Owner's Manual

WS-165-150-BLK

Water Softener

Tier1®

Table of Contents

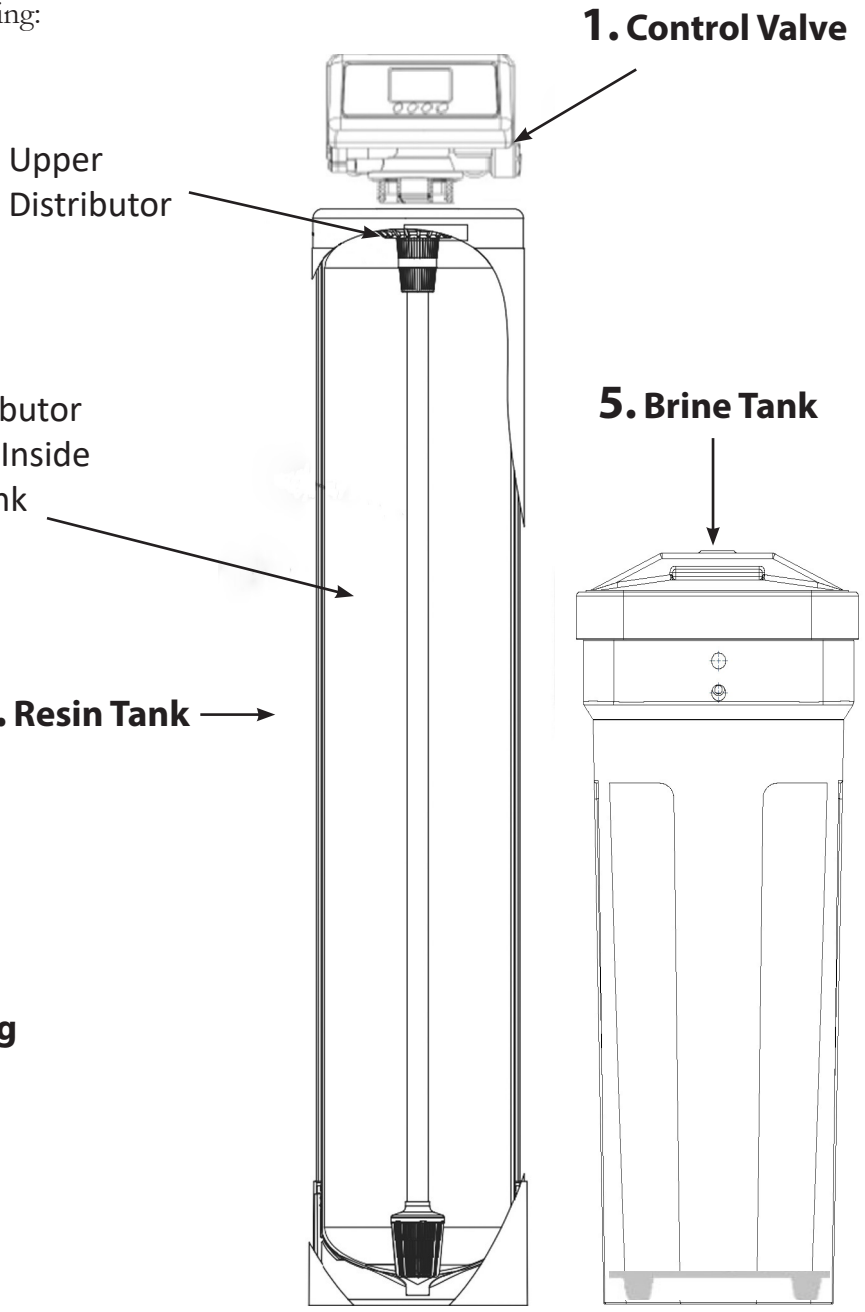
What is included with the WS-165-150-BLK

Check the entire unit for any shipping-related damage, missing parts, or damage to shipping cartons. Contact the transportation company for all damage and loss claims. Tier1® is not responsible for damage in transit. Small parts needed to assemble the softener are contained in parts bags, the control valve box, or in the owner's manual zip-lock bag. To avoid loss of small parts, keep them in the parts bag until you are ready to use them.

What is included in the box?

Model WS-165-150-BLK includes the following:

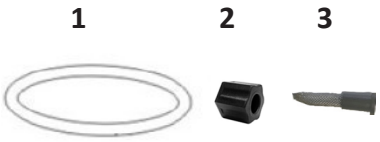
1. Control Valve with Bypass
2. Resin Tank
3. Parts Bags
4. Owner's Manual Zip-lock Bag
5. Brine Tank and Brine Valve Assembly



3. Parts Bags

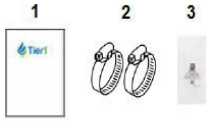
Parts Bag A includes:
1. Brine Well Overflow Elbow
2. Brine Well Bracket
3. Blue "C" Clip

Parts Bag B includes:
1. Master O-Ring (3.25" outside diameter)
2. Brine Line Connector Nut
3. Brine Line Bushing/Filter Screen



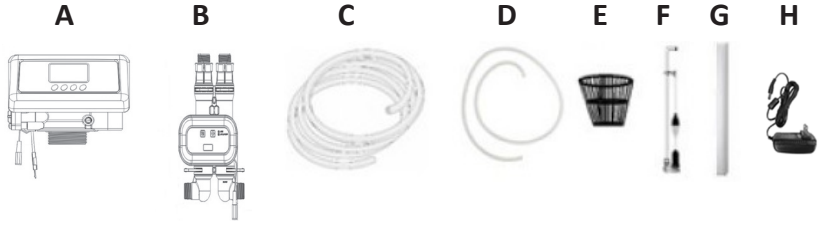
4. Owner's Manual Resealable Bag

1. Owner's Manual
2. Hose clamps (x2)
3. Silicone Lubricant



Additional Components

A. Control Valve
B. Bypass and 4 clips
C. Clear Drain Tubing (10')
D. PVC Tubing
E. Upper Distributor
F. Brine Valve
G. Brine Well
H. Control Valve Power Cord



Operating Conditions

This softening system will operate at maximum efficiency under the following conditions:

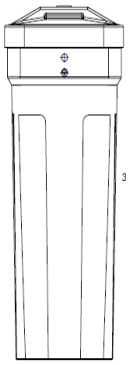
Operating Conditions		
Working conditions	Working pressure	21 psi to 120 psi
	Water temperature	40°F - 120°F (5° C - 50°C)
Working Environment	Environment temperature	40°F - 120°F (5°C - 50°C)
	Relative humidity	≤95% when temperature is 25C/77°F
	Power source	AC100~240V/50~60Hz
Inlet Water Quality	Water turbidity	Down-flow Regeneration <5FTU
	Chlorine	<0.1ppm
	Iron2	<0.3ppm

- All plumbing and electrical work should be performed by an accredited professional to ensure all local, municipal, and state codes are met.
- Do not use the water softener with water that is unsafe or of unknown quality.
- Do not use the brine tube, injector body, or other connectors on the valve as a handle to carry the system.
- Ensure there is salt in the brine tank at all times when in use for softening. The brine tank should contain clean water softening salt only, at least 99.5% pure. Do not use small grain salt.
- When there is moderate to high turbidity, a filter should be installed before the softening system on the inlet side.
- If the water pressure exceeds 80 psi, it is recommended to install a pressure valve. If the water pressure is under 20 psi, a boost pump must be installed before the water inlet.

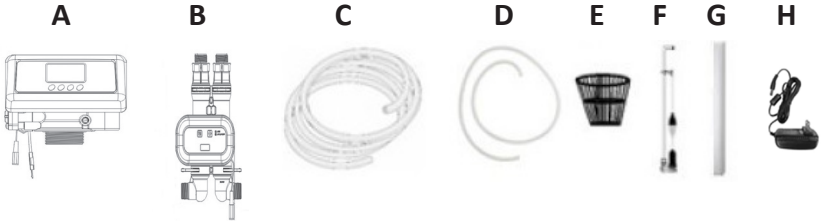
Assembly Instructions

Locate the following parts:

Brine Tank - Inside the brine tank you will find:



A. Control Valve with
B. Bypass with 4 clips
C. Clear Drain Tubing (10')
D. PVC Tubing
E. Upper Distributor
F. Brine Valve
G. Brine Well
H. Control Valve Power Cord

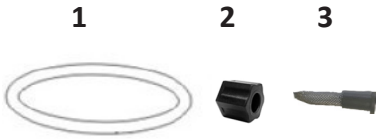


Parts Bag A includes:

1. Brine Well Overflow Elbow
2. Brine Well Bracket
3. Blue "C" Clip

Parts Bag B includes:

1. Master O-Ring (3.25" outside diameter)
2. Brine Line Nut
3. Brine Line Bushing/Filter Screen



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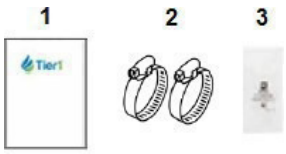


Prior to Assembly

IMPORTANT NOTE: To avoid irreversible damage to connector threading, hand tighten plastic connections first. If leaks are noted during initial start up, gently tighten with tool.

1. Prior to installation of this water softener, ensure you are aware of local laws and codes regarding the installation, use, and maintenance of water softeners.

2. Resin Tank - the tank may be shipped with a temporary shipping cap, a master O-Ring, and a piece of tape covering the riser tube. This is to prevent resin from entering the riser tube during shipping. The cap, master O-Ring, and tape must be removed and discarded prior to attaching control valve and the upper distributor. (Another master O-ring is supplied.)

3. Unpack the Tier1 **WS-165-150-BLK** and ensure all listed parts are included.

4. Turn off the main water line to your home prior to installation.

5. If you will be draining the tank, shut off the power supply to your water heater.

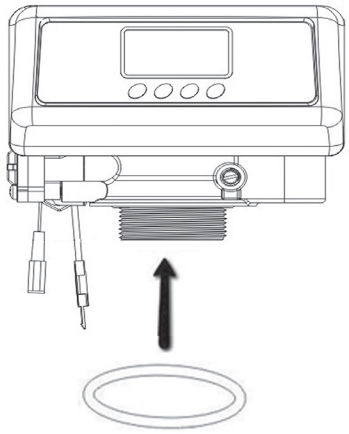
6. Turn on the water faucets in the highest and lowest levels of your home.

Begin assembly on pages 7-12.

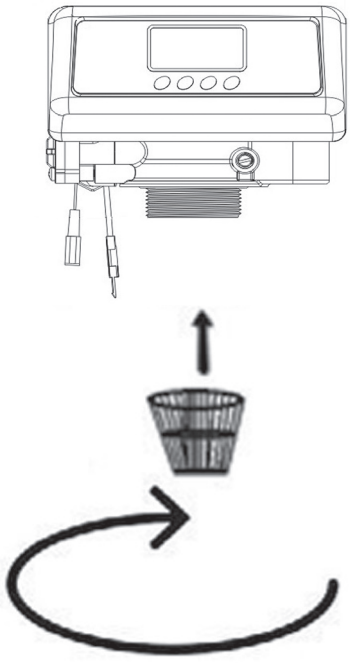
Assembly Instructions

STEP 1: Attach the Control Valve to the Resin Tank

A. Locate the Master O-ring (from Parts Bag B) and lightly coat with silicone lubricant (from Owner's Manual Zip-lock Bag). Insert into bottom of control valve as shown below.



B. Connect the upper distributor to bottom of control valve, line up slots and twist as shown below.



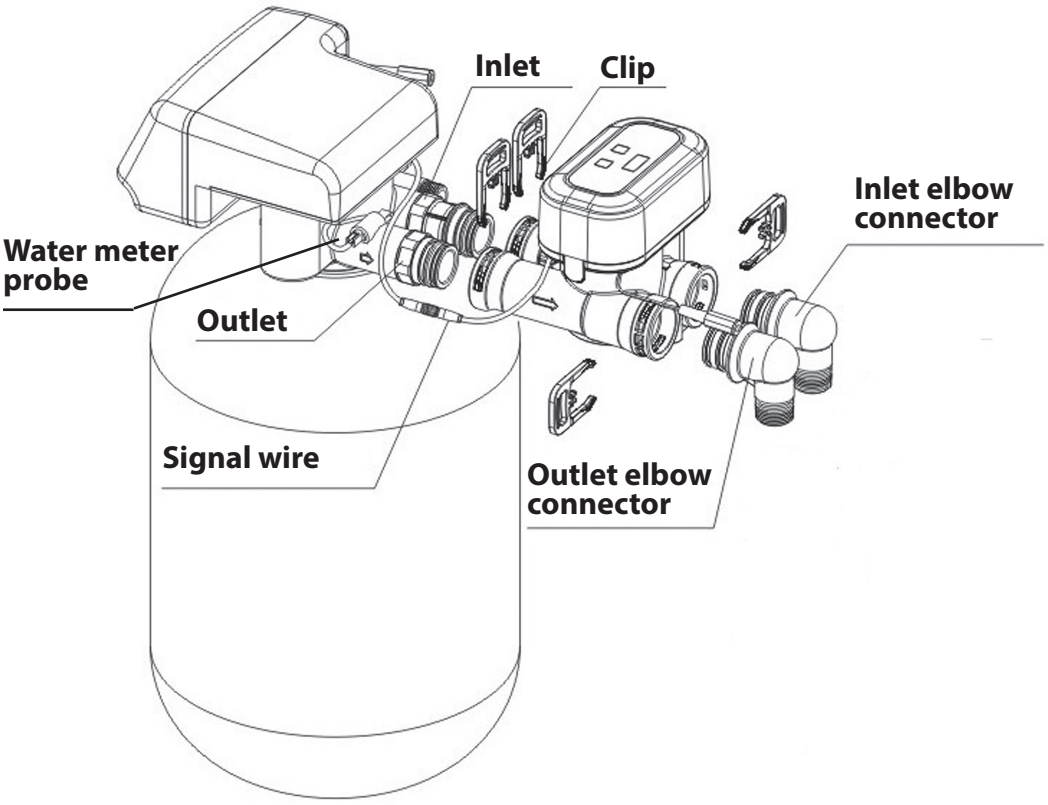
Twist to securely seat

C. Center the riser pipe within the resin tank.
D. Attach the control valve to the resin tank by sliding the upper distributor over the riser pipe.
E. Securely tighten the control valve by hand, tightening it clockwise.

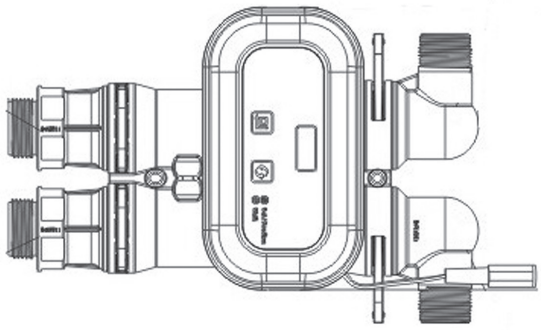
Assembly Instructions

STEP 2: Connect Bypass Valve to Control Valve

A. Attach bypass valve to control valve by firmly pushing inlet and outlet of bypass valve into control valve. Install plastic clips to secure bypass.
B. Connect inlet and outlet elbow connectors to pipe connection end of bypass valve. Install plastic clips.
C. Connect the signal wire ends from control valve and bypass. Tighten nut.
D. Verify water meter probe is installed in probe port on control valve.



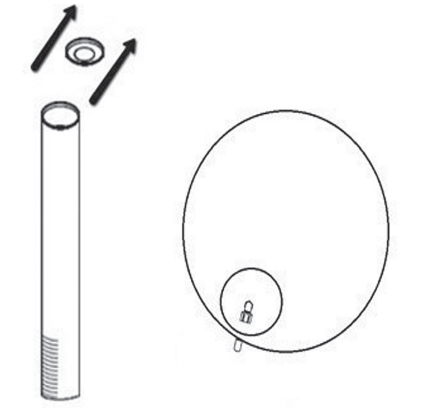
Top view of bypass assembly



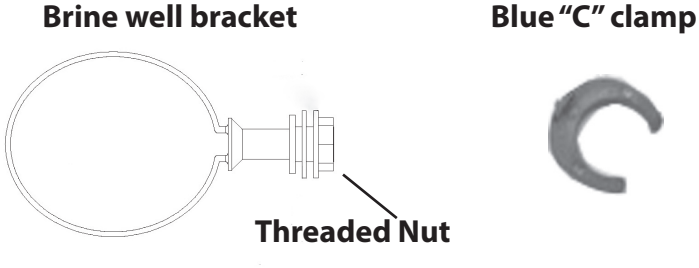
Assembly Instructions

STEP 3: Connect Brine Line to the Brine Tank

A. Remove brine well cap from brine well.

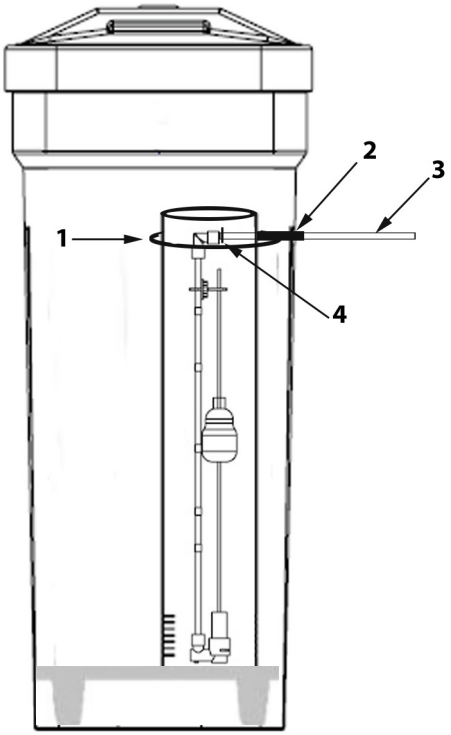


B. Locate brine well bracket and blue "C" clamp in Parts Bag A.



C. Remove nut from threaded end of brine well bracket. Slide bracket (1) over top of brine well, lining up hole in bracket with hole in brine tank as shown in Figure 1.1.
D. Insert threaded end of bracket into top hole (2) of brine tank. Replace nut on bracket outside of hole in tank.
E. Feed PVC tubing (3) from outside the brine tank through the hole in the bracket. Push tubing firmly into quick connect fitting on brine valve.
F. When fully inserted, secure tubing by placing blue "c" clamp (4) from Parts Bag A in between collar of quick connect fitting and brine valve.
G. Replace brine well cap.

FIGURE 1.1

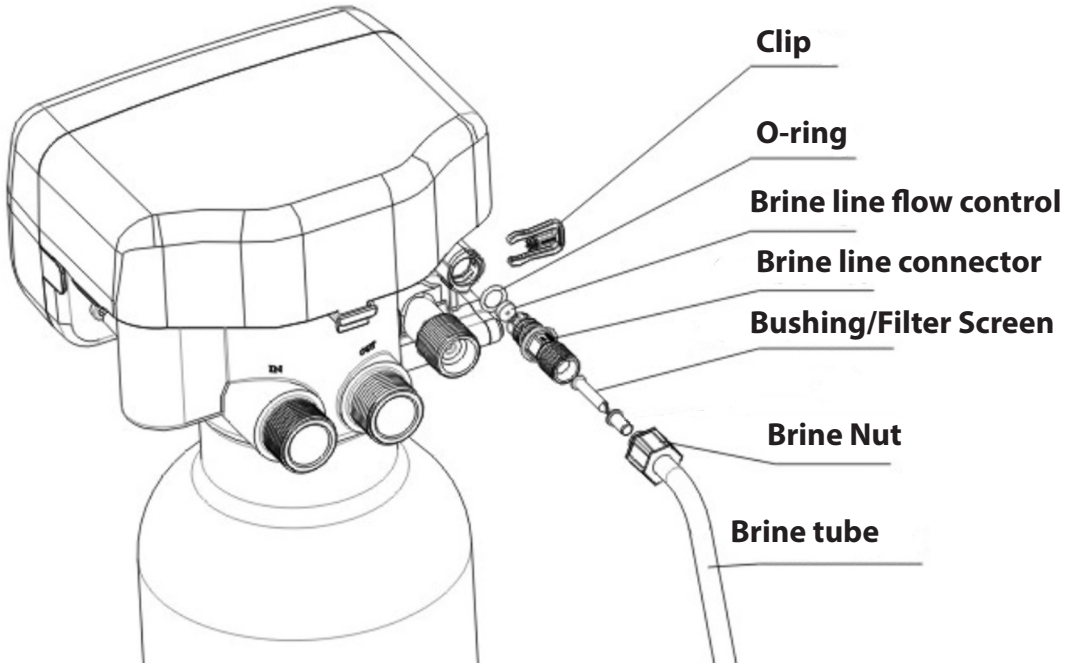


Follow steps on next page to connect brine tubing to control valve.

Assembly Instructions

STEP 4: Connect Brine Line to the Control Valve

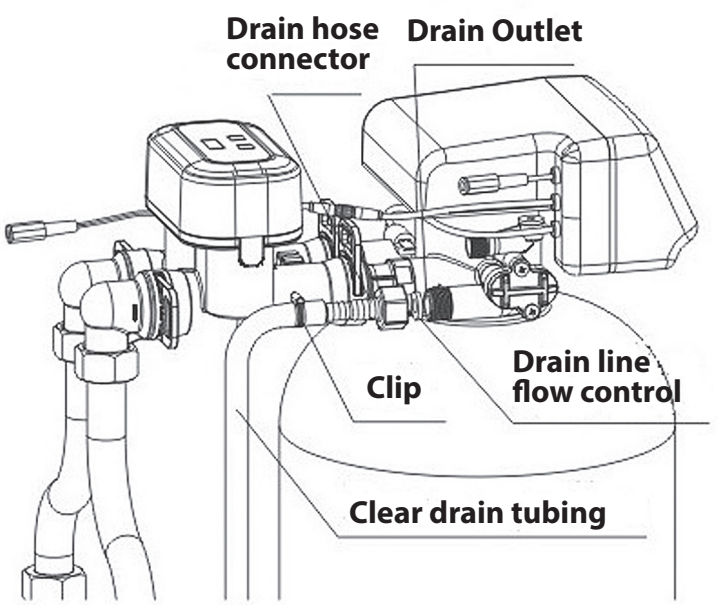
A. Slide brine nut over end of brine tube. Insert brine tube bushing/filter screen into the end of brine tube.
B. Insert brine tubing into brine line connector.
C. Tighten hexagonal nut onto brine line connector.

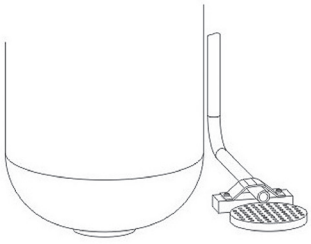


STEP 5: Connect backwash drain line to control valve

Note: There is one 10' length of clear drain tubing provided. This tubing will need to be cut to be used for both backwash drain line from control valve and overflow drain line from brine tank. You should measure the length you need for the backwash line from the resin tank first, using the remainder for the brine tank overflow line.

A. Slide drain hose connector into drain outlet.
B. Insert drain line flow control into drain outlet.
C. Attach clear drain tubing to connector. Secure using a hose clamp (from Owner's Manual Zip-lock Bag.)
D. Secure the clear drain tubing over a floor drain or other suitable drain. Leave an air gap of about 1 1/2" between the end of the hose and the drain. An air gap is necessary to prevent backflow of sewer line.





Assembly Instructions

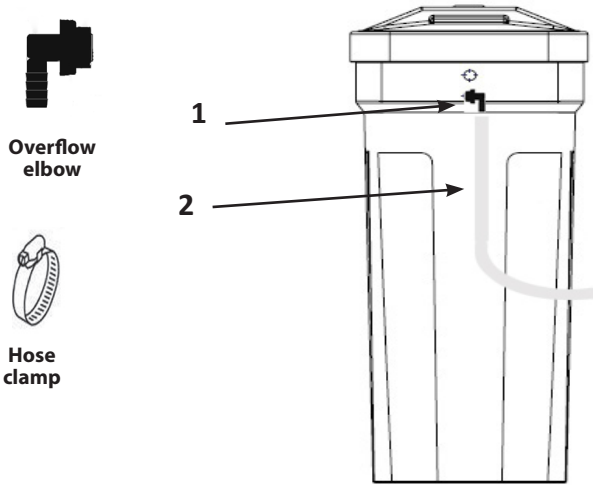
STEP 6: Connect overflow drain line to brine tank

A. Locate overflow elbow (in Parts Bag A.) Remove nut from threading. Insert drain elbow (1) in bottom half of brine tank below brine line as shown in Figure 1.2.

B. Replace nut on drain elbow inside of brine tank. Attach clear drain tubing (2) to the drain elbow. Secure with hose clamp (form Owner's Manual Zip-Lock Bag).

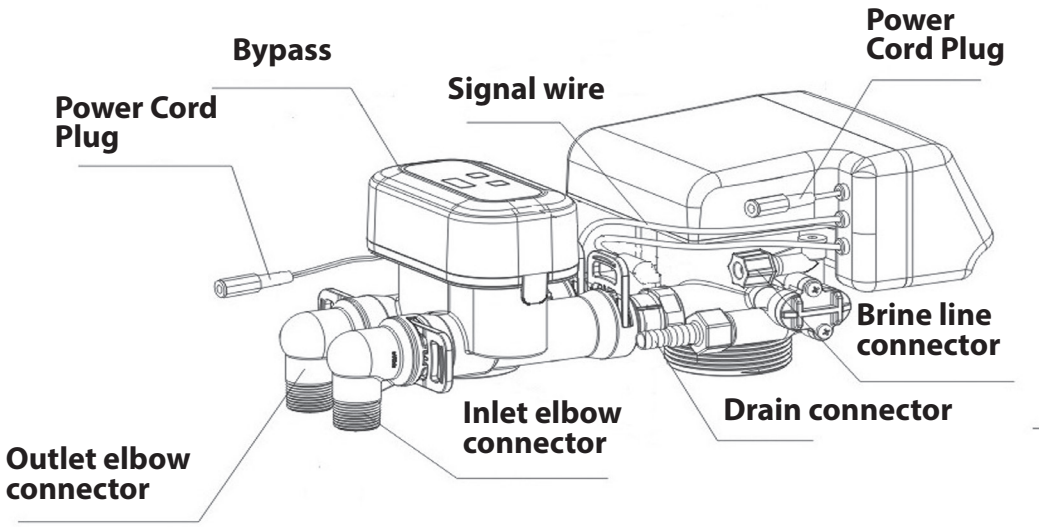
C. Secure the clear drain tubing over a floor drain or other suitable drain. Check your local codes to ensure compliance. Leave an air gap of about 1 1/2" between the end of the hose and the drain. An air gap is necessary to prevent backflow of sewer line.

FIGURE 1.2



STEP 7: Connect Inlet elbow connector to home water supply.

STEP 8: Connect Outlet elbow connector to home plumbing.



STEP 9: Flush water lines and program control valve as on following pages before first use.

Flushing the water lines

Before operating water softener for the first time, flush out your water lines and the water softener bypass.

1. Turn off the water source at the inlet to your home.
2. Disconnect the bypass from the control valve.
3. Place a container underneath the bypass to catch water. Turn on the water source to allow water to flow through and remove any foreign material from the water lines.
4. Turn off the water source.
5. Reconnect the bypass to the control valve.
6. Check for any leaks.

System Startup and Programming

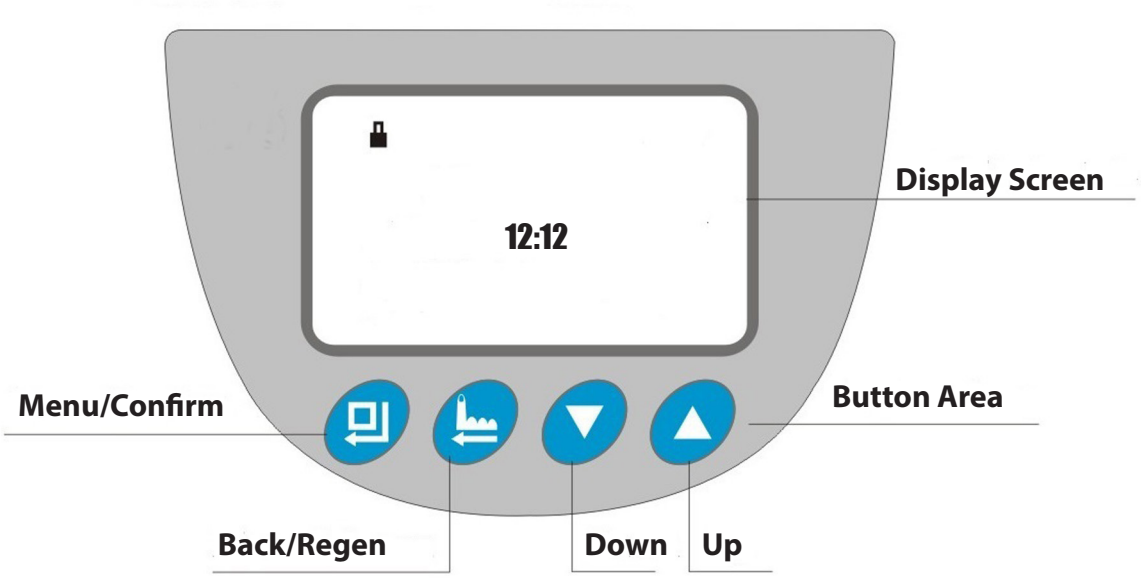
Attach one plug of the power cord to the control valve power cord (top cord), and the other plug to the bypass power cord. Plug in the power cord.

Programming instructions begin on next page.

A programming key detailing button settings is below.

Step by step programming instructions begin on page 13.

Please review all settings and adjust as necessary for your water hardness to ensure that the water softener will work most effectively for your needs.



Programming

Valve Programming Instructions

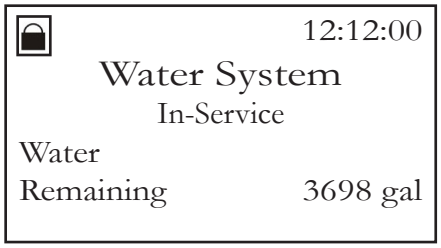
When control valve is first plugged in, screen will show "F79". After a minute, a beep will sound and the button lock indicator- will display. The default time of day - 12:12 - will flash in the middle of the screen. To begin programming, press and hold both up and down keys for 5 seconds until the button lock indicator light turns off.

Item	Process Steps	Screen Display
Time of Day	1. Press Menu key. Display shows "Set Softener Para." as shown in Fig. 2A. "Set Time of Day" is selected automatically. 2. Press Menu key. Display shows "Set Time of Day" as in Fig. 2B. (24-hour clock.) Hour value "12" flashes. Press Up or Down keys to adjust hour value. 3. Press Menu key. Minute value "30" flashes. Press Up or Down keys to adjust Minute value. 4. Press Menu key to return to first screen.	**Fig. 2A** Set Softener Para. › Set Time of Day Set Regen. Time Set Water Hardness ↓ **Fig. 2B** Set Time of Day 12:30
Regeneration Time	1. Press Down key to select "Set Regen. Time" as in Fig. 2-C. 2. Press Menu key. Display shows "Set Regen. Time" as shown in Fig. 2D. Hour value "02" flashes. Press Up or Down key to adjust hour value. 3. Press Menu key. Minute value "00" flashes. Press Up or Down key to adjust minute value. 4. Press Menu key to return to first screen.	**Fig. 2C** Set Softener Para. Set Time of Day › Set Regen. Time Set Water Hardness ↓ **Fig. 2D** Set Regen. Time 02:00
Water Hardness	1. Press Down key to select "Set Water Hardness" as in Fig. 2E. 2. Press Menu key. Displays shows "Set Water Hardness" as shown in Fig. 2F. Hardness value "150" flashes. Press Up or Down to adjust hardness value in mg/l [mg/l = parts per million (ppm)] 3. Press Menu key to return to first screen.	**Fig. 2E** Set Softener Para. Set Time of Day Set Regen. Time › Set Water Hardness ↓ **Fig. 2F** Set Water Hardness 150 mg/L
Bypass Set	1. Press Down key to select "Bypass set" as in Fig. 2G. 2. Press Menu key. Display shows "Bypass set" as in Fig. 2H. Press Up or Down key to choose Intelligent Bypass mode. 3.Press Menu key to return to select mode. 4. Press Regen key to return to home screen and put softener into service.	**Fig. 2G** Set Softener Para. ↑ Set Regen. Time Set Water Hardness › Bypass Set **Fig. 2H** Bypass set ⦿Intelligent bypass ○No bypass ○Fully bypass

Programming

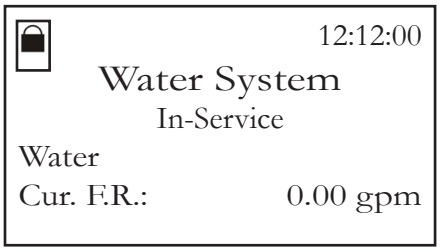
Control Valve Display while in Service

While in service, the control valve rotates between the following screens:



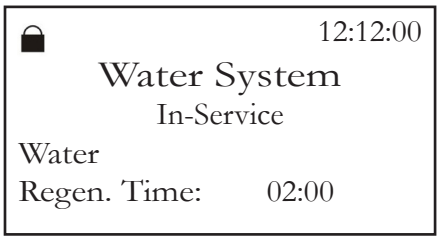
Screen 1:
Button lock key — Current time of day in 24-hour clock

Number of gallons remaining to be used before triggering a regeneration. Note: Typical water usage is calculated at 75 gallons per person per day.



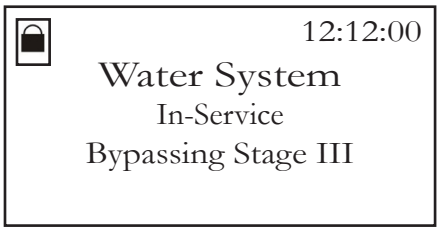
Screen 2:
Button lock key — Current time of day in 24-hour clock

Current water flow rate in gallons per minute. When a faucet is turned on this should register a number if everything is working correctly.



Screen3:
Button lock key — Current time of day in 24-hour clock

Regeneration Time of Day (default setting is 2:00 AM)



Screen 4:
Button lock key — Current time of day in 24-hour clock

Automatic bypass setting based on water hardness. Stage I: 426 - 550 mg/L Stage II: 301-425 mg/L Stage III: 200-300 mg/L

Programming

After Control Valve has been programmed, perform the following steps before first use:

Open a water line and let water flow until water runs clear.

Press and hold both up  and down  keys simultaneously for 3 seconds to unlock the key pad.

Press Regen  key to advance through each cycle, following the below instructions.

When you press the Regen key, the screen will display "motor running" as it positions the ceramic disc. Once "motor running" disappears and the next phase is displayed, press manual return key to advance to the next phrase.

1 - Backwash - lets air out of the drain line. Process will take 8-10 minutes to purge the system.
Press Regen key to advance to the next phase, brine and slow rinse.
2 - Brine and slow rinse - verify the air check valve is closed by listening to be sure no air is being drawn into the system. Press Regen key to advance to the next phase, brine refill.
3 - Brine refill - This stage will fill the brine tank with the correct amount of water. Allow the brine refill phase to run, do not advance past this phase until it is complete. After this phase has completed, press Regen key to advance to Fast rinse, then press Regen key again to return to In Service position.

Add salt to the brine tank (40 pound minimum, 120 pound maximum).
Note: We recommend using water softener salt, 99% pure.

Install brine tank cover.

Turn on a faucet away from the installation location. Turn off faucet when plumbing lines have been purged.
Your water softener should now be fully operational.

To verify that your water softener is functioning correctly, take a water sample test to verify hardness reduction.

Manual Regeneration

To force a manual regeneration:

Press and hold up  and down  keys for five seconds until a beep sounds and the button lock indicator light turns off.

Press Regen key  to start the backwash.
Press Regen key again to move to Brine and Slow Rinse (60 minutes)
Press Regen key again to move to Brine Refill (13 minutes)
Press Regen key again to move to Fast rinse (10 minutes)
Press Regen key again to return to In-Service.

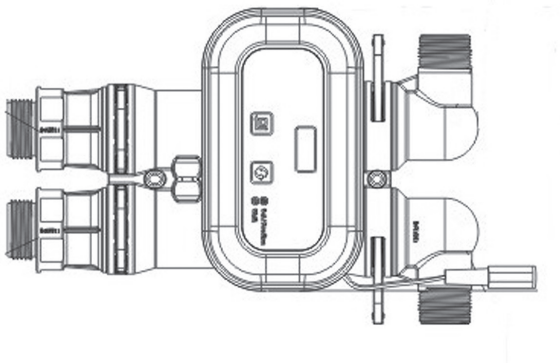
Bypass Valve Information

Automatic Bypass Information

The automatic bypass is controlled by the settings chosen on the control valve.

The keys on the bypass valve serve no function when connected to the control valve and should not be used.

Top view of bypass assembly



Bypass stages

The bypass stage used by the automatic bypass is determined by the water hardness setting selected during programming of the control valve.

Bypassing Stage III - water hardness 200-300 mg/L
Bypassing Stage II - water hardness 301-425 mg/L
Bypassing Stage I - water hardness 426-550 mg/L

Turning Off Bypass

The control valve controls the bypass settings. To change the bypass settings, press and hold both up ▲ and down ▼ keys simultaneously for 3 seconds to unlock the key pad.

Press Menu 回 key. Display shows "Set Softener Para."
"Set Time of Day" is selected automatically.

Press Down key until can select "Bypass set" as shown in Fig. 3A.

Fig. 3A

```
Set Softener Para.        ↑
  Set Regen. Time
  Set Water Hardness
› Bypass Set
```

Fig. 3B

```
        Bypass set
  ⦿Intelligent bypass
  ○No bypass
  ○Fully bypass
```

Bypass is set to Intelligent Bypass during normal service as shown in Fig. 3B.

If you do not want unsoftened water to be able to flow during your softener's regeneration, press Down key to select "No bypass".

If you want to allow water to fully bypass the water softener, press Down key to select "Fully Bypass."

Press Menu key to return to In-Service Status.

Care and Maintenance

Bridging

Humidity or the 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, preventing the water softener from working.

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

Caution

Liquid brine will irritate eyes, skin, and open wounds. Gently wash exposed areas with fresh water. Keep children away from water softener.

Product Care

To retain the attractive appearance of your new softener, clean occasionally with a mild soap solution. Do not use abrasive cleaners, ammonia, or solvents. Never subject your softener to freezing or to temperatures above 43 degrees Celsius (110 degrees Fahrenheit).

Effective water softener maintenance is critical to ensuring your system operates efficiently. The Tier1 water softener cleanser is packaged in a 16 ounce bottle, simply pour the entire bottle into the brine well every four months. The cleanser will eliminate contaminants and build up that are not removed during a backwash cycle or regeneration phase. Purchase at **tier1water.com/ws-clnsr-16.**

WS-165-150-BLK

Water Softener

SOMETHING NOT RIGHT?

Tier1® Technical Support is here to assist you. We're happy to answer any questions you may have.

1-855-378-9116

Tier1®

www.Tier1water.com

1-855-378-9116

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