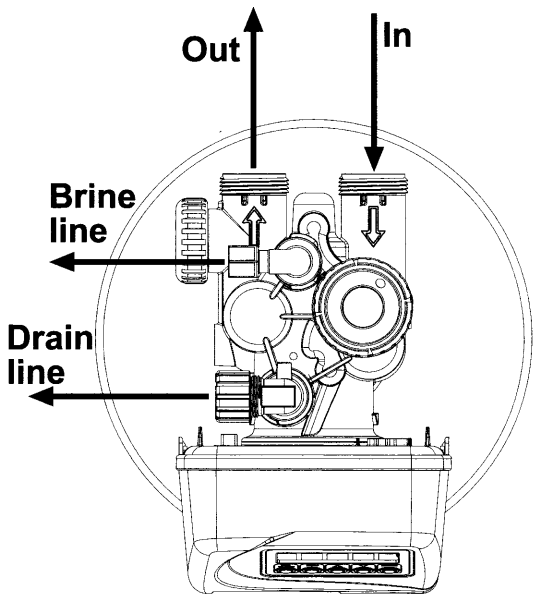
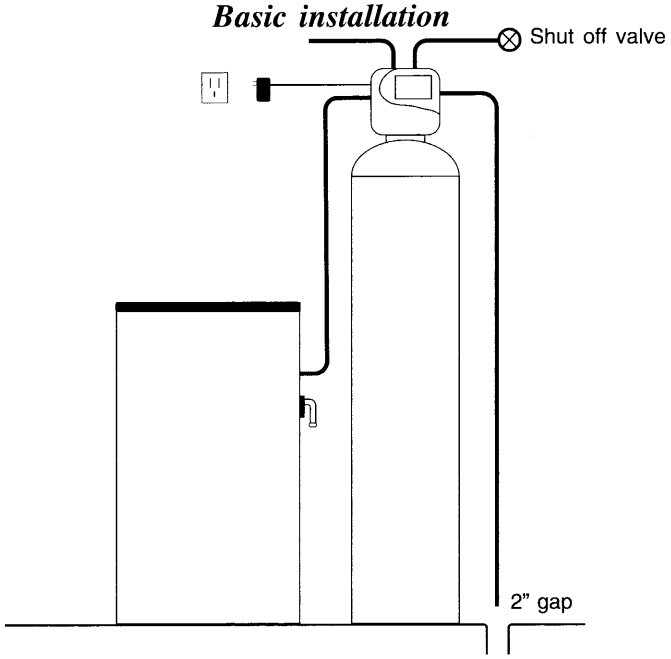
Installation

Top view



Basic installation



GENERAL INSTALLATION & SERVICE WARNINGS

The control valve, fittings and/or bypass are designed to accommodate minor plumbing misalignments but are not designed to support the weight of a system or the plumbing.

Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicon lubricant may be used on black o-rings but is not necessary. **Avoid any type of lubricants, including silicone, on red or clear lip seals.**

Do not use pipe dope or other sealants on threads. Teflon tape must be used on the threads of the 1" NPT elbow or the ¼" NPT connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connections or caps because o-ring seals are used. The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic Service Wrench, #V3193. If necessary a pliers can be used to unscrew the nut or cap. **Do not use a pipe wrench** to tighten or loosen nuts or caps. **Do not place screwdriver in slots on caps and/or tap with a hammer.**

SITE REQUIREMENTS:

- Water pressure, 20-125 psi
- Water temperature
- The tanks should be on a firm, level surface
- Electrical: Use a 115/120v, 60Hz uninterrupted outlet
- Current draw is 0.25 amperes
- A 15-foot power cord is furnished
- The plug-in transformer is for dry locations only
- Batteries are not used

1. The distance between the drain and the water conditioner should be as short as possible. All plumbing should be done in accordance with local plumbing codes.

2. Since salt must be periodically added to the brine tank, it should be located where it is easily accessible.

3. Do not install any water conditioner with less than 10 feet of piping between its outlet and the inlet of a water heater.

4. Do not locate unit where it or its connections (including the drain and overflow lines) will ever be subjected to room temperatures under 34° F.

5. The use of resin cleaners in an unvented enclosure is not recommended.

6. INLET/OUTLET PLUMBING: Connect to a supply line downstream of outdoor spigots. Install an inlet shutoff valve and plumb to the unit's bypass valve inlet located at the right rear as you face the unit. There are a variety of installation fittings available. They are listed under **Installation Fitting Assemblies.** When assembling the installation fitting package (inlet and outlet), connect the fitting to the plumbing system first and then attach the nut, split ring and o-ring. Heat from soldering or solvent cements may damage the nut, split ring or o-ring. Solder joints should be cool and solvent cements should be set before installing the nut, split ring and o-ring. Avoid getting solder flux, primer, and solvent cement on any part of the o-rings, split rings, bypass valve or control

valve. If the building's electrical system is grounded to the plumbing, install a copper grounding strap from the inlet to the outlet pipe. **Plumbing must be done in accordance with all applicable local codes.**

7. DRAIN LINE: First, be sure that the drain can handle the backwash rate of the system. Solder joints near the drain must be done prior to connecting the drain line flow control fitting. Leave at least 6" between the drain line flow control fitting and solder joints. Failure to do this could cause interior damage to the flow control. Install a ½" I.D. flexible plastic tube to the Drain Line Assembly or discard the tubing nut and use the ¾" NPT fitting for rigid pipe. If the backwash rate is greater than 7 gpm, use a ¾" drain line. Where the drain line is elevated but empties into a drain below the level of the control valve, form a 7" loop at the discharge end of the line so that the bottom of the loop is level with the drain connection on the control valve. This will provide an adequate anti-siphon trap. Where the drain empties into an overhead sewer line, a sink-type trap must be used. Run drain tube to its discharge point in accordance with plumbing codes. Pay special attention to codes for air gaps and anti-siphon devices.

8. BRINE TANK CONNECTION: Install a **3/8**" O.D. polyethylene tube from the Refill Elbow to the Brine Valve in the brine tank.

9. OVERFLOW LINE CONNECTION:
AN OVERFLOW DRAIN LINE IS RECOMMENDED WHERE A BRINE OVERFLOW COULD DAMAGE FURNISHINGS OR THE BUILDING STRUCTURE.
Your softener may be equipped with a brine tank safety float which greatly reduces the chance of an accidental brine overflow. In the event of a malfunction, however, an OVERFLOW LINE CONNECTION will direct the "overflow" to the drain instead of spilling on the floor where it could cause considerable damage. This fitting should be on the side of the cabinet or the brine tank.
To connect overflow fitting, locate hole in side of brine tank. Insert overflow fitting into tank and tighten with plastic thumb nut and gasket from the inside. Attach a length of ½" I.D. tubing (not supplied) to fitting and run to drain. Do not elevate overflow line higher than 3" below bottom of overflow fitting. Do not "tie" this tube into the drain line of the control valve. Overflow line must be a direct, separate line from overflow fitting to drain, sewer, or tub. Allow an air gap as per the drain line instructions.

IMPORTANT: Never insert a drain line directly into a drain, sewer line, or trap. Always allow an air gap between the drain line and the wastewater to prevent the possibility of sewage being back-siphoned into the conditioner.

10. SERIAL NUMBER: Record the serial number on the installer's and customer's records.

Bypass Valve

The bypass valve is typically used to isolate the control valve from the plumbing system's water pressure in order to perform control valve repairs or maintenance. The WS1 bypass valve is particularly unique in the water treatment industry due to its versatility and state of the art design features. The 1" full flow bypass valve incorporates four positions including a diagnostic position that allows service personal to work on a pressurized system while still providing untreated bypass water to the facility or residence. Its completely non-metallic, all plastic design allows for easy access and serviceability without the need for tools.

The bypass body and rotors are glass filled Noryl and the nuts and caps are glass filled polypropylene. All seals are self-lubricating EPDM to help prevent valve seizing after long periods of non-use. Internal o-rings can easily be replaced if service is required.

The bypass consists of two interchangeable plug valves that are operated independently by red arrow shaped handles. The handles identify the flow direction of the water. The plug valves enable the bypass valve to operate in four positions.

1. **Normal Operation Position:** The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve. Water flows through the control valve during normal operation and this position also allows the control valve to isolate the media bed during the regeneration cycle. (See Figure 1)
2. **Bypass Position:** The inlet and outlet handles point to the center of the bypass, the control valve is isolated from the water pressure contained in the plumbing system. Untreated water is supplied to the plumbing system. (See Figure 2)
3. **Diagnostic Position:** The inlet handle points in the direction of flow and the outlet handle points to the center of bypass valve, system water pressure is allowed to the control valve and the plumbing system while not allowing water to exit from the control valve to the plumbing. (See Figure 3)
4. **Shut Off Position:** The inlet handle points to the center of the bypass valve and the outlet handle points in the direction of flow, the water is shut off to the plumbing system . If water is available on the outlet side of the softener it is an indication of water bypass around the system (i.e. a plumbing connection somewhere in the building bypasses the system). (See Figure 4)

BYPASS VALVE OPERATION

Figure 1

NORMAL OPERATION

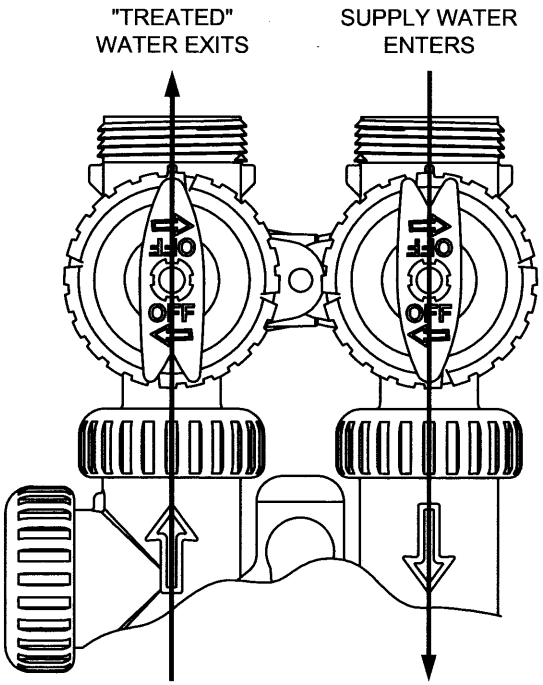


Figure 2

BYPASS OPERATION

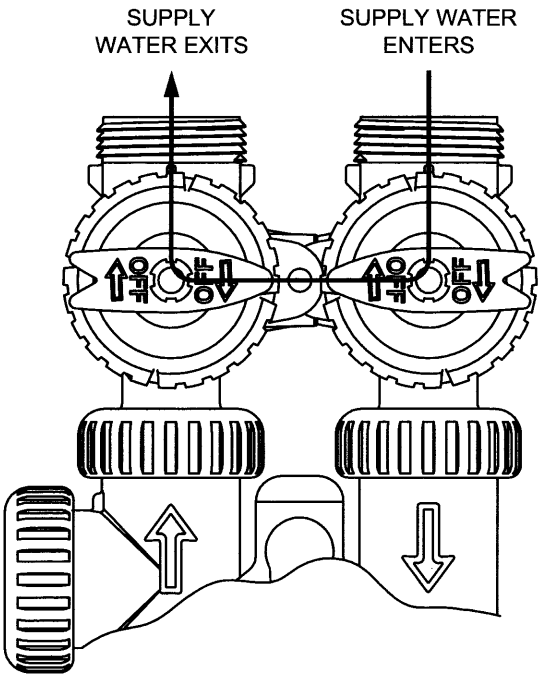


Figure 3

DIAGNOSTIC MODE

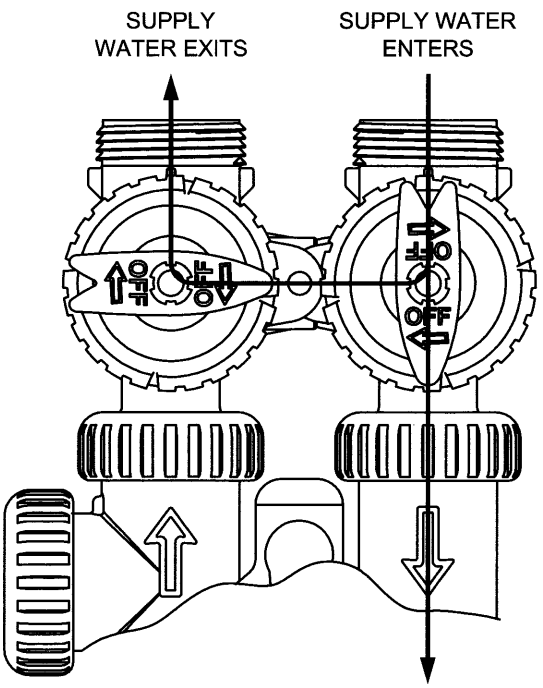
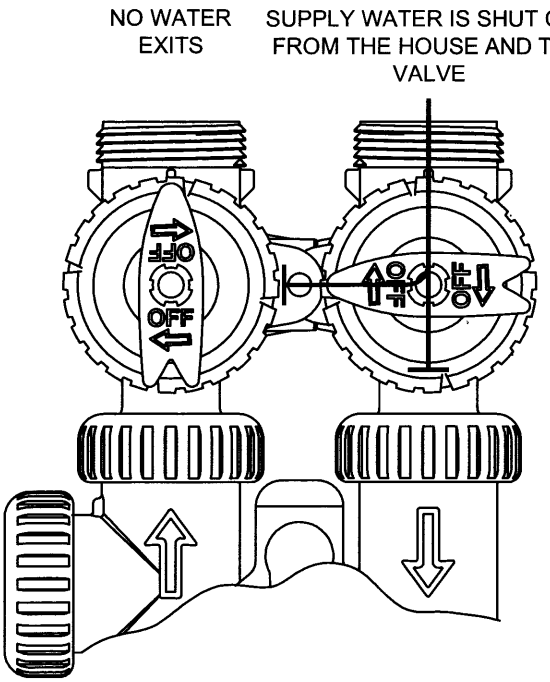


Figure 4

SHUT OFF MODE



Start-up Instructions

• After installation is completed and checked for leaks, rotate the bypass handles to the bypass position (see bypass valve diagram page).

• Fully open a cold water faucet.

• Allow water to run until clear to rid pipes of debris, which may have occurred during installation.

• The system is now ready for testing:

1. With the bypass valve in the bypass position, manually pour enough water into the brine tank to reach the top of the air check valve.

2. Press and hold the REGEN button for three seconds until the drive motor starts. Wait until the motor stops and the display reads "Backwash." The backwash time will begin to count down.

3. Open the inlet handle of the bypass valve very slightly allowing water to fill the tank slowly in order to expel air. CAUTION: If water flows too rapidly, there will be a loss of media out of the drain.

4. When the water is flowing steadily to the drain without the presence of air, press the REGEN button to advance the control to the brine position. The brine time will begin to count down.

5. Fully open the inlet bypass valve handle (bypass is now in the diagnostic position)
   Check to verify that water is being drawn from the brine tank
   There should be a slow flow to the drain
   Allow three minutes for the media bed to settle

6. Press the REGEN button again to advance the control to the next position and allow water to run to drain for 2-3 minutes. Control will transfer and the display will read backwash or rinse depending on the program used. If backwash is displayed press the REGEN button to advance the control to the rinse position. Allow water to run to drain until clear.

7. Press the REGEN button to advance the control to where the display reads fill. This will allow water to run into the brine tank and prepare it for the next regeneration. Allow the brine tank to fill automatically.

8. While the brine tank is filling, load it with water softener salt.

9. SANITIZE! For each cubic foot of resin, add two ounces of 5 1/4% household chlorine bleach to the water in the brine tank brine well. Press and hold the REGEN button for three seconds to begin regeneration. Allow the system to complete the regeneration automatically. The system will now be sanitized and producing soft water. Be sure to check for local codes, which may also specify sanitization methods.

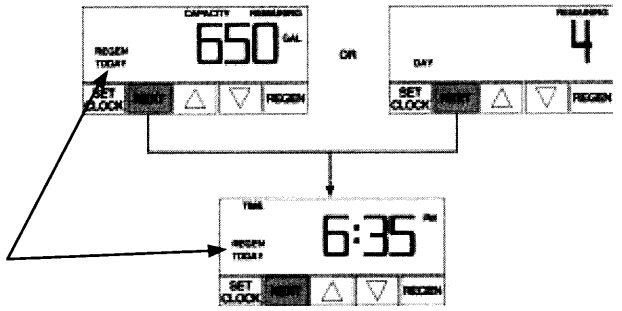
General Information

PLEASE NOTE: For complete instructions refer to manual. Hand tighten nuts only.

GENERAL OPERATION

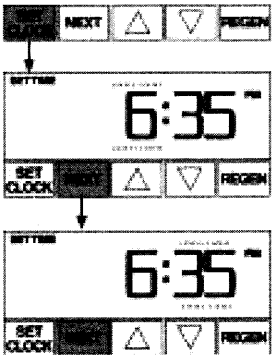
When the system is operating one of two displays will be shown. Time of day will be one choice, gallons of treated water available or days until the next regeneration will be the other choice. Pressing "NEXT" will toggle between the two choices.

REGEN TODAY will show if a regeneration is expected "Tonight."



TO SET TIME OF DAY

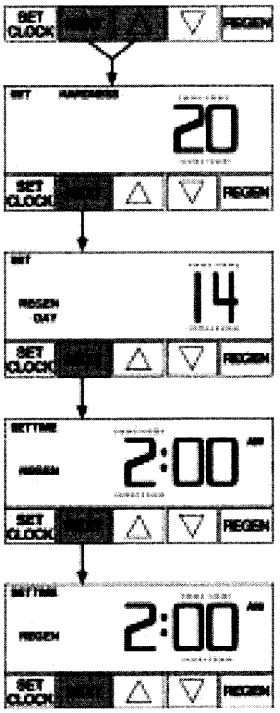
In the event of a prolonged power outage, time of day flashes, indicating that this needs to be reset. All other information will be stored in memory no matter how long the power outage. Please complete the steps as shown to the right. To access this mode, press "SET CLOCK."



1. Accessed by pressing "SET CLOCK."
2. Adjust hours with up and down arrows, AM/PM toggles at 12.
3. Press "NEXT."
4. Adjust minutes with up and down arrows.
5. Press "NEXT" to complete and return to normal operation.

ADJUST HARDNESS, DAYS BETWEEN REGENERATIONS, OR TIME OF REGENERATION

For initial set-up or to make adjustments, please complete the steps as shown to the right. Access this mode by pressing "NEXT" and "Δ" simultaneously. **NOTE:** Hardness display shows "-nA-" if used as a filter. If other displays do not appear, refer to manual.



1. Accessed by pressing "NEXT" and up arrow simultaneously.
2. Adjust hardness using up and down arrows.
3. Press "NEXT."
4. Adjust days between regenerations using up and down arrows.
5. Press "NEXT."
6. Adjust time of regeneration hours with up and down arrows, AM/PM toggles at 12.
7. Press "NEXT."
8. Adjust time of regeneration minutes with up and down arrows.
9. Press "NEXT" to complete and return to normal operation.

General Information

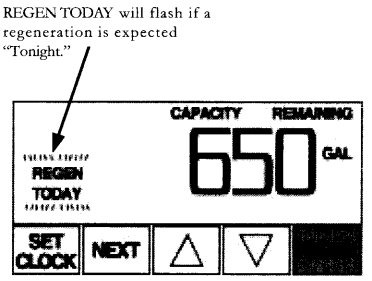
MANUAL REGENERATION

NOTE: For softeners, if brine tank does not contain salt, fill with salt and wait at least 2 hours before regeneration.

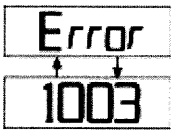
If you need to initiate a manual regeneration, either immediately, or tonight at the preprogrammed time for regeneration (typically 2:00 AM), complete the following steps.

For Immediate Regeneration:
Press and hold "REGEN" until valve motor starts (typically 3 seconds).

For Regeneration Tonight:
Press and release "REGEN" (notice that flashing "REGEN TODAY" appears).



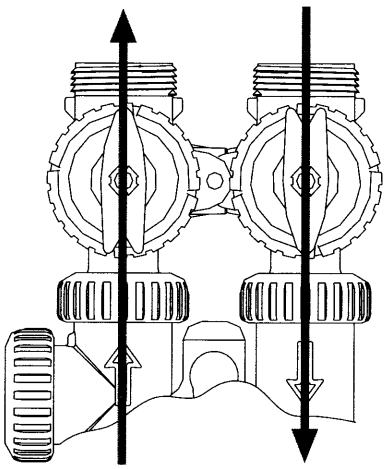
If the display toggles between "Error" and an error code (i.e. a number), call a service technician and report the error code.



To **shut-off water** to the system, please position arrow handles as shown in the **bypass operation** diagram below. If your valve doesn't look like the diagram below, contact your service technician for instructions on how to shut-off water.

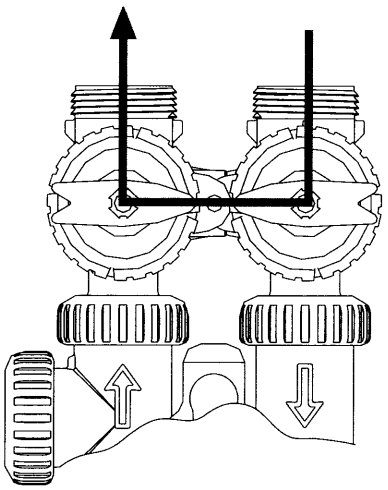
NORMAL OPERATION

Treated Water Exits — Supply Water Enters



BYPASS OPERATION

Supply Water Exits — Supply Water Enters



NOTES:

Installation date: _____

Injector color installed: _____

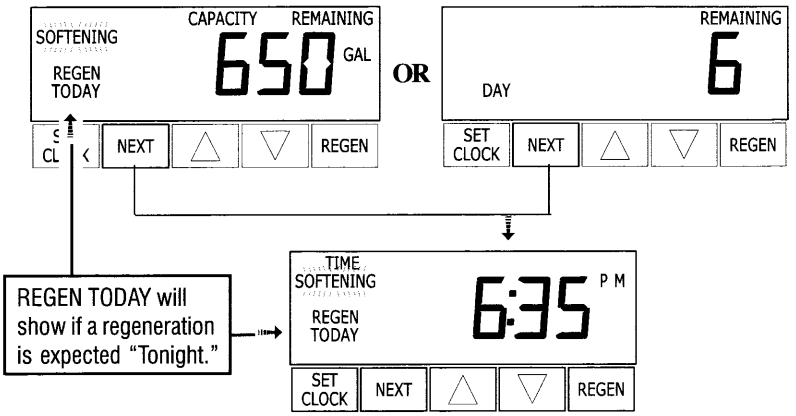
Drain Control size installed: _____

Hardness (gpg): _____
Water pressure: _____
Salt setting: _____
Iron (ppm): _____
Manganese (ppm): _____
TDS (ppm): _____
pH: _____

User Displays/Settings

General Operation

When the system is operating one of two displays will be shown. Pressing NEXT will alternate between the displays. One of the displays is always the current time of day. The second display is one of the following: days remaining or gallons remaining. Days remaining is the number of days left before the system goes through a regeneration cycle. Capacity remaining is the number of gallons that will be treated before the system goes through a regeneration cycle. The user can scroll between the displays as desired.



If the system has called for a regeneration that will occur at the preset time of regeneration, the words REGEN TODAY will appear on the display.

When water is being treated (i.e. water is flowing through the system) the word "Softening" or "Filtering" flashes on the display if a water meter is installed.

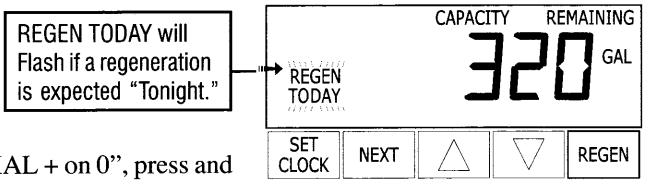
Regeneration Mode

Typically a system is set to regenerate at a time of low water usage. An example of a time with low water usage is when a household is asleep. If there is a demand for water when the system is regenerating, untreated water will be used.

When the system begins to regenerate, the display will change to include information about the step of the regeneration process and the time remaining for that step to be completed. The system runs through the steps automatically and will reset itself to provide treated water when the regeneration has been completed.

Manual Regeneration

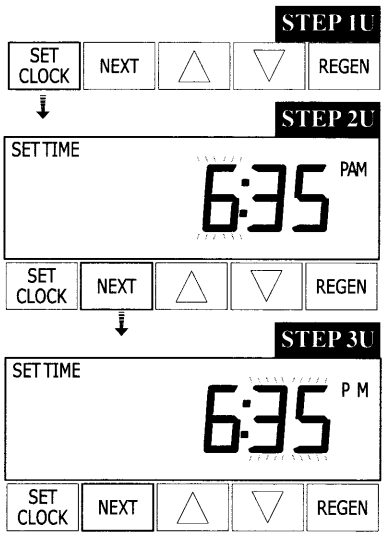
Sometimes there is a need to regenerate the system, sooner than when the system calls for it, usually referred to as manual regeneration. There may be a period of heavy water usage because of guests or a heavy laundry day.



To initiate a manual regeneration at the preset delayed regeneration time, when the regeneration time option is set to "NORMAL" or "NORMAL + on 0", press and release "REGEN". The words "REGEN TODAY" will flash on the display to indicate that the system will regenerate at the preset delayed regeneration time. If you pressed the "REGEN" button in error, pressing the button again will cancel the request. Note: If the regeneration time option is set to "on 0" there is no set delayed regeneration time so "REGEN TODAY" will not activate if "REGEN" button is pressed.

To initiate a manual regeneration immediately, press and hold the "REGEN" button for three seconds. The system will begin to regenerate immediately. The request cannot be cancelled.

Note: For softeners, if brine tank does not contain salt, fill with salt and wait at least two hours before regenerating.



Set Time of Day

The user can also set the time of day. Time of day should only need to be set after extended power outages or when daylight saving time begins or ends. If an extended power outage occurs, the time of day will flash on and off which indicates the time of day should be reset.

STEP 1U – Press SET CLOCK.

STEP 2U - Current Time (hour): Set the hour of the day using ∇ or Δ buttons. AM/PM toggles after 12. Press NEXT to go to step 3U.

STEP 3U - Current Time (minutes): Set the minutes of the day using ∇ or Δ buttons. Press NEXT to exit Set Clock. Press REGEN to return to previous step.

Power Loss

If the power goes out for less than two hours, the system will automatically reset itself. If an extended power outage occurs, the time of day will flash on and off which indicates the time of day should be reset. The system will remember the rest.

Error Message

If the word "ERROR" and a number are alternately flashing on the display contact the OEM for help. This indicates that the valve was not able to function properly.