HAGUE

# HYDROCLEAN® HC3



# OWNER'S MANUAL AND INSTALLATION GUIDE

*VERSION 2.7*

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# 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.

The warranty begins on the date of purchase, or 60 days from the date of manufacture if the date of purchase cannot be verified.

**Coverage**

This limited warranty covers the Hague Quality Water International 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 Warranty**

Hague Quality Water International warrants that upon receipt from the original owner of The Hague Equipment Mineral Tank, Brine Tank, found to be defective in material or workmanship, Hague will replace said part(s) at no charge for those parts for 5 YEARS from date of installation. And thereafter, will replace said parts upon payment of the following percentages of the then current list price: 6th through 10th year - 50% of current price list. Media is not warranted. The warranty period for any replacement will run for the balance of the original warranty length. If industry standards, product improvements, or product obsolescence prohibit Hague from furnishing an identical model replacement and repair is not available, Hague reserves the right to provide a replacement product of comparable capacity and functionality; however, the owner will be charged for the additional value of the replacement, if applicable.

Hague Quality Water International further warrants that upon receipt from the original owner of The Hague Equipment Valve and/or Power System Components (i.e. complete valve or controller) found to be defective in material or workmanship, Hague will replace said part(s), at no charge for those parts, for 5 YEARS from date of installation.

All defective parts must be returned, along with the equipment serial number and date of original installation, to Hague Quality Water International PREPAID, and replacement parts will be returned by Hague Quality Water International 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. Hague Quality Water International 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, sulfur, 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, Hague Quality Water International 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:

Hague Quality Water International
1900 Prospect Court
Appleton, WI, 54914

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). No warranty coverage will be provided if the claimant is unable to provide proof of purchase upon request.

Product registration is available but not required to obtain any of the warranty coverage described herein. Please register your product at haguewater.com/warranty-registration. Scan the QR code to get started.

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# Contents


**Owner Information** ..... **4**
- General Information ..... 4
- Getting Maximum Efficiency From the Appliance ..... 5
- Five-Button Controller ..... 6
- Customer Settings ..... 8
- Checklist Before Installation ..... 9

**Installation and Maintenance Information** ..... **9**
- Precautions ..... 10
- Installation Steps and Start-Up Procedures ..... 11
- Bypass Valve ..... 14
- Blending Valve ..... 15
- Setting and Using the Controller ..... 15
- Service Settings ..... 16
- 1NF Replenishment Procedure ..... 19
- 2IF Iron Filter Sizing Formula ..... 21
- Iron Filter and Potassium Permanganate Feeder Installation Guide ..... 22
- Assembly and Parts ..... 24
- Troubleshooting ..... 39
- Water Conditioner Specifications ..... 41
- Filter Descriptions ..... 41
- Filter Specifications ..... 42


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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 and filter appliance models:

**Softeners**

- 25
- 25CX
- 35
- 48
- 64
- 105

**Filters**

- 2IF
- 1CF
- 1NF
- 1MMF*

If your specific model is not listed here, your appliance has been customized to solve additional water conditioning problems that you may have. Your dealer will be happy to explain any additional special features.

****The HC3 1MMF is not a WQA certified model.***

## For Owner's Reference

Date of Installation: _____

Model Number: _____

Serial Number[1]: _____

Installer's Signature: _____

Dealership Name: _____

Dealership Address: _____

_____

Dealership Phone Number: _____

Hardness: _____

Iron: _____

pH: _____

Water Pressure: _____

Water Temp: _____

Returned Warranty Card Date[2]: _____

[1] The serial number is located on the valve body in front of the bypass.

[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.




**Figure 1: Valve Body Showing Serial Number**

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# 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. For iron filter, see *Filter Specifications*. Refill the salt when the level drops below the water level in the brine tank. A resin cleaner can be used on a monthly basis. Clean white pellet, cube-style, or solar 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. See *Filter Specifications*.
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 chlorine bleach solution to the brine well of the brine tank. Add 1.2 fluid ounces (35 mL) of bleach per cubic foot of resin.
   **Example:**

| Model | Chlorine oz (mL) |
|---|---|
| 25 | 1.0 (30) |
| 25CX | 1.0 (30) |
| 35 | 1.5 (44) |
| 48 | 2.0 (59) |
| 64 | 2.5 (74) |
| 105 | 4.0 (118) |

   The brine tank should have water in it to permit the solution to be carried into the softener. 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. To bypass, turn the blue knob counterclockwise until it hits the stop; turn it clockwise to restore service.
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 tank and air check/draw tube assembly annually or when sediment is present in the brine tank.
12. Potassium permanganate must be replenished periodically for the 2IF iron filter.

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# 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.

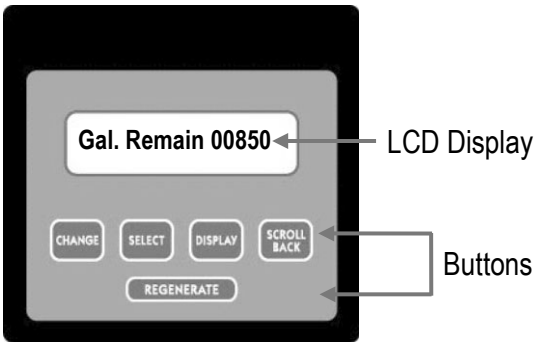



**Figure 2: Five-Button Controller**

| 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<br>• The amount of soft water remaining until the next automatic regeneration (Each person in the household uses about 75 gallons [283 liters] per day)<br>• The number of days until the next regeneration (Mode 1, Filter = No)<br>• The flow rate in gallons (or liters) per minute (Filter = No)<br>• 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.<br>• 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. |
| Select | The Select button is used to move the cursor when setting parameters.<br>1. Press and release the Select button to move the cursor one digit to the right of the parameter to be changed.<br>2. When the cursor is at the extreme right position, press the Select button again to reset the cursor to the extreme left position. |

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# 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. |
| Display | The Display button is used to enter programming modes and also to save a value and display the next value to be changed.<br>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.<br>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. |

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# 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.
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.

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## 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. See *Filter Specifications* for details on each filter.

- ❒ **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 |
| **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.

- ❒ **Water Pressure**—Not less than 20 psi (1.4 bar) constant for models (25, 35, 48) or 30 psi (2.1 bar) for (64, 105, and filters). If water pressure exceeds 70 psi (4.8 bar), a pressure regulator is recommended.
- ❒ **Water Supply Flow Rate**—A minimum of 5 gallons (19 liters) per minute (7 gpm for filters [26.5 L/min]) 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°F (4°C) or greater than 120°F (49°C). For 2IF iron filters, do not exceed 80°F (27°C).
- ❒ **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*.
- ❒ **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.

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# 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 to ensure water will flow through it freely and that the inlet pipe is sized correctly. For well water with iron, the recommended minimum inlet pipe size is 3/4-inch I.D. and for municipal water the recommended minimum inlet pipe size is 1/2-inch I.D.
6. Install a gravity drain on the brine tank.
7. Secure the drain line on the appliance and at the drain outlet. See *Installation Steps and Start-Up Procedures*. Install the drain line so that there is a 2-inch (5 cm) air gap between the drain line and the drain outlet.
8. Allow a minimum of 8 to 10 feet (2.4 to 3.0 m) 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.

**Note:** A bacteriostasis claim does not mean that these devices will make microbiologically unsafe water safe to consume or use.

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# 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 Figure 4. **Caution:** Do not plumb the appliance in backward.
F. Place the appliance in the desired location using Figure 3 as a guide. The diagram in Figure 3 applies to basement, slab, crawl space, and outside installations.
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 (3 meters) 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.

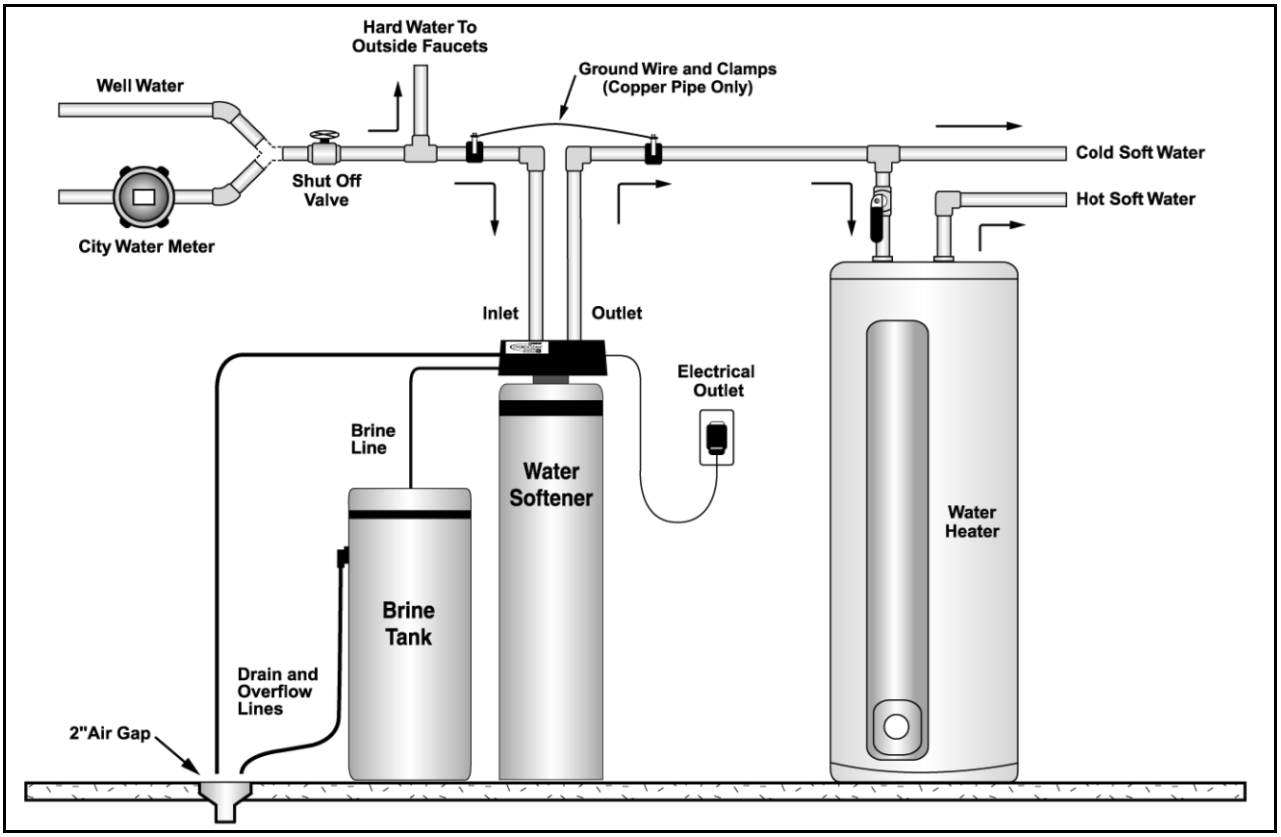



**Figure 3: Appliance Placement**

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# 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*

A. Connect water lines in compliance with all state and local, building, plumbing, and electrical codes.

## Step 4 *Connect the Brine Tank*

A. Connect the brine tank to the valve head with the flexible 3/8-inch poly tube included with the appliance. Insert the plastic insert in the end of the brine tube. See Figure 23.

## Step 5 *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 each overflow elbow is in the down position.
B. Connect 1/2-inch 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 (8 cm) lower than the bottom of the overflow fitting. Maintain a minimum of 2-inch (5 cm) between the overflow line and the flood level rim of the waste receptor to prevent back-siphoning. The gravity line cannot be run overhead.

## Step 6 *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 of 1/2-inch I.D. tubing (not supplied). The size cannot be reduced.
   **Note:** If the drain line is 25 feet (7.6 meters) 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.
B. Route the drain line to a floor drain, laundry tub, or other suitable waste receptor. Maintain the same 2-inch (5 cm) air gap as with the overflow line. This drain line should make the shortest run to the suitable drain.
C. The drain line may be elevated up to 8 feet (2.4 meters) from the discharge on the appliance as long as the water pressure in your system is 40 psi (2.8 bar) or more.

## Step 7 *Flush Lines*

A. Place the bypass valve 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.

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# Installation Steps and Start-Up Procedures, Cont.

## Step 8 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 valve 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.

## Step 9 Plug in the Transformer

A. Connect the transformer power cord to the back of the controller.
B. Plug the transformer into an appropriate outlet.
C. Ensure that the outlet selected is not operated by an On/Off switch.

## Step 10 Set Up the Controller

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

## Step 11 Add Water to the Brine Tank

A. Add water to the brine tank to a minimum of 2 inches (5 cm) above the grid plate. After the first regeneration, the appliance will automatically refill the correct amount of water into the brine tank.
B. Ensure that the bypass valve is in the Service position.
C. Ensure that the salt dosage is set as recommended for the application.
D. 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 tank until the air check/draw tube sets (8–10 minutes).
E. Press the Regenerate button to advance to the Brine Refill position. Let the tank fill with the proper amount of water. The controller will then step the main control valve to the Home position.
   **Note:** This initial startup is the only time you will add water to the brine tank. Do not add water at any other time.

## Step 12 Fill the Brine Tank With Salt

A. Fill the brine tank with salt. Use clean white pellet, cube-style, 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.
B. 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.

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# Installation Steps and Start-Up Procedures, Cont.

## Step 13 *Complete the Installation*

A. Ensure that the bypass valve is left in the Service position. See Figure 4.
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 (272 liters) 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 2.
E. Adjust the blending valve if it is being used. See *Blending Valve*.
F. Test the water at the test port to verify soft water.
G. Place the cover on the cabinet.

# 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 valve is attached to the main control valve. See Figure 4. To engage the bypass valve, locate the blue knob on top of the bypass valve. Turn the knob counterclockwise until it hits the stop. 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 blue knob clockwise until it hits the stop.




**Figure 4: Bypass Valve**

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# Blending Valve

In some situations, the blending valve may be used to decrease water softness. The amount of hardness blended back into the water line is determined by the hardness of the incoming water and the setting of the blending valve. Where extremely hard water is present, the blending valve may only need to be "cracked" open. Where the incoming water has relatively low levels of hardness, the blending valve will need to be opened further.

The blending valve is located between the input and output connections on the top of the bypass valve. See Figure 4. It is adjusted by placing a flat blade screwdriver in the slot provided and turning clockwise to open. Total movement of the blending valve from full closed to full open is 1/4 revolution. Precise setting of the blending valve will require "trial and error" testing. The initial setting should be conservative. Because of the blending valve's ease of access and adjustment, the user can increase or decrease the setting according to their preference over a period of time.

Use of the blending valve is not recommended where objectionable concentrations of ferrous iron or sediment are present. Because the blending valve is mixing "raw" water with softened, any ferrous iron or sediment in the "raw" water will also be blended and reintroduced into the softened water line.

**Note:** If the appliance is installed for barium and/or radium reduction, the blending valve must remain in the fully closed position at all times.

# 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 9.

## 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 5: Regenerate Button**

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# 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<br>Entrer Langue Fra<br>Entre La Leng. Esp<br>Sprache deutsch<br>Scelta Lingua IT | |
| Units ENG | Units of measure | ENG or MET | |
| Soft. v. # X.XX | Displays the current software version | Cannot be set | |
| Mode 2 | Operating Mode:<br>Timer (Mode 1)<br>Demand Delayed (Mode 2) | 1 or 2 | See *Operating Modes* |
| Regen Freq. 01 | How often regeneration occurs | 1–12 days | Only displays when in Mode 1 |
| Hard. Gr. 040 | Hardness of the water that was tested | 003 to 999 Grains<br>(00000 to 99999 mg/L) | This is the actual hardness reading and is not compensated for iron and/or manganese |
| Iron ppm 00 | 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 00 | 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 tank | Sodium or Potassium | See *Warning* |
| Comp. Hard. 00040 | Compensated hardness using the hardness, iron, and manganese settings | Cannot be set<br>ppm or mg/L | The formula used is:<br>Hardness + (4 x each ppm iron) + (4 x each ppm manganese) = compensated hardness |
| Capac. Gr. 24480 | The desired softening capacity number | 00000 to 99999 Grains<br>(0000 to 9999 gm) | See *Water Conditioner Specifications* or *Modes 1 and 2 Setting Chart* for capacities based on salt usage |

**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.

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# Service Settings, Cont.

| Display | | Meaning | Possible Values | Comments |
|---|---|---|---|---|
| 72–96 hr Regen | Yes | A way to force regeneration at regularly scheduled intervals | No (or Yes, for iron) | See *72–96 Hour Regeneration* |
| Backwash 1 | 03.0 | Number of minutes the first backwash cycle lasts | 00.0 to 99.9 | Set to the nearest tenth of a minute |
| 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 | 02.0 | Number of minutes the second backwash cycle lasts | 00.0 to 99.9 | Set to the nearest tenth of a minute |
| Salt lbs. | 06.0 | 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 | No | 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 | No or Yes | If set to Yes, it will disable the flow GPM on home screen and removes salt=sodium/potassium option |
| Signal Mode | 0 | Used by qualified service personnel | No or Yes 0,1,2,3 | Has no effect on the function of the appliance |

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

## Operating Modes

The appliance has two operating modes: Timer mode and Demand 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—Demand Delayed mode*

When the appliance is in Demand 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.

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# Service Settings, Cont.

## Mode 1 (Timer) and Mode 2 (Demand Delayed) Setting Chart

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

| | 25* | 25CX** | 35* | 48* | 64* | 105* |
|---|---|---|---|---|---|---|
| **#1 Salt Setting** | | | | | | |
| Backwash 1 (minutes) | 0 | 0 | 0 | 0 | 0 | 0 |
| Brine/Rinse (minutes) | 11 | 11 | 15 | 20 | 11 | 18 |
| Backwash 2 (minutes) | 10 | 10 | 10 | 10 | 10 | 10 |
| Capacity–grains @ salt–lb (grams @ salt–kg)*** | 9,100 @ 2.0 (589 @ 0.9) | 9,100 @ 2.0 (589 @ 0.9) | 12,500 @ 2.8 (810 @ 1.3) | 17,100 @ 3.8 (1108 @ 1.7) | 22,800 @ 5.0 (1477 @ 2.3) | 37,600 @ 8.3 (2436 @ 3.8) |
| **#2 Salt Setting** | | | | | | |
| Backwash 1 (minutes) | 0 | 0 | 0 | 0 | 0 | 0 |
| Brine/Rinse (minutes) | 16 | 16 | 22 | 30 | 17 | 28 |
| Backwash 2 (minutes) | 10 | 10 | 10 | 10 | 10 | 10 |
| Capacity–grains @ salt–lb (grams @ salt–kg) | 12,500 @ 3.0 (810 @ 1.4) | 12,500 @ 3.0 (810 @ 1.4) | 17,200 @ 4.2 (1114 @ 1.9) | 23,400 @ 5.7 (1516 @ 2.6) | 31,200 @ 7.6 (2021 @ 3.4) | 51,500 @ 12.5 (3337 @ 5.7) |
| **#3 Salt Setting** | | | | | | |
| Backwash 1 (minutes) | 0 | 0 | 0 | 0 | 0 | 0 |
| Brine/Rinse (minutes) | 21 | 21 | 29 | 40 | 22 | 37 |
| Backwash 2 (minutes) | 10 | 10 | 10 | 10 | 10 | 10 |
| Capacity–grains @ salt–lb (grams @ salt–kg) | 15,100 @ 4 (978 @ 1.8) | 15,100 @ 4 (978 @ 1.8) | 20,800 @ 5.5 (1347 @ 2.5) | 28,500 @ 7.5 (1846 @ 3.4) | 37,900 @ 10 (2455 @ 4.5) | 62,600 @ 16.5 (4056 @ 7.5) |
| **#4 Salt Setting** | | | | | | |
| Backwash 1 (minutes) | 0 | 0 | 0 | 0 | 0 | 0 |
| Brine/Rinse (minutes) | 30 | 30 | 41 | 56 | 31 | 51 |
| Backwash 2 (minutes) | 10 | 10 | 10 | 10 | 10 | 10 |
| Capacity–grains @ salt–lb (grams @ salt–kg) | 18,900 @ 5.6 (1224 @ 2.5) | 18,900 @ 5.6 (1224 @ 2.5) | 25,900 @ 7.7 (1678 @ 3.5) | 35,300 @ 10.5 (2287 @ 4.8) | 47,100 @ 14 (3052 @ 6.4) | 77,800 @ 23.1 (5041 @ 10.5) |
| **#5 Salt Setting** | | | | | | |
| Backwash 1 (minutes) | 0 | 0 | 0 | 0 | 0 | 0 |
| Brine/Rinse (minutes) | 64 | 64 | 88 | 99 | 67 | 99 |
| Backwash 2 (minutes) | 10 | 10 | 10 | 10 | 10 | 10 |
| Capacity–grains @ salt–lb (grams @ salt–kg) | 21,700 @ 12 (1406 @ 5.4) | 27,100 @ 12 (1406 @ 5.4) | 29,900 @ 16.5 (1937 @ 7.5) | 40,800 @ 22.5 (2643 @ 10.2) | 54,400 @ 30 (3525 @ 13.6) | 89,200 @ 49.5 (5780 @ 22.5) |

* When iron is present in the water supply, regeneration frequency cannot exceed 96 hours. Additionally, a minimum salt setting of 7 lb (3.2 kg) per cubic foot of resin is required (#4 salt setting.)

** This model is designed for use on chlorinated, municipal water supplies only. Reduces tastes, odors, chlorine, and most man-made pollutants.

*** Do not use standard 18-inch (2.5 cm) diameter brine tank with salt grid for salt settings less than 3 lb (1.4 kg).

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# 1NF Replenishment Procedure

The neutralizing media that adjusts the pH level of the water must be refilled periodically. Typically, this media is calcite and is available from Hague. To refill the neutralizing media, measure the appliance's media bed depth upon installation (factory freeboard). Use this measurement to determine the amount of media to add to maintain optimum performance of the 1NF.

## Tools and Materials Needed

The following tools and materials are needed to replace the neutralizing media:

- Analog scale (do not use digital)
- Steel tape measure
- 5-gallon bucket with handle
- Replacement media (P/N M050)
- 1/2-inch siphon hose
- Funnel with 1-inch fill tube
- 36-inch wooden ruler or dowel rod
- 3/4-inch cap plug

## Replenishment Procedure

The replenishment procedure is as follows:

### Step 1 *Turn Off the Water*

A. Turn off the water to the appliance.
B. Open a tap to depressurize the appliance.
C. Close the tap.
D. Remove the screws that secure the bypass.

### Step 2 *Remove Water From Media Tank*

A. Remove the control valve from the tank and plug the riser to prevent media from dropping into the riser.
B. Insert the siphon hose into the tank.
C. Siphon the water into the bucket down to the media level in the tank.

### Step 3 *Calculate Amount of Media to Add*

A. Measure the freeboard distance from the top of the tank to the media. SeeFigure 6.
**Note:** The recommended freeboard distance is 14 inches (36 cm).
B. Add four pounds (1.8 kg) of media per inch below 14 inches (36 cm).

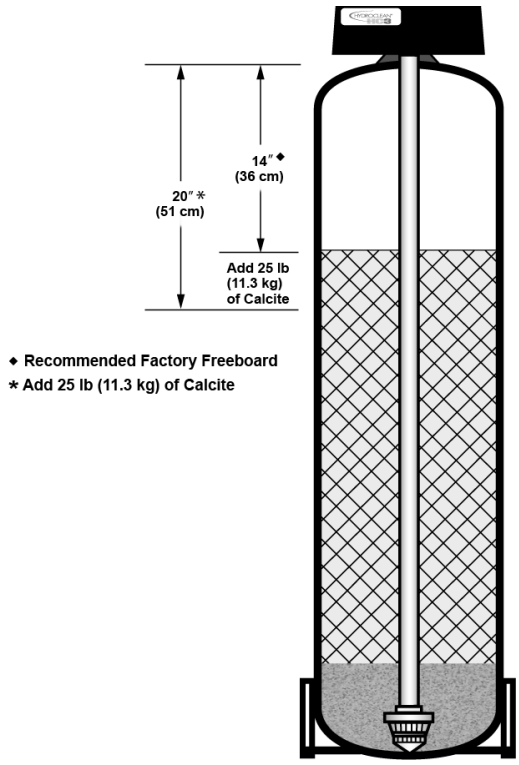



**Figure 6: Max Freeboard Amount**

**Example:**

| | |
|---|---|
| Measured freeboard | 20 inches (51 cm) |
| Minus factory freeboard | - 14 inches (36 cm) |
| Adjusted freeboard | 6 inches (15 cm) |

Replenishment equals approximately 25 lb* (11.3 kg) of media.

* Add 25 lb (11.3 kg) of Calcite (P/N M050). It is not necessary to replenish the 1NF before the freeboard reaches 20 inches (51 cm). Rebedding a 1NF requires a Calcite/Corosex Mix (P/N M090).

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# 1NF Replenishment Procedure, Cont.

## Step 4 *Add Replenishment Media*

A. Weigh the replenishment media.
B. Place the funnel into the tank.
C. Pour the media into the funnel to fill the tank with the measured amount of media.

## Step 5 *Replace Control Valve*

A. Make sure the threads of the tank are clean.
B. Replace the control valve.
**Caution:** Do not overtighten the control valve.

## Step 6 *Check for Leaks*

A. Turn on the water to re-pressurize the appliance.
B. Check for leaks.
C. Fix any leaks.

## Step 7 *Backwash Neutralizer*

A. Press the Regenerate button.
B. When the controller reads “Backwash,” slowly rotate the bypass knob clockwise to displace air until the drain runs steady. Fully rotate the bypass knob clockwise to place the appliance in the Service position. Let the appliance finish the backwash cycle and return to service.

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# 2IF Iron Filter Sizing Formula

This iron filter may be programmed to regenerate every 1–12 days. Select the frequency based on the amount of iron in the water and the number of people in the household. **For optimum performance, program the water softener to regenerate first, followed by the iron filter.**

**Example:** Softener 1:00 am; Iron Filter 3:00 am.

## Regeneration Cycle Frequency Worksheet

This table will help you determine how often the iron filter will need to regenerate.

| | Worksheet | | Example | |
|---|---|---|---|---|
| Total Iron | ____ ppm (mg/L) x 1 = | ____ ppm (mg/L) | 3.5 ppm (mg/L) x 1 = | 3.5 ppm (mg/L) |
| + Manganese* | ____ ppm (mg/L) x 3 = | ____ ppm (mg/L) | 0.2 ppm (mg/L) x 3 = | 0.6 ppm (mg/L) |
| + Sulfur | ____ ppm (mg/L) x 5 = | ____ ppm (mg/L) | 1.0 ppm (mg/L) x 5 = | 5.0 ppm (mg/L) |
| **= Total compensated ppm** | | **____ ppm (mg/L)** | | **9.1 ppm (mg/L)** |
| x Gallons per day for one person | | 75 gallons (284 L) | | 75 gallons (284 L) |
| **= ppm per person per day** | **=** | **____ ppm (mg/L)** | | **682.5 ppm (mg/L)** |
| x Number of people in household | | ____ people | | 3 people |
| **= Daily ppm capacity** | **=** | **____ ppm (mg/L)** | | **2048 ppm (mg/L)** |
| Iron filter capacity | | 8000 ppm (mg/L) | | 8000 ppm (mg/L) |
| ÷ Daily ppm requirements | | ____ ppm (mg/L) | | 2048 ppm (mg/L) |
| = Frequency of regeneration | | ____ days | | 3.9 days |
| Set regeneration frequency | @ | ____ days | | 3 days |

*If manganese is unknown, multiply the iron and sulfur total by 1.15 to adjust total compensated ppm.

## Determine Monthly Usage

This table will help you determine how much regenerant the iron filter will use each month.

| | Worksheet | Example |
|---|---|---|
| Total days per month | ____ days | 30 days |
| ÷ Frequency of regeneration | ____ days | 3 days |
| **= Regenerations per month** | **____ regenerations** | **10 regenerations** |
| x 4 oz per regeneration = oz $KMnO_4$ per month | ____ oz | 4 oz (118 g) x 10 regenerations = 40 oz (1.1 kg) |
| ÷ 16 **= lb per month** | **____ lb** | 40 oz (1.1 kg) ÷ 16 oz/lb (1 kg/kg) **= 2.5 lb (1.1 kg)** |

**Notes:**

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# Iron Filter and Potassium Permanganate Feeder Installation Guide

**Important:** This iron filter is capable of treating a combination of undesirable constituents in the water (iron, manganese, and/or hydrogen sulfide). However, the filter must be applied within the operating limits stated in the *Filter Specifications* in this manual. Failure to comply with these specifications will degrade performance and possibly cause the control valve to malfunction.

**Note:** The iron filter should be installed after the pressure tank or water meter and before the water heater or any water softener appliance, unless otherwise recommended. See Figure 7. A minimum 3/4-inch pipe is required for proper function of the filter. Examine the inlet piping to make sure the pipe is not plugged with lime or iron. If the piping is plugged, it must be cleaned or replaced.

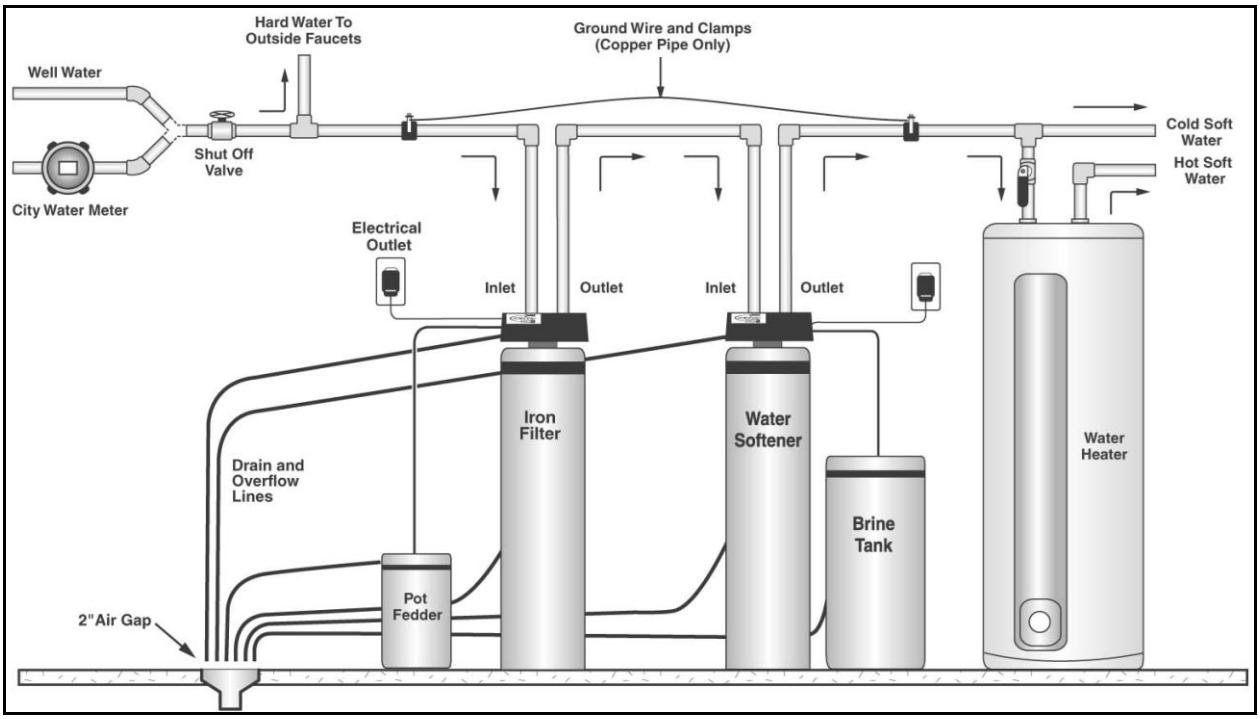



**Figure 7: Iron Filter and Potassium Permanganate Feeder Placement**

## Step 1 *Install Filter*

A. Follow steps 1–3 of *Installation Steps and Start-Up Procedures*.
B. Instead of connecting the brine tank, connect the potassium permanganate feeder as outlined below.

## Step 2 *Unpack Feeder*

A. Remove feeder from shipping carton.
B. Read the instructions in red, remove the label from the feeder, and discard it into the shipping carton.
C. See Figure 7 for feeder placement.
D. Remove the cover and set it aside.
E. Pull up on the brine well cap to remove the safety shutoff assembly. Remove the rubber band from the air check/draw tube float rod assembly and replace the safety shutoff back into the brine well.
F. Remove the plastic bag containing the three stainless steel screws and the 3/8-inch tubing.

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# Iron Filter and Potassium Permanganate Feeder Installation Guide, Cont.

## Step 3 Connect Lines

A. Connect the 3/8-inch tubing to the brine valve on the filter by pushing the tube to the stop. Pull back on the tubing to install the red locking clip behind the collet.
B. Connect the tubing to the feeder.
C. Connect the overflow line.

## Step 4 Add Water to Feeder

A. Add 2 gallons (7.6 liters) of treated water to the feeder. The water should cover the felt pad by at least 1/2 inch (1.3 cm).
**Caution:** Do not use water that contains iron, manganese, or hydrogen sulfide.
**Caution:** Do not adjust the float assembly. This feeder is preset for a 4-ounce (118 mL) feed of potassium permanganate. Use care when working with potassium permanganate. Follow instructions printed on the cover of the feeder as well as the instructions on the potassium permanganate container.

## Step 5 Set Air Check/Draw Tube

A. Allow the water to be drawn out of the feeder until the air check/draw tube sets and then let the feeder tank refill to the right level.
B. Follow steps 5–10 of *Installation Steps and Start-Up Procedures*.

## Step 6 Add Potassium Permanganate to Feeder

A. Slowly add 5 lb (2.3 kg) of potassium permanganate ($KMnO_4$) to the feeder. Coarse granular potassium permanganate is recommended for this filter appliance (P/N 5030).
**Warning:** Follow the safety instructions on the container when working with potassium permanganate. Use care when removing the cover and pouring it into the feeder.
B. Place the cover on the feeder and secure it with the three stainless steel screws.

## Step 7 Regenerate Filter

A. Regenerate the iron filter immediately to charge the manganese greensand. To start a regeneration, push and hold the Regenerate button until the controller displays "Going to."

## Step 8 Complete the Installation

A. Follow Step 13 of the *Installation Steps and Start-Up Procedures*.

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# Assembly and Parts

## Hook-Up/Cover Assembly

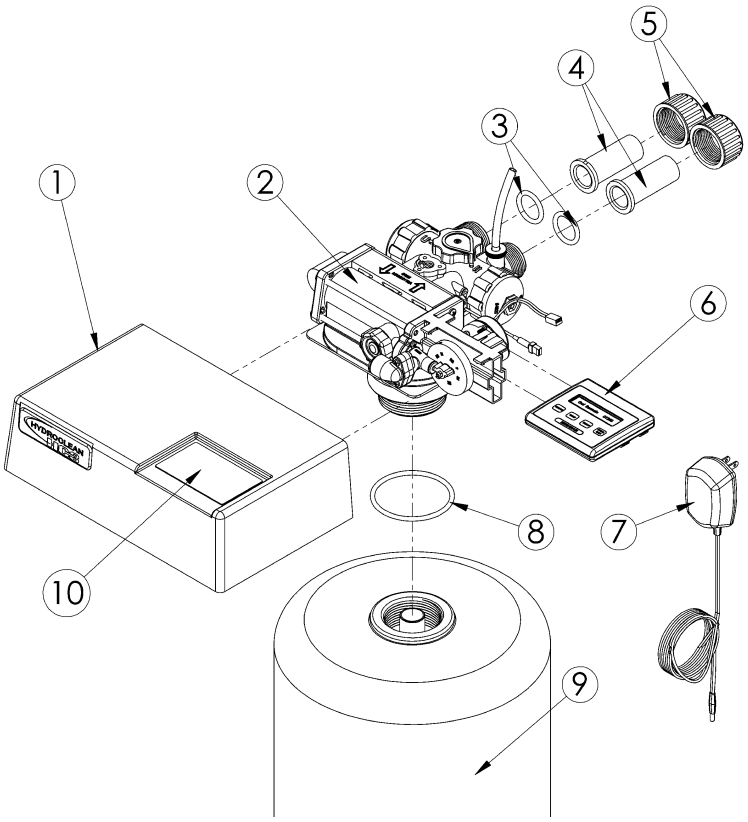



**Figure 8: Hook-Up/Cover Assembly**

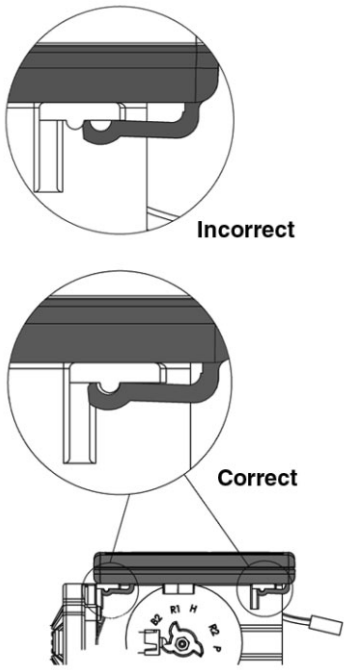



**Figure 9: Controller Tab Lock Detail**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | 53008 | Valve Cover (Rain Resistant) without Label (optional) | 1 |
| | 53500 | Valve Cover (Rain Resistant) with Label (standard) | |
| | 53505 | Valve Cover Assembly with Window (optional on Custom Valves) | |
| 2 | 53501 | Valve Assembly w/O-Ring | 1 |
| 3 | 90837 | Hook Up O-Ring* | 2 |
| 4 | 90259 | 1-inch CPVC CTS Adapter* | 2 |
| | 90254 | 3/4-inch/1-inch Copper Adapter* (optional) | |
| | 90258 | 1-inch Copper Adapter* (optional) | |
| | 90256 | 3/4-inch PVC Adapter* (optional) | |
| 5 | 90251 | Bypass Nut* | 2 |
| 6 | 54550 | 5 Button Controller | 1 |
| 7 | 93245 | Transformer | 1 |
| 8 | 53202 | Tank O-Ring | 1 |
| 9 | BT844 | Resin Tank Jacket (Not included with Model 25 Valve) | 1 |
| | BT948 | Resin Tank Jacket (Not included with Model 25 Valve) | |
| | BT1047 | Resin Tank Jacket (Not included with Model 25 Valve) | |
| | BT1054 | Resin Tank Jacket (Not included with Model 25 Valve) | |
| 10 | 95209 | Clear Viewing Panel (on 53505 Custom Valve Cover Only) | 1 |

* Parts 3, 4, and 5 make up the hook-up kit. Part numbers for kits are, respectively, 90513, 90509, 90512, and 90511.

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# Assembly and Parts, Cont.

## Standard Brine Tank Assembly

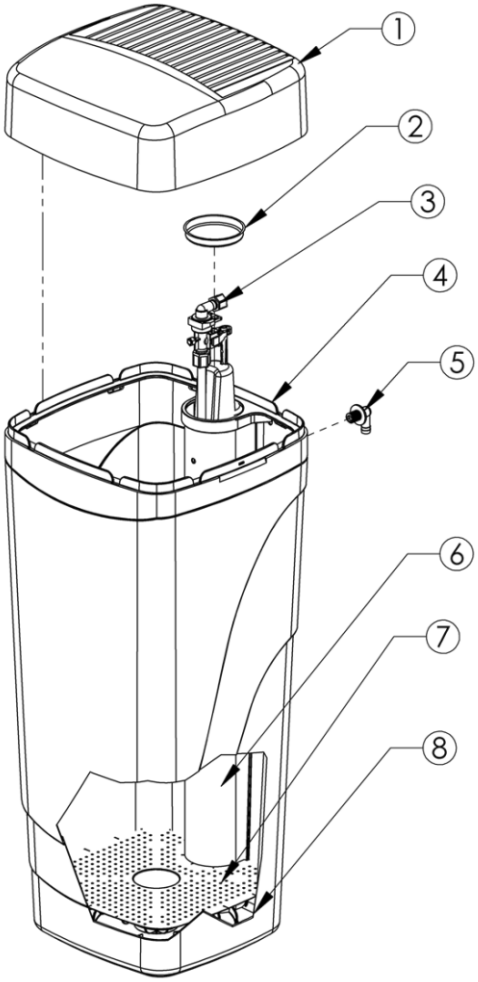



**Figure 10: Standard Brine Tank Assembly (25, 25CX, 35, and 48)**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | 54006 | Brine Tank Cover | 1 |
| 2 | 90103 | Brine Well Cap | 1 |
| 3 | 54625 | Safety Shutoff Assembly | 1 |
| 4 | 54007 | Support Panel (BT) | 1 |
| 5 | C0700A | Cabinet Overflow | 1 |
| 6 | 54008 | Brine Well | 1 |
| 7 | 54009 | Grid Plate | 1 |
| 8 | 54003 | Cabinet | 1 |
| | 54509 | Entire Assembly (all of the above parts) | |

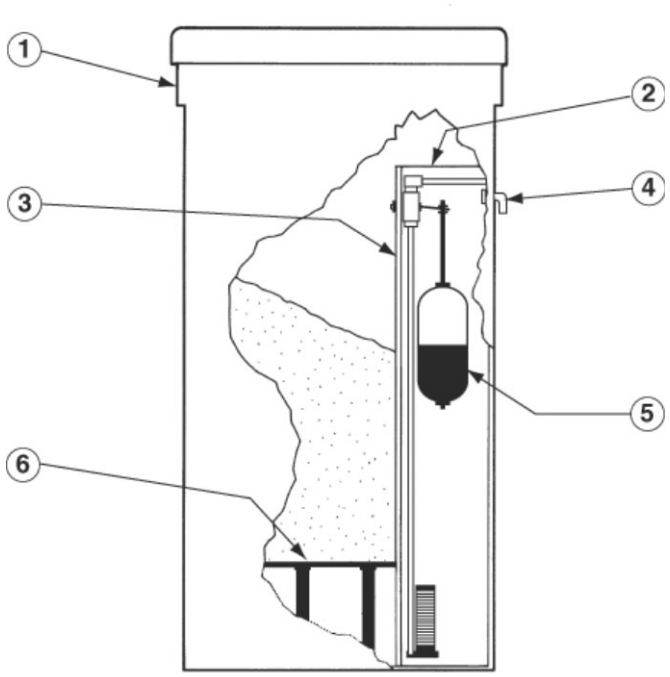



**Figure 11: Standard 24" x 50" Brine Tank (64 and 105)**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | BT2450 | 24-inch x 50-inch Brine Tank and Lid | 1 |
| 2 | C0600 | Brine Well Cap | 1 |
| 3 | C0850 | Brine Well | 1 |
| 4 | C0700A and C0700B | Overflow Elbow and Nut | 1 |
| 5 | H5300 | Safety Shut-off Assembly with Float and Air Check/Draw Tube | 1 |
| 6 | C0670 | Grid Plate | 1 |
| | 93848 | 3/8-inch x 5-feet Brine Line (not shown) | 1 |
| | UAS-175 | Entire Assembly (all of the above parts) | |

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# Assembly and Parts, Cont.

## Optional Brine Tank Assembly

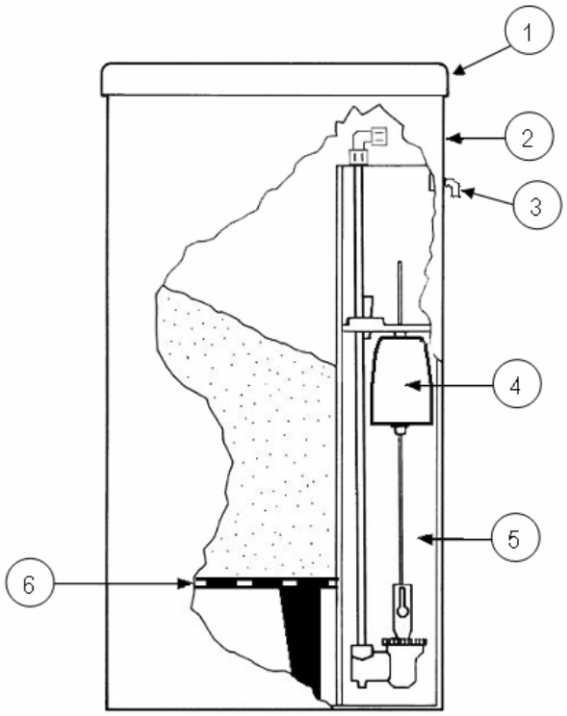



**Figure 12: Optional Brine Tank Assembly**

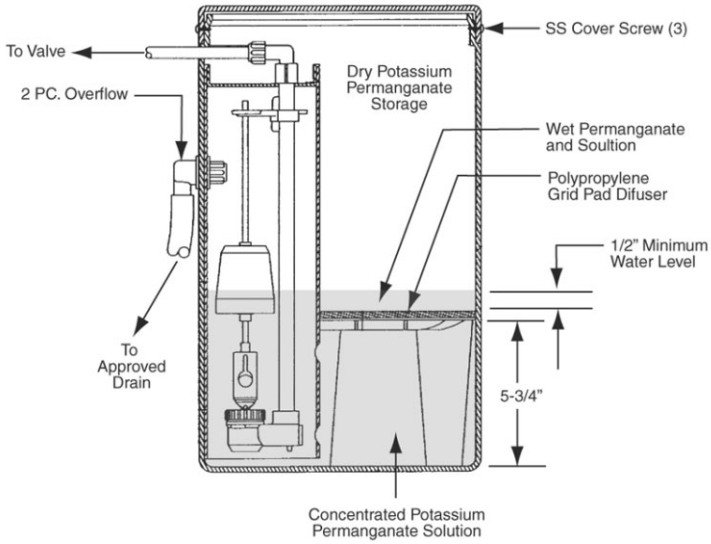


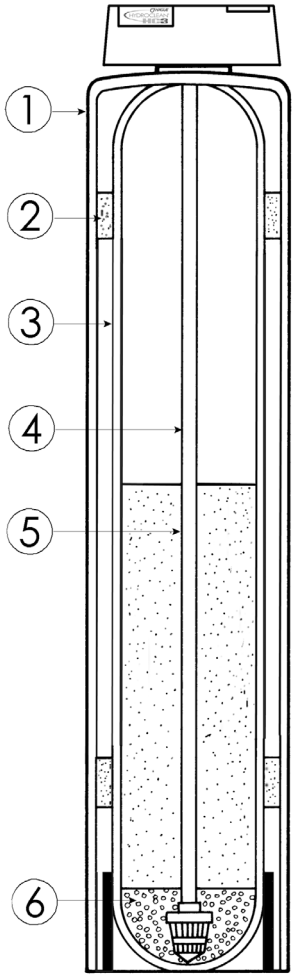

**Figure 13: Potassium Permanganate Feeder (P/N PT1424)**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | BT055 | Brine Tank Cover | 1 |
| 2 | BT1833-HWC | Brine Tank | 1 |
| 3 | C0700 | Overflow Fitting | 1 |
| 4 | 93811-26.5 | Air Check/Draw Tube Assembly | 1 |
| 5 | C0800 | Brine Well | 1 |
| 6 | C0650 | Grid Plate | 1 |
| 7 | 93848 | 3/8-inch X 5-feet Brine Line (not shown) | |
| | 53560 | Brine Tank Assembly (all of the parts above) | |

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# Assembly and Parts, Cont.

## Resin Tank Assembly




| | Part # | Description |
|---|---|---|
| 1 | BT844 | Thermo Jacket – 44" |
| | BT948 | Thermo Jacket - 48" |
| | BT1047 | Thermo Jacket - 47" |
| | BT1054 | Thermo Jacket - 54" |
| 2 | C1400 | Thermo Foam - 8" |
| | C1430 | Thermo Foam - 9" |
| | C1480 | Thermo Foam - 10" |
| 3 | MT844 | Thermo Tank - 8" x 44" |
| | MT948 | Thermo Tank - 9" x 48" |
| | MT1047 | Thermo Tank - 10" x 47" |
| | MT1054 | Thermo Tank - 10" x 54" |
| | MT1252 | Thermo Tank - 12" x 52" |
| | MT1465 | Thermo Tank - 14" x 65" |
| 4 | CAS-820 | 1-inch Riser Special Series |
| | CAS-822 | 1-inch Riser 2TN, 25 |
| | CAS-823 | 1-inch Riser 25CX, 35 |
| | CAS-824 | 1-inch Riser 48 |
| | CAS-827 | 1-inch Riser 64 |
| | CAS-828 | 1-inch Riser 105 |
| 5 | M010 | Resin - C249 High Capacity |
| | M030 | Manganese Greensand |
| | M049 | Activated Carbon |
| | M050 | Calcite |
| | M060 | Corosex |
| | M090 | Calcite / Corosex Mix |
| 6 | M035 | Quartz Gravel |

**Figure 14: Resin Tank Assembly**

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# Assembly and Parts, Cont.

## Valve Assembly

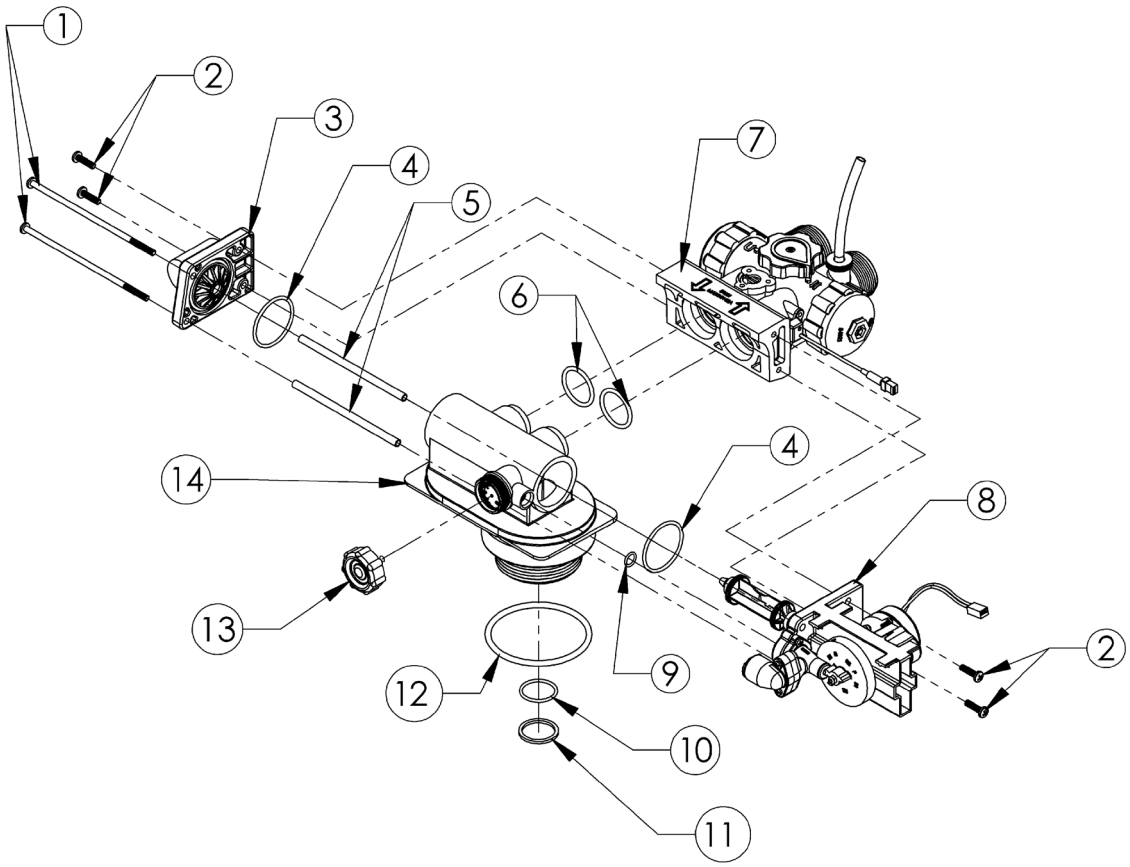



**Figure 15: Valve Assembly**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | 93809 | End Cap Screw | 2 |
| 2 | 93870 | End Cap Screw | 4 |
| 3 | 90614 | Drain End Cap Assembly | 1 |
| 4 | 93808 | O-Ring | 2 |
| 5 | 93835 | Spacer Tube | 2 |
| 6 | 93838 | I/O Adapter O-Ring | 2 |
| 7 | 54600 | Bypass Valve Assembly | 1 |
| 8 | 95301T-JG* | Drive End Cap Assembly | 1 |
| | 95302T-BWO* | Drive End Cap Assembly-Backwash Only | |
| 9 | 120110 | Small End Cap O-Ring | 1 |
| 10 | 53201 | Pilot O-Ring | 1 |
| 11 | 53004 | Pilot O-Ring Retainer | 1 |
| 12 | 53202 | Tank O-Ring | 1 |
| 13 | 93504 | Injector Assembly | 1 |
| | 93504-Red | Injector Assembly- 64, 105, and 2IF | |
| 14 | 53501 | Valve Housing | 1 |

* This assembly does not include a magnet disc or drive motor, and must be ordered separately.

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# Assembly and Parts, Cont.

## Brine Valve Housing Assembly

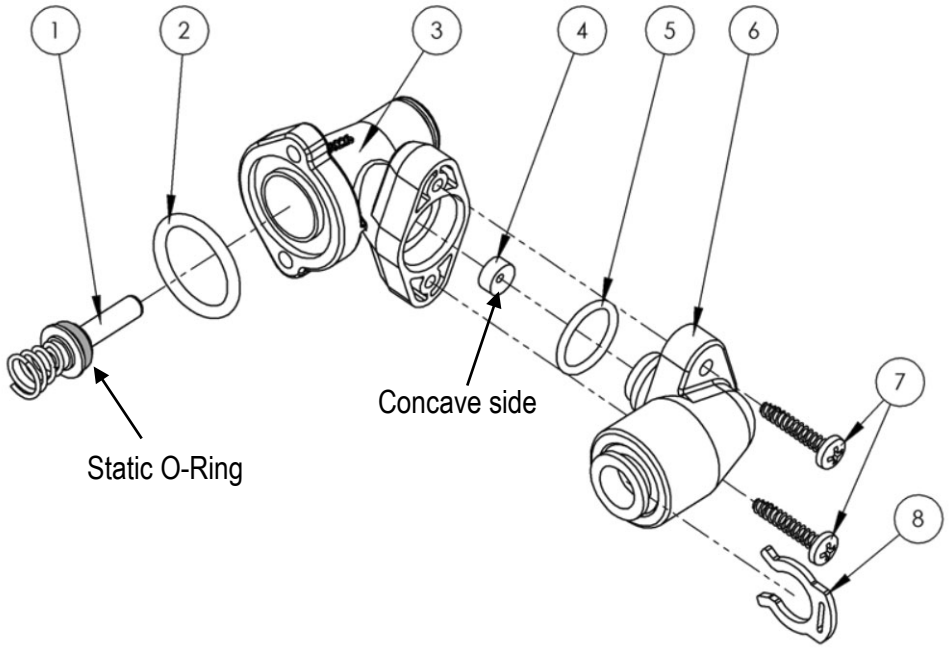



**Figure 16: Brine Valve Housing Assembly**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | 53511 | Piston Assembly (includes O-Ring & Spring) | 1 |
| 2 | 90821 | O-Ring | 1 |
| 3 | 53510 | Housing (Not sold separately) | 1 |
| 4 | 90843 | 0.5 gpm Flow Control | 1 |
| 5 | 93805 | O-Ring | 1 |
| 6 | 93247 | Housing End Cap (Not sold separately) | 1 |
| 7 | 90818 | Screw, self-tapping | 2 |
| 8 | 200199 | 3/8-inch Locking Clip | 1 |
| | 93601-JG | 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 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. |
| **93247 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 onto the housing end cap, lubricate with silicone grease and then using a twisting action, insert the Cap into the housing.<br>**Caution:** The 3/8-inch locking clip must be installed to prevent air from being drawn into the appliance during brine rinse. |

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# Assembly and Parts, Cont.

## Bypass Valve Assembly

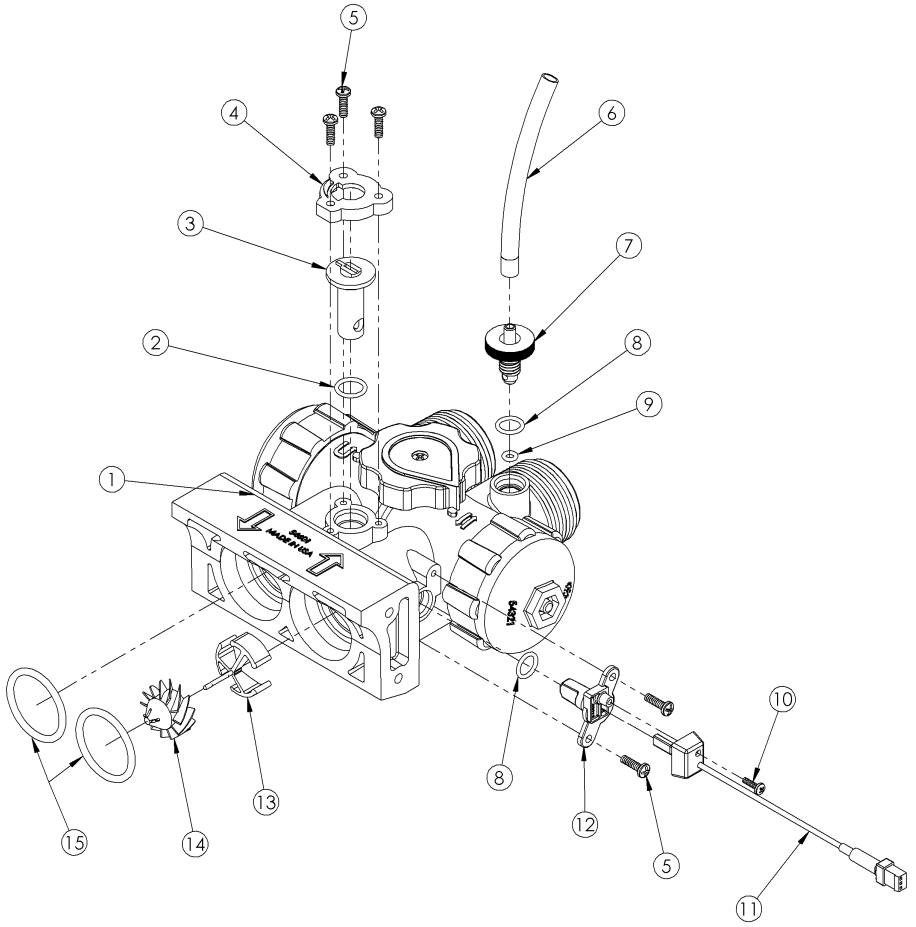



**Figure 17: Bypass Valve Assembly**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | 54600 | Bypass Valve Assembly (also includes items 2-15) | 1 |
| 2 | 90827 | O-Ring | 1 |
| 3 | 90222 | Blending Dial | 1 |
| 4 | 90252 | Cap - Blending Dial | 1 |
| 5 | 90802 | Screw | 5 |
| 6 | 90812 | Tubing 4.0-inch | 1 |
| 7 | 90226 | Test Port Valve | 1 |
| 8 | 90828 | O-Ring | 2 |
| 9 | 90264 | O-Ring | 1 |
| 10 | 90809 | Screw | 1 |
| 11 | 93860 | Turbine Sensor Wire with Cap | 1 |
| 12 | 93271 | Turbine Sensor Housing | 1 |
| 13 | 54320 | Plastic Turbine Axle | 1 |
| 14 | 90522 | Turbine Assembly | 1 |
| 15 | 93838 | O-Ring | 2 |

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# Assembly and Parts, Cont.

## Bypass Valve Assembly Cont.

| | |
|---|---|
| **90252 Blending Dial Cap** | The Cap should be held in place by the three 1/2-inch self-tapping screws and be in the proper orientation. |
| **90222 Blending Dial** | The Dial permits the addition of "untreated water" into the soft water outlet. It is closed when pointing toward the Main Control Valve and open when pointing toward the inlet side. |
| **90226 Test Port Valve** | The Test Port Valve is used to draw water samples from the unit. When the Bypass Valve is in the Service position, the water tested should be soft, treated water. When the Bypass Valve is in Bypass position, the water treated is from the raw, incoming water supply.<br>**Note:** There are two types of seals on the Test Port. One seal is an O-Ring which seals off the threaded area when the Valve is opened. The other seal is a compression O-Ring seal between the Test Port Valve material and the Bypass Housing. If this seal is "overtightened," it can damage the O-Ring and cause a permanent leak. |
| **93860 Turbine Sensor Wire with Cap** | Picks up the magnetic field from the Turbine and relays it to the Controller. Care should be taken when putting the Sensor Wire into the Sensor Housing. The cap is then put in place and the self-tapping mounting screw is installed. A slot is provided in the cap for the wire to exit. The three-wire socket connector must be properly installed in the controller. Stops on the connector prevent improper (upside down) assembly. Do not force the connector past the stops. |
| **54320 Plastic Turbine Axle** | Sits on a ridge in the Main Control Valve side of the outlet stream of the Bypass Valve Assembly. Needs to fit around the Turbine Sensor Housing when assembled. If the Plastic Turbine Axle is not correctly seated, the Sensor Wire may not sense the Turbine magnet. |
| **90522 Turbine Assembly** | The Turbine must have a 1/8-inch diameter Rare Earth magnet pressed into place adjacent to the axle opening. When assembled to the axle, the Turbine should spin freely. Do not use any lubricants. If the Turbine should become "jammed," clean and flush the Turbine and Bypass Valve. |
| **54600 Bypass Valve Assembly** | Makes the connection between the plumbing and the appliance. The Bypass Valve Assembly allows water to bypass the appliance for service or when untreated water is desired. The recommended seal for the 1-1/4-inch male inlet-outlet threads is the plastic Bypass Nut, O-Ring, and 1-inch CPVC CTS Adapter. Make sure the O-Ring is between the Bypass Valve Assembly and the flange on the CPVC Adapter. The O-Ring seal areas at the Main Control Valve inlet and outlet must be smooth, free of defects and debris, and lubricated with silicone grease before assembling. When attaching to the Main Control Valve, put the O-Rings on the male bosses on the Main Control Valve and push the Bypass Valve Assembly into place; if not, the O-Rings may be "pinched." If the O-Rings get pinched, replace with new ones. The Bypass Valve Assembly is pre-assembled and is not considered field-serviceable. If the Bypass Valve Assembly is damaged it must be replaced with a new assembly. |

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# Assembly and Parts, Cont.

## Drive End Cap Assembly

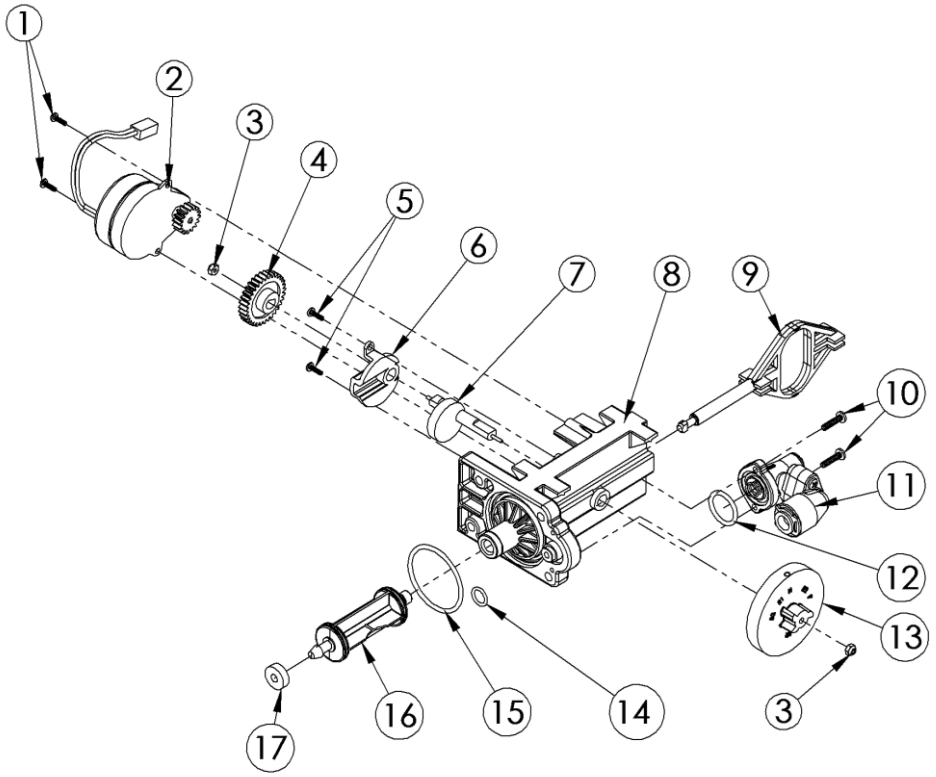



**Figure 18: Drive End Cap Assembly**

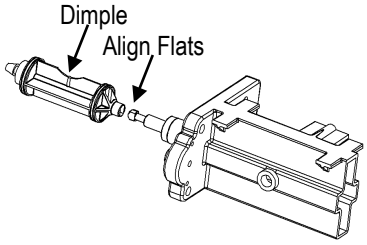
| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | 90802 | Screw, self-tapping | 2 |
| 2 | 90217 | Drive Motor | 1 |
| 3 | 93891 | 1/4-inch Hex Nut | 2 |
| 4 | 93238 | Drive Gear | 1 |
| 5 | 90809 | Screw, self-tapping | 2 |
| 6 | 93219 | Piston Slide Cam Cover | 1 |
| 7 | 93217 | Piston Slide Cam | 1 |
| 8 | 93583 | Drive End Cap | 1 |
| 9 | 54202 | Piston Slide | 1 |
| 10 | 90818 | Screw, self-tapping | 2 |
| 11 | 93601-JG | Brine Valve Housing Assembly | 1 |
| 12 | 90821 | O-Ring | 1 |
| 13 | 54502KIT | Magnet Disk Assembly | 1 |
| 14 | 120110 | O-Ring | 1 |
| 15 | 93808 | O-Ring | 1 |
| 16 | 53344 | Drive Piston Assembly (includes 93839 Drain Gasket) | 1 |
| 17 | 93839 | Drain Gasket | 1 |
| | 95301T-JG | Drive End Cap Assembly (all of the above parts except 1, 2, and 13) | |
| | 95302T-BWO | Drive End Cap Assembly-Backwash Only (all of the above parts except 1, 2, 10, 11, 12, and 13) | |
| | 53525 | Drive Piston Retrofit Kit (only parts 9 and 16) | |

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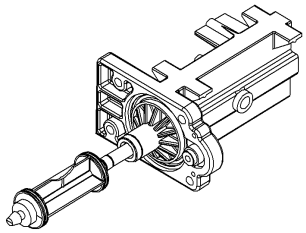
# Assembly and Parts, Cont.

## Drive End Cap Assembly Cont.

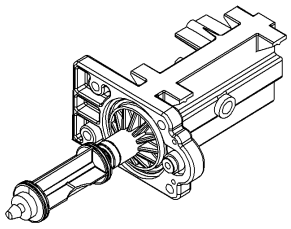
| | |
|---|---|
| **90217 Drive Motor** | The Motor is held in place by two 1/2-inch self-tapping screws. The screws should be "snug." The brass pinion gear on the Motor should engage the plastic Drive Gear. The wires should be securely fastened to the Control. |
| **93238 Drive Gear** | The Drive Gear 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. |
| **93219 Piston Slide Cam Cover** | The cover secures the Piston Slide Cam 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. This Cam Shaft should turn freely before the Motor is assembled. |
| **93583 Drive End Cap** | Seals the two openings on the main control valve. 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 main control valve, care should be taken to make sure the small O-Ring is aligned with the opening in the main control valve 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. |
| **93601-JG Brine Valve Housing Assembly** | Attaches to the Drive End Cap with two 3/4-inch self-tapping screws and has one O-Ring seal. The O-Ring is used as an axial or face seal. The O-Ring sits in a groove in the Brine Valve Housing. The groove and the face seal must be free of defects such as pits and scratches or debris. |
| **53344 Drive Piston Assembly** | The Drive Piston attaches to the Piston Slide by placing the "slot" of the Piston onto the matching flat of the Slide. To remove Piston, rotate Piston 90° counterclockwise. To replace the Piston, rotate 90° clockwise until you hear an audible "click." See reference drawings below. |




Position Piston Assembly (53322) Vertical



Slide Piston Assembly Onto Piston Slide. Push Toward End Cap to Stop.



Rotate The Piston Assembly 90 Degrees Clockwise Until You Hear An Audible Click As It Snaps Into Place

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# Assembly and Parts, Cont.

## Injector Assembly

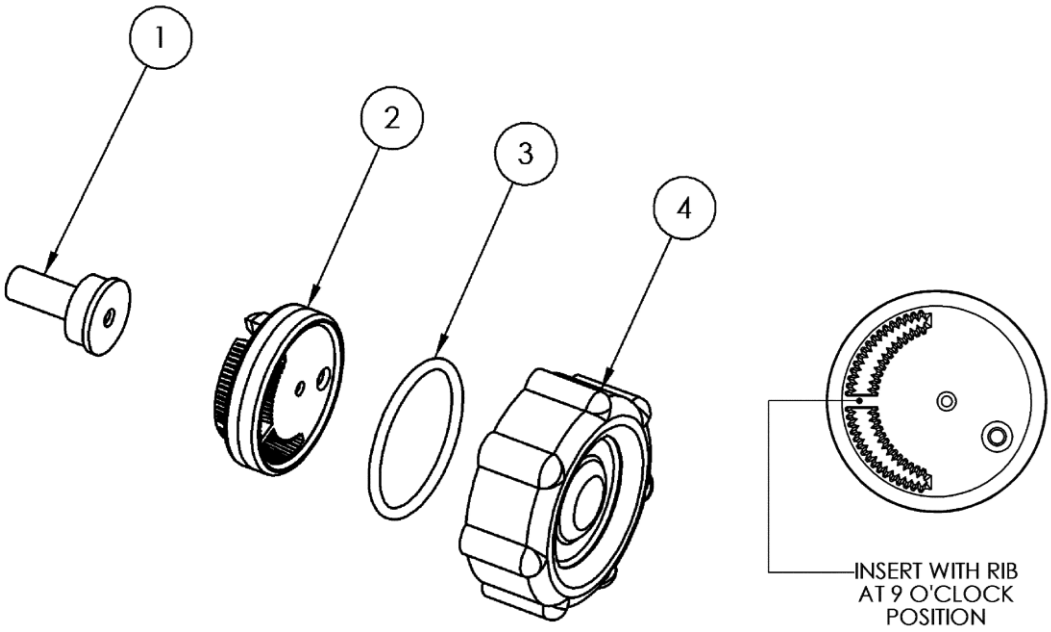



**Figure 19: Injector Assembly**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | 93223 | Injector Throat | 1 |
| | 93223-Red* | Injector Throat | |
| 2 | 53224 | Injector Nozzle with Over-Mold Gasket | 1 |
| | 53224-Red* | Injector Nozzle with Over-Mold Gasket | |
| 3 | 93806 | O-Ring | 1 |
| 4 | 53235 | Injector Cap | 1 |
| | 93504 | Entire Assembly (all of the above parts) | |
| | 93504-Red* | Entire Assembly (all of the above parts) | |

* For use on 12-inch (30.5 cm) and 14-inch (35.6 cm) diameter softener tanks and 2IF only

| | |
|---|---|
| **93223 Injector Throat** | In conjunction with the Injector Nozzle it creates the vacuum that draws the brine solution from the brine tank. 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 a new one. |
| **53224 Injector Nozzle with Over-Mold Gasket** | Together with the Injector Throat creates the vacuum that draws the brine solution from the brine tank. The small hole in the Injector Nozzle is the one that creates the "injection-stream" that enters the Throat. It is important that this hole is round, undamaged, and clear of debris. 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. Flush screen with water to clean. The over-mold gasket seals between the Injector Nozzle and the Injector Cap. |
| **53235 Injector Cap** | Holds the injector assembly together and seals the assembly to the Main Control Valve. |

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# Assembly and Parts, Cont.

## Drain End Cap Assembly

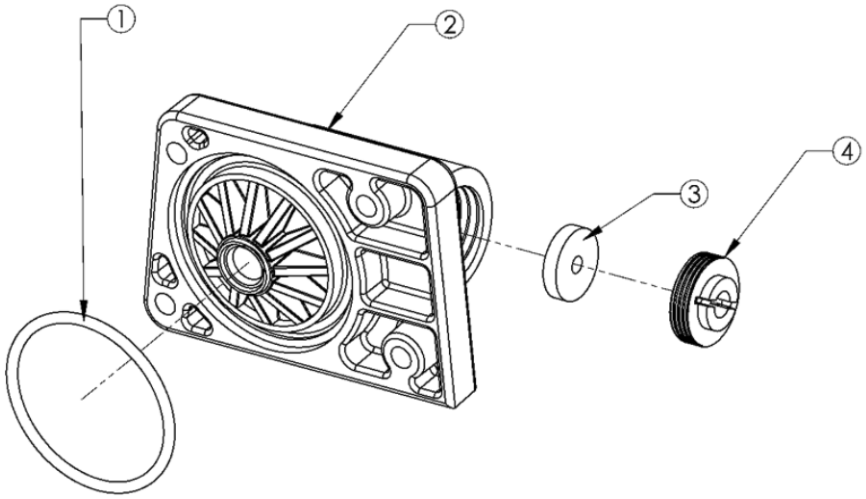



**Figure 20: Drain End Cap Assembly**

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

* Must specify drain line flow control size. X.X indicates the backwash rate in gpm. Example: 90614 – 2.4

| | |
|---|---|
| **90268 Drain End Cap** | The Drain End Cap seals the left opening on the Main Control Valve. The 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. When assembling the End Cap to the Main Control Valve, 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 *Specifications*. When assembling the flow control, ensure that the rounded (radiused) side of the hole faces in toward the water flow. Available parts:<br>• H2086 - 1.2*<br>• H2086 - 1.5*<br>• H2086 - 2.0*<br>• H2086 - 2.4*<br>• H2086 - 3.0*<br>• H2086 - 4.0*<br>• H2086 - 5.0*<br>• H2086 - 7.0*<br>* Indicates the backwash flow rate in gpm. |
| **90267 Retainer** | The Retainer holds the backwash Flow Control in place. One side is smooth and the other has a groove for a screwdriver. When assembling the retainer to the Drain End Cap, the retainer should be screwed in until it stops. If the retainer is not fully engaged, the Flow Control may not function properly. |

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# Assembly and Parts, Cont.

## Optional 3/4-inch and 1-inch I/O Adapter Assemblies with Blending Valve

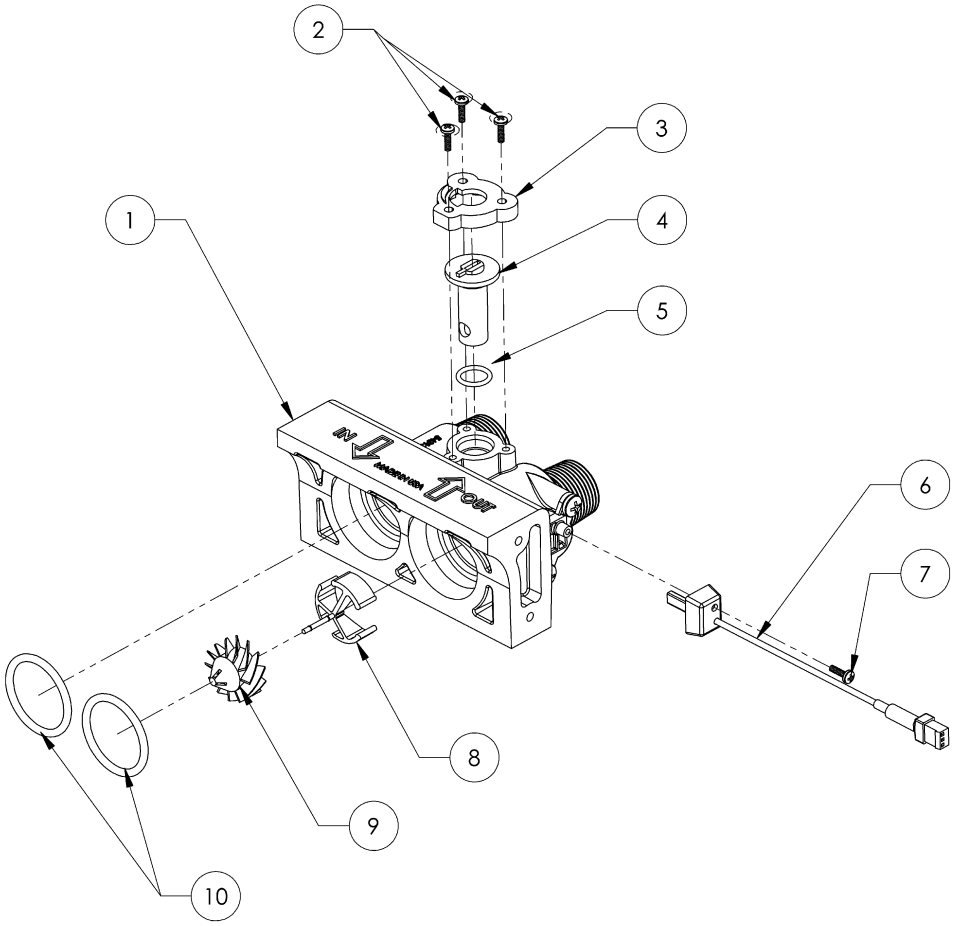



**Figure 21: 3/4-inch I/O Adapter Assembly with Blending Valve**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | 93521 | 3/4-inch I/O Adapter Assembly (includes parts 1–9) | 1 |
| | 93521-1 | 1-inch I/O Adapter Assembly (not shown) | |
| | 93521-BWO | 3/4-inch I/O Backwash Only Assembly (not shown) | |
| | 93521-1-BWO | 1-inch I/O Backwash Only Assembly (not shown) | |
| 2 | 90802 | # 6 X .5 Screw, self-tapping | 3 |
| 3 | 90252 | Blending Dial Cap | 1 |
| 4 | 90222 | Blending Dial | 1 |
| 5 | 90827 | O-Ring | 1 |
| 6 | 93860* | Turbine Sensor Assembly with Cap | 1 |
| 7 | 90809* | Sensor Cap Screw, self-tapping | 1 |
| 8 | 54320* | Turbine Axle | 1 |
| 9 | 90522* | Turbine Assembly | 1 |
| 10 | 93838 | O-Ring | 2 |

* Not included on Backwash Only models

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# Assembly and Parts, Cont.

## Safety Shutoff Assembly

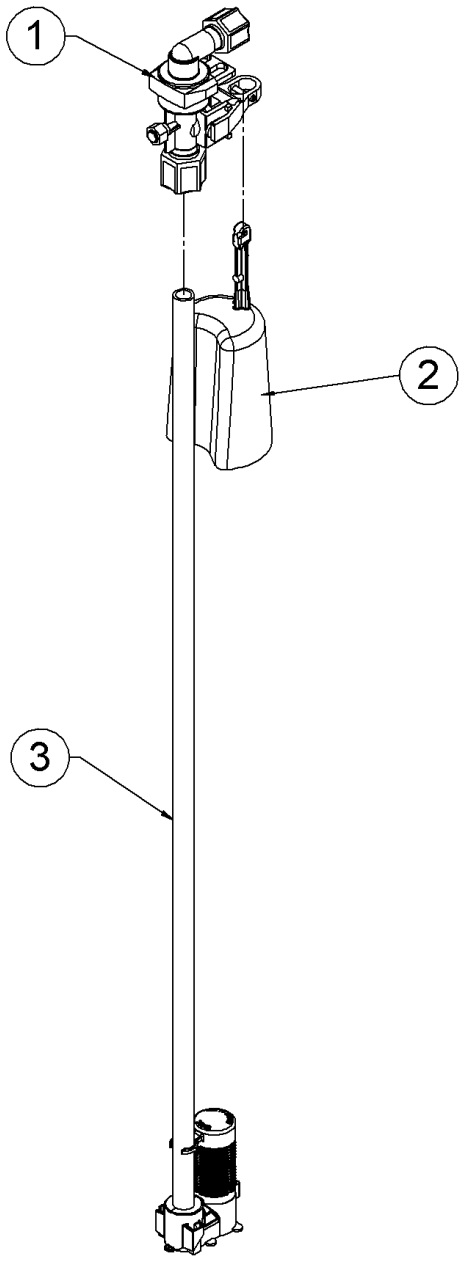



**Figure 22: Safety Shutoff Assembly**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | 54226 | Safety Shutoff (See Figure 23) | 1 |
| 2 | 56018 | Float | 1 |
| 3 | 54160 | Air Check/Draw Tube | 1 |
| | 54625 | Entire Assembly (all of the above parts) | |

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# Assembly and Parts, Cont.

## Brine Valve Elbow Installation

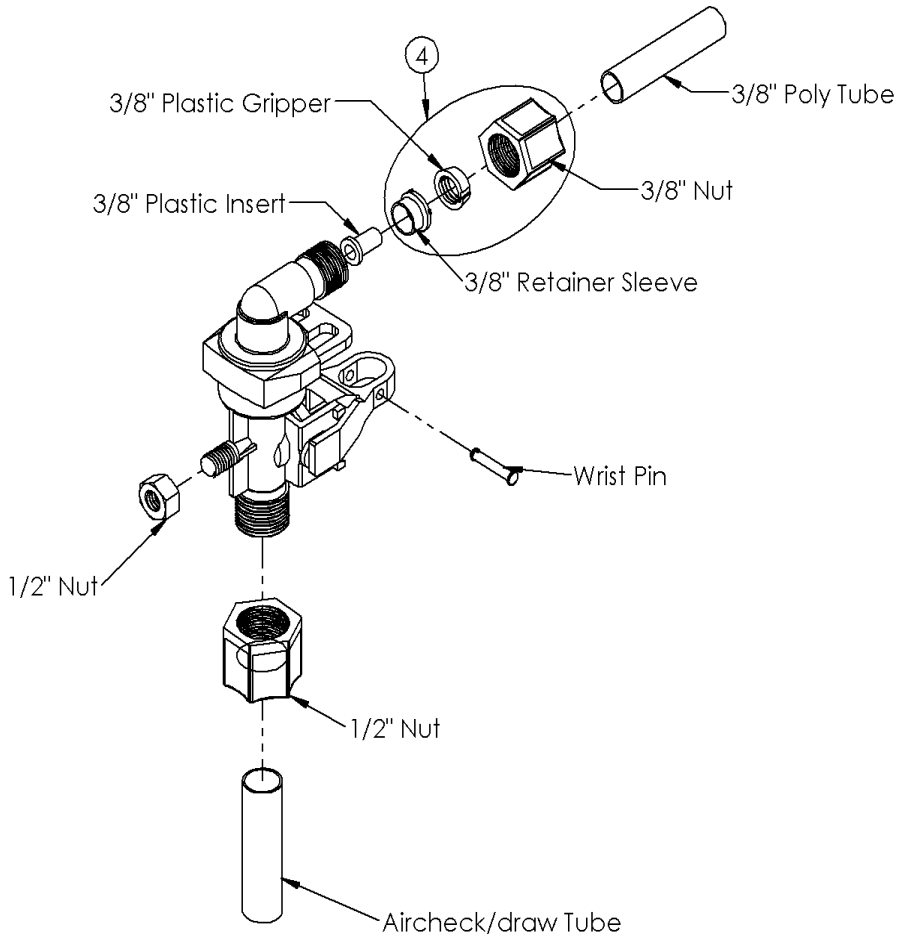



**Figure 23: Brine Valve Elbow Installation**

| | Part # | Description | Quantity |
|---|---|---|---|
| 1 | 54112 | 1/2-inch Compression Assembly | 1 |
| 2 | 54138 | 3/8-inch 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.

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# Troubleshooting

| Problem | Possible Cause | Solution |
|---|---|---|
| **No soft water after regeneration** | No salt in brine tank | Add salt |
| | Sediment in brine tank has plugged the brine line and air check/draw tube | Remove the brine line and flush clean Remove the air check/draw tube and flush with clean water. Clean injector assembly. Clean any sediment from brine tank |
| | Flow control is plugged | Remove brine piston housing and clear debris from the flow control |
| | Drain line is pinched, frozen, or restricted | Straighten, thaw, or unclog the drain line |
| | Clogged injector assembly | Remove injector cap and clean nozzle and throat with a wooden toothpick. Replace throat if removed |
| | Salt bridge has formed due to high humidity or the wrong kind of salt | 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 |
| **No soft water** | The bypass valve is in the Bypass position | Place the bypass valve in the Service position |
| | Appliance is plumbed backward | Check that appliance is plumbed correctly |
| | Extended power outage | Reset the time of day |
| | Water hardness has increased | Re-test the water and re-enter a new setting number |
| | Not metering water | Flow should be indicated with water usage. If no flow, see below |
| | Blending dial is open | Make sure blending dial is closed |
| **No flow is indicated when water is flowing** | The bypass valve is in the Bypass position | Place the bypass valve in the Service position |
| | Appliance is plumbed backward | Check that appliance is plumbed correctly |
| | Sensor not receiving signal from magnet on turbine | 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 |
| | Turbine is jammed | Remove bypass valve and clear debris from turbine |
| **Flow indicated when water is not being used** | The household plumbing system has a leak | Repair the leak |
| **No read-out in display** | Electric cord is unplugged | Plug in the transformer |
| | No electric power at outlet | Check power source. Make sure outlet is not controlled by a switch |
| | Defective transformer | Test with voltmeter for 12 VAC at control. If less than 10 VAC or greater than 16 VAC, replace the transformer |
| | Defective circuit board | With 12 VAC present at controller, replace the controller |
| | High ambient room temperature. If the temperature exceeds 120°F (49°C), the display will blank out. This does not affect the operation of the controller | No action necessary |

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# Troubleshooting, Cont.

| Problem | Possible Cause | Solution |
|---|---|---|
| **Appliance stays in regeneration** | Controller not attached properly | Make sure the controller is pushed all the way onto the drive end cap |
| | Defective magnet disk | Replace magnet disk |
| | Foreign object in main control valve | Remove foreign object(s) from the main control valve |
| | Broken valve assembly. Motor running | Repair the drive end cap |
| **Excess water in brine tank** | Drain line is pinched, frozen, or restricted | Straighten, thaw, or unclog the drain line |
| | Plugged brine line, brine line flow control, or air check/draw tube | Clean flow control, air check/draw tube, and brine line. Clean any sediment from the brine tank |
| | Plugged injector assembly | Clean or replace injector. Replace throat if removed |
| | Sticking brine refill valve | Remove valve. Check for obstruction and remove |
| **Not regenerating in proper sequence** | Magnet disk defective | Replace magnet disk |
| | Defective controller | Replace controller |
| **Salty water (pink water from iron filter)** | Plugged injector | Replace injector screen, nozzle, and throat |
| | Low water pressure | Maintain minimum pressure of 30 psi (2.1 bar) |
| | Drain line or flow control is restricted | Remove restriction |
| | Brine line restricted or crimped | Remove restriction, replace if crimped |
| | Excessive amount of water in brine tank | Verify correct water level relative to salt setting. Check brine line and fittings for loose connections |
| | Insufficient rinse time | Check mode setting chart for proper brine rinse time. Adjust time, if necessary |
| | Intermittent pressure drop from feed source | Install check valve on the inlet water line to the appliance (Check local plumbing codes first) |
| | Brine valve drips water back to brine tank | Clean brine valve housing, replace piston assembly |

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# Water Conditioner Specifications

| Five-Button Dual Mode Controller | 25 | 25CX | 35 | 48 | 64 | 105 |
|---|---|---|---|---|---|---|
| Max Compensated Hardness–gpg (g/L) | 60 (1.0) | 25 (0.4) | 90 (1.5) | 110 (1.9) | 120 (2.0) | 130 (2.2) |
| Iron in solution–ppm | 2[1] | NA | 6[1] | 8[1] | 10[1] | 10[1] |
| Minimum pH–standard units | 7 | 7 | 7 | 7 | 7 | 7 |
| Tannin–ppm | NA | NA | NA | NA | NA | NA |
| Sulfur–ppm–SulfurStat | NA | NA | NA | NA | NA | NA |
| Maximum Chlorine–ppm | 1 | 1 | 1 | 1 | 1 | 1 |
| Capacity grains (grams) @ 2.5 lb (1.1 kg) salt/cu.ft.[2] (# 1 Salt Setting) | 9,100 (589) | 9,100 (589) | 12,500 (810) | 17,100 (1108) | 22,800 (1477) | 37,600 (2436) |
| Capacity grains (grams) @ 3.8 lb (1.7 kg) salt/cu.ft. (# 2 Salt Setting) | 12,500 (810) | 12,500 (810) | 17,200 (1114) | 23,400 (1516) | 31,200 (2021) | 51,500 (3337) |
| Capacity grains (grams) @ 5.0 lb (2.3 kg) salt/cu.ft. (# 3 Salt Setting) | 15,100 (978) | 15,100 (978) | 20,800 (1347) | 28,500 (1846) | 37,900 (2455) | 62,600 (4056) |
| Capacity grains (grams) @ 7.0 lb (3.2 kg) salt/cu.ft. (# 4 Salt Setting) | 18,900 (1224) | 18,900 (1224) | 25,900 (1678) | 35,300 (2287) | 47,100 (3052) | 77,800 (5041) |
| Capacity grains (grams) @ 15 lb (6.8 kg) salt/cu.ft. (# 5 Salt Setting) | 21,700 (1406) | 21,700 (1406) | 29,900 (1937) | 40,800 (2643) | 54,400 (3525) | 89,200 (5780) |
| Brine line flow control refill–gpm (L/min) | 0.5 (1.9) | 0.5 (1.9) | 0.5 (1.9) | 0.5 (1.9) | 0.5 (1.9) | 0.5 (1.9) |
| Media tank size–inches (cm) Dia. x Ht. | 8 x 44 (20 x 112) | 9 x 48 (23 x 122) | 9 x 48 (23 x 122) | 10 x 54 (25 x 137) | 12 x 52 (30 x 132) | 14 x 65 (36 x 165) |
| Resin/media amount cu.ft. (cu. m) | 0.8 (0.02) | 1.1 (0.03) | 1.1 (0.03) | 1.5 (0.04) | 2.0 (0.06) | 3.3 (0.09) |
| Media type | HCR | HCR/HCM | HCR | HCR | HCR | HCR |
| Bed depth–inch (cm) | 30 (76) | 33 (84) | 33 (84) | 35 (89) | 34 (86) | 43 (109) |
| Freeboard–inch (cm) | 14 (36) | 15 (38) | 15 (38) | 19 (48) | 18 (46) | 22 (56) |
| Water Pressure–min–max psi (bar) | 20–120 (1.4–8.3) | 20–120 (1.4–8.3) | 20–120 (1.4–8.3) | 20–120 (1.4–8.3) | 30–120 (2.1–8.3) | 30–120 (2.1–8.3) |
| Water temperature–min–max °F (°C) | 40–120 (4–49) | 40–120 (4–49) | 40–120 (4–49) | 40–120 (4–49) | 40–120 (4–49) | 40–120 (4–49) |
| Minimum water volume for backwash–gpm (L/min) | 1.5 (5.6) | 2.0 (7.5) | 2.0 (7.5) | 2.4 (9.1) | 4.0 (15) | 5.0 (19) |
| Flow Rate gpm (L/min)( @ 15 psi drop | 9 (34) | 10.5 (40) | 10 (38) | 12 (45) | 16 (60) | 18.5 (70) |
| Pressure Drop in psi (bar) @ normal flow rate–gpm (L/min) | 7.8@6 (0.54@22.7) | 7.2@6 (0.50@22.7) | 7.6@6 (0.52@22.7) | 7.3@9 (0.50@34.1) | 8.5@12 (0.59@45.4) | 11@14 (0.76@53.0) |
| Pipe size–inch | 3/4 | 3/4 | 3/4 | 3/4 | 1 | 1 |
| Height–inch (cm) | 48 (122) | 52 (132) | 52 (132) | 58 (147) | 56 (142) | 69 (175) |
| Floor space–inch (cm) | 18 x 27 (46 x 69) | 18 x 28 (46 x 71) | 18 x 28 (46 x 71) | 18 x 29 (46 x 74) | 26 x 36 (66 x 91) | 30 x 38 (76 x 97) |
| Brine or solution tank size–inch (cm) | 18 x 33 (46 x 84) | 18 x 33 (46 x 84) | 18 x 33 (46 x 84) | 18 x 33 (46 x 84) | 24 x 50 (61 x 127) | 24 x 50 (61 x 127) |
| Brine or solution tank capacity–lb (kg) | 200 (91) | 200 (91) | 200 (91) | 200 (91) | 640 (290) | 640 (290) |
| Water volume per regen. gal–factory setting (L) | From 19.5 (73.7) | From 24.5 (92.6) | From 27.5 (104) | From 35 (132) | From 51.5 (195) | From 69 (260) |
| Length of regeneration (minutes) | From 23 | From 23 | From 27 | From 32 | From 21 | From 28 |
| Shipping weight–lb (kg) | 100 (45) | 125 (57) | 130 (59) | 160 (73) | 190 (86) | 275 (125) |
| Quartz Gravel–lb (kg) | 10 (4.5) | 12 (5.4) | 12 (5.4) | 14 (6.4) | 20 (9.1) | 30 (13.6) |

**Standard Features:**
Metered or timed HC3 valve, Hydro-Clean distributor, high capacity resin and self-leveling thermo media tank.
**Options:** Low profile valve cover, 1-inch full flow bypass valve.

**Legend:**
[1] When iron is present in the raw water supply, regeneration frequency cannot exceed 96 hours. Additionally, a minimum salt setting of 7 lb (3.2 kg) per cubic foot of resin is required.
[2] Do not use standard 18-inch (45.7 cm) diameter brine tank with salt grid for salt settings less than 3 lb (1.4 kg).
N/A: No Application

# Filter Descriptions

The following table describes the available filters.

| Filter | Purpose |
|---|---|
| **2IF** | Removes iron and iron algae. Also removes up to 5 ppm $H_2S$ with the presence of 2 ppm iron. Refer to 2IF Sizing Formula to determine regeneration frequency. |
| **1CF** | Removes tastes, odors and will reduce most man-made pollutants. Backwashes as needed. |
| **1NF** | Designed to raise the pH of most low-pH water. The mineral media must be replenished periodically. Backwashes every 2 days. |
| **1MMF** | Designed to remove heavy sediment and suspended solids. It is capable of filtering down to 10 microns in size. Backwashes as needed. |

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# Filter Specifications

| Five-Button Dual Mode Controller—Special Series | 2IF | 1CF | 1NF | 1MMF* |
|---|---|---|---|---|
| Capacity–ppm | 8,000 | N/A | N/A | N/A |
| Sulfur $H_2S$–ppm | 5 | N/A | N/A | N/A |
| Iron in solution–ppm | 20 | 0 | 0 | 0 |
| Max Compensated Hardness–gpg (g/L) | NA | NA | 5 (0.08) | NA |
| Minimum pH–standard units | 7 | 7 | 5[1] | 7 |
| Media type | Manganese Greensand | Activated Carbon | Calcite/Corosex | Multi-Grade |
| Brine line flow control refill–gpm (L/min) | 0.5 (1.9) | NA | NA | NA |
| Media tank size–inches (cm) Dia. x Ht. | 10 x 47 (25 x 119) | 10 x 47 (25 x 119) | 10 x 47 (25 x 119) | 10 x 47 (25 x 119) |
| Resin/media amount cu.ft. (cu. m) | 1.0 (0.03) | 1.33 (0.04) | 1.25 (0.04) | 1.5 (0.04) |
| Quartz Gravel–lb (kg) | 14 (6.4) | 14 (6.4) | 14[2] (6.4) | 16[3] (7.3) |
| Bed depth–inch (cm) | 26.5 (67.3) | 33.75 (85.7) | 32 (81.3) | 33 (83.8) |
| Freeboard–inch (cm) | 19.5 (49.5) | 12.25 (31.1) | 14 (35.6) | 13 (33.0) |
| Water Pressure–min–max psi (bar) | 30–120 (2.1–8.3) | 30–120 (2.1–8.3) | 30–120 (2.1–8.3) | 30–120 (2.1–8.3) |
| Water temperature–min–max °F (°C) | 33–80 (0.56–26.7) | 33–120 (0.56–48.9) | 33–120 (0.56–48.9) | 33–120 (0.56–48.9) |
| Minimum water volume for backwash–gpm (L/min) | 5.0 (19) | 5.0 (19) | 5.0 (19) | 7.0 (26) |
| Mode Setting | 1 | 1 | 1 | 1 |
| Backwash #1 (min) | 10 | 7 | 7 | 7 |
| Brine/rinse (min) | 45 | 0 | 0 | 0 |
| Backwash #2 (min) | 5 | 0 | 0 | 0 |
| Salt–lb (kg) | 3 (1.4) | 0 | 0 | 0 |
| Flow Rate (gpm) @ 15 psi drop | 6 (23) | 8 (30) | 6 (23) | 8.5 (32) |
| Pipe size–inch (cm) | 1 (2.54) | 1 (2.54) | 1 (2.54) | 1 (2.54) |
| Height–inch (cm) | 51 (130) | 51 (130) | 51 (130) | 51 (130) |
| Floor space–inch (cm) | 16 x 27 (41 x 69) | 11 x 11 (28 x 28) | 11 x 11 (28 x 28) | 11 x 11 (28 x 28) |
| Brine or solution tank size–inch (cm) | 16 x 21 (41 x 53) | NA | NA | NA |
| Brine or solution tank capacity–lb (kg) | 5 (2.3) $KMnO_4$ | NA | NA | NA |
| Water volume per regen. (gal–factory setting) (liter) | 57.5 (218) | 35 (132) | 35 (132) | 49 (185) |
| Length of regeneration (minutes) | 55 | 7 | 7 | 7 |
| Regenerant used | 4 oz $KMnO_4$ | N/A | N/A | N/A |
| | This model removes $H_2S$ with the presence of at least 2 ppm iron. Follow instructions on feeder cover and regenerant package. | Backwash only model. Must not be backwashed for 24 hours after installation. | Backwash only model. Must backwash at least every two days or media may solidify. Will add some hardness to water. | Backwash only model. Backwashes every 3 days or as needed. |
| Shipping weight–lb (kg) | 175 (79) | 100 (45) | 175 (79) | 175 (79) |

[1] **Caution:** The 1NF will raise the pH of most, but not all low pH water. Some water requires the addition of caustic soda with a chemical feed pump.

[2] The neutralizing media that adjusts the pH value of the water must be replenished periodically. When the freeboard distance measures 20 inches (51 cm), add 25 lb (11.3 kg) of M050 Calcite.

[3] The 1MMF uses garnet for an under bed instead of quartz gravel.

**Special Series:**

**Standard:** HC3 valve, self leveling thermo media tank, bypass with test port and 1-inch CPVC CTS piping adapters, 1-inch high flow distributor.

**Options:** 3/4-inch or 1-inch inlet/outlet adapter, tank jacket, salt shelf.

**Streamline brine tank:** 11-inch X 11-inch X 34-inch P/N 53571 (not available for 64 or 105.)

N/A: No Application

* The HC3 Model 1MMF is not a WQA certified model.

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## Notes

# *HC3 has these third-party listings:*

The HC3 models 25, 25CX, 35, 48, 64, 105, 2IF, 1CF, and 1NF are tested and certified by WQA according to CSA B483.1.


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