



# Matrixx Smart Metered Water Softener

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## Unpacking and Inspection

Be sure to check the entire unit for any shipping damage or lost parts. Also note damage to the shipping cartons. Contact US Water Systems at 1-800-608-8792 to report any shipping damage within **24 hours of delivery**. Claims made after 24 hours may not be honored. Small parts, needed to install the unit, will be in a parts bag. To avoid loss of the small parts, keep them in the parts bag until you are ready to use them.

## Safety Guide

*For your safety, the information in this manual must be followed to minimize the risk of electric shock, property damage or personal injury.*

- Check and comply with provincial / state and local codes. These codes must be followed.
- Use care when handling the system. Do not turn upside down, drop, drag or set on sharp protrusions.
- The water softening system works on 12 volt-60 Hz electrical power only. Be sure to use only the included transformer.
- Transformer must be plugged into an indoor 120 volt, grounded outlet only.
- Keep the salt lid in place on the brine tank unless servicing the unit or refilling with salt.
- **WARNING:** This system is not intended for treating water that is micro biologically unsafe or of unknown quality without adequate disinfection before or after the system. Contact US Water Systems for disinfection treatment equipment.

## Before Starting Installation

### Proper Installation

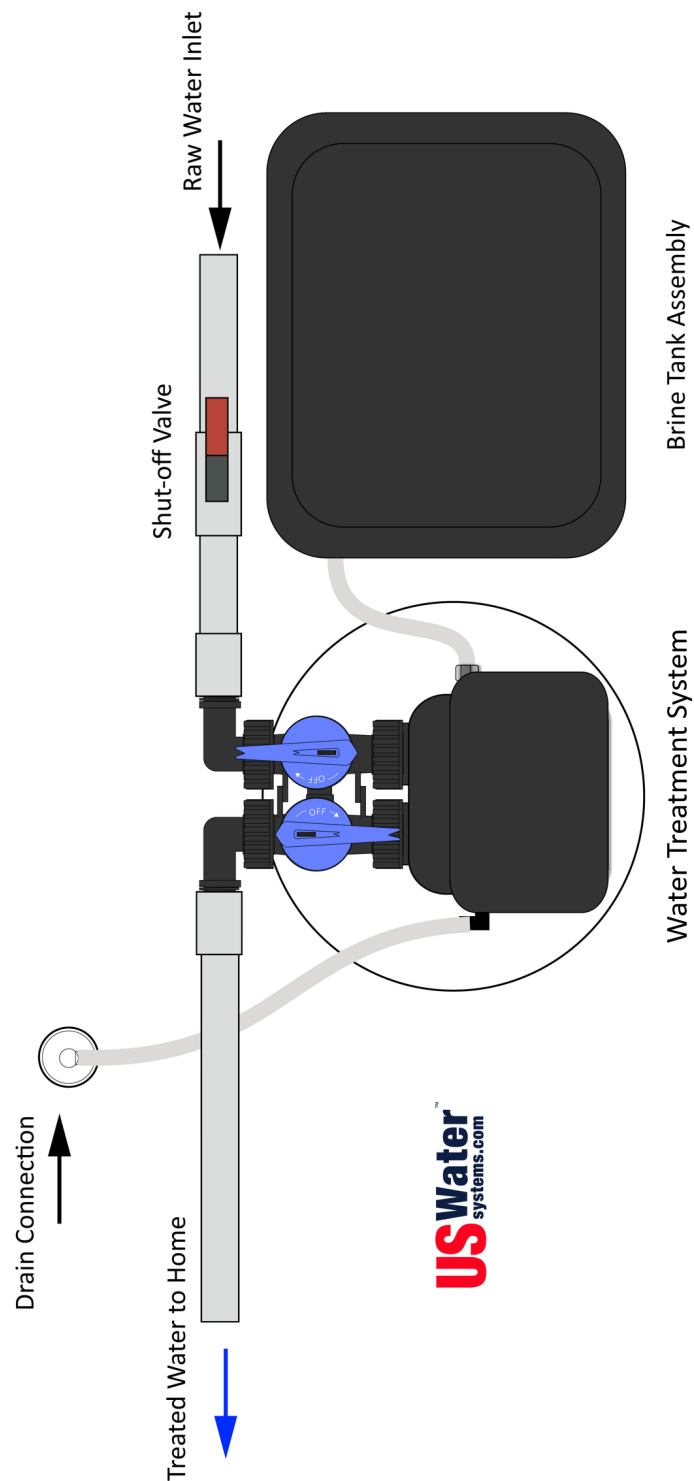
*This water softening system must be properly installed and located in accordance with the Installation Instructions before it is used or the warranty will be void.*

- **Do not** Install or store where it will be exposed to temperatures below freezing or exposed to any type of weather. Water freezing in the system will break it. Do not attempt to treat water over 100°F.
- **Do not** install in direct sunlight. Excessive sun or heat may cause distortion or other damage to non-metallic parts.
- Properly ground to conform with all governing codes and ordinances.
- Use only *lead-free solder and flux* for all sweat-solder connections as required by state and federal codes.
- Maximum allowable inlet water pressure is 100 psi. If daytime pressure is over 80 psi, night time pressure may exceed the maximum. Use a pressure reducing valve (PRV) to reduce the pressure.
- Softener resins may degrade in the presence of chlorine or chloramines above 2 ppm. If the feed water has chlorine or chloramines in excess of this amount, it could reduce the life of the resin. In these conditions, a whole house carbon filter system with a chlorine reducing media is recommended. Contact US Water Systems for chlorine and chloramine removal equipment.
- **Warning:** Discard all unused parts and packaging material after installation. Small parts remaining after the installation could be a choke hazard.

### Tools, Pipe, Fittings, and Other Materials

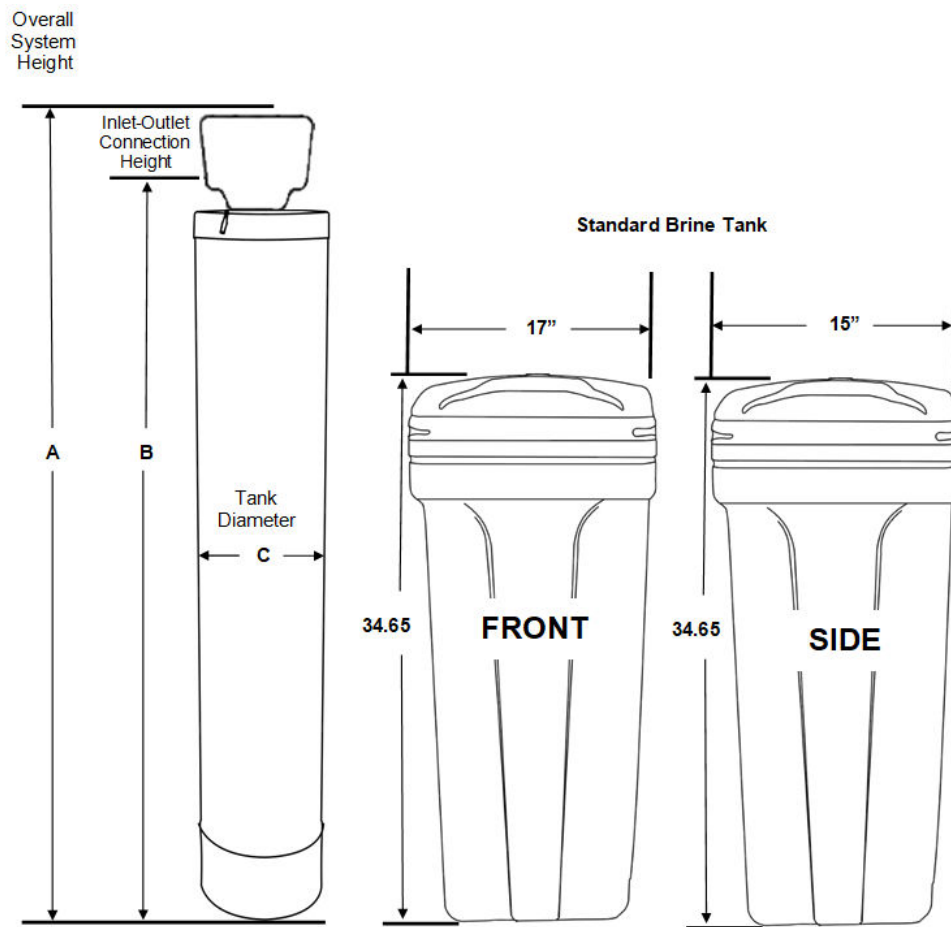
- Channel Locks
- Screwdriver
- Teflon Tape
- Razor Knife
- Two adjustable wrenches
- Additional tools may be required if modification to home plumbing is required.
- To maintain full valve flow, be sure the plumbing size matches the size of the valve. The outlet pipe should be the same size or larger than the water supply pipe.
- Use copper, brass, or PEX pipe and fittings. Some codes may also allow PVC Plastic pipe.
- **ALWAYS** install the included bypass valve or install a 3 shut-off valve hard piped bypass. Bypass valves allow the water to be turned off to the softener but can still provide water to the house for water use during repairs or service.
- 5/8" OD, 1/2" ID drain line is needed for the valve drain.
- A length of 5/8" OD drain line tubing is needed for the brine tank over flow fitting (optional).
- Extra Course Grade or Crystal Solar Salt (99.8% pure) water softener salt is needed to fill the brine tank.

## System Overview



## System Dimensions

Model	Tank Size	A	B	C
MXX-100	9" x 48"	54.375"	50.875"	9"
MXX-150	10" x 54"	60.375"	57"	10"
MXX-200	12" x 52"	58.625"	55.25"	12"



## Specifications

Model Number	MXX-100	MXX-150	MXX-200
Tank Size	9" x 48"	10" x 54"	12" x 52"
Capacity (cu/ft)	1	1.5	2
Maximum Capacity*	35,000 Grains	53,000 Grains	70,000 Grains
<b>High Efficiency Settings**</b>	<b>15,000 Grains</b>	<b>22,500 Grains</b>	<b>30,000 Grains</b>
Salt Setting	3 lbs	4.5 lbs	6 lbs
Water Usage	33 Gallons	41 Gallons	62 Gallons
Backwash	2 Minutes	3 Minutes	4 minutes
Brine/Rinse	40 Minutes	40 Minutes	50 Minutes
Fast Rinse	4 Minutes	5 Minutes	6 Minutes
Brine Refill	2 Minutes	3 Minutes	4 Minutes
<b>Optimal Settings</b>	<b>24,000 Grains</b>	<b>36,000 Grains</b>	<b>48,000 Grains</b>
Salt Setting	6 lbs	9 lbs	12 lbs
Water Usage	72 Gallons	81 Gallons	104 Gallons
Backwash	10 Minutes	10 Minutes	10 Minutes
Brine/Rinse	60 Minutes	60 Minutes	60 Minutes
Fast Rinse	10 Minutes	10 Minutes	10 Minutes
Brine Refill	4 Minutes	6 Minutes	8 Minutes
<b>Maximum Settings</b>	<b>32,000 Grains</b>	<b>48,000 Grains</b>	<b>64,000 Grains</b>
Salt Setting	15 lbs	23 lbs	30 lbs
Water Usage	67 Gallons	89 Gallons	120 Gallons
Backwash	8 Minutes	10 Minutes	10 Minutes
Brine/Rinse	60 Minutes	70 Minutes	80 Minutes
Fast Rinse	8 Minutes	9 Minutes	10 Minutes
Brine Refill	10 Minutes	16 Minutes	20 Minutes
Backwash Flow Control (GPM)	2.0	2.4	3.5
Brine Flow Control (GPM)	0.5		
Service Flow Rates	10 GPM	15 GPM	20 GPM
Peak Flow Rates	12 GPM	17 GPM	22 GPM
Pressure Drop @ Service Flow	5-7 PSI		
Pressure Drop @ Peak Flow	15-20 PSI		
Water Pressure	20 PSI Min / 100 PSI Max		
Water Temperature	39°F Min / 100°F Max		
Plumbing Connections	1" or 3/4" MPT		
Electrical Requirements	100-240V, 50/60 Hz, 0.3 A / Output 12V, 500mA		
Brine Tank Size	15" x 17" x 36"		
Salt Storage Capacity	275 lbs		

**\* Capacity when new ; \*\* Treating Moderate Hardness only**

- Continuous operation at flow rates greater than the service flow rate may affect capacity and efficiency performance.
- The manufacturer reserves the right to make product improvements which may deviate from the specifications and descriptions stated herein, without obligation to change previously manufactured products or to note the change.
- The above capacity and flow rate specifications have not been validated by the WQA.



## How the Water Softener Works

Water hardness is derived from Calcium and Magnesium minerals that have been dissolved into the water under the earth's surface. These minerals are found in limestone deposits and are the source of hard water. The amount of hardness in a given water supply is dependent upon the quantity of Calcium and Magnesium present and the length of time water has been in contact with them. This can vary dramatically from source to source and, for this reason, a water analysis is imperative in order to determine the proper treatment method. The degree of hardness increases as the concentration of Calcium and Magnesium "ions" increases and is measured in **Grains Per Gallon (gpg)**.

The problem of hard water in the home/business comes to light in many facets of daily use. Water spots and scum left behind on bathtubs, fixtures, and showers; wear and tear on appliances; calcium build-up in hot water heaters and piping; and, greater amounts of soap and detergents being used are just a few examples.

The modern water softener is designed to reduce hardness ions and their unpleasant side effects. Special resin beads in the softener mineral tank are used to change hard water into soft water. The surfaces of these beads are covered with sodium ions. As hard water enters the mineral tank and comes into contact with the resin, an exchange of ions takes place as dissolved Calcium and Magnesium ions cling to the resin surface and sodium ions take their place, thus softening the water. This process is called **Ion Exchange**. Over time, the sodium ions used for the exchange process become depleted and must be replenished.

The water softener provides a Regeneration process whereby brine solution enters the mineral tank, driving-off the collected hardness ions and replenishes the surface of the resin beads with more sodium ions. This process is automatically initiated by the control valve on the mineral tank. The regeneration process has five basic cycles as follows:

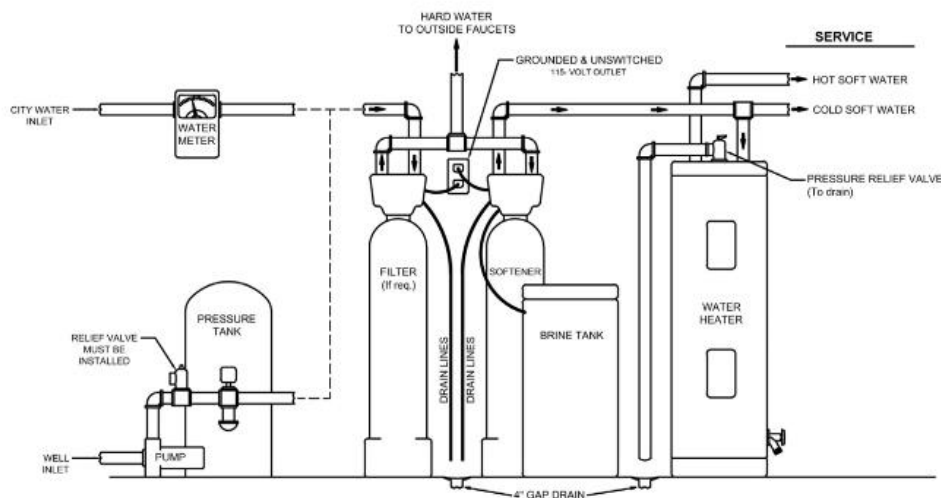
1. **Backwash** - The control valve directs the water flow in a reverse direction through the mineral tank, separating the resin beads and flushing any accumulated particles to a waste drain.
2. **Brine & Rinse** - In the first part of this cycle, the control valve directs brine solution downward through the mineral tank, driving-off collected hardness ions and replenishing the resin beads with sodium ions. The second part of the cycle rinses hardness ions and excess brine from the mineral tank to the waste drain.
3. **Rapid Rinse** - The control valve directs the water flow downward, settling and re compacting the resin bed.
4. **Brine Refill** - The control valve directs fresh water into the salt compartment to create new brine solution for the next scheduled regeneration.
5. **Service** - This is the normal “operating” cycle where hard water enters the mineral tank, comes into contact with the resin beads, and exchanges hardness ions for sodium ions - the water then becomes “soft” and ready for use.

## Where to Install the Softener

- Place the softener as close as possible to the pressure tank (well system) or water meter (city water).
- Place the softener as close as possible to a floor drain or other acceptable drain point (laundry tub, sump, standpipe, etc)
- Connect the softener to the main water supply pipe **BEFORE** the water heater (10' or more). **DO NOT RUN HOT WATER THROUGH THE SOFTENER.** Temperature of water passing through the softener must be less than 100°F.
- **Outside faucets and irrigation systems should be supplied with hard water prior to the water softener.**
- Do not install the softener in a place where it could freeze. **Damage caused by freezing is not covered by the warranty.**
- Put the softener in a place where water damage is least likely to occur if a leak develops. **The manufacturer will not repair or pay for water damage.**
- A 120 volt electric outlet is needed within 6 ft of the softener. The transformer has an attached 6 foot power cable. **Be sure the electrical outlet and transformer are in an inside location so they are protected from wet weather.**
- If installing in an outside location, you must take the steps necessary to ensure the softener, installation plumbing, wiring, etc are protected from the elements and contamination sources.
- **Keep the softener out of direct sunlight.** The sun's heat may soften and distort plastic parts.

### TWO TANK SETUP

(Incoming Water from Left-Side)



## Softener Preparation

### Softener Tank Preparation

**Water Pressure:** A minimum of 20 pounds of water pressure is required for the regeneration valve to operate effectively.

**Electrical Facilities:** An uninterrupted alternating current (AC) supply is required. *Note: Other voltages are available. Please make sure your voltage supply is compatible with your unit before installation.*

**Existing Plumbing:** Condition of existing plumbing should be free from lime and iron buildup. Piping that is built up heavily with lime and/or iron should be replaced.

**Location of Tank and Drain:** The resin tank should be located close to a drain to prevent air breaks and back flow.

**Caution:** Water pressure is not to exceed 80 psi, water temperature is not to exceed 110°F (43°C), and the unit cannot be subjected to freezing conditions.

### Resin Installation

1. Remove the tank from the carton.
2. Verify the riser tube is centered in the bottom of the tank. There is an indentation in the bottom of the tank that will allow the distributor tube to be centered. A flashlight may be needed to verify the tube is in the center of the tank.



3. Install the clear, plastic cap that is provided in the install kit onto the distributor tube.

4. Use the blue funnel provided to pour the media into the tank. Pour it evenly around the hole to ensure it is well distributed in the tank and pour slow enough to keep from plugging the hole. A helper may be needed to hold the funnel during the filling process. **NOTE:** It is recommended that a dust mask and safety goggles be worn to prevent possible injury.
5. When the media is installed, move the tank side to side to settle the media. Remove the funnel and cap from the distributor tube.



6. Lubricate the distributor O-ring and the outer tank O-ring.



7. Install the upper basket on the bottom of the valve by lining up the tabs then turning the basket clockwise to lock it in place. Place the upper basket over the distributor tube and push the valve onto the tank. Thread the valve on the tank by turning it clockwise. Be sure not to cross thread the valve on the tank.



8. Tighten the valve hand tight then snug it further by tapping it with the palm of the hand. **DO NOT** use tools to tighten the valve or damage could occur.



## Installation Instructions

1. If your hot water tank is electric, turn off the power to it to avoid damage to the element in the tank.
2. If you have a private well, turn the power off to the pump and then shut off the main water shut off valve. If you have municipal water, simply shut off the main valve. Go to a faucet or spigot (preferably on the lowest floor of the house) and turn on the cold water until all pressure is relieved and the flow of water stops.
3. Locate the softener tank and brine tank close to a drain where the system will be installed. The surface should be clean and level.

**NOTE:** Any solder joints being soldered near the valve must be done before connecting any piping to the valve. Always leave at least 6" (152 mm) between the control valve and joints being soldered when soldering pipes that are connected to the valve. Failure to do this could cause damage to the valve.

The softener system is equipped with male pipe threaded ports on the control valve bypass. The bypass is marked with arrows to show proper flow direction. The arrow pointing toward the valve indicates the inlet. The arrow pointing away from the valve is the outlet.

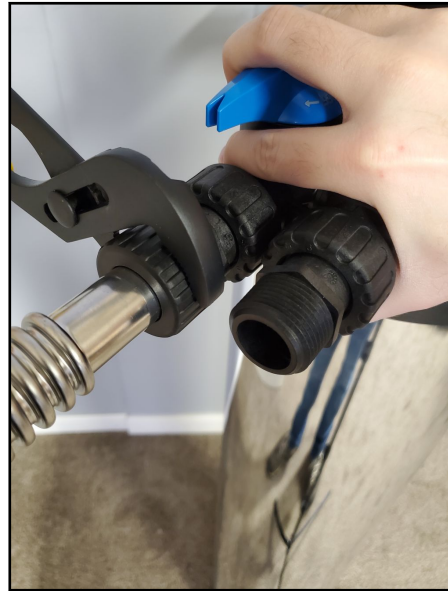




4. Insert the provided plumbing fittings into the bypass. 3/4" straights and 1" elbow male pipe thread fittings are supplied so ensure you pick the correct one for your plumbing. Tighten the retaining nuts hand tight, ensuring that the fittings are not cross threaded.



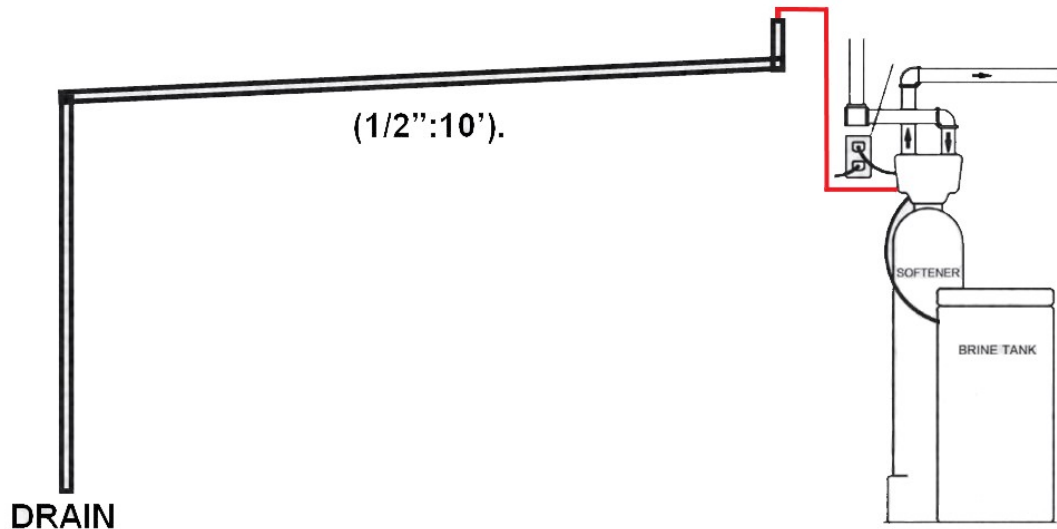
5. Be sure to use Teflon tape or other pipe sealant on the plumbing fitting threads and install them on the bypass accordingly. Use an adjustable wrench to ensure they are tight.



**NOTE: All piping should be secured to prevent stress on the bypass valve and connectors.**

**NOTE: Connections above are made using a stainless steel flex connector with a rubber gasket and do not require Teflon tape.**

6. Connect the drain hose to the valve and secure it with a hose clamp. Run the drain hose to the nearest laundry tub, floor drain or approved air gap fitting. The drain can be ran overhead or down along the floor. Drain tubing should be a minimum of 1/2" ID. When running the drain overhead, it is important that the tubing has no dips or kinks. If the drain is ran overhead and must run linearly to the available drain, it is recommended that a hard pipe is used of larger diameter than the drain line. This linear pipe should have a physical "drop" toward the drain (1/2" : 10'). The goal is to have a gravity drain without much back pressure when traveling long distances.

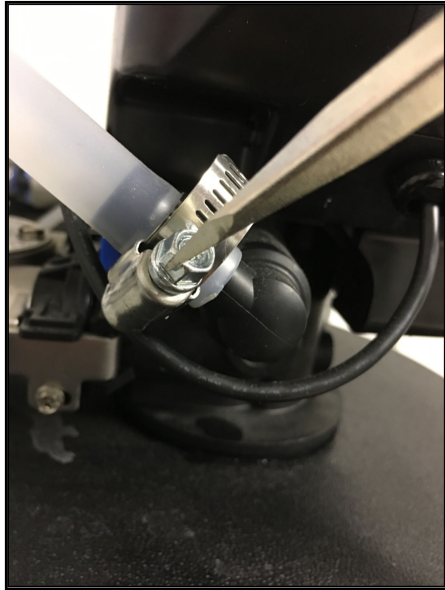


**NOTE: A direct connection into a waste drain is not recommended. A physical air gap of at least 1.5" should be used to avoid bacteria and wastewater traveling back through the drain line into the softener.**

There are two combinations of provided drain line/clamps that come with the system. Clear, hard walled drain line will come with a silver hose clamp and it is recommended to have a flat head screwdriver available to tighten the hose.

For the black, softer material drain line, there will be a brass hose clamp provided. It is recommended to have flat nose pliers available to widen the hose clamp and slide it up onto the valve attachment once the hose is pushed onto the barb.





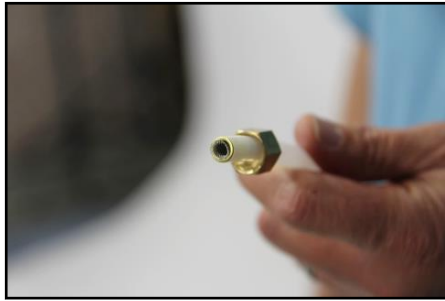
**NOTE:** Be sure to secure the drain line. The softener will drain with force and it should be secured to prevent a leak. Hose clamps should be used to secure the drain line at the connection points.

Two different brine line connections are available for the valve. There is no qualitative difference between the two but installation does vary. Please confirm which version you have and proceed accordingly.

7. **If Valve has Quick Connect Brine Connection:** Remove the blue locking clip from the brine line connection on the valve. Put it to the side. REMOVE the brass insert from the brine line and push it into the brine line connection on the valve until it stops. Lightly tug back on to ensure it's installed correctly. It should not be able to be removed from the valve. Reinstall the blue locking clip onto the brine connection.

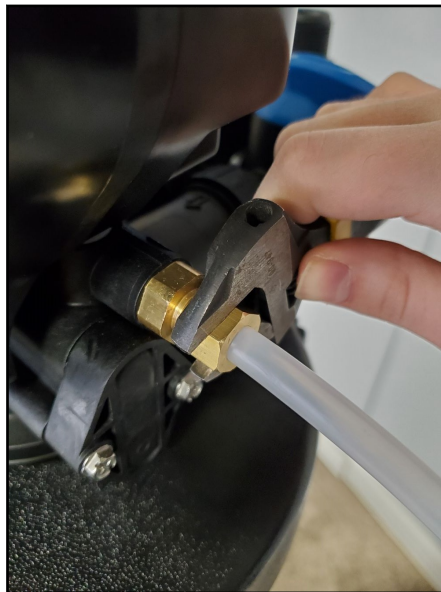


8. **If Valve has Brass Brine Connection:** Connect the brine line to the control valve by removing the nut and sleeve from the control valve. Slide the nut and sleeve over the brine line. There is a brass stiffener pre-installed in the line.

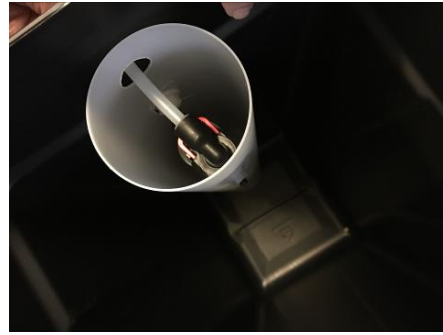
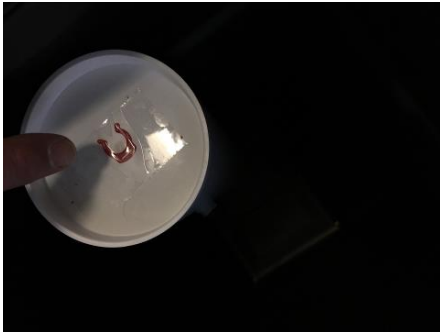


9. Push the brine line in the control valve until it stops. Then push the nut down on the fitting and tighten it hand tight. Use an adjustable wrench to tighten the nut an additional 1/2 turn.

**CAUTION: Use two wrenches to tighten the brass nut. The brass fitting must be held while tightening the brass nut. If not, damage may occur to the valve body.**



10. Now connect the brine line to the brine tank safety float assembly. Remove the brine tank lid and the brine well cap. There is a red clip on the cap that will be used to hold the brine line in place. Remove it, and the tape holding it, and put it to the side. Then push the brine line through the brine tank and brine well. REMOVE the brass insert for this connection. Push the brine line into the brine safety valve. Make sure it is completely pushed in. Then install the red locking clip around the brine fitting between the gray collar and the brine elbow. Install the white cap on the tube.



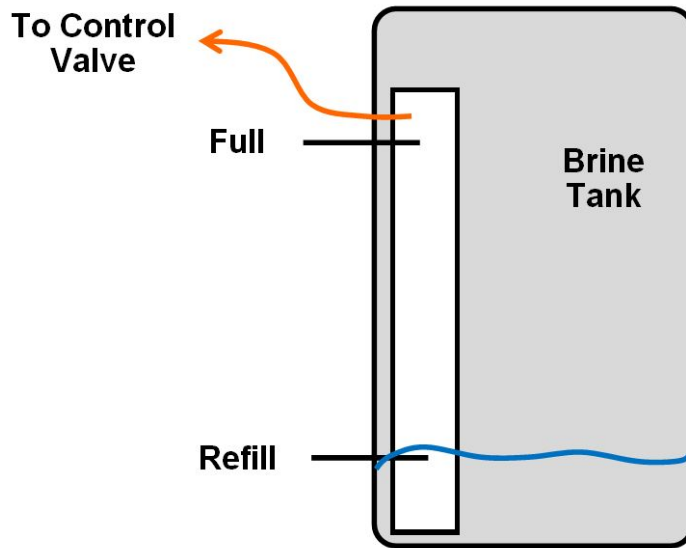
11. Turn both bypass handles so they are perpendicular to the bypass to place the unit in the bypass position. Slowly turn on the main water supply. At the nearest cold treated faucet or spigot, open the faucet and let water run a few minutes or until the system is free of any air or foreign material resulting from the plumbing work. If a faucet is used, make sure the screen is removed first.



12. Make sure there are no leaks in the plumbing system before proceeding. Close the water tap when water runs clean. Check for leaks again.

13. Open the brine tank lid and add 1-2 gallons of water to the brine tank. Add a minimum of 80 lbs of salt to the brine tank.

**NOTE:** Salt should be filled, used completely and refilled. Salt should not be "topped off" each month. It is better to completely fill the tank with salt (full is 2" below the top of the white safety float tube in the tank) then use the salt until water can be seen on top of the salt. Then refill the salt.



14. Proceed to start up instructions

**NOTE:** The unit is not ready for service until you complete the start up instructions



## System Regeneration

### Normal Operation

**Home Display** - The home display will alternate between the time of day and gallons left until the next regeneration. The meter will count down to zero (0000) and then regenerate at the scheduled time set.

### Starting a Regeneration Cycle

1. To Start **Delayed Extra Cycle**
  - If Days Remaining Until Next Regeneration does not read '0000', press and hold the Set/Change button for 3 seconds until the display reads '0000'
  - Regeneration cycle will initiate at the next designated regeneration time.
2. To start **Immediate Extra Cycle**, first complete above step.
  - With Gallons Remaining Until Next Regeneration at '0000', press and hold the **Set/Change** button.
  - After 3 seconds, the regeneration cycle will begin.
3. To **Fast Cycle** thru regeneration, first complete above 2 steps.
  - Press and hold the Set/Change button for 3 seconds to advance to the next cycle step. Fast Cycle is not necessary unless desired to manually step through each cycle step. (Repeat until valve returns to home display)

Softener Cycles		Default (Min)
Step 1	Backwash	10
Step 2	Brine & Rinse	60
Step 3	Rapid Rinse	10
Step 4	Brine Refill	Size Specific

## Programming Using Onboard Buttons

1. To enter the Main Menu, press the **Menu/Enter** button. (Time of Day will flash)
2. To set the **Time of Day**, press the **Set/Change** button. (First digit will flash)
  - To change digit value, press the Set/Change button.
  - To accept the digit value, press the Menu/Enter button.
  - Next digit will flash to begin setting.
  - Once the last digit display is accepted, all digits will flash.
3. To set **A.M. or P.M.**, press the **Menu/Enter** button.
  - To change digit value, press the Set/Change button.
  - To accept the digit value, press the Menu/Enter button.
  - Once A.M. or P.M. is accepted, the next menu item will flash.
4. To set **Hardness**, an "H" will appear to enter Compensated Hardness in grains per gallon (gpg). Default setting is 25 gpg.

**NOTE:** If the water contains iron and / or manganese, multiply the total parts per million (ppm) by "four" (4) and then add to the grains per gallon (gpg) of hardness. Use this COMPENSATED HARDNESS level when programming the regeneration frequency.
5. To Exit Main Menu, press the **Menu/Enter** button.

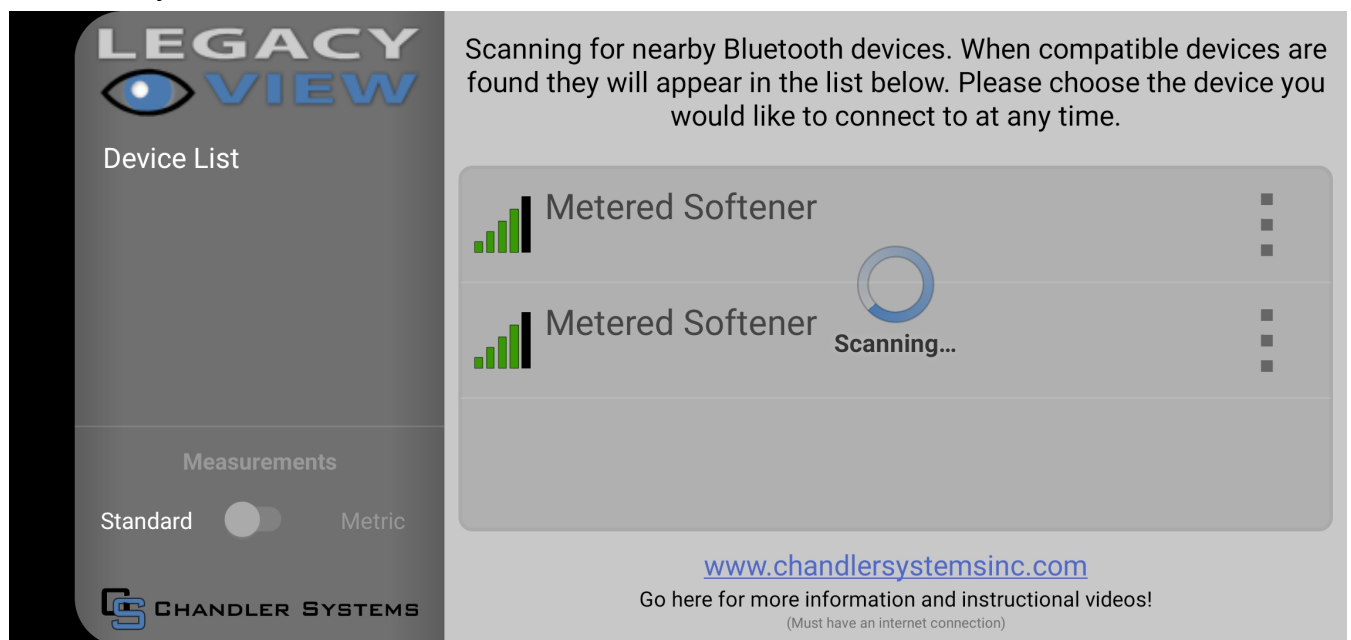
**NOTE:** If no buttons are pressed for 60 seconds, the Main Menu will be exited automatically.

## Programming Using Legacy View App

The Legacy View app allows the user to control every aspect of the water system from the convenience of a smart phone. The Legacy View app will allow the user to monitor usage history, change cycle times, start a regeneration and advance through a regeneration.

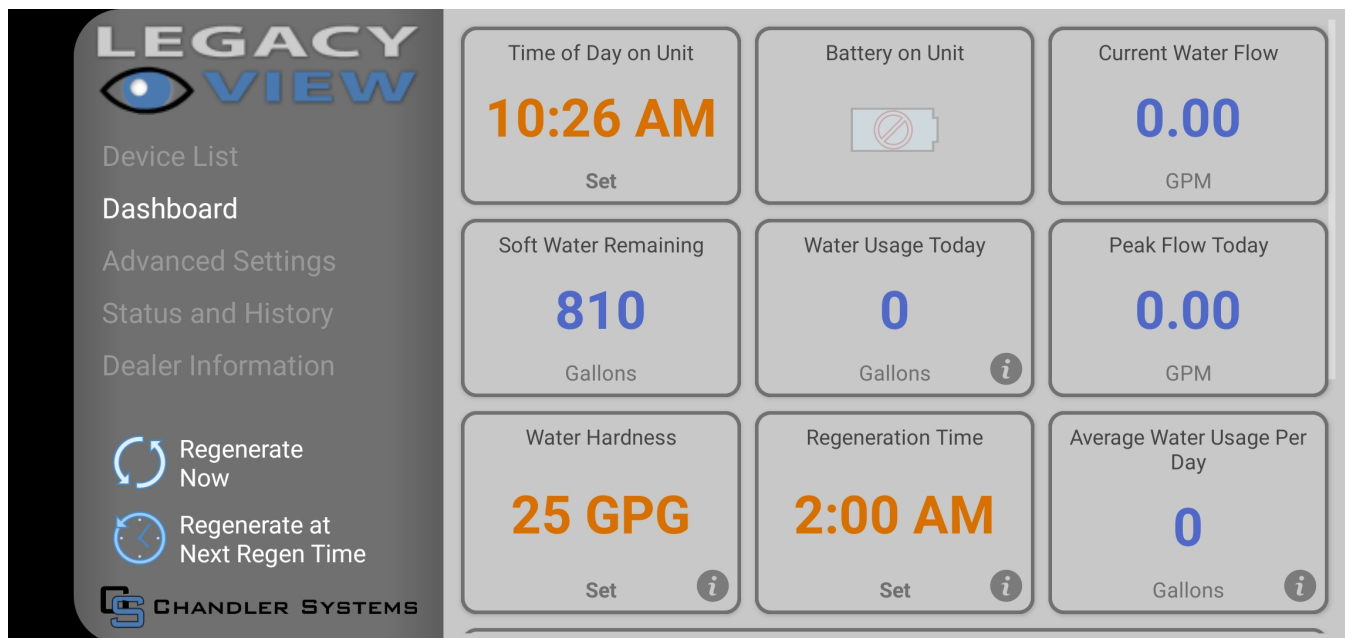
### To use the Legacy View Bluetooth App:

1. Go to the App store on the phone to be used and search for "Legacy View".
2. Download the free Legacy View app.
3. Open the app to begin programming.
4. Once the app is open, it will begin scanning for control valves in the Bluetooth vicinity.



5. Once the app connects to the control valve or valves, they will appear on the screen. Each valve can be renamed by tapping on the three vertical dots on the valve listed on the screen. Choose "Label Device" and a lettered keyboard will appear. The user can name the valve using the keyboard then save it by pushing "OK".
6. Choose the valve to be programmed by tapping on the name. A "Dashboard" will show up for the control valve.

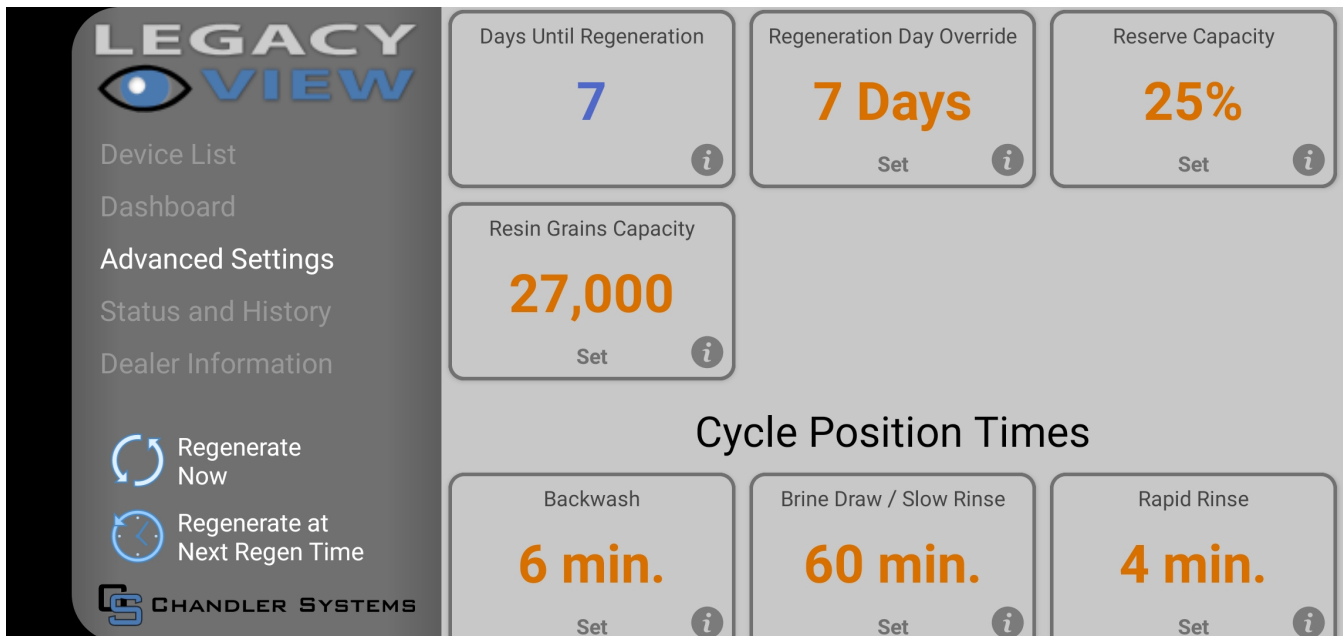
## Dashboard



Parameters that can be changed are indicated with orange font. To change a parameter, tap on the orange font then use the keyboard that appears to change the value.

1. **Time of Day:** Tap on the "Time of Day" box. A box will appear that allows you to set the unit to the time that matches the device being used to program the unit. Press "OK" and the time will change to the current time of the device.
2. **Water Hardness:** Tap on the "Water Hardness" box and input the water hardness of the water being treated. This info can be found by performing a water test or by contacting the municipality. If the water hardness is expressed as ppm or mg/L, it should be converted to GPG (grains per gallon). This can be done by dividing the value given in ppm or mg/L by 17.1. This will give GPG. Once the GPG is known, add 5 GPG to the value and input that as the water hardness.
3. **Regeneration Time:** Tap on the "Regeneration Time" box. Input the desired regeneration time for normal operation. This is typically two hours after everyone in the house is asleep or the business is closed for the day.

## Advanced Settings



Parameters that can be changed are indicated with orange font. To change a parameter, tap on the orange font then use the keyboard that appears to change the value.

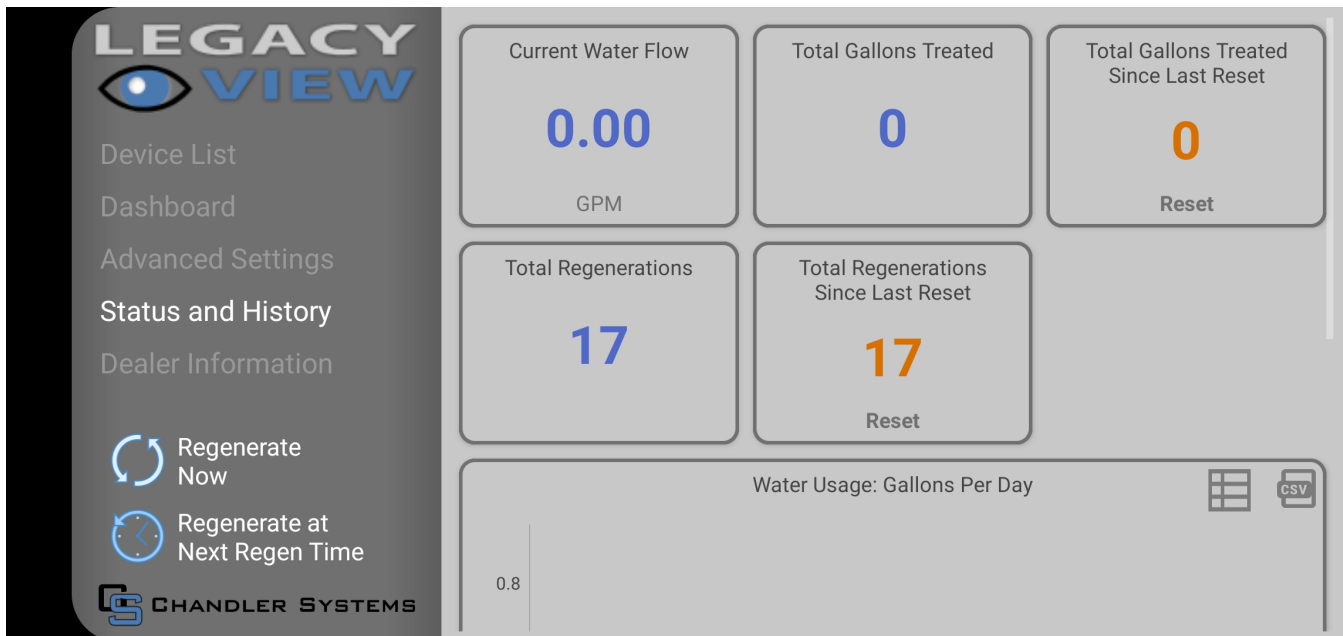
1. **Regeneration Day Override:** Adjust this parameter to every 14 days. If the system will be down more than two weeks at times, set the unit to 10 days.
2. **Reserve Capacity:** Adjust the reserve capacity to 10% for 1-3 people in the home. Set to 25% for 4+ people in the home.
3. **Resin Grains:** Adjust this as follows:

Model	Grains Cap	Brine Fill
080-MXX-100	24,000	4 mins.
080-MXX-150	36,000	6 mins.
080-MXX-200	48,000	8 mins.

4. **Backwash:** This should be set to "10" mins and should not be changed.
5. **Brine Draw/Slow Rinse:** This should be set to "60" mins and should not be changed.
6. **Rapid Rinse:** This should be set to "10" mins and should not be changed.
7. **Brine Refill:** See table above for proper brine refill mins.

\*If High Efficiency or Maximum settings are needed, please call 1-800-608-8792 and a service technician will ensure they are applicable for the situation.

## Status and History



The Status and History screen shows current conditions of the system as well as flow rate and usage history. There are two parameters that can be reset.

1. **Total Regenerations:** This parameter shows how many times the system has regenerated since it was put in service or since the last time the value was reset.
2. **Total Water Treated:** This parameter shows the total amount of water that has been treated since the system was put in service or since the last time the value was reset.

## Regenerating Using the Legacy View App

There are two options for regenerating the system. Tap on the desired option and press "OK".

1. **Regenerate Now:** Regenerate Now will queue an immediate regeneration and will start instantly.
2. **Regenerate at Next Regen Time:** Regenerate at Next Regen Time will queue the system to regenerate at the specified regeneration time chosen in the programming.

## System Start-Up

1. With the bypass handles in the bypass position, initiate an immediate regeneration. This will advance the valve to the backwash position.
2. Once the valve has stopped moving and is in the backwash position, slowly open the bypass handles about 1/8th turn. Water should slowly enter the tank.  
**NOTE:** If there is a loud knocking sound, simply turn the bypass handle back a bit as the system is filling too quickly.
3. During the backwash cycle, slowly open the bypass valve until there is water coming out of the drain hose. Then open the bypass valve fully.
4. Allow the system to backwash and push all the air out through the drain.
5. The valve will automatically move to the Brine Draw cycle when the backwash cycle is complete. Skip this cycle by pressing and holding the “Set/Change” button on the control valve or by pressing “Go to Next Regen Step” on the Legacy View App.
6. This will move the valve to Rapid Rinse. Allow the unit to rinse for the entire cycle. The water in the drain should be running clear by the end of the Rapid Rinse cycle.
7. The valve will then advance to the Refill cycle. Allow the system to refill for the entire cycle. This will ensure there is no air in the brine line and that it is primed for the system’s first regeneration.
8. Once the system has returned to the Service position after the Refill cycle, the system is installed and ready for use. Just make sure to check the salt and don’t allow it to run out.

**NOTE:** If the water is not running clear by the end of the Rapid Rinse cycle, initiate an immediate regeneration again and repeat Steps 4 - 8. Repeat this process for as long as the water is not clear.

## Water Softener Features

### Battery Back-Up (Uses a standard 9-volt alkaline battery.)

- During power failures, the battery will maintain the time of day as long as the battery has power. The display is turned off to conserve battery power during this time. To confirm that the battery is working, press either button and the display will turn on for five (5) seconds.
- If power failure occurs while the system is regenerating, the control valve will motor to a shut off position to prevent constant flow to drain. Depending upon the system pressure and other factors, it is possible to observe a reduced flow to drain during this step. After power is restored, the control valve will return and finish the cycle where it left off prior to the power interruption.
- When used without battery back-up, during a power failure, the unit stops at its current point in the regeneration position and then restarts at that point when the power is restored. The time will be offset by the increment of time the unit was without power so it is necessary to reset the time of day on the unit. No other system will be affected.

**WARNING: DO NOT INSTALL THE BATTERY BACKUP UNTIL THE SYSTEM HAS BEEN PROGRAMMED AND START UP IS COMPLETE!**

1. Remove the two screws on the back of the valve.

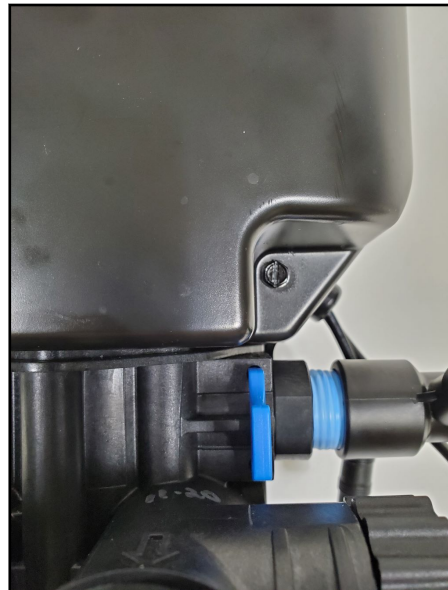
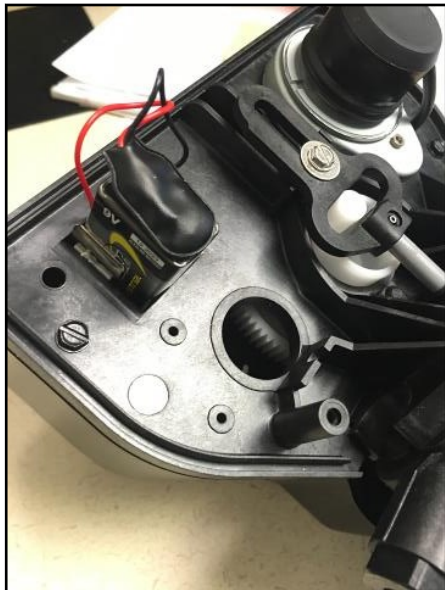




2. Pull out the 9V battery connector, remove the battery cover, and attach the battery to the connector.



3. Push the battery back in the holder on the valve and replace the cover and screws.



## About The System

### Safety Float

The brine tank is equipped with a safety float which prevents your brine tank from overflowing as a result of a malfunction such as a power failure.

### New Sounds

You may notice new sounds as your water softener operates. The regeneration cycle lasts up to 120 minutes. During this time, you may hear water running intermittently to the drain.

### Automatic Hard Water Bypass During Regeneration

The regeneration cycle can last 30 to 180 minutes, after which soft water service will be restored. During regeneration, hard water is automatically bypassed for use in the household. Hot water should be used as little as possible during this time to prevent hard water from filling the water heater. This is why automatic regeneration is set for sometime during the night and manual regeneration's should be performed when little or no water will be used in the household. Normal regeneration time is 2:00 AM.

### Manual Bypass

In the case of emergency, such as an overflowing brine tank, you can isolate your water softener from the water supply using the bypass valve located at the back of the control. In normal operation, the bypass is open with the handles in line with the inlet and outlet pipes.

To isolate the softener, simply rotate the handles clockwise (as indicated by the word OFF and arrow pointer on the handles) until they stop. Water can be used at related fixtures and appliances as the water supply is bypassing the softener. However, the water used will be hard. To resume soft water service, open the bypass valve by rotating the handles counter clockwise.



## **Maintenance**

### **Adding Salt**

Use only Extra Course Grade or Crystal Solar Salt (99.8% Pure) water softener salt. Check the salt level monthly. It is important to maintain the salt level above the water level. Salt should be filled, used completely, and refilled. Salt should not be “topped off” each month. It is better to completely fill the tank with salt (full is 2” below the top of the white safety float tube in the tank”) then use the salt until water can be seen on top of the salt. Then refill the salt.

### **Salt Bridging**

Humidity or wrong type of salt may create a cavity between the water and the salt. This action, known as “bridging”, prevents the brine solution from being made, leading to the water supply being hard.

If salt bridging is suspected, carefully pound on the outside of the brine tank or pour some warm water over the salt to break up the bridge. This should always be followed up by allowing the unit to use up any remaining salt and then thoroughly cleaning out the brine tank. Allow two hours to produce a brine solution, then manually regenerate the softener.

### **Running Out of Salt**

In the event that the system runs out of salt, refill the system with salt and remove the lid on the white brine safety tube in the salt tank. Then pour 5 gallons of warm water in the white brine safety tube and put the lid back in place. Allow the water to sit in the tank for about 4 hours. Then manually regenerate the system. Once the system is done regenerating, repeat the process allowing 4 hours between manual regenerations. This will bring the resin back to full charge and ready to work automatically again.

### **Resin Cleaning**

Included with your US Water Systems softener is 1 - 16oz bottle of ResKleen Resin Cleaner. This does not need to be added at the time of install but every month thereafter for city water and every 2 weeks thereafter for well water. This is a specially formulated water softener cleaner that is NSF Certified as safe. It protects your investment and helps your water softener to operate more efficiently and longer. On city water, pour a bottle in the brine well every month. On well water, pour a bottle every two weeks. If water quality is subpar, you can add more often to maintain optimum efficiency.

## Control Valve Error Code Diagnosis

Under normal operating conditions, when your control valve is in the “in service” position, the display should alternate between the current time of day and the number of days remaining (for filters and time clock softeners) or gallons remaining (for metered softeners) until the next regeneration. This is the “home display.”

If the valve is currently going through a regeneration cycle, the display will show the cycle step on the left side of the display and the number of minutes remaining in that step on the right side of the display. If any other information is being displayed, then the valve is informing you of an issue.

There are five error codes which could indicate an issue with the control valve. When an error is being displayed, the valve will be in a stopped position, and the buttons will not respond to being pressed. Even if the cause of the error code is corrected, the error code will not clear until the power supply has been disconnected and reconnected (this will be referred to as “cycling” the power). All error codes are displayed as the letters “Err” followed by a flashing number 2-6:

**Error 2** - Valve is searching for homing slot.

Allow valve to continue running. If the homing slot is found, the valve will return to the home display, otherwise, another error code will appear.

**Error 3** - No encoder slots are being seen.

This occurs when the motor is running, but the encoder is not seeing any of the slots in the encoder wheel. This can happen if the encoder has been disconnected, but typically occurs when debris in the valve body has stopped the piston, causing the encoder wheel to be unable to turn.

1. Check encoder connection. If the encoder is plugged in and snapped into place, skip to step #2. If encoder is disconnected, reconnect it and cycle power to clear the error.
2. Disconnect powerhead from valve body, cycle power to clear the error code. Manually cycle the powerhead through the regeneration cycle steps to verify that the motor can cycle properly while the powerhead is disconnected from the valve body. If the error #3 returns, order a new 085-SS3MTR-KIT to replace the circuit board & motor.
3. Remove piston and seals from the valve body and inspect valve body for debris. Replace seals. Inspect piston and replace piston if Teflon coating is worn.

**Error 4** - Unable to find homing slot.

1. Check encoder wheel for debris.
2. Cycle power. Valve should either find home or go to a different error code. If error 4 returns, replace powerhead assembly.

### **Error 5 - Motor overload.**

This occurs when the motor current is too high. This could be caused by an issue with the motor itself, but is typically caused by friction in the valve body.

1. Disconnect powerhead from valve body and cycle power to clear the error code.
2. If the error 5 returns, replace the motor. Otherwise, manually cycle the powerhead through the regeneration cycle steps to verify that the motor can cycle properly while the powerhead is disconnected from the valve body. Either way, proceed to the next step.
3. Remove piston and seals from the valve body and inspect valve body for debris. Replace seals. Inspect piston and replace piston if Teflon coating is worn.

### **Error 6 - No motor current.**

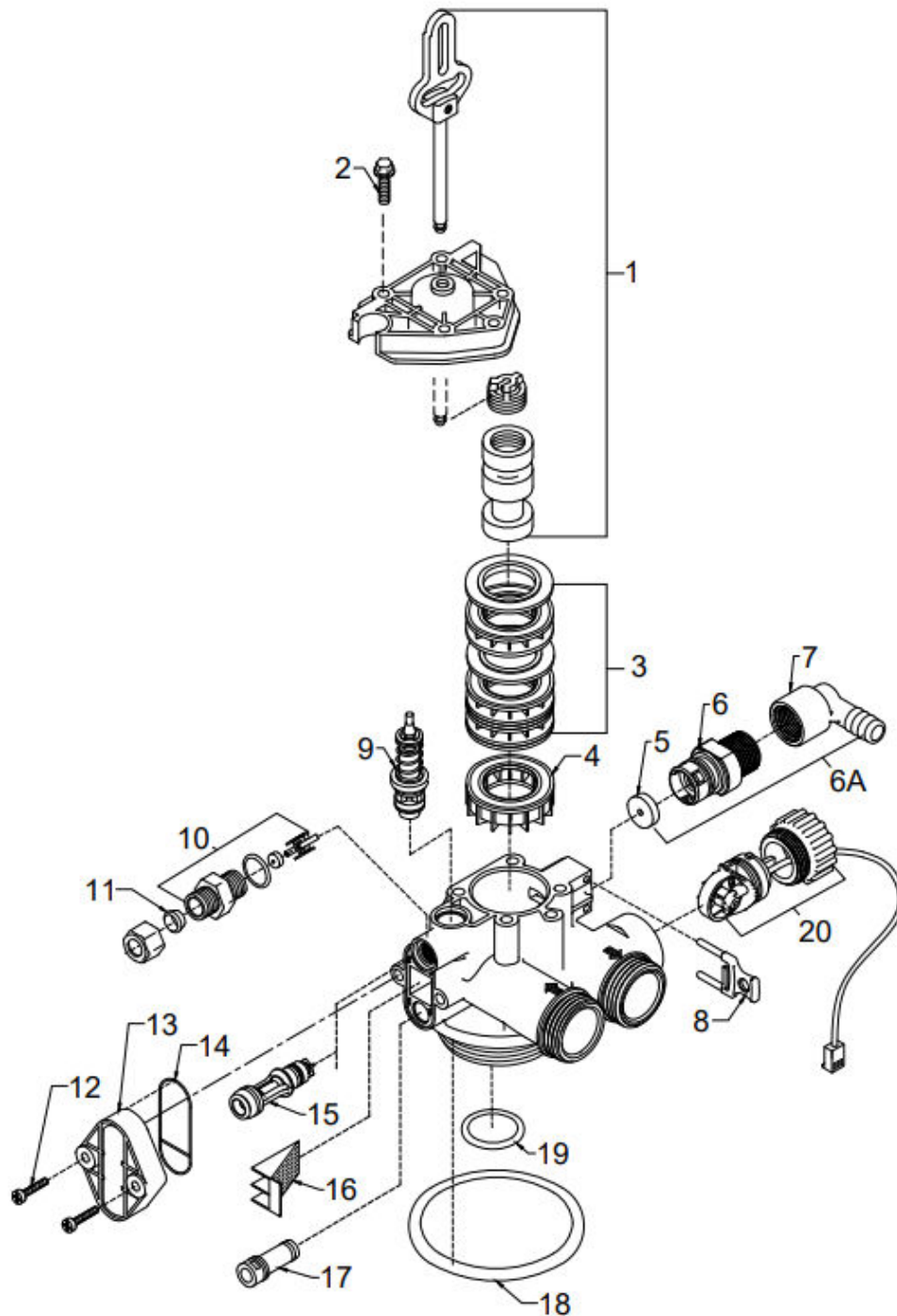
This typically occurs if the motor cable has come unplugged from the circuit board. If motor cable is connected to the motor and plugged into the circuit board, the circuit board may need to be replaced.

### **No Display**

If your display is blank, there is no power going to the circuit board due to one of the following factors:

- The electrical outlet is not powered or is switched off
- The power cable has come unplugged from the circuit board
- The power supply has come unplugged from your electrical outlet
- The power supply has come unplugged from the control valve
- The power supply is not working

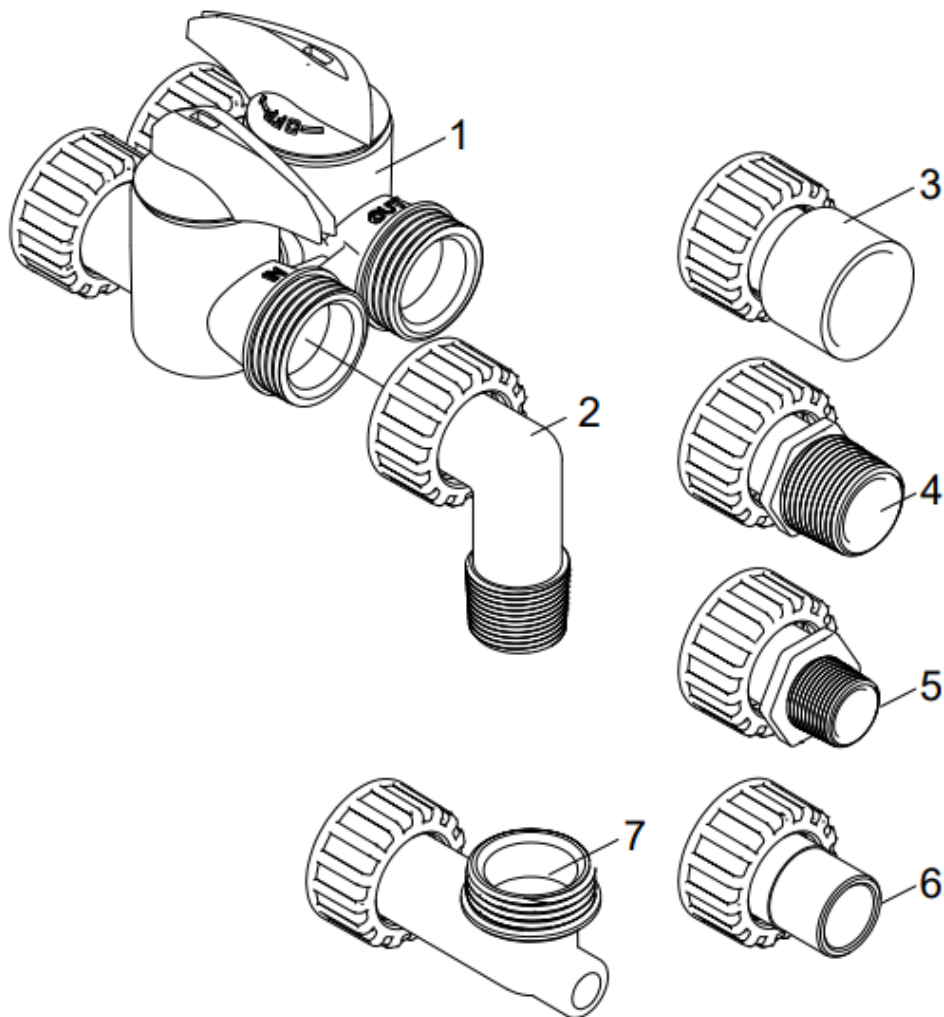
## Control Valve Exploded View



## Control Valve Parts List

REF	Description	Part No.	QTY
1	Piston Assembly	085-MX-SFP	1
2	10-24 X 3/4" Screw SST	311-1024-34	3
3	Seal and Spacer Kit	085-MX-SS	1
4	End Spacer	N/S	1
5	Flow Control Button 1.5 GPM	085-DLFC-15	1
	Flow Control Button 2.0 GPM	085-DLFC-20	1
	Flow Control Button 2.4 GPM	085-DLFC-24	1
	Flow Control Button 3.5 GPM	085-DLFC-35	1
	Flow Control Button 4.0 GPM	085-DLFC-40	1
6	DLFC Assy	085-DLFC-ASSY	1
7	90 Degree Hose Barb Elbow	085-MX-DLF	1
8	Drain Retainer	085-DLFC-RTN	1
9	Brine Valve	085-MX-BV	1
10	BLFC Assembly	085-BLFC-ASSY	1
11	DLFC Ferrule 3/8"	085-DL-FER	1
12	10-24 X 3/4" Screw SST	311-1024-34	2
13	Injector Cap	085-INJ-CAP	1
14	Injector Cap Seal	085-INJ-SEAL	1
15	Injector, White	085-INJ-WH	1
	Injector, Blue	085-INJ-BL	1
	Injector, Yellow	085-INJ-YL	1
16	Injection Screen	085-INJ-SC	1
17	Plug	085-INJ-PL	1
18	Tank. O-Ring	085-FXO-CV-ORING	1
19	Dist O-Ring	085-DIST-ORING	1
20	Meter Assembly	085-METER-ASSY	1

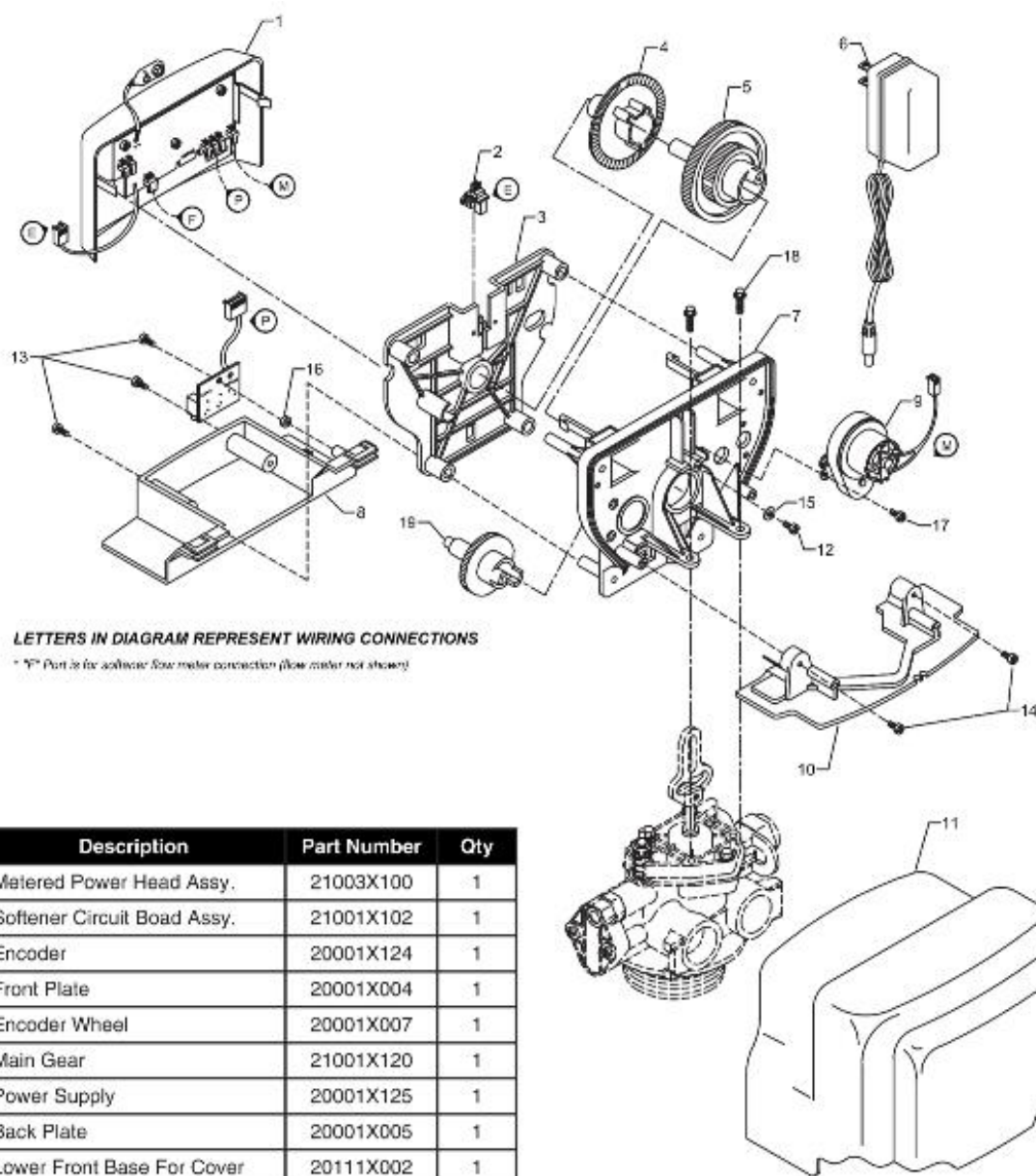
## Bypass Exploded View / Parts List



REF	Description	Part No.
1	D15 Bypass	085-PBP
2	1" NPT Elbow Set	085-PBP-ELL-100
3	1" Female Straight Slip Set	085-PBP-SJ-100
4	1" NPT Straight Set	085-PBP-100
5	3/4" NPT Straight Set	085-PBP-075
6	3/4" Female Straight Slip Set	085-PBP-SJ-075
7a	Elbow, Vertical Adapter (Blank)	085-PBPA-BL
7b	Elbow, Vertical Adapter (1/4" NPT Tapped)	085-PBPA-025



## Power Head Exploded View / Parts List



Ref	Description	Part Number	Qty
0	Metered Power Head Assy.	21003X100	1
1	Softener Circuit Board Assy.	21001X102	1
2	Encoder	20001X124	1
3	Front Plate	20001X004	1
4	Encoder Wheel	20001X007	1
5	Main Gear	21001X120	1
6	Power Supply	20001X125	1
7	Back Plate	20001X005	1
8	Lower Front Base For Cover	20111X002	1
9	Motor	20016X006	1
10	Lower Back Base for Cover	20111X003	1
11	Valve Cover	20111X000	1
12	Piston Screw	20001X003	1
13	Screw	SC10	3
14	Screw	SC9	2
15	Piston Washer	20001X002	1
16	Washer Circuit Board	20111X014	1
17	Screw Motor	SC2	1
21	Valve Hex Screw	20001X001	2

## Warranty

US Water Systems, Inc. ("US Water Systems") warrants that your new water softener is built of quality material and workmanship. When properly installed and maintained, it will give years of trouble-free service. TO PLACE THIS EQUIPMENT UNDER WARRANTY, THE WARRANTY REGISTRATION MUST BE COMPLETED AND RETURNED BY THE ORIGINAL OWNER TO US WATER SYSTEMS, INC. WITHIN 30 DAYS OF INSTALLATION.

**Coverage** - This limited warranty covers the Matrixx Water Softener (the "System" hereafter) delivered to the original owner when the appliance is purchased for personal, family, or household use only and not for commercial applications. It is intended to cover defects occurring in workmanship or materials or both. US Water Systems warrants that upon receipt from the owner of any Media Tank, Brine Tank, Control Valve incorporated into the System, or polystyrene resin used as part of the System, found to be defective in material or workmanship, US Water Systems will repair or replace the defective item, at no charge for that item, under the procedures and limitations outlined below.

**10 YEAR PARTS WARRANTY** - US Water Systems will replace any valve part (i.e., seals, spacers, pistons, etc.), electronics or miscellaneous part of the System, to any original purchaser of the System in possession of the System, as indicated by the serial number, which fails within ten (10) years from date of manufacture provided the failure is due to a defect in material or workmanship. THE DURATION OF THE IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY AS THEY APPLY TO THE PARTS OF THE SYSTEM COVERED BY THIS PARAGRAPH OF THE LIMITED WARRANTY ARE LIMITED TO THE DURATION OF THE LIMITED WARRANTY SET FORTH IN THIS PARAGRAPH.

**Lifetime Warranty on Resin, Media Tank and Brine Tank** - US Water Systems will replace the resin, media tank or brine tank of the System, to any original purchaser of the System in possession of the System, which fails if the System was at all times operated in accordance with specifications set forth in the System's handbook and not subject to freezing and other general limitations about the System. THE DURATION OF THE IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY AS THEY APPLY TO THE PARTS OF THE SYSTEM COVERED BY THIS PARAGRAPH OF THE LIMITED WARRANTY ARE LIMITED TO THE DURATION OF THE LIMITED WARRANTY SET FORTH IN THIS PARAGRAPH.

**General Provisions** - US Water Systems assumes no responsibility for subsequent or consequential damage, labor or expense incurred as a result of a defect or for failure to meet the terms of this limited warranty because of circumstances beyond its control. Installation workmanship failure is not covered under this limited warranty. Damage caused by environmental conditions such as, fire, freezing, accidents, unreasonable use, abuse, neglect, lightning strikes, humidity or heat is not covered under this limited warranty. It is

the responsibility of the customer to pay any and all shipping charges for the return or replacement of any part covered under this limited warranty. In the event the water supply being processed through the System contains sand, bacterial iron, algae, sulfur, tannins, organic matter, high levels of chlorine or chloramine, methane, or other unusual substances, then unless the owner's manual or appliance specifications for the System provides that the System is capable of handling these substances, other special treatment of the water supply must be used to remove these substances before they enter the System. Otherwise, US Water Systems shall have no obligations under this limited warranty. This limited warranty does not cover damage to a part or parts of the System resulting from improper installation. All plumbing and electrical connections should be made in accordance with all local codes and the installation instructions provided with the System. The limited warranty does not cover damage resulting from use with inadequate or defective plumbing; inadequate or defective water supply or high or low pressure; inadequate or defective house wiring; improper voltage, electrical service, or electrical connections; or violation of applicable building, plumbing, or electrical codes, laws, ordinances, or regulations.

**VALVE EXCHANGE PROGRAM:** US Water Systems realizes that some customers may not be able or willing to disassemble the control valve and replace certain internal parts. To that end, US Water Systems has a valve exchange program whereby, US Water Systems will send a factory reconditioned valve to the customer and take back their faulty valve for the current Valve Exchange Cost (in 2025, the cost is currently \$89.95), plus shipping charges. Customers are not obligated to use the Valve Exchange Program, in which case, the warranty will be honored by replacing any faulty parts. US Water Systems does not authorize any person to assume for us any other obligation on the sale of this water system. No responsibility is assumed for delays or failure to meet this limited warranty caused by strike, government regulations or other circumstances beyond the control of US WATER SYSTEMS, INC. To obtain warranty service, call or write: US WATER SYSTEMS, INC. 9250 Bradford Road Plainfield, IN 46168 (800-608-8792). THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND ANY IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY ARE LIMITED TO THE TERMS OF THIS LIMITED WARRANTY, AND THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THOSE HEREIN. US WATER SYSTEMS SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES. Some states do not allow the exclusion or limitations of incidental or consequential damages so the above limitation may not apply to you. This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state. THIS LIMITED WARRANTY MAY BE TRANSFERRED TO A SUBSEQUENT OWNER WITH WRITTEN APPROVAL OF US WATER SYSTEMS AND PAYMENT OF STANDARD TRANSFER FEE.