 | 1" NPT Elbow Assembly (2 req'd) |
| | EBA915 | Optional 1 1/2" NPT Elbow Assy (2 req'd) |

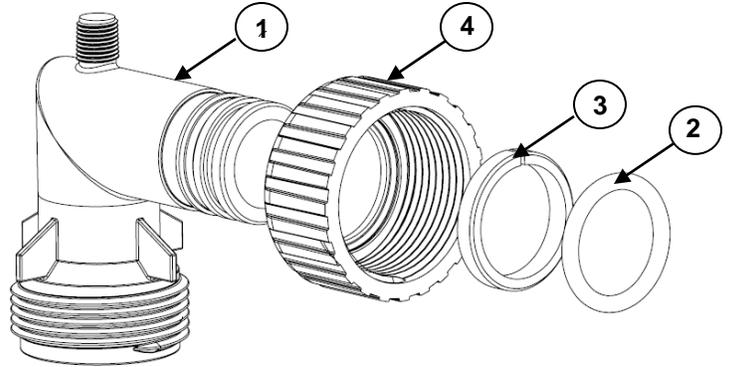
| REF # | Part Number | Description |
|--------------|-------------|--|
| 19 | TAF131 | Tank Attachment |
| 20 | TN101 | Tank Nut |
| 21 | VG145 | Venturi Gasket |
| 22 | VP145 | Venturi Plate |
| 23 | VB145 | Venturi Hex Head Bolt, 18-8 SS 1/4-20 x 1/2" |
| 24 | QCF987 | Quick Connect Flow Assembly |
| 25 | HPC-075 | Hair Pin Clip |
| 26 | HEH138 | Hall Effect Sensor Wire Harness |
| 27 | WH137 | Power Wire Harness with Nut & Lock Washer |
| 28 | UQS-100 | Seal for Quick Connect Flow Assy |
| 29 | OR255 | O-ring, 255, Pilot Tube O-ring |
| 30 | RO-LC38BL | QC 3/8" Locking Clip |
| NOT SHOWN | GL463412 | Drain Fitting, Hose Barb, 90° Elbow, 3/4" FPT x 1/2" barb (NEW) |
| | 12338 | Drain Fitting, Hose Barb, 90° Elbow, 1/2" MNPT x 1/2" barb (OLD) |
| | 12089 | 3.0 gpm DLFC washer, CTX30 |
| | 3600-12091 | 4.0 gpm DLFC washer, CTX45 |
| | 12092 | 5.0 gpm DLFC washer, CTX60 |
| | 12408 | 7.0 gpm DLFC washer, CTX75 |
| | FHS101 | Top Screen (-HE & Cabinets Only) |
| | SA900 | Distributor Adaptor (-HE & Cabinets Only) |

Installation Fitting Assemblies



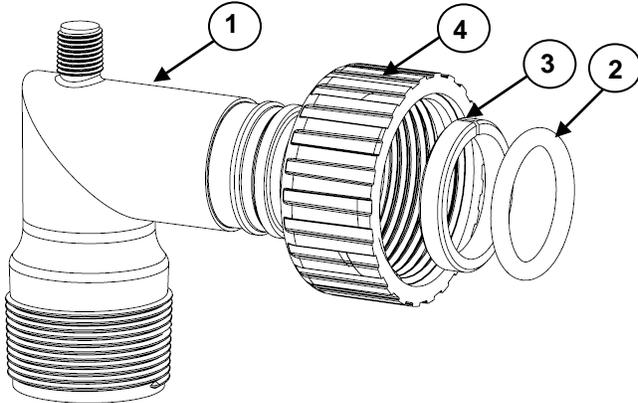
| 1" PVC MALE NPT ELBOW | | | |
|-----------------------|--------|---------------------|-----|
| Ref | Part # | Description | Qty |
| | EBA900 | 1" Elbow Assembly | 1* |
| 1 | EB100 | 1" Elbow | 1 |
| 2 | OR323 | O-ring, -323 | 1 |
| 3 | C-101 | Split Ring Retainer | 1 |
| 4 | C-102 | Connector Nut | 1 |

(*2 required)



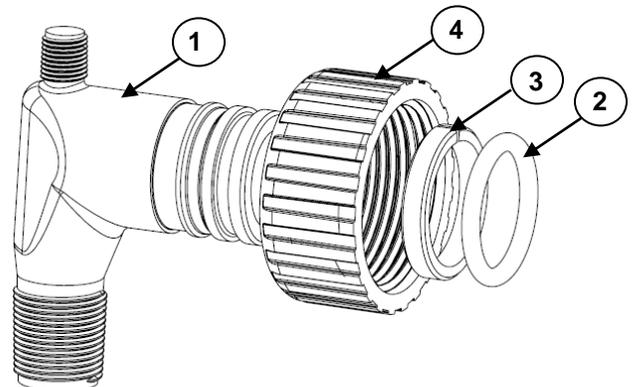
| 90 DEGREE CLOSE INSTALL ADAPTER | | | |
|---------------------------------|--------|---------------------------|-----|
| Ref | Part # | Description | Qty |
| | EBA910 | 90° Bypass Elbow Assembly | 1* |
| 1 | EB175 | Bypass Elbow | 1 |
| 2 | OR323 | O-ring, -323 | 1 |
| 3 | C-101 | Split Ring Retainer | 1 |
| 4 | C-102 | Connector Nut | 1 |

(*2 required)



| 1-1/2" PVC MALE NPT ELBOW | | | |
|---------------------------|--------|-----------------------|-----|
| Ref | Part # | Description | Qty |
| | EBA915 | 1-1/2" Elbow Assembly | 1* |
| 1 | EB150 | 1.5" Elbow | 1 |
| 2 | OR323 | O-ring, -323 | 1 |
| 3 | C-101 | Split Ring Retainer | 1 |
| 4 | C-102 | Connector Nut | 1 |

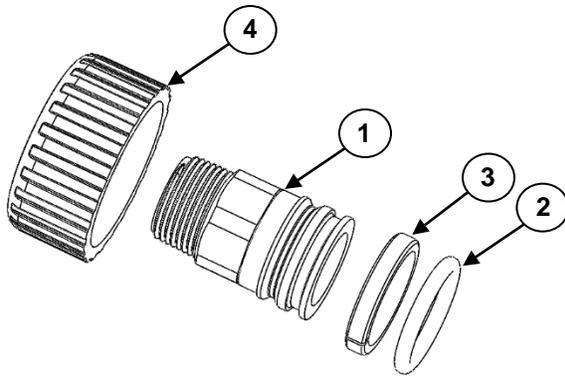
(*2 required)



| 3/4" PVC MALE NPT ELBOW | | | |
|-------------------------|--------|---------------------|-----|
| Ref | Part # | Description | Qty |
| | EBA975 | 3/4" Elbow Assembly | 1* |
| 1 | EB750 | 3/4" Elbow | 1 |
| 2 | OR323 | O-ring, -323 | 1 |
| 3 | C-101 | Split Ring Retainer | 1 |
| 4 | C-102 | Connector Nut | 1 |

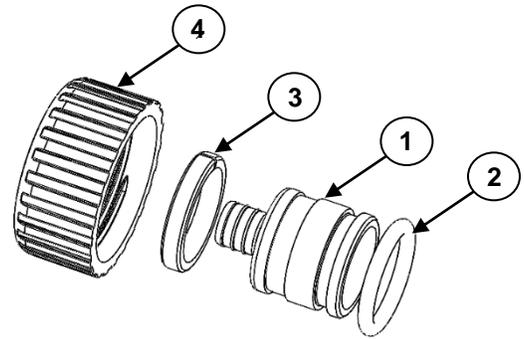
(*2 required)

Installation Fitting Assemblies



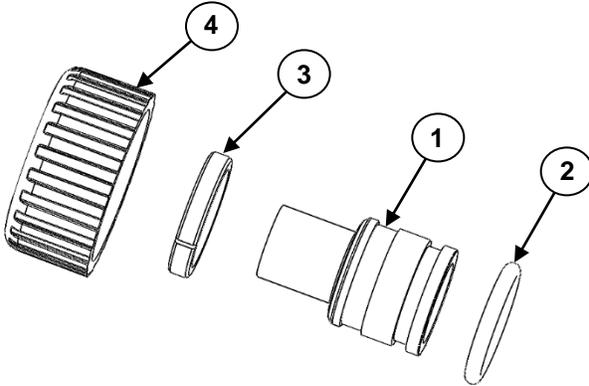
| 1" STRAIGHT NPT FITTING | | | |
|-------------------------|---------|------------------------------|-----|
| Ref | Part # | Description | Qty |
| | TC204-1 | 1" Straight Fitting Assembly | 1* |
| 1 | TC101-1 | 1" Straight Fitting | 1 |
| 2 | OR323 | O-ring, -323 | 1 |
| 3 | C-101 | Split Ring Retainer | 1 |
| 4 | C-102 | Connector Nut | 1 |

(*2 required)



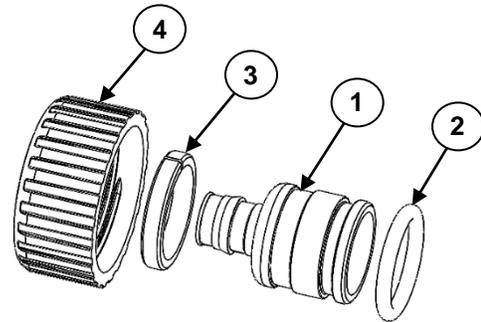
| 3/4" PEX ADAPTER | | | |
|------------------|---------|---------------------|-----|
| Ref | Part # | Description | Qty |
| | PEX965 | 3/4" PEX Assembly | 1* |
| 1 | PXTS750 | 3/4" PEX Fitting | 1 |
| 2 | OR323 | O-ring, -323 | 1 |
| 3 | C-101 | Split Ring Retainer | 1 |
| 4 | C-102 | Connector Nut | 1 |

(*2 required)



| 3/4" SWEAT ADAPTER | | | |
|--------------------|--------|---------------------|-----|
| Ref | Part # | Description | Qty |
| | SFA975 | 3/4" Sweat Assembly | 1* |
| 1 | SWF175 | 3/4" Sweat Fitting | 1 |
| 2 | OR323 | O-ring, -323 | 1 |
| 3 | C-101 | Split Ring Retainer | 1 |
| 4 | C-102 | Connector Nut | 1 |

(*2 required)



| 3/4" UPONOR ADAPTER | | | |
|---------------------|---------|----------------------|-----|
| Ref | Part # | Description | Qty |
| | UPN985 | 3/4" Uponor Assembly | 1* |
| 1 | UPNR750 | 3/4" Uponor Fitting | 1 |
| 2 | OR323 | O-ring, -323 | 1 |
| 3 | C-101 | Split Ring Retainer | 1 |
| 4 | C-102 | Connector Nut | 1 |

(*2 required)

Installation Fitting Assemblies (cont.)



| 3/4" QUICK CONNECT | | | |
|--------------------|--------|-----------------------------|-----|
| Ref | Part # | Description | Qty |
| | QFNCR4 | 3/4" Quick Connect Assembly | 1* |

(*2 required)

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Troubleshooting

| PROBLEM | CAUSE | SOLUTION |
|--|--|--|
| 1. Softener fails to regenerate | A. Electrical service to unit has been interrupted | A. Ensure permanent electrical service to unit (switch, circuit breaker, plug, etc.) |
| | B. Faulty meter or control board | B. Verify meter cable is connected or replace defective component |
| | C. Defective drive motor or micro switch | C. Verify connections to control board or replace defective component |
| | D. Improper unit configuration | D. Verify unit is not bypassed, verify programming |
| 2. Softener delivers hard water | A. Bypass valve is open | A. Close bypass valve |
| | B. No salt in brine tank or salt is "bridged" | B. Verify salt is not "bridged" and add salt to brine tank and maintain salt level above water level |
| | C. Injectors or screen plugged | C. Clean or replace injectors and screen |
| | D. Insufficient water flowing into brine tank | D. Check brine tank fill time and clean brine line flow control |
| | E. Leak at distributor tube | E. Check length of distributor tube and pilot tube o-ring |
| | F. Internal valve leak | F. Replace piston and seals/spacer kit |
| | G. Flow meter obstructed | G. Clean flow meter |
| | H. Softener not regenerating | H. See Problem 1 above |
| | I. Flow rate exceeds rated service flow | I. Verify the softener is properly sized |
| 3. Unit uses too much salt | A. Improper configuration | A. Verify proper salt setting, verify day override setting, verify adjusted hardness setting |
| | B. Excessive water in brine tank | B. See Problem # 7 |
| | C. Leak in plumbing or fixtures | C. Verify there are no leaks |
| 4. Loss of water pressure | A. Softener too small for application | A. Check application requirements and resize water softener as required |
| | B. Foreign material buildup in plumbing system or water softener | B. Clean or replace plumbing, as necessary, additional treatment equipment may be required |
| 5. Loss of resin through drain line | A. Air in water system | A1. Check for low water table conditions in well A2. Check for positive seal on brine line connections and air check |
| | B. Drain line flow control is too large | B. Ensure proper drain line flow control is installed |
| 6. Iron in softened water | A. Iron exceeds recommended parameters or iron bacteria is present | A. Test incoming water supply and install OXY Series iron filter prior to softener, as needed |
| | B. Iron fouled resin | B. Check and lengthen backwash, rinse times. Increase salt setting. Increase frequency of regeneration. Use resin cleaner in brine tank. |
| 7. Excessive water level in brine tank | A. Restricted drain flow control | A. Clean drain line flow control |
| | B. Drain line too long or installed overhead or restricted | B. Verify drain line is not restricted or improperly installed |
| | C. Vinyl drain line was used | C. Replace drain line with rigid or semi-rigid material with no kinks and as few elbows as possible |
| | D. Brine valve leaking (soft water) | D. Replace brine valve assembly |
| | E. Injector/screen plugged (hard water) | E. Clean or replace injectors and screen |
| | F. Improper configuration | F. Verify the salt setting |
| | G. Either end of the brine line is not fully inserted into fitting | G. Ensure brine line is inserted at least 5/8" into fittings |

Troubleshooting (continued)

| PROBLEM | CAUSE | SOLUTION |
|--|---|---|
| 8. Salty water after regeneration | A. Injectors or screen plugged | A. Clean or replace injectors and screen |
| | B. Restricted drain flow control | B. Clean drain line flow control |
| | C. Brine valve sticking | C. Replace brine valve assembly |
| | D. Brine tank is overfilled | D. See Problem # 7 |
| | E. Rinse cycle too short | E. Lengthen rinse cycle |
| 9. Water leaks to drain continuously | A. Foreign material in control valve | A. Remove and inspect piston and seal kit. Replace as necessary |
| | B. Drive motor stopped during regeneration cycle | B. Check for obstruction in piston and seals. Replace drive motor. |
| | C. Control valve continuously cycling | C. See Problem #10 |
| | D. Internal valve seal leak | D. Replace seals and/or piston |
| 10. Control valve continuously cycling | A. Faulty homing switch | A. Replace homing switch |
| 11. Resin in service line | A. Softener installed backwards | A. Verify supply water is plumbed to inlet of softener by putting inlet bypass handle in the SHUTOFF position (Figure 4, Page 6) and advancing the control valve to a backwash position and unplugging power from the control valve. If the backwash flow rate does not diminish, the unit is plumbed in backwards. |
| | B. Hot water backed up from water heater has melted internal components | B. Replace all damaged components |
| 12. Meter fails to register flow | A. External bypass or cross connect in plumbing | A. Test for external bypass by putting inlet bypass handle in the SHUTOFF position (Figure 4, Page 6) and open a treated faucet. If it does not trickle to a stop, locate the open bypass or cross connect and correct it. |
| | B. Meter cable unplugged at meter module or circuit board | B. Plug in meter cable. |
| | C. Meter turbine not securely snapped into meter axel | C. Remove meter module and snap securely onto axel and reinstall or replace if unable to snap in place. |
| | D. Meter module pushed too far into valve body outlet | D. Pull meter module very slightly back in the valve body outlet. |
| 13. Call Error | A. Wires for drive motor or microswitches are unplugged | A. Verify drive motor and microswitch wires are connected correctly |
| | B. Circuit board needs reset | B. Turn on both VAC and ECO lights then unplug power for 10 seconds and plug power back in. |
| 14. Call Error and/or softener stuck in DRAW cycle at 0:00 countdown | A. Defective component in powerhead assembly: Drive cam, microswitch position, seal & spacer cartridge, piston | A. Replace powerhead assembly or individual components |

TEN YEAR LIMITED WARRANTY

WARRANTY – Franklin Electric Co., Inc. 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
- Five years on the brine tank
- Ten years on the mineral tank

GENERAL CONDITIONS – Should a defect or malfunction occur, contact Franklin Water Treatment technical services @ (260)693-1972. We will require a full description of the problem, model number, serial number and date of purchase. All warranty part replacements must be authorized by FWT technical service personnel or FWT factory sales representatives.

We assume no warranty liability in connection with this water conditioner other than specified herein. This warranty is in lieu of all other warranties, expressed or implied, including warranties of fitness for a particular purpose. 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

| | | | |
|---|-------------------------|----------------|--------------|
| Original Purchaser | Date of Purchase | Model # | |
| Address of Original Installation | | City | State |
| Dealer Purchased From | Dealer Address | City | State |

Franklin Electric Co., Inc.
Water Treatment
12630 U.S. 33 North, Churubusco, IN 46723