Installation Instructions and Owner's Manual

XT Series

Water Softening System

Scan the QR code above with a smart phone to view the installation video!

Franklin Electric, Co., Inc.
Water Treatment
12630 US Highway 33 N
Churubusco, IN 46723
Phone (260) 693-1972 Fax (260) 693-0602

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Pre-installation Instructions

Description of the water softener system

This water softener system includes a brine (salt) tank and a resin (media) tank with a backwashing control valve. Incoming water flows into the control valve and is directed down through the ion exchange softening resin. This 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.

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. 90 minutes prior to regeneration the control valve will put fresh water into the salt tank to make brine. Then during regeneration, it will draw the brine solution out of the salt tank and flush both the accumulated hardness and excess salt to the drain.

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 may require special ion exchange resin or an iron filter. If bacterial iron or ferric (red water) iron is present or iron level exceeds 4.0 mg/l, an iron filter must 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. O2 & O3 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 should be installed after the pressure tank on a private well system or 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 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. 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. (see installation diagram Fig. 1).

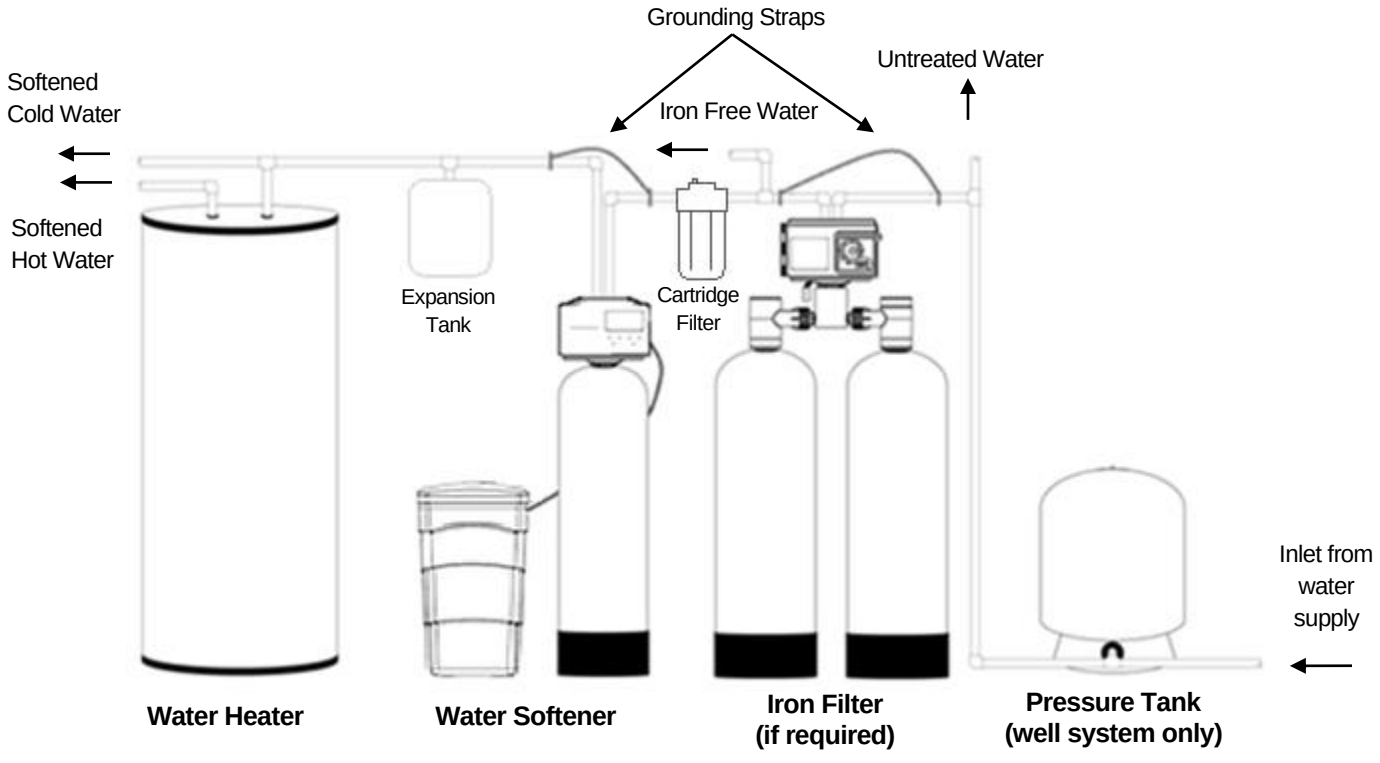


FIGURE 1: Typical Installation

Detailed Installation Instructions

STEP 1: Carefully remove all components from packaging. DO NOT DISCARD PACKAGING until all water softener components and fittings have been located.

STEP 2: Using the integrated coupling nuts, attach the bypass valve to the inlet/outlet of the control valve and put the bypass handles in the bypass position (Figure 2).

STEP 3: Place unit at desired installation position.

STEP 4: 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 5: 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.

STEP 6: Use the provided polyethylene tubing (**NO VINYL TUBING**) to run drain line from control valve barbed drain fitting (Figure 2) to floor drain or sump pit capable of handling the backwash rate of the softener (refer to specifications 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.

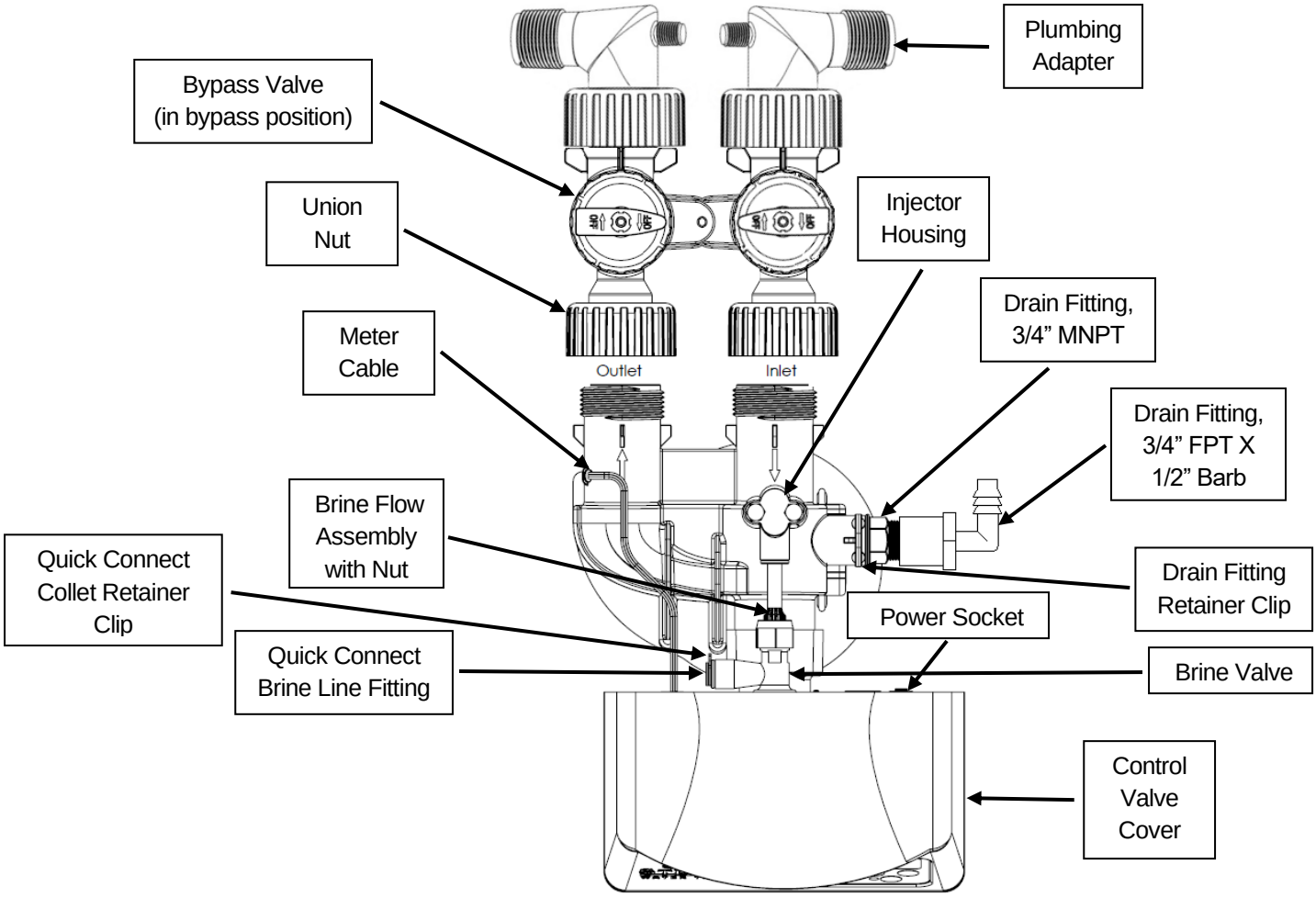


FIGURE 2: Top View of Control Valve

Detailed Installation Instructions (continued)

STEP 7: Connect one end of the 3/8" brine line to the control valve quick connect brine line fitting (Figure 2, Page 5). 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 (Figure 3). Remove the quick connect collet retainer clip (if included) 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. <u>DO NOT</u> PUT SALT INTO THE BRINE TANK AT THIS TIME.**

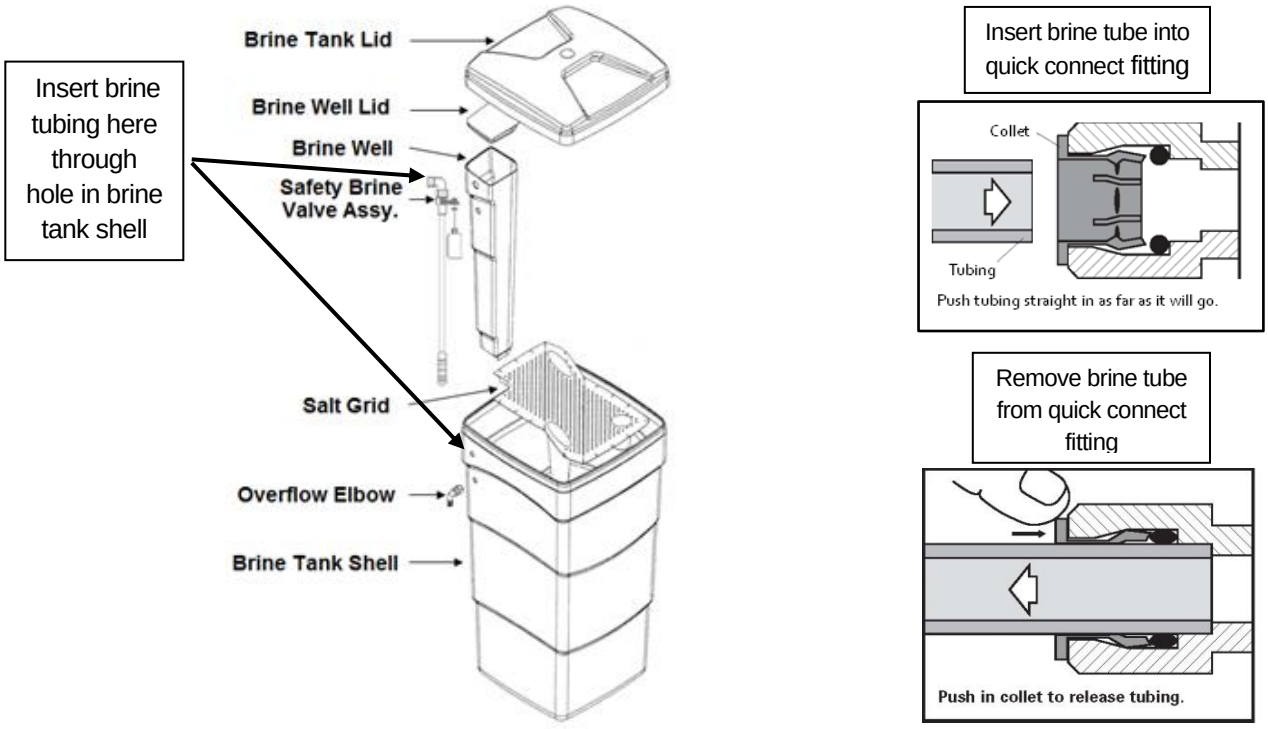


FIGURE 3: Brine Tank Components

STEP 8: If desired, install overflow tubing (not provided) from overflow elbow on brine tank (Figure 3) to floor drain. Tubing must be lower than the 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 9: Plug the transformer into an un-switched electrical outlet and insert the power cord plug into the power socket (Figure 2, Page 5) on the back of the control valve. Ensure control valve is in "Service" mode (time of day is displayed on the screen {refer to page 8 for Home Screen Display}).

STEP 10: Place bypass valve in the "Bypass" position (refer to Figure 2, Page 5; Figure 4, Page 7) and open main supply valve or turn on power to pump on private well systems.

STEP 11: Add water in the brine tank to slightly above the top level of the salt grid (approx. 6 gallons). **<u>DO NOT</u> ADD SALT TO THE BRINE TANK AT THIS TIME.**

Detailed Installation Instructions (continued)

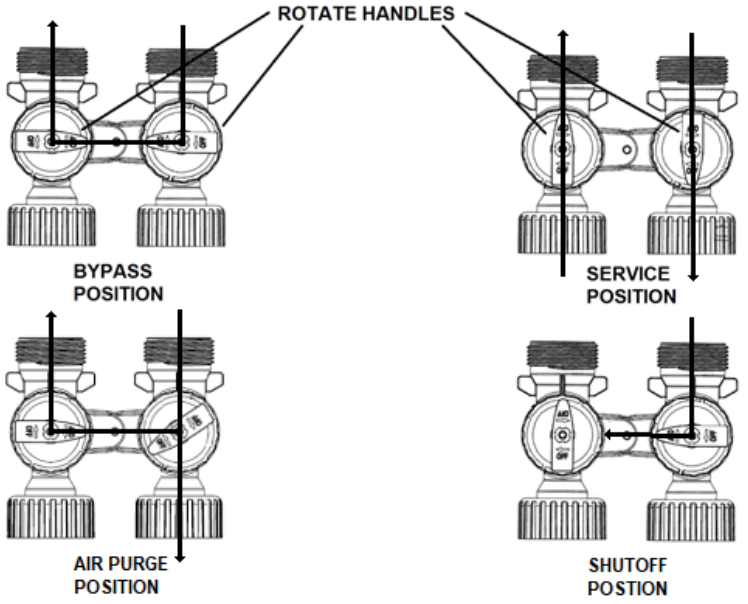


FIGURE 4: Bypass Valve Operation

STEP 12: 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 13: 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 14: 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 15: 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 16: Check for leaks and correct as necessary.

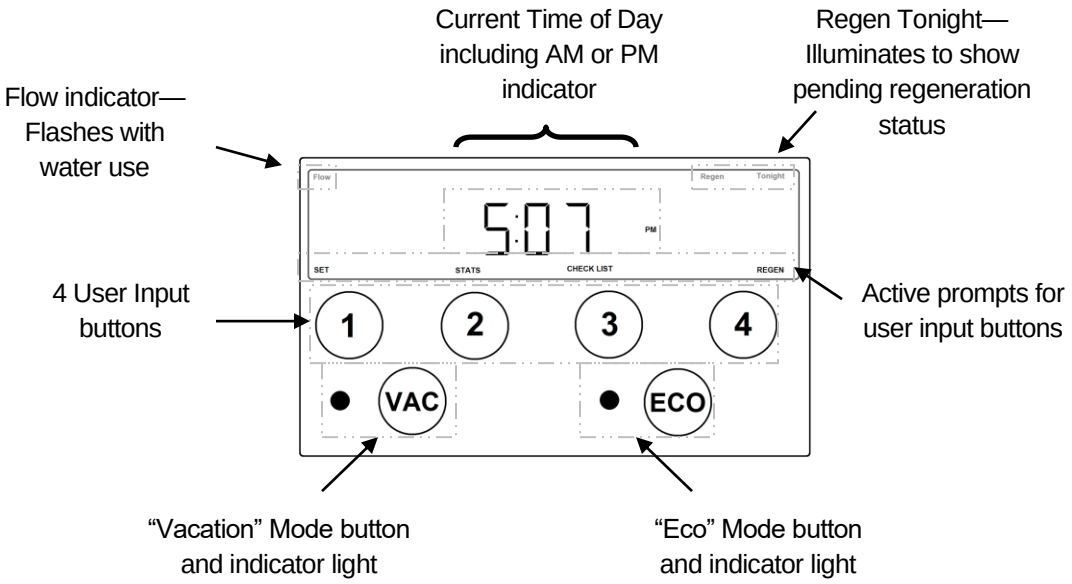
STEP 17: Turn power or fuel supply back on to water heater.

STEP 18: 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 19: Press the SET button (1) to set the current time of day on the timer (Page 8, note AM and PM).

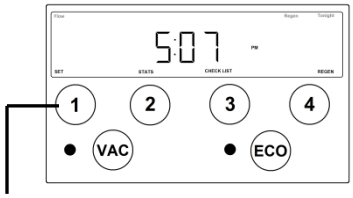
STEP 20: Add at least 40 lbs of water softener salt to the brine tank. Any type of water softening salt may be used.

Display and Operation - Home Screen



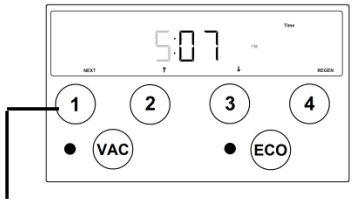
The active prompts displayed at the bottom of the circuit board indicate the function of each user button.

Display and Operation - Setting Time



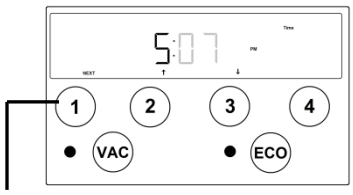
"Home" screen displays current time-of-day.

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.

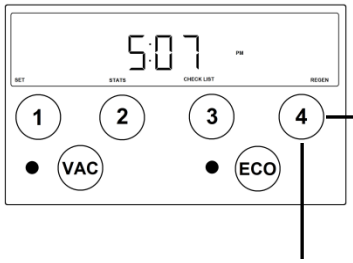
Press 'NEXT' button to set current minutes.



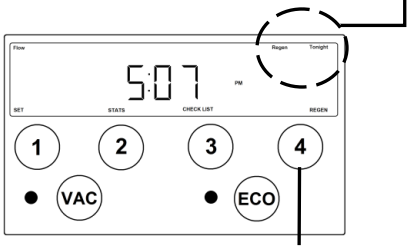
Using '↑' and '↓', set the current minutes.

Press 'NEXT' button to save changes and return to 'Home' screen.

Initiating Regeneration



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)



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

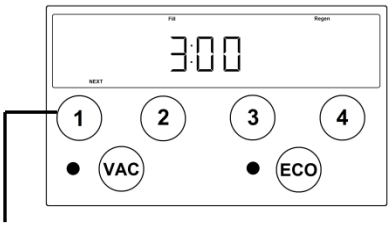
Pressing and HOLDING the 'REGEN' button for approximately 3 seconds will initiate an immediate regeneration.

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. A second (delayed) regeneration may be queued by briefly pressing and releasing the "REGEN" button during a regeneration cycle. "Regen Tonight" will display.

Regeneration Process

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.

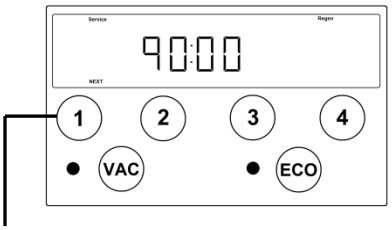
Cycle: **BRINE FILL**



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**

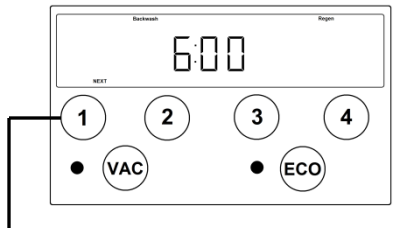


Press 'NEXT' button to advance to Backwash Cycle.

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**

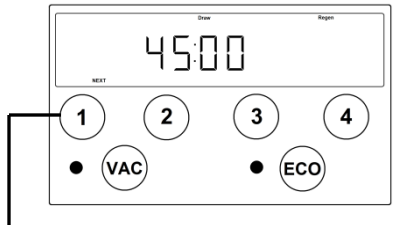


Press 'NEXT' button to advance to Brine Draw Cycle.

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 out the drain flushing accumulated solids and preparing the resin for the brine cycle.
5. Softening systems with a single mineral tank will 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.

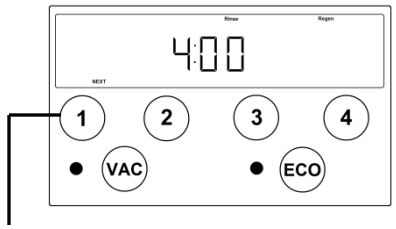
Cycle: **DRAW**



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 with a single mineral tank will have an internal bypass to allow untreated (hard) water for service during this cycle.

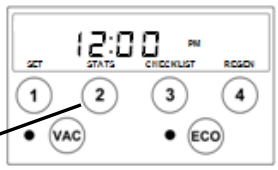
Cycle: **RINSE**



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

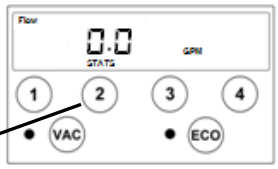
1. The Rinse and Regen indicators will be illuminated on the display.
2. The control valve will advance to the Rapid Rinse position.
3. The cycle duration will begin to count down on the display once the control valve is in the proper position.
4. Water will flow down through the resin and out the drain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

Display and Operation – Statistics



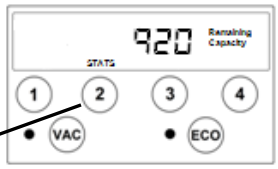
“Home” screen displays current time-of-day.

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



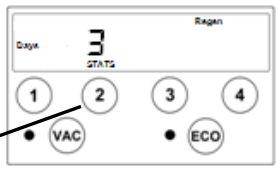
Current “Flow” screen displays current flow (gpm) through the softener.

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



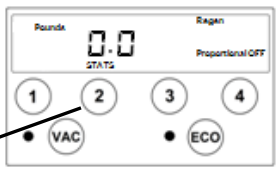
“Remaining Capacity” screen displays the number of gallons that can be treated by the softener before it needs to be regenerated.

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



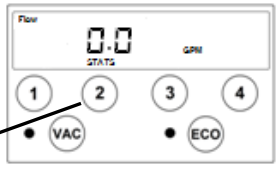
“Days Regen” screen displays the number of since the last regeneration. ‘0’ indicates the softener regenerated within the current day (12:00 am is considered the beginning of the day).

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



“Lbs Salt” screen displays the number of lbs of salt used for regeneration within the current day (12:00 am is considered the beginning of the day). ‘0’ indicates the unit did not regenerate in the current day.

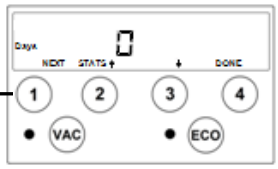
Press ‘STATS’ button to advance to the peak FLOW screen.



Peak ‘Flow’ screen displays the highest flow rate which occurred within the last number of days that equals ½ of the “A” value for days of history to be retained. IE A 56 (default) ÷ 2 = 28 days.

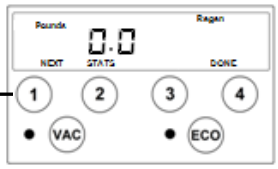
Press ‘STATS’ button to advance to the DAYS STATS history screen.

Display and Operation – Statistics (continued)



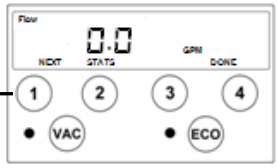
'Days Stats' history screen provides access to up to 56 days of historical data including: lbs of salt used (on any day that regeneration occurred), peak flow rate and gallons used for the day number that is selected using '↑' and '↓' (0 is today, 1 is yesterday, etc.).

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



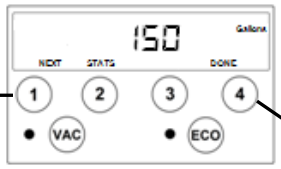
'Pounds Regen' history screen displays lbs of salt used (on any day that regeneration occurs). '0.0' indicates the unit did not regenerate on this day.

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.

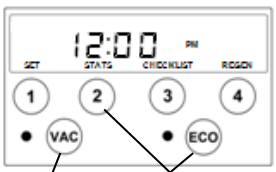
Press 'NEXT' button to advance to the GALLONS used screen for the currently selected day number.



'Gallons' used history screen displays water usage, in gallons, 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.

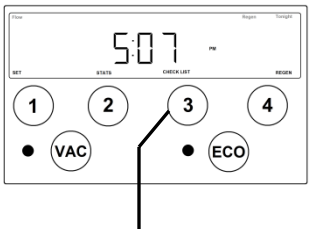
Purge History



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.

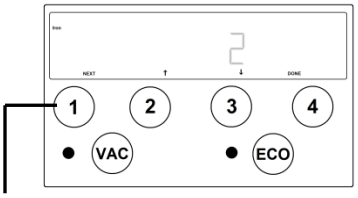
Display and Operation – Installer Settings – Cycles

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.

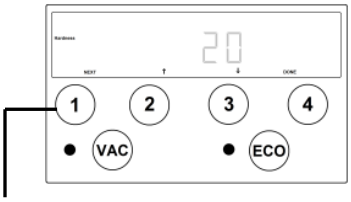
Press and HOLD 'CHECKLIST' button for approximately 3 seconds to access installer settings.



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.

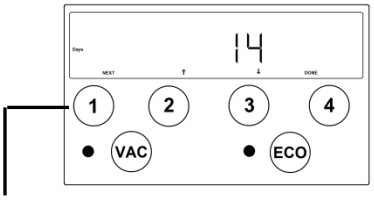
Press 'NEXT' button to set incoming HARDNESS level.



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

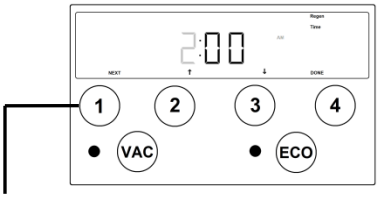
NOTE: This softener is set to calculate hardness as grains per gallon (gpg). If your water hardness is reported in milligrams per liter (mg/l) or parts per million (ppm) divide these results by 17.1 to convert to grains per gallon.

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.

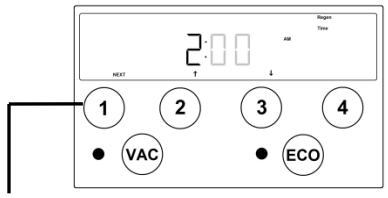
Press 'NEXT' button to set REGENERATION TIME hours.



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.

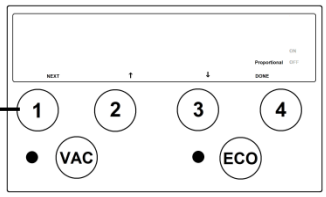
Press 'NEXT' button to set REGENERATION TIME minutes.

Display and Operation – Installer Settings – Cycles (continued)



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

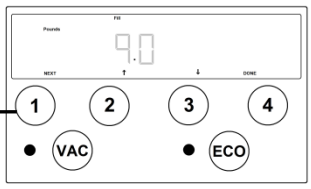
Press 'NEXT' button to set PROPORTIONAL BRINING.



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.)

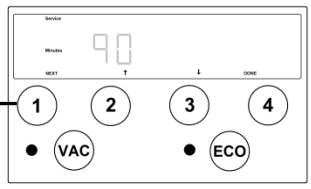
CAUTION: Changing the cycle durations will affect the water softener's performance and efficiency. The following settings should only be altered by a knowledgeable water treatment professional.

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



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

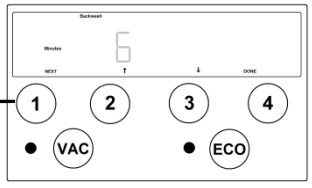
Press 'NEXT' button to set cycle #2 duration.



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.

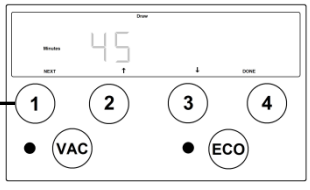
NOTE: Minimum recommended time is 90 minutes.

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

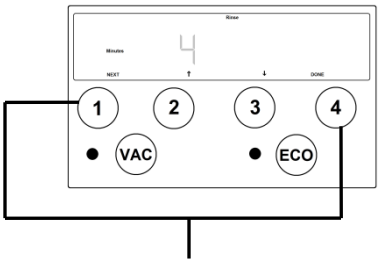
Press 'NEXT' button to set cycle #4 duration.



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.

Display and Operation – Installer Settings – Cycles (continued)

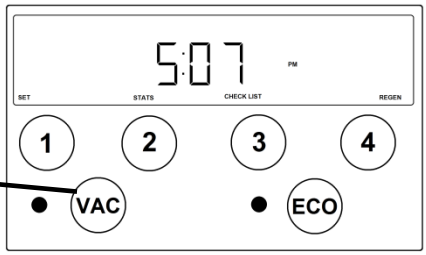


Ensure the **Rinse** and **Minutes** indicators are illuminated. Using '↑' and '↓', set the desired length of time for RINSE cycle.

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

Vacation Mode

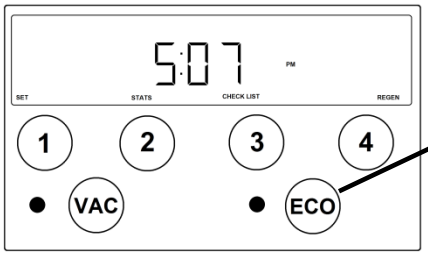
The VACATION mode may be activated or deactivated by pressing the VAC button on the front panel. The red LED light will be illuminated when the vacation mode is activated.



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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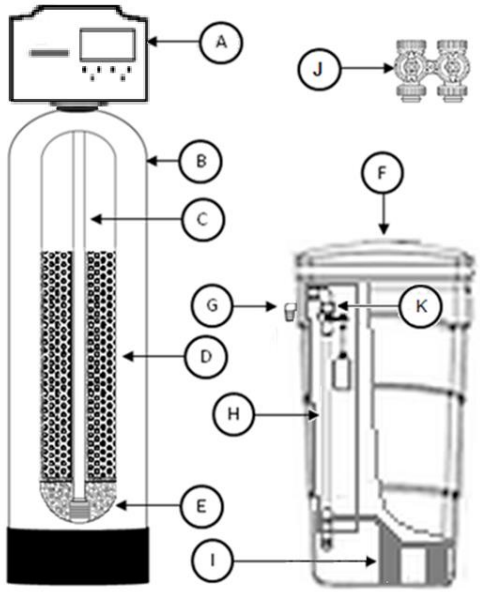
Specifications

Description	Two Tank Models					Cabinet Models		Space Saver Models	
	XT0844	XT0948	XT1054	XT1248	XT1354	XTCC1035	XTCC1044	XTC0835	XTC1035
Resin Volume ft³	0.75	1.0	1.5	2.0	2.5	1.0	1.3	0.75	1.0
Capacity, gpg									
@Factory Salt @ 9lb/ft³	18 ,000	24,000	36,000	48,000	60,000	24,000	32,000	18 ,000	24,000
@Max. Salt @ 15lb/ft³	22,500	30,000	45,000	60,000	75,000	30,000	40,000	22,500	30,000
Gravel Underbed, lbs	15	15	20	25	30	20	20	20	20
Operating Flow Rate, gpm									
Continuous (3 gpm/ft³)	2	3	5	6	8	3	4	2	3
Service (<=8 gpm/ft³, <15psi drop)	6	8	10	12	13	8	10	6	8
Peak (<=18 gpm/ft³, <20 psi drop)	12	13	13	14	14	14	14	15	14
Regen. Flow Rates, gpm									
Backwash & Rapid Rinse	2.0	2.4	3.0	4.0	5.0	3.0	3.0	3.0	3.0
Injector	White	Blue	Blue	Blue	Blue	Blue	Blue	White	Blue
Brine Draw - Rinse (@ 50 psi)	0.32-0.35	0.42-0.72	0.42-0.72	0.42-0.72	0.42-0.72	0.42-0.72	0.42-0.72	0.32-0.35	0.42-0.72
***Service Pipe Size, in.**	3/4" & 1"	3/4" & 1"	3/4" & 1"	3/4" & 1"	3/4" & 1"	3/4" & 1"	3/4" & 1"	3/4" & 1"	3/4" & 1"
Factory Regeneration Settings									
Brine Tank Fill (lbs of salt)	6	9	13.5	18	22.5	9	12	6	9
Softening (minutes dissolving salt)	90	90	90	90	90	90	90	90	90
Backwash (minutes)	5	5	6	6	6	4	5	4	4
Brine Draw & Rinse (minutes)	40	40	45	55	55	40	40	40	40
Rapid Rinse (minutes)	6	7	8	8	8	5	7	4	5
Total Water Used, gallons	38	58	75	97	127	56	66	40	56
Dimensions in.									
Mineral Tank, diameter x height	8x44	9x48	10x54	12x48	13x54	10x35	10x44	10x35	10x35
Brine Tank, width x depth x height	18x18x33	18x18x33	18x18x33	18x18x33	18x18x33	-NA-	-NA-	12X12X34	12X12X34
Overall, depth x width x height:									
(less 90° adapters)	21x28x55	21x29x59	21x30x65	21x30x59	21x31x65	27x13x47	27x13x53	21x24x47	21x24x47
(with 90° adapters)	18x28x59	18x29x63	18x30x69	18x30x63	18x31x69	22x13x51	22x13x57	16x24x51	16x24x51
Approximate Ship Wt., lbs.	94	110	143	168	219	115	133	101	113

Description	HE Two Tank Models					HE Space Saver Models	
	XT0844-HE	XT0948-HE	XT1054-HE	XT1248-HE	XT1354-HE	XTC0835-HE	XTC1035-HE
Resin Volume ft³	0.75	1.0	1.5	2.0	2.5	0.75	1.0
Capacity, grains							
@Factory Salt @ 6lb/ft³	18,000	22,000	33,000	44,000	55,000	18,000	22,000
@Max. Salt @ 15lb/ft³	23,000	31,000	46,500	62,000	77,500	23,000	31,000
Gravel Underbed, lbs	15	15	20	25	30	20	20
Operating Flow Rate, gpm							
Continuous (3 gpm/ft³)	2	3	5	6	8	2	3
Service (<=8 gpm/ft³, <15 psi drop)	6	8	10	12	13	6	8
Peak (<=18 gpm/ft³, <20 psi drop)	12	13	13	14	14	15	14
Regen. Flow Rates, gpm							
Backwash & Rapid Rinse	2.0	2.4	3.0	4.0	5.0	3.0	3.0
Injector	White	Blue	Blue	Blue	Blue	White	Blue
Brine Draw / Rinse (@ 50 psi)	0.32-0.35	0.42-0.72	0.42-0.72	0.42-0.72	0.42-0.72	0.32-0.35	0.42-0.72
***Service Pipe Size, in.**	3/4" & 1"	3/4" & 1"	3/4" & 1"	3/4" & 1"	3/4" & 1"	3/4" & 1"	3/4" & 1"
Factory Regeneration Settings							
Brine Tank Fill (lbs of salt)	6	6	9	12	15	6	6
Softening (minutes dissolving salt)	90	90	90	90	90	90	90
Backwash (minutes)	5	5	6	6	6	4	4
Brine Draw & Rinse (minutes)	40	40	40	50	60	40	40
Rapid Rinse (minutes)	6	7	8	8	8	4	5
Total Water Used, gallons	38	60	74	96	118	40	58
Dimensions in.							
Mineral Tank, diameter x height	8x44	9x48	10x54	12x48	13x54	10x35	10x35
Brine Tank, width x depth x height	18x18x33	18x18x33	18x18x33	18x18x33	18x18x33	12X12X34	12X12X34
Overall, depth x width x height:							
(less opt. 90° adapters)	21x28x55	21x29x59	21x30x65	21x30x59	21x31x65	21x24x47	21x24x47
(with opt. 90° adapters)	18x28x59	18x29x63	18x30x69	18x30x63	18x31x69	16x24x51	16x24x51
Approximate Ship Wt., lbs.	94	110	143	168	219	101	113

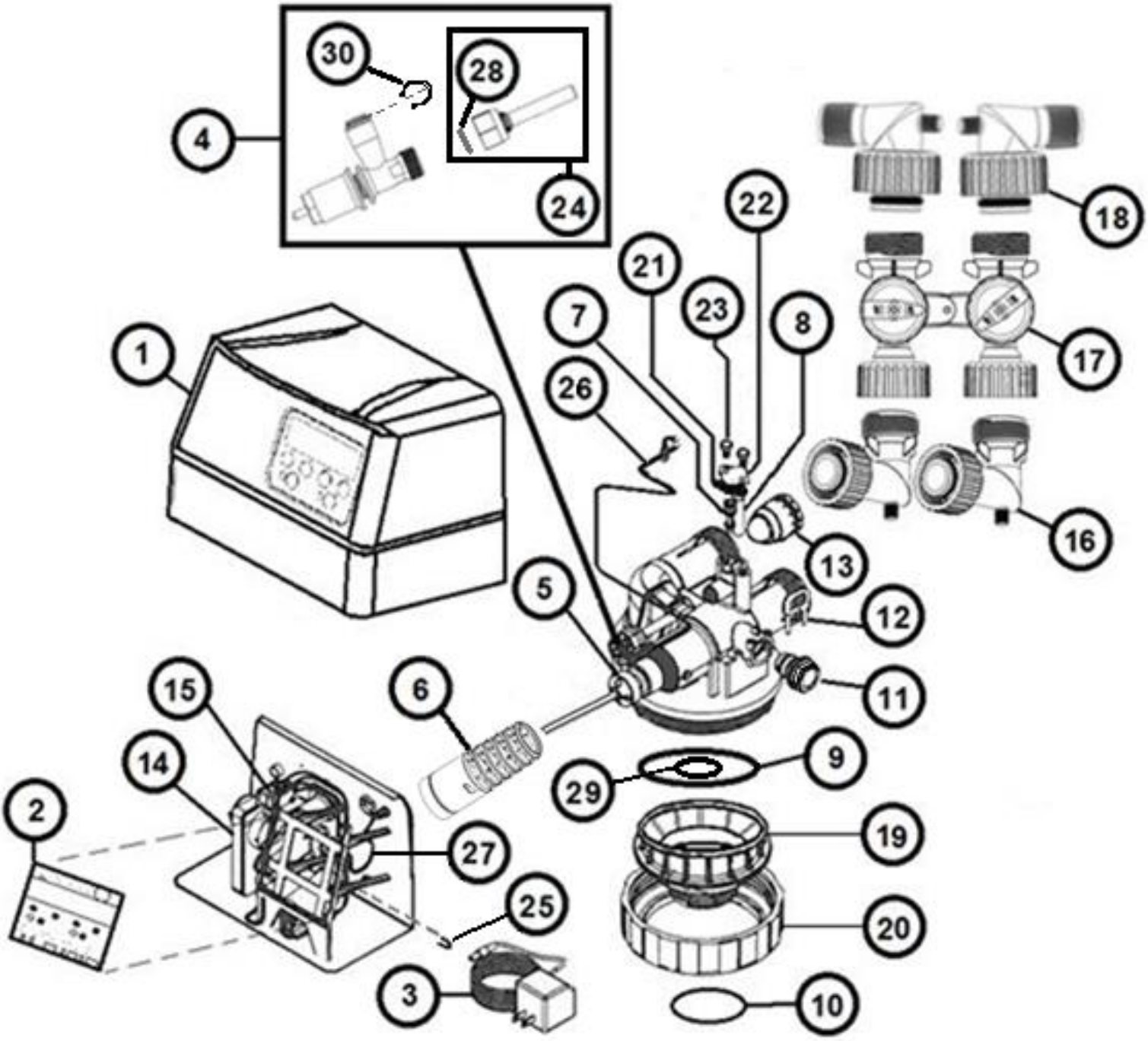
Component Parts Breakdown



Ref	Description	Two Tank Models					Cabinet Models		Space Saver Models	
		XT0844	XT0948	XT1054	XT1248	XT1354	XTCC1035	XTCC1044	XTC0835	XTC1035
A	Control Valve L/ bypass	XT0844-VLV-ASSY-L-BP	XT0948-VLV-ASSY- L-BP	XT1054-VLV-ASSY- L-BP	XT1248-VLV-ASSY- L-BP	XT1354-VLV-ASSY- L-BP	XTCC1035-VLV-ASSY-L-BP	XTCC1044-VLV-ASSY-L-BP	XTC0835-VLV-ASSY-L-BP	XTCS30-VLV-ASSY-L-BP
B	Mineral Tank	MTP0844GR	MTP0948GR	MTP1054GR	MTP1248GR	MTP1354GR	MTP1035GR	MTP1044GR	MTP1035GR	MTP1035GR
C	Distributor	D100SX-44	D100SX-48	D100SX-54	D100SX-48	D100SX-54	D100S-48	D100S-48	D100SX-48	D100SX-48
D	Resin	Qty 1-1/2 - H05P	Qty 2 - H05P	Qty 3 - H05P	Qty 4 - H05P	Qty 5 - H05P	Qty 2 - H05P	Qty 2.5 - H05P	Qty 1-1/2 - H05P	Qty 2 - H05P
E	1/4" X 1/8" Gravel	Qty 1 - QC20	Qty 1 - QC20	Qty 1 - QC20	Qty 1 - QC20	Qty 1-1/2 - QC20	Qty 1 - QC20	Qty 1 - QC20	Qty 1 - QC20	Qty 1 - QC20
F	Brine Tank Assy.	BTSQ1833ASSY	BTSQ1833ASSY	BTSQ1833ASSY	BTSQ1833ASSY	BTSQ1833ASSY	BC-1035C	BC-1044C	BT1234ASSY	BT1234ASSY
G	Overflow Fitting	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO
H	Safety Brine Vlv.	SBV14ASSY	SBV14ASSY	SBV14ASSY	SBV14ASSY	SBV14ASSY	SBV14ASSY	SBV14ASSY	SBV14ASSY	SBV14ASSY
I	Salt Platform	BTSG18SQ	BTSG18SQ	BTSG18SQ	BTSG18SQ	BTSG18SQ	-NA-	-NA-	BTSG12	BTSG12
J	Bypass	BP-213	BP-213	BP-213	BP-213	BP-213	BP-213	BP-213	BP-213	BP-213
K	Elbow Locking Clip	FC103	FC103	FC103	FC103	FC103	FC103	FC103	FC103	FC103
-NA-	Top Screen	-NA-	-NA-	-NA-	-NA-	-NA-	FHS101	FHS101	-NA-	-NA-
-NA-	Distributor Adapter	-NA-	-NA-	-NA-	-NA-	-NA-	SA900	SA900	-NA-	-NA-

Ref	Description	HE Two Tank Models					HE Space Saver Models	
		XT0844-HE	XT0948-HE	XT1054-HE	XT1248-HE	XT1354-HE	XTC0835-HE	XTC1035-HE
A	Control Valve L/ bypass	XT0844-HE-VLV-ASSY-L-BP	XT0948-HE-VLV-ASSY- L-BP	XT1054-HE-VLV-ASSY- L-BP	XT1248-HE-VLV-ASSY- L-BP	XT1354-HE-VLV-ASSY- L-BP	XTC0835-HE-VLV-ASSY-L-BP	XTC1035-HE-VLV-ASSY-L-BP
B	Mineral Tank	MTP0844GR	MTP0948GR	MTP1054GR	MTP1248GR	MTP1354GR	MTP1035GR	MTP1035GR
C	Distributor	D100S-44	D100S-48	D100S-54	D100S-48	D100S-54	D100S-48	D100S-48
D	Resin	Qty 1-1/2 - UHE05P	Qty 2 - UHE05P	Qty 3 - UHE05P	Qty 4 - UHE05P	Qty 5 - UHE05P	Qty 1-1/2 - UHE05P	Qty 2 - UHE05P
E	1/4" X 1/8" Gravel	Qty 1 - QC20	Qty 1 - QC20	Qty 1 - QC20	Qty 1 - QC20	Qty 1-1/2 - QC20	Qty 1 - QC20	Qty 1 - QC20
F	Brine Tank Assy.	BTSQ1833ASSY	BTSQ1833ASSY	BTSQ1833ASSY	BTSQ1833ASSY	BTSQ1833ASSY	BT1234ASSY	BT1234ASSY
G	Overflow Fitting	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO	BT-OVERFLO
H	Safety Brine Vlv.	SBV14ASSY	SBV14ASSY	SBV14ASSY	SBV14ASSY	SBV14ASSY	SBV14ASSY	SBV14ASSY
I	Salt Platform	BTSG18SQ	BTSG18SQ	BTSG18SQ	BTSG18SQ	BTSG18SQ	BTSG12	BTSG12
J	Bypass	BP-213	BP-213	BP-213	BP-213	BP-213	BP-213	BP-213
K	Elbow Locking Clip	FC103	FC103	FC103	FC103	FC103	FC103	FC103
-NA-	Top Screen	FHS101	FHS101	FHS101	FHS101	FHS101	FHS101	FHS101
-NA-	Distributor Adapter	SA900	SA900	SA900	SA900	SA900	SA900	SA900

Control Valve Parts Breakdown

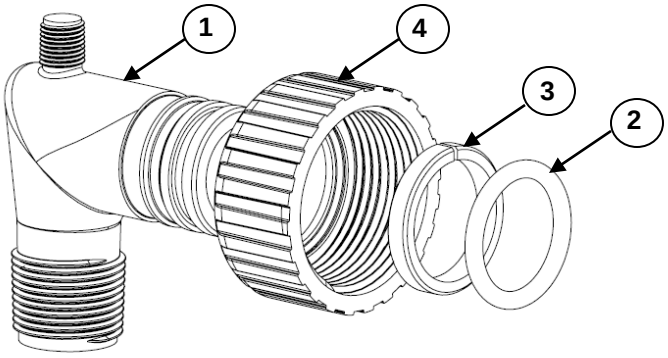


Control Valve Parts List

REF #	Part Number	Description
1	FCC-954	Front Cover, AVID
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	¾" NPT Elbow Assembly (2 req'd)
	EBA900	1" NPT Elbow Assembly (2 req'd)
	EBA915	Optional 1 ½" NPT Elbow Assy (2 req'd)

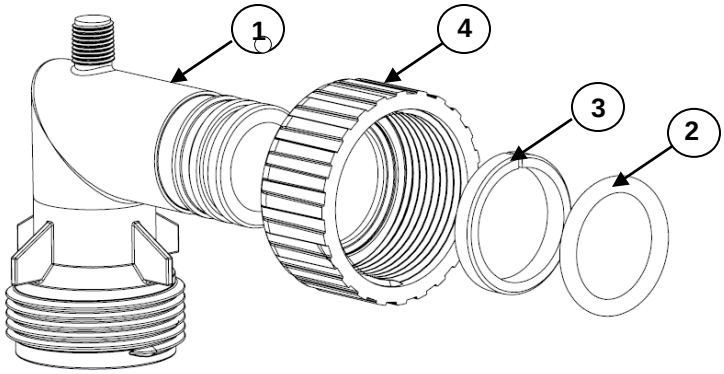
REF #	Part Number	Description
19	TAF131	Tank Attachment
20	TN101	Tank Nut
21	VG145	Venturi Gasket
22	VP145	Venturi Plate
23	VB145	Venturi Hex Head Bolt, 18-8 SS 1/4-20 x 1/2"
24	QCF987	Quick Connect Flow Assembly
25	HPC-075	Hair Pin Clip
26	HEH138	Hall Effect Sensor Wire Harness
27	WH137	Power Wire Harness 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)
	12087	2.0 gpm DLFC washer, XT0844
	3600-12088	2.4 gpm DLFC washer, XT0948
	12089	3.0 gpm DLFC washer, XTCS0835, XTC1035, XTCC1035, XTCC1044, XT1054
	3600-12091	4.0 gpm DLFC washer, XT1248
	12092	5.0 gpm DLFC washer, XT1354
	FHS101	Top Screen (-HE & Cabinets Only)
	SA900	Distributor Adaptor (-HE & Cabinets Only)

Installation Fitting Assemblies



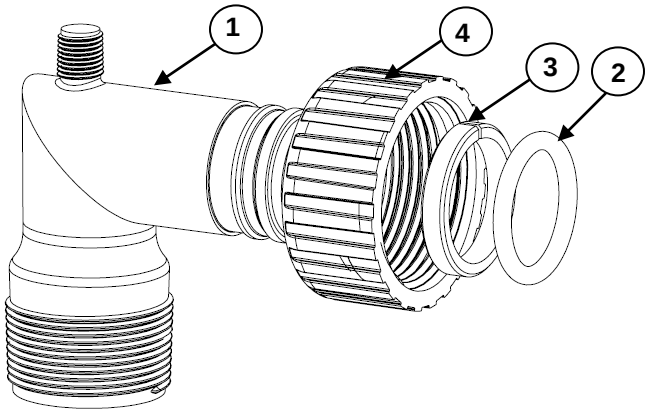
1” PVC MALE NPT ELBOW			
Ref	**Part #**	**Description**	**Qty**
	EBA900	1” Elbow Assembly	1*
1	EB100	1” Elbow	1
2	OR323	O-ring, -323	1
3	C-101	Split Ring Retainer	1
4	C-102	Connector Nut	1

(*2 required)



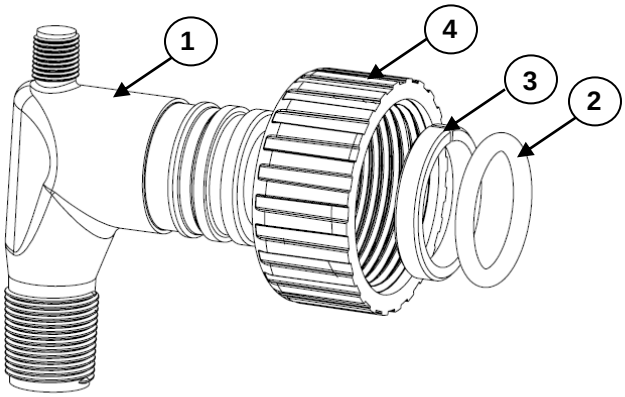
90 DEGREE CLOSE INSTALL ADAPTER			
Ref	**Part #**	**Description**	**Qty**
	EBA910	90° Bypass Elbow Assembly	1*
1	EB175	Bypass Elbow	1
2	OR323	O-ring, -323	1
3	C-101	Split Ring Retainer	1
4	C-102	Connector Nut	1

(*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

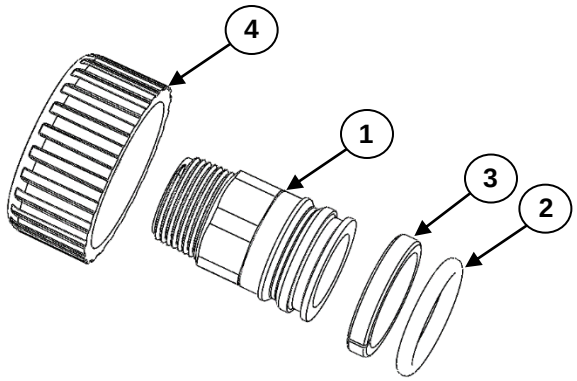
(*2 required)



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

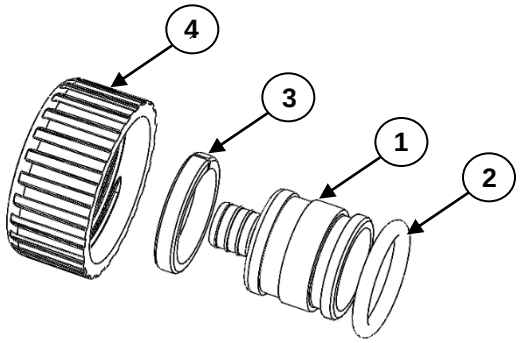
(*2 required)

Installation Fitting Assemblies



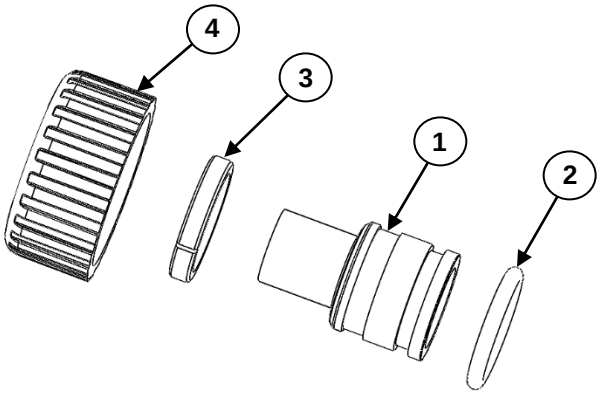
1" STRAIGHT NPT FITTING			
Ref	**Part #**	**Description**	**Qty**
	TC204-1	1" Straight Fitting Assembly	1*
1	TC101-1	1" Straight Fitting	1
2	OR323	O-ring, -323	1
3	C-101	Split Ring Retainer	1
4	C-102	Connector Nut	1

(*2 required)



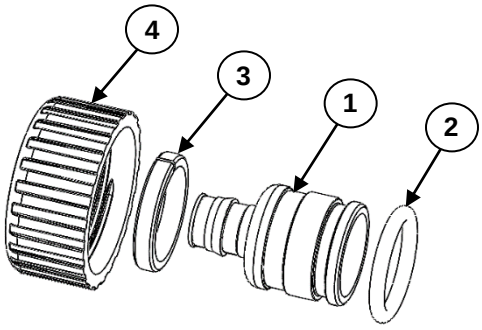
3/4" PEX ADAPTER			
Ref	**Part #**	**Description**	**Qty**
	PEX965	3/4" PEX Assembly	1*
1	PXTS750	3/4" PEX Fitting	1
2	OR323	O-ring, -323	1
3	C-101	Split Ring Retainer	1
4	C-102	Connector Nut	1

(*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 in 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 7) 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 7) 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