Hellenbrand

ProMate 1®

WATER CONDITIONING SYSTEM

Owner's Manual

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Manufactured by:
HELLENBRAND
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This owner's manual is designed to assist owners and installers with the operation, maintenance and installation of your new water softener. It is our sincere hope that this manual is clear, concise and helpful to both owner and installer. We have included detailed instructions on general operating conditions, pre-installation and installation instructions, start-up, and timer and meter programming. We have included a troubleshooting guide, service instructions and parts diagrams to assist you.

Owners will appreciate the simplified, illustrated format for operation, programming and troubleshooting. **In the event that you need professional assistance for servicing your water softener, please contact the dealer who installed this system.**

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FREQUENTLY ASKED QUESTIONS

1. **Do I still use the same amount of soap in the dishwasher, clothes washer and showers now that I have a water softener?** No, the Water Quality Association states soft water can save up to 55% on detergent use. Start with using half the amount of detergent previously used, this can be adjusted up or down based on preference. Soft water helps fabrics last longer, because hardness minerals combined with soap can make fabric fibers brittle.

2. **What is the health impact of drinking soft water?** The sodium added to water by softening is a non-issue most of the time, even for people on a sodium-restricted diet. One could soften up to 75 grains per gallon water with sodium chloride and still be well within the US Food and Drug Administration's labeling of a "Low Sodium" beverage. People on a sodium-restricted diet should consult their physician.

3. **Should I use soft water for my plants?** Some plants may be sensitive to even small amounts of sodium. We suggest using hard water for watering plants, often a kitchen cold faucet is plumbed for hard water or the outside faucets are usually plumbed for hard water. If not, you can place your softener on bypass and fill water containers at the closest sink. Water from a reverse osmosis system can always be used to water plants.

4. **Will water spots disappear now that I have soft water?** Water spots caused by hardness scale will disappear with a functioning water softener. However, other natural minerals dissolved in the water in high enough concentrations may cause spotting. These mineral spots will be much easier to wipe away compared to hardness spotting.

5. **Will soft water cause my water or ice cubes to look or taste different?** Most people can tell the difference in taste between hard and soft water, it is a personal preference. Ice cubes will appear the same, they may look cloudy due to air in water or dissolved minerals, and this will not change because now they are made with softened water. A reverse osmosis drinking water system will provide clearer ice cubes.

JOB SPECIFICATION SHEET

MODEL NO. _____

***WATER TEST AT TIME OF INSTALLATION**

_____ Hardness $CaCo_3$ (gpg) _____ Other_____

_____ Iron (ppm) _____ Other_____

_____ pH _____ Other_____

***SIZING INFORMATION**

All Water is Softened Except:

_____ Rear Hose Bib _____ Front Hose Bib _____ Kitchen Cold _____ Toilets _____ All Cold

_____ Other _____

The average family uses 50 gallons per person daily for all water uses in the home, about 40 gallons per person daily if soft water is not supplied to the toilets, and about 30 gallons per person daily if only hot water is softened.

_____ Daily Water Usage (Gallons/Person)

x _____ Family Size (Number of people in family)

= _____ Total Gallons Per Day

x _____ Grains Per Gallon of Hardness

(Note: Add 3 grains per gallon of hardness for each ppm iron for total compensated hardness)

= _____ Total Grains Per Day

*INSTALLATION DATE _____

*REVISION (REV) NUMBER_____

NOTES _____

_____

Dealer Name _____ Phone _____

Address _____ Email _____

_____

Hellenbrand products are not for sale or distribution into the State of California effective 8/31/18

SOFT WATER BASICS

Hardness

Excess amounts of calcium and magnesium in water produce hardness. A water softener removes the majority of calcium and magnesium to produce softened water.

Hardness is measured in terms of grains. (This grain weight is derived from the average weight of a dry grain of wheat.) When your water is tested the grain hardness is calculated and expressed as grains per gallon (gpg). This calculation, as well as the number of people in your household will help determine what type and size of water softener will most efficiently soften your water.

Your water softener contains an ion exchange media (sometimes called resin) which removes the hardness from water as it flows through the softener tank. Eventually so much hardness collects on the exchange media that the softener can no longer soften water. At this point it is considered "exhausted". Regeneration is now necessary.

Regeneration

To regenerate the exchange media, it must be rinsed with a brine (salt) solution. This removes the hardness from the exchange media and replaces it with sodium. The exchange media is then ready to remove hardness from water. The hardness minerals and excess brine solution are rinsed down the drain.

During the regeneration cycle the softener is also back-washed. This reversing of the normal flow of water serves to remove sediment which may have accumulated during the softening process due to the filtering action of the exchange media. Backwashing also loosens and fluffs up the bed of exchange media to insure that during regeneration the brine solution will come into contact with all the media.

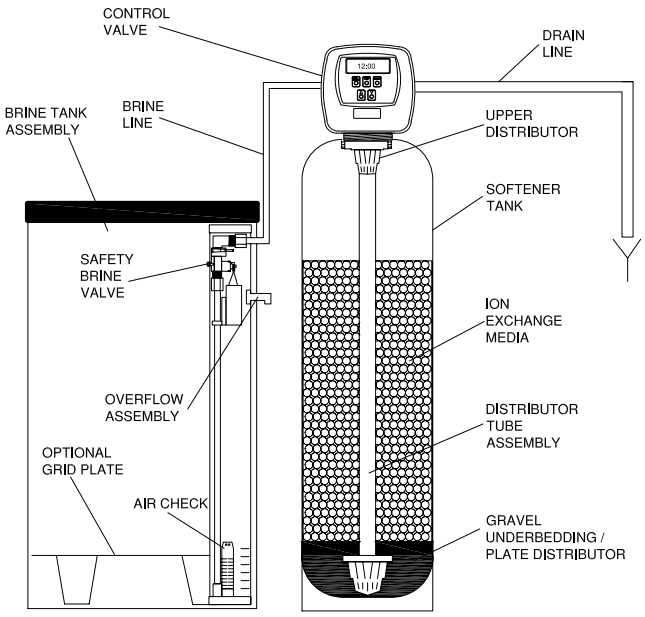


Figure 1

Maintenance of Your Softener

Salt: Salt to a softener is what gasoline is to a car. Not only must a softener have salt, but it should be the proper type to insure efficient recharging of the unit. Ask your dealer what type of salt may best suit your needs. Always have an adequate supply of salt on hand. Check the salt level of your brine tank every couple of weeks initially to determine how much salt you use - this will depend on how much water you use. As a rule of thumb, with 20 gpg hard water, about a 1/2 lb. of salt per person per day is used. In other words, a family of four uses 60 lbs. of salt a month. If your household does not use much water, do not fill your salt keeper over 1/2 full, salt bridging may occur in the brine tank. This may result in hard water due to ineffective regeneration. Fill the tank approximately three-fourths full, with a minimum of 12" of salt. DO NOT USE Block Salt when the PM1 control is programmed with a brine tank prefill. Block salt does not dissolve quick enough to provide a good regeneration.

Cleaning Salt Tank: Salt tank may require periodic cleaning. Inspect the salt tank at least once a year for buildup of insoluble materials. It is recommended to periodically clean the salt tank no matter what kind of salt you are using. See page 18, miscellaneous #2 for details on cleaning.

REMEMBER: Salt is the fuel to run your water softener. Buy the **best clean salt available.**

OPERATING CONDITIONS

Your water conditioner has been designed to adequately handle up to 100 grains per gallon of hardness that might be encountered as well as up to 2 ppm of ferrous bicarbonate iron. This is iron that is dissolved in an oxygen-free water supply. It is not visible to the eye in a freshly drawn sample because the water appears clear. But upon standing in contact with air, the ferrous iron will become oxidized to the ferric state and start to precipitate as a reddish brown floc. It can then be seen and if allowed to remain in the supply will cause discolored water. In order for your conditioner to remove the iron, air (oxygen) must be kept from coming in contact with water until after it has been passed through the water conditioner. In some cases, additional equipment may be required to treat water supplies having special characteristics, such as: ferric hydroxide iron, iron bacteria, low pH, taste and odors, etc. If any question should exist, contact your dealer.

This water softener is not intended to be used for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after treatment.

PRE-INSTALLATION CHECK LIST

(All electrical & plumbing should be done in accordance to all local codes)

Water Pressure: A minimum of 25 pounds of water pressure (psi) is required for regeneration. Maximum 125 psi.

Water Quality: On rural water supplies there is often a problem with sand or sediment in the water. (This problem occasionally occurs in public water supplies.) If the water is not filtered before being softened, the sand and sediment will plug up the water softener restricting the flow through the resin bed. This problem often requires rebedding of the mineral tank. ***Note:*** *Well and/or pump problems affecting the operation of the softener are repairs that are not covered under warranty. To prevent these unnecessary, and expensive repairs that are not covered under warranty, we recommend the installation of an in-line filter system ahead of softener installations.*

Electrical: A continuous 110 volt 60 cycle current supply is required. *Make certain the current supply is uninterrupted and cannot be turned off with another switch. All electrical connections must be connected per local codes.* ***Surge protection is recommended with all electric controls.***

Existing Plumbing: Condition of existing plumbing must be free from lime and iron build-up. Piping that is built-up heavily with lime and/or iron must be replaced. If piping is blocked with iron, additional equipment must be installed ahead of the water conditioner to correct the problem.

Drain Line: The conditioner should be located close to a drain. Avoid overhead drain lines if possible to prevent back pressure on the brine injector. Overhead drains are not to exceed 8 feet above the floor and no more than 20 feet in length. The pipe size for the drain line should be a minimum of 3/4". **Backwash flow rates in excess of 7 gpm or length in excess of 20' require 1" drain line.**

Bypass Valves: Always provide for the installation of a bypass valve.

Softening: It is recommended that the conditioner be installed to soften both the hot and cold water supply. A separate hard water faucet may be plumbed for drinking purposes if you desire. Outside faucets should be left on hard water.

Caution: Water temperature is not to exceed 110°F; the conditioner cannot be subject to freezing conditions, or to a vacuum due to loss of pressure (such as a water main break).

BYPASS VALVE OPERATION

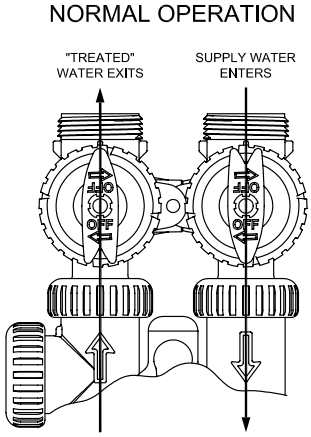


Figure 2

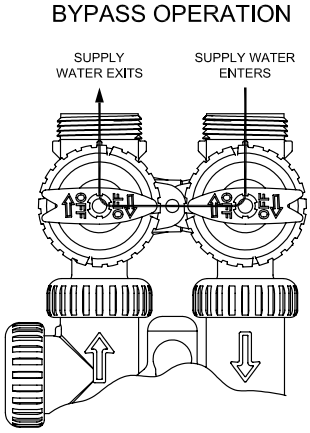


Figure 3

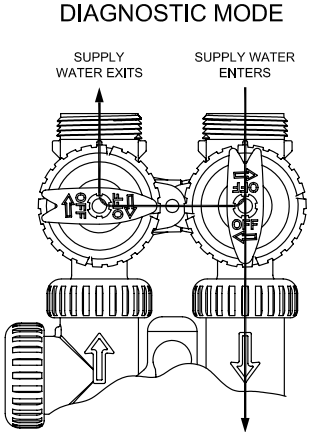


Figure 4

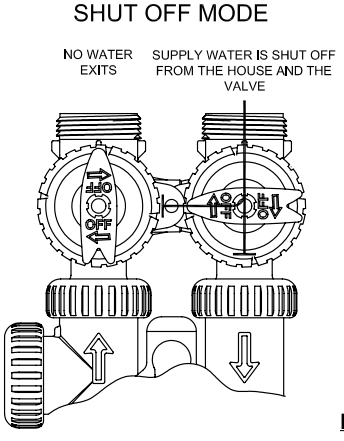


Figure 5

INSTALLATION INSTRUCTIONS

(All electrical & plumbing should be done in accordance to all local codes)

- 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. Only teflon tape may be used on threads. Teflon tape is not necessary on the nut connection or caps because of o-ring seals.

- **The pipe size for the drain line should be a minimum of 3/4". Backwash flow rates in excess of 7 gpm or length in excess of 20' require 1" drain line.**

1. Place the conditioner where you want to install it, making sure it is on a clean, level and firm base.
2. Do all necessary plumbing (inlet to inlet, outlet to outlet and drain line to drain). 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.
3. 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 primer and solvent cement on any part of the o-rings, split rings, bypass valve or control valve.
4. **A jumper ground wire should be installed between the inlet and outlet pipe whenever the metallic continuity of a water distribution piping system is interrupted. Install grounding strap on metal pipes.**
5. The drain connection may be made using either 5/8" polytube (See figure 6a, page 6) or a 3/4" female adapter. If soldering, joints near the drain must be done prior to connecting the drain line flow control fitting. Leave at least 6" between the drain line control fitting and solder joints when soldering pipes that are connected on the drain line control fitting. Failure to do this could cause interior damage to the drain line flow control fitting.
6. The brine refill flow control assembly is installed in an easy to access refill elbow located on top of the control valve. The refill flow control assembly is attached to the control valve with a locking clip. The locking clip allows the elbow to rotate 270 degrees so the outlet can be orientated towards the saltkeeper.
7. Connect the brine line found in the brine tank to the brine connection on the control valve. The control valve has a standard refill elbow which a 3/8" flexible tube can be connected, see figure 6a, page 6. (An optional elbow can be ordered which accommodates a 1/2" flexible tube for a high regenerant draw rate situation). Both elbows use the same refill flow control and retainer. Do not connect the other end of the brine line to the safety brine valve in the brine tank at this time. Make sure the floor is clean beneath the salt tank and that it is level and smooth.
8. A 1/2" (inside diameter) gravity drain line may be connected to the overflow fitting on the side of the brine tank. This overflow is in case of a malfunction in the brine shut off. If the unit is installed where water may flow in the event of an overflow and cause water damage, connect a length of flexible tubing and run to a drain below the level of the overflow. **(Do not connect the tubing to the drain line on the control valve. Do not run tubing above overflow height at any point.)**

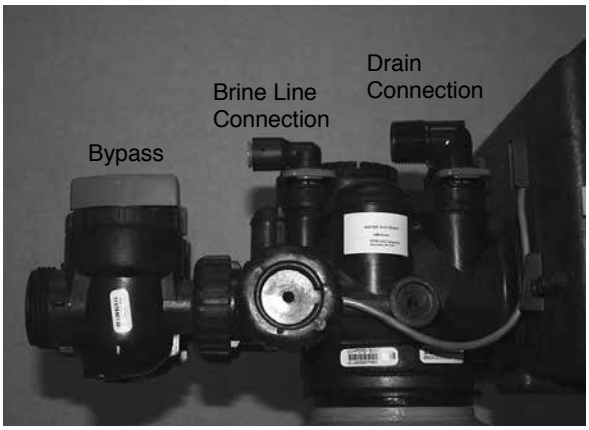


Figure 6a

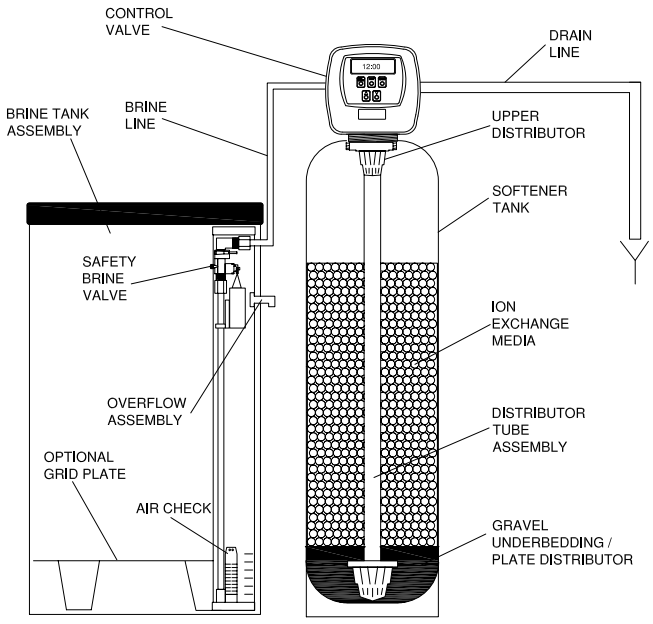


Figure 6b

Initial Start Up

The initial start up will probably be done by the technician installing the softener system. If not, the following instructions will step you through the process.

1. Complete all plumbing connections: inlet, outlet, drain line and brine line. Do not add salt at this time.
2. Place the bypass valve in the bypass position. (See figure 3 page 5) Turn on the main water supply. Open a cold soft water faucet to flush the piping of any air and/or foreign material. Run until the water is clear.
3. Manually add 6 inches of water to the brine tank.
4. Now plug the transformer into a 110-volt receptacle. (Be certain the outlet is uninterrupted.) Within 5 seconds the control will automatically align itself into the softening mode and the display will flash 12:00 (am).
5. Set the time of day. (figure 9, page 8)
6. Push REGEN button and hold it down for 3 seconds. The system will advance to the “First” position. (Note: Depending on how the system is programmed it could read backwash, rinse, brine or fill). Keep pushing REGEN button until “Rinse” shows in the lower right hand corner of display. Slowly place the by-pass into the “diagnostic mode” (see fig 4, page 5). Run water to the drain until it runs clear. Return the by-pass valve to the by-pass position (fig 3, page 5). Push REGEN button until “Time” appears in upper left hand corner of display.
7. Once again, push REGEN button and hold down for 3 seconds. Keep pushing REGEN button until “Backwash” appears. Slowly place the by-pass valve into the “Diagnostic Mode” 1/2 way. Allow water to slowly fill the mineral tank. When a solid stream of water starts coming out of the drain line, open the by-pass inlet valve all the way and allow to run out the drain until water clears. Then slowly place the by-pass into the “normal operation” mode by opening the outlet side of by-pass valve, figure 2, page 5.
8. Press the regen button until LED display says “BRINE”. Loosen the brine line from the top of the safety brine valve in the brine tank. Place finger over the end of the tube to check for suction. If no suction, see troubleshooting guide. If proper suction, reattach brine tube to safety brine valve, and allow it to draw water down to the bottom of the air check.
9. Press REGEN button again until LED once again displays “BACKWASH”. Keep in backwash until water once again runs clear at the drain.
10. Press REGEN button again until “RINSE” is displayed. Allow rinse cycle to run its full coarse. While the rinse cycle is finishing, this would be a good time to load your brine tank with salt.
11. Once the rinse cycle has finished the softener control will return to the softening cycle. The LED screen will indicate “TIME”.
12. Next set your softeners water hardness, days override and regeneration time settings (see figure 10a, page 8).
13. Next set the salt monitor (see figure 10b, page 11). Your programming is now complete.

USER DISPLAYS/SETTINGS

General Operation

When the system is operating, one of three displays may 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 third display will be current flow rate or will not appear if the valve is set up as a filter or if the Set Low Salt Warning is set to off. The user can scroll between the displays as desired.

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.

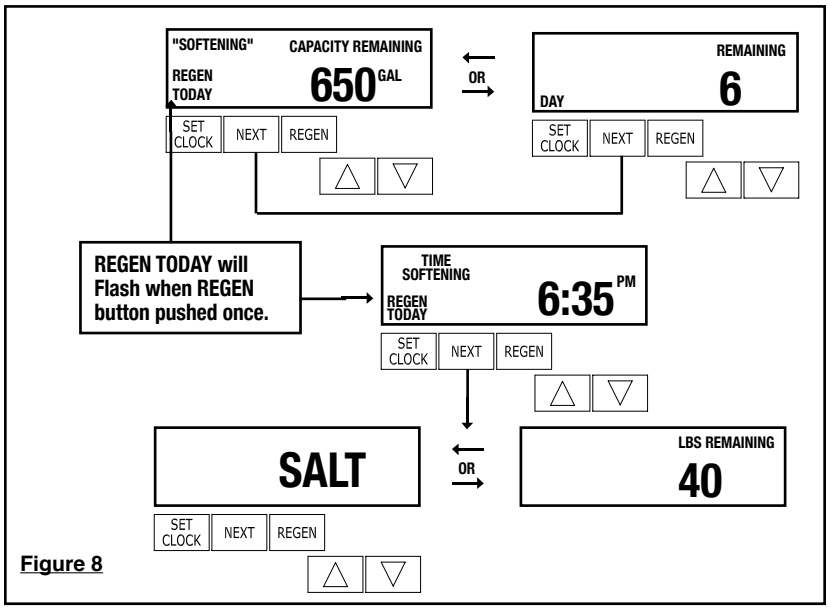


Figure 8

SET TIME OF DAY

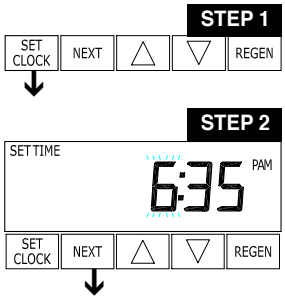


Figure 9

Step 1 - Press SET CLOCK.

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

Step 3 - Current Time (minutes): Set the minutes of day using ▲ or ▼ buttons. Press NEXT to exit Set Clock. Press REGEN to return to previous step.

Power Loss - Lithium battery on circuit board provides up to 24 hours of time- clock backup during power outages. After 24 hours, only the time of day needs to be reset, all other values are stored in non-volatile memory. If a power loss last less than 24 hours and time of day is flashing, replace coin type 2032 battery. Do not forget to reset for daylight savings time.

INSTALLER DISPLAYS/SETTINGS

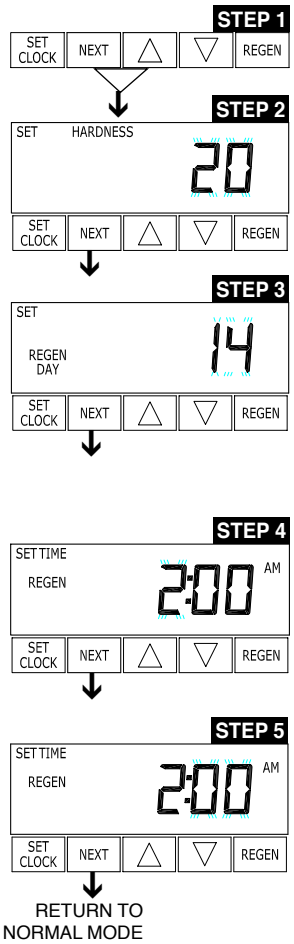


Figure 10a

Step 1 - Press NEXT and ▲ simultaneously for 3 seconds.

Step 2 - Hardness: Set the amount of total compensated hardness in grains (hardness as calcium carbonate) per gallon using ▲ or ▼ buttons. The default is 20 with value ranges from 1 to 150 in 1 grain increments. Note: The grains per gallon should be increased if soluble iron needs to be reduced. Add 3 grains of hardness for each ppm of iron present.

Step 3 - Day Override: This sets the 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 ▲ or ▼ buttons:
• number of days between regeneration (1 to 28); or
• "oFF"

Press NEXT to go to step 4. Press REGEN to return to previous step.

Step 4 - Next Regeneration Time (hour): Set the hour of day for regeneration using ▲ or ▼ buttons. AM/PM toggles after 12. The default time is 2:00 a.m. This display will show "REGEN" on 0 GAL if system is set for immediate regeneration. Press NEXT to go to step 5. Press REGEN to return to previous step.

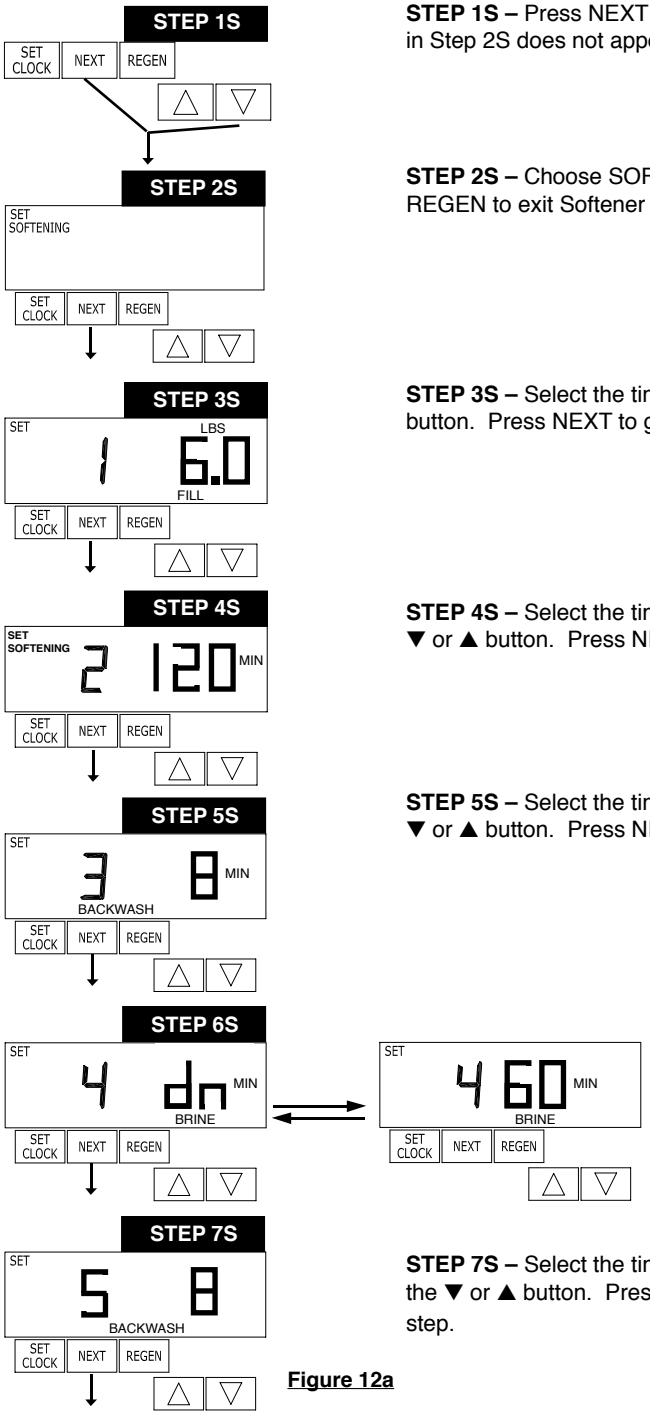
Note: When installing this unit as part of a multi unit parallel system the regen time of day must be adjusted to prevent multiple units from regenerating at the same time.

Step 5 - Next Regeneration Time (minutes): Set the minutes of day for regeneration using ▲ or ▼ buttons. This display will not be shown if system is set for immediate regeneration. Press NEXT to exit Installer Displays/Settings. Press REGEN to return to previous step.

CYCLE TIME ADJUSTMENTS

Normally it is not recommended to adjust the lengths of the cycle times. However, certain water conditions may dictate adjustments. This should only be done from the recommendation of a water conditioning professional. The following charts shows the upper and lower limits of each cycle.

Cycle Options	Units	Lower/Upper Limit	Factory Setting
Fill	Lbs.	0.1 to 5200	See Page 28
Softening (Service)	Minutes	1 to 480	120
Backwash	Minutes	1 to 120	8
Brine	Minutes	1 to 180	60
Backwash	Minutes	1 to 120	8
Rinse	Minutes	1 to 120	4



STEP 1S – Press NEXT and ▼ simultaneously for 3 seconds until display changes. If screen in Step 2S does not appear in 5 seconds the lock on the valve is activated.

STEP 2S – Choose SOFTENING using ▼ or ▲ button. Press NEXT to go to Step 3S. Press REGEN to exit Softener System Setup.

STEP 3S – Select the time for the first cycle (which in this example is FILL) using the ▼ or ▲ button. Press NEXT to go to Step 4S. Press REGEN to return to previous step.

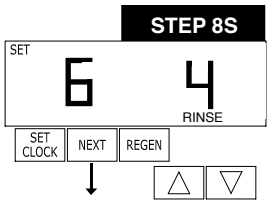
STEP 4S – Select the time for the second cycle (which in this example is SOFTENING) using ▼ or ▲ button. Press NEXT to go to Step 5S. Press REGEN to return to the previous step.

STEP 5S – Select the time for the third cycle (which in this example is BACKWASH) using the ▼ or ▲ button. Press NEXT to go to Step 6S. Press REGEN to return to the previous step.

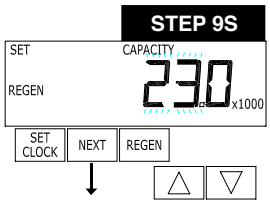
STEP 6S – Select the time for the fourth cycle (which in this example is dn BRINE) using the ▼ or ▲ button. Press NEXT to go to Step 7S. Press REGEN to return to the previous step.

STEP 7S – Select the time for the fourth cycle (which in this example is 2nd Backwash) using the ▼ or ▲ button. Press NEXT to go to Step 8S. Press REGEN to return to the previous step.

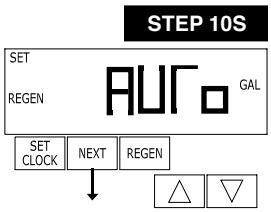
Figure 12a



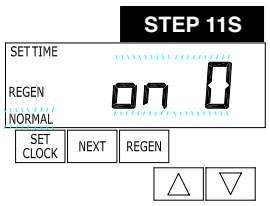
STEP 8S – Select the time for the fourth cycle (which in this example is RINSE) using the ▼ or ▲ button. Press NEXT to go to Step 9S. Press REGEN to return to the previous step.



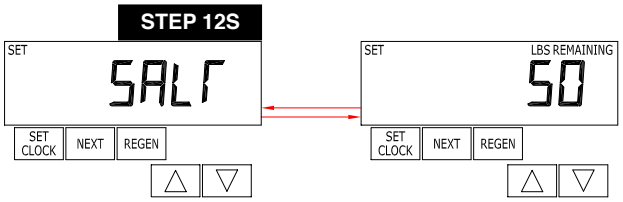
STEP 9S - Set Grain Capacity using the ▼ or ▲ button. The ion exchange capacity is in grains of hardness as calcium carbonate for the system based on the pounds of salt that will be used. Calculate the pounds of salt using the fill time previously selected. The allowable grains capacity range varies from 5,000 to 1,500,000 grains. The increment increase is 500 for the range from 5000 to 30,000; 1000 for the range of 30,000 to 100,000; 2000 for the range of 100,000 to 200,000; and 5000 for range of 200,000 to 1,500,000. Grains capacity is affected by the fill time. The capacity and hardness levels entered are used to automatically calculate reserve capacity when gallon capacity is set to AUTO. Press NEXT to go to Step 10S. Press REGEN to return to previous step.



STEP 10S – set Gallons Capacity using ▼ or ▲ button. If value is set to:
• "AUTO" gallon capacity will be automatically calculated and reserve capacity will be automatically estimated;
• "oFF" regeneration will be based solely on the day override set (see Installer Display/Settings Step 3I); or
• as a number of gallons (allowable range 20 to 1,500,000) regeneration initiation will be based off the value specified.
Increment increase is 20 for the range 20 to 2000, 100 for the range of 2000 to 10,000 and 500 for the range of 10,000 to 50,000 and 2000 for the range of 50,000 to 1,500,000.
If "oFF" or a number is used, hardness display will not be allowed to be set in Installer Displays/Settings Step 2I. See Table 8 for more detail. Press NEXT to go to Step 11S. Press REGEN to return to previous step.



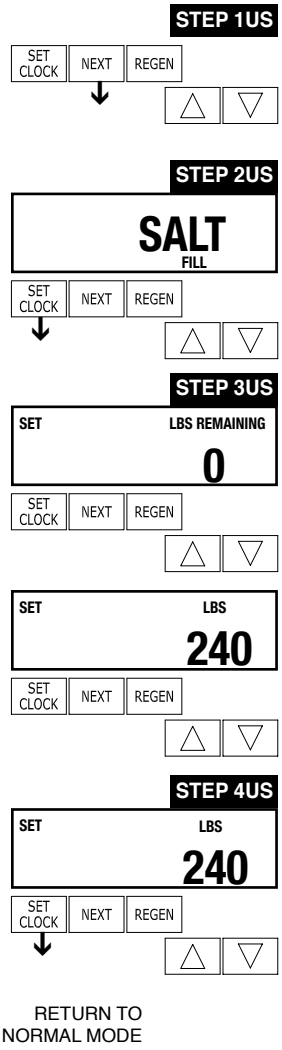
STEP 11S – Set Regeneration Time Options using the ▼ or ▲ button. If value is set to:
• "NORMAL" means regeneration will occur at the preset time;
• "on O" means regeneration will occur immediately when the gallons capacity reaches 0 (zero); or
• "NORMAL + on 0" means regeneration will occur at one of the following:
- the preset time when the gallons capacity falls below the reserve or the specified number of days between regenerations is reached, whichever comes first; or
- immediately after 10 minutes of no water usage when the gallon capacity reaches 0 (zero).
Press NEXT to go to Step 12S. Press REGEN to return to previous step.



STEP 12S – Set **Low Salt Warning** using the ▼ or ▲ button. If value is set to:
• "oFF" no low salt level warning will appear for the user, or
• a specific value "FILL SALT" will flash on the display when the calculated remaining pounds of salt falls below that level. Allowable values range from 10 to 400 pounds in 10 pound increments.

Press NEXT to exit Softener System Setup. Press REGEN to return to previous step.

SET SALT MONITOR OPTION



RETURN TO NORMAL MODE

NOTE: This screen will not appear if system is set up as a filter or the 'set low salt warning' is set to off. See dealer for details

Step 1US - Press the NEXT button until SALT appears in the display. It does not matter if the SALT display alternates with the LBS REMAINING display.

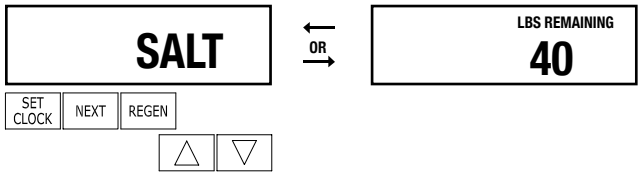
Step 2US - Press SET CLOCK

Step 3US - Set LBS REMAINING: Use the ▼ or ▲ button to adjust the pounds remaining in the brine tank.

NOTE: Estimate the pounds of salt in the brine tank and add it to the amount of salt added to the brine tank. The example at the left would indicate 200 lbs. of salt being added to a brine tank that has 40 lbs. remaining.

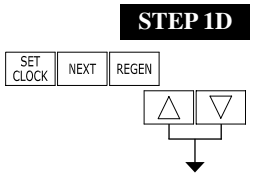
Step 4US - Press SET CLOCK to exit Adding Salt.

NOTE: The salt used per regeneration setting can be set in increments of 0.1 pounds, but LBS REMAINING screen will round up or down to the closet whole number.

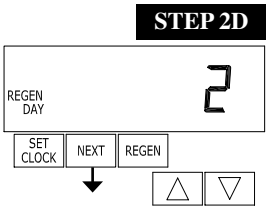


Once the salt remaining as gone below the set point the display will automatically flash Salt Fill.

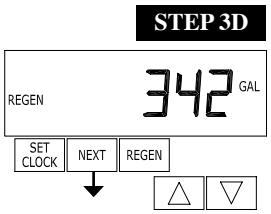
DIAGNOSTICS



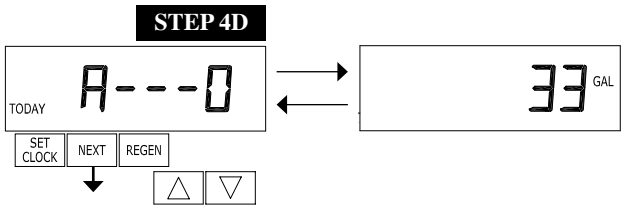
STEP 1D – Press ▲ and ▼ simultaneously for three seconds. If screen in step 2D does not appear in 5 seconds the lock on the valve is activated. To unlock press ▼, NEXT, ▲, and SET CLOCK in sequence, then press ▲ and ▼ simultaneously for 3 seconds.



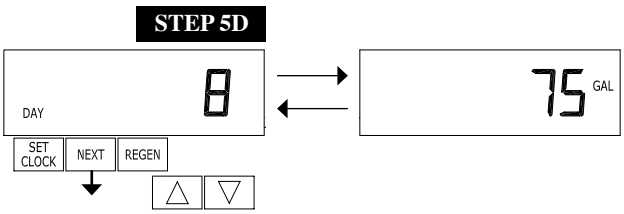
STEP 2D – Days, since last regeneration: This display shows the days since the last regeneration occurred. Press NEXT to go to Step 3D. Press REGEN to exit Diagnostics.



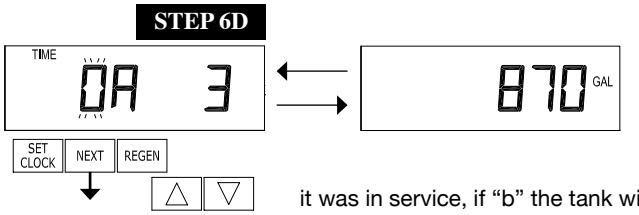
STEP 3D – Volume, since last regeneration: This display shows the volume of water that has been treated since the last regeneration. This display will equal zero if a water meter is not installed. Press NEXT to go to Step 4D. Press REGEN to return to previous step.



STEP 4D – Volume, reserve capacity used for last 7 days: If the valve is set up as a softener, a meter is installed and Set Volume Capacity is set to "Auto," this display shows 0 day (for today) and flashes the reserve capacity. Pressing ▲ will show day 1 (which would be yesterday) and flashes the reserve capacity used. Pressing ▲ again will show day 2 (the day before yesterday) and the reserve capacity. Keep pressing ▲ to show the capacity for days 3, 4, 5 and 6. ▼ can be pressed to move backwards in the day series. Display does not appear if 1.0T is selected in Step 2CS. Press NEXT at any time to go to Step 5D. Press REGEN to return to previous step.

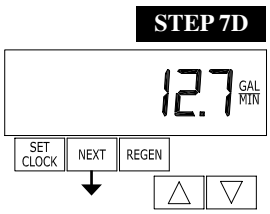


STEP 5D - Volume, 63-day usage history: This display shows day 1 (for yesterday) and flashes the volume of water treated yesterday. Pressing ▲ will show day 2 (which would be the day before yesterday) and flashes the volume of water treated on that day. Continue to press ▲ to show the maximum volume of water treated for the last 63 days. If a regeneration occurred on the day the word "REGEN" will also be displayed. This display will show dashes if a water meter is not installed. Press NEXT at any time to go to Step 6D. Press REGEN to return to previous step.

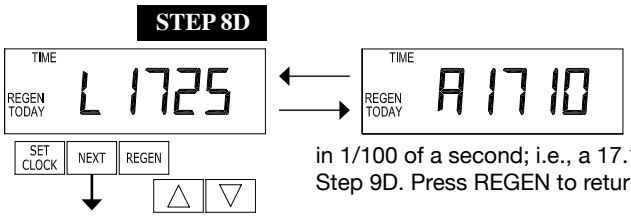


STEP 6D – Twin Tank Valve Transfer History only displays when 1.0T was selected in Step 2CS. Use ▲ or ▼ to scroll through the last 10 tank transfers.

The first position in the display ranges from 0 to 9 with the lowest number being the most recent transfer. The second position in the display will be either "A" or "b". If "A" then the tank with the valve on it was in service, if "b" the tank with the in/out head on it was in service. The next three digits represent the number of hours ago that the transfer occurred. The display alternates with the volume that was treated before the tank transferred. Press NEXT at any time to go to Step 7D. Press REGEN to return to previous step.

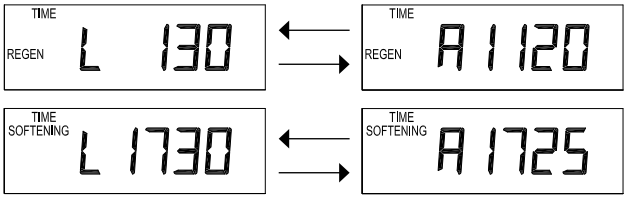


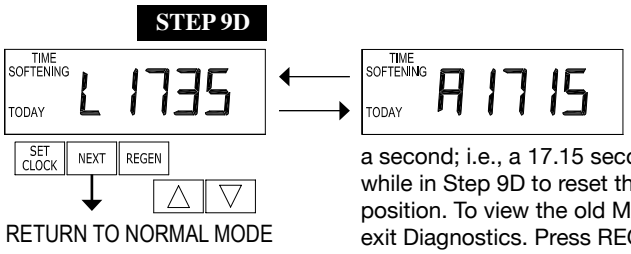
STEP 7D – Flow rate, maximum last seven days: The maximum flow rate in gallons per minute that occurred in the last seven days will be displayed. This display will equal zero if a water meter is not installed. Press NEXT to go to Step 8D. Press REGEN to return to previous step.



STEP 8D – MAV Drive History in the direction of extended piston rod position. Display will not be shown if 1.0T is not selected in Step 2CS or OFF is selected in Step 4CS. If the display does appear up to a four digit number will appear after the "L" which stands for latest and "A" which stands for average. Drive time is measured in 1/100 of a second; i.e., a 17.10 second move is displayed as 1710. Press NEXT at any time to go to Step 9D. Press REGEN to return to previous step.

Press and hold ▲ and ▼ buttons for 3 seconds while in Step 8D to reset the MAV drive history in both the retracted and extended piston rod position. To view the old MAV drive history data for retracted and extended rod position press and hold SET CLOCK and ▲ while in Step 8D. Press NEXT to advance display to the old MAV drive history.



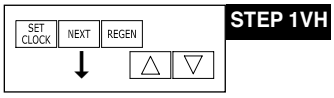


STEP 9D – MAV Drive History in the direction of retracted piston rod position. Display will not be shown if 1.0T is not selected in Step 2CS or OFF is selected in Step 4CS. If the display does appear, up to a four digit number will appear after the "L" which stands for latest and "A" which stands for average. Drive time is measured in 1/100 of a second; i.e., a 17.15 second move is displayed as 1715. Press and hold ▲ and ▼ for 3 seconds while in Step 9D to reset the MAV drive history in both the extended and retracted piston rod position. To view the old MAV drive history data see Step 8D. Press the NEXT button at any time exit Diagnostics. Press REGEN to return to previous step.

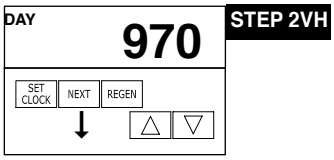
When desired, all programming and all information in Diagnostics may be reset to defaults when the valve is installed in a new location. To reset to defaults, press NEXT and ▼ simultaneously to go to the Softening/Filtering screen. Press ▲ and ▼ simultaneously to reset diagnostic values and all programming to defaults. Screen will return to User Display.

VALVE HISTORY

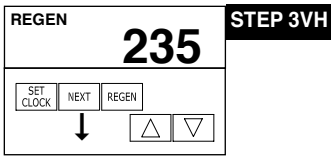
(Can not be reset)



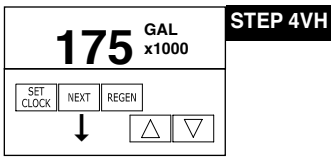
STEP 1VH – Press ▼ and ▲ simultaneously for three seconds, or until display changes and release, then press ▼ and ▲ simultaneously and release. If screen in step 2VH does not appear in 5 seconds the lock on the valve is activated.



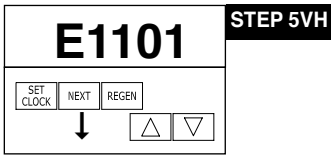
STEP 2VH – **Days, total since start-up:** This display shows the total days since startup. Press the NEXT button to go to Step 3VH. Press REGEN to return to previous step.



STEP 3VH – **Regenerations, total number since start-up:** This display shows the total number of regenerations that have occurred since startup. Press the NEXT button to go to Step 4VH. Press REGEN to return to previous step.



STEP 4VH – **Volume, total used since start-up:** This display shows the total gallons treated since startup. This display will equal zero if a water meter is not installed. Press NEXT button to go to Step 5VH. Press REGEN to return to previous step.



STEP 5VH – **Error Log history:** up to 10 errors. Press ▼ and ▲ buttons to view each recorded error. If no errors have occurred " E 1 – –" is displayed. Press NEXT to exit valve history.

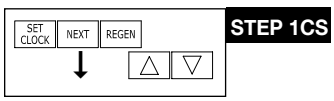
CYCLE SEQUENCE

Cycle Sequence instructions allows the operator to set the order of the cycle. The Softener System Setup allows the operator to set how long the cycles will last. The operator may choose up to 9 cycles in any order.

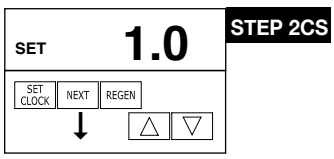
END must be used as the last cycle option. The SOFTENING cycle should only be used in brine prefill applications to allow salt to dissolve.

Cycle Options		
BACKWASH	DN BRINE	FILL
RINSE	SOFTENING	END

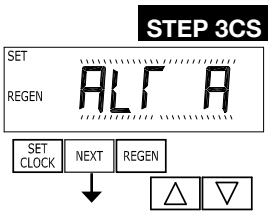
The following is an example of how to set a valve so that when regeneration is initiated, BACKWASH occurs first, dn BRINE occurs second, RINSE occurs third, and FILL occurs fourth.



STEP 1 CS – Press NEXT and ▼ simultaneously until display changes, then release. Again press NEXT and ▼ simultaneously and release. If screen in step 2CS does not appear in 5 seconds the lock on the valve may be activated.



STEP 2 CS – **Meter Size.** Use the ▲or▼ to select 1 for 1" ProMate-1.0 valve. Press NEXT to go to Step 3CS. Press REGEN to exit cycle sequence.



Step 3CS – Allows selection of one of the following using ▼ or ▲:
- the Control Valve to have no hard water bypass;
- the Control Valve to act as an alternator; or
- the Control Valve to have a separate source during the regeneration cycle; or
- the Control Valve to operate with the Clack System Controller.

Select OFF when none of these features are used.

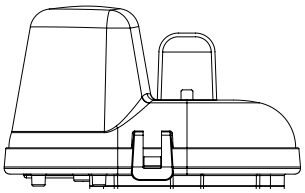
This display will not appear if 1.0T was selected in Step 2CS.

Only use Clack No Hard Water Bypass Valves or Clack Motorized Alternating Valves (MAV) with these selections. Clack No Hard Water Bypass Valves (1" or 1.25" V3070FF or V3070FM) are not designed to be used with the alternator or separate source functions.

Selecting the Control Valve to act as an alternator:

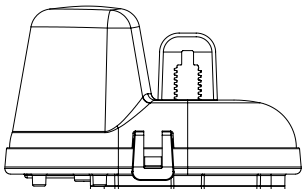
Prior to starting the programming steps, connect the interconnect cable to each control valve board's three pin connector labeled COMM CABLE. Also connect the meter cord to either control valve to the three pin connector labeled 'METER'.			
		Softener Valve Programming Steps	
OEM Cycle Sequence	Step 3CS	Set to ALT A Connect the outlet plumbing of Valve A to the MAV's A port and connect the MAV's two pin wire connector to the two pin connector labeled "DRIVE" on Valve A	Set to ALT B Connect the outlet plumbing of Valve B to the MAV's B port. No electrical connections are required between Valve B and the MAV
Softener System Setup	Step 10S	Set to 'AUTO'	Set to 'AUTO'
Softener System Setup	Step 11S	Set regeneration time option to 'On O'.	Set regeneration time option to 'On O'.
Installer Display Setting	Step 3I	Set Day Over ride to "oFF"	Set Day Over ride to "oFF"

NOTE: If the control valve is in an error state during regeneration mode the MAV will close the B port and keep open the A port until the error is corrected and reset.



Retracted

Valve "A" in Service Position = MAV piston rod Retracted



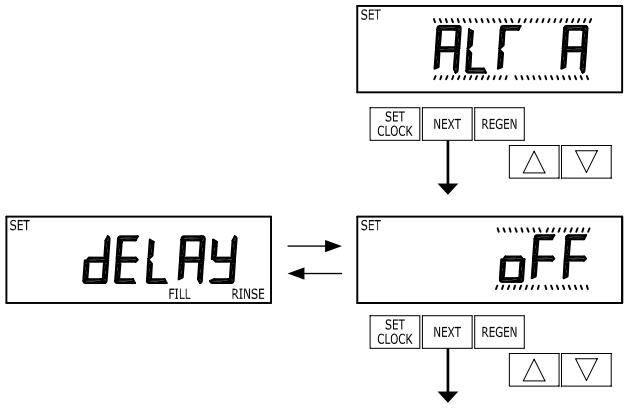
Extended

Valve "B" in Service Position = MAV piston rod Extended

Note: Clack Twin Alternator Operations
- Twin alternating systems can be programmed with a day override setting combined with the normal volume-based regeneration programming. A twin alternating system in this configuration will then regenerate based on the volume used or the day override if there is a period of low water usage.
- Twin alternating systems can be programmed as a time clock only based regenerating system. In this configuration, the days remaining are counted only on the unit that is in service. The unit in Stand-by Mode only notes days in diagnostics, which results in time clock only twin regeneration initiation.
- Twin alternating systems can be programmed for a delayed regeneration time. The system will allow an immediate transfer of the MAV to switch tanks and place a fully regenerated unit in service once a unit becomes exhausted. The exhausted unit will then be placed into Stand-by Mode and allowed to have a delayed regeneration at the pre-set time.

For systems using **WS1, WS1.25 and WS1.5** valves there will be an option to delay the last two cycles of regeneration (only "Rinse" and "Fill"). This feature splits the regeneration into two portions. The first portion of the regeneration will start immediately and all programmed cycles before the "Rinse" and "Fill" cycles will be performed. After all programmed cycles before "Rinse" and "Fill" are completed the control valve will drive to the service position (displaying "Delayed Rinse + Fill Pending"). When the volume of the on-line unit is depleted to 10% of its programmed capacity, the control valve will be triggered to finish the second portion of the regeneration. Once "Rinse" and "Fill" are completed, the valve will re-enter Standby mode until requested to come on-line for Service.

WS1, WS1.25 and WS1.5 Valves



Configuring the Control Valve to operate with Clack System Controller:
Select SYS to link the Control Valve to the Clack System Controller. For communication between the Control Valve and the System Controller, a three-wire communication cable is required.
Press NEXT to go to Step 5CS. Press REGEN to return to previous step.

Configuring the Control Valve for Separate Source Operation:

Select SEPS for control operation. For separate source operation the three wire connector is not used.

Selection requires that a connection to a Clack Motorized Alternator Valve (MAV) is made to the two pin connector labeled ALTERNATOR DRIVE located on the printed circuit board. The C port of the MAV must be connected to the valve inlet and the A port connected to the separate source used during regeneration. The B port must be connected to the feed water supply.

When set to SEPS the MAV will be driven closed before the first regeneration cycle, and be driven open after the last regeneration cycle.

NOTE: If the control valve enters into an error state during regeneration mode, the MAV will remain in its current state until the error is corrected and reset.

Configuring the Control Valve for No Hard Water Bypass Operation:

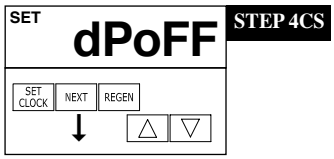
Select nHbP for control operation. For no hard water bypass operation the three wire connector is not used.

Selection requires that a connection to MAV or a Clack No Hard Water Bypass Valve is made to the two pin connector labeled ALTERNATOR DRIVE located on the printed circuit board. If using a MAV, the A port of the MAV must be plugged and the valve outlet connected to the B port. When set to nHbP the MAV will be driven closed before the first regeneration cycle that is not FILL or SOFTENING or FILTERING, and be driven open after the last regeneration cycle that is not FILL.

NOTE: If the control valve enters into an error state during regeneration mode, the no hard water bypass valve will remain in its current state until the error is corrected and reset.

STEP 3 CS Option – Seperate Source – Use ▼ or ▲ buttons to select **SEPS**. Selection requires that connection is made from 3-way MAV to two-pin connector on board labeled Alternator Drive. "C" port is connected to valve inlet. "A" port is connected to separate source supply. "B" port is connected to feed water supply. MAV will be driven closed before first regen cycle & driven open after last regeneration cycle. If error occurs during regeneration, MAV remains in current state until error is corrected and reset.

STEP 3 CS Option – SYS – For use with SystemMate Demand Recall Panel.

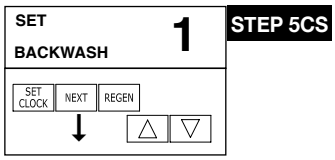


STEP 4CS – **Select an auxiliary input** to trigger REGEN. Selection only matters if a connection is made to the two pin connector labeled DP SWITCH located on the printed circuit board. Use ▲or▼ arrows to select. **Factory setting is dPoff.** Following is an example of the options:

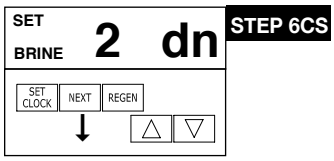
dPon0 - If the dP switch is closed for an accumulative time of 2 minutes, a regeneration will occur immediately. Factory Setting is dPon0.

dPdEL - If the dP switch is closed for an accumulative time of 2 minutes, a regeneration will occur at the scheduled regeneration time.

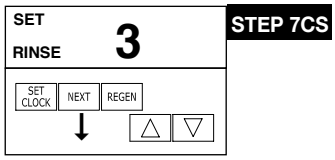
HoLd - If the dP switch is closed, a regeneration will be prevented from occurring. Press NEXT to go to Step 9CS. Press REGEN to return to previous step.



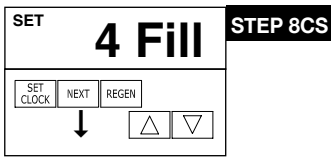
STEP 5CS – First Regeneration Cycle. Press ▼ or ▲ buttons to select, in this example it is backwash. Press NEXT to go to Step 6CS. Press REGEN to return to previous step.



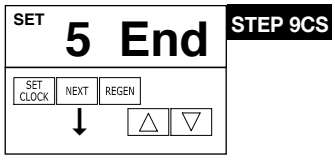
STEP 6CS – Second Regeneration Cycle. Press ▼ or ▲ buttons to select, in this example it is dn Brine. Press NEXT to go to Step 7CS. Press REGEN to return to previous step.



STEP 7CS – Third Regeneration Cycle. Press ▼ or ▲ buttons to select, in this example it is Rinse. Press NEXT to go to Step 8CS. Press REGEN to return to previous step.



STEP 8CS – Fourth Regeneration Cycle. Press ▼ or ▲ buttons to select, in this example it is Fill. Press NEXT to go to Step 9CS. Press REGEN to return to previous step.



STEP 9CS – Programmer can select up to 9 regeneration cycles. After all cycles have been programmed, an END cycle must be added. Press ▼ or ▲ buttons until END appears. Press NEXT to exit Cycle Sequence. Press REGEN to return to previous step.

RETURN TO NORMAL MODE

WATER SOFTENER DISINFECTION

The construction materials of your water softener will not support bacterial growth nor will these materials contaminate a water supply. However, the normal conditions existing during shipping, storage, and installation indicate the advisability of disinfecting a softener after installation, before the softener is used to treat potable water. In addition, during normal use a softener may become fouled with organic matter or in some cases, with bacteria from the water supply.

Therefore, every water softener should be disinfected after installation, some will require periodic disinfection during their normal life. You have two choices for disinfection as follows:

A. SODIUM HYPOCHLORITE (household bleach)
5.25% SODIUM HYPOCHLORITE solutions are available under such trade names such as Clorox, Linco, Bo Peep, White Sail and Eagle Brand Bleach. If stronger solutions are used, such as those sold for commercial laundries, adjust the dosage accordingly.
1. Dosage:
a. Softening resin; 1.2 fluid ounce per cubic foot of resin.
2. Add the required amount of hypochlorite solution to the brine well of the brine tank.
a. Proceed with the normal regeneration. Press REGEN and allow the water softener to go through a normal regeneration.

B. EPA and NSF approved Sani-System by Pro Products. This can be purchased from your water treatment provider or at: http://proproducts.com/products/sani-system.

MISCELLANEOUS

1. Salt Usage: See your water conditioning professional for a recommendation on the best type of salt for your application.
2. Brine Tank Cleaning:
   a. Remove brine tank cover.
   b. Scoop out as much old salt as possible.
   c. Disconnect brine tubing from safety brine valve at brine well.
   d. Remove safety brine valve from brine well.
   e. Place one hand in brine well to hold overflow nut and remove 2-piece overflow.
   f. Remove optional brine well and optional grid plate, if used, from saltkeeper.
   g. Remove any remaining salt and/or impurities from brine tank.
   h. Using clean water and a brush or rag, wipe and rinse inside of brine tank. Also wipe and rinse the grid plate and brine well.
   i. Reassemble brine tank reversing steps c - f. Note: If grid plate is used and it is damaged or cracked, replace with new one.
   j. Put brine tank in place making sure there is no debris or foreign material beneath it.
   k. Reconnect brine tubing to safety brine valve.
   l. Manually add 6 inches of water to the saltkeeper (or to approximately 1” above the grid plate, if used).
   m. Add new salt. Important: Do not add the old salt which was removed earlier unless it is clean and not mushy. We recommend using new salt.
   n. Follow the disinfection instructions found at top of page.
   o. Put on brine tank cover.

TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION

After resolving the cause of any error code or any service work on valve, press NEXT & REGEN simultaneously for 5 seconds or disconnect power supply for 5 seconds at PC board and reconnect to resynchronize software with piston position.

VALVE ERROR CODES

Error Code 101 - Unable to recognize start of regeneration	A1. Control not reading piston position	A1. Resynchronize software with piston position by pressing start NEXT and REGEN buttons simultaneously for 5 seconds, until screen changes. Initiate regeneration to verify function by pressing and holding REGEN button until regeneration initiates, step through regeneration modes by pushing REGEN button each time motor stops. A2. Verify motor connection to PC board; motor wires are intact and motor fully inserted to engage pinion, (should also be flushed with barrel). A3. Verify correct assembly; PC board snapped onto drive bracket and wires are in backplate guides and drive bracket snapped onto backplate. Verify three drive gears are in place on drive bracket and reflective surface are clean and gears rotate freely.
Error Code 102 - Unexpected stall	B1. Mechanical Binding	B1a. Check for any foreign material in stack assembly impeding piston movement and remove; verify seals intact and in place in stack assembly, if not replace stack assembly. B1b. Check for incorrect assembly, drive bracket not snapped into place, motor pushed inside of barrel of drive bracket (black gear on motor end should be flush with end of shaft). B1c. Drive gears unable to rotate freely - replace gear(s) if not rotating freely.
	B2. Improper voltage being delivered to board	B2. Motor unable to move piston, check voltage is present on 12V DC motor at start of regeneration modes. Transformer should provide 12 volts when plugged into outlet and not attached to board - if not replace transformer
Error Code 103 - Motor ran too long, timed out trying to reach home position	C1. Piston unable to reach home position	C1. Incorrect assembly; check drive bracket is correctly seated and snapped into place on backplate, wires outside of guides on backplate can impede drive bracket from correct position. C2. Check PC board is seated on posts and snapped into place on drive bracket C3. Drive gear labels dirty or missing, missing or broken gear, replace as needed

MAV ERROR CODES

After resolving any MAV error or servicing MAV, resynchronize software with piston positioning by pressing NEXT and REGEN buttons simultaneously for 5 seconds or disconnecting power from PC board for 5 seconds and reconnecting.

ALTERNATING MAV DRIVE - ERROR CODES 106 & 107

Error Code 106 - Alternating MAV ran too long		A1. Control valve is programmed for alternating or as NHWB without having MAV connected to board. Reprogram valve to proper setting or connect MAV to alternating MAV drive on PC board A2. MAV motor not fully engaged with gears
Error Code 107 - Alternating MAV stalled	Mechanical Binding	B1. Open MAV and check for foreign material on stack assembly, remove if present, verify seals intact and in place. If not, replace stack assembly B2. Drive gear should spin freely-replace if necessary
1. Control valve stalled in regeneration	A. Motor not operating B. No electric power at outlet C. Defective transformer D. Defective PC board E. Broken drive gear or drive cap assembly F. Broken piston retainer G. Broken main or regenerant piston	A. Replace Motor B. Repair outlet or use working outlet C. Replace transformer D. Replace PC board E. Replace drive gear or drive cap assembly F. Replace drive cap assembly G. Replace main or regenerant piston

TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
2. Blank or incomplete display on board	A. Transformer unplugged	A. Plug transformer into uninterrupted power supply, verify power connection is plugged into 4-prong connection on PC board
	B. No electric power at outlet	B. Repair outlet or use working outlet, should read 115V with voltmeter at outlet. Verify power cannot be turned off with another switch
	C. Defective transformer	C. Check voltate at connection with transformer plugged in. Should read >12 volt AC with voltmeter. Replace transformer if inadequate voltage
	D. Low battery after power outage	D. If power outage occurred and battery on board has low voltage, the microprocessor may not recover cleanly and display properly. Disconnect power from circuit board and remove battery, wait 5 minutes. Reconnect power, if displays appropriately, replace battery (lithium CR2032). If you do not have battery at time of evaluation, leave the battery out of board, only concern will be time of day reset will be needed if power outage occurs again. Voltage on battery should be > than 3 volts.
3. Control valve does not regenerate automatically when REGEN button is depressed and held	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 assembly	C. Replace drive gear or drive cap assembly
	D. Defective PC board	D. Replace PC board
4. Control valve does not regenerate automatically but does when REGEN button is depressed	A. Bypass 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 free rotation or foreign matter
	D. Defective meter	D. Replace meter
	E. Defective PC board	E. Replace PC board
	F. Programming error	F. Check control valve set-up procedure
5. Time of day flashes on and off	A. Battery back-up maintains time-of-day up to 2 years in event of power outage and battery is not depleted. Time of day flashes when battery is depleted.	A. Reset time of day and replace battery on PC Board (Lithium coin type battery 2032)
6. Softener delivers hard water.	A. Bypass valve is open or faulty.	A. Close bypass valve or replace.
	B. No salt or low salt level in brine tank.	B. Add salt to brine tank and maintain salt level above water level.
	C. Softener fails to draw brine.	C. See problem #10.
	D. Excessive water usage.	D. Check gallon capacity settings.
	E. Insufficient brine level in brine tank.	E. Check brine refill setting and refill flow restrictor for blockage.
	F. Resin level inadequate.	F. See problem #7.
	G. Meter faulty.	G. Test meter and clean or replace meter.
	H. Raw water hardness fluctuation.	H. Test raw water hardness and adjust settings to highest known hardness.
7. Unit uses too much salt.	A. Improper brine refill setting.	A. Check brine refill setting for proper salt dosage
	B. Improper settings.	B. Check water hardness and reevaluate capacity setting specification
	C. Excessive water in brine tank.	C. See problem #9.
	D. Leaking faucets, toilets, etc...	D. Repair or replace those items.
	E. Brine line flow control out of place	E. Replace Brine line flow control.
8. Loss of resin.	A. Backwash controller missing.	A. Install backwash controller.
	B. Faulty distributor tube assembly.	B. Check distributor tube assembly for cracks or holes.
	C. Air being drawn in through brine system.	C. Check for leaks in brine lines, fittings, or air check. Repair or replace.
	D. Air in water supply system	D. 1. Install upper distributor if missing. 2. Ensure that water supply system has an air eliminator.
9. Softener delivers salty water.	A. Low water pressure.	A. Check incoming water pressure - Must remain at minimum of 25 psi.
	B. Excessive water in brine tank.	B. See problem #9.
	C. Wrong size injector.	C. Install correct injector.

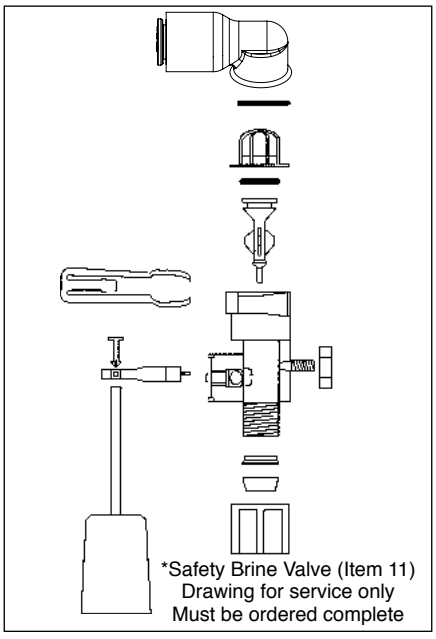
TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
10. Excessive water in brine tank.	A. Plugged injector. B. Faulty piston/seal assembly. C. Plugged or kinked drain line. D. Backwash flow controller closed off. E. Defective brine line flow control.	A. Remove injector and clean ports. B. Replace piston/seal assembly. C. Correct any kinking or plugging of drain line. D. Check backwash flow controller. E. Replace brine refill flow control.
11. Softener fails to draw brine.	A. Injector is plugged, absent/missing oring(s) B. Faulty piston assembly. C. Brine line connection leak. D. Drain line plugged creating excess back pressure. E. Drain line too long or too high. F. Low inlet pressure.	A. Remove injector and clean ports/replace if necessary B. Check piston assembly. C. Inspect brine line during refill cycle for leaks. D. Inspect drain line for blockage. E. Refer to drain line specifications. F. Increase inlet pressure to a minimum of 25 psi.
12. Continuous flow to drain.	A. Piston assembly failure. B. Motor failure. C. Circuit board failure.	A. Replace piston assembly. B. Replace motor. C. Replace circuit board.
13. Loss of water pressure.	A. Resin bed fouled with sand or sediment. B. Resin bed mushing due to high amount of oxidizers in water supply (chlorine).	A. Rebed softener and install sediment filter ahead of softener. B. Rebed softener. Install dechlorination system ahead of softener
14. Iron in softened water.	A. Iron has fouled resin bed. B. Iron is not in a soluble state. C. Prefilter failure. D. Iron level excessive. E. Control fails to regenerate.	A. Use iron-reducing resin cleaner to clean resin bed, and increase salt dosage or regenerate more frequently or rebed softener. Install an Iron Curtain System ahead of the softener. B. Test water to determine type of iron, install iron reduction system. C. Check prefilter. D. Install iron reduction system. E. See problem #3, page 20.
15. Control does not display correct time of day	A. Power outage > 2 years B. Power outage < 2 years, time of day flashing, battery depleted	A. Reset time of day B. Replace lithium coin type battery on circuit board Model 2032 battery
16. No “softening” or “filtering” display when water is flowing	A. Bypass valve in bypass position B. Meter connection disconnected C. Restricted/stalled meter turbine D. Defective meter E. Defective PC board	A. Put bypass valve in service position B. Connect meter to PC board C. Remove meter and check for free rotation, clean foreign material D. Replace meter E. Replace PC board
17. Control valve regenerates at wrong time of day	A. Power outages > 24 hours B. Time of day not set correctly C. Time of regeneration incorrect D. Control valve set at “on 0” (immediate regeneration) E. Control valve set at NORMAL + on 0	A. Reset control valve to correct time of day B. Reset to correct time of day C. Reset regeneration time D. Check control valve set-up procedure regeneration time option (see page 28) E. Check control valve set-up procedure regeneration time option (see page 28)

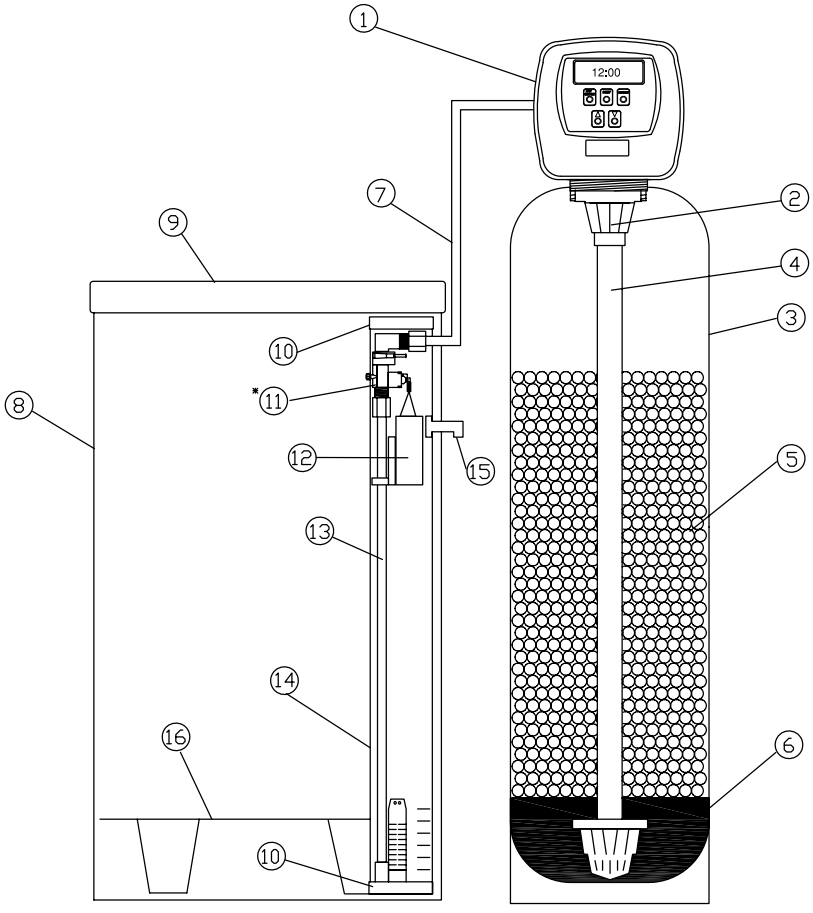
PROMATE-1® CONDITIONER & BRINE TANK ASSEMBLIES

Item	Description	Qty	Part #	
1	Metered Control Valve	1	107253-PM1-32K	
2	Top Diffuser	1	101539	
3&4	Mineral Tank Assembly		Item 3 only	Item 4 only
			Mineral Tank	**Distributor Assy**
	PM1-024 8 x 44	1	104535	101505
	PM1-032 9 x 48	1	104539	101508
	PM1-032-10 10 x 44	1	104548	101505
	PM1-048 10 x 54	1	104554	101512
	PM1-064 13 x 54	1	104567	101512
5	Ion Exchange Resin	*	101123	*See Specifications for amount, see page 29
6	Underbedding		100983	
7-15	Brine Tank 18 x 33	1	104409	
	Brine Tank 18 x 40	1	104415	
b	24x50 Salt Keeper Tank-Black	1	104497	
9a	Brine Tank Cover 18x40	1	101448	
b	Brine Tank Cover 24x50		Included with 8a	
10-14	Safety Brine Valve Assy 50”		104173	
10	Cap, Brine Well	2	101365	
11*	Safety Brine Valve	1	101274	
12	Float Assembly	1	111853	
13	Air Check	1	101181	
14 a	Brine Well 40”-41”	1	102877	
b	Brine Well 50”		102878	
15	2-Piece Overflow	1	102217	
16 a	Grid Plate 18” (optional)	1	101758	
b	Grid Plate 24” (optional)	1	101754	
–	Owners Manual (Not Shown)	1	106231	

*Must be ordered as complete assembly



*Safety Brine Valve (Item 11)
Drawing for service only
Must be ordered complete



FRONT COVER AND DRIVE ASSEMBLY

ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	112590	Front Cover Assy w/Label	1
2	102096	Motor	1
3	101262	Drive Bracket & Spring Clip	1
4	101234	PC Board-CC	1
5	101746	Drive Gear 12x36	3
6	101459	Drive Gear Cover	1
Not Shown	102653	Transformer 110V-12V	1

After completing any valve maintenance involving the drive assembly or the drive cap assembly and pistons, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack from the printed circuit board (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 (ex: 154) and then reset the valve to the service position.

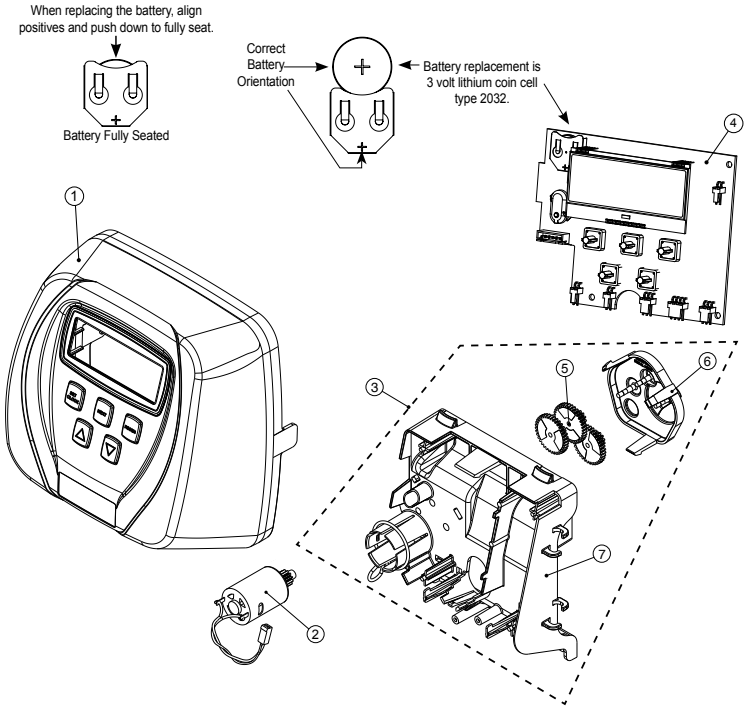


Figure 14

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

ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	102548	Spacer Stack Assy	1
2	101613	Drive Cap Assy.	1
3	102167	O-Ring 228	1
4a	102292*	Piston Downflow Assy.	1**
4b	102297*	Piston Upflow Assy.	1
5	102296	Regenerant Piston	1
6	102192	O-ring 337-tank	1
7	102860	Valve Body	1
8	102299	Back Plate	1
9	102892	Service Wrench - Not Shown	1

*102292 is labeled with DN and 102297 is labeled with UP.
Note: The regenerant piston is not used in backwash only applications.
**Standard Option.

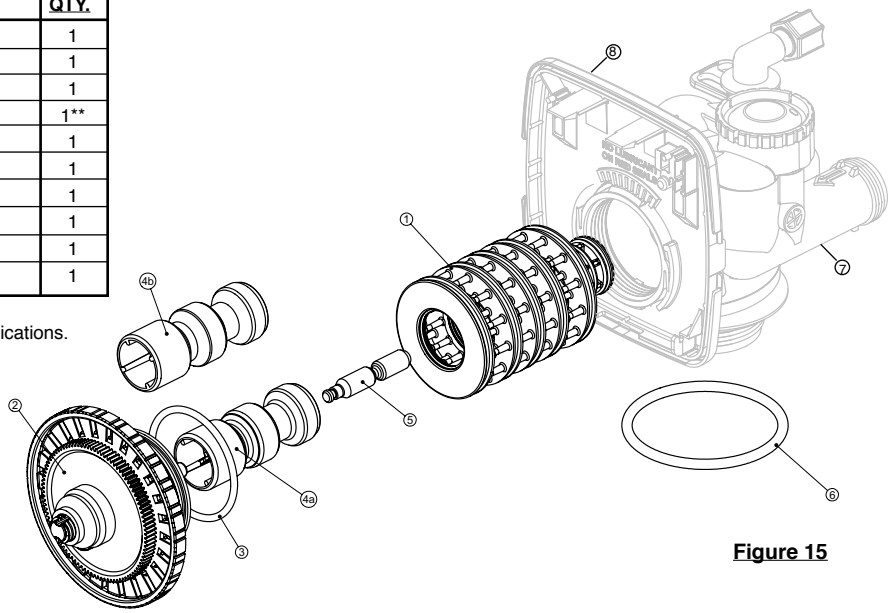


Figure 15

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.**

After completing any valve maintenance involving the drive assembly or the drive cap assembly and pistons, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack from the printed circuit board (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 (ex: 154) and then reset the valve to the service position.

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

ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	101375	Injector Cap	1
2	102159	O-ring 135	1
3	102457	Injector Screen	1
4	102319	Injector Assy. Z Plug-Filter	1
5	101825	Injector Assy. A Black	1
	101826	Injector Assy. B Brown	
	101827	Injector Assy. C Violet	
	101828	Injector Assy. D Red	
	101829	Injector Assy. E White	
	101830	Injector Assy. F Blue	
	101831	Injector Assy. G Yellow	
	101832	Injector Assy. H Green	
	101833	Injector Assy. I Orange	
	101834	Injector Assy. J Light Blue	
	101835	Injector Assy K Light Green	
Not Shown	106767	O-ring 011	*
Not Shown	106768	O-ring 013	*

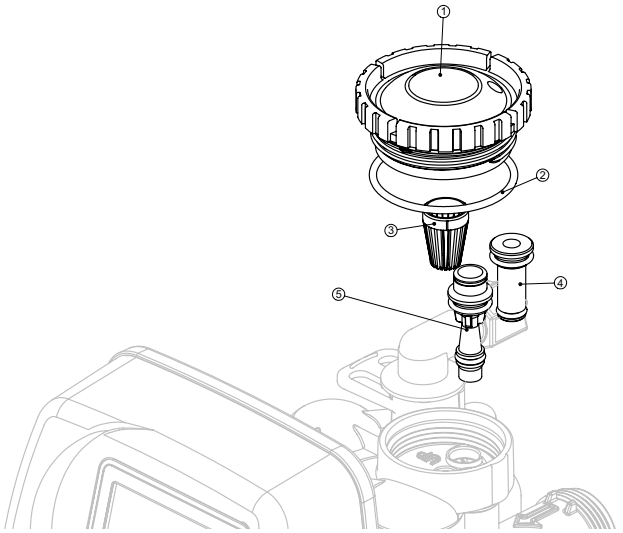


Figure 16

* The injector plug and the injector each contain one 011 (lower) and 013 (upper) o-ring.

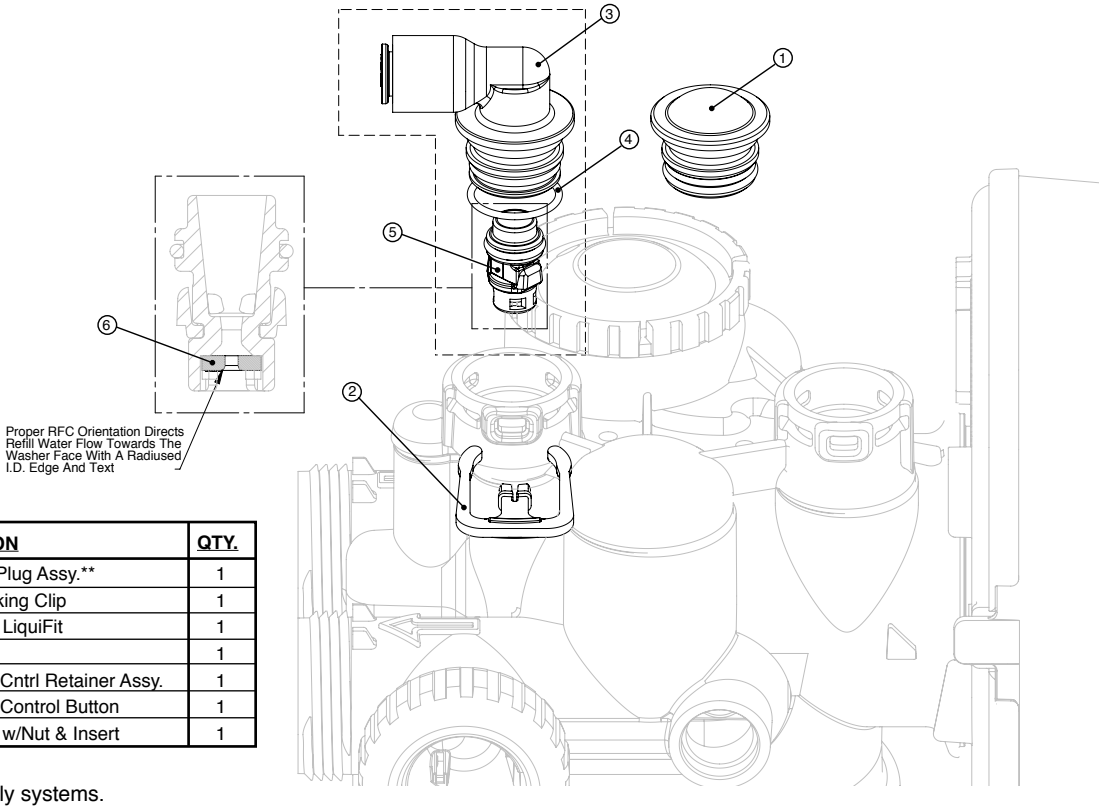
See system specification, injector color on page 28 for current injector.

Note: For upflow position, injector is located in the up hole and injector plug in the down hole. For a filter that only backwashes injector plugs are located in both holes.

The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic wrench. 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.

Do not use pipe dope or other sealants on threads. Teflon tape must be used on threads of the 1" NPT connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connection nor caps because of o-rings seals.

REFILL AND REFILL PORT PLUG



ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	102322	Refill Port Plug Assy.**	1
2	101414	Elbow Locking Clip	1
3	111389	Elbow 3/8" LiquiFit	1
4	102153	O-ring 019	1
5	102418*	Refill Flow Cntrl Retainer Assy.	1
6	102421	Refill Flow Control Button	1
Not Shown	101617	1/2" Elbow w/Nut & Insert	1

*Assembly includes item #6.

**This part is required for backwash only systems.

Figure 17

DRAIN LINE - 3/4”

ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	101414	Elbow Locking Clip	1
2	101871	Polytube Insert, 5/8”	Optional
3	102131	Nut 3/4” Drain Elbow	Optional
4-5	101618	Drain Elbow 3/4” Male Assy-Vent	Optional
4-5	101619	Drain Elbow 3/4" Male Assy-No Vent	1
5	102153	O-ring 019	1
6	102406	DLFC Retainer Assy.	1
7	101551	DLFC 0.7 gpm for 3/4”	1
	101552	DLFC 1.0 gpm for 3/4”	
	101556	DLFC 1.3 gpm for 3/4”	One
	101559	DLFC 1.7 gpm for 3/4”	DLFC
	101574	DLFC 2.2 gpm for 3/4”	must
	101577	DLFC 2.7 gpm for 3/4”	be used
	101583	DLFC 3.2 gpm for 3/4”	if 3/4
	101588	DLFC 4.2 gpm for 3/4”	fitting
	101591	DLFC 5.3 gpm for 3/4”	is used
	101593	DLFC 6.5 gpm for 3/4”	
	101595	DLFC 7.5 gpm for 3/4”	

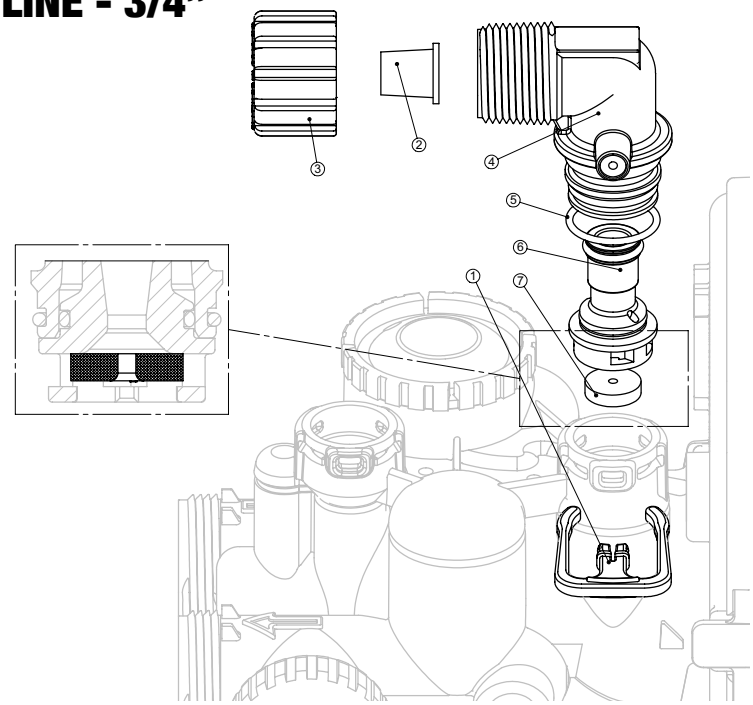


Figure 18

Systems are shipped without 3/4” nut for drain elbow (polytube installation only) and 5/8” polytube insert (polytube installation only).

See System Specifications DLFC on page 28, for correct DLFC size for your unit.

DRAIN LINE - 1”

ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	101414	Elbow Locking Clip	1
2	101635	Drain Ftg, 1” Straight Assy-Vent	Optional
2	101636	Drain Ftg, 1" Straing Assy-No Vent	1
3*	101244	Drain Ftg Body, 1”	1
4*	101160	Drain Ftg Adapter, 1”	1
5*	102153	O-ring 019	1
6*	102437	Split Ring	1
7*	102141	Nut, 1” QC	1
8*	102165	O-ring 215	1
9	101599	DLFC 9.0 gpm for 1”	
	101562	DLFC10.0 gpm for 1”	One
	101564	DLFC 11.0 gpm for 1”	DLFC
	101567	DLFC 13.0 gpm for 1”	must be
	101568	DLFC 15.0 gpm for 1”	used if
	101571	DLFC 17.0 gpm for 1”	1” fitting
	101578	DLFC 20.0 gpm for 1”	is used
	101580	DLFC 25.0 gpm for 1”	

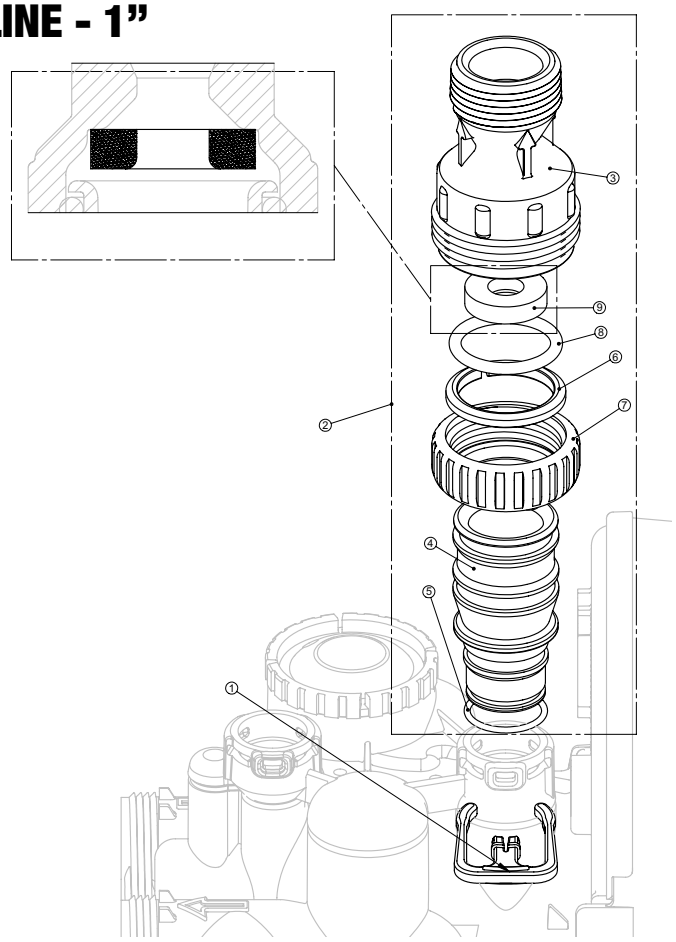


Figure 19

See System Specifications DLFC on page 28, for correct DLFC size for your unit.

The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic wrench. 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.

Do not use pipe dope or other sealants on threads. Teflon tape must be used on threads of the 1” NPT connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connection nor caps because of o-rings seals.

WATER METER AND METER PLUG

ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	102141	Nut 1” QC	1
2-4	102051*	Meter Assy.	1
3	102687	Turbine Assy.	1
4	102165	O-ring 215	1
5	102231	Meter Plug Assy.**	1

*Order number 102051 includes 102687 and 102165, which are item numbers 3 & 4.
**Only used if metering is not to be done (time clock units)

The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic wrench. 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.

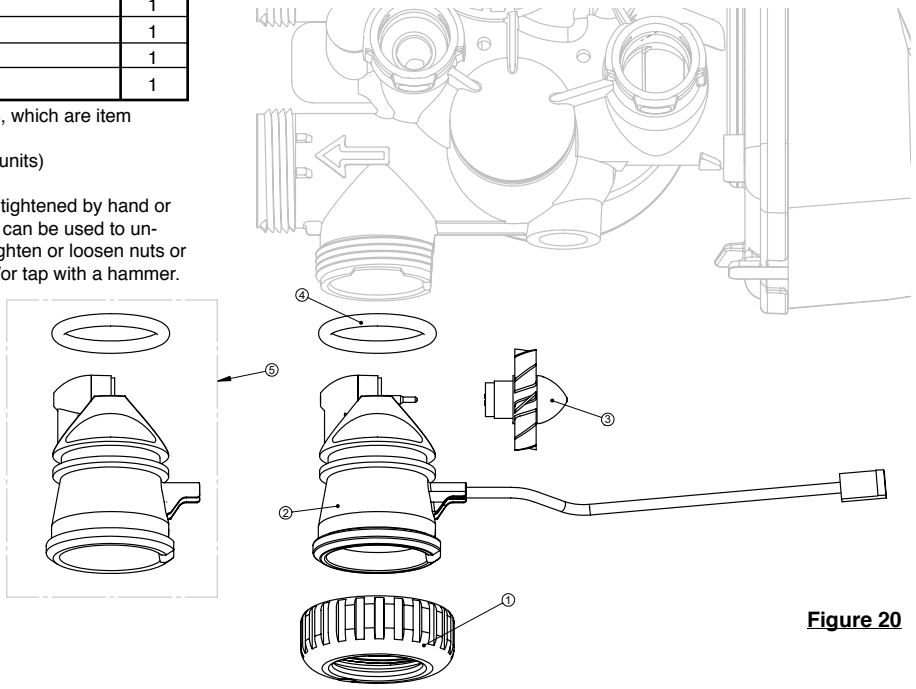


Figure 20

BYPASS VALVE

Bypass Valve

ITEM NO.	ORDER NO.	DESCRIPTION	QTY
1	102141	Nut 1" Quick Connect	2
2	102437	Split Ring	2
3	102165	O'Ring 215	2
4	102450	Bypass 1" Rotor	2
5	110997	Bypass Cap	2
6	110998	Bypass Handle	2
7	109479	Bypass Rotor Seal Retainer	2
8	102159	O-Ring 135	2
9	102161	O-Ring 112	2
10	102160	O-Ring 214	2

(Not Shown) Bypass Vertical Adapter Assembly

ORDER NO.	DESCRIPTION	QTY
102141	Nut 1" Quick Connect	2
102437	Split Ring	2
102165	O'Ring 215	2
106858	Bypass Verticle Adapter	2

The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic wrench. 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.

Do not use pipe dope or other sealants on threads. Teflon tape must be used on threads of the 1” NPT connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connection nor caps because of o-ring seals.

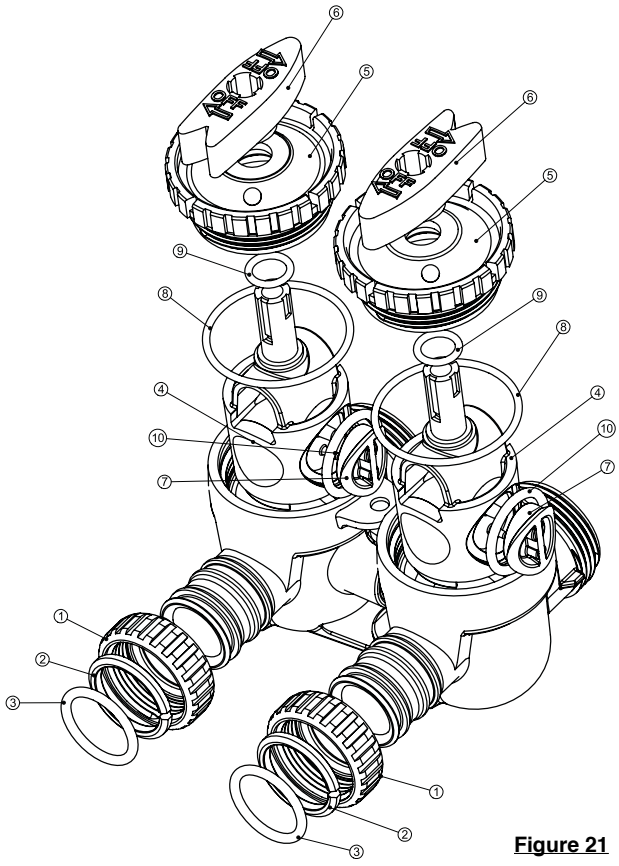
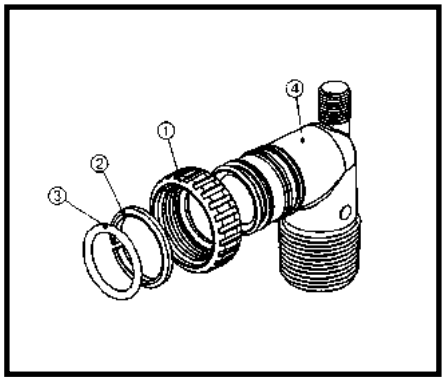
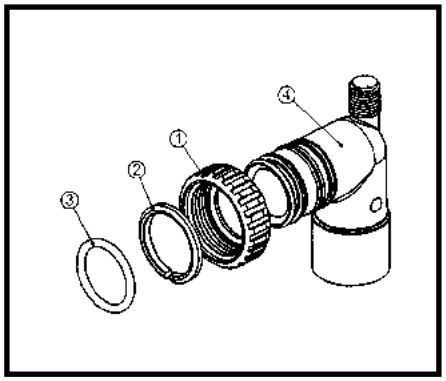


Figure 21

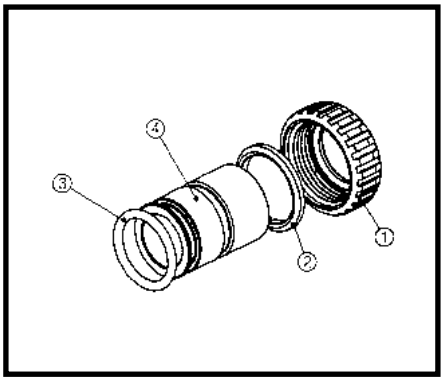
INSTALLATION FITTING ASSEMBLIES



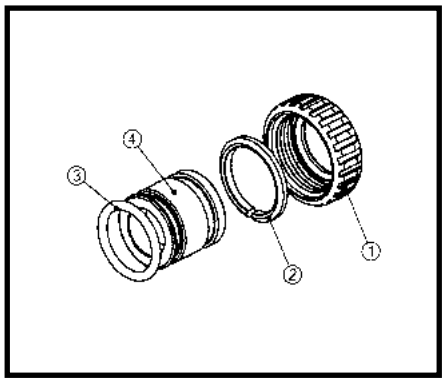
101639 - Fitting 1" PVC Male NPT



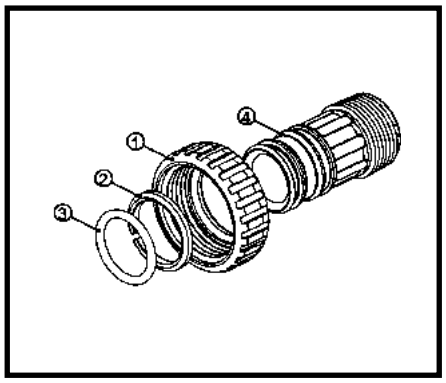
101640 - Fitting 3/4" & 1" PVC Solv 90



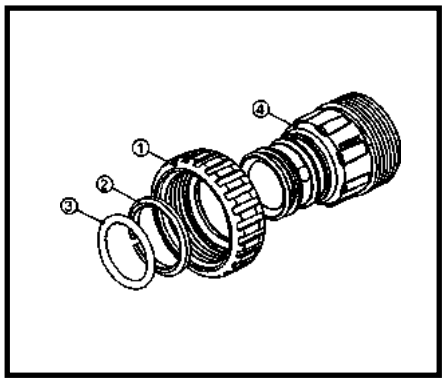
108618 - Fitting 1" Lead Free Brass Sweat



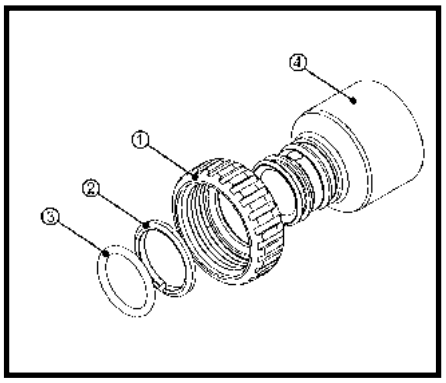
108617 - Fitting 3/4" Lead Free Brass Sweat



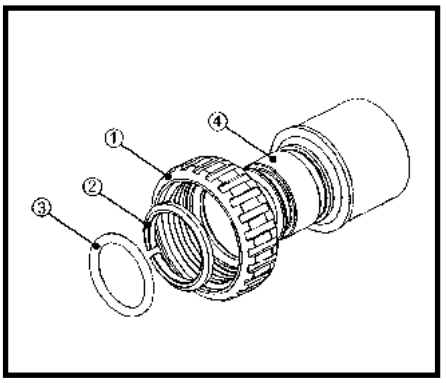
101643 - Fitting 1" Male NPT



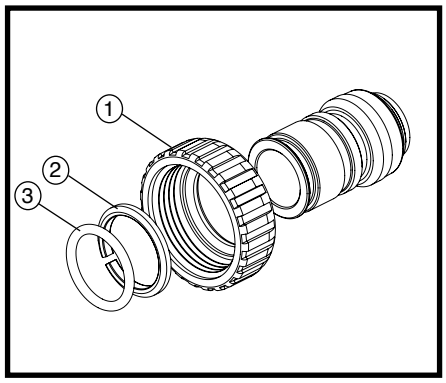
101644 - Fitting 1-1/4" Male NPT



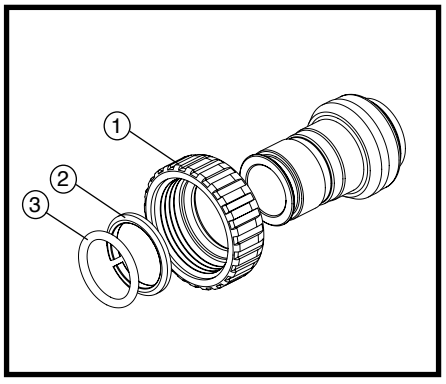
101648 - Fitting 1-1/4" & 1-1/2" Brass Sweat



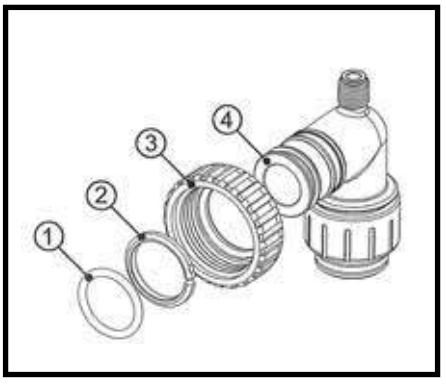
101646 - Fitting 1-1/4" &1-1/2" PVC Solvent



110135 - Fitting 3/4" Brass Sharkbite



110136 - Fitting 1" Brass Sharkbite



108478 - Fitting 3/4" John Guest QC

The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic wrench. 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.

Do not use pipe dope or other sealants on threads. Teflon tape must be used on threads of the 1" NPT connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connection nor caps because of o-rings seals.

ITEM NO.	ORDER NO.	DESCRIPTION
1	102141	Nut 1" Quick Connect
2	102437	Split Ring
3	102165	O-Ring 215

PROMATE-1® SYSTEM SPECIFICATIONS

Model			PM1-024	PM1-032	PM1-032-10	PM1-048	PM1-064
Factory Regeneration Settings							
Cycle 1	Fill	Minutes	3.0	4.0	4.0	6.0	8.0
		Gallons	1.5	2.0	2.0	3.0	4.0
Cycle 2	Softening	Minutes	120	120	120	120	120
		Gallons	0	0	0	0	0
Cycle 3	Backwash	Minutes	8	8	8	8	8
		Gallons	10.4	13.6	17.6	17.6	25.6
Cycle 4	Brine Dr DN	Minutes	60	60	60	60	68
		Gallons	13.8	16.2	16.2	19.2	38.8
Cycle 5	Rinse	Minutes	4	4	4	4	4
		Gallons	5.2	6.8	8.8	8.8	16.8
Cycle 6	Optional						
Total Regen Gallons			30.9	38.6	44.6	48.6	85.2

*Calculations are based on factory low salt setting @ 35 psi

Refill Lbs / Minutes	Lbs. Min.	Lbs. Min.	Lbs. Min.	Lbs. Min.	Lbs. Min.
Efficient salt @ 3.3 LBS	2.5/1.7	3.3/2.2	3.3/2.2	5.0/3.4	6.6/4.4
Low Salt @ 6.0 LBS	**4.5/3.0**	**6.0/4.0**	**6.0/4.0**	**9.0/6.0**	**12/8.0**
Medium Salt @ 10 LBS	7.5/5.0	10/6.7	10.0/6.7	15.0/10.0	20/13.5
High salt @ 15 LBS	11.3/7.5	15/10.0	15/10.0	22.5/15.0	30/20.0

Capacity - Efficiency					
Efficient - 4200 grains/lb	10,000	13,200	13,200	20,000	26,400
low Salt - 3800 grains/lb	**17,100**	**22,800**	**22,800**	**34,200**	**45,600**
Medium Salt - 2800 grains/lb	21,000	28,000	28,000	42,000	56,000
High Salt - 2100 grains/lb	23,730	31,500	31,500	47,250	63,000

Service Flow Rates					
Continuous @ 10 psi loss	9.8	10.1	11.3	10.5	14.2
Peak @ 15 psi loss	13.1	13	14.5	14.1	18.2

Flint Underbed (Lbs)	8 lbs	11 lbs	14 lbs	14 lbs	20 lbs
High Capacity Resin (Cu. Ft.)	0.75	1	1	1.5	2
Resin Tank Size	8X44	9X48	10X44	10X54	12X52
Recommended Brine Tank Size	18X33	18X33	18X33	18X40	18X40
Min/Max salt setting in Lbs	3/17	3/17	3/17	3/26	3/26
** Grid Height	NA	NA	NA	NA	NA
Salt Storage Capacity lbs	275	275	275	412	412
BLFC on Valve	YES	YES	YES	YES	YES
Safety Brine Valve	474	474	474	474	474
BLFC at Brine Tank	NO	NO	NO	NO	NO
Brine Line Size	3/8"	3/8"	3/8"	3/8"	3/8"
DLFC (gpm)	1.3	1.7	2.2	2.2	3.2
BLFC (gpm)	0.5	0.5	0.5	0.5	0.5
Injector Size	VIOLET	RED	RED	WHITE	YELLOW
Injector Draw Rate @ 35 psi (gpm)	0.18	0.21	0.21	0.25	0.44
Injector Slow Rinse Rate @ 35 psi (gpm)	0.23	0.27	0.27	0.32	0.57
Factory Meter Setting (for single unit)	850	1,125	1,125	1,700	2,275
Size of connections					
Inlet / Outlet	1"	1"	1"	1"	1"
Drain line	3/4"	3/4"	3/4"	3/4"	3/4"
Brine Line	3/8"	3/8"	3/8"	3/8"	3/8"
Recommended minimum pipe size					
Drain Line	3/4"	3/4"	3/4"	3/4"	3/4"
Brine Line	3/8"	3/8"	3/8"	3/8"	3/8"
Shipping Weight (includes pallet)					
Stock Code Number					

** High Salting may require different grid height and/or larger brine tank

Factory default setting are shown in bold

Recommended minimum pipes sizes are copper pipe equivalent, when using PEX increase one nominal size

Hellenbrand products are not for sale or distribution into the State of California effective 8/21/18.

800870 REV C
5/13/19

Residential Water Softener & Filter Limited Warranty

INCLUDES – ProMate®, ProMate-1®, ProMate-5®, ProMate-6®, ProMate-6 DMT®, ProMate-6.5 DMT®, ProMate-7.0®, PROMATE-7.1 DMT®, ProMate®-EcoMax, ProMate®-EcoMax Duo and E6
EXCLUDES – Iron Curtain®, Iron Curtain® Jr. and Storm Filter Systems

Hellenbrand warrants to the original consumer purchaser that the System and the parts listed below will be free from defects in material and/or workmanship from the date of the original installation for the following time periods:

For a Period of FIVE YEARS: The filter control valve electrical parts including the motor and board, control valve body, and internal parts.
For a Period of TEN YEARS: Mineral tanks, 6" Diameter - 13" Diameter.
For a Period of FIVE YEARS: Mineral tanks, 14" Diameter - Up.
For a Period of FIVE YEARS: The salt storage/cabinet tank.
For a Period of ONE YEAR: The entire water conditioner system ("System").

Any parts used for replacement are warranted for the remainder of the original warranty period for the applicable part.

THIS WARRANTY IS EFFECTIVE TO THE ORIGINAL CONSUMER PURCHASER ONLY, AND ONLY FOR AS LONG AS THE SYSTEM REMAINS AT THE ORIGINAL INSTALLATION SITE. COVERAGE TERMINATES IF YOU SELL OR OTHERWISE TRANSFER THE SYSTEM OR IF THE SYSTEM IS MOVED FROM THE ORIGINAL INSTALLATION SITE.

No sales representative, distributor, agent, dealer, reseller, authorized seller or any other person or entity is authorized to make any other warranty, or modify or expand the warranty provided herein on behalf of Hellenbrand. Upon expiration of the applicable warranty period, Hellenbrand shall have no further liability related to the System/parts to which the warranty period applies, except with respect to valid warranty claims asserted during the appropriate warranty period.

If the System or any part described above becomes defective within the specified warranty period, you should notify your local authorized seller of Hellenbrand products, and arrange a time during normal business hours for the inspection of the System at the original installation site. You may also contact Hellenbrand and we will provide you with the contact information for your local authorized seller of Hellenbrand products. Hellenbrand, at its option, will repair or replace the System or any part found defective within the terms of this warranty. You are responsible for freight from our factory and any service fees charged by the local authorized seller of Hellenbrand products for installation, repair, removal, replacement, service, etc., of any System or parts. This warranty does not include any labor charges. This paragraph sets forth the exclusive remedy for any valid warranty claims against Hellenbrand.

THIS WARRANTY DOES NOT COVER defects caused by sand, sediment or bacteria fouling, accident, fire, flood, Act of God, misuse, misapplication, neglect, alteration, installation or operation contrary to Hellenbrand's printed instructions, or installation, repair or service by anyone other than Hellenbrand or an authorized seller of Hellenbrand products.

IN ADDITION, THIS WARRANTY DOES NOT COVER UNPROTECTED OUTDOOR INSTALLATIONS. This System, including all of the electrical components, must be protected against windblown dust, falling and windblown rain, freezing temperatures and the formation of ice, with an appropriate enclosure consisting of a floor, roof, walls, ventilation and heat.

As a manufacturer, we do not know the characteristics of your water supply or the purpose for which you are purchasing this system. You should be aware that the quality of water supplies may vary seasonally or over a period of time, and that your water usage rate may vary as well. Water characteristics may change considerably if this System is moved to a new location. For these reasons, Hellenbrand assumes no liability for the determination of the proper equipment necessary to meet your needs; and Hellenbrand does not authorize others to assume such obligations for Hellenbrand.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, REMEDIES FOR DEFECTS OR FAILURES ARE LIMITED TO THE REMEDIES PROVIDED IN THIS WARRANTY. THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE SET FORTH HEREIN. ANY IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, NON-INFRINGEMENT, OR ANY WARRANTIES ARISING FROM COURSE OF PERFORMANCE, COURSE OF DEALING, OR FROM USAGES OF TRADE, ARE LIMITED IN DURATION TO THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE.

UNDER NO CIRCUMSTANCES SHALL HELLENBRAND BE LIABLE TO THE ORIGINAL CONSUMER PURCHASER OR TO ANY OTHER PERSON FOR ANY INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OR FOR ANY OTHER LOSS, DAMAGE, OR EXPENSE OF ANY KIND, INCLUDING LOSS OF PROFITS, WHETHER ARISING OUT OF BREACH OF WARRANTY, BREACH OF CONTRACT, IN TORT OR OTHERWISE, AND REGARDLESS OF WHETHER HELLENBRAND WAS AWARE OF THE POSSIBILITY OF SUCH LOSS. THESE LIMITATIONS WILL APPLY REGARDLESS OF ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you. Similarly, some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Hellenbrand products are not for sale or distribution into the State of California effective 8/31/18.