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Introduction

The Infusion water softening system provides calcium and magnesium (hardness) removal throughout the home. The Infusion water softening system should be installed at the point of entry to treat your entire home, both hot and cold water. The Infusion water softener should be installed after any iron treatment system. The Infusion water softener is sometimes used to "polish" the water after a manganese removal system that is being fed with high amounts of manganese. Irrigation systems and outside spigots should be installed prior to the Infusion water softening system but after iron removal systems.

The Infusion water softening system removes hardness using a process called ion exchange. The Infusion water softener uses cation resin to act as the catalyst for ions to exchange. This resin captures the hardness (calcium and magnesium) and releases sodium. The resin will continue to exchange calcium and magnesium for sodium until the resin is exhausted. The resin can no longer capture hardness when the bead is fully impacted with calcium and magnesium. At this point the resin must be regenerated. When the system regenerates, a salt solution is slowly introduced to the resin media and the calcium and magnesium break off the resin bead and are replaced (exchanged) with sodium. The resin bead is now saturated with sodium now and is ready to capture more hardness. The resin media in the Infusion tank provides very little filtration. It is recommended that proper sediment filtration is installed prior to the Infusion water softener system. Sediment filtration may be needed before or after iron removal systems. The placement of sediment filtration depends on the complete water treatment system but should always be installed prior to the Infusion water softener.

This a metered based water softener that will regenerate on demand. This is much more efficient than older “time clock” models that regenerated on a specific night. The Infusion water softener system has a water meter that tracks the amount of water being used and regenerates only when a specific amount of water has passed through the system. This makes it much more efficient.

Infusion Benefits
- Calcium and magnesium (hardness) removal
- Meter based on demand regeneration for maximum efficiency
- Virtually maintenance free.
- Improves the efficiency of water-using appliances by preventing scaling and restrictions
- Simple installation
System Overview
**Infusion Softener Tank Installation Instructions**

**WATER PRESSURE:** A minimum of 20 pounds of water pressure is required for regeneration valve to operate effectively.

**ELECTRICAL FACILITIES:** An uninterrupted alternating current (A/C) 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 INFUSION TANK AND DRAIN:** The Infusion tank should be located close to a drain and utilize an air gap to prevent air breaks and back flow.

**BY-PASS VALVES:** The Infusion Water Softener is equipped with a built in by-pass valve.

**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.

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**Media Installation**

1. Use a piece of duct tape to cover the top of the distributor tube. Be sure the distributor tube is centered in the tank. There is an indentation in the bottom of the tank that will help center the distributor tube. Install the supplied funnel and pour the base media in the tank. A helper may be needed to hold the funnel while filling the tank. Dust masks and safety goggles should be worn to prevent injury. If you purchased multiple systems, there will be several boxes. Each system and the boxes associated with the system will be marked with the respective system’s part number. Match the part numbers on the boxes to be sure you have the correct components and media for each system. The infusion water softener uses 10% cross-linked resin. The size of the system will determine how much resin is shipped with the system. Pour all the resin received in the tank. If gravel was shipped with softener and is marked with the softener part number, pour it in the tank prior to the resin. Once the media is poured in the tank, rinse any media or debris from the threads on the tank. Remove the tape from the distributor tube.
2. Lubricate the distributor O-ring seal and tank O-ring seal on the control valve. Note: Only use food grade silicone lubricant. Install the upper basket on the bottom of the valve. Place the main control valve on tank by placing the upper basket over the distributor tube. Turn the valve clockwise to start the threads. Be sure the valve is not “cross threaded” in the tank. Turn the valve until it is hand tight. Give it a couple taps with the palm of your hand to tighten further. DO NOT use tools to tighten the valve because damage could occur with the use of pipe wrenches or channel locks.
Installation Instructions

Place the Infusion softener tank in the desired location making sure the unit is level and on a firm base.

During cold weather, the installer should warm the valve to room temperature before operating.

All plumbing should be done in accordance with local plumbing codes. The pipe size for residential drain line should be a minimum of 1/2" (13 mm). Backwash flow rates in excess of 7 gpm (26 Lpm) or a drain tube length in excess of 20 (6 m) require 3/4" (19 mm) drain line.

1. The unit is equipped with a 1” NPT female bypass. Attach the piping to the bypass. Be sure to connect the plumbing properly. There are arrows on the bypass that indicate flow. The arrow pointing toward the unit is the “inlet” connection and the arrow that points away from the unit is the “outlet” connection. Any solder joints within 12” of the system should be completed prior to installing the piping in the bypass. If solder joints are close to the tank, use care to prevent damage from the torch.
CAUTION
• Do not exceed 125 psi water pressure
• Do not exceed 110°F (43°C) water temperature
• Do not subject unit to freezing conditions
2. Teflon tape is the only sealant to be used on the drain fitting. Attach the drain line to the unit and the drain for the home following all local plumbing codes. Hose clamps are recommended to secure the tubing to the barb fitting.
3. Remove the nut and sleeves from the control valve brine elbow. Slide the nut and sleeves over the supplied 3/8” tubing. Be sure the sleeves are oriented properly (see). Install the tube stiffener in the tubing. Now install the brine screen in the tube stiffener. Push the tube into the brine elbow on the control valve. Slide the nut and sleeves down to the elbow and tighten the nut by turning it clockwise. Be sure not to cross thread the nut on the elbow. Once hand tight, turn it an additional 1/2 turn with pliers or channel locks. The connections for this line should be tight to prevent system failure or leaks. 90% of the problems with water softeners are caused by this line being clogged or loose.
4. Remove the lid from the brine tank. Remove the cap from the 4” brine well in the brine (salt) tank. Remove the nut from the brine safety valve elbow in the brine well. Be careful not to drop the nut in the brine tank. Push the 3/8” brine tube through the hole in the side of the brine tank. Install the nut on the tube. Install the tube stiffener in the end of the tubing. Push the tube into the elbow on the brine safety valve in the brine well. Be careful not to drop the nut or tube stiffener in the brine tank. Slide the nut down on the tube and tighten it on the elbow by turning it clockwise until it is hand tight. Be sure not to cross thread the nut on the elbow. Once hand tight, turn it an additional 1/2 turn with pliers or channel locks.
5. Place the unit in the by-pass position. There is a pointer on the bypass valve handle that will point to either “bypass” or “service”. Turn on the main water supply. Open a cold soft water tap nearby and let run a few minutes or until the system is free from foreign material (usually solder) that may have resulted from the installation. Once clean, close the water tap and check for leaks. If there are leaks, repair them now.

6. Plug unit into an electrical outlet. Note: All electrical connections must be connected according to local codes. Be certain the outlet is uninterrupted. Extension cords should be avoided but if necessary, they should be grounded 14 gauge cords. A surge protector should be used in areas prone to lightning strikes and power surges.
1. When in the service mode the service icon will be illuminated. If a delayed regeneration is initiated the service icon will blink.

2. The flow indicator icon will blink when water is being used.

3. When setting the time of day and delayed regeneration time, be sure the clock is in the correct 12 hour time cycle. When you are in the PM time cycle the PM icon will be illuminated. If it is not illuminated the clock is in the AM time cycle.

4. When the display is in the service mode it will flash from the time of day to the remaining capacity before regeneration (in gallons).

5. When water is being used and the flow icon is blinking (water drip on right hand side of display) the remaining capacity value will decrease for each gallon used.

6. The service icon will be illuminated during programming or regeneration.

7. The extra cycle button serves as an enter/return button when programming. The up and down arrows allow value changes in each parameter programming mode. Once the value is reached the extra cycle button can be pushed to save the value and move to the next parameter.
8. The extra cycle button also initiates immediate or delayed regenerations. Pushing and releasing it immediately triggers a delayed regeneration (will regenerate at the time specified under RT in the programming mode). The service icon will blink when a delayed regeneration is initiated. Pushing and holding the extra cycle button for 5 seconds will initiate an immediate regeneration. The service icon will blink and the valve will move to the first regeneration position and begin the process.

9. If the error icon is illuminated there is a problem with the unit and a service technician should be contacted.

10. The x1000 icon will illuminate when values are multiplied by 1000 (capacity setting).

11. The system will hold the values for up to 48 hours after a power outage. Outages exceeding 48 hours should have the programming values revisited. It is a good idea to write down the programming parameters/values so they are available if a reprogramming is required.
<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>169-ISF-1C</th>
<th>169-ISF-2C</th>
<th>169-ISF-3C</th>
<th>169-ISF-4C</th>
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<td>50,000</td>
<td>63,000</td>
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<td>Feed Water Actual +5</td>
<td>Feed Water Actual +5</td>
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<td>+10 For Every Household Member</td>
<td>+10 For Every Household Member</td>
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<td>RAPID RINSE (RR)</td>
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</table>
Programming

1. Set the clock to 12:01PM. This can be done by pressing and holding either the “up” or “down” button until the time begins to change. Once the time of day is at 12:01 PM, press the “extra cycle” button to hold the time. Now press and hold the “up” and “down” arrows simultaneously and hold them for 3-5 seconds.

2. The screen will change to “display format” (DF). This parameter should be set to “GAL” for gallons. The “up” and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.

3. The next parameter to appear will be “valve type” (VT). This should be set to “dF1b”. The “up” and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.

4. The next parameter to appear will be “control type” (CT). This should be set to “delayed regeneration” (Fd). The “up” and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.

5. The next parameter to appear will be “number of tanks” (NT). This should be set to - - - 1 for one tank. The “up” and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.

6. The next parameter to appear will be “capacity” (C). This should be set using the programming chart. This value is X1000. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.
7. The next parameter to appear will be “hardness” (H). This should be set to 5 GPG above the actual feed water hardness. If the feed water hardness is unknown, the local municipality may have that info. If the info is not available or if the system is fed from a private well, a water hardness kit can be purchased from www.uswatersystems.com and the hardness can be tested onsite.

8. The next parameter to appear will be “reserve selection” (RS). This should be set to “Safety Factor” (SF). The “up” and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.

9. The next parameter to appear is “Safety Factor” (SF). This should be set to 10% for every person in the home. Example; 4 people in the home would be set at 40 (%). The “up” and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.

10. The next parameter to appear will be “day override” (DO). This will be set the number of days between regeneration. This should be set to “10”, so the unit will regenerate after 10 days if the gallons capacity wasn’t eclipsed. The “up” and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.

11. The next parameter to appear will be “regeneration time” (RT). This will be set to 2:00 AM. This should not be changed unless there is a better time for your application. This setting should be set for 2-3 hours after bedtime. The “up” and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.
12. The next parameter to appear will be “backwash time” (BW). This is factory set to 10 minutes. This should not be changed unless a certified water specialist from US Water Systems recommends another setting. The “up“ and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.

13. The next parameter to appear will be “brine draw” (BD). This should be set to 60 minutes. This should not be changed unless a certified water specialist from US Water Systems recommends another setting. The “up“ and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.

14. The next parameter to appear will be “rapid rinse” (RR). This is factory set at 10 minutes. This should not be changed unless a certified water specialist from US Water Systems recommends another setting. The “up“ and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.

15. The final parameter to appear will be “brine fill” (BF). This should be set using the programming chart. The “up“ and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the next parameter.
16. The next parameter to appear is “flow meter type” (FM). This should be set to 0.7 for 3/4” turbine meter. The “up” and “down” arrows can be used to change this value. Once the value is set, press the “extra cycle” button to hold the setting and move to the service screen/position.

17. Set the clock to actual time where the system is installed. This can be done by pressing and holding either the “up” or “down” button until the time begins to change. “PM” will show up next to the minute value if the clock is in the PM time cycle. If there is nothing showing up next to minute digit, the clock is in the AM time cycle. Once the time of day is at the actual time, press the “extra cycle” button to hold the time. The unit programming is now complete.

Programming is now complete and Startup can be performed.
Start-Up Instructions

The Infusion water softener system should be installed with the inlet, outlet, and drain connections made in accordance with the manufacturer's recommendations, and to meet applicable plumbing codes. The Infusion water softener system is equipped with an SXT electronic controller. The controller has three buttons; an “up” and “down” arrows and a “extra cycle” button (diamond shaped arrow lines on the button).

1. Press and hold the “extra cycle” button until the valve begins to move. The first cycle is the “backwash” (BW) cycle. Slowly open the bypass valve about 1/4 turn and let the tank fill with water. Once water is coming out of the drain tube the bypass can be opened further. Continue to slowly open the bypass valve in 1/8 turn increments until it is fully open. It is very important to slowly open the bypass valve or damage could occur. Let the unit backwash until the drain water runs clear and there is no air coming out of the drain line. The bypass valve should be fully opened before the backwash cycle is complete.
2. Advance the valve to the next cycle, by pressing the “extra cycle” button and releasing it immediately. This will move the valve to the next cycle. The next cycle to appear will be the “brine draw” (BD). Press and release the “extra cycle” button and skip the brine draw cycle.

3. The next cycle to appear will be the “rapid rinse” (RR) cycle. Let the unit run for the full rapid rinse cycle. Be sure the water is running clear at the drain and there is no air.

4. The next cycle to appear will be the “brine fill” (BF). Let the unit run for the entire brine fill cycle. This will ensure the proper amount of water is in the brine tank. Once the cycle is complete the valve will automatically advance back to the service position (time of day will appear and alternate to gallons remaining before the next regeneration).

5. Open a spigot or faucet down stream and let the water run. The water should be clear and free of air. Once the water is clear the faucet or spigot can be closed. The unit is now flushed and ready for operation.
LIMITED WARRANTY

US Water Systems, Inc. warrants the Infusion system as follows:

- The Tanks are warranted to be free of defects in materials and workmanship for life from the date of original installation.
- The Heads is warranted to be free of defects in materials and workmanship for 5 years from date of original installation.

Conditions

1. Any component failure must not result from abuse, fire, freezing or other acts of nature, violence, or improper installation.
2. Equipment must be installed and operated in compliance with the local plumbing codes, and on an approved water supply.
3. Equipment is limited to use at water pressures not to exceed 100 PSI and temperatures not to exceed 110 degrees F.
4. Information, including model number, serial number, and date of installation, must be provided for any claims pertaining to equipment in warranty.
5. Defective parts are subject to inspection by either US Water Systems, Inc. or any authorized representative before final commitment of warranty adjustment is made.
6. US Water Systems, Inc. reserves the right to make changes or substitutions in parts or equipment with material of equal quality or value and of then current production.

Limitations

Our obligation under this warranty with respect to the tank or valve is limited to furnishing a replacement for, or at our option, repairing any part or parts to our satisfaction that prove defective within the warranty period stated above. Such replacement parts will be delivered to the owner F.O.B. nearest factory, at no cost, excluding freight and local labor charges, if any.

US Water Systems, Inc. shall not be liable for freight, handling or labor charges, or consequential damages.
Limited Lifetime Warranty

For the lifetime of the original purchaser, at the original residential place of installation of this Infusion Water Conditioning System, US WATER SYSTEMS, INC. warrants the following:

LIFETIME COVERAGE
Media Tanks
Free of all costs to you except transportation and labor charges, we warrant that we will replace or repair the fiberglass media tank and the control valve body, if for any reason it is found to be defective, because of faulty materials or workmanship.

FIVE YEAR COVERAGE
Head Assembly & Electronics
We warrant that for five (5) years from the date of purchase, we will replace the head assemblies or electronic components at no charge to you except for transportation and standard labor charges. Electronics damaged due to environmental issues or improper installation is not covered.

GENERAL PROVISIONS
This warranty does not apply to any commercial or industrial installations or to any part of the water conditioner which has been subjected to misuse, neglect, alteration or accident; or to any damage caused by fire, flood, freezing, Acts of God, or any other casualty, or if the original serial numbers have been removed.

These warranties are in lieu of all other warranties expressed or implied, and we do not authorize any person to assume for us any other obligation on the sale of this water conditioner. No responsibility is assumed for delays or failure to meet these warranties 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. 1209 COUNTRY CLUB ROAD INDIANAPOLIS, IN 46234 (800) 608-USWA.

ANY IMPLIED WARRANTIES OF FITNESS OR MERCHANTABILITY ARE LIMITED TO THE TERMS OF THIS EXPRESSED WARRANTY AND THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THOSE HEREIN. US WATER 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 WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

THIS WARRANTY MAY BE TRANSFERRED TO A SUBSEQUENT OWNER WITH WRITTEN APPROVAL OF US WATER AND PAYMENT OF STANDARD TRANSFER FEE.