

HomeGUARD™

Full Size Performance In Half The Space.



OWNER'S MANUAL AND INSTALLATION GUIDE

VERSION 1.1

10 Year Limited Warranty

To Whom Warranty Is Extended

This warranty is issued to the original owner at the original location site and is not transferable to other sites or to subsequent owners of the system.

TO PLACE THE EQUIPMENT UNDER WARRANTY, THE WARRANTY REGISTRATION CARD MUST BE COMPLETED AND RETURNED BY THE ORIGINAL OWNER TO **HomeGuard®** WITHIN 30 DAYS OF INSTALLATION.

Coverage

This limited warranty covers the **HomeGuard®** system delivered to the original owner at the original location when the system is purchased for personal, family, or household use. It is intended to cover defects occurring in workmanship or materials or both.

Warrantor's Performance and Length of Limited Warranty

HomeGuard® warrants that upon receipt from the original owner of any mechanical or electronic part which is found to be defective in materials or workmanship, **HomeGuard®** will repair or replace the defective item for 3 years from date of original installation. Media is not warranted.

HomeGuard® further warrants that upon receipt from the original owner of any **HomeGuard®** media tank/valve body, brine cabinet, found to be defective in material or workmanship, **HomeGuard®** will repair or replace the defective item for 10 years from date of original installation.

All defective parts must be returned, along with the equipment serial number and date of original installation, to **HomeGuard®** PREPAID, and replacement parts will be returned by **HomeGuard®** to the original owner FREIGHT COLLECT.

Further Exclusions and Limitations on Warranty

THERE ARE NO WARRANTIES OTHER THAN THOSE DESCRIBED IN THIS WARRANTY INSTRUMENT.

This warranty does not cover any service call or labor costs incurred with respect to the removal and replacement of any defective part or parts. **HomeGuard®** will not be liable for, nor will it pay service call or labor charges incurred or expended with respect to this warranty.

In the event the water supply being processed through this product contains sand, bacterial iron, algae, sulphur, tannins, organic matter, or other unusual substances, then, unless the system is represented as being capable of handling these substances in the system specifications, other special treatment of the water supply must be used to remove these substances before they enter this product. Otherwise, **HomeGuard®** shall have no obligations under this warranty.

This warranty does not cover damage to a part or parts of the system from causes such as fire, accidents, freezing, or unreasonable use, abuse, or neglect by the owner.

This 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 warranty does not cover damage resulting from use with inadequate or defective plumbing; inadequate or defective water supply or 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.

THIS WARRANTY DOES NOT COVER INCIDENTAL, CONSEQUENTIAL, OR SECONDARY DAMAGES.

ANY IMPLIED WARRANTIES ON THE PRODUCT DESCRIBED IN THIS WARRANTY WILL NOT BE EFFECTIVE AFTER THE EXPIRATION OF THIS WARRANTY.

No dealer, agent, representative or other person is authorized to extend or expand this limited warranty.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusion 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.

Claims Procedures

Any defects covered by this warranty should be promptly reported to:

HomeGuard®
4343 South Hamilton Road
Groveport, Ohio 43125

When writing about the defects, please provide the original owner's name, telephone number, and original address, serial number and model number of the product, and date of purchase. (This information should be listed in General Information at the front of this manual.) **HomeGuard®** reserves the right to replace defective parts with exact duplicates or their equivalent.

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General Information

Congratulations on choosing a superior Hague water treatment appliance! Soon you and your family will be enjoying clean, clear water. Use this guide to attain the maximum benefit from your appliance. As an owner, you may find the first few pages to be the most helpful in solving your needs. If you have trouble with the operation of your appliance, see *Troubleshooting* in the back of this manual or contact your independent Hague dealer.

Warning: This appliance must be applied to potable water only. It is recommended that an independent Hague dealer install and maintain this appliance.

Note: The manufacturer reserves the right to make specification and product changes without prior notice.

This manual is for installation, operation, and maintenance of the following water conditioning appliance models:

- HomeGuard® 400

For Owner's Reference

Date of Installation: _____

Model Number: _____

Serial Number¹: _____

Installer's Signature: _____

Dealership Name: _____

Dealership Address: _____

Dealership Phone Number: _____

Hardness: _____

Iron: _____

pH: _____

TDS: _____

Water Pressure: _____

Water Temp: _____

Returned Warranty Card Date²: _____

¹ The serial number is located on the control valve adjacent to the controller.

² Completely fill out the Warranty Card and return it by mail to ensure that the appliance is registered with the factory and the warranty becomes validated.

Getting Maximum Efficiency From the Appliance

To achieve the maximum benefit and performance from this appliance, familiarize yourself with this manual and the appliance.

1. The salt level should always be at least 1/3 full. Refill the salt when the level drops below the water level in the brine cabinet. A clean pellet, solar, or cube-type salt is recommended. Do not use rock salt.
Caution: Do not mix different types of salt.
2. You may use a salt substitute (such as potassium chloride) in place of water conditioner salt. A Hague dealer should be contacted before a switch is made to a salt substitute. If potassium chloride is used in place of salt, the technician must select the potassium option during the programming of the controller. See *Service Settings*.
Caution: Do not use potassium chloride if there is iron and/or manganese in the water.
3. Should your electricity be off for any reason, check your controller for the correct time and reset as necessary. See *Customer Settings*.
4. Program the appliance to regenerate at a time when the water is not being used. If there is more than one appliance, allow two hours between each regeneration.
5. If dirt, sand, or large particles are present in the water supply, the appropriate Hague filter can eliminate this problem.
6. The appliance may be disinfected with 5.25% sodium hypochlorite, which is the active ingredient in household chlorine bleach. To disinfect the appliance, add 0.5 fluid ounces of chlorine bleach solution to the brine well of the brine cabinet. The brine cabinet should have water in it. Start a manual regeneration.
7. Protect the appliance, including the drain line, from freezing.
8. The bypass valve (located on the main control valve) enables you to bypass the appliance if any work is being performed on the appliance, well pump, or plumbing. See *Bypass Valve*. Use Bypass mode also for watering plants or lawns with untreated water.
9. Before putting the appliance back in service after work has been performed, turn on the nearest cold water tap until water runs clear.
10. Adhere to all operational, maintenance, and placement requirements.
11. Inspect and clean the brine cabinet and air check/draw tube assembly annually or when sediment is present in the brine cabinet.
12. This product is certified for barium and radium 226/228 reduction according to NSF/ANSI Standard 44. Any bypass system must be completely in the Service position to ensure maximum barium and radium 226/228 reduction.

Efficiency Statements

This product is efficiency rated according to NSF/ANSI 44. The stated efficiencies are valid only at the specified salt dosage and 8 gpm (30 L/m):

Model	Rated Efficiency	Salt Dosage	Capacity at That Dosage
400	4,900 grains/lb (697 grams/kg)	1 lb (0.45 kg)	4,900 grains (316 grams)

Five-Button Controller

This appliance features a five-button controller with an LCD display. The controller can be used to view the appliance's status, perform regenerations, and change settings. An independent Hague dealer should set the Service Settings during installation of the appliance.

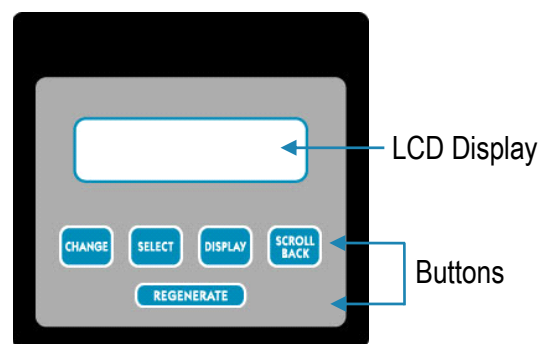


Figure 1: Five-Button Controller

Controller Part	Function
LCD Display	Shows the status of the controller; it is very important to know which mode the controller is in for proper operations
Normal Operating Mode	Shows <ul style="list-style-type: none"> The amount of soft water remaining until the next automatic regeneration (Each person in the household uses about 75 gallons per day) The number of days until the next regeneration (Mode 1, Filter = No) The flow rate in gallons per minute (Filter = No) Whether the appliance will regenerate tonight (If the Regenerate button has been pressed and released)
Service Settings Mode	Includes settings such as the language, mode, water hardness, and time of each regeneration step. Service Settings must be set before Customer Settings. Otherwise, some values may not be available. Service Settings Mode is intended for use by qualified service personnel
Customer Setting Mode	Includes setting the time of day, the regeneration time, and the number of people in the household; depending on the service settings, this option may not be available
Water Flowing Indicator	Indicates that water is flowing through the appliance; useful for checking for proper plumbing and leaks
Recharge/Regeneration Status	Shows regeneration cycle positions during regeneration
Buttons	The Change, Select, Display, and Scroll Back buttons are used when changing Customer Settings and Service Settings.
Change	The Change button is used with the Select button to set the value of certain parameters. <ul style="list-style-type: none"> When you press the Change button, the value under the cursor changes to the next available value, typically increasing by one until all values have been displayed and the process begins again.

Five-Button Controller, Cont.

Controller Part	Function
Buttons, Cont.	The Change, Select, Display, and Scroll Back buttons are used when changing Customer Settings and Service Settings.
Select	<p>The Select button is used to move the cursor when setting parameters.</p> <ol style="list-style-type: none"> 1. Press and release the Select button to move the cursor one digit to the right of the parameter to be changed. 2. When the cursor is at the extreme right position, press the Select button again to reset the cursor to the extreme left position.
Display	<p>The Display button is used to enter programming modes and also to save a value and display the next value to be changed.</p> <ol style="list-style-type: none"> 1. To program Service Settings, press and hold both the Display button and the Select button for about five seconds while “Service Setting” is displayed. 2. To program Customer Settings, press and hold the Display button for about five seconds while “Customer Setting” is displayed.
Scroll Back	The Scroll Back function is used to step back to a previous parameter setting. It is typically used to go back to correct a setting without the need to scroll forward through all settings.
Regenerate	The Regenerate button at the bottom of the controller is used when starting your water conditioning appliance, to start an immediate regeneration, or to restore capacity if you run out of salt.

Customer Settings

Service Settings must be set before Customer Settings; Service Settings should be set during installation of the appliance.

To set Customer Settings, press and hold the Display button for about five seconds while “Customer Setting” displays. Release the button when “Set Time” displays. If the setting displayed is correct, press Display to move to the next setting.

Step 1 *Set Time of Day*

Display reads “Set Time” followed by the current time that is set; the cursor will be under the second hours digit.

To Change the Time of Day

- A. Press Change repeatedly until the current hour is displayed.
- B. Press Select to set the hour and move the cursor to the right.
- C. Do the same to set the minutes. Select AM or PM. When the desired time is displayed, press Display to step to the next parameter.

Note: Whenever you experience an electrical outage, check your controller for the correct time. Make any necessary corrections.

Step 2 *Set Regeneration Time*

Display reads “Reg. Time” followed by the current regeneration time that is set; the cursor will be under the second hours digit. Usually you want to set a regeneration time when water will not be used.

To Change the Regeneration Time

- A. Follow the procedure outlined above for setting the time.
- B. When the desired regeneration time is displayed, press Display.

Step 3 *Set Number of People*

Display reads “# People” followed by the current setting for the number of people in the household; the cursor will be under the tens digit.

To Change the Number of People

- A. Press Change repeatedly until the desired value is displayed; values will cycle from 0 to 9.
- B. Press Select and the cursor moves to the right.
- C. When the desired number of people is displayed, press Display to exit the Customer Setting mode.

When you press the Display button at “# People,” the values are saved, and the controller returns to Normal operating mode.

Checklist Before Installation

Refer to this checklist before installation.

- Water Quality**—If the water supply contains sand, sulfur, bacteria, iron bacteria, tannins, algae, oil, acid, or other unusual substances, consider pre-treating the water to remove these contaminants before the water supply enters the appliance, unless the appliance is represented as being capable of treating these contaminants in its specifications.

The appropriate Hague Water Filter can address these water shortcomings. Contact your water treatment specialist for assistance in obtaining appropriate pre-treatment before the water supply enters this appliance.

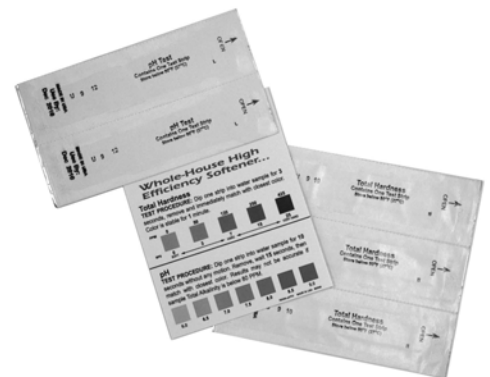
- Iron**—A common problem found in many water supplies is iron. It is important to know what type of and how much iron is in the water supply.

Iron Type	Description
Ferrous Iron* (sometimes called clear water or dissolved iron)	Only type of iron that can be treated with a water softener. See Maximum Ferrous Iron in <i>Specifications</i> .
Ferric Iron	Insoluble and the particles can eventually foul a resin bed. It should be filtered out before the water reaches the softener
Organic Iron or Bacterial Iron	Attached to other organic compounds in the water. Additional treatment is needed to remove this type of iron
Colloidal Iron	Not dissolved, yet stays in suspension. A softener cannot remove this type of iron

* If the water supply contains ferrous iron, a commercially available resin bed cleaner should be used every six months. Follow the instructions on the container. The hardness setting increases by 4 grains per gallon for every 1 mg/L (ppm) of ferrous iron programmed into the controller.

- Water Characteristics**—The conditioner requires a pH of 7 or above to function properly. An iron test to determine iron levels is also necessary. An Acid Neutralizing Filter may be necessary if pH levels are below 7.

- Water Hardness**—Double check the hardness of the water with the test strips provided to verify that your appliance is the right one for the job. If the result of your hardness test strip reaches the test maximum of 25 grains per gallon (427.5 ppm), mix 1 cup (0.25 liters) tap water with 1 cup (0.25 liters) distilled water. Then retest this mixture for hardness. Multiply your reading by 2 and use this setting number. If total hardness exceeds 35 grains (600 ppm) of hardness, do not install this product and contact your water treatment specialist.



- Water Pressure**—Not less than 20 psi or greater than 120 psi (1.4–8.4 bar) constant. If water pressure exceeds 70 psi (4.8 bar), a pressure regulator is recommended.
- Water Supply Flow Rate**—A minimum of 2.4 gallons (9 liters) per minute or equal to the backwash flow rate of the particular model is recommended. For the purposes of plumbing sizing, only the rated service flow rate and corresponding pressure loss may be used. Prolonged operation of a water conditioner at flow rates exceeding the tested service flow rate may compromise performance.
- Water Temperature**—Not less than 40° or greater than 120°F (6°–49°C).

Checklist Before Installation, Cont.

- ❑ **Drain**—Drain the appliance to an appropriate drain, such as a floor drain or washer drain that will comply with all local and state plumbing codes. To prevent back-siphoning, provide an adequate air gap or a siphon break. See *Installation Steps and Start-Up Procedures*. For installations under the kitchen sink, be sure to install the drain line using a dishwasher air gap. Call the factory for recommended installation.
- ❑ **Electricity**—The transformer supplied is for a standard 115 volt, 60-cycle AC outlet for locations in North America or 220 volt, 50-cycle AC outlet for locations outside North America. The transformer supplied for Japan is 100 volt, 50/60 cycle AC.

If you have any questions, contact your water treatment specialist.

Precautions

Do

1. Comply with all state and local, building, plumbing, and electrical codes.
2. Install the appliance before the water heater.
3. Install the appliance after the pressure tank on well-water installations.
4. Install a pressure-reducing valve if the inlet pressure exceeds 70 psi (4.8 bar).
5. Examine the inlet line from the pressure tank to appliance on well water with iron (recommended minimum inlet pipe size 3/4-inch I.D.). On municipal water, recommended minimum inlet pipe size is 1/2-inch I.D.
6. Install a gravity drain on the cabinet.
7. Secure the drain line on the appliance and at the drain outlet. See *Installation Steps and Start-Up Procedures*.
8. Allow a minimum of 8 to 10 feet (2.4 to 3.1 meters) of 3/4-inch pipe from the outlet of the appliance to the inlet of the water heater.

Do Not

1. Do not install if checklist items are not satisfactory. See *Checklist Before Installation*.
2. Do not install if the incoming or outlet piping water temperature exceeds 120°F (49°C). See *Water Conditioner Specifications*.
3. Do not allow soldering torch heat to be transferred to valve components or plastic parts when using the optional copper adapters.
4. Do not overtighten the plastic fittings.
5. Do not plumb the appliance against a wall that would prohibit access to plumbing. See *Installation Steps and Start-Up Procedures*.
6. Do not install the appliance backward. Follow the arrows on the inlet and outlet.
7. Do not plug the transformer into an outlet that is activated by an On/Off switch.
8. Do not connect the drain and the overflow (gravity drain) lines together.
9. Do not use to treat water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the appliance.
10. Do not allow your appliance or drain line to freeze.

Installation Steps and Start-Up Procedures

Step 1 *Prepare the Placement Area*

- A. Make sure the placement area is clean.
 - B. Turn off the electricity and water supply to the water heater. For gas water heaters, turn the gas cock to "Pilot."
 - C. Examine the inlet plumbing to ensure that the pipe is not plugged with lime, iron, or any other substance. Clean or replace plugged plumbing.
 - D. Make sure the inlet/outlet and drain connections meet the applicable state and local codes.
 - E. Check the arrows on the bypass valve to ensure that the water flows in the proper direction. See *Bypass Valve*.
- Caution:** Do not plumb the appliance in backward.
- F. Place the appliance in the desired location using Figure 2 as a guide. The diagram in Figure 2 applies to basement, slab, crawl space, and outside installations. For under counter (kitchen sink), consult the factory for recommended instructions.
 - G. For most installations, install the appliance after the pressure tank and any water filter appliance or water meter and before the water heater unless otherwise recommended. When installing any additional filters, such as a carbon filter for well water, place the filter after any water conditioning appliance unless otherwise recommended.
- Water Heaters:** If less than 10 feet of pipe connects the water treatment appliance(s) to the water heater, install a check valve between the water treatment appliance and the water heater as close to the water heater as possible. Ensure that the water heater has an adequately rated temperature and pressure safety relief valve.
- H. For outside installations, the appliance should be enclosed so it is protected from the weather.

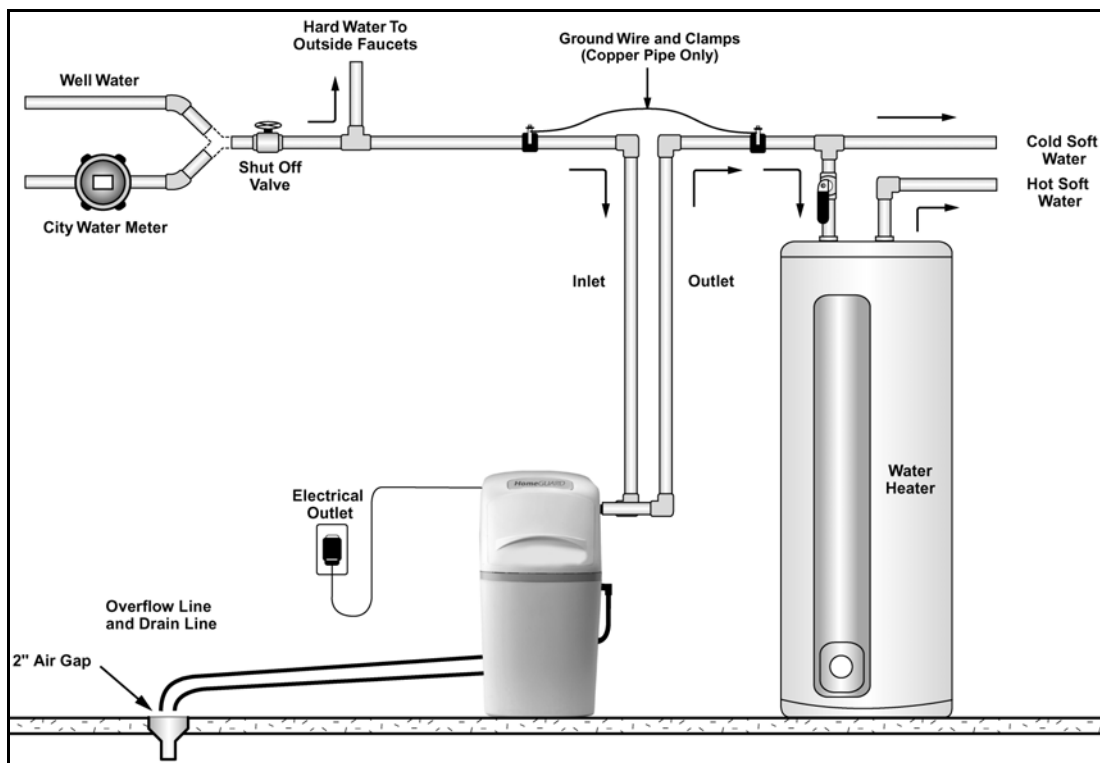


Figure 2: Appliance Placement

Installation Steps and Start-Up Procedures, Cont.

Step 2 *Turn Off Water Supply*

- A. Turn off the water supply.
- B. Open the hot and cold water taps to depressurize the lines.

Step 3 *Connect Water Lines*

Note: See *Optional Plumbing Procedures* for information on copper fittings and joining plastic pipe.

- A. Remove the valve cover.
 1. Open the salt port lid on the valve cover and slide it down.
 2. Place your fingertips on the bottom, inner edge of the valve cover. (You may need to use two hands).
 3. Squeeze the edge and pull the valve cover toward yourself until it clicks free. (See Figure 3.)
 4. Lift and remove the valve cover.
- B. Install Qest fittings. Qest connection fittings are provided with your appliance. Qest fittings provide a convenient, easy-to-use three-piece assembly for 3/4-inch copper plumbing or 3/4-inch CTS CPVC plastic tubing. Ensure that the three components (1: collar, 2: metal retaining ring, and 3: nylon sleeve) are correctly installed in sequence on the pipe. (See Figure 4.)

Note: Do not use Teflon tape or plumber's putty with Qest fittings. They are not necessary.
- C. Attach the water lines to the appliance in compliance with all state and local, building, plumbing, and electrical codes. (See Figure 5.) Do NOT over tighten the connections on the plastic threads.
- D. Check the arrows on the valve to ensure that the water flows in the proper direction.

Caution: Do NOT plumb your appliance in backward.



Figure 3: Remove Valve Cover



Figure 4: Qest Fittings

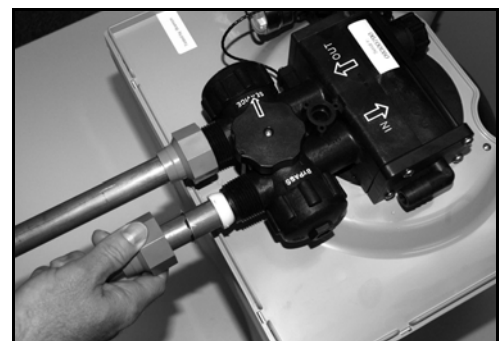


Figure 5: Connect Water Lines

Installation Steps and Start-Up Procedures, Cont.

Step 4 *Connect Gravity Overflow Connection*

The overflow line drains away excess water should the tank fill with too much water or the appliance malfunction.

- A. Check that the overflow elbow is in the down position.
- B. Connect 1/2-inch (12.7 mm) I.D. tubing (size cannot be reduced) between the overflow fitting and a floor drain, laundry tub, or other suitable waste receptor. This tubing is not supplied with the appliance. Ensure that the overflow line ends at a drain that is at least 3 inches (76 mm) lower than the bottom of the overflow fitting. Maintain a minimum 2-inch air gap. The gravity line cannot be run overhead.

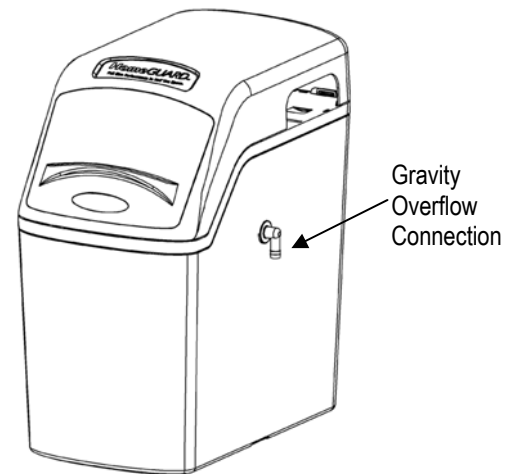


Figure 6: Gravity Overflow Connection

Step 5 *Connect Drain Line*

The drain line carries away the backwash water as part of the regeneration cycle.

- A. Connect the drain line to the drain end cap with a minimum 1/2-inch (12.7 mm) I.D. tubing (supplied). The size cannot be reduced.
- B. Route the drain line to a floor drain, laundry tub, or other suitable waste receptor. Maintain a minimum 2-inch air gap between the drain line and the flood level rim of the waste receptor to prevent back-siphoning. This drain line should make the shortest run to the suitable drain.
- C. The drain line may be elevated up to 8 feet from the discharge on the appliance as long as the water pressure in your system is 40 psi or more.
- D. If the drain line is 25 feet or longer, increase the drain line to 3/4-inch I.D. The end of the drain line must be equal to or lower in height than the control valve.

Caution: The drain line must not be kinked, crimped, or restricted in any way.



Figure 7: Connect Drain Line



Figure 8: Bypass Position

Step 6 *Flush Lines*

- A. Place the appliance in the Bypass position.
- B. Turn on the main water supply.
- C. Open the nearest cold water faucet to flush the plumbing of any excess soldering flux, air, or any other foreign material.

Installation Steps and Start-Up Procedures, Cont.

Step 7 **Check for Leaks**

- A. Close all faucets.
- B. Check all lines and connections for leaks. If leaks are found:
 1. Turn off the main water supply.
 2. Open a cold water faucet to depressurize the lines.
 3. Close the faucet to eliminate any siphoning action.
 4. Repair all leaks.
 5. Turn on the water supply.
 6. Place the bypass in the Service position to slowly fill the media tank.
 7. Open a cold water faucet to purge air out of the media tank.
 8. Close the faucet and recheck for leaks.



Figure 9: Service Position

Step 8 **Plug in the Transformer**

- A. Connect the transformer power cord to the back of the controller.
- B. Make sure the transformer cord is fed through the same area as the drain and water lines.
- C. Plug the transformer into an appropriate outlet.
- D. Ensure that the outlet selected is not operated by an On/Off switch.



Figure 10: Connect Transformer Power Cord

Step 9 **Set Up the Controller**

- A. Program the appliance controller. See *Setting and Using the Controller*.

Step 10 **Add Water to the Brine Cabinet**

- A. Remove any packaging or installation materials. Do NOT remove the grid plate.
- B. Add water to the brine cabinet to a minimum of 2 inches above the grid plate. After the first regeneration, the appliance will automatically refill the correct amount of water into the brine cabinet.
- C. Ensure that the bypass is in Service position.
- D. Ensure that the salt dosage is set as recommended for the application.
- E. Initiate a manual regeneration (see *Setting and Using the Controller*) and inspect for proper operation. Allow the appliance to draw all the water out of the brine cabinet until the air check/draw tube sets (8–10 minutes).
- F. Press the Regenerate button to advance to the Brine Refill (04) position. Let the tank fill with the proper amount of water. The controller will then step the valve to the Home position.

Note: This initial startup is the only time you will add water to the brine cabinet. Do not add water at any other time.

Installation Steps and Start-Up Procedures, Cont.

Step 11 *Fill the Brine Cabinet With Salt*

- A. If the grid plate is not sitting on its supports at the bottom of the brine cabinet, carefully reposition it.
- B. Fill the brine cabinet with salt. (See Figure 11.) Use clean, white pellet or solar salt. Do not mix pellet with solar salt.
Note: Always keep the salt level above the water level. For convenience, completely fill the tank when refilling with salt.
- C. After you add salt, including adding it after the tank has run out of salt, wait two hours for saturated brine before starting any regeneration.
Caution: Use of potassium chloride when iron and/or manganese are present in the raw water supply is not recommended.



Figure 11: Fill Brine Cabinet With Salt

Step 12 *Complete the Installation*

- A. Ensure that the bypass is left in the Service position. See *Bypass Valve*.
- B. Ensure the water supply is on.
- C. Open the inlet valve and turn on the electricity to the water heater. For gas water heaters, return the gas cock to "On."
- D. Open a cold water tap and allow the appliance to flush for 20 minutes or until approximately 72 gallons have passed through the appliance. This procedure is required to meet NSF compliance. Verify the flow rate on the controller, which indicates water flow. See Figure 1.
- E. Test the water at the nearest tap to verify soft water.
- F. Place the cover on the cabinet.
- G. Close the salt port lid.

Bypass Valve

The bypass valve can isolate the appliance should the appliance malfunction or leak. It can also permit the use of untreated water for watering plants, shrubs, or lawns.

The bypass is located on the main control valve. See Figure 12. To engage the bypass, turn the knob to the Bypass position. The appliance will be bypassed and all water to the home is raw, untreated water. To prevent untreated water from entering the home, water should not be used inside the home when the appliance is in Bypass mode. Ensure that the appliance is returned to Service mode when the appliance is repaired or the use of untreated water is complete by turning the knob to Service.

To blend hardness back into the water using the bypass, turn the knob slightly from the Service position toward the Bypass position.



Figure 12: Bypass Valve

Optional Plumbing Procedures

This section provides information on plumbing with copper fittings and with plastic pipe.

Hard Plumbing the Bypass With Copper Fittings

Do not use Qest fittings for hard plumbing with copper fittings. When preparing the male threaded fittings of the I/O adapter, use the following guidelines to avoid damage to the plastic pipe threads.

- A. Wrap the threads three times with 1/2-in. wide Teflon tape. Place each consecutive wrap on top of the previous wrap.
- B. To prevent tearing of the tape, use Teflon paste on the first two male threads only. The paste lubricates the tape and fills the small void areas that might exist between the threads. When the joint is complete, there will be a small bead of sealant at the fitting interface, which indicates a properly joined connection.
- C. Use a union with a threaded connection to facilitate repair of potential leaks in soldered joints.
- D. Prepare the copper tail assemblies in advance to enable them to cool prior to final assembly. Advance preparation and cooling will prevent heat damage to the plastic pipe threads of the adapter.
- E. Ensure that the copper tube is long enough to allow fitting clearance with the valve cover in place.
- F. Turn the fitting counterclockwise until you feel the threads engage and then tighten to prevent cross threading. Do NOT overtighten the fittings.

Caution: Do NOT allow heat from the torch to transfer to the plastic valve component, which could be damaged.

Optional Plumbing Procedures, Cont.

Plastic (PVC/CPVC) Pipe Joining Procedure

To ensure reliable joint integrity when using solvent cement for PVC/CPVC plumbing, follow these recommendations:

- A. **Cutting**—The pipe must be cut square to allow for the proper interfacing of the pipe end and the fitting socket bottom. Use a wheel cutter, miter saw, or a ratchet shear for best results.
- B. **Deburring and Beveling**—Use a knife, plastic pipe deburring tool, or a file to remove burrs from the end of the pipe. Be sure to remove all burrs from the inside as well as the outside of the pipe. All pipe ends should be beveled to permit easier insertion of the pipe into the fitting. Failure to bevel the pipe end may cause a “wiping” effect in the fitting where the cement is forced to the end of the fitting socket. This creates a weak joint.
- C. **Test Dry Fit of the Joint**—Tapered fitting sockets are designed so that an interference fit should occur when the pipe is inserted about one-third to two-thirds of the way into the socket. Occasionally, when pipe and fitting dimensions are at the tolerance extremes, it will be possible to fully insert dry pipe to the bottom of the fitting socket. When this happens, a sufficient quantity of cement must be applied to the joint to fill the gap between the pipe and fitting.
- D. **Inspection, Cleaning, and Priming**—Inspect the inside of the pipe and fitting sockets and remove dirt, grease, or moisture with a clean dry cloth. If wiping fails to clean the surfaces, use a chemical cleaner. Check for possible damage such as splits or cracks and replace if necessary. Use purple primer to penetrate and soften the bonding surfaces of the PVC or CPVC pipe and fittings. Proceed without hesitation to the cementing procedure while the primed surfaces are still wet.
- E. **Application of Solvent Cement**—Apply the solvent cement evenly and quickly around the outside of the pipe while the primer is still wet. Apply a light coat of cement evenly around the inside of the fitting socket. Do not allow excess cement to “puddle” in the fitting. Apply a second coat of cement to the pipe end.
- F. **Joint Assembly**—Working quickly, insert the pipe into the fitting socket and give a 1/4-turn of the pipe or fitting while pushing toward the fitting stop. This action will evenly distribute the cement. Do NOT continue to rotate the pipe or fitting after the stop has been reached. Hold the joint tightly together for about 15 seconds to prevent the pipe from “creeping” out of the fitting. A good joint will have sufficient cement to make a small bead all the way around the outside of the fitting hub. The joint should not be disturbed immediately after the cementing procedure. Allow adequate time for the joint to cure properly. Exact drying time is hard to predict because of environmental variables. Follow the recommended joint curing times on the primer and cement container labels.

Setting and Using the Controller

The controller must be set up correctly for the appliance to perform properly.

Note: Ensure that the bottom of the controller is firmly locked onto the four tabs on the top of the drive end cap assembly. See Figure 15.

Regenerate Button

The Regenerate button is used when starting the water filtration appliance and to start an immediate regeneration. The Regenerate button can be used in three ways:

1. The Regenerate button can be used to put the appliance into an immediate regeneration.
 - A. Press and hold the Regenerate button for about five seconds until the display changes from “Regenerate” to “Going to.”
 - B. The appliance is in regeneration mode and will display the status of each cycle. After all regeneration cycles are complete, the display will return to Normal operating mode.
2. The Regenerate button can be used to quickly advance through all of the regeneration cycles to speed up the cycles, which is used when starting up or diagnosing the appliance only.
 - A. To advance through the regeneration cycles, press and hold the Regenerate button for about five seconds until the display changes to “Going to.”
 - B. The cycle position will display (for example, Backwash 1).
 - C. Each cycle can be advanced by pressing the Regenerate button. Always wait until the cycle position displays before advancing to the next cycle position.
3. Press and release the Regenerate button in Normal operating mode to schedule a regeneration tonight or toggle it off.

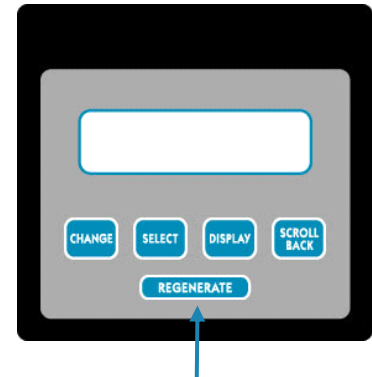


Figure 13: Regenerate Button

Service Settings

To program Service settings on the controller, press and hold the Select and Display buttons while “Service Settings” is displayed until “Set Language Eng” is displayed. Programming Service Settings is similar to programming Customer Settings (see *Customer Settings* for programming details). The values that can be set are listed below. The values in the table are factory default settings only.

Note: The Service Settings must be set before the Customer Settings.

Display	Meaning	Possible Values	Comments
Set Language Eng	Set the language of the display	Set Language Eng Entrer Langue Fra Entre La Leng. Esp	
Units ENG	Units of measure	ENG or MET	
Soft. v. # 1.22B	Displays the current software version	Cannot be set	
Mode <u>2</u>	Operating Mode: Timer (Mode 1) Meter Delayed (Mode 2)	1 or 2	See <i>Operating Modes</i>
Regen Freq. <u>01</u>	How often regeneration occurs	1–12 days	Mode 1
Hard. Gr. <u>040</u>	Hardness of the water that was tested	003 to 999 Grains (00000 to 99999 mg/L)	This is the actual hardness reading and is not compensated for iron
Iron ppm <u>00</u>	Amount of iron in parts per million of the water that was tested	00 to 99 ppm (mg/L)	This value is used to calculate compensated hardness automatically
Mang. ppm <u>00</u>	Amount of manganese in parts per million of incoming water	00 to 99 ppm (mg/L)	This value is used to calculate compensated hardness automatically
Salt = Sodium	Regenerant filling the brine cabinet	Sodium or Potassium	See <i>Warning</i>
Comp. Hard. 00040	Compensated hardness using the hardness, iron, and manganese settings	Cannot be set ppm or mg/L	The formula used is: Hardness + (4 x each ppm iron) + (4 x each ppm manganese) = compensated hardness
Capac. Gr. <u>28730</u>	The desired softening capacity number	00000 to 99999 Grains (0000 to 9999 gm)	See <i>Water Conditioner Specifications</i> or <i>Modes 1 and 2 Setting Chart</i> for capacities based on salt usage
72–96 hr Regen No	A way to force regeneration at regularly-scheduled intervals	No (or Yes, for iron)	See <i>72–96 Hour Regeneration</i>
Backwash 1 <u>01.0</u>	Number of minutes the first backwash cycle lasts	00.0 to 99.9	Set to the nearest tenth of a minute

Warning: When iron and/or manganese is present in the water supply, do not use potassium chloride as a regenerant. Iron and/or manganese bacteria may develop and foul the conditioning media and may void the warranty.

This table continues on the next page.

Service Settings, Cont.

Display	Meaning	Possible Values	Comments
Brine/Rinse 30.0	Number of minutes the brine and slow rinse cycle lasts	00.0 to 99.9	Set to the nearest tenth of a minute
Backwash 2 05.0	Number of minutes the second backwash cycle lasts	00.0 to 99.9	Set to the nearest tenth of a minute
Salt lbs. 06.2	Amount of salt set to be used in each regeneration to achieve the capacity setting	00.0 to 99.9 lb (kg)	Set to the nearest tenth
Turbine Test No	Used by qualified personnel for diagnostic purposes	No or Yes	Do not engage this feature
Reg. Tonight Yes	Sets the appliance to regenerate tonight	No or Yes	If set to Yes, it will force a regeneration at the next set regeneration time (such as 02:00 AM). After the regeneration, the value will be set to No
Filter? No	Used by qualified service personnel to set the model number	No or Yes	Has no effect on the function of the appliance

When you press the Display button at “Filter?,” the values are saved, and the controller returns to Normal operating mode.

Operating Modes

The appliance has two operating modes: Timer mode and Meter Delayed mode. Both modes are equipped with Capacity Guard®, which ensures that a supply of conditioned water will be available even with excessive water usage.

Mode 1—Timer Mode

When the appliance is in Timer mode, it will regenerate based on the frequency that is set, for example every day or up to every 12 days. The time of regeneration can be set.

Mode 2—Meter Delayed Mode

When the appliance is in Meter Delayed mode, it will regenerate based on the actual water usage and the total capacity of the appliance. The time that the regeneration takes place can be set, for example 2:00 AM. Should the total capacity be depleted before the set regeneration time, a forced regeneration will occur.

72–96 Hour Regeneration

If this value is set to Yes, the appliance will be forced to regenerate every 72–96 hours unless a regeneration based on water usage occurs within the time interval. The value should always be set to Yes if iron is present in the water.

Service Settings, Cont.

Mode 1 (Timer Mode) and Mode 2 (Meter Delayed Mode) Setting Chart

This section provides guidance for using different service settings to achieve the desired capacity.

	400
Mode 1 and 2	Yes
Regeneration Frequency	As required
96 hour regeneration (if iron present—yes) ¹	—
#1 Salt Setting	
Backwash 1 (minutes)	0
Brine/Rinse (minutes)	9
Backwash 2 (minutes)	2
Capacity (grains) @ salt (lb)	4,900 @ 1 lb
#2 Salt Setting	
Backwash 1 (minutes)	0
Brine/Rinse (minutes)	12
Backwash 2 (minutes)	2
Capacity (grains) @ salt (lb)	8,600 @ 2 lb
#3 Salt Setting	
Backwash 1 (minutes)	0
Brine/Rinse (minutes)	15
Backwash 2 (minutes)	2
Capacity (grains) @ salt (lb)	10,700 @ 3 lb

¹ If iron is present in water supply, use salt setting #3.

Assembly and Parts

Cabinet and Cover Assemblies

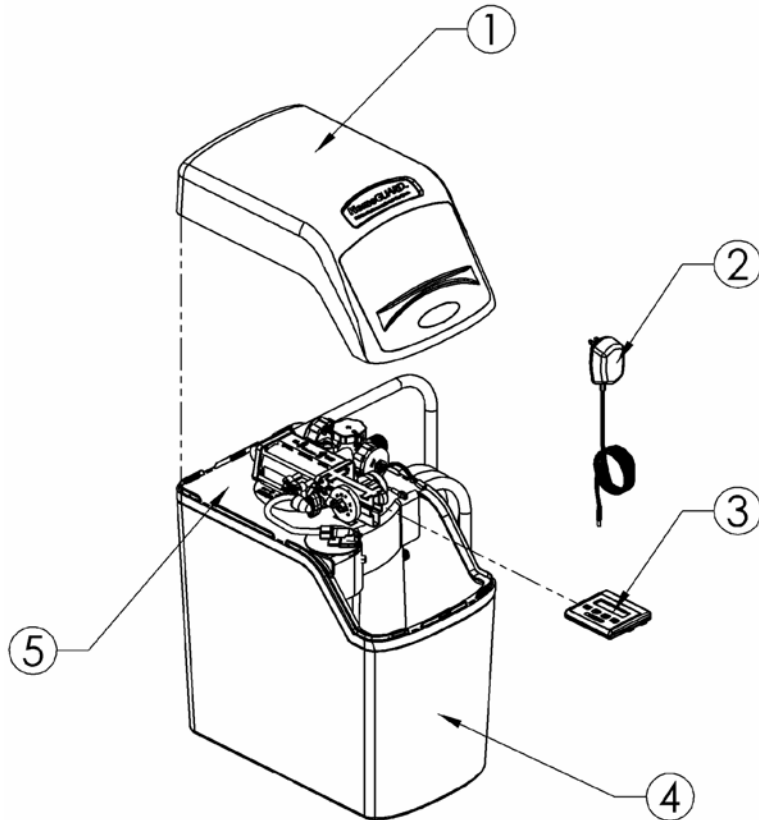


Figure 14: Cabinet and Cover Assemblies

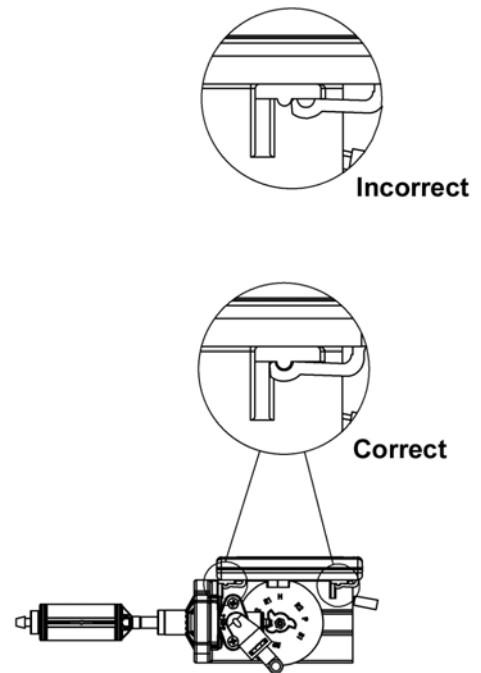


Figure 15: Controller Tab Lock Detail

	Part #	Description	Quantity
1	55300	Valve Cover Assembly	1
2	93245	Transformer 115V	1
3	54550	Computer Control Assembly	1
4	56004	Cabinet	1
5	56006	Support Panel	1

Assembly and Parts, Cont.

Cabinet and Assemblies

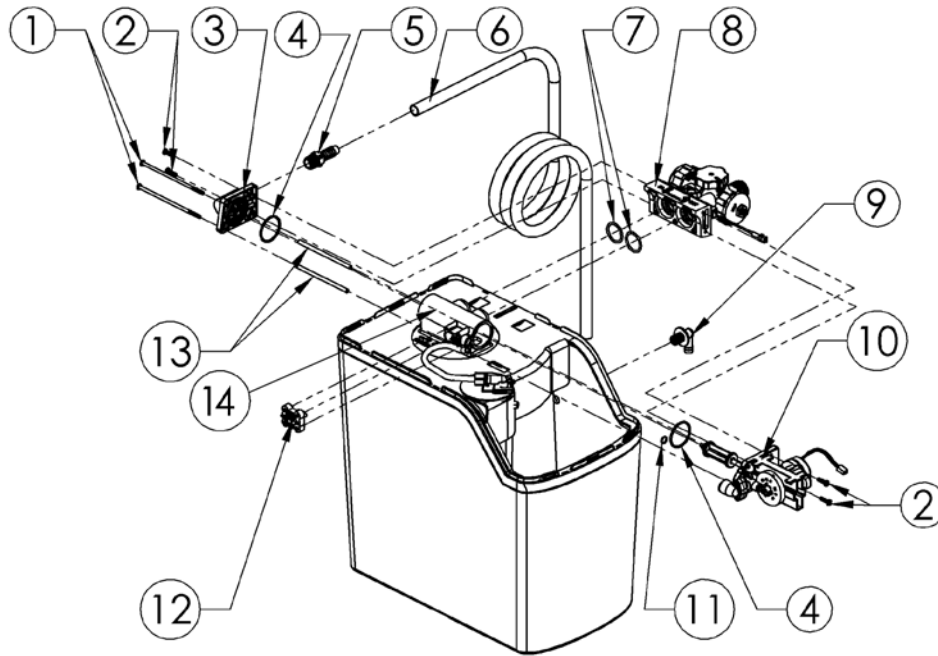


Figure 16: Cabinet and Assemblies

	Part #	Description	Quantity
1	93809	Screw	2
2	93870	Screw	4
3	90614-2.4	Drain End Cap	1
4	93808	O-Ring	2
5	V185	Drain Fitting, 1/2" (12.7 mm)	1
6	93842	Drain Hose, 8' (2.4 m)	1
7	93838	O-Ring	2
8	54512	Bypass Assembly, (3/4" IO Assembly Shown)	1
9	C0700A	Cabinet Overflow	1
10	95301T	Drive End Cap Assembly	1
11	90828	O-Ring	1
12	93501	Injector Assembly	1
13	93835	Sleeve	2
14	56500	Replacement Tank with Media	1

Assembly and Parts, Cont.

Injector Assembly

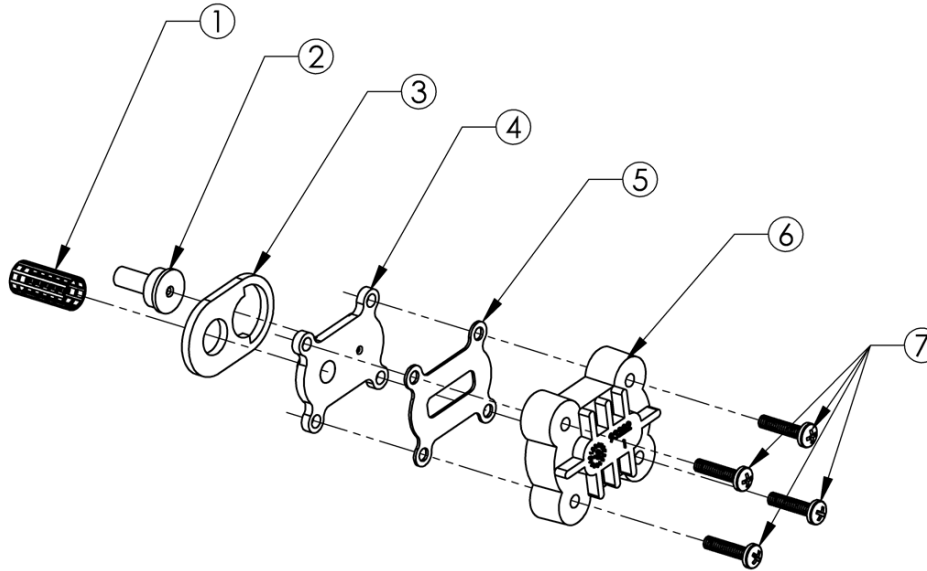


Figure 17: Injector Assembly

	Part #	Description	Quantity
1	93810	Injector Screen	1
2	93223	Injector Throat	1
3	93220	Injector Seal (Thick)	1
4	93221	Injector Nozzle	1
5	93232	Top Injector Seal (Thin)	1
6	93222	Injector Cap	1
7	90807	Screw	4
	93501	Entire Assembly (all of the above parts)	

Assembly and Parts, Cont.

Injector Assembly Cont.

93223 Injector Throat	In conjunction with the Injector Nozzle, Part # 93221, it creates the vacuum that draws the brine solution from the brine cabinet. The center hole should be clear of debris, round and undamaged. The Throat should be pressed flush into the opening in the valve. If the Throat is removed, it must be replaced with anew one.
93220 Thick Injector Seal	Seals between the Injector Nozzle and the Main Valve Body. The gasket has a definite hole pattern that has to match-up with the Nozzle and Main Valve Body opening. The gasket seals at its outer edges and between the inlet screen and nozzle opening. These areas must be free of defects such as tears or pits and be free of debris.
93221 Injector Nozzle	Together with the Throat, 93223, creates the vacuum that draws the brine solution from the Brine Cabinet. There are two openings in the Nozzle plate. The small hole, flush on both sides, is the one that creates the “injection-stream” that enters the Throat. It is important that this hole is clear of debris, round and undamaged. If this hole becomes “clogged”, do not use anything such as metal objects to clear this opening. Damage may occur. Use a clean cloth and flush with water. If necessary, a wooden toothpick may be used. When assembling to the Valve, the Nozzle hole should line up with the Throat.
93232 Thin Injector Seal	Seals between the Injector Nozzle and Injector Cap. The gasket must be free of defects such as tears or cuts and be free of debris.
93222 Injector Cap	Holds the injector assembly together and seals the assembly to the Main Valve Body. The four machine screws should be tightened evenly and “snug”.
93810 Injector Screen	Acts as pre-filter to keep debris from entering the Injector Nozzle and Throat. Attaches to the cylinder on the Nozzle plate and spherical “bump” inside the Valve Body. Some compression of the screen may occur during assembly. The opening in the screen must be clear to ensure proper flow to the Injector assembly.

Assembly and Parts, Cont.

Drive End Cap Assembly

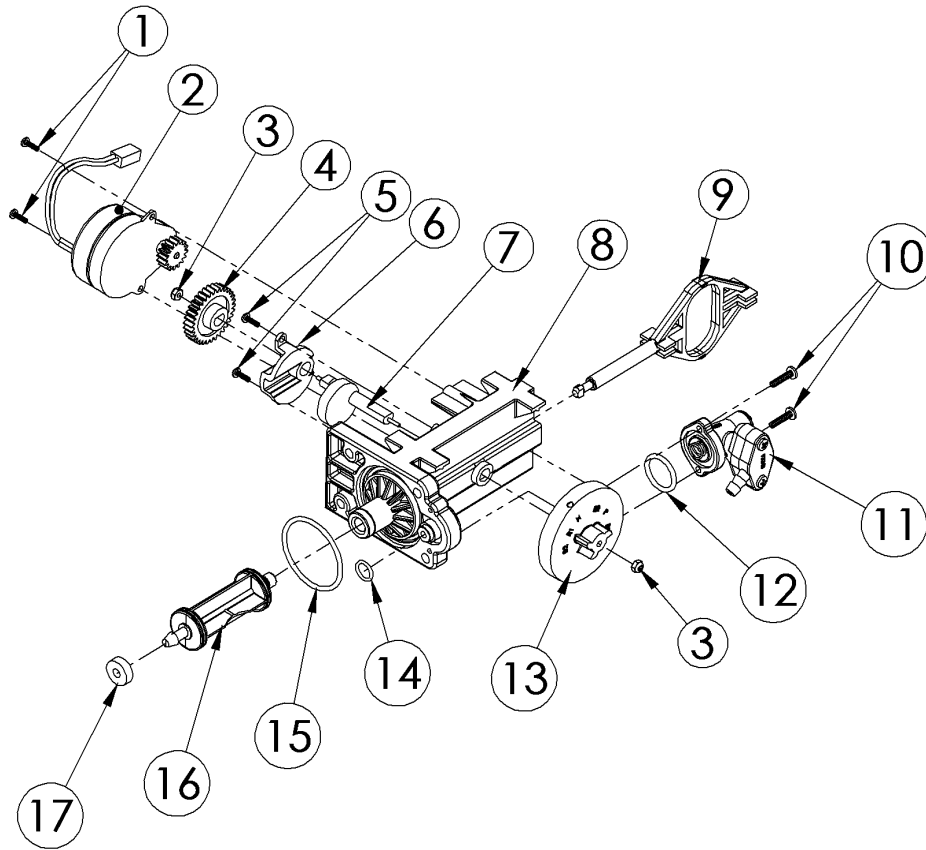


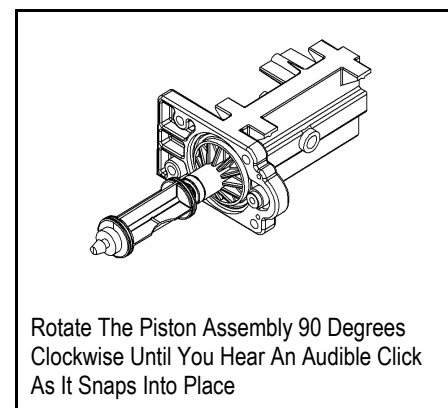
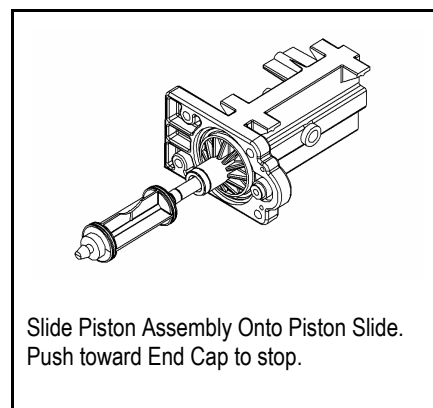
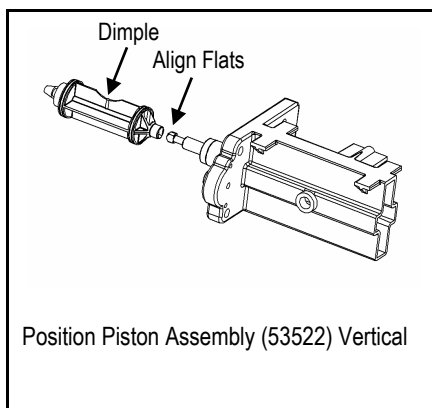
Figure 18: Drive End Cap Assembly

	Part #	Description	Quantity
1	90802	Screw, self-tapping	2
2	90217	Drive Motor	1
3	93891	1/4" Hex Nut	2
4	93238	Drive Gear	1
5	90809	Screw, self-tapping	2
6	93219	Piston Slide Cam Cover	1
7	93217	Piston Slide Cam	1
8	93583	Drive End Cap	1
9	54202	Piston Slide	1
10	90818	Screw, self-tapping	2
11	93601	Brine Valve Housing Assembly	1
12	90821	O-Ring	1
13	54502	Magnet Disk Assembly	1
14	90828	O-Ring	1
15	93808	O-Ring	1
16	53522	Drive Piston Assembly (includes 93839 Drain Gasket)	1
17	93839	Drain Gasket	1
	95301T	Entire Assembly (all of the above parts except 1, 2, and 13)	

Assembly and Parts, Cont.

Drive End Cap Assembly Cont.

90217 Drive Motor	The Motor is held in place by two 1/2-inch self-tapping screws. The screws should be “snug.” The brass pinion gear on the Motor should engage the plastic Drive Gear. The wires should be securely fastened to the Control.
93238 Drive Gear	The Drive Gear is assembled to the Slide Cam by means of a “keyed” opening which transfers the “torque” generated by the Motor to the rest of the drive system. If the drive system becomes jammed, this opening can become “rounded” causing the gear to turn, but not the Piston Slide Cam. If this occurs, clear the jam and replace the Drive Gear and Piston Slide Cam (93217).
93219 Piston Slide Cam Cover	The cover secures the Piston Slide Cam (93217) in place and acts as a bushing for the Cam Shaft.
93217 Piston Slide Cam	This is the “heart” of the drive system. There is a threaded stainless steel shaft that runs through the main drive axle. The Drive Gear is attached at the short end and the Magnet Disc at the other end. The Slide Cam is assembled inside of the Piston Slide (54202). This Cam Shaft should turn freely before the Motor is assembled.
93583 Drive End Cap	Seals the two openings on the Main Valve Body. The larger diameter opening is sealed with an O-Ring used as an axial or “face” seal. The O-Ring sits in a groove in the End Cap. This groove must be free of defects such as pits or scratches and also free of debris. The smaller diameter seal is accomplished with an O-Ring used as a radial seal. The O-Ring should be placed on the male boss on the End Cap. When assembling the End Cap to the Valve Body, care should be taken to make sure the small O-Ring is aligned with the opening in the Valve Body and that the large O-Ring stays in the groove in the End Cap. If misaligned, the O-Rings can become pinched and leak.
54202 Piston Slide	The Slide should move freely inside the End Cap Housing.
53522 Drive Piston Assembly	The Drive Piston attaches to the Piston Slide (54202) by placing the “slot” of the Piston onto the matching flat of the Slide. To remove Piston, rotate Piston 90° counterclockwise. To replace Piston, rotate 90° clockwise until you hear an audible “click.” See reference drawings below.



Assembly and Parts, Cont.

Bypass Assembly

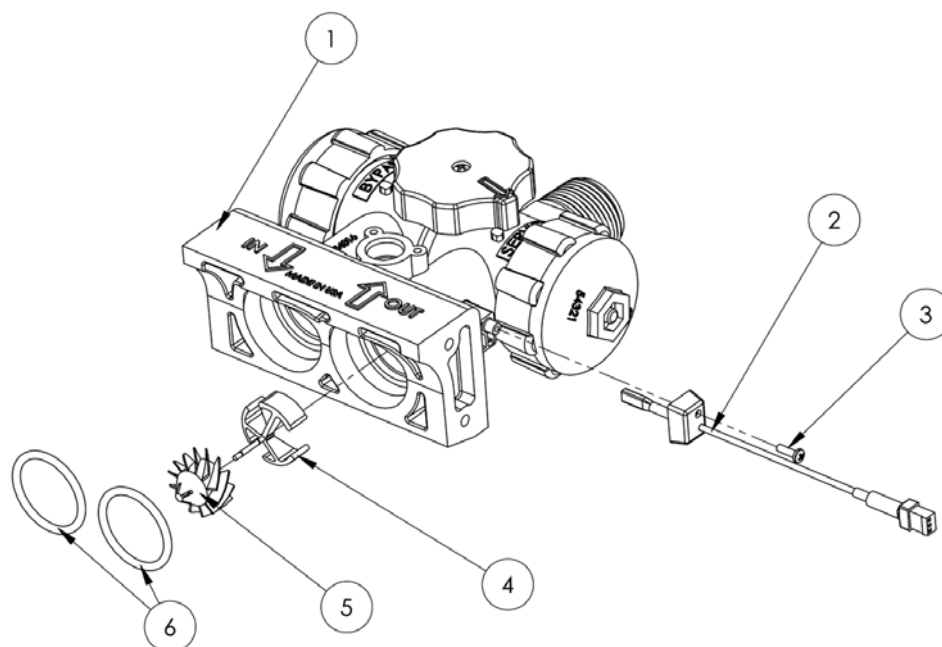


Figure 19: Bypass Assembly

	Part #	Description	Quantity
1	54512	Bypass Assembly	1
2	93860	Turbine Sensor Assembly	1
3	90809	Sensor Cap Screw	1
4	54320	Plastic Turbine Axle	1
5	90522	Turbine Assembly	1
6	93838	O-Ring	2
	54512	Entire Assembly (all of the above parts)	

Assembly and Parts, Cont.

Brine Valve Housing Assembly

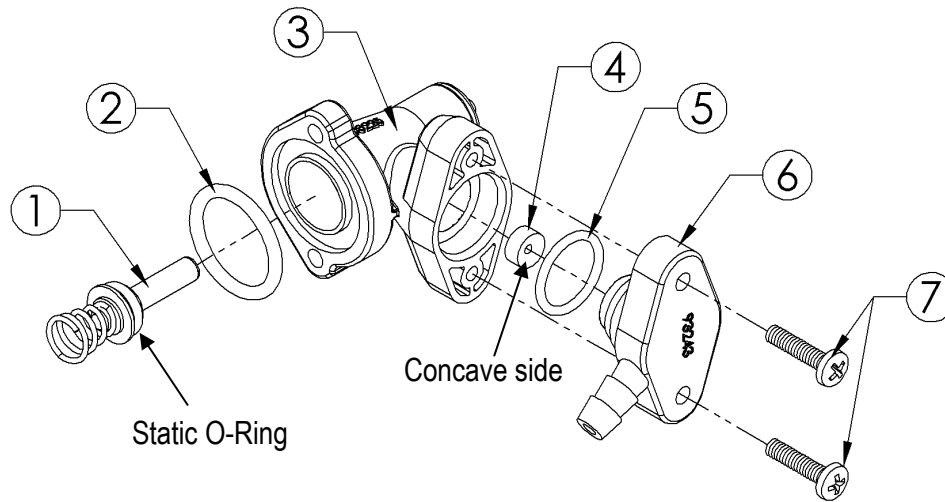


Figure 20: Brine Valve Housing Assembly

	Part #	Description	Quantity
1	53511	Piston Assembly (includes O-Ring & Spring)	1
2	90821	O-Ring	1
3	53510	Housing	1
4	90843	0.5 gpm Flow Control	1
5	93805	O-Ring	1
6	93243	Housing End Cap	1
7	90818	Screw, self-tapping	2
	93601	Entire Assembly (all of the above parts)	

53511 Brine Piston	The Piston should have an O-Ring on the shaft side of the flange and a spring pressed onto a boss on the other side. The O-Ring should be free of defects such as cuts or debris on the shaft side.
53510 Housing	Just inside the entrance hole for the Brine Piston (53511) is a concave seat area that must be free of defects such as nicks, indentations, or debris. This seat area ensures a leak-free seal for the static O-Ring on the Brine Piston. If any defects are detected by visual inspection, repair or replace as needed.
90843 0.5 gpm Flow Control	The Flow Button has two distinct and different sides. One is “flat”; the other is “concave.” The button should be centered in the housing opening with the four locator “ribs” with the concave side facing the Housing End Cap (93243).
93243 Housing End Cap	The Cap is held in place by two 3/4-inch self-tapping screws that engage the Housing flange. An O-Ring seals the Cap and Housing. Place the O-Ring into the housing opening, lubricate with silicone grease and then using a twisting action, pressure insert the Cap.

Assembly and Parts, Cont.

Drain End Cap Assembly

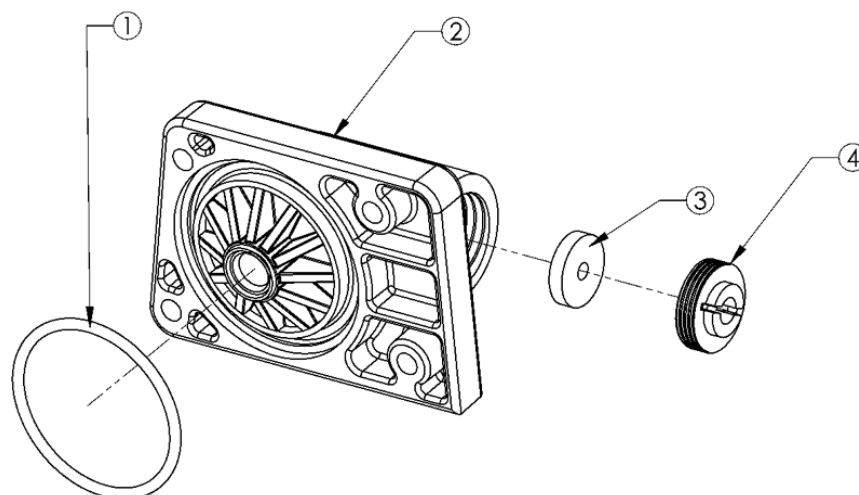


Figure 21: Drain End Cap Assembly

	Part #	Description	Quantity
1	93808	O-Ring	1
2	90268	Drain End Cap	1
3	H2086-2.4	Drain Line Flow Control	1
4	90267	Retainer	1
	90614-2.4	Entire Assembly (all the above parts)	1

90268 Drain End Cap	The Drain End Cap (90268) seals the left opening on the Main Valve Body. The opening is sealed with an O-Ring used as axial or “face” seal. The O-Ring sits in a groove in the End Cap. This groove must be free of defects such as pits or scratches and also free of debris. When assembling the End Cap to the Valve Body, care should be taken to make sure that the O-Ring stays in the groove in the End Cap. If misaligned, the O-Ring can become pinched and leak.
H2086 Drain Line Flow Control	The Drain Line Flow Control (DLFC) maintains a constant (plus or minus 10%) backwash flow rate at varying pressures. Care should be taken when replacing DLFCs to ensure that the correct rate is being used for a particular model. Refer to <i>Specifications</i> . When assembling the flow control, ensure that the rounded (radiused) side of the hole faces in toward the water flow. <ul style="list-style-type: none"> H2086-2.4
90267 Retainer	The Retainer (90267) holds the backwash Flow Control (H2086) in place. One side is smooth and the other has a groove for a screwdriver. When assembling the retainer to the Drain End Cap (90268), the retainer should be screwed in until it stops. If the retainer is not fully engaged, the Flow Control may not function properly.

Assembly and Parts, Cont.

Safety Shutoff Assembly

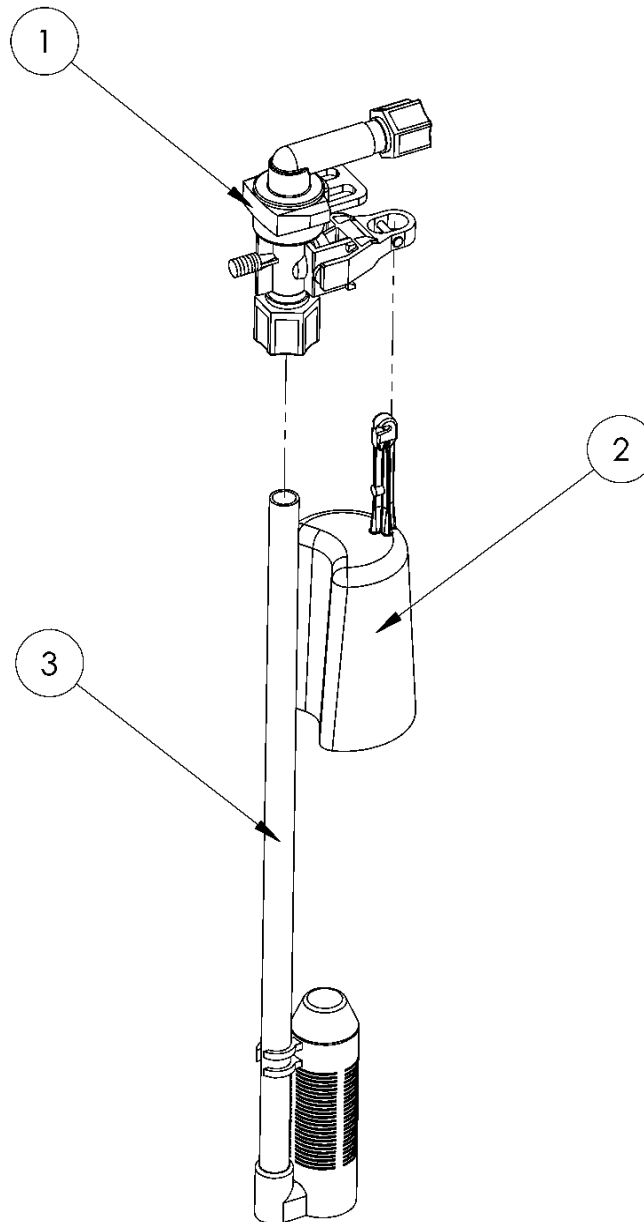


Figure 22: Safety Shutoff Assembly

	Part #	Description	Quantity
1	54226	Safety Shutoff	1
2	56018	Float	1
3	56200	Air Check	1
	56024	Entire Assembly (all of the above parts)	

Assembly and Parts, Cont.

Safety Shutoff Valve Elbow Installation

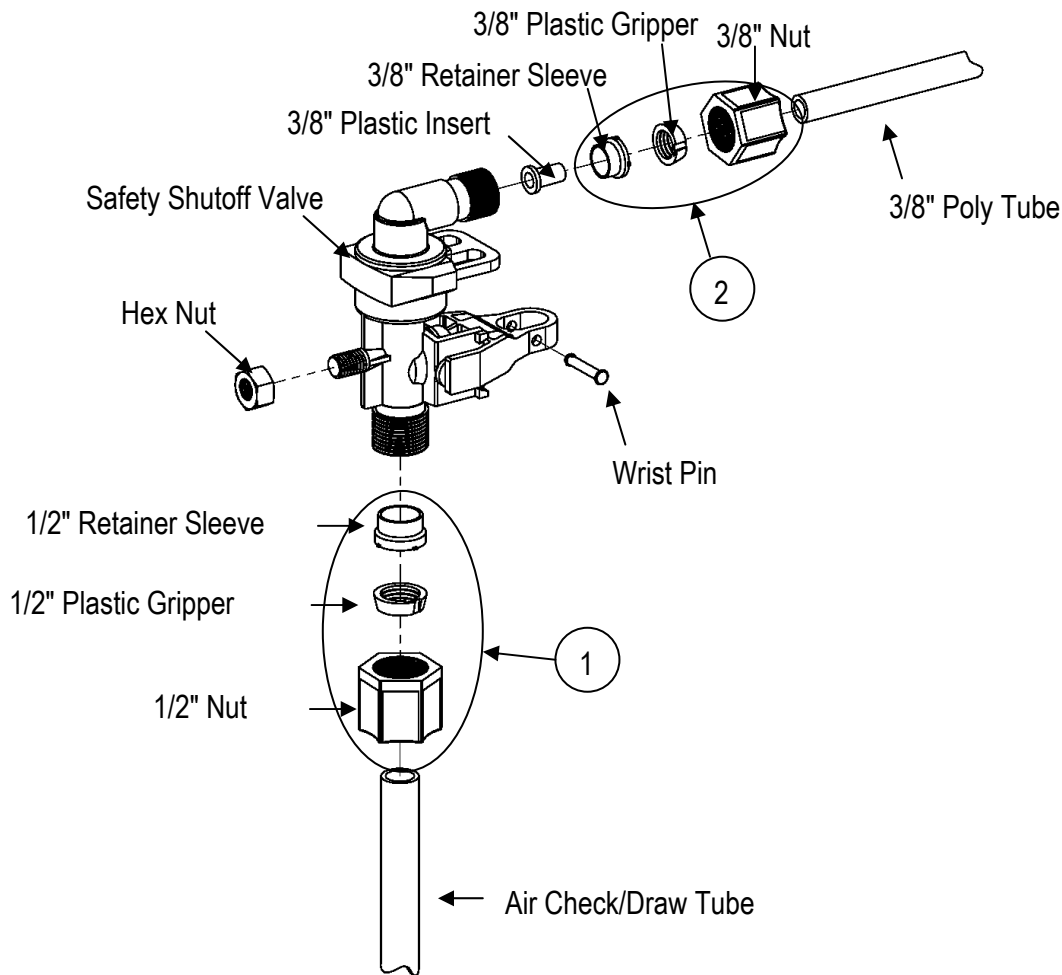


Figure 23: Safety Shutoff Valve Elbow Installation

	Part #	Description	Quantity
1	54112	1/2" Compression Assembly	1
2	54138	3/8" Compression Assembly	1

The nut, gripper, and retainer sleeve are a three-piece assembly that can come apart if removed from the elbow body. Parts must be reassembled exactly as shown to function properly.

When connecting the 3/8-inch poly tube, first assemble the nut, gripper, and retainer sleeve on the tubing. Then insert the plastic insert. Screw the nut on the elbow body. With a wrench, tighten the nut securely to create a water-tight connection.

Troubleshooting

Problem	Possible Cause	Solution
No soft water after regeneration	<p>No salt in brine cabinet</p> <p>Sediment in brine cabinet has plugged the brine line and air check/draw tube</p> <p>Flow control is plugged</p> <p>Drain line is pinched, frozen, or restricted</p> <p>Clogged injector assembly</p> <p>Salt bridge has formed due to high humidity or the wrong kind of salt</p>	<p>Add salt</p> <p>Remove the brine line and flush clean</p> <p>Remove the air check/draw tube and flush with clean water. Clean injector assembly. Clean any sediment from brine cabinet</p> <p>Remove brine piston housing and clear debris from the flow control</p> <p>Straighten, thaw, or unclog the drain line</p> <p>Remove injector cap and clean nozzle and throat with a wooden toothpick. Replace throat if removed</p> <p>Test with a blunt object like a broom handle. Push the handle into the salt to dislodge the salt bridge, or use hot water around the inside perimeter to loosen salt</p>
No soft water	<p>The bypass valve is in the Bypass position</p> <p>Appliance is plumbed backward</p> <p>Extended power outage</p> <p>Water hardness has increased</p> <p>Not metering water</p>	<p>Place the bypass valve in the Service position</p> <p>Check that appliance is plumbed correctly</p> <p>Reset the time of day</p> <p>Re-test the water and re-enter a new setting number</p> <p>Flow should be indicated with water usage. If no flow, see below</p>
No flow is indicated when water is flowing	<p>The bypass valve is in the Bypass position</p> <p>Appliance is plumbed backward</p> <p>Sensor not receiving signal from magnet on turbine</p>	<p>Place the bypass valve in the Service position</p> <p>Check that appliance is plumbed correctly</p> <p>Remove sensor from bypass housing. Test with magnet on either flat side of sensor. If flow is indicated, check turbine. If no flow, replace sensor</p>
Flow indicated when water is not being used	<p>The household plumbing system has a leak</p>	<p>Repair the leak</p>
No read-out in display	<p>Electric cord is unplugged</p> <p>No electric power at outlet</p> <p>Defective transformer</p> <p>Defective circuit board</p> <p>High ambient room temperature. If the temperature exceeds 120°F, the display will blank out. This does not affect the operation of the controller</p>	<p>Plug in the transformer</p> <p>Check power source. Make sure outlet is not controlled by a switch</p> <p>Test with volt meter for 12 VAC at control. If less than 10 VAC or greater than 14 VAC, replace the transformer</p> <p>With 12 VAC present at controller, replace the controller</p> <p>No action necessary</p>

Troubleshooting, Cont.

Problem	Possible Cause	Solution
Appliance stays in regeneration	Controller not attached properly Defective magnet disk Foreign object in valve body Broken valve assembly. Motor running	Make sure the controller is pushed all the way onto the drive end cap Replace magnet disk Remove foreign object(s) from the valve body Repair the drive end cap
Excess water in brine cabinet	Restricted, frozen, or pinched drain line Plugged brine line, brine line flow control, or air check/draw tube Plugged injector assembly	Remove restriction, thaw, or straighten drain line Clean flow control, air check/draw tube, and brine line. Clean any sediment from the brine cabinet Clean or replace injector. Replace throat if removed
Not regenerating in proper sequence	Magnet disk defective Defective controller	Replace magnet disk Replace controller
Salty water	Plugged injector Low water pressure Drain line or flow control is restricted Brine line restricted or crimped Excessive amount of water in brine cabinet Insufficient rinse time Intermittent pressure drop from feed source Brine valve drips water back to brine cabinet	Replace injector screen, nozzle, and throat Maintain minimum pressure of 30 psi Remove restriction Remove restriction, replace if crimped Verify correct water level relative to salt setting. Check brine line and fittings for loose connections Check mode setting chart for proper brine rinse time. Adjust time, if necessary Install check valve on the inlet water line to the appliance (Check local plumbing codes first) Clean brine valve housing, replace piston assembly

Water Conditioner Specifications

	400
Max Compensated Hardness gpg (mg/L)	35 (600)
Minimum pH (standard units)	7
Maximum Ferrous Iron	3
Media type and amounts	Chlorostat (2.0 lb) Self Cleaning Filter Media.(1.5 lb) Super Fine Mesh Resin 0.4 cu. ft (0.01 cu. m)
*Salt usage (used per regeneration) / Capacity	1 lb / 4,900 grains
*Salt usage (used per regeneration) / Capacity	2 lb / 8,600 grains
*Salt usage (used per regeneration) / Capacity	3 lb / 10,700 grains
Minimum / Maximum water and ambient temperature	40°/ 120°F
Mineral tank size (in.)	9 I.D.X 16
Flow rate gpm @ 15 psi drop	9.4
Flow rate gpm @ 25 psi drop	12
Maximum flow rate to drain during regeneration(backwash)	2.4 gpm (9.1 Lpm)
Water Pressure (minimum)	20 psi (1.4 bar)
Water Pressure (maximum)	120 psi (8.3 bar)
Minimum water flow required	2.4 gpm (9.1 Lpm)
Controller type	5 Button
Regeneration time [1 lb (0.45 kg) salt setting]	12 minutes
Regeneration time [2 lb (0.91 kg) salt setting]	15 minutes
Regeneration time [3 lb (1.36 kg) salt setting]	18 minutes
Water used/regeneration [1 lb (0.45 kg) salt setting]	10.3 gallons (39 liters)
Water used/regeneration [2 lb (0.91 kg) salt setting]	11.5 gallons (43.5 liters)
Water used/regeneration [3 lb (1.36 kg) salt setting]	13.3 gallons (50.4 liters)
Frequency of regeneration	Demand or Timer
Salt Storage (pellet salt)	30 lb (13.6 kg)
Height	21.5 in.(54.6 cm)
Footprint (width x depth)	11.25 in.(28.6 cm) x 18.5 in.(47 cm)
Electrical Rating	115 VAC, 60 Hz / 220 VAC, 50 Hz
Plumbing Connections	3/4 in. or 1 in. male
Shipping Weight - Approximate	55 lb (25 kg)

* Use clean, white pellet, solar, cube-type, block, or brick salt.

HomeGuard®

has these third-party listings:



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The WQA Gold Seal assures that this product has been tested and validated by the Water Quality Association. This validation assures that all electrical components are UL or CSA listed and all components that are in contact with the treated water are FDA or NSF listed. The appliance conforms to NSF/ANSI 44 for softening performance, efficiency, Barium reduction, and Radium 226/228 reduction as verified and substantiated by test data. Barium/Radium reduction occurs as long as the appliance is softening the water. Test product water hardness every 12 months to check for proper functioning.



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