



Water Softening system

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Water Softening System

Owner's Manual & Installation Instructions

Models GNPR40L, GNPR48L



Write the model and serial numbers here:

Model # _____

Serial # _____

To find these numbers, lift the cover and look on the rim below the control panel.



IMPORTANT SAFETY INFORMATION.

READ ALL INSTRUCTIONS BEFORE USING.

⚠ WARNING!

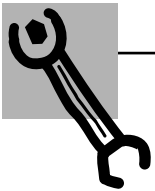
For your safety, the information in this manual must be followed to minimize the risk of electric shock, property damage or personal injury.



SAFETY PRECAUTIONS

- Check and comply with your state and local codes. You must follow these guidelines.
- Use care when handling the water softening system. Do not turn upside down, drop, drag or set on sharp protrusions.
- Water softening systems using sodium chloride (salt) for regeneration add sodium to the water. *Persons on sodium restricted diets should consider the added sodium as part of their overall intake. Potassium chloride can be used as an alternative to sodium chloride in your softener.*
- The water softening system works on 12 volt-60 Hz electrical power only. *Be sure to use only the included transformer.*
- Transformer must be plugged into an indoor 120 volt, grounded outlet only.
- Use clean water softening salts only, at least 99.5% pure. NUGGET, PELLET or coarse SOLAR salts are recommended. Do not use rock, block, granulated or ice cream making salts. These products may contain dirt and sediments, or mush and cake, and will create maintenance problems.
- Keep the brine tank cover in place on the softener unless servicing the unit or refilling with salt.

⚠ WARNING: Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.



PROPER INSTALLATION

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

- Install or store where it will not be exposed to temperatures below freezing or exposed to any type of weather. Water freezing in the system will break it.
- **Do not** install in direct sunlight. Excessive sun or heat may cause distortion or other damage to non-metallic parts. Do not attempt to treat water over 100°F.
- Properly ground the system to conform with all governing codes and ordinances.
- Use only *lead-free solder and flux* for all sweat-solder connections, as required by state and federal codes.
- The water softening system requires a minimum water flow of three gallons per minute at the inlet. Maximum allowable inlet water pressure is 125 psi. If daytime pressure is over 80 psi, nighttime pressure may exceed the maximum. Use a pressure reducing valve to reduce the flow if necessary.
- Softener resins may degrade in the presence of chlorine above 2 ppm. If you have chlorine in excess of this amount, you may experience reduced life of the resin. In these conditions, you may wish to consider purchasing a GE point-of-entry household filtration system with a chlorine reducing filter.

⚠ WARNING: Discard all unused parts and packaging material after installation. Small parts remaining after the installation could be a choke hazard.



READ AND FOLLOW THIS SAFETY INFORMATION CAREFULLY.

SAVE THESE INSTRUCTIONS

Installation Instructions

Water Softening System

Models GNPR40L and GNPR48L

? Questions? Call 800.GE.CARES (800.432.2737) or Visit our Website at: ge.com

⚠ WARNING: Read entire manual. Failure to follow all guides and rules could cause personal injury or property damage.

- Check with your state and/or local public works department for plumbing codes. You must follow their guides as you install the Water Softening system.

NOTE: Failure to comply with these installation instructions will void the product warranty, and the installer will be responsible for any service, repair or damages caused thereby.

BEFORE BEGINNING INSTALLATION

Read these instructions completely and carefully.

- **IMPORTANT** – Save these instructions for local inspector's use.
- **IMPORTANT** – Observe all governing codes and ordinances.
- **Note to Installer** – Be sure to leave these instructions with the Consumer.
- **Note to Consumer** – Keep these instructions for future reference.
- Proper installation is the responsibility of the installer.
- Product failure due to improper installation is not covered under the Warranty.

IMPORTANT INSTALLATION RECOMMENDATIONS (CONT.)

⚠ WARNING: Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. The water should be tested periodically to verify that the system is performing satisfactorily.

IMPORTANT INSTALLATION RECOMMENDATIONS

- **In the Commonwealth of Massachusetts, Plumbing Code 248 CMR shall be adhered to. Consult with your licensed plumber.**
- Use only lead-free solder and flux for all sweat-solder connections, as required by state and federal codes.
- Connect the softener to the main water supply pipe **before** or **ahead of the** water heater. **DO NOT RUN HOT WATER THROUGH THE SOFTENER.** Temperature of water passing through the softener must be less than 100°F.

Installation Instructions

UNPACKING AND INSPECTION

Be sure to check the entire softener for any shipping damage or missing parts. Also note damage to the shipping cartons. Contact the transportation company for all damage and loss claims. The manufacturer is not responsible for damages in transit.

Small parts needed to install the softener are packaged either in a bag or box. To avoid loss of the small parts, keep them packaged until you are ready to use them. Be sure not to discard components hidden in packaging.

TOOLS AND MATERIALS REQUIRED FOR INSTALLATION

- Teflon tape
- Razor knife
- One adjustable wrench
- 1/2" vinyl/pvc drain line (the length required will be determined by your specific location)
- Additional tools may be required if modification to home plumbing is necessary.
- In and out fittings included with the softener are 1" copper adapters. You should maintain the same, or larger, pipe size as the water supply pipe, up to the softener inlet and outlet. Then, use the necessary adapters to connect the water supply to the 1" copper adapters.
- Use the included bypass valve to install the softener. The bypass valve allows you to turn off water to the softener for servicing, but still have water pressure in the house pipes.
- Use appropriate fitting/pipe material (i.e., copper, brass, galvanized or CPVC) to connect the 1" copper adapters to the house plumbing.
- If a rigid valve drain is needed to comply with plumbing codes, you can buy the parts needed to connect a 1/2" copper tubing or plastic pipe drain.
- Clean nugget or pellet water softener salt is needed to fill the brine tank.

WHERE TO INSTALL THE SOFTENER

- Place the softener as close as possible to a sewer drain, or other acceptable drain point or standpipe.
- It is recommended to keep outside faucets on hard water to save soft water and salt.
- Do not install the softener in a place where it could freeze. **Freeze damage is not covered by the warranty.**
- Do not install the softener where it would block access to the water heater or access to the main water shutoff.
- Put the softener in a place where water damage is least likely to occur if a leak develops. The manufacturer will not repair or pay for water damage.
- A 120-volt electric outlet is needed to plug in the included transformer. The softener has a 10-foot power cable. If the outlet is remote (up to 100 feet), use 18 gauge wire to connect. **Be sure the electric outlet and transformer are in an inside location, to protect from wet weather.** Be sure the outlet is unswitched to prevent accidental shutoff.
- If installing in an outside location, you must take the steps necessary to assure the softener, installation plumbing, wiring, etc., are as well protected from the elements (sunlight, rain, wind, heat, cold), contamination, vandalism, etc., as when installed indoors. **Outdoor installation is not recommended, and voids the warranty.**
- **Keep the softener out of direct sunlight.** The sun's heat may distort non-metallic parts and may damage the electronics.

Installation Instructions

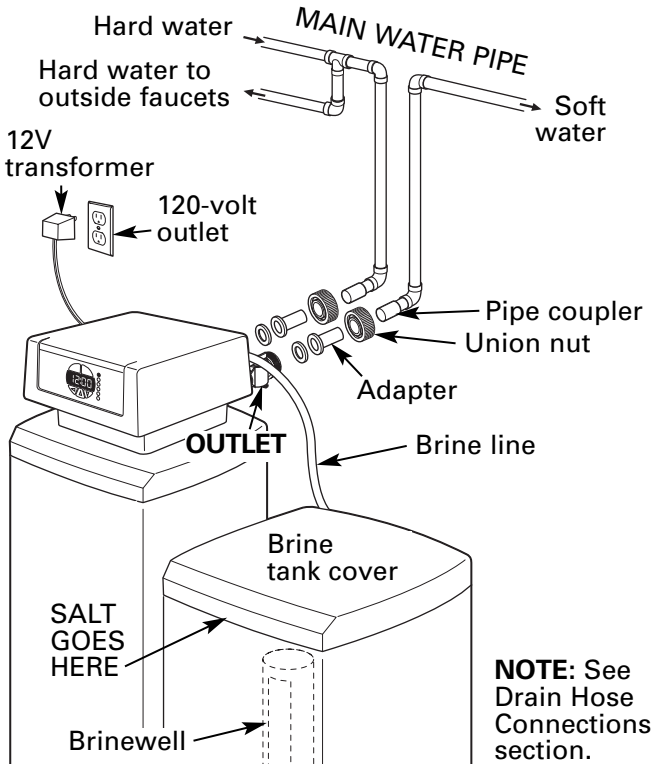
PLAN HOW YOU WILL INSTALL THE SOFTENER

You must first decide how to run the inlet and outlet pipes to the softener. Look at the house main water pipe at the point where you will connect the softener. Is the pipe soldered copper, glued plastic or threaded galvanized? What is the pipe size?

⚠ WARNING: Use only lead-free solder and flux to prevent lead poisoning.

See *Typical Installation Illustration*. Use this as a guide when planning your particular installation. **Be sure to direct the incoming hard water supply to the softener valve inlet fitting.** The valve is marked **IN** and **OUT**.

TYPICAL INSTALLATION ILLUSTRATION



OPTIONAL 3-VALVE BYPASS INSTALLATION ILLUSTRATION

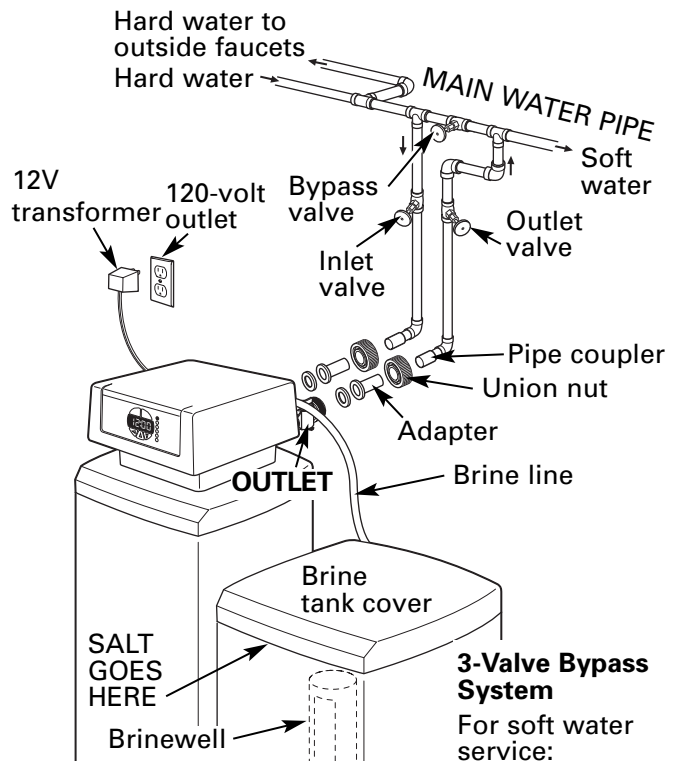


Fig. 1 CROSSOVER
Use if water supply flows from the left. Include single or 3-valve bypass.

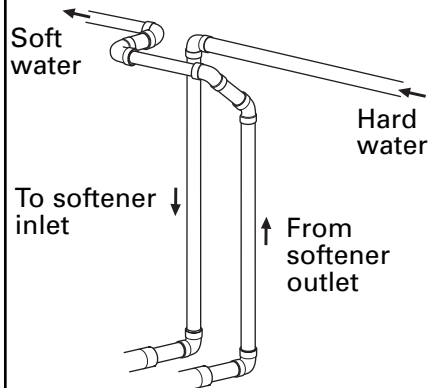
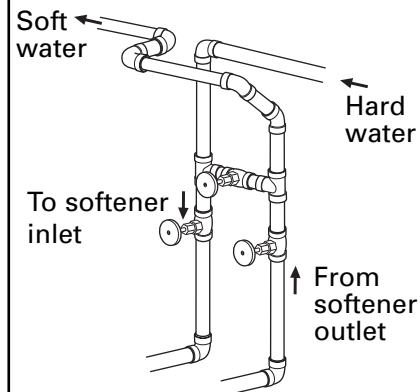


Fig. 2 CROSSOVER
Use if water supply flows from the left. Include single or 3-valve bypass.



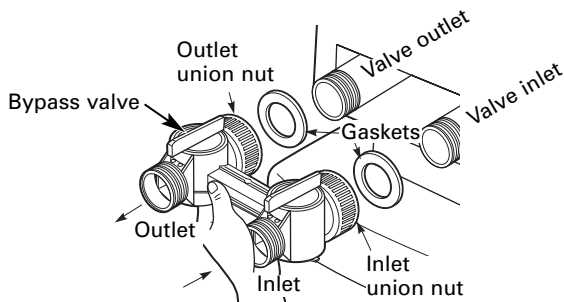
Installation Instructions

BEFORE YOU BEGIN

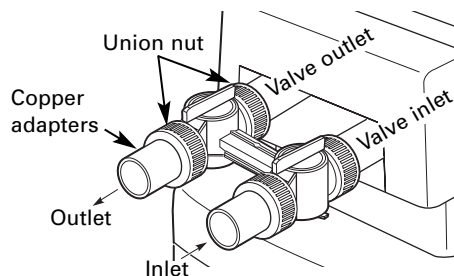
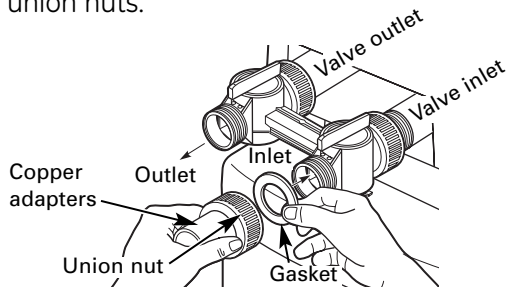
- Turn off the gas or electric supply to the water heater, in the possibility that the water heater may be drained while draining pipes.
- Turn off the water supply to pipes to be cut and drain the house water pipes.
- Open both hot and cold faucets at the lowest location possible.

1 INSTALL BYPASS VALVE

- Make sure there is a gasket secured inside the inlet and outlet union nuts of the bypass. Then assemble the union nut to the valve inlet and outlet, hand-tightening both union nuts simultaneously. It is not necessary to lubricate or use sealant on the rubber gaskets or union nuts.

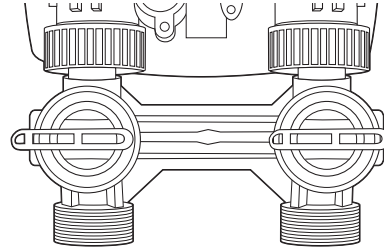


- Insert copper adapters through union nuts. Place the rubber gaskets into the union nuts and assemble to bypass valve. It is not necessary to lubricate or use sealant on rubber gasket or union nuts.

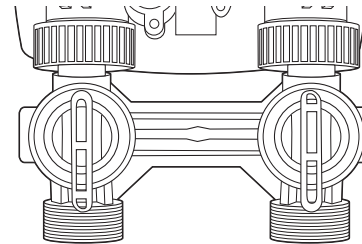


OPERATION

To bypass the Water Softener with the bypass valve, rotate the handles clockwise so they are both perpendicular to the flow path of the inlet and outlet water stream, as shown below.



To return to the conditioned water or service position, rotate the handles counterclockwise so they are parallel to the flow path of the inlet and outlet water stream, as shown below.



2 MOVE THE SOFTENER ASSEMBLY INTO INSTALLATION POSITION

Before sliding softener in position, be sure the installation surface is level and smooth. Sharp objects under the tank may puncture it. If needed, place the tank on a section of 3/4" thick (minimum) plywood. Then, place shims under the plywood as needed to level the softener. Slide softener into position.

Installation Instructions

3 PLUMB "IN" AND "OUT" PIPES TO AND FROM SOFTENER

CAUTION: Observe all of the following cautions as you connect inlet and outlet plumbing. See Typical Installation Illustration.

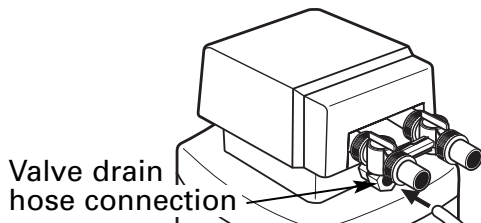
- BE SURE INCOMING **HARD WATER** SUPPLY IS DIRECTED TO THE SOFTENER VALVE **INLET** PORT. If house water flow is from the right, use a plumbing **crossover** as shown in Typical Installation Illustration.
- With the softener in place, determine the correct length of piping required to connect the household plumbing to the 1" copper adapter on the softener. Test fit all connections.

NOTE: The softener must not support the home's plumbing in the vertical direction. Secure the inlet and outlet pipes to the wall/ceiling using pipe clamps or straps. Be certain the home's plumbing does not exert any force on the softener bypass.

- Remove softener from installation space.
- Disconnect copper adapters and union nuts from bypass valve.
- Reconnect copper adapters with union nuts and gaskets in place to home plumbing. Before soldering adapters, slide union nuts and gasket away from area being soldered. **NOTE:** Torch heat will damage plastic parts.
- Support inlet and outlet plumbing in some manner (use pipe hangers or clamps) **to keep the weight off of the valve fittings.**
- Slide softener back into position.
- Make final connections to the bypass valve.

4 CONNECT AND RUN THE VALVE DRAIN HOSE

- Check that drain port on valve body has white tape on it. If not, apply Teflon Tape to threads prior to installing the valve drain fitting.
- Connect valve drain fitting to valve drain port. Tighten connection with a wrench.
- Connect 1/2" diameter drain hose (not provided) to the valve drain fitting. Tighten connections with wrench.

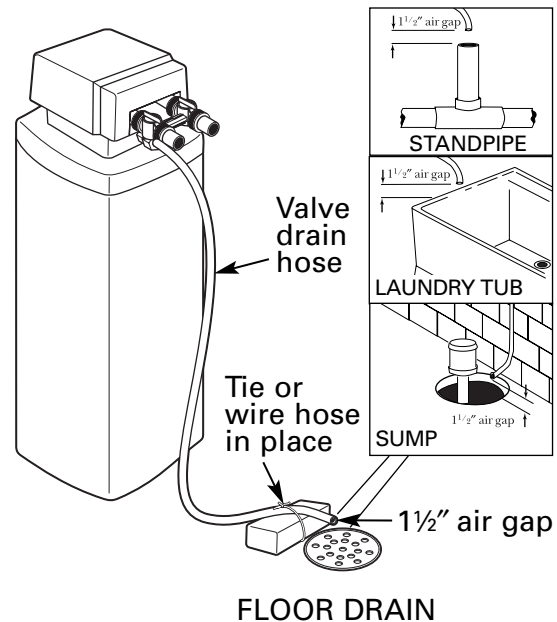


4 CONNECT AND RUN THE VALVE DRAIN HOSE (CONT.)

- Locate the other end of the hose at a suitable drain point (floor drain, sump, laundry tub, etc.) that terminates at the sewer. **Check and comply with local codes.**
- Tie or wire the hose in place at the drain point. High water pressure will cause it to whip during the back-wash and fast rinse cycles of regeneration. **Also provide an air gap of at least 1-1/2" between the end of the hose and the drain point.** An air gap prevents possible siphoning of sewer water into the softener, if the sewer should "back-up."

The water softener will not work if water cannot exit this hose during regeneration.

- Elevating the drain hose may cause back pressure that could reduce the brine draw during regeneration. If raising the drain line overhead is required to get to the drain point, measure the inlet water pressure to the softener first. For inlet pressures between 20 and 50 psi, do not raise higher than 8' above the floor. For inlet pressure above 50 psi, the drain line may be raised to a maximum height of 14'.



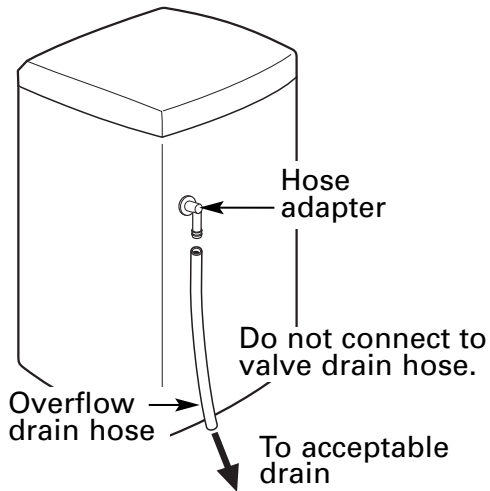
Installation Instructions

5 INSTALL THE BRINE TANK OVERFLOW AND HOSE

- Connect overflow drain hose to fitting on side of brine tank.
- Locate the other end of the hose at the drain point. **DO NOT ELEVATE** this hose higher than the elbow on the brine tank.

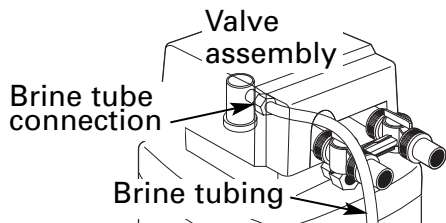
IMPORTANT: DO NOT TEE OVERFLOW HOSE TO VALVE DRAIN HOSE.

NOTE: This drain is for safety only. If the cabinet (brine tank) should over-fill with water, the excess is carried to the drain.

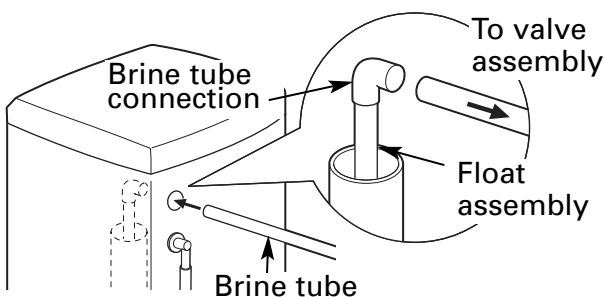


6 BRINE TUBING CONNECTION

Connect brine tube to clear air check assembly on the main valve:



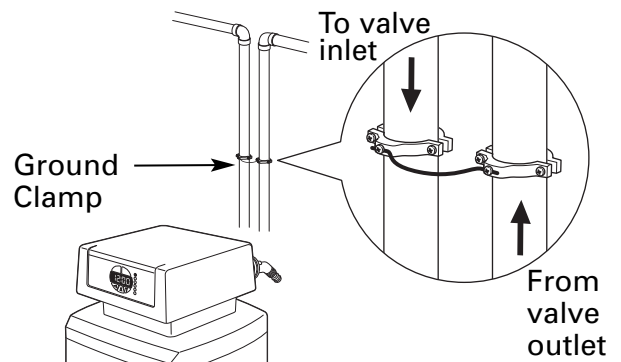
- Route brine tube through 1" hole in brine tank above hose adapter.
- Connect tubing to 90° fitting on top of float assembly. Press in firmly to fully seat in fitting.



7 INSTALL GROUNDING WIRE AND CLAMPS

IMPORTANT: A copper or galvanized house cold water pipe is often used to ground electrical outlets in the home. **Grounding protects you from electrical shock.** The water softener may have broken this ground path. To restore connection, install UL approved grounding hardware or 6-gauge copper wire across the softener valve, tightly clamped, using UL approved grounding clamps at both ends as shown. Zinc clamps should not be used on copper plumbing. Grounding hardware is not provided with the unit. It may be purchased separately from your local hardware store.

NOTE: Clean copper pipe and ends of wire with emery paper. Bare wire is recommended. If insulated wire is used, it should be stripped 3/4" at each end before cleaning with emery paper.



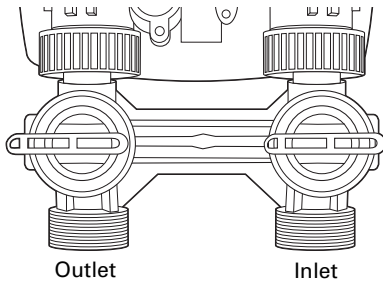
Installation Instructions

START-UP RINSING PROCEDURE (BYPASS VALVE IS OPTIONAL)

1 OPEN WATER SUPPLY

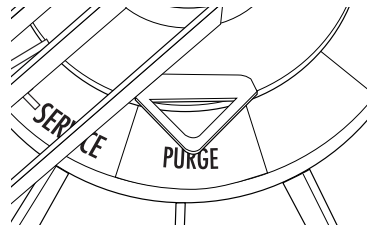
With the plumbing, drain line and overflow connections completed, slowly open the water supply, allowing the lines to pressurize.

NOTE: The optional bypass should still be in bypass mode as shown.



2 ADVANCE THE CONTROL VALVE

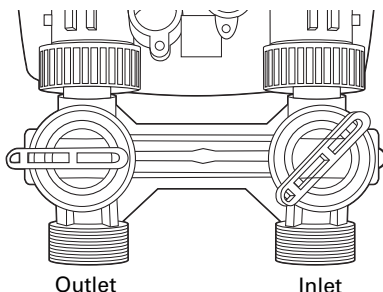
With the transformer unplugged, manually advance the control valve by depressing the drive gear and rotating the main system gear to the purge position (see Step 4).



3 PURGE THE SYSTEM

Slowly open the inlet valve (only) on the bypass valve to the half-opened position, allowing the system to pressurize. It is normal to hear air blowing to the drain during this procedure.

Once the air clears and water begins to run to the drain, open the inlet valve (only) to the full open position and allow the water to run to the drain in purge for a minimum of 20 minutes.

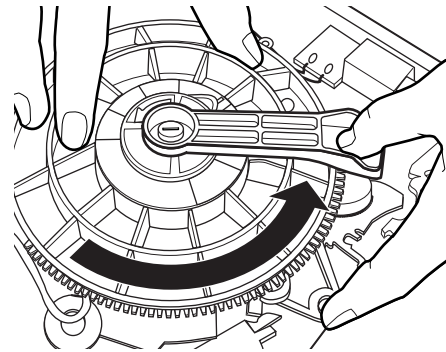


4 RUN THE WATER

After the 20-minute purge cycle, manually advance the main gear to the backwash cycle and allow to run for a minimum of 10 minutes.

After 10 minutes during the backwash cycle, open both the inlet and outlet valves on the bypass to the fully opened position.

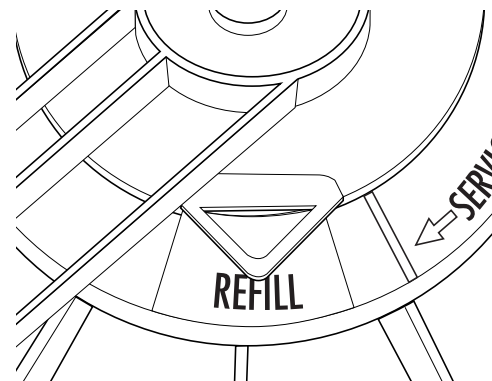
NOTE: When advancing the main gear manually while under water pressure, it is normal for the gear to encounter resistance as the valve chambers depressurize. If resistance occurs, pause five seconds to allow the valve to depressurize before advancing to the next step.



Advance the gear in the counterclockwise direction only. Damage will occur if advanced in the opposite direction.

5 FILL BRINE TANK

After the ten-minute backwash cycle, manually advance the control valve to the brine refill position for ten minutes, allowing water to flow into the brine storage tank.

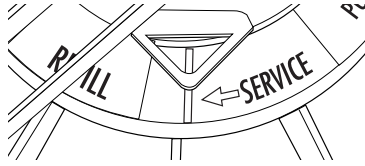


Once water begins to flow into the tank, fill the brine tank with a minimum of 80 lbs. of salt pellets.

Installation Instructions

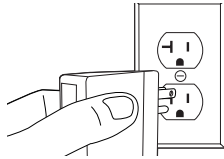
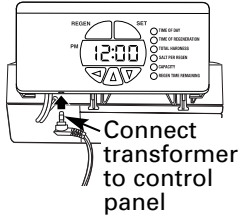
6 ADVANCE CONTROL VALVE TO SERVICE POSITION

After the ten-minute refill time, manually advance the control valve to the service position.



7 CONNECT TO ELECTRICAL POWER

- The softener works on 12 volt-60Hz electric power. The included transformer changes standard 120-volt AC house power to 12 volts DC. Connect transformer to control panel. Plug is located on the bottom left of the control panel. **Plug the transformer into a 120-volt outlet only.** Be sure the outlet is always live so it can not be switched off by mistake.

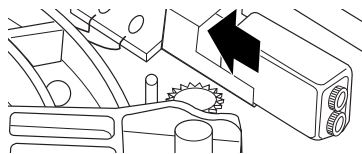


8 INSTALL 9V BATTERY FOR BATTERY BACKUP FEATURE

Your softening system has a battery backup feature that allows the control to continue monitoring water flow and maintain the proper time of day during short power outages. The control uses a standard 9-volt battery (not supplied).

During a power outage, the display will be turned off and the motor will not run, but the control will continue to monitor water flow and time. If power is out and a regeneration is needed, the regeneration will be delayed until power is restored. If power is lost during the regeneration, the control will resume the regeneration when power is restored.

While batteries may last for over a year, it is recommended that you replace the battery every year.



During an interruption in power supply, a typical new 9-volt alkaline battery provides approximately 40 hours of power for the control.

If there is a power outage, after power is restored, verify that the time in the control is correct. If it is, system is OK. If time is incorrect, set the correct time in the control and replace the 9-volt battery. If system has been without power for over 24 hours, initiate an immediate regeneration cycle by pressing the **REGEN** button.

8 INSTALL 9V BATTERY FOR BATTERY BACKUP FEATURE (CONT.)

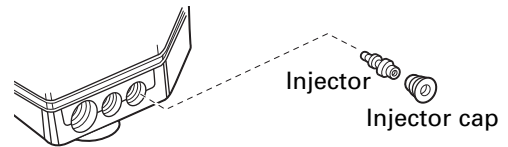
To install a battery:

1. Remove the control valve cover.
2. The battery pocket is located in the upper left corner of the control as shown.
3. Connect the battery, matching up negative and positive posts.
4. Insert battery into holder located on the back of the control panel. Make sure terminal wires are routed away from the valve gears.

9 INJECTOR SELECTION

- The injector is critical to the proper flow through the resin tank during the regeneration cycle. The injector supplied with the unit from the factory is applicable to installations with supply water pressure up to 70 psi.
- If supply water pressure is greater than 70 psi, injector assembly WS15X10059 should be installed.

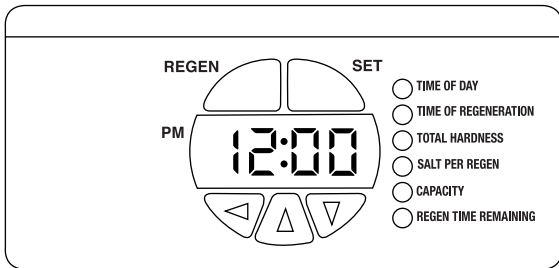
Water Pressure	Injector	Part Number
20-70 psi	5 bumps	WS15X10060
70-125 psi	4 bumps	WS15X10059



Installation Instructions

PROGRAMMING THE CONTROL

PROGRAMMING THE CONTROL



The green indicator lights up next to the name of the active control setting.

Pressing the DOWN ▼ button displays the settings in order. By continuing to press the DOWN ▼ button, the settings start over, beginning with the time of day. Pressing the UP ▲ button displays the settings in reverse order.

To change the settings, press the SET button on the top right. A digit on the display will start to flash. If you want to change this number, press the UP ▲ button to increase the number or the DOWN ▼ button to decrease the number.

When the number is correct, press the LEFT ◀ button. The digit to the right will stop flashing and the next digit to the left starts flashing.

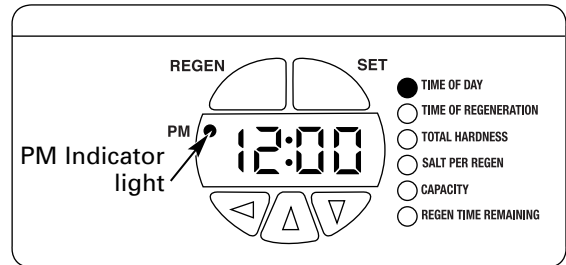
To skip the number without changing, press the LEFT ◀ button. When you reach the far left digit, press the LEFT ◀ button to return to the digit on the right.

NOTE: If you press and hold either the UP ▲ or DOWN ▼ button for more than 1 second, the flashing number will increase or decrease at ten counts per second.

You can only change the flashing digit. Continue changing numbers until you reach the desired setting. Press the SET button. The numbers stop flashing and the control accepts the new settings. After approximately 30 seconds, the control starts alternating the display between TIME OF DAY and CAPACITY.

NOTE: If the new setting is not accepted because it was outside the allowable range, the old value will be displayed. Refer to the table guides for correct settings.

SET PRESENT TIME OF DAY



Press UP ▲ or DOWN ▼ button to select TIME OF DAY.

1. Press the SET button. The display will show the time of day with the minutes blinking.
2. Press UP ▲ or DOWN ▼ button to set. The UP button advances the digit; the DOWN button moves the digit in reverse.

When the number is correct, press the LEFT ◀ button. The digit to the right will stop flashing and the next digit to the left starts flashing. You can only change the flashing number.

If the present time is between noon and midnight, be sure PM indicator light is on. If the present time is between midnight and noon, be sure PM indicator light is off.

To change AM/PM, advance the far left digit. The digit will alternate between 0 and 1. As the digit alternates, the PM light will turn on and off.

NOTE: Each press of an UP ▲ or DOWN ▼ button changes the digit by one minute. Holding the button changes the digit at a rapid rate.

3. When the present time is correct, press SET to accept.

Installation Instructions

TIME OF REGENERATION

The system has a default setting of 2:00 a.m.

To change:

- Use the UP ▲ or DOWN ▼ button to select a new time for regeneration.
- Use procedure in **SET PRESENT TIME OF DAY**.
- Press the **SET** button to accept.

TOTAL WATER HARDNESS

Water hardness is the hardness of the supply water to the house in grains per gallon. The system has a default setting of 25 grains/gallon.

A water test should be performed at the time of installation to determine your water hardness (grains/gallon). You can get the grains per gallon (gpg) hardness of your water supply from a water analysis laboratory. If you are on a municipal supply, call your local water department. If your report shows hardness in parts per million (ppm), simply divide by 17.1 to get the equivalent number of grains per gallon.

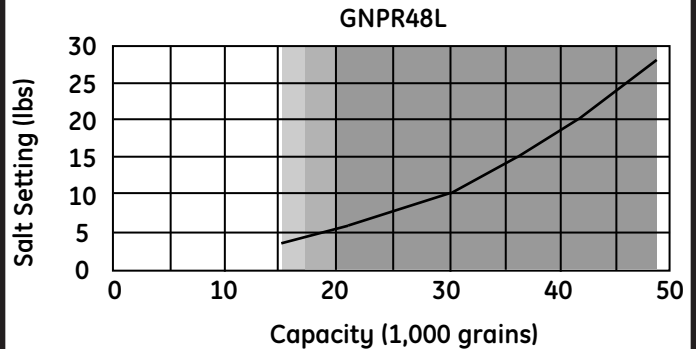
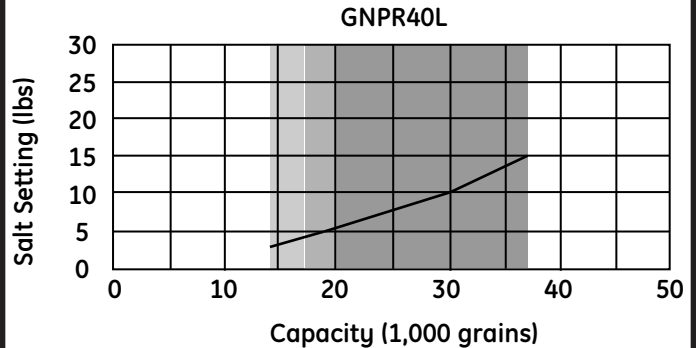
To change:

- Use the UP ▲ or DOWN ▼ button to select total water hardness.
- Press the **SET** button.
- Change the digits by using the UP ▲, DOWN ▼ or LEFT button.
- Press the **SET** button to accept.

SALT PER REGEN AND CAPACITY

These two settings are required to provide the most efficient operation of the system in your installation.

Salt efficiency is improved by regenerating part of the capacity. For example, the GNPR40 has 37,100 grains of capacity. It is more efficient to regenerate 20,000 grains of capacity more frequently than waiting and regenerating the complete 37,100 grains.



Both **SALT PER REGEN** and **CAPACITY** are determined based on the chart on page 13.

FOR CALIFORNIA INSTALLATIONS:

- California regulations require the control setting to yield 4,000 grains of capacity per pound of salt. To meet these requirements, the **SALT PER REGEN** and **CAPACITY** must be set no higher than indicated below:

Model	Capacity Default	Salt Default
GNPR40L	16.5 KGr	4.0 lbs
GNPR48L	15.2 KGr	3.6 lbs

Installation Instructions

SALT PER REGEN AND CAPACITY (CONT.)

NOTE: Both **SALT PER REGEN** and **CAPACITY** inputs must be based on the **SYSTEM CAPACITY INPUTS CHART**.

How to determine correct salt dosage and capacity:

The correct salt dosage and capacity are determined based on the family size and water hardness. Use the following procedure and example:

- Daily Water Usage = number of persons in household x 80 gallons
For a family of 3
Daily Water Usage = 3 x 80 = 240 gallons/day
 - Water Hardness - have the water tested or call your local water company. For this example, 20 grains is assumed.
 - Calculate total grains used per day = gallons/day x hardness = grains/day
240 gallons/day x 20 grains = 4,800 grains/day
 - Water softener should be set to regenerate every 5 days.
Req Capacity = 5 days x 4,800 grains/day = 24,000
 - Use **SYSTEM CAPACITY INPUT** table to select capacity and determine lbs of salt per regeneration.
For GNPR40 use setting at 24,000 grains.
 - Program the control:
Capacity: 24,000 grains
Lbs of Salt: 7.0
- If water supply has a high level of sediment or iron, set system to regenerate every 3 days:
- Use the UP ▲ or DOWN ▼ button to select **SALT PER REGEN**.
 - Press the **SET** button.
 - Use the UP ▲, DOWN ▼ and LEFT ◀ buttons to select **SALT PER REGEN** amount.
 - Press the **SET** button to accept.
 - Use the UP ▲ or DOWN ▼ button to select **CAPACITY**.
 - Press the **SET** button.
 - Use the UP ▲, DOWN ▼ and LEFT ◀ buttons to select correct capacity.
 - Press the **SET** button to accept.

SYSTEM CAPACITY INPUTS

Example of Lbs of Salt req. per regen	CAPACITY (x 1,000)	
	GNPR40L	GNPR48L
3.0	14.1 ⁴⁰	N/A
3.6	15.5	15.2 ⁴⁸
4.0	16.5	15.5
5.0	19.0	18.0
6.0	22.0	21.0
7.0	24.0	23.5
7.5	24.4 ⁴⁰	24.3
8.0	25.6	25.0
9.0	27.9	26.1 ⁴⁸
10.0	30.0	30.0
11.0	31.9	31.5
12.0	33.6	33.0
13.0	35.1	34.0
14.0	36.4	35.2
15.0	37.1 ⁴⁰	36.0
16.0	N/A	37.0
17.0	N/A	38.0
18.0	N/A	39.8
19.0	N/A	41.0
20.0	N/A	41.5
21.0	N/A	42.0
22.0	N/A	43.0
23.0	N/A	44.0
24.0	N/A	45.2
25.0	N/A	45.9
26.0	N/A	46.5
27.0	N/A	47.2
28.0	N/A	48.9 ⁴⁸

⁴⁰GNPR40L certified capacity at salt setting

⁴⁸GNPR48L certified capacity at salt setting

NOTE: The 3.0 lbs salt setting (GNPR40L) and the 3.6 lbs salt setting (GNPR48L) are certified using the 5 bump injector. The 7.5 lbs (GNPR40L), 15 lbs (GNPR40L), 9 lbs (GNPR48L) and 18 lbs (GNPR48L) are certified using the 4 bump injector.

Installation Instructions

NORMAL OPERATION

The control will cycle between TIME OF DAY and CAPACITY about every 10 seconds, as indicated by the green indicator light.

Capacity in Normal Operation mode is the gallons of water available until the next regeneration cycle.

During a regeneration cycle, the control will cycle between TIME OF DAY and REGEN TIME REMAINING.

REGEN TIME REMAINING is the number of minutes until the regeneration cycle is complete.

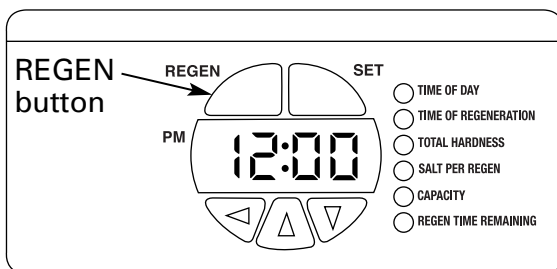
MANUAL REGENERATION

Occasionally you may find it necessary to initiate a manual regeneration. This is done by pressing the **REGEN** button on the front of the display. When you press the **REGEN** button, the control performs a full regeneration of the water conditioner immediately.

In the event the system is allowed to run out of salt, it will be necessary to run "Back to Back" regenerations. This can be done easily by pressing the **REGEN** button one time, waiting at least one minute and pressing the **REGEN** button again.

NOTE: The second regeneration will begin immediately after the first is completed.

"Back to Back" regenerations are necessary if full exhaustion occurs due to low regenerate levels or system malfunction. The system works on a highly efficient proportionate-brining method. When the system is not aware of the lack of proper regenerate (salt), a larger portion of the resin bed becomes exhausted.



ERROR CODES

This system continuously monitors itself and displays an error message if it detects something wrong. This typically happens when the valve has not advanced through the regeneration cycle properly.

When an error is detected, the display shows the letters "Err" with a number from 1 to 4. The table on page 24 describes each error, the cause of the error and the solutions.

To clear the error from the display, press any button on the control. If the error still exists, the control will display the error message again after 30 seconds.

SOUNDS YOU WILL HEAR

During the regeneration cycle, the softener makes several sounds. These sounds are normal.

- Clicking sound – This occurs as the valve assembly advances. It is the opening and closing of the valve ports.
- Harmonic sound – As the valve transitions between cycles in regeneration, a high-pitched harmonic noise may be heard for a few seconds.
- Water flow sound – In the backwash and purge portions of the regeneration, water flow is very high – 2-3 gpm. This is required to flush the tank of accumulated minerals and sediments.

Installation Instructions

SANITIZING PROCEDURES

To complete the installation, do the following sanitizing procedures.

Care is taken at the factory to keep your water softener clean and sanitary. Materials used to make the softener will not infect or contaminate your water supply and will not cause bacteria to form or grow. However, during shipping, storage, installation and operation, bacteria could get into the softener. For this reason, sanitizing as follows is suggested when installing.

NOTE: Sanitizing is recommended by the Water Quality Association for disinfecting.

1. Be sure to complete all installation steps, including programming the control.
2. Pour about 3/4 oz. (1½ tablespoons) of common 5.25% unscented household bleach (Clorox, Linco, Bo Peep, White Sail, Eagle, etc.) into the **brinewell**. Refer to illustration on page 5.
3. **IMPORTANT:** Press and hold for 3 seconds the faceplate **REGEN** button to start an immediate regeneration. The indicator light will alternate between TIME OF DAY and REGEN TIME REMAINING. The bleach will be drawn through the water softener, and out the drain. This process takes approximately 3 hours.

4. If, after sanitization, water from the house faucet tastes salty or has a slight color, this is a preservative from the resin tank. Turn on the cold soft water faucets and drain for a few minutes or until clear.

NOTE: When the sanitizing regeneration is over, all remaining bleach is flushed from the conditioner and your house **COLD** water supply is fully soft immediately. However, your water heater is filled with hard water and as hot water is used, it will refill with soft water. When all the hard water is replaced in the water heater, hot only and mixed hot and cold water will be fully soft. If you want totally soft water immediately, after the above regeneration, drain the water heater until the water runs cold.

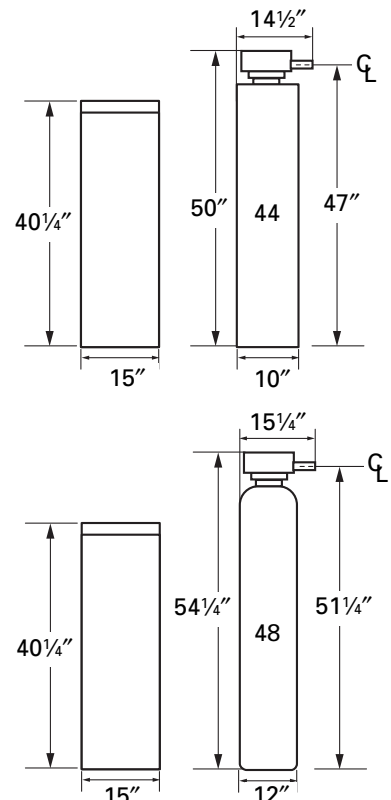
▲WARNING: If you do drain the water heater, use extreme care as the hot water could cause burns. Turn the water heater off prior to draining.

SPECIFICATIONS/DIMENSIONS

		GNPR40L	GNPR48L
Resin Tank Size		10x44"	12x48"
Resin Volume		1.25 ft ³	1.50 ft ³
Refill Controller		0.35 gpm	0.35 gpm
Backwash Controller		2.8 gpm	2.8 gpm
Brine Tank	Size	15x40"	15x40"
	Capacity	350 lbs	350 lbs
Operation Temperature	Min.	34°	34°
	Max.	100°F	100°F
Flow Rate		15.2 gpm	18.0 gpm
Pressure Drop		15.0 psi	15.0 psi
Maximum Flow to Drain		4.0 gpm	3.5 gpm

These systems conform to WQA NSF/ANSI 44 for the specific capacity claims as verified and substantiated by test data.

- * Testing was performed using pellet grade sodium chloride as the regenerant salt.
- ** Efficiency rating is valid only at the lowest stated salt dosage. These softeners were efficiency rated according to WQA NSF/ANSI 44.
- *** Extent of iron removal may vary with conditions. The capacity to reduce clear water iron is substantiated by WQA test data. State of Wisconsin requires additional treatment if water supply contains greater than 5 ppm clear water iron. Use of Diamond Crystal® Red•Out® or Super Iron Out® will improve iron removal. Refer to **Cleaning Iron Out of the Water Softening System** section.



About the water softener system.

Service

When the water softening system is providing soft water, it is called "Service." During service, hard water flows from the house main water pipe into the water softening system. Inside the water softening system resin tank is a bed made up of thousands of tiny, plastic resin beads. As hard water passes through the bed, each bead attracts and holds the hard minerals. This is called ion-exchanging. It is much like a magnet attracting and holding metals. Water without hard minerals (soft water) flows from the water softening system and to the house pipes.

After a period of time, the resin beads become coated with hard minerals and they have to be cleaned. This cleaning is called regeneration. The regeneration cycle is started at 2:00 AM (factory setting) by the water softening system control, and consists of five stages or cycles. These are **FILL, BRINING, BRINE RINSE, BACKWASH** and **FAST RINSE**.

Automatic Hard Water Bypass During Regeneration

For emergency needs, hard water is available to the home during the regeneration cycles.

However, you should avoid using HOT water because the water heater will fill with the hard water.

Fill

Salt dissolved in water is called brine. Brine is needed to clean the hard minerals from resin beads. To make the brine, water flows into the salt storage area during the fill stage.

Brining

During brining, brine travels from the salt storage area into the resin tank. Brine is the cleaning agent needed to remove hard minerals from the resin beads. The hard minerals and brine are discharged to the drain.

The nozzle and venturi create a suction to move the brine, maintaining a very slow rate to get the best resin cleaning with the least salt.

Brine Rinse

After a pre-measured amount of brine is used, the brine valve closes. Water continues to flow in the same path as during brining, except for the discontinued brine flow. Hard minerals and brine flush from the resin tank to the drain.

Backwash

During backwash, water travels **up** through the resin tank at a fast flow rate, flushing accumulated iron, dirt and sediments from the resin bed and to the drain.

Fast Rinse

Backwash is followed by a fast flow of water **down** through the resin tank. The fast flow flushes brine from the bottom of the tank, and packs the resin bed.

After fast rinse, the water softening system returns to soft water service.

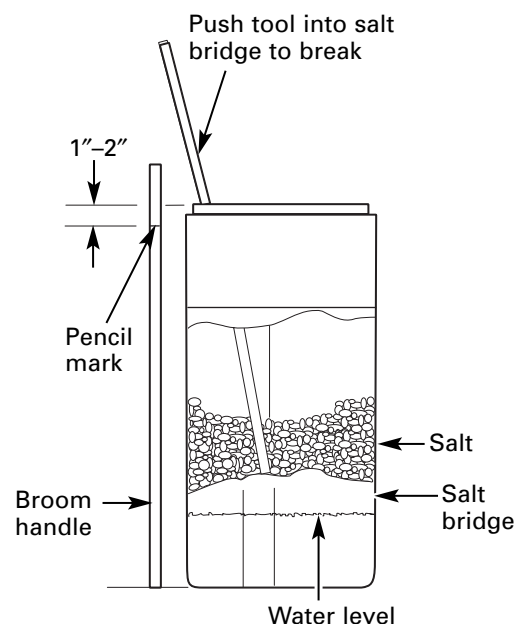
Breaking a Salt Bridge

Sometimes, a hard crust or salt bridge forms in the salt storage area. It is usually caused by high humidity or the wrong kind of salt. When the salt bridges, an empty space forms between the water and salt. Then salt will not dissolve in the water to make brine.

If the brine tank is full of salt, it is hard to tell if you have a salt bridge. Salt is loose on top, but the bridge is under it. The following is the best way to check for a salt bridge.

Salt should be loose all the way to the bottom of the tank. Take a broom handle or like tool, and carefully push it down into the salt, working it up and down. If the tool strikes a hard object (be sure it's not the bottom or sides of the tank), it's most likely a salt bridge. Carefully break the bridge with the tool. **Do not** pound on the walls of the tank.

If the wrong kind of salt made the bridge, take it out. Then fill the tank with nugget or pellet salt only. In humid areas, it is best to fill with less salt, more often to prevent a salt bridge from forming.

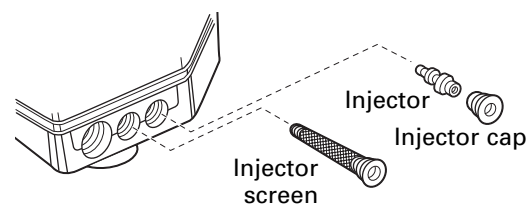


Cleaning the Injector and Screen

A clean injector and screen is needed for the water softening system to work properly. This small unit makes the suction to move brine from the brine tank storage area to the resin tank during regeneration. If it becomes plugged with sand, dirt, etc., the water softening system will not work and you will get hard water. This will be evident by a high level of water in the brine tank—over 4" when the system is in service mode.

TO CLEAN:

- Put system in Bypass mode and relieve water pressure.
- Remove injector screen (a flat-head screwdriver is required).
- Remove injector cap and injector (needle nose pliers are required).
- Clean and flush thoroughly.
- Check for damage.
- Reassemble injector and injector screen.
- To check proper operation, see page 30, *Checking the Brine Draw and Refill Function*.
- Initiate REGEN cycle to restore resin bed. A back-to-back regeneration is suggested. Excess water in the brine tank will be removed.



Injector screen and cap installation

Care and cleaning of the water softening system.

Checking the Salt Storage Level and Refilling

Brine (salt dissolved in water) is needed for each and every regeneration. The water for making brine is metered into the salt storage area by the water softening system valve and control.

However, you must keep the tank supplied with salt.

Use clean water softening salts only, at least 99.5% pure. NUGGET, PELLET or coarse SOLAR salts are recommended. **Do not use rock, block, granulated or ice cream making salts.** They contain dirt and sediments, or mush and cake, and will create maintenance problems.

⚠ CAUTION: *Water softening salt with iron removing additives:* Some salts may have an additive to help the water softening system handle iron in the water supply. Although this additive may help to keep the water softening system resin clean, it may also release corrosive fumes that weaken and shorten the life of some water softening system parts. GE recommends using only Diamond Crystal® Red•Out® brand salt.

Cleaning Iron Out of the Water Softening System

Your water softening system takes hardness minerals (calcium and magnesium) out of the water. Also, it can control some (see the *Specification Guidelines* section) “clear water” iron. With clear water iron, water from a faucet is clear when first put into a glass. After 15 to 30 minutes, the water begins to cloud or turn rust colored. A water softening system **will not** remove any iron that makes the water cloudy or rusty as it comes from the faucet (called red water iron). To take red water iron out of water, or over the maximum of clear water iron, an iron filter or other equipment is needed.

GE recommends using only Diamond Crystal® Red•Out® brand salts with Iron Fighter® additive to help keep the resin bed clean of clear iron. If your water supply has clear water iron, periodic resin bed cleaning is needed. GE recommends using Super Iron Out® brand resin bed cleaner to thoroughly clean your resin bed if your iron content is high. Clean the bed at least every six months, or more often if iron appears in the soft water between cleanings.

IMPORTANT: It is important to mix the resin bed cleaner with water (following the manufacturer’s instructions), pour it into the **brinewell tube** (see page 5) and regenerate the softener immediately. Do not pour the resin bed cleaner in with the salt, as it will not be as effective in cleaning the resin, and can cause damage to the softener if it is left in the brine tank for an extended period due to the corrosive gases that are formed.

The control has an adjustable backwash cycle. The backwash can be lengthened to better flush the resin bed from high sediment or iron situations. See the *Advanced Control Setting* section or consult an installer.

Also set LBS OF SALT and CAPACITY so the system will regenerate about every 3 days. See page 13.



Troubleshooting Tips
 Save time and money! Review the chart on these pages first and you may not need to call for service.

NO SOFT WATER – Most Common Problems:

Check the following before calling for service:

- Not enough salt—brine tank should be at least 1/3 full.
- Bypass valve in “Bypass” position—flange on knobs should be in line with pipes (see page 6).
- Hardness setting too low. Check hardness setting and adjust. Verify hardness of supply water—from local water company, water test or call the GE Answer Center.
- Salt Bridge—salt solidifies above water level so that brine water is not in contact with salt. See the *Breaking a Salt Bridge* section.

Problem	Possible Causes	What To Do
No soft water	Faucet or fixture where sample was taken not plumbed to soft water. <i>NOTE: Be sure sample is from a faucet that does not mix soft and hard water. For example, a single lever kitchen faucet, if the cold side is plumbed to hard water.</i>	<ul style="list-style-type: none"> • To conserve salt, the installer may have isolated some fixtures (outside faucets, toilets, etc.) from soft water. From the outlet of the water softening system, trace the water flow path, in house plumbing. If soft water is not directed to a faucet or fixture where wanted, consult a plumber.
	No salt in the brine tank or salt bridged	<ul style="list-style-type: none"> • Check for a salt bridge or, if the tank is empty, refill with recommended salt. Press (for 3 seconds) the REGEN button to start an immediate regeneration and restore soft water supply. See page 17, <i>Breaking a Salt Bridge</i>.
	Transformer unplugged at wall outlet or power cable to softener not connected. Fuse blown or circuit breaker popped on circuit to electrical outlet. Electrical outlet on a circuit that can continuously be switched off	<ul style="list-style-type: none"> • Check for a loss of electrical power to the water softening system, due to any of these conditions and correct as needed. With the power supply restored, observe the faceplate time display and read <i>Programming the Control</i> section. <i>NOTE: The electrical outlet for the softener should be live so it cannot be accidentally switched off.</i>
	Manual bypass valve in bypass position	<ul style="list-style-type: none"> • Be sure the flange on the bypass valve knobs are in line with the pipes.
	Valve drain hose pinched, plugged, elevated too high or otherwise restricted	<ul style="list-style-type: none"> • Any restriction in this drain hose may prevent proper operation of the nozzle and venturi and reduce or prevent brine draw during regeneration.
	Injector and injector screen dirty, incorrectly assembled or damaged	<ul style="list-style-type: none"> • This will be evident by a high level of water in the brine tank. Water level will be greater than 4” when the system is in the service position. • Refer to <i>Cleaning the Injector and Screen</i> instructions. With water pressure to the water softening system off, remove the injector and injector screen. Thoroughly clean and flush. Check for any damage. Reassemble to valve assembly.
	If resin bed is fully exhausted, for example, after a malfunction, one regeneration cycle may not fully restore capacity	<ul style="list-style-type: none"> • Complete “back to back” regenerations. Initiate Regeneration cycle, wait 1 minute, then press REGEN again. See page 14.

Before you call for service...



Troubleshooting Tips

Problem	Possible Causes	What To Do
Water hard sometimes	Using hot water while the water softening system is regenerating	<ul style="list-style-type: none"> Avoid using hot water during water softening system regeneration because the water heater will refill with hard water.
	Control HARDNESS number setting too low	<ul style="list-style-type: none"> Press the SET button to enter a new value. Be sure the number shown is the same as the actual grains per gallon hardness of your water supply. See the <i>Programming the Control</i> section if a change in the setting is needed.
	Grains of hardness in your water supply have increased	<ul style="list-style-type: none"> Water hardness can change over time, especially in well water. To check, have the water tested by a water analysis laboratory or call your local water department. Adjust the hardness number setting as needed.
	System capacity inputs, Salt per Regeneration and Capacity set too low	<ul style="list-style-type: none"> See <i>Salt per Regen and Capacity</i> section so system will regenerate about every 5 days. See instructions on pages 12 and 13.
	If resin bed is fully exhausted, for example, after a malfunction, one regeneration cycle may not fully restore capacity	<ul style="list-style-type: none"> Complete “back to back” regenerations. Initiate Regeneration cycle, wait 1 minute, then press REGEN again. See page 14.
Water feels slippery after installation of water softening system	Absence of hardness minerals	<ul style="list-style-type: none"> This is normal. Hardness in water gives it the abrasive feel you may have been accustomed to. The slippery feel is the clean feel of soft water.
Water softening system not using any salt	Water softening system is a “demand” unit	<ul style="list-style-type: none"> Does not use much salt to regenerate—very efficient.
	Possible salt bridge	<ul style="list-style-type: none"> See the <i>Breaking a Salt Bridge</i> section.
	Possible plugged injector and screen	<ul style="list-style-type: none"> See the <i>Cleaning the Injector and Screen</i> section.
Water is blue color after water softening system was installed	Acidic water in copper plumbing	<ul style="list-style-type: none"> Have the water tested at once.
Cloudiness on glassware (automatic dishwashers)	Combination of soft water and too much detergent	<ul style="list-style-type: none"> This is called <i>etching</i> and is permanent. To prevent this from happening, use less detergent if you have soft water. Wash glassware in the shortest cycle that will get them clean.
Excessive/high level of water in brine tank	Valve drain hose pinched, plugged, elevated too high or otherwise restricted	<ul style="list-style-type: none"> Any restriction in this drain hose may prevent proper operation of the injector and screen and reduce or prevent brine draw during regeneration.
	Injector or injector screen dirty	<ul style="list-style-type: none"> See the <i>Cleaning the Injector and Screen</i> section, page 17. With water pressure to the water softening system off, remove the injector and injector screen. Thoroughly clean and flush. Check for any damage. Reassemble to valve assembly.

Problem	Possible Causes	What To Do
Salty tasting or brown/yellow colored water after installation	Unit not sanitized	<ul style="list-style-type: none"> • Complete the <i>Sanitizing Procedures</i> on page 15. • At completion of regeneration cycle (approx. 2 hrs), run water from faucets to purge the salty water.
	Low water pressure	Check pressure. <ul style="list-style-type: none"> • Drain height 8' or less, pressure should be minimum of 20 psi. • Drain height above 8', pressure should be minimum of 50 psi.
	Restricted drain hose	<ul style="list-style-type: none"> • Clean and reconnect drain line. • Check for kinks in drain line.
Brown/yellow colored water	Unit was idle for a period of time	<ul style="list-style-type: none"> • Complete the <i>Sanitizing Procedures</i> on page 15.
Sounds you might hear during regeneration cycle	Running water from the unit into a drain during regeneration	<ul style="list-style-type: none"> • This is normal. High water flows in backwash cycle, flushes minerals and sediments from resin tank.
	Harmonic noises during regeneration	<ul style="list-style-type: none"> • This is normal.
	Clicking	<ul style="list-style-type: none"> • This is normal. This is the sound of various valves opening and closing as valves cycle through regeneration cycle.
Water has air bubbles and is cloudy	Air in system after installation	<ul style="list-style-type: none"> • Will go away after it runs for a while.

Advanced programming and troubleshooting section.

▲WARNING: *Advanced programming should only be performed by a qualified technician.*

This section was designed for the use of water treatment professionals. Default settings are based on water conditions at a typical installation. Before making any changes, consult a water treatment professional, as incorrect settings may result in a system malfunction. Programming the control is not covered under the warranty.

To access advanced programming, simultaneously hold down the UP ▲ and DOWN ▼ buttons. This will allow you to enter advanced programming settings P6 through P19 (see table below).

Advanced Programming Parameters

Parameter	Description	Range	Minimum Increments	Units of Measure	Notes
P6	Refill controller	1-99	1	gpm	0.33 gpm, both models
P7	Brine draw value	1-99	1	Minutes	40L – 15 and 48L – 16
P8	Not used	N/A	N/A	N/A	N/A
P9	Backwash time	3-30	1	Minutes	Skip this parameter to accept the default or enter a value.
P10	Slow rinse time	8-125	1	Minutes	GNPR40L = 67 GNPR48L = 83
P11	Fast rinse time	2-19	1	Minutes	Skip this parameter to accept the default or enter a value.
P12	Units of measure	0-1	1		0 = U.S. 1 = Metric Skip this parameter to accept the default (U.S.).
P13	Clock mode	0-1	1		0 = 12-hour clock 1 = 24-hour clock Skip this parameter to accept the default (12-hour).
P14	Calendar override	0-30	1	days	0 = no calendar override Skip this parameter to accept the default (no override).
P15	Reserve type	0-3	1		0 = variable reserve
P16	Fixed reserve capacity or initial average value	0-70	1	percent of capacity	Description depends on the value entered for P15 (Reserve type). Skip this parameter to accept the default.
P17	Operation type	0-1	1		0 = Not used 1 = 5-cycle counter current
P18	Salt/capacity change lock out	0-1	1		0 = None 1 = salt/capacity change locked out Skip this parameter to accept the default (no lock out).
P19	Factory defaults	DO NOT CHANGE	1		Loads in factory default values. DO NOT CHANGE THIS PARAMETER.

Default Settings

The following table represents preset values programmed into the system at the factory for both levels for the model shown.

Required Parameters

Name	Description	GNPR40L	GNPR48L
P1	Time of day	Set in field	Set in field
P2	Time of regeneration	2:00 a.m.	2:00 a.m.
P3	Hardness	Set in field (25 grains)	Set in field (25 grains)
P4	Salt amount	7.5 lbs	9.0 lbs
P5	Capacity	24.4 Kgr	26.1 Kgr

Advanced Programming Parameters

Name	Description	GNPR40L	GNPR48L
P6	Refill controller	0.33 gpm	0.33 gpm
P7	Brine draw value	15 min.	16 min.
P8	Not used	N/A	N/A
P9	Backwash time	12 min.	12 min.
P10	Slow rinse time	67 min.	83 min.
P11	Fast rinse time	4.0 min.	4.0 min.
P12	Units of measure	0	0
P13	Clock mode	0	0
P14	Calendar override	0	0
P15	Reserve type	0	0
P16	Fixed reserve capacity or initial average value	N/A	N/A
P17	Operation type	1	1
P18	Salt/capacity change lock out	0	0
P19	Factory defaults	9	9

Advanced troubleshooting.

Manual Indexing for Each Regeneration

The control valve may be manually indexed to each regeneration position as follows:

1. Remove the control valve cover.
2. Press down on the top of the drive gear to disengage the cam gear. (See Step 1 in *Start-Up Rinsing Procedure* section.)
3. With the cam gear disengaged, rotate the cam gear counterclockwise to the various positions, using the same steps as the *Start-Up Rinsing Procedure*.

The control valve may also be operated in a fast mode for testing the control. To activate the fast mode, follow Steps 1 and 2 above to disengage the cam gear. When the cam gear is disengaged, it should be advanced slightly in a counterclockwise direction.

The switch will then activate the motor to cause the cam gear to advance through all the cycles in about 30 minutes. The control will not recognize a fast mode as a regeneration. Manual regenerations can be initiated only by pressing the manual regeneration switch on the face of the control.

Error Detection Codes

Code	Description	Cause	Solution
Err 1	<i>Electronics failure</i>	Control settings need reprogramming	<ul style="list-style-type: none"> • Press any key to load default values. Refer to <i>Programming the Control</i>.
Err 2	<i>Improper start of regeneration (limit switch open when it should be closed)</i>	Valve cam gear has been manually rotated during a regeneration	<ul style="list-style-type: none"> • Press any key to clear the alarm. (Alarm automatically clears at "TIME OF REGEN").
		Valve cam gear has been manually rotated out of "service" position	<ul style="list-style-type: none"> • The control will turn the motor on and drive the cam gear to the proper location.
		Faulty motor	<ul style="list-style-type: none"> • Replace motor assembly.
		Motor wire disconnected	<ul style="list-style-type: none"> • Make sure motor wire is fully connected to control.
Err 3	<i>Improper finish of regeneration (limit switch closed when it should be open)</i>	Valve cam gear has been manually rotated out of "service" position	<ul style="list-style-type: none"> • The control will turn the motor on and drive the cam gear to the proper location.
		Faulty motor	<ul style="list-style-type: none"> • Replace motor assembly.
		Motor wire disconnected	<ul style="list-style-type: none"> • Make sure motor wire is fully connected to control.
Err 4	<i>Improper control settings (one or more settings out of the allowable range)</i>	Faulty switch	<ul style="list-style-type: none"> • Replace switch.
		One or more settings is out of the allowable range	<ul style="list-style-type: none"> • See the <i>Advanced Programming Parameters</i> section on page 22 and <i>Default Settings</i> section on page 23.

Errors

This system continuously monitors itself and displays an error message if it detects something wrong.

When an error is detected, the display shows the letters "Err" with a number from 1 to 4. The table below lists Err numbers, a description of each error, the cause of the error and the solutions.

To clear the error from the display, press any button on the control. If the error still exists, the control will display the error message again after 30 seconds.

Troubleshooting Procedures

Problem	Possible Causes	What To Do
Capacity display stays at "9999" even though there is water usage	Total system capacity was calculated to be a value greater than 9999	<ul style="list-style-type: none"> As the water usage continues, the remaining capacity will drop below 9999, then other values will be shown.
Control does not respond to REGEN button	Button is not active in the programming mode	<ul style="list-style-type: none"> Wait for 30 seconds until lights begin to alternate.
Control does not display time of day	Transformer is unplugged	<ul style="list-style-type: none"> Check connection to control and wall outlet.
	No electric power at outlet	<ul style="list-style-type: none"> Repair outlet or use a working outlet.
	Defective transformer	<ul style="list-style-type: none"> Replace transformer.
	Defective circuit board	<ul style="list-style-type: none"> Replace control.
Control does not display correct time of day	Outlet operated by a switch	<ul style="list-style-type: none"> Use an outlet not controlled by a switch.
	Power outage	<ul style="list-style-type: none"> Reset time of day and replace battery.
No water flow display when water is flowing (colon doesn't blink)	Bypass valve in "bypass" position	<ul style="list-style-type: none"> Set bypass valve into "service" position.
	Meter probe disconnected or not fully connected to meter housing	<ul style="list-style-type: none"> Fully insert probe into meter housing.
	Restricted meter turbine rotation due to foreign material in meter	<ul style="list-style-type: none"> Remove bypass valve, free up turbine and flush with clean water. Turbine should spin freely. If not, refer to the <i>Water Meter Maintenance</i> section.
	Defective meter probe	<ul style="list-style-type: none"> Replace control.
	Defective circuit board	<ul style="list-style-type: none"> Replace control.
Control display is frozen at REGEN TIME REMAINING	Back to back regenerations were requested	<ul style="list-style-type: none"> Refer to <i>Manual Regeneration</i> section.
Control regenerates at the wrong time of day	Power outages	<ul style="list-style-type: none"> Reset time of day to correct time of day and replace battery.
	Time of day set incorrectly	<ul style="list-style-type: none"> Reset time of day to correct time of day. Note PM light.
	Time of regeneration set incorrectly	<ul style="list-style-type: none"> Reset time of regeneration. Note PM light.
Cam gear stalled in regeneration cycle	Motor not operating	<ul style="list-style-type: none"> Replace motor assembly.
	Motor runs backward	<ul style="list-style-type: none"> Replace motor assembly.
	No electric power at outlet	<ul style="list-style-type: none"> Repair outlet or use a working outlet.
	Broken gear	<ul style="list-style-type: none"> Replace gear.
	Defective switch	<ul style="list-style-type: none"> Replace switch.
	Binding of cam gear	<ul style="list-style-type: none"> Remove foreign object obstruction from valve discs or cam gear.
	Water pressure greater than 125 psi during regeneration	<ul style="list-style-type: none"> Install pressure regulator to reduce pressure.
	Defective circuit board	<ul style="list-style-type: none"> Replace control.
Continuous regeneration. Cam gear does not stop at the end of regeneration.	Defective switch	<ul style="list-style-type: none"> Replace switch.
Control does not regenerate automatically or when REGEN button is pressed	Transformer unplugged	<ul style="list-style-type: none"> Connect power.
	No electric power at outlet	<ul style="list-style-type: none"> Repair outlet or use a working outlet.
	Defective motor	<ul style="list-style-type: none"> Replace motor assembly.
	Defective switch	<ul style="list-style-type: none"> Replace switch.
Control does not regenerate automatically but does regenerate when REGEN button is pressed	If water flow display is not operative, refer to "No water flow display when water is flowing" in this table	<ul style="list-style-type: none"> Refer to "No water flow display when water is flowing" in this table.
	Incorrect hardness and capacity settings	<ul style="list-style-type: none"> Set new control values. See the <i>Programming the Control</i> section.
	Defective circuit board	<ul style="list-style-type: none"> Replace control.

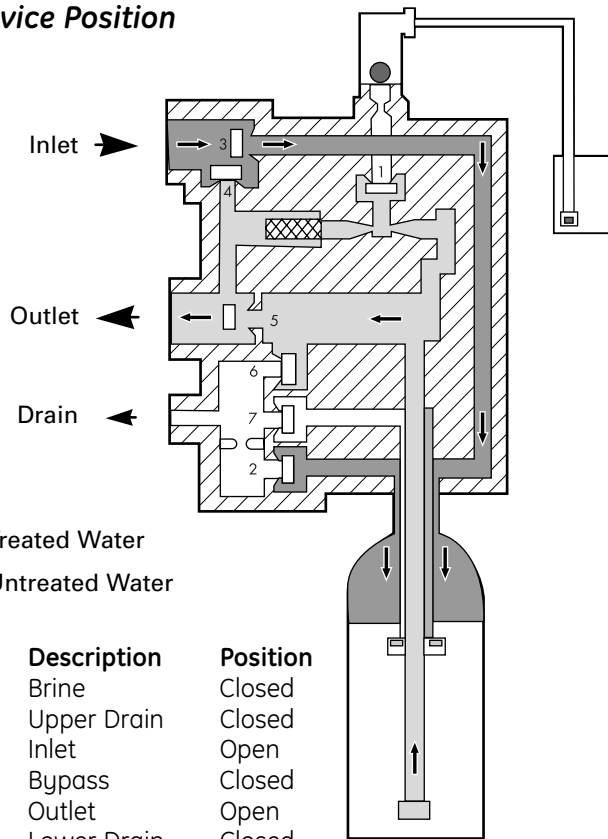
Advanced troubleshooting.

Problem	Possible Causes	What To Do
Run out of soft water between regenerations	Incorrect injector	<ul style="list-style-type: none"> With water pressure > 70 psi, use 4 bump injectors (WS15X10059).
	Improper regeneration	<ul style="list-style-type: none"> Repeat regeneration, making certain correct salt dosage is used.
	Fouled resin bed	<ul style="list-style-type: none"> Use resin cleaner.
	Incorrect salt dose and capacity setting	<ul style="list-style-type: none"> Set Salt per Regen and Capacity setting to proper level. Refer to the <i>Programming the Control</i> sections.
	Incorrect hardness	<ul style="list-style-type: none"> Set to correct hardness. Refer to the <i>Programming the Control</i> sections.
	Water hardness has increased	<ul style="list-style-type: none"> Set to new value. Refer to the <i>Programming the Control</i> sections.
	Restricted meter turbine rotation due to foreign material in meter housing	<ul style="list-style-type: none"> Remove bypass, free up turbine and flush with clean water. Turbine should spin freely—if not, replace meter.
	Water usage below 1/5 gallon per minute	<ul style="list-style-type: none"> Repair leaky plumbing and/or fixtures.
	Brine draw value from Advanced Programming Parameters table is incorrect	<ul style="list-style-type: none"> Set correct brine draw value.
	Incorrect salt type or use of grid plate (salt shelf)	<ul style="list-style-type: none"> Do not use block salt or grid plate (salt shelf) in brine tank.
Control does not draw brine	Low water pressure	<ul style="list-style-type: none"> Increase water pressure (20 psi at conditioner).
	Restricted drain line	<ul style="list-style-type: none"> Remove obstruction.
	Injector or injector screen is plugged	<ul style="list-style-type: none"> Clean injector and screen. Refer to the <i>Cleaning the Injector and Screen</i> section.
	Injector defective	<ul style="list-style-type: none"> Replace injector and cap.
	Valve disc 3 and/or 5 not closed	<ul style="list-style-type: none"> Manually operate cam gear to flush out foreign matter holding disc open. Replace if needed.
Air check valve prematurely closed	<ul style="list-style-type: none"> Briefly put control into brine refill status. Refer to the <i>Manual Regeneration</i> section. Repair air check valve if needed. 	
Brine tank overflow	Brine valve disc 1 held open	<ul style="list-style-type: none"> Manually operate cam gear to flush out foreign matter holding disc open.
	Valve disc 2 not closed during brine draw, causing brine refill	<ul style="list-style-type: none"> Manually operate cam gear to flush out foreign matter holding disc open.
	Air leak in brine line to air check	<ul style="list-style-type: none"> Check all connections in brine line for leaks.
	Salt setting too high	<ul style="list-style-type: none"> Set in new values. Refer to <i>Advanced Programming</i> section.
	Float assembly malfunctions	<ul style="list-style-type: none"> Inspect float assembly in brine well for proper operation. It must be able to move freely.
Intermittent or irregular brine draw	Low water pressure	<ul style="list-style-type: none"> Increase water pressure (20 psi at conditioner).
	Defective injector	<ul style="list-style-type: none"> Replace both injector and injector cap.
No conditioned water after regeneration	Unit did not regenerate	<ul style="list-style-type: none"> Check for power.
	No salt in brine tank	<ul style="list-style-type: none"> Add salt to brine tank.
	Plugged injector	<ul style="list-style-type: none"> Remove injector and flush it and injector screen.
	Air check valve closed prematurely	<ul style="list-style-type: none"> Put control momentarily into REFILL to free air check. Replace or repair air check as needed.
	Incorrect salt type or use of grid plate (salt shelf) in brine tank	<ul style="list-style-type: none"> Do not use block salt or grid plate (salt shelf) in brine tank.
Control backwashes at excessively low or high rate	Incorrect backwash controller	<ul style="list-style-type: none"> Replace with correct size controller.
	Foreign matter affecting controller operation	<ul style="list-style-type: none"> Remove and clean controller.

Problem	Possible Causes	What To Do
Flowing or dripping water at drain line or brine line after regeneration	Drain valve (2 or 6) or brine valve (1) held open by foreign matter	<ul style="list-style-type: none"> Manually operate cam gear to flush out foreign matter holding disc open.
	Weak valve stem return spring on top plate	<ul style="list-style-type: none"> Replace spring.
	Resin in valve	<ul style="list-style-type: none"> Clean valve and backwash control.
Hard water leakage during service	Improper regeneration	<ul style="list-style-type: none"> Repeat regeneration, making sure the correct salt dosage is used.
	Leaking bypass valve	<ul style="list-style-type: none"> Replace bypass valve.
	O-ring around riser tube damaged	<ul style="list-style-type: none"> Replace O-ring.
	Incorrect salt type or use of grid plate (salt shelf) in brine tank	<ul style="list-style-type: none"> Do not use block salt or grid plate (salt shelf) in brine tank.

Flow diagrams.

1 Service Position

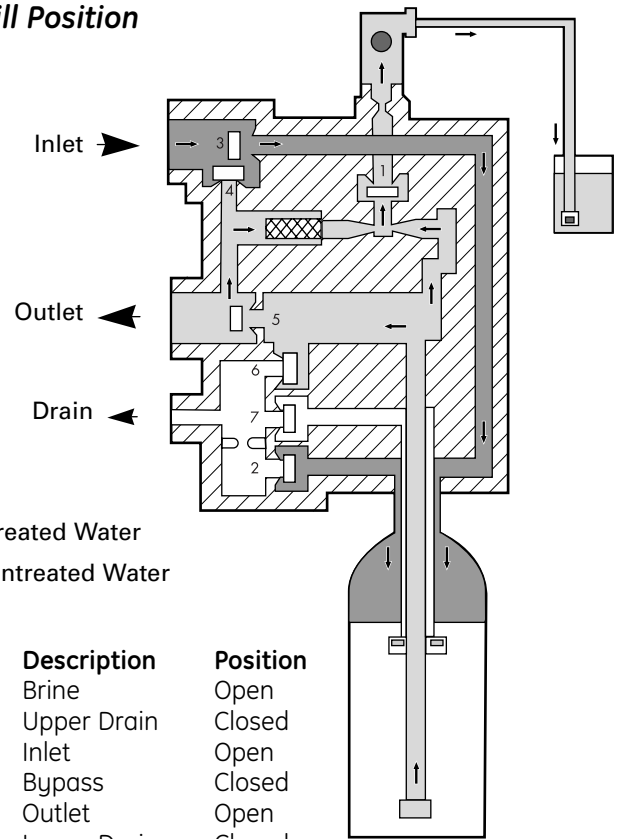


Treated Water
 Untreated Water

Valve

No.	Description	Position
1	Brine	Closed
2	Upper Drain	Closed
3	Inlet	Open
4	Bypass	Closed
5	Outlet	Open
6	Lower Drain	Closed
7	Center Dist.	Closed

2 Refill Position

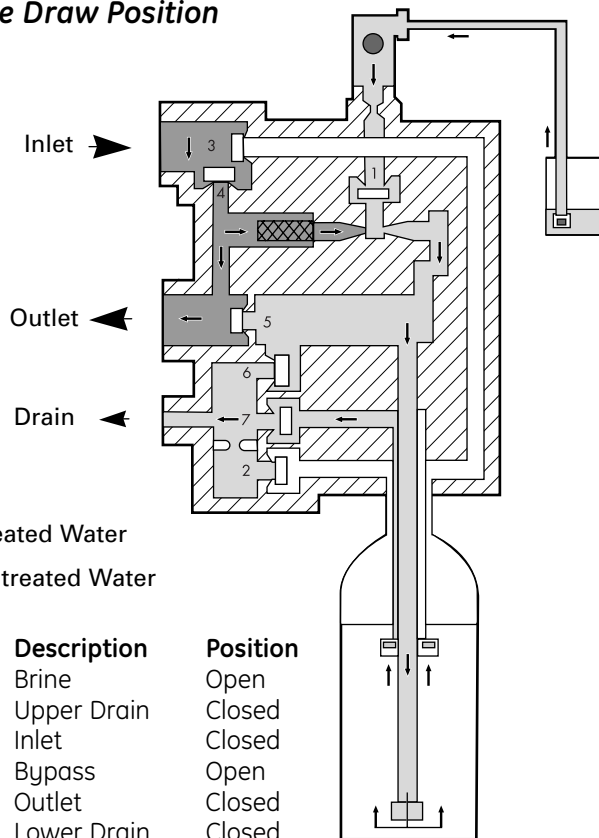


Treated Water
 Untreated Water

Valve

No.	Description	Position
1	Brine	Open
2	Upper Drain	Closed
3	Inlet	Open
4	Bypass	Closed
5	Outlet	Open
6	Lower Drain	Closed
7	Center Dist.	Closed

3 Brine Draw Position

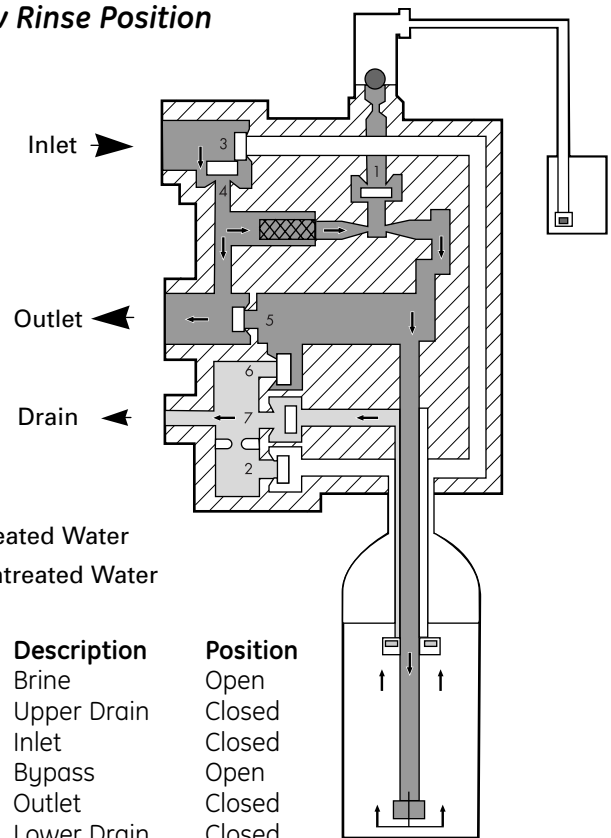


Treated Water
 Untreated Water

Valve

No.	Description	Position
1	Brine	Open
2	Upper Drain	Closed
3	Inlet	Closed
4	Bypass	Open
5	Outlet	Closed
6	Lower Drain	Closed
7	Center Dist.	Open

4 Slow Rinse Position

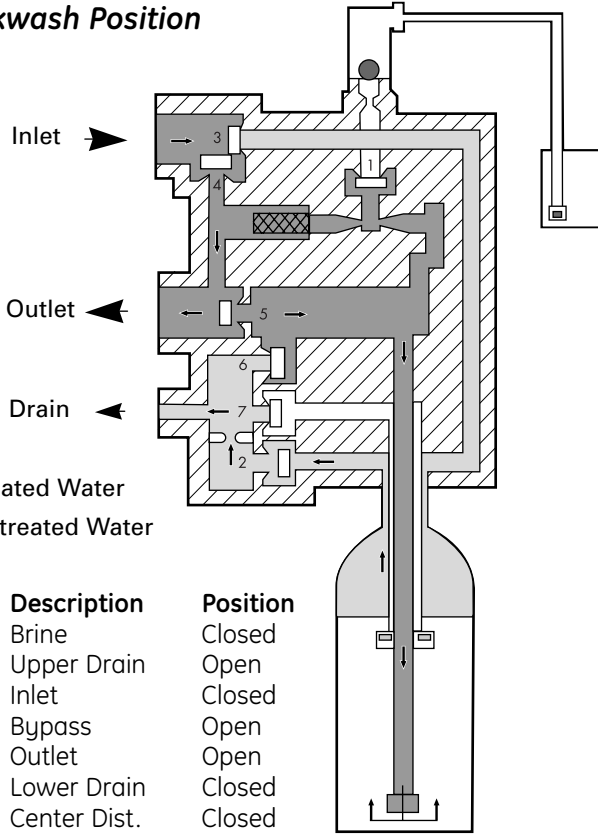


Treated Water
 Untreated Water

Valve

No.	Description	Position
1	Brine	Open
2	Upper Drain	Closed
3	Inlet	Closed
4	Bypass	Open
5	Outlet	Closed
6	Lower Drain	Closed
7	Center Dist.	Open

5 Backwash Position

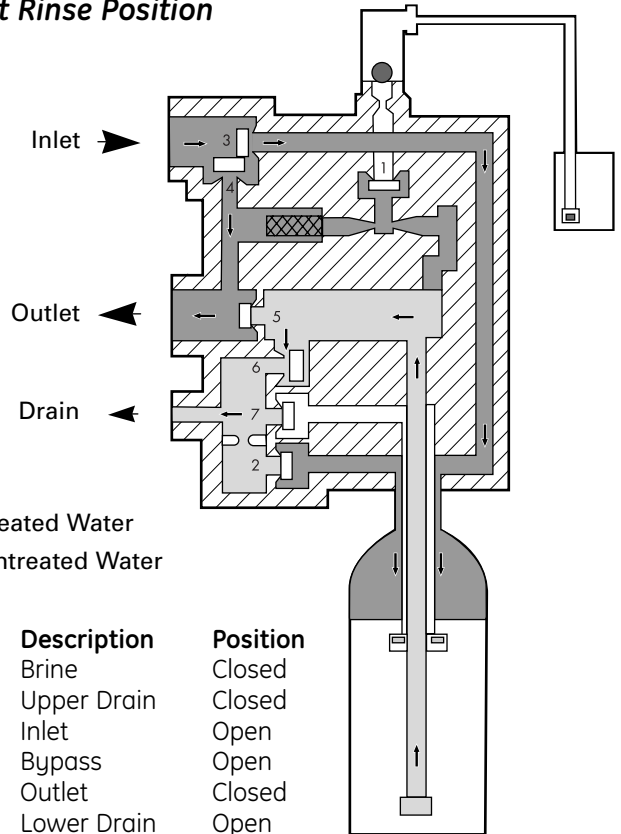


Treated Water
 Untreated Water

Valve

Valve No.	Description	Position
1	Brine	Closed
2	Upper Drain	Open
3	Inlet	Closed
4	Bypass	Open
5	Outlet	Open
6	Lower Drain	Closed
7	Center Dist.	Closed

6 Fast Rinse Position

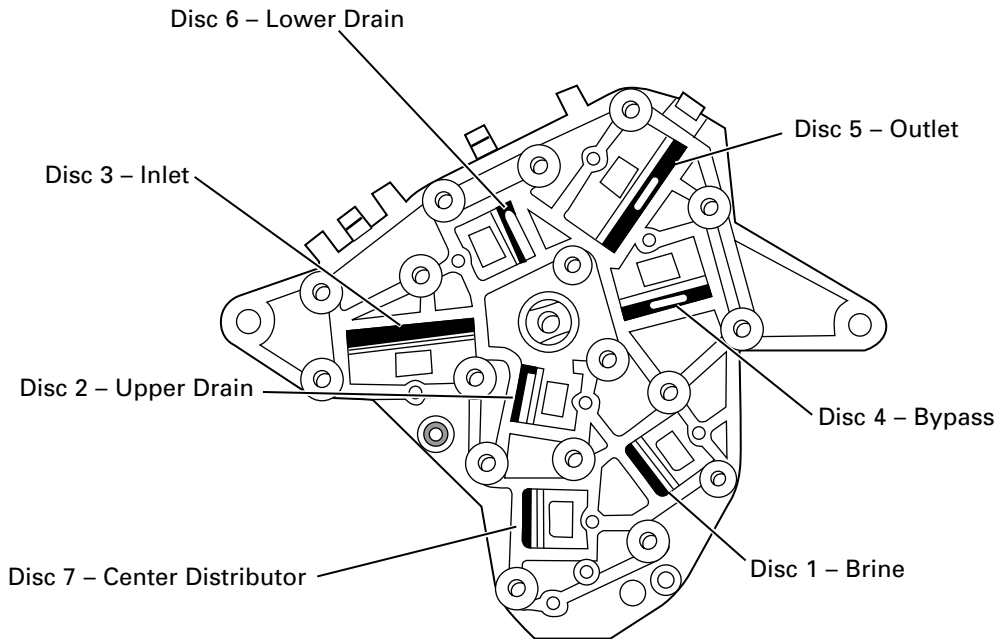


Treated Water
 Untreated Water

Valve

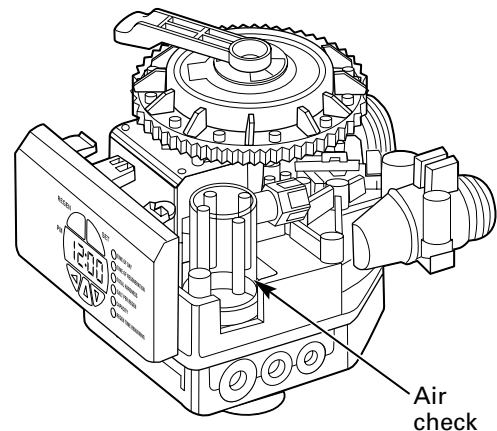
Valve No.	Description	Position
1	Brine	Closed
2	Upper Drain	Closed
3	Inlet	Open
4	Bypass	Open
5	Outlet	Closed
6	Lower Drain	Open
7	Center Dist.	Closed

Valve Disc Identification



Checking the brine draw and refill function.

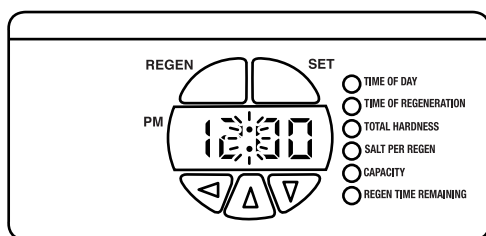
1. Disconnect power to the control by unplugging the wall transformer or unplugging the power cord from the bottom of the control.
2. Press down on the top of the drive gear to disengage the cam gear.
3. With the cam gear disengaged, rotate the cam gear counterclockwise to the REFILL position until the air check fills with water, and water flows through the brine line into the brine tank. Do not run for more than three minutes.
4. Press down on the drive gear, and rotate the cam gear counterclockwise to the DRAW/RINSE position. Check that water is being drawn from the brine tank. The water level in the brine tank will recede very slowly. Observe the water level for at least one minute. If the water level does not recede, if it goes up or if air enters the transparent air check chamber and the ball falls and seats, refer to the *Troubleshooting* section in this manual.
5. When water is being drawn from the brine tank, press down on the drive gear and rotate the cam gear counterclockwise to just before the SERVICE position. Connect power to the control and allow the motor to drive the cam gear to the SERVICE position. The motor will stop. Run cold water from a nearby faucet until the water is clear and soft.



Water meter.

In rare instances, the turbine wheel of the water meter can collect small particles of oxidized iron, eventually preventing the wheel from turning.

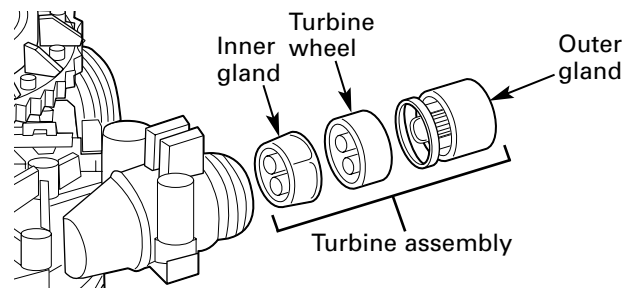
If the flow indicator light does not blink when conditioned water is flowing from the unit, it is an indication that the turbine wheel is not turning.



1. Disconnect electrical power to the unit.
2. Shut off the water supply or put the bypass valve(s) into the BYPASS position.
3. Relieve resin tank pressure:
 - A. Remove control valve cover.
 - B. Press down on the top of the drive gear to disengage the cam gear.
 - C. With the cam gear disengaged, rotate the cam gear counterclockwise to the BACKWASH position.

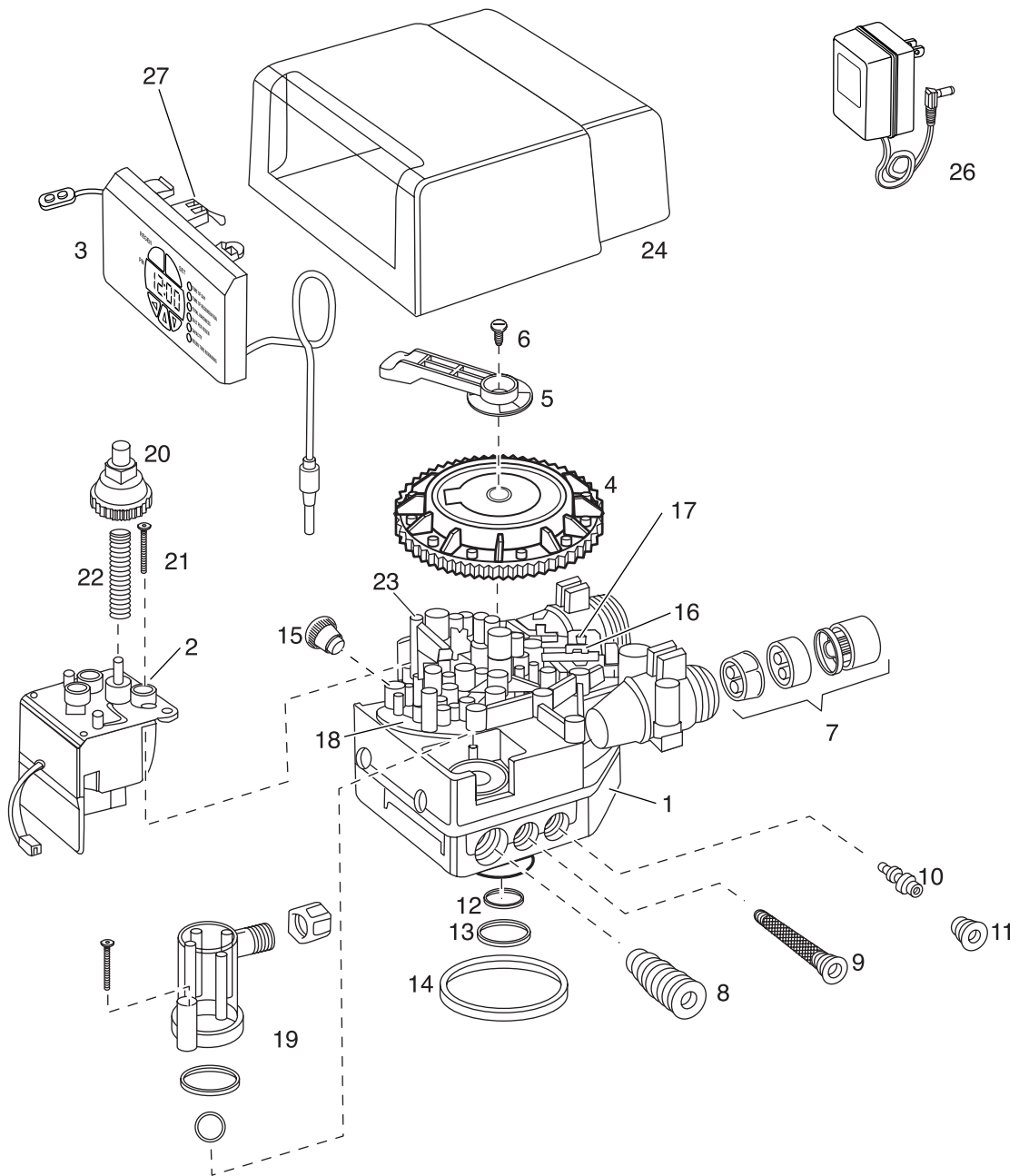
Check that there is no water flow through the drain line before performing service or preventative maintenance.

4. Disconnect the water conditioner from the plumbing.

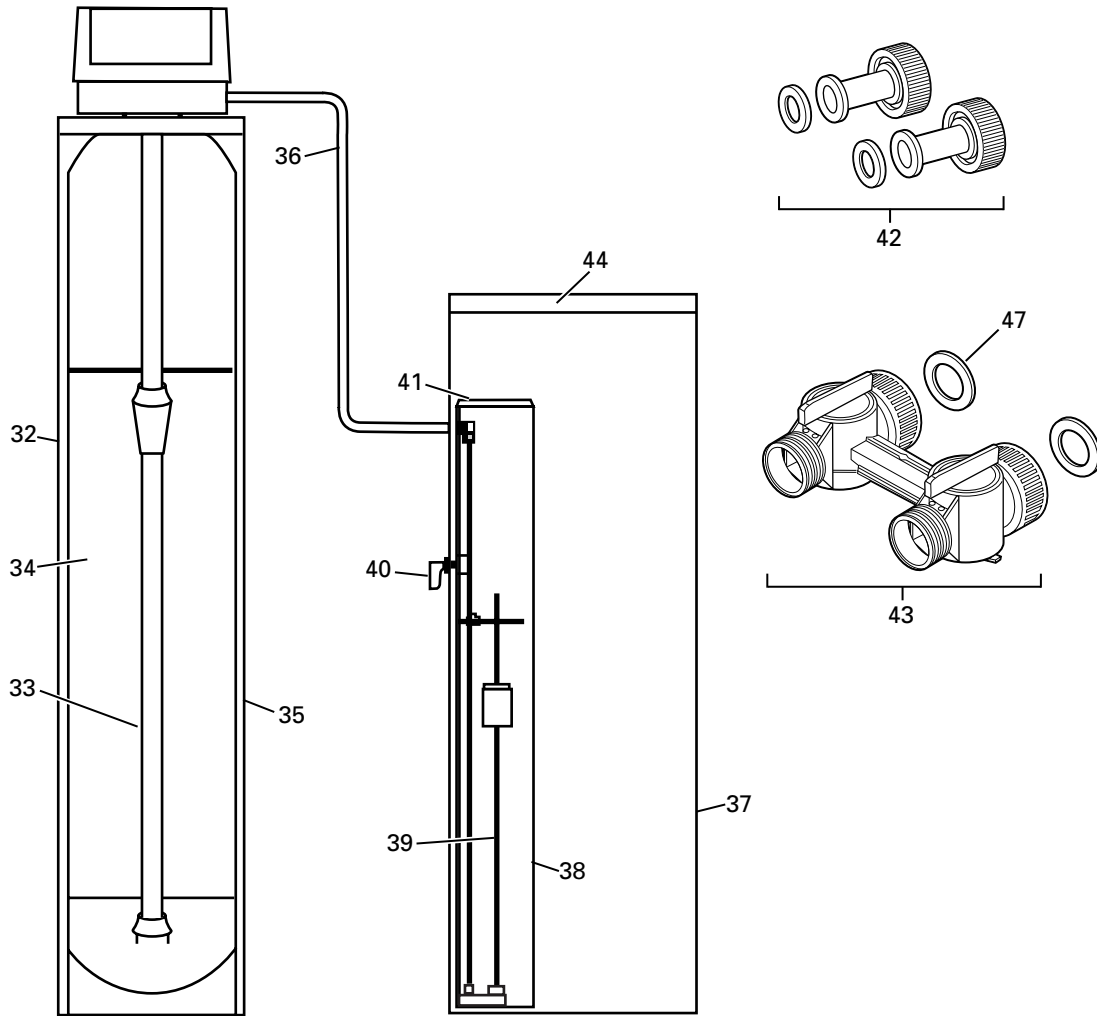


5. Using a needle-nose pliers, remove the outer gland and the turbine wheel from the outlet of the valve. Generally, it will not be necessary to remove the inner gland.
6. Clean all iron deposits and/or debris off the turbine wheel. Excessive accumulation of iron may be removed from the components with a solution of sodium hydrosulfite (or sodium disulfite). Rinse the components thoroughly in clean water after using the iron removal solution.
7. Flush accumulated iron deposits and/or debris from the inside of the valve outlet.
8. Reinstall the turbine wheel into the outlet side of the valve, being certain that the turbine wheel shaft is carefully seated into the bearing of the inner gland.
9. Carefully reinstall the outer gland into the outlet side of the valve. Check turbine rotation.
10. Reconnect the water conditioner to the plumbing and follow *Initial Start-Up* section.
11. Open the downstream faucet (conditioned water) and check to be certain that the flow indicator (colon) is blinking.

Control valve diagram.



Systems diagram.



GENERAL ELECTRIC PARTS CATALOG

REF. NO.	GE PART NO.	PART DESCRIPTION	G	G
			N	N
			P	P
			R	R
			4	4
			0	8
			L	L
			(00)	(00)
			QTY	QTY
0001	WS15X10054	VALVE BODY ASSEMBLY	1	1
0002	WS26X10014	DRIVE MOTOR - 60 Hz	1	1
0003	WS21X10022	CONTROL ASSEMBLY	1	1
0004	WS26X10015	CAM GEAR	1	1
0005	WS28X10050	BRACKET	1	1
0006	WS02X10037	SCREW, 10-32 X 1/2	1	1
0007	WS26X10016	TURBINE GROUP	1	1
0008	WS15X10055	BRINE/BACKWASH CONTROL	1	1
0009	WS15X10056	INJECTOR SCREEN ASSEMBLY	1	1
0010	WS15X10059	INJECTOR ASSEMBLY, 4 BUMPS	1	1
0010	WS15X10060	INJECTOR ASSEMBLY, 5 BUMPS	1	1
0011	WS31X10032	INJECTOR CAP ASSEMBLY	1	1
0012	WS03X10049	O-RING, 1 X 1-1/4 X 1/8	1	1
0013	WS03X10050	O-RING, 1-5/16 X 1/2 X 3/32	1	1
0014	WS03X10051	O-RING, 3-1/8 ID X 3/16	1	1
0015	WS31X10033	CAP PLUG	1	1
0016	WS35X10053	VALVE DISC KIT	1	1
0017	WS03X10052	VALVE DISC SPRING	1	1
0018	WS31X10034	TOP PLATE WITH SPRINGS	1	1
0019	WS35X10054	AIR CHECK KIT	1	1
0020	WS26X10017	DRIVE GEAR	1	1
0021	WS02X10038	SCREW, 8-18 X 1-1/2	1	1
0022	WS03X10053	SPRING	1	1
0023	WS02X10039	TOP PLATE SCREW	1	1
0024	WS31X10035	BLACK COVER	1	1
0026	WS26X10018	TRANSFORMER - 120V	1	1
0027	WS21X10023	MICRO SWITCH	1	1
0032	WS32X10024	10 X 44 RESIN TANK	1	
	WS32X10027	12 X 48 RESIN TANK		1
0033	WS14X10003	DISTRIBUTOR, 10 X 44 TANK	1	
	WS14X10004	DISTRIBUTOR, 12 X 48 TANK		1
0034	WS01X10016	RESIN MEDIA, 1.5 CUFT	1	1
0035	WS31X10036	RESIN TANK COVER	1	
0036	WS07X10022	BRINE LINE - 5 FT	1	1
0037	WS32X10025	BRINE TANK	1	1
0038	WS32X10026	BRINE WELL	1	1
0039	WS35X10055	FLOAT ASSEMBLY	1	1
0040	WS02X10040	OVERFLOW FITTING	1	1
0041	WS31X10037	BRINE WELL CAP	1	1
0042	WS60X10015	1" COPPER TAIL PIECE	1	1
0043	WS15X10057	BYPASS VALVE	1	1
0044	WS31X10038	BRINE TANK LID	1	1
0047	WS16X10001	BYPASS VALVE GASKETS	1	1

GE Water Softening System Warranty. (For Customers in the United States)



All warranty service provided by our SmartWater™ Authorized Servicer Network. To schedule service, call 800.952.5039 (U.S.) or 866.777.7627 (Canada). Please have serial number and model number available when calling for service.

Staple your receipt here.
Proof of the original purchase date is needed to obtain service under the warranty.

For The Period Of: We Will Replace:

One Year From the date of the original purchase	Any part of the Water Softening System which fails due to a defect in materials or workmanship. During this limited one-year warranty , GE will also provide, free of charge , all labor and related service to replace the defective part.
Three Years From the date of the original purchase	The electronic monitor , if it fails due to a defect in materials or workmanship. During this three-year limited warranty , you will be responsible for any labor or related service costs.
Ten Years From the date of the original purchase	A replacement brine tank or cabinet , if either fails due to a defect in materials or workmanship. During this ten-year limited warranty , you will be responsible for any labor or related service costs.

What Is Not Covered:

- Service trips to your home to teach you how to use the product.
- Improper installation, delivery or maintenance.
- Failure of the product if it is abused, misused, altered, used commercially or used for other than the intended purpose.
- Use of this product where water is microbiologically unsafe or of unknown quality, without adequate disinfection before or after the system. Systems certified for cyst reduction may be used on disinfected water that may contain filterable cysts.
- Replacement of house fuses or resetting of circuit breakers.
- Damage to the product caused by accident, fire, floods or acts of God.
- Incidental or consequential damage caused by possible defects with this appliance, its installation or repair.
- Product not accessible to provide required service.

EXCLUSION OF IMPLIED WARRANTIES—Your sole and exclusive remedy is product repair as provided in this Limited Warranty. Any implied warranties, including the implied warranties of merchantability or fitness for a particular purpose, are limited to one year or the shortest period allowed by law.

This warranty is extended to the original purchaser and any succeeding owner for products purchased for home use within the USA. If the product is located in an area where service by a GE Authorized Servicer is not available, you may be responsible for a trip charge or you may be required to bring the product to an Authorized GE Service location for service. In Alaska, the warranty excludes the cost of shipping or service calls to your home.

Some states do not allow the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. To know what your legal rights are, consult your local or state consumer affairs office or your state's Attorney General.

Warrantor: General Electric Company, Louisville, KY 40225

GE Water Softening System Warranty. (For Customers in Canada)



All warranty service provided by our Factory Service Centers or an authorized technician. For service, call toll free 1.866.777.7627. Please have serial number and model number available when calling for service.

For The Period Of: We Will Replace:

One Year From the date of the original purchase	Any part of the Water Softening System which fails due to a defect in materials or workmanship. During this limited one-year warranty , GE will also provide, free of charge , all labor and related service to replace the defective part.
Three Years From the date of the original purchase	The electronic monitor , if it fails due to a defect in materials or workmanship. During this three-year limited warranty , you will be responsible for any labor or related service costs.
Ten Years From the date of the original purchase	A replacement brine tank or cabinet , if either fails due to a defect in materials or workmanship. During this ten-year limited warranty , you will be responsible for any labor or related service costs.

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- Improper installation, delivery or maintenance.
- Failure of the product if it is abused, misused, altered, used commercially or used for other than the intended purpose.
- Use of this product where water is microbiologically unsafe or of unknown quality, without adequate disinfection before or after the system. Systems certified for cyst reduction may be used on disinfected water that may contain filterable cysts.
- Replacement of house fuses or resetting of circuit breakers.
- Damage to the product caused by accident, fire, floods or acts of God.
- Incidental or consequential damage caused by possible defects with this appliance, its installation or repair.
- Product not accessible to provide required service.

EXCLUSION OF IMPLIED WARRANTIES—Your sole and exclusive remedy is product repair as provided in this Limited Warranty. Any implied warranties, including the implied warranties of merchantability or fitness for a particular purpose, are limited to one year or the shortest period allowed by law.

This warranty is extended to the original purchaser and any succeeding owner for products purchased for home use within Canada. In-home warranty service will be provided in areas where it is available and deemed reasonable by Mabe to provide.

WARRANTOR IS NOT RESPONSIBLE FOR CONSEQUENTIAL DAMAGES.

Warrantor: MABE CANADA INC.

Consumer Support.



GE Appliances Website

ge.com

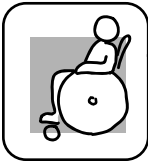
Have a question or need assistance with your appliance? Try the GE Appliances Website 24 hours a day, any day of the year! For greater convenience and faster service, you can now download Owner's Manuals or order parts online.



Schedule Service

ge.com

Expert GE repair service is only one step away from your door. Schedule your service at your convenience by calling 800.GE.CARES (800.432.2737) during normal business hours.



Real Life Design Studio

ge.com

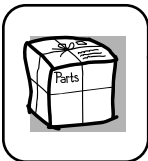
GE supports the Universal Design concept—products, services and environments that can be used by people of all ages, sizes and capabilities. We recognize the need to design for a wide range of physical and mental abilities and impairments. For details of GE's Universal Design applications, including kitchen design ideas for people with disabilities, check out our Website today. For the hearing impaired, please call 800.TDD.GEAC (800.833.4322).



Extended Warranties

ge.com

Purchase a GE extended warranty and learn about special discounts that are available while your warranty is still in effect. You can purchase it on-line anytime, or call 800.626.2224 during normal business hours. GE Consumer Home Services will still be there after your warranty expires.



Parts and Accessories

ge.com

Individuals qualified to service their own appliances can have parts or accessories sent directly to their homes (VISA, MasterCard and Discover cards are accepted). Order on-line today, 24 hours every day or by phone at 800.626.2002 during normal business hours.

Instructions contained in this manual cover procedures to be performed by any user. Other servicing generally should be referred to qualified service personnel. Caution must be exercised, since improper servicing may cause unsafe operation.



Contact Us

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If you are not satisfied with the service you receive from GE, contact us on our Website with all the details including your phone number, or write to:

General Manager, Customer Relations
GE Appliances, Appliance Park
Louisville, KY 40225



Register Your Appliance

ge.com

Register your new appliance on-line—at your convenience! Timely product registration will allow for enhanced communication and prompt service under the terms of your warranty, should the need arise. You may also mail in the pre-printed registration card included in the packing material, or detach and use the form in this Owner's Manual.