Peerless, Inc.
Water Conditioning Equipment
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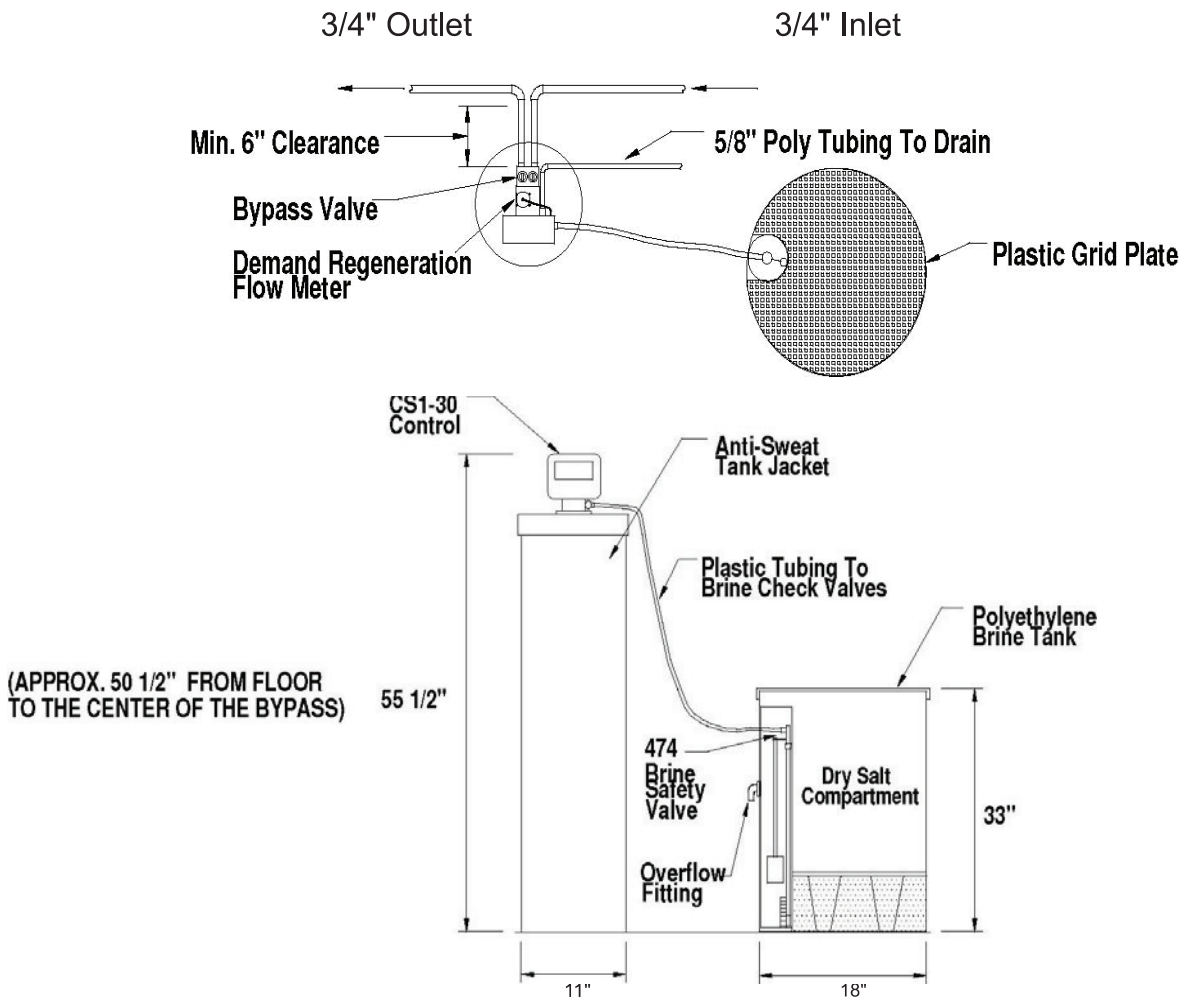
Operation & Maintenance Manual

CME Series
Water Softeners

30 CME DRAWING



PEERLESS 30 CME AUTOMATIC WATER SOFTENER	
Maximum Softening Capacity	**30,000 grains**
Softener Tank	**9 x 48 Polyester Fiberglass - 150 PSI W.P.**
Brine Tank	**18 x 33 Polyethylene w/Cover**
Service Flow Rate	**8.3 GPM**
Backwash Rate	**1.3 GPM**
Media	**1 cubic foot**
Piping Size	**3/4”**
Control Center - Valve	**CS1-30**
Meter	**1”**
Elec. Req’d	**115V/60Hz**

Installation Diagram

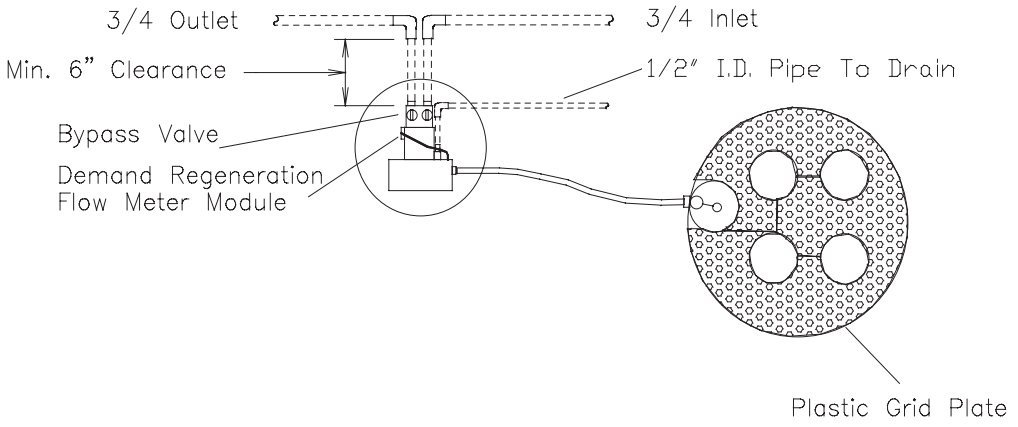
Specifications:

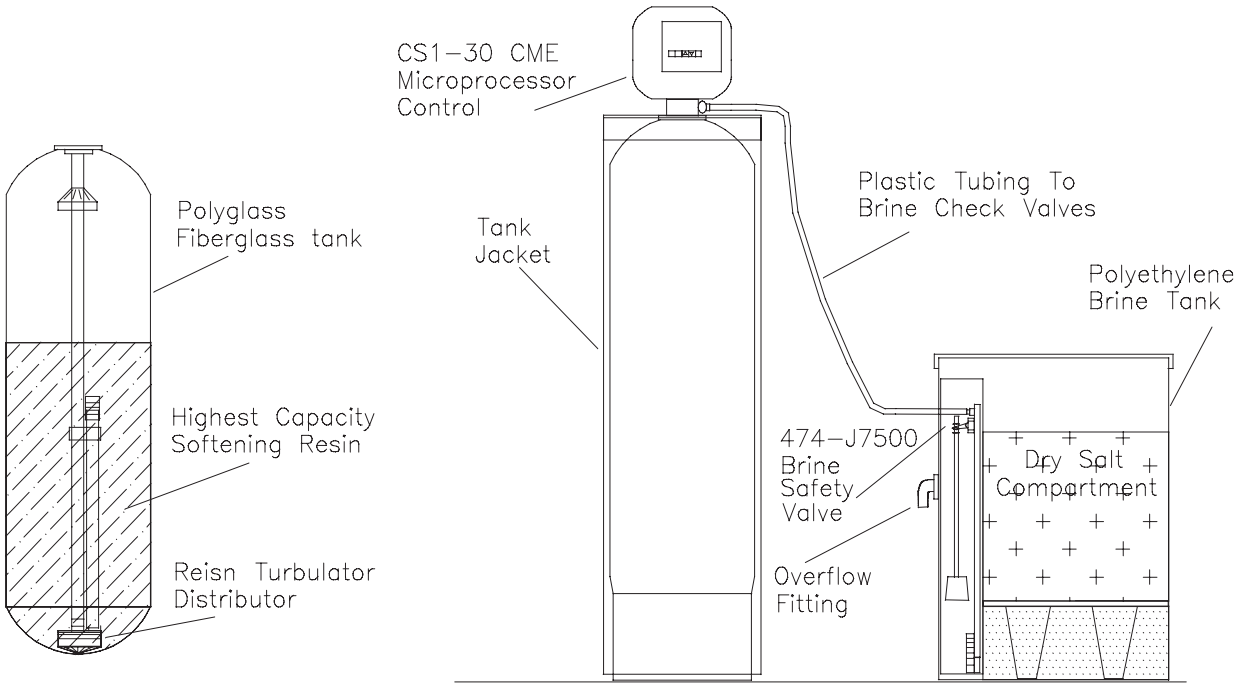
Rough in Dimension - From the floor to the center of bypass approximately 50-1/2".
Maxium distance and size for Drain line: 50' horizontal, 10' vertical rise, using 1/2" ID drain line.

Maxium distance and size for Brine line: 15' horizontal, (see note), using 1/4" ID poly tubing.

Note: The horizontal distance for the Brine tank can be increased to 35' if the Brine tank is installed above the unit. Example: Softener installed in the basement and Brine tank installed on 1st floor. The brine tank can **Not** be installed below bottom of unit. The Drain and Brine lines should **Not** be installed with tubing that can collapse. This will cause the unit to malfunction.

Caution: Do **Not** connect drain line tubing from control valve to over flow fitting/tubing on brine tank.





START UP PROCEDURE
PEERLESS CME WATER SOFTENER

1. Pipe ¾" or 1" inlet and outlet service piping, according to the print, and arrows on bypass.

2. Connect brine line (furnished in brine tank) from brine tank to valve. Line must be air tight.

3. Connect 5/8" OD poly tubing (not supplied) from valve to suitable drain. DO NOT use clear collapsible tubing.

4. With the bypass valve in the bypass position, open a cold water tap nearby and let it run a few minutes. Once free from air, close tap. Partly open bypass to allow water to slowly fill tank. Once water stops running into the tank, rotate the bypass valve into the full service position. Again, open a cold water tap nearby and let the water run until the water is clear and free of air.

5. Plug the unit into an approved 120V AC outlet. Press the **Set Clock** button once and hour will flash. Use the up or down triangle buttons until the correct hour is displayed. Press the **Set Clock** button again and the minutes will flash. Use the up or down triangle buttons until the correct minutes are displayed. Press the **Set Clock** button to finish.

NOTE: Time of day must be set correctly to either AM or PM.

6A. Test the raw water, and set computed grains of hardness expressed as gpg (grains per gallon), and iron expressed as ppm (parts per million) Do not forget to compensate for iron. The iron result in ppm should be rounded up to the nearest whole number. Take that number and times it by four (4). Take that result and add it to the hardness value. This is the number you will use to set up your control for your specific requirements.

NOTE: If your iron result is higher than 5 ppm, we recommend an iron filter be installed before the softener. If an iron filter is installed, or you do not have any iron in your water, you do not have to compensate for iron when setting up the control for your specific requirements.

B .To set the total hardness in the unit, press the Next and Up triangle buttons at the ***same time***. The display will show Hardness. Press the Up or Down triangle to enter your total hardness result from stop 6.A.

C. Press the Next button, and the display will show Regen Day. The factory default is set at 7. Please do not change this value.

D. Press the Next button, and the display will show Time Regen. The factory default is set at 2:00 A.M. Press the Up or Down triangle to change the hour. Press the Next button and the minutes will flash. To change press the Up or Down triangle to change the minutes. Press the Next button to finish.

7. Manually add water to brine tank until water is ½" above the grid.

8A. Press and hold the Regen button for 5 seconds. Release when display shows backwash. Let the water run for 5 minutes.

B. Press the Regen button and release. The display will show Brine. Wait 1 minute.

C. Press the Regen button and release. The display will show Backwash. Wait 1 minute.

D. Press the Regen button and release. The display will show Rinse. Wait one 1 minute.

E. Press the Regen button and release. The display will show Fill. Push down on the float rod to purge air from the brine line.

9. Fill brine tank with salt. Peerless recommends Hardi-Cube, Dura-Cube or Mini-Cube or salt substitutes, i.e. Potassium Chloride, (trade names) K-Life or Soft Touch.

10. Open the cold water valves in house to relieve air. Let water run for 3 minutes and test cold water to make sure it is soft.

11. Hot water from the water heater (unless drained and filled with soft water) will not become soft until the customer has used approximately 3 times the holding capacity of the water heater.

12. Write the installation date (month/year) on the sticker found inside the front cover. Plug in 9V Alkaline Battery that is supplied with your unit

CONTROL PROGRAMMING

INSTALLER (I) Displays/Settings

STEP 1I – Press NEXT and arrow up simultaneously for 3 seconds.

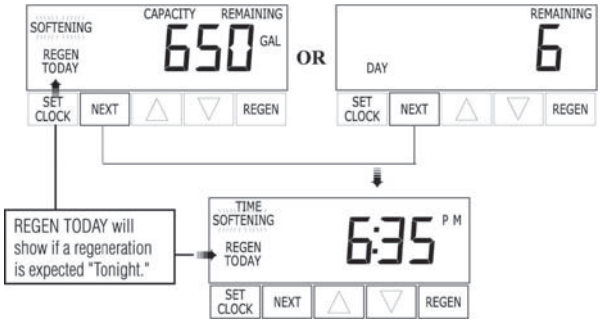
STEP 2I – Hardness: Set the amount of hardness as calcium carbonate per gallon using, arrow down or arrow up buttons. The default is 20 with value ranges from 1 to 150 in 1 grain increments. Note the drains per gallon can be increased if soluble iron needs to be reduced. Press NEXT to go to step 3I. Press REGEN to exit Installer Displays/Settings.

STEP 3I - Day Override: When gallon capacity is set to off, sets the number of days between regenerations. When gallon capacity is set to AUTO or to a number sets the maximum number of days between regenerations. If value set to “off” regeneration initiation is based solely on gallons used. If value is set as a number (allowable range from 1 to 28) a regeneration initiation will be called for on that day even if sufficient number of gallons were not used to call for a regeneration. Set Day Override using arrow button to days between regeneration (1 to 28); or OFF. Press NEXT to go to step 4I. Press REGEN to return to previous step.

STEP 4I – Next Regeneration Time (hour): Set the hour of day for regeneration using down or up arrow buttons. AM/PM toggles after 12. The default time is 2:00 AM. Press NEXT to go to step 5I. Press REGEN to return to previous step.

STEP 5I - Next Regeneration Time (minutes): Set the minutes of day regeneration using the arrow buttons. Press NEXT to exit Installer Displays/Settings. Press REGEN to return to previous step.

To initiate a manual regeneration immediately, press and hold the REGEN button for 3 seconds. The system will beam to regenerate immediately. The control valve may be stepped through the various regeneration cycles by pressing the “REGEN” button.



User (U) Displays/Settings

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 are 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.

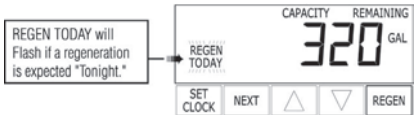
When water is being treated (i.e. water is flowing through the system) the word “Softening” flashes on the display.

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

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.

CONTROL PROGRAMMING CONTINUED

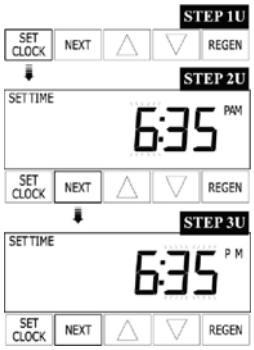
SET TIME OF DAY

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 savings 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 the down or up arrow 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 down or up arrow buttons. Press NEXT to exit Set Clock. Press REGEN to return to the 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 Peerless, Inc. @ 269-344-6137 for help. This indicates that the valve was not able to function properly.

SANITIZING THE SYSTEM

1. At completion of softener installation, you should sanitize the system.

2. Take the lid off the brine (salt) tank and then take the cap off of the brine well. Pour about ½ cup of 5.25% unscented household bleach into the brine well. Replace cap and lid. (This can be done with or without salt in tank.)

3. Press and hold regeneration button to start the regeneration process immediately.

Each water softener is handled in a manner to keep clean and sanitary. The materials used will not contaminate your water supply or cause bacteria to grow. However, during shipping, storage, installation, and operation, bacteria growth could develop. Some water supplies may need periodic disinfecting.

BYPASS VALVE

The bypass valve is typically used to isolate the control valve from the plumbing system's water pressure in order to per-form control valve repairs or maintenance. The W100SM 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 personnel to work on a pressurized system while still providing untreated bypass water to the facility or residence. It's 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 nonuse .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.

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 17)

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 18)

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 exiting current constant and moving a permanent magnet near the semiconductor produces a voltage output proportional to the movement of the magnet. Hall-effect devices provide a high-speed response, excellent temperature stability and no physical contact.** Has not been tested for compliance with California Proposition 65 so this control valve to the plumbing. (See figure 19)

Shut-Off Position: The inlet handle points to the center off the bypass valve and the outlet handle points in the direction of flow; the water is shut off to the plumbing systems. 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 20)

BYPASS VALVE DIAGRAMS

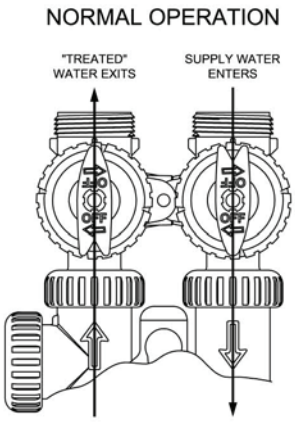


Figure 17

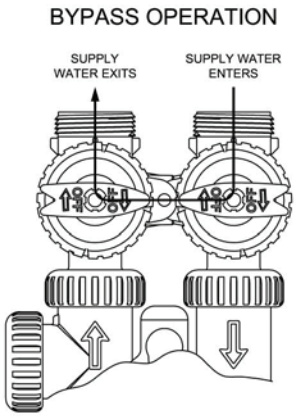


Figure 18

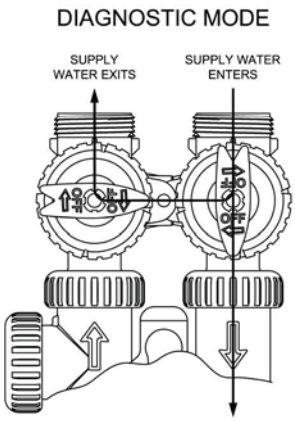


Figure 19

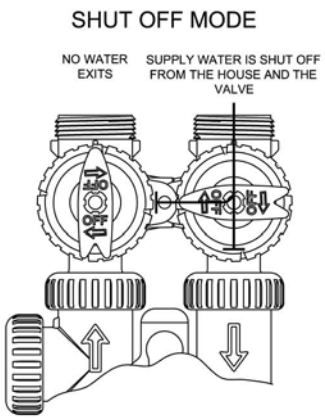


Figure 20

SERVICE INSTRUCTIONS

DRIVE ASSEMBLY

Remove the valve cover to access the drive assembly.

Disconnect the power source plug (black wire) from the PC board prior to disconnecting the motor or water meter plugs from the PC board. The motor plug connects to the two-pin jack on the left-hand side of the PC board. The power source plug connects to the four-pin jack. The four-pin jack is between the two-pin and three-pin jacks. The water meter plug (gray wire) connects to the three.

The PC board can be removed separately from the drive bracket but it is not recommended. Do not attempt to remove the display panel from the PC board. Handle the board by the edges. To remove the PC board from the drive bracket, unplug the power, water meter and motor plugs from the PC board. Lift the middle latch along the top of the drive bracket while pulling outward on the top of the PC board. The drive bracket has two plastic pins that fit into the holes on the lower edge of the PC board. Once the PC board is tilted about 45˚ from the drive bracket it can be lifted off of these pins. To reinstall the PC board, position the lower edge of the PC board so that the holes in the PC board line up with the plastic pins. Push the top of the PC board towards the valve until it snaps under the middle latch, weave the power and water meter wires into the holders and reconnect the motor water meter and power plugs.

The drive bracket must be removed to access the drive cap assembly and pistons or the drive gear cover. It is not necessary to remove the PC board from the drive bracket to remove the drive bracket. To remove the drive bracket start by removing the plugs for the power source and the water meter. Unweave the wires from the side holders. Two tabs on the top of the drive back plate hold the drive bracket in place. Simultaneously lift the two tabs and gently ease the top of the drive bracket towards your body. The lower edge of the drive bracket has two notches that rest on the drive back plate. Lift up and outward on the drive bracket to disengage the notches. To reassemble seat the bottom of the drive bracket so the notches are engaged at the bottom of the drive back plate. Push the top of the drive bracket towards the two latches. The drive bracket may have to be lifted slightly to let the threaded piston rod pass through the hole in the drive bracket. Maintain a slight engaging force on top of the drive bracket while deflecting the bracket slightly to the left by pressing on the side of the upper right corner. This helps the drive gears mesh with the drive cap assembly. The drive bracket is properly seated when it snaps under the latches on the drive back plate. If resistance is felt before latching, then notches are not fully engaged, the piston rod is not in hole, the wires are jammed between the drive bracket and drive back plate, or the gear is not engaging the drive cap assembly.

To inspect drive gears, the drive gear cover needs to be removed. The drive gear cover is held in place on the drive bracket by three clips. The largest of the three clips is always orientated to the bottom of the drive bracket. Before trying to remove the drive gear cover, the drive bracket must be removed from the drive back plate. The drive gear cover can be removed from the drive bracket without removing the motor or the PC board. Simultaneously, push in and down on the large clip at the bottom and the clip on the left-hand side of the drive bracket behind the PC board. Keep your other fingers behind the drive gear cover so the drive gears do not drop on the ground. Replace broken or damaged drive gears. Do not lubricate any of the gears. Avoid getting any foreign matter on the reflective coating because dirt or oils may interfere with pulse counting.

The drive gear cover only fits on one way, with the large clip orientated towards the bottom. If all three clips are outside of the gear shroud on the drive bracket the drive gear cover slips easily into place.

The drive bracket does not need to be removed from the drive plate if the motor needs to be removed. To remove the motor, disconnect the power and motor plugs from the jacks on the PC board. Move the spring clip loop to the right and hold. Rotate the motor at least a ½ turn in either direction before gently pulling on the wire connections to remove the motor. Pulling directly on the wire without rotating the motor may break the wires off the motor.

Replace the motor if necessary. Do not lubricate the motor or the gears. When reinstalling the motor gently turn the motor wile inserting so that the gear on the motor meshes with the gears under the drive gear cover and the small plastic bulge engages one of the slots on the motor housing. Reconnect the motor plug to the two-pronged jack on the lower left-hand side of the PC board. If the motor will not easily engage with the drive gear when reinstalling, lift and slightly rotate motor before reinserting.

Replace the valve cover. After completing any valve maintenance, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the software version (e.g. 154) and then reset the valve to the service position.

DRIVE CAP ASSEMBLY, MAIN PISTON AND REGENERANT PISTON

The drive assembly must be removed to access the drive cap assembly. The drive cap assembly must be removed to access the piston(s). The drive cap assembly is threaded into the control valve body and seals with an o-ring. To remove the drive cap assembly, use the special plastic wrench or insert a 1/4" to 1" flat bladed screwdriver into one of the slots around the top 2" of the drive cap assembly so it engages the notches molded into the drive back plate around the top 2" of the piston cavity. See Figure 5. The notches are visible through the holes. Lever the screwdriver so the drive cap assembly turns counter clockwise. Once loosened unscrew the drive cap assembly by hand and pull straight out. The drive cap assembly contains the drive cap, the main drive gear, drive cap spline, piston rod and various other parts that should not be dissembled in the field. The only replaceable part on the drive cap assembly is the o-ring. Attached to the drive cap assembly is the main piston (downflow or upflow) and if a regenerant is used, a regenerant piston. The regenerant piston (the small diameter one behind the main piston) is removed from the main piston by unsnapping it from it's latch. Chemically clean in dilute sodium bisulfite or vinegar and replace the regenerant piston if needed. To remove the main downflow or upflow piston fully extend the piston rod and then unsnap the main piston from its latch by pressing on the side with the number. Chemically clean in dilute sodium bisulfite or vinegar and replace the main piston. Reattach the main piston to the drive cap assembly. Reattach the regenerant piston (if needed) to the main piston. Do not lubricate the piston rod, main piston or regenerant piston.

Lubricant will adversely affect the red or clear lip seals. Reinsert the drive cap assembly and piston into the spacer stack assembly and hand tighten the drive cap assembly. Continue to tighten the drive cap assembly using a screwdriver as a ratchet until the black o-ring on the spacer stack assembly is no longer visible through the drain port. Excessive force can break the notches molded into the drive back plate. Make certain that the main drive gear still turns freely. The exact position of the piston is not important as long as the main gear drive turns freely.

Reattach the drive assembly to the control valve and connect all plugs. After completing any valve maintenance, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the software version (e.g. 154) then reset the valve to the service position.

SPACER STACK ASSEMBLY

To access the spacer stack assembly remove the drive assembly, drive cap assembly and piston. The spacer stack assembly can be removed easily without tools by using thumb and forefinger. Inspect the black o-rings and red or clear lip seals for wear or damage. Replace the entire stack if necessary. The spacer stack assembly has been 100% tested at the factory to insure proper orientation of one-way seals. Do not disassemble the stack.

The spacer stack assembly may be chemically cleaned (dilute sodium bisulfite or vinegar) or wiped with a soft cloth.

The spacer stack assembly can be pushed in to the control valve body bore by hand. Since the spacer stack assembly can be compressed it is easier to use a blunt object (5/8" to 1-1/8" in diameter) to push the center of the assembly into the control valve body. The assembly is properly seated when at least four threads are exposed (approximately 5/8") Do not force the spacer stack assembly in. The control valve body bore interior can be lubricated with silicone to allow for easy insertion of the entire stack. Do not use silicone or any other type of lubricant on the red or clear lip seals or the piston.

Reattach the drive cap assembly, and piston(s) and the drive assembly.

After completing any valve maintenance, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the software version (e.g. 154) and then reset the valve to the service position.

The plug and/or injector can be pried out with a small screwdriver. The plug can be wiped clean. If the plug leaks replace the entire plug. The injector consists of a throat and a nozzle. Chemically clean the injector with vinegar or sodium bisulfite. The holes can be blown out with air. Both pieces have small diameter holes that control the flow rates of water to insure that the proper concentration of regenerant is used. Sharp objects, which can score the plastic, should not be used to clean the injector. Scoring the injector or increasing the diameter of the hole could change the operating parameters of the injector. Two holes are labeled DN and UP. Check for compliance with one of the following:

a. For downflow systems, the appropriate size injector is located in the “DN” hole, a plug is in the “UP” hole and the piston is a combination of the downflow main piston and the regenerant piston;

b. For upflow systems, the appropriate size injector is located in the “UP” hole, a plug is in the “DN” hole and the piston is a combination of the upflow main piston and the regenerant piston; or

c. For backwash only systems, a plug is in the “DN” hole and in the “UP” hole, and the piston only has a downflow main piston (the regenerant piston must be removed) and a plug is in the refill flow control position.

Push the plug(s) and/or injectors firmly in place, replace the screen and hand tighten the injector cap.

REFILL FLOW CONTROL ASSEMBLY OR REFILL PORT PLUG

To clean or replace the refill flow control, pull out the elbow-locking clip and then pull straight up on the elbow. Replace the elbow-locking clip in the slot so that it is not misplaced. Twist to remove the white flow control retainer. The flow control can be removed by prying upward through the side slots of the retainer with a small blade flat screwdriver.

Chemically clean the flow control or the white flow control retainer using dilute sodium bisulfite or vinegar. Do not use a wire brush. If necessary, replace the flow control o-ring on the flow control retainer, or the o-ring on the elbow.

Reseat the flow control so the rounded end is visible in the flow control. Reseat the white flow control retainer by pushing the retainer into the elbow until the o-ring seats. Remove locking clip, push down on elbow to reseat and insert locking clip.

Do not use Vaseline, oils, or other unacceptable lubricants on o-rings. A silicon lubricant may be used on the o-ring on elbow or the white retainer.

SERVICE INSTRUCTIONS CONTINUED

WATER METER OR METER PLUG

The water meter assembly is connected to the PC board by a wire. If the entire water meter assembly is to be replaced, remove the control valve cover and remove the power source and water meter plugs from the PC board. Unlatch the drive assembly and lean it forward. Unthread the water meter wire from the side of the drive assembly and through the drive back plate. To reinstall, rethread the water meter wire through the drive back plate and the side of the drive assembly. Reattach the drive assembly and the water meter and power plugs. If no water meter wire is visible, then a plug is installed and not a water meter. The water meter wire does not need to be removed from the PC board if the water meter is only being inspected and cleaned.

To remove the water assembly, unscrew the meter cap on the left side of the control valve. Pliers may be used to unscrew the nut if necessary. With the nut removed, a slot at the top of the water meter is visible. Twist a flat blade screwdriver in the slot between the control valve body and the meter. When the meter is part way out it is easy to remove the water meter from the housing. Once with water meter is removed from the control valve body, use your fingers to gently pull forward on the turbine to remove it from the shaft.

Do not use a wire brush to clean. Wipe with a clean cloth or chemically clean in dilute solution of bisulfite or vinegar. The turbine can be immersed in the chemical. Do not immerse electronics. If the turbine is scored or damaged, or the bearings on the turbine are worn, replace the turbine.

Do not lubricate the turbine shaft. The turbine shaft bearings are pre-lubricated. Do not used Vaseline, oils, or other unacceptable lubricants on the o-ring. A silicone lubricants may be used on the black o-ring.

Snap the turbine on the shaft and reinsert the water meter into the side slot. Hand tighten the nut. Do not use a pipe wrench to tighten nut.

BYPASS VALVE

The working parts of the bypass valve are the rotor assemblies that are contained under the bypass valve caps. Before working on the rotors, make sure the system is depressurized. Turn the red arrow shaped handles towards the center of the bypass valve and back to the arrow direction several times to ensure rotor is turning freely.

The nuts and caps are designed to be unscrewed or tightened by hand. If necessary a pair of 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. To access the rotor, unscrew the cap and lift the cap, rotor and handle out as one unit. Twisting the unit as you pull it out will help to remove it more easily. There are three o-rings: one under the rotor cap, one on the rotor stem and the rotor seal. Replace worn o-rings. Clean rotor. Reinstall rotor.

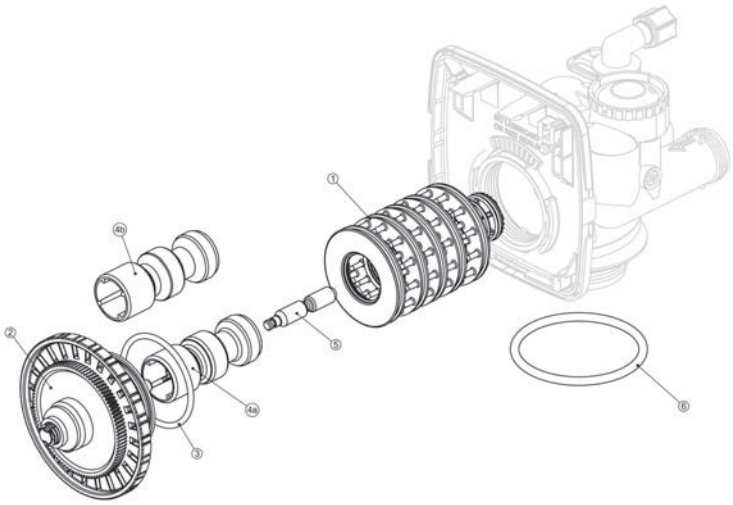
When reinstalling the red arrow handles be sure that:

1 O-rings on both rotors face to the right when being viewed from the front of the control valve when the handle pointers are lined up with the control valve body arrows; or

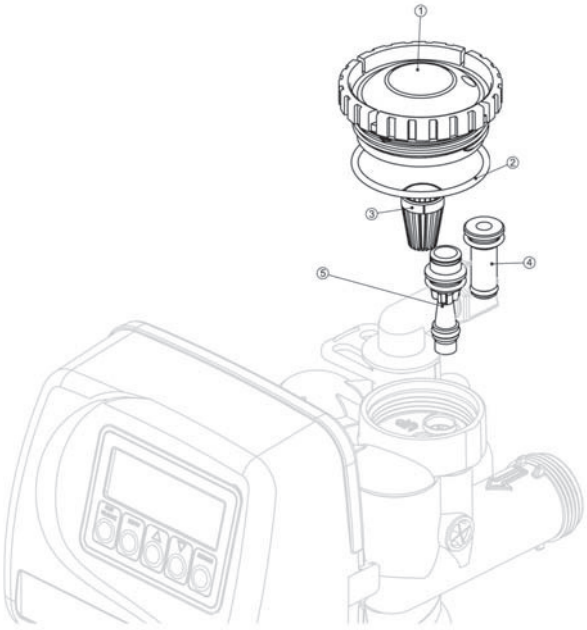
2 Arrows point toward each other in the bypass position. Since the handles can be pulled off, they could be accidentally reinstalled 180° from their correct orientation. To install the red arrow handles correctly, keep the handles pointed in the same

direction as the arrows engraved on the control valve body while tightening the bypass valve caps. After completing, any valve maintenance, press and hold NEXT
and REGEN buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording then flash the software version (e.g. 154) and then reset the valve to the service position.

DRIVE CAP ASSEMBLY, DOWNFLOW PISTON, UPFLOW PISTON REGENERANT PISTON AND SPACER STACK ASSEMBLY



INJECTOR CAP, INJECTOR SCREEN, INJECTOR PLUG AND O-RING



System Troubleshooting

PROBLEM	CAUSE	CORRECTION
1. Loss of Resin	A. Broken distribution tube	A. Replace distribution tube.
	B. Inlet/Outlet connection reversed.	B. Reconnect inlet/outlet connection properly.
2. Softener fails to regenerate.	A. Electrical service to unit has been interrupted.	A. Assure permanent electrical service (check fuse, plug, pull chain or switch.
	B. Timer is defective.	B. Replace timer.
	C. Power failure.	C. Reset time of day.
3. Hard Water	A. Bypass valve is open.	A. Close bypass valve.
	B. No salt in brine tank.	B. Add salt to brine tank and maintain salt level abovewater level.
	C. Injector screen plugged.	C. Clean injector screen.
	D. Insufficient water flowing into brine tank.	D. Check brine tank fill time and clean brine line flow control if plugged.
	E. Hot water tank hardness,	E. Repeated flushing of the hot water tank is required.
	F. Leak at distributor tube.	F. Make sure distributor tube is not cracked. Check “O” Ring and tube pilot.
	G. Internal valve leaking.	G. Replace seals and spacers and or piston.
4. Unit used too much salt.	A. Improper salt setting.	A. Check salt usage and sat setting.
	B. Excessive water in brine tank.	B. See Problem No. 8.
5. Loss of water pressure.	A. Iron buildup in line to water conditioner.	A. Clean line to water conditioner.
	B. Iron buildup in water conditioner.	B. Clear control and add mineral cleaner and increase regeneration frequency.
	C. Inlet of control plugged due to foreign material broken loose from pipes by recent work done on plumbing system.	C. Remove piston and clean control.
6. Loss of mineral through drain line.	A. Air in water system.	A. Assure that well system has proper air eliminator control. Check for dry well condition.
7. Iron in conditioned water.	A. Fouled mineral bed.	A. Check backwash, brine draw, and brine tank fill. Increase frequency of regeneration. Increase backwash time.

System Troubleshooting (continued)

PROBLEM	CAUSE	CORRECTION
8. Excessive water in brine tank.	A. Plugged drain line flow control.	A. Clean flow control.
	B. Plugged injector system.	B. Clean injector and screen.
	C. Foreign material in brine valve.	C. Replace timer.
	D. Defectie controller.	D. Replace controller.
	E. Foreign material in brine line flow control.	E. Clean brine line flow control.
9. Softener fails to draw brine.	A. Drain line flow control is plugged.	A. Clean drain line flow control
	B. Injector is plugged.	B. Clean injector.
	C. Injector screen plugged.	C. Clean screen.
	D. Line pressure is too low.	D. Increase line pressure to 20 P.S.I.
	E. Internal control leak.	E. Change seals, spacers, and piston assembly.
10. Control cycles continuously.	A. Broken or shorted switch,	A. Determine if switch or timer is faulty and replace it, or replace complete power head.
11. Drain flows continuously.	A. Piston is not positioned correctly when in service.	A. Check timer program and positioning of control. Replace power head assembly if not positioning properly.
	B. Foreign material in control.	B. Remove power head assembly and inspect bore. Remove foreign material and check control in various regeneration positions.
	C. Internal control leak	C. Replace seals and piston assembly.
12. Brine tank fills during brine step.	A. Clogged drain.	A. Replace drain line.
	B. Internal piston seal leaks.	B. Replace seals in piston assembly.

Troubleshooting Programming

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Timer does not display time of day	a. Transformer unplugged	a. Connect power
	b. No electric power at outlet	b. Repair outlet or use working outlet.
	c. Defective transformer	c. Replace transformer
	d. Defective PC board	d. Replace PC board
2. Timer does not display correct time of day	a. Switched outlet	a. Use uninterrupted outlet
	b. Power outage	b. Reset time of day
	c. Defective PC board	c. Replace PC board
3. No softening display when water is flowing	a. Bypass valve in bypass position	a. Put bypass valve in service position
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
4. Control valve regenerates at wrong time of day of day	a. Power outages	a. Reset control valve to correct time
	b. Time of day not set correctly	b. Reset to correct time of day
	c. Time of regeneration incorrect	c. Reset regeneration time
	d. Control valve set at “on 0” (immediate regeneration)	d. Check control valve set-up procedure regeneration time option
	e. Control valve set at NORMAL on 0	e. Check control valve set-up procedure regeneration time option
5. ERROR followed by code number Error Code 1001 -Unable to recognize start of regeneration Error Code 1002 - Unexpected stall Error Code 1003 - Motor ran to long, timed out trying to reach next cycle position Error Code 1004 - Motor ran to long, timed out trying to reach home position If other Error Codes display contact the factory.	a. Control valve has just been serviced	a. Press NEXT and REGEN for 3 seconds or unplug power source Jack (black wire) and plug back in to reset control valve
	b. Foreign matter is lodged in control valve.	b. Check piston and spacer stack assembly for foreign matter.
	c. High drive forces on piston	c. Replace piston(s) and spacer stack assembled.
	d. Control valve piston not in home position	d. Press NEXT and REGEN for 3 seconds or unplug power source jack (black wire) and plug back in to reset control valve
	e. Motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure	e. Check motor and wiring. Replace motor if necessary
	f. Drive gear label dirty or damaged missing or broken gear	f. Replace or clean drive gear
	g. Drive bracket incorrectly aligned to back plate	g. Reseat drive bracket properly
	h. PC board is damaged or defective	h. Replace PC board
	i. PC board incorrectly aligned to drive bracket	i. Ensure PC board is correctly snapped on to drive

Troubleshooting Programming (continued)

PROBLEM	POSSIBLE CAUSE	SOLUTION
6. Control valve stalled in regeneration	a. Motor not operating	a. Replace motor
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective transformer	c. Replace transformer
	d. Defective PC board	d. Replace PC board
	e. Broken drive gear or drive cap assembly	e. Replace drive gear or drive cap assembly
	f. Broken piston retainer	f. Replace drive cap assembly
	g. Broken main or regenerant piston	g. Replace main or regenerant piston
7. Control valve does not regenerate when REGEN button is pressed.	a. Transformer unplugged	a. Connect transformer
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Broken drive gear or drive cap	c. Replace drive gear or drive cap assembly
	d. Defective PC board	d. Replace PC board
8. Control valve does not regenerate automatically but does when REGEN button is depressed	a. By-pass valve in bypass position	a. Put control valve in service position
	b. Meter connection disconnected	b. Connect meter to PC board
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign matter
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
	f. Set-up error	f. Check control valve set-up procedure
9. Time of day flashes on and off	a. Power has been out more than two hours, the transformer was unplugged and then plugged back into the wall outlet, the transformer plug was unplugged and then plugged back into the board or the NEXT and REGEN buttons were pressed to reset the valve.	a. Reset the time of day

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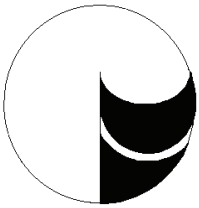

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