

*Hellenbrand*<sup>®</sup>

# ***ProMate* 1<sup>™</sup>**

**WATER CONDITIONING SYSTEM**



## **Owner's Manual**

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*Manufactured by:*  
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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 minute 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.

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Dealer Name \_\_\_\_\_ Phone \_\_\_\_\_

Address \_\_\_\_\_

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# JOB SPECIFICATION SHEET

MODEL NO. \_\_\_\_\_

## \*WATER TEST AT TIME OF INSTALLATION

\_\_\_\_\_ Hardness CaCO<sub>3</sub> (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 75 gallons per person daily for all water uses in the home, about 50 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 \_\_\_\_\_

\*SERIAL NUMBER \_\_\_\_\_

NOTES \_\_\_\_\_

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# 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.

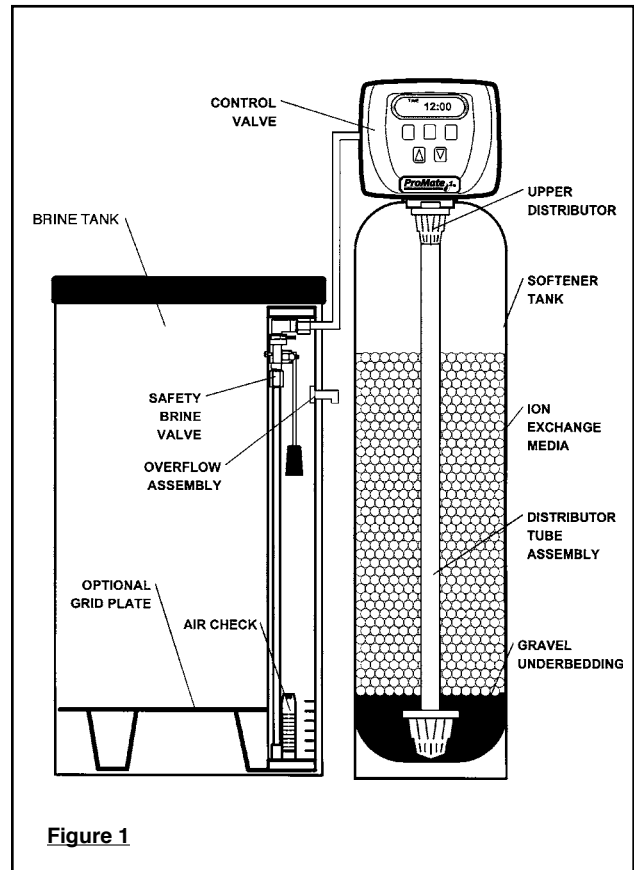
During the regeneration cycle the softener is also backwashed. This reversing of the normal flow of water serves to remove sediment which may have accumulated during the softening process due to the filtering action of the exchange media. Backwashing also loosens and fluffs up the bed of exchange media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

## 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 ProMate control is programmed with a brine tank refill. Block salt does not dissolve quick enough to provide a good regeneration.

**Cleaning Salt Keeper:** Salt keeper may require periodic cleaning. Inspect the salt keeper at least once a year for buildup of insoluble materials. It is recommended to periodically clean the salt keeper no matter what kind of salt you are using. See page 9, miscellaneous #3 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 20 pounds of water pressure (psi) is required for regeneration. Maximum 120 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

NORMAL OPERATION

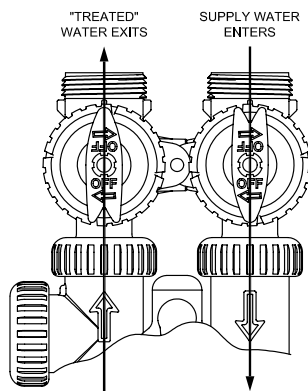


Figure 2

BYPASS OPERATION

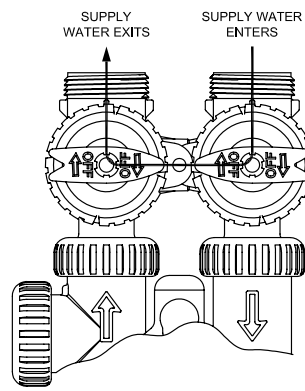


Figure 3

DIAGNOSTIC MODE

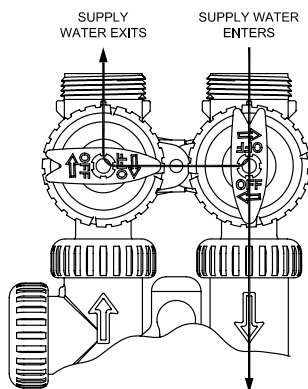


Figure 4

SHUT OFF MODE

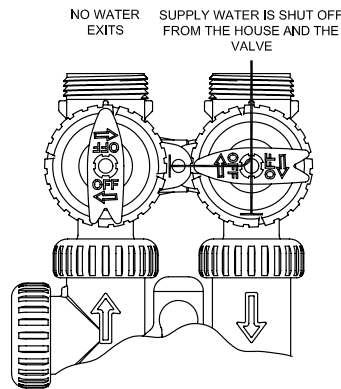


Figure 5

# 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 5. (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.**)

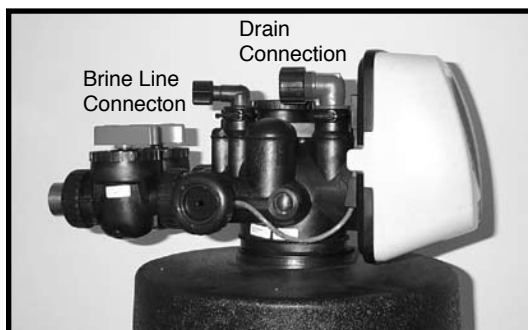
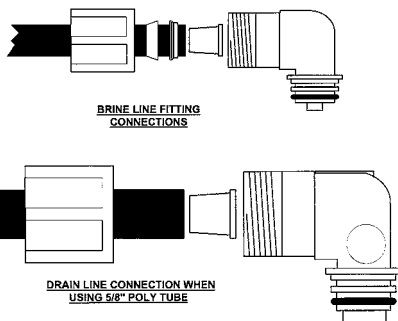


Figure 6a

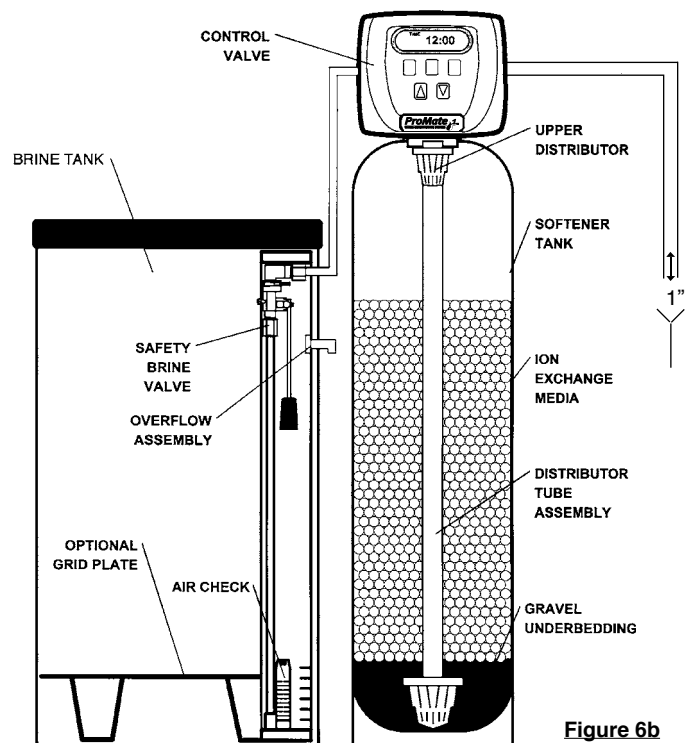


Figure 6b

# PROGRAMMING

## General Information

The ProMate-1 control valve is the “brain” of your water softener. It consists of the valve body and powerhead with solid state microprocessor.

The display panel (see Figure 7) consists of the LCD display, power light, and five push buttons which are used in displaying and programming the water softener settings.

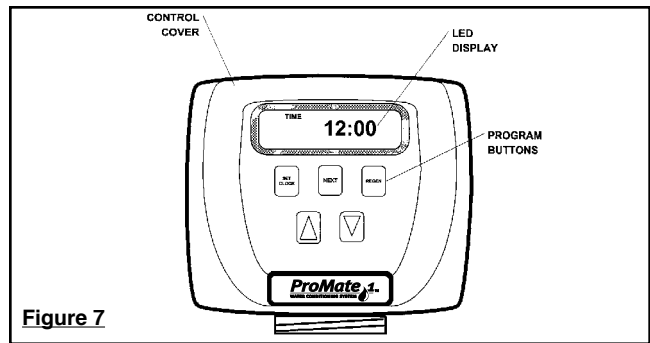


Figure 7

## 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). (Figure 7, page 7).
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. (See #12, Page 14) If proper suction, reattach brine tube to safety brine valve, and allow it to draw water down to the bottom of the air check, (figure 6b, page 5).
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 course. 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 9). Your programming is now complete.

## 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 not appear if the valve is set up as a filter or if the Set Low Salt Warning is set to off (See dealer for details). 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 display.

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

## USER DISPLAYS/SETTINGS

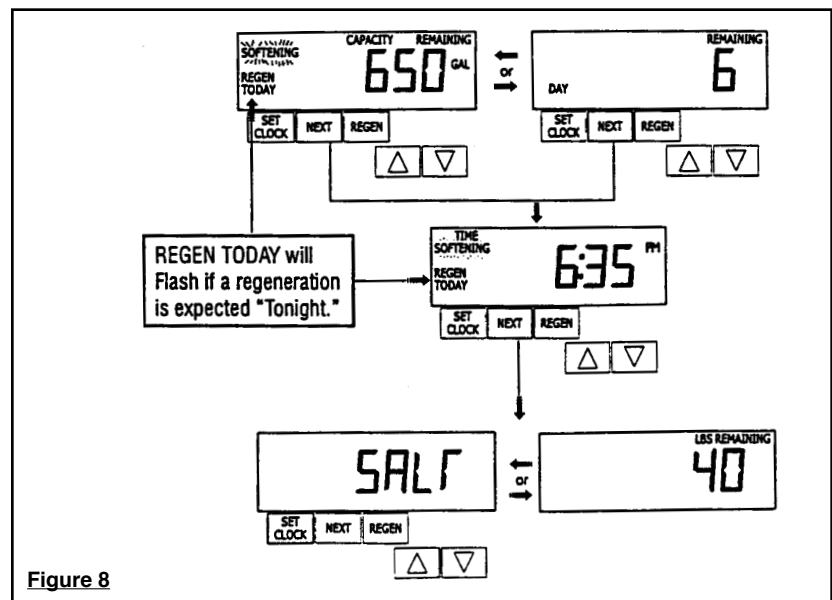


Figure 8

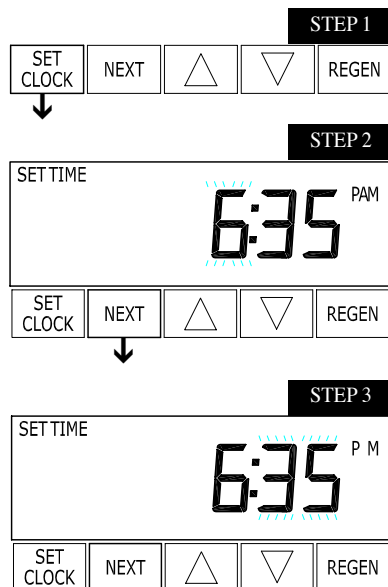


Figure 9

## SET TIME OF DAY

**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.

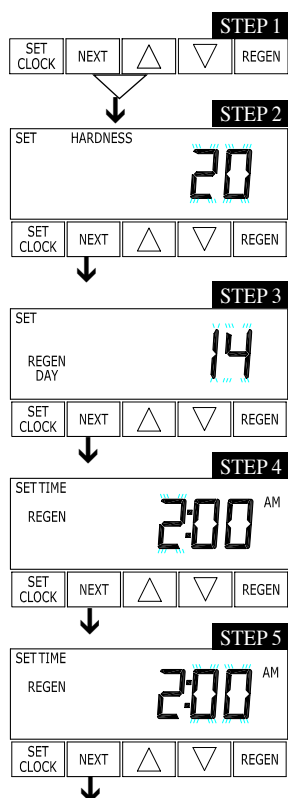


Figure 10a

## INSTALLER DISPLAYS/SETTINGS

**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. If this display shows nA -, then system is either set-up in “time clock” or “filter” modes. (See page 23). Press NEXT to go to Step 3. Press REGEN to exit Installer Displays/Settings.

**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”

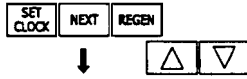
See figure 12a & b, page 10-11, for more detail on softener setup. Press NEXT to go to step 4. Press REGEN to return to previous step.

**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. See table 6, page 19. Press NEXT to go to step 5. Press REGEN to return to previous step.

**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.

# SET SALT MONITOR OPTION

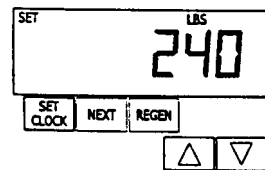
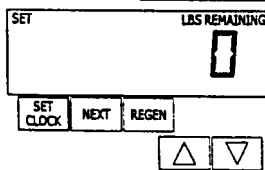
## STEP 1US



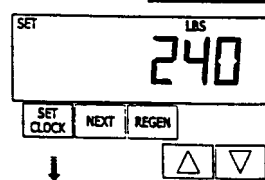
## STEP 2US



## STEP 3US



## STEP 4US



RETURN TO NORMAL MODE **Figure 10b**

**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.

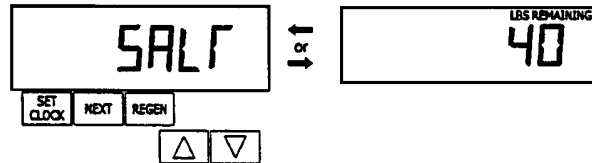
**Step 2US** - Press SET CLOCK

**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 closest whole number.



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

## 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 the household is asleep. If there is a demand for water when the system is regenerating, untreated water will be supplied.

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

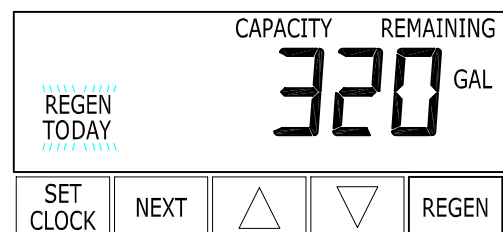
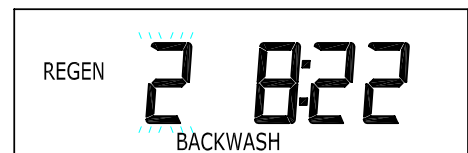
Sometimes there is a need to regenerate the system, sooner than when the system calls for it, usually referred to as manual regeneration. There may be a period of heavy water usage because of guests or a heavy laundry day.

To initiate a manual regeneration at the preset delayed regeneration time, 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.

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. You must cycle all the way through the cycles to make it stop. PLEASE NOTE: This will reset the meter.

Note: If the salt keeper does not contain salt. Fill with salt and wait at least two hours before regenerating.

**Regeneration Step #2**  
(shows time remaining in regen step is 8 minutes 22 seconds)

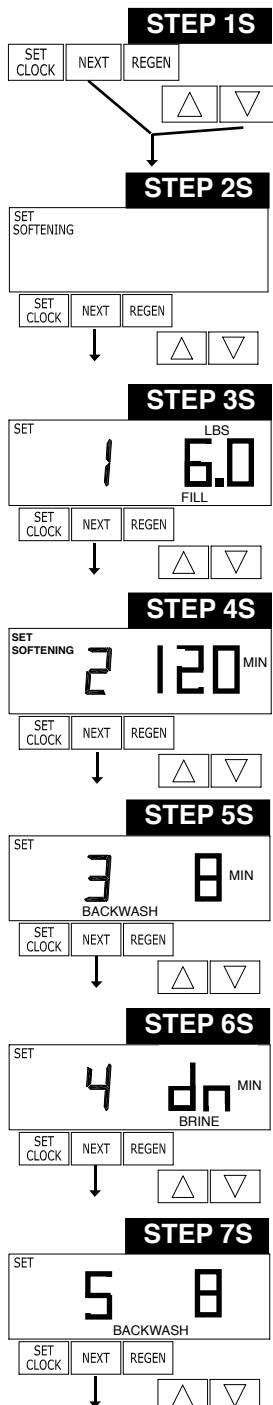


**Figure 11**

# 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 99.9	See Page 20
Softening (Service)	Minutes	1 to 999	120
Backwash	Minutes	1 to 999	8
Brine	Minutes	1 to 999	60
Backwash	Minutes	1 to 99	8
Rinse	Minutes	1 to 999	4



**STEP 1S** – Press NEXT and ▼ simultaneously for 3 seconds. 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.

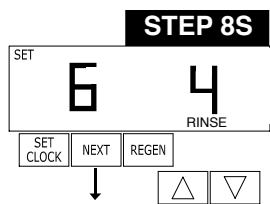
**STEP 4S** – Select the time for the second cycle (which in this example is SOFTENING) using ▼ or ▲ button. Press NEXT to go to Step 5S. Press REGEN to return to the previous step.

**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.

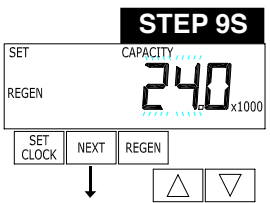
**STEP 6S** – Select the time for the fourth cycle (which in this example is dn BRINE) using the ▼ or ▲ button. Press NEXT to go to Step 7S. Press REGEN to return to the previous step.

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

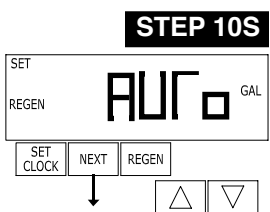
Figure 12a



**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 200,000 grains. The increment increase is 500 for the range from 5000 to 30,000; 1000 for the range of 30,000 to 100,000; and 2000 for the range of 100,000 to 200,000. Grains capacity is affected by the fill time. The grains capacity for the selected fill time should be confirmed by testing. 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.

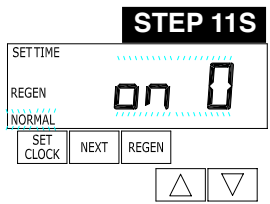


**STEP 10S** – set Gallons Capacity using ▼ or ▲ button. If value is set to:

- “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 (allowable range 20 to 50,000) regeneration initiation will be based off the value specified.

Increment increase is 20 for the range 20 to 1000, 50 for the range of 1000 to 10,000 and 100 for the range of 10,000 to 50,000.

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:

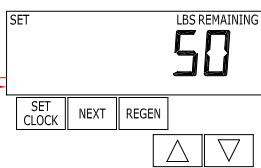
- “NORMAL” means regeneration will occur at the preset time;
- “on O” means regeneration will occur immediately when the gallons capacity reaches 0 (zero); or
- “NORMAL + on 0” means regeneration will occur at one of the following:
  - the preset time when the gallons capacity falls below the reserve 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).

See page 23 for more options. 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.



**Figure 12b**

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

---

## WATER SOFTENER DISINFECTION

The materials of construction 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. Disinfect as follows:

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 mineral (see page 18).
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.

---

## 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.

# TROUBLE SHOOTING

PROBLEM	CAUSE	CORRECTION
1.ERROR followed by code number		
<b>Error Code 1001</b> - Unable to recognize start of regeneration	A. Control valve has just been serviced	A. Press NEXT and REGEN for 3 seconds or unplug power source jack from PC Board (black wire) and plug back in to reset control valve
<b>Error Code 1002</b> - Unexpected stall	B. Foreign matter is lodged in control valve	B. Check piston and spacer stack assembly for foreign matter
<b>Error Code 1003</b> - Motor ran to long, timed out trying to reach next cycle position	C. High drive forces on piston	C. Loosen drive cap assembly 1/4 turn or replace piston and spacer stack assembly
<b>Error Code 1004</b> - Motor ran to long, timed out trying to reach home position	D1. Control valve piston not in home position	D1. Press NEXT and REGEN for 3 seconds or unplug power source jack (black wire) and plug back in to reset control valve
	D2. Motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure	D2. Check motor and wiring. Replace motor if necessary
	D3. Drive gear label dirty or damaged, missing or broken gear	D3. Replace or clean drive gear
	D4. Drive bracket incorrectly aligned to back plate	D4. Reset drive bracket
	D5. PC board is damaged or defective	D5. Replace PC board
	D6. PC board incorrectly aligned to drive bracket	D6. Ensure PC board is correctly snapped on to drive bracket
<b>If other Error Codes display contact the factory</b>		
<b>Error Code 4003</b>	E. Miscommunication through board or Low voltage through board	E. Unplug, re-plug in, if this does not resolve problem replace PC board
2. 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 our 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
3. Control valve does not regenerate automatically when REGEN button is depressed and held	A. Transformer unplugged B. No electric power at outlet C. Broken drive gear or drive cap assembly D. Defective PC board	A. Connect transformer B. Repair outlet or use working outlet C. Replace drive gear or drive cap assembly D. Replace PC board
4. Control valve does not regenerate automatically but does when REGEN button is depressed	A. By-pass valve in bypass position B. Meter connection disconnected C. Restricted/stalled meter turbine  D. Defective meter E. Defective PC board F. Set-up error	A. Put control valve in service position B. Connect meter to PC board C. Remove meter and check for rotation or foreign matter D. Replace meter E. Replace PC board 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 8 hours in event of power outage and battery is not depleted. B. Prior to 2/2007 PC board did not have battery back-up - capacitor held time of day up to 2 hours.	A. Reset time of day and replace battery on PC Board (Lithium coin type battery 2032) B. Reset time of day.
6. Softener delivers hard water.	A. Bypass valve is open or faulty. B. No salt or low salt level in brine tank.  C. Softener fails to draw brine. D. Excessive water usage. E. Insufficient brine level in brine tank.  F. Resin level inadequate. G. Meter faulty. H. Raw water hardness fluctuation.	A. Close bypass valve or replace. B. Add salt to brine tank and maintain salt level above water level. C. See problem #11. D. Check gallon capacity settings. E. Check brine refill setting and refill flow restrictor for blockage. F. See problem #9. G. Test meter and clean or replace meter. H. Test raw water hardness and adjust settings to highest known hardness.
7. Unit uses too much salt.	A. Improper brine refill setting. B. Improper settings.  C. Excessive water in brine tank. D. Leaking faucets, toilets, etc...	A. Check brine refill setting for proper salt dosage B. Check water hardness and reevaluate capacity setting specification C. See problem #11. D. Repair or replace those items.

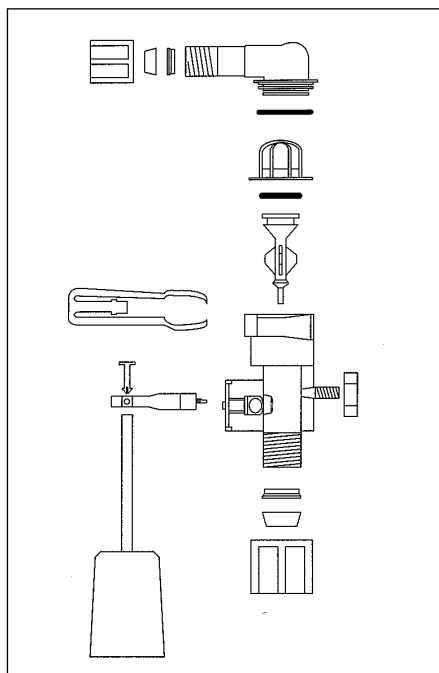
# TROUBLE SHOOTING

PROBLEM	CAUSE	CORRECTION
8. Loss of resin.	<ul style="list-style-type: none"> <li>A. Backwash controller missing.</li> <li>B. Faulty distributor tube assembly.</li> <li>C. Air in water supply system.</li> </ul>	<ul style="list-style-type: none"> <li>A. Install backwash controller.</li> <li>B. Check distributor tube assembly for cracks or holes.</li> <li>C.               <ul style="list-style-type: none"> <li>1. Check for leaks in brine lines, fittings, or air check. Repair or replace.</li> <li>2. Install upper distributor.</li> <li>3. Ensure that water supply system has an air eliminator.</li> </ul> </li> </ul>
9. Softener delivers salt water.	<ul style="list-style-type: none"> <li>A. Low water pressure.</li> <li>B. Excessive water in brine tank.</li> <li>C. Wrong size injector.</li> </ul>	<ul style="list-style-type: none"> <li>A. Check incoming water pressure - Must remain at minimum of 25 psi.</li> <li>B. See problem #11.</li> <li>C. Install correct injector.</li> </ul>
10. Excessive water in brine tank.	<ul style="list-style-type: none"> <li>A. Plugged injector.</li> <li>B. Faulty piston assembly.</li> <li>C. Plugged or kinked drain line.</li> <li>D. Backwash flow controller closed off.</li> <li>E. Defective brine line flow control.</li> </ul>	<ul style="list-style-type: none"> <li>A. Remove injector and clean ports.</li> <li>B. Replace piston assembly.</li> <li>C. Inspect drain line for kinks or plugging.</li> <li>D. Check backwash flow controller.</li> <li>E. Replace brine refill flow control.</li> </ul>
11. Softener fails to draw brine.	<ul style="list-style-type: none"> <li>A. Injector is plugged.</li> <li>B. Faulty piston assembly.</li> <li>C. Brine line connection leak.</li> <li>D. Drain line plugged creating excess back pressure.</li> <li>E. Drain line too long or too high</li> <li>F. Low inlet pressure.</li> </ul>	<ul style="list-style-type: none"> <li>A. Remove injector and clean ports.</li> <li>B. Check piston assembly.</li> <li>C. Inspect brine line during refill cycle for leaks.</li> <li>D. Inspect drain line for blockage.</li> <li>E. Refer to drain line specifications.</li> <li>F. Increase inlet pressure to a minimum of 25 psi.</li> </ul>
12. Continuous flow to drain.	<ul style="list-style-type: none"> <li>A. Piston assembly failure.</li> <li>B. Motor failure.</li> <li>C. Circuit board failure.</li> </ul>	<ul style="list-style-type: none"> <li>A. Replace piston assembly.</li> <li>B. Replace motor.</li> <li>C. Replace circuit board.</li> </ul>
13. Loss of water pressure.	<ul style="list-style-type: none"> <li>A. Iron build-up in resin.</li> <li>B. Resin bed fouled with sand or sediment.</li> <li>C. Resin bed mushing due to high amount of oxidizers in water supply (chlorine).</li> </ul>	<ul style="list-style-type: none"> <li>A. See problem #15.</li> <li>B. Rebed softener and install sediment filter ahead of softener.</li> <li>C. Rebed softener. Install dechlorinator system</li> </ul>
14. Iron in softened water.	<ul style="list-style-type: none"> <li>A. Iron has fouled resin bed.</li> <li>B. Iron is not in a soluble state.</li> <li>C. Prefilter failure.</li> <li>D. Iron level excessive.</li> <li>E. Control fails to regenerate.</li> </ul>	<ul style="list-style-type: none"> <li>A. Use iron reducing resin cleaner to cleanse resin bed, and increase salt dosage or regenerate more frequently. Install an Iron Curtain System ahead of the softener.</li> <li>B. Test water to determine type of iron, install iron reduction system.</li> <li>C. Check prefilter.</li> <li>D. Install iron reduction system.</li> <li>E. See problem #4.</li> </ul>
15. Absent or incomplete LED display	<ul style="list-style-type: none"> <li>A. Transformer unplugged</li> <li>B. No electric power at outlet</li> <li>C. Defective transformer</li> <li>D. Short in meter</li> <li>E. Defective PC board</li> </ul>	<ul style="list-style-type: none"> <li>A. Plug transformer into uninterrupted outlet</li> <li>B. Repair outlet or use working outlet</li> <li>C. Replace transformer</li> <li>D. Unplug from PC board if LED display lights appropriately, replace meter</li> <li>E. Replace PC board</li> </ul>
16. Control does not display correct time of day	<ul style="list-style-type: none"> <li>A. Power outage &gt; 24 hours</li> <li>B. Power outage &lt; 24 hours, time of day flashing, battery depleted</li> </ul>	<ul style="list-style-type: none"> <li>A. Reset time of day</li> <li>B. Replace lithium coin type battery on circuit board Model 2032 battery</li> </ul>
17. No "softening" or "filtering" display when water is flowing	<ul style="list-style-type: none"> <li>A. Bypass valve in bypass position</li> <li>B. Meter connection disconnected</li> <li>C. Restricted/stalled meter turbine</li> <li>D. Defective meter</li> <li>E. Defective PC board</li> </ul>	<ul style="list-style-type: none"> <li>A. Put bypass valve in service position</li> <li>B. Connect meter to PC board</li> <li>C. Remove meter and check for rotation, clean foreign material</li> <li>D. Replace meter</li> <li>E. Replace PC board</li> </ul>
18. Control valve regenerates at wrong time of day	<ul style="list-style-type: none"> <li>A. Power outages &gt; 24 hours</li> <li>B. Time of day not set correctly</li> <li>C. Time of regeneration incorrect</li> <li>D. Control valve set at "on 0" (immediate regeneration)</li> <li>E. Control valve set at NORMAL + on 0</li> </ul>	<ul style="list-style-type: none"> <li>A. Reset control valve to correct time of day</li> <li>B. Reset to correct time of day</li> <li>C. Reset regeneration time</li> <li>D. Check control valve set-up procedure regeneration time option (see programming options on page 23).</li> <li>E. Check control valve set-up procedure regeneration time option (see programming options on page 23).</li> </ul>

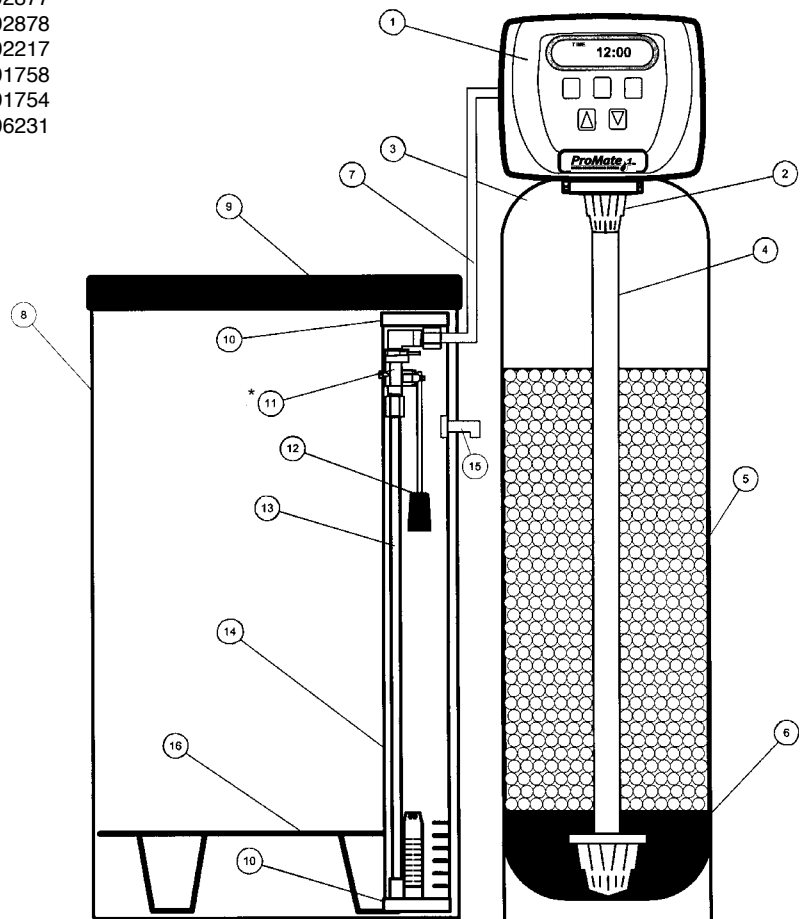
# PROMATE-1 CONDITIONER & SALT KEEPER ASSEMBLIES

Item	Description	Qty	Part #		
1	Control Center-Metered	1	60-PM1-ED (see pages 13-17 for detailed components)		
	Control Center-Time Clock	1	60-PM1-TC		
2	Top Diffuser	1	101539		
3&4	Mineral Tank Assembly		Item 3 only	Item 4 only	Not Shown
			<b>Mineral Tank</b>	<b>Distributor Assy</b>	<b>Granite Tank Jacket</b>
	PM-24 8 x 44	1	19-RT0844NAT	9-93243-RT	103626
	PM-32 9 x 48	1	19-RT0948NAT	9-93247-RT	103630
	PM-48 10 x 44	1	19-RT1044NAT	9-93243-RT	103633
	PM-48 10 x 54	1	19-RT1054NAT	9-93253-RT	103638
	PM-64 13 x 54	1	19-RT1354NAT	9-93254-RT	
	PM-96 14 x 65	1	19-RT1465NAT	101514	<b>Tank Adapter</b>
	PM-128 16 x 65	1	19-RT1665NAT-4	101514	100314
	PM-160 18 x 65	1	19-RT1865NAT-4	9-TO418 (Hub & Lateral)	100314
	PM-192 20 x 62	1	19-RT2062NAT-4	9-TO421 (Hub & Lateral)	100314
5	Ion Exchange Resin	*	101108	*See Specifications for amount	
6	Underbedding	*	100983	*See Specifications for amount	
7-15a	Salt Keeper Assy (18x40)-Granite	1	104449		
b	Salt Keeper Assy (24x41)	1	104424		
c	Salt Keeper Assy (24x50)	1	104426		
7	3/8" x 6" Brine Line	1	102671		
8a	24x41 Salt Keeper Tank-Black	1	104495		
b	24x50 Salt Keeper Tank-Black	1	104497		
9a	Salt Keeper Cvr 18x40	1	101448		
b	Salt Keeper Cvr 24x41		Included with 8b		
c	Salt Keeper Cvr 24x50		Included with 8c		
10-14 a	Safety Brine Valve Assy 41"		104172		
b	Safety Brine Valve Assy 50"		104173		
10	Cap, Brine Well	2	101365		
11*	Safety Brine Valve	1	101274		
12	Float Assembly	1	101660		
13	Air Check	1	101181		
14 a	Brine Well 40"-41"	1	102877		
b	Brine Well 50"	1	102878		
15	2-Piece Overflow	1	102217		
16 a	Grid Plate 18" (optional)	1	101758		
b	Grid Plate 24" (optional)	1	101754		
-	Owners Manual	1	106231		

Figure 13



\*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	103461	Front Cover Assy w/Label	1
2-6	15-V3002CC	Drive Assembly-CC	*
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.

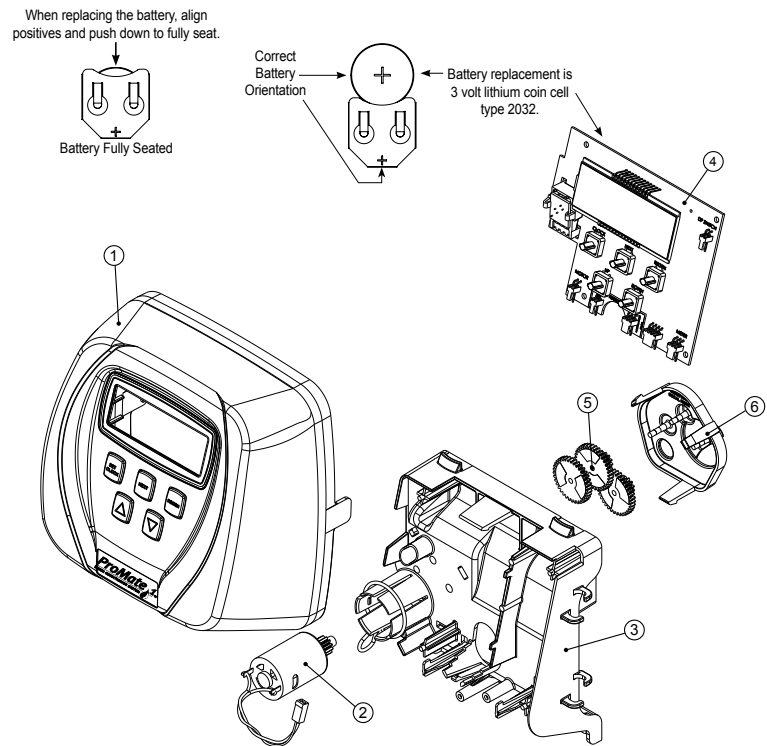


Figure 14

## 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.

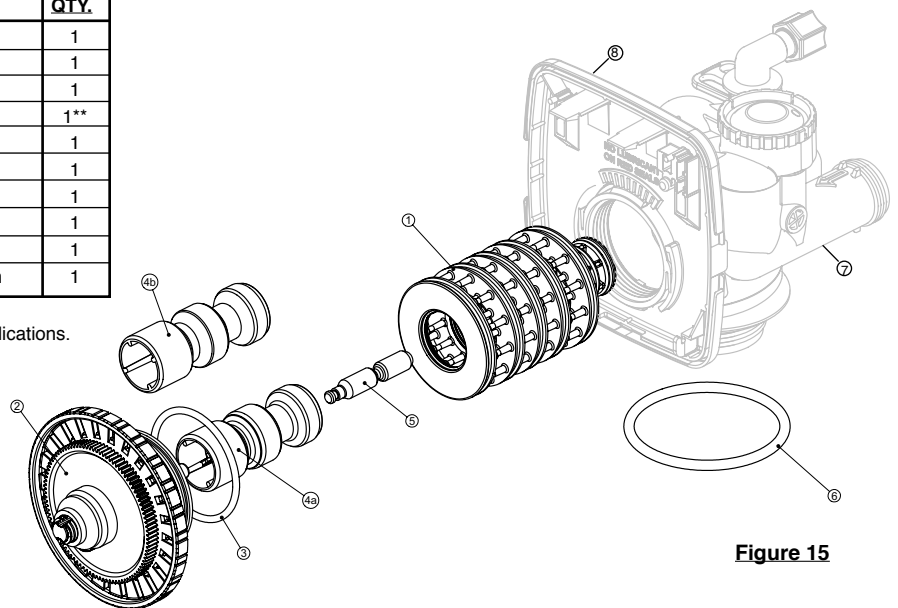


Figure 15

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	*

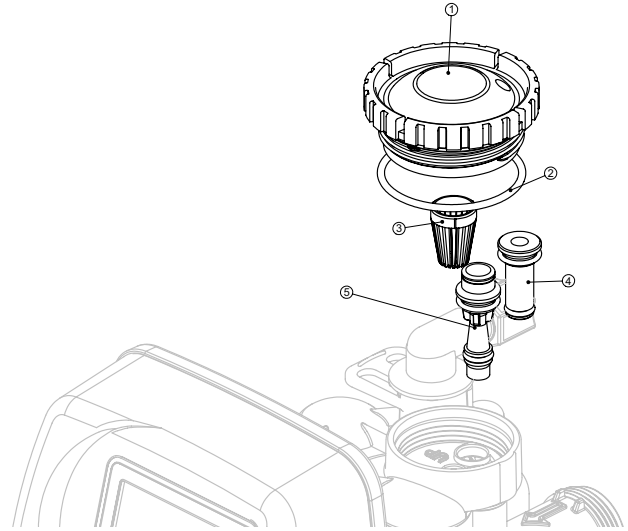


Figure 16

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

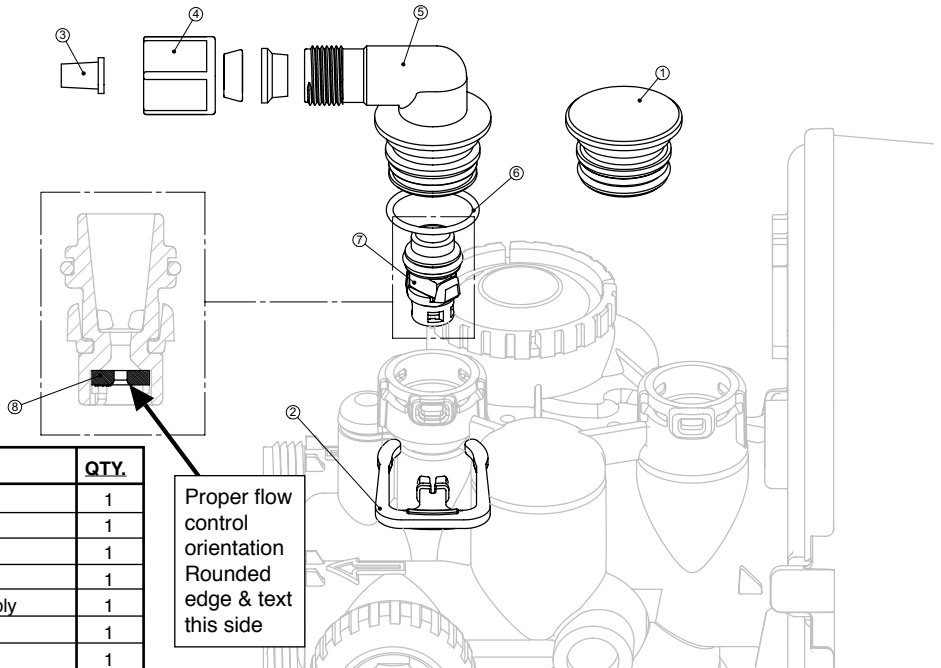
See system specification, injector color on page 18 for current injector.

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	101870	Polytube Insert 3/8	1
4	102130	Nut 3/8	1
5-8	103589	3/8" Refill Elbow Assembly	1
5	101620	Elbow Cap 3/8	1
6	102153	O-ring 019	1
7	102418*	Refill Flow Cntrl Retainer Assy.	1
8	102421	Refill Flow Control Button	1
Not Shown	101617	1/2" Elbow w/Nut & Insert	1

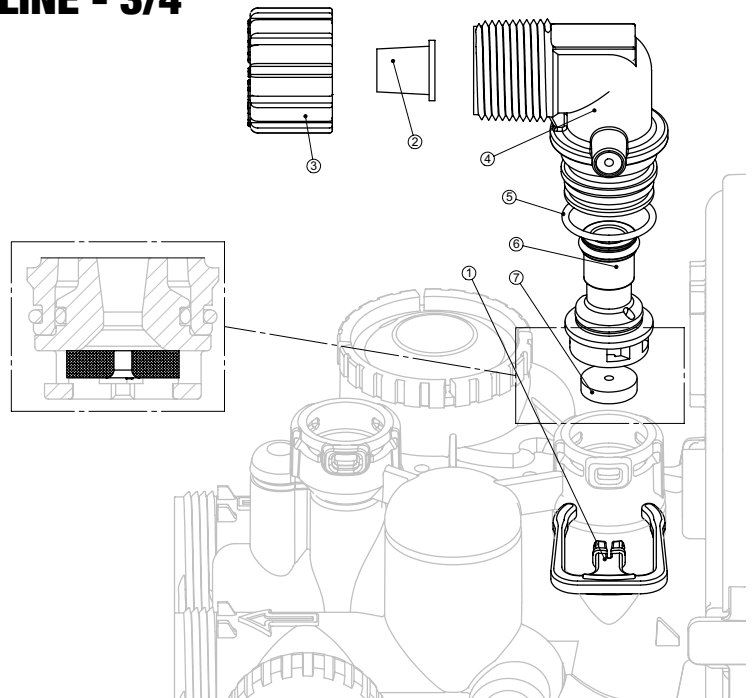
\*Assembly includes item #8.

\*\*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"	Option
3	102131	Nut 3/4" Drain Elbow	Option
4-5	101618	Drain Elbow 3/4" Male Assy-Vent	1
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"	One DLFC must be used if 3/4 fitting is used
	101552	DLFC 1.0 gpm for 3/4"	
	101556	DLFC 1.3 gpm for 3/4"	
	101559	DLFC 1.7 gpm for 3/4"	
	101574	DLFC 2.2 gpm for 3/4"	
	101577	DLFC 2.7 gpm for 3/4"	
	101583	DLFC 3.2 gpm for 3/4"	
	101588	DLFC 4.2 gpm for 3/4"	
	101591	DLFC 5.3 gpm for 3/4"	
	101593	DLFC 6.5 gpm for 3/4"	
	101595	DLFC 7.5 gpm for 3/4"	



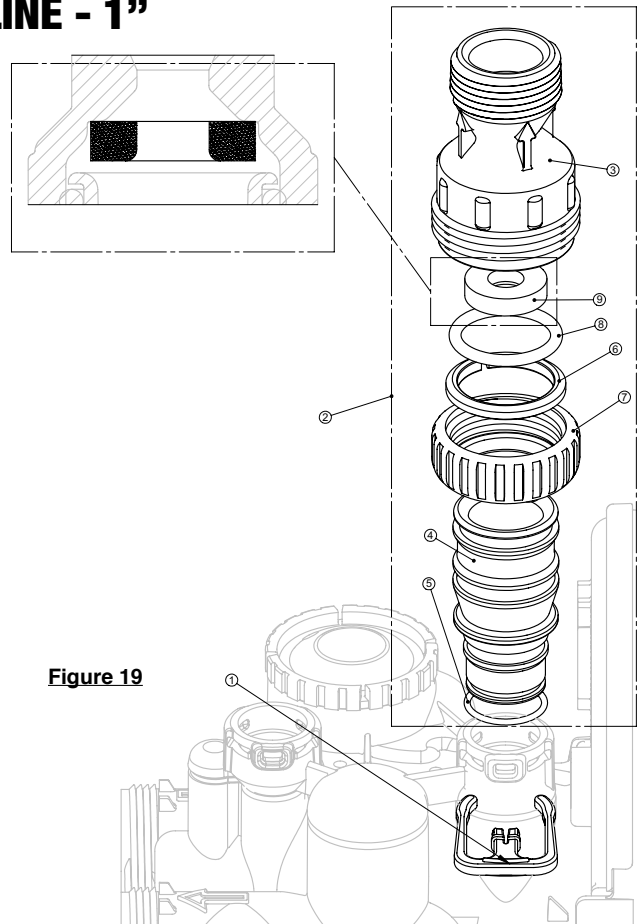
**Figure 18**

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 18, 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	1
2	101636	Drain Ftg, 1" Straining 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"	One DLFC must be used if 1" fitting is used
	101562	DLFC 10.0 gpm for 1"	
	101564	DLFC 11.0 gpm for 1"	
	101567	DLFC 13.0 gpm for 1"	
	101568	DLFC 15.0 gpm for 1"	
	101571	DLFC 17.0 gpm for 1"	
	101578	DLFC 20.0 gpm for 1"	
	101580	DLFC 25.0 gpm for 1"	



**Figure 19**

See System Specifications DLFC on page 22, 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.

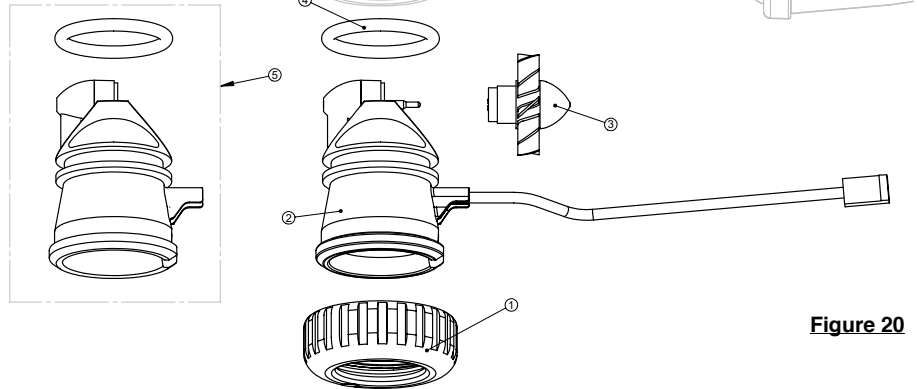


Figure 20

# BYPASS VALVE

ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	101325	Complete Bypass Assembly	

**NOTE: Individual Bypass Components Are Not Available, Must Order Complete Bypass Assembly.**

ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	102141	Nut 1" Quick Connect	2
2	102437	Split Ring	2
3	102165	O-Ring 215	2
11*	101172	Bypass Vert Adpt. Assy (set of 2)	1

\*11 (Not Shown)

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.

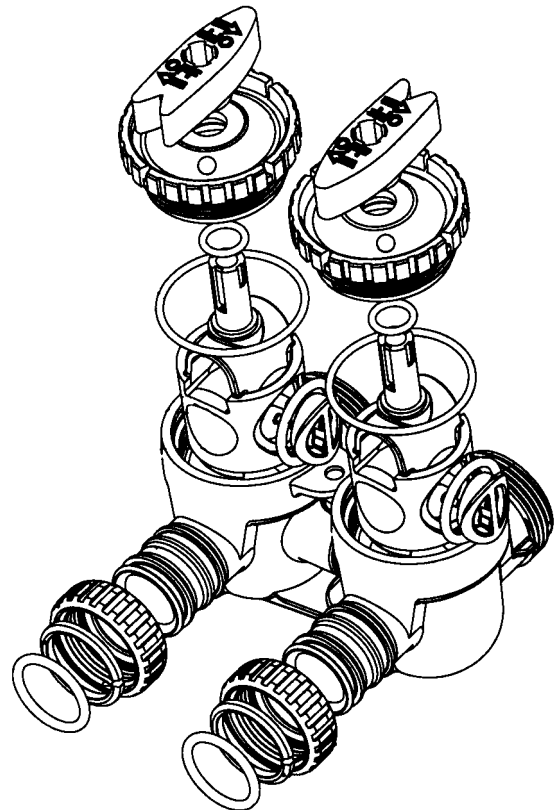


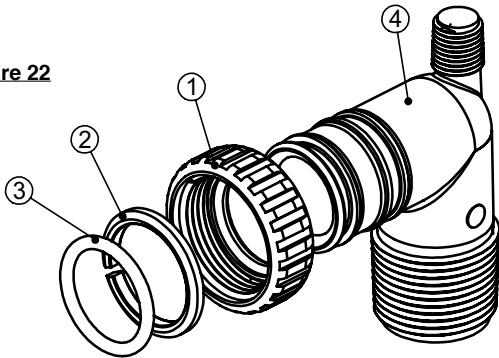
Figure 21

# INSTALLATION FITTING ASSEMBLIES

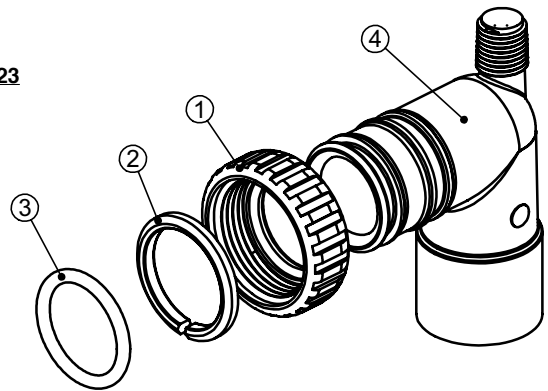
ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	102141	Nut 1" Quick Connect	2
2	102437	Split Ring	2
3	102165	O-Ring 215	2
4	106761	Fitting 1" PVC Male NPT Elb.	2
1-4	101639	Fitting 1" PVC Male NPT Asy. (Set of 2)	1

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	106762	Fitting 3/4" & 1" PVC Solv. 90	2
1-4	101640	Fitting 3/4" & 1" PVC Solv 90 (set of 2)	1

**Figure 22**



**Figure 23**



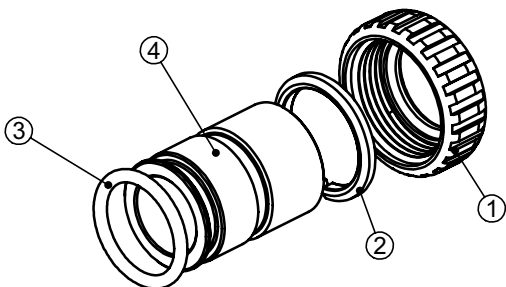
The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic wrench. If necessary a pliers can be used to unscrew the nut or cap. Do not use a pipe wrench to tighten or loosen nuts or caps. Do not place screwdriver in slots on caps and/or tap with a hammer.

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.

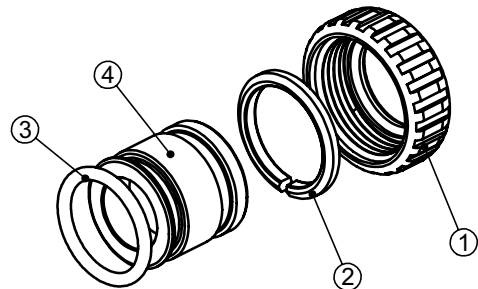
ITEM NO.	ORDER NO.	DESCRIPTION	QTY.
1	102141	Nut 1" Quick Connect	2
2	102437	Split Ring	2
3	102165	O-Ring 215	2
4	106763	Fitting 1" Brass Sweat	2
1-4	101641	Fitting 1" Brass Sweat Asy (Set of 2)	1

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	106764	Fitting 3/4" Brass Sweat	2
1-4	101642	Fitting 3/4" Brass Sweat Asy (Set of 2)	1

**Figure 24**



**Figure 25**



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	106765	Fitting 1" Plastic Male NPT	2
1-4	101643	Fitting 1" Male NPT Asy. (Set of 2)	1

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	106766	Fitting 1-1/4" Plastic Male NPT	2
1-4	101644	Fitting 1-1/4" Male NPT (Set of 2)	1

Figure 26

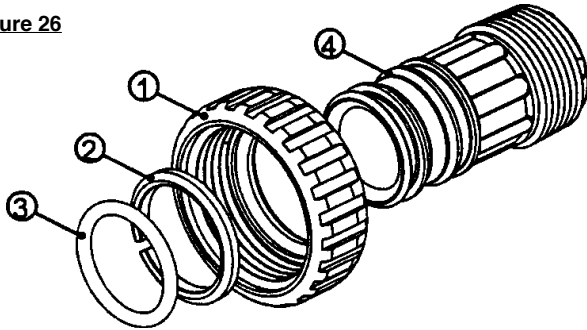
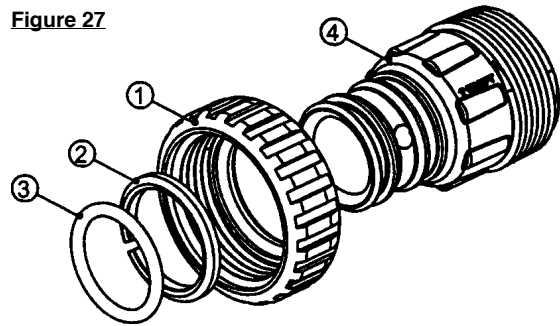
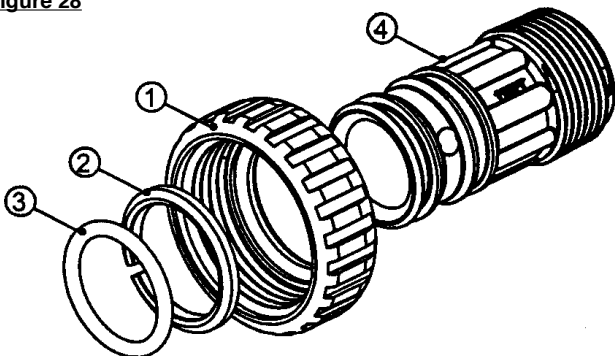


Figure 27



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	15-V3316	Fitting 1" Plastic Male BSPT	2
1-4	101645	Fitting 1" Male BST Asy. (Set of 2)	1

Figure 28



# PROMATE 1 SYSTEM SPECIFICATIONS

## ED-“ELECTRONIC DEMAND”

## TC-“TIME CLOCK”

MODEL	PM1-24ED PM1-24TC	PM1-32ED PM1-32TC	PM1-32-10ED PM1-32-10TC	PM1-48ED PM1-48TC	PM1-64ED PM1-64TC	PM1-96ED PM1-96TC	PM1-128ED PM1-128TC	PM1-160ED PM1-160TC	PM1-192ED PM1-192TC
<b>FACTORY PRESET MINUTES</b>									
Backwash-1; Min	8	8	8	8	8	8	8	8	8
Brine; Min.	60	60	60	60	60	60	60	60	60
Backwash-2; Min	8	8	8	8	8	8	8	8	8
Fast Rinse; Min	4	4	4	4	4	4	4	4	4
<b>Refill-Minutes</b>									
-High Efficiency	3.0	4.0	4.0	6.0	8.0	12.0	16.0	20.0	24.0
-Low Salting	4.0	5.3	5.3	8.0	10.7	16.0	21.3	26.7	32.0
- <b>Medium Salting*</b>	<b>5.0</b>	<b>6.7</b>	<b>6.7</b>	<b>10.0</b>	<b>13.5</b>	<b>20.0</b>	<b>27.0</b>	<b>33.5</b>	<b>40.0</b>
-High Salting	7.5	10.0	10.0	15.0	20.0	30.0	40.0	50.0	60.0
<b>Refill-Lbs of Salt</b>									
-High Efficiency	4.5	6.0	6.0	9.0	12.0	18.0	24.0	30.0	36.0
-Low Salting	6.0	8.0	8.0	12.0	16.0	24.0	32.0	40.0	48.0
- <b>Medium Salting*</b>	<b>7.5</b>	<b>10.0</b>	<b>10.0</b>	<b>15.0</b>	<b>20.0</b>	<b>30.0</b>	<b>40.0</b>	<b>50.0</b>	<b>60.0</b>
-High Salting	11.5	15.0	15.0	22.5	30.0	45.0	60.0	75.0	90.0
<b>Capacity Grains</b>									
-High Efficiency	17,200	22,930	22,930	34,400	45,870	68,810	91,750	114,690	137,620
-Low Salting	19,980	26,650	26,650	39,970	53,300	79,950	106,600	133,250	159,900
- <b>Medium Salting*</b>	<b>21,040</b>	<b>28,060</b>	<b>28,060</b>	<b>42,090</b>	<b>56,120</b>	<b>84,180</b>	<b>112,240</b>	<b>140,300</b>	<b>168,360</b>
-High Salting	24,230	32,310	32,310	48,460	64,620	96,930	129,240	161,550	193,860
<b>Water Usage (U.S. Gallons)</b>									
<b>At Factory Settings and 40 psi Inlet Pressure</b>	<b>44</b>	<b>54</b>	<b>68</b>	<b>69</b>	<b>127</b>	<b>134</b>	<b>179</b>	<b>245</b>	<b>272</b>
<b>Service Flow Rate;</b>									
Flow Rate @ 10 psi	9.8	10.1	11.3	10.5	14.2	14.4	15.1	17.3	17.8
Flow Rate @ 15 psi	13.1	13.0	14.5	14.1	18.2	19.2	20.1	22.7	23.1
Mineral; Cu Ft.	0.75	1	1	1.5	2	3	4	5	6
Underbedding;lbs	8	11	14	14	40	40	45	50	75
Mineral Tank Dimen.	8x44	9x48	10x44	10x54	13x54	14x65	16x65	18x65	20x62
Brine Tank Dimen.	18x40	18x40	18x40	18x40	18x40	24x41	24x41	24x50	24x50
Drain Line Flow Control	1.3	1.7	2.2	2.2	4.2	4.2	5.3	7.5	7.5
Brine Line Flow Control	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Injector; color	C-Violet	D-Red	D-Red	E-White	G-Yellow	H-Green	I-Orange	J-L. Blue	K-L. Green

\*Factory Settings are in bold

System conforms to ANSI/NSF 44 for specific performance claims as verified and substantiated by test data.  
**For high salting applications, larger brine tanks may be needed. Consult factory for recommendation.**

## PROGRAMMING OPTIONS

Reserve Gallons	Regeneration Type	Days Override	
AUTO	NORMAL	oFF	Reserve capacity automatically estimated. Regeneration occurs when gallons capacity falls below the reserve capacity at the next Regen Set Time.
AUTO	NORMAL	1 to 24	Reserve capacity automatically estimated. Regeneration occurs at the next Regen Set Time when gallons capacity falls below the reserve capacity or the specified number of days between regenerations is reached.
20 to 50,100	NORMAL	oFF	Reserve capacity <u>not</u> automatically estimated. Regeneration occurs at the next Regen Set Time when gallons capacity reaches 0.
oFF	NORMAL	1 to 24	Reserve capacity <u>not</u> automatically estimated. Regeneration occurs at the next Regen Set Time when the specified number of days between regenerations is reached.
20 to 50,100	NORMAL	1 to 24	Reserve capacity <u>not</u> automatically estimated. Regeneration occurs at the next Regen Set Time when gallons capacity reaches 0 or the specified number of days between regenerations is reached.
AUTO	On 0	oFF	Reserve capacity <u>not</u> automatically estimated. Regeneration occurs immediately when gallons capacity reaches 0. Time of regeneration will not be allowed to be set because of regeneration will always occur when gallons capacity reaches 0.
20 to 50,100	On 0	oFF	Reserve capacity <u>not</u> automatically estimated. Regeneration occurs immediately when gallons capacity reaches 0. Time of regeneration will not be allowed to be set because regeneration will always occur on 0.
AUTO	NORMAL on 0	oFF	Reserve capacity automatically estimated. Regeneration occurs when gallons capacity falls below the reserve capacity at the next Regen Set Time or regeneration occurs immediately after 10 minutes of no water usage when gallon capacity reaches 0.
<b>AUTO*</b>	<b>NORMAL on 0*</b>	1 to 24 <b>*14</b>	Reserve capacity automatically estimated. Regeneration occurs at the next Regen Set Time when gallons capacity falls below the reserve capacity or the specified number of days between regenerations is reached or regeneration occurs immediately after 10 minutes of no water usage when gallon capacity reaches 0.
20 to 50,100	NORMAL	1 to 24	Reserve capacity <u>not</u> automatically estimated. Regeneration occurs at the next Regen Set Time when specified number of days between regenerations is reached or regeneration occurs immediately after 10 minutes of no water usage when gallon capacity reaches 0.

\*Factory settings in bold

## GENERAL SPECIFICATIONS

### OPERATING PRESSURES

Minimum/Maximum .....20 psi-120 psi

### OPERATING TEMPERATURES

Minimum/Maximum .....40° - 110° F

### METER

Accuracy.....±5%  
Flow Rate Range.....0.25 - 27 GPM  
Gallon Range .....20 - 50,100

### DIMENSIONS

Drain Line .....3/4" or 1" NPT  
Brine Line .....3/8" Poly Tube  
Electrical Current Draw/Voltage/Frequency .....0.5A/110v/60Hz

Compatible with the following regenerants or chemicals: Sodium chloride, potassium permanganate, sodium bisulfite, sodium hydroxide, hydroxide, hydrochloric acid, chlorine and chloramines.

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# PROMATE-1® SERIES WATER SOFTENERS LIMITED WARRANTY

Hellenbrand, Inc., warrants to the original consumer purchaser that the ProMate® 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 control valve including electrical parts, internal parts, and valve body.

For a Period of TEN YEARS: Mineral tanks, 6" Diameter - 13" Diameter.

For a Period of FIVE YEARS: Mineral tanks, 14" - Up.

For a Period of FIVE YEARS: The salt storage/cabinet tank.

For a Period of ONE YEAR: Any other component.

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

**THIS WARRANTY IS EFFECTIVE TO THE ORIGINAL CONSUMER PURCHASER ONLY, AND ONLY AS LONG AS THE PROMATE® REMAINS AT THE ORIGINAL INSTALLATION SITE.**

No sales representative, distributor, agent, dealer, reseller or any other person is authorized to make any other warranty on behalf of Hellenbrand, Inc. Upon expiration of the applicable warranty period(s), Hellenbrand, Inc., shall have no further liability related to the products/parts to which the warranty period(s) apply, except with respect to valid warranty claims asserted during the appropriate warranty period(s).

If a part described above becomes defective within the specified warranty period, you should notify your ProMate® sales representative and arrange a time during normal business hours for the inspection of the water conditioner at the original installation site. Any part found defective within the terms of this warranty will, at Hellenbrand, Inc.'s option, be repaired or replaced. You are responsible for freight from our factory and local service charges. This paragraph sets forth the exclusive remedy for any valid warranty claims against Hellenbrand, Inc.

**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, Inc.'s printed instructions, or installation, repair or service by anyone other than Hellenbrand, Inc., or an authorized Hellenbrand reseller.

As a manufacturer, we do not know the characteristics of your water supply or the purpose for which you are purchasing this water conditioner. Please understand 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 can also change considerably if your water conditioner is moved to a new location. For these reasons, we assume no liability for the determination of the proper equipment necessary to meet your requirements and we do not authorize others to assume such obligations for us.

**REMEDIES FOR DEFECTS OR FAILURES, TO THE EXTENT PERMITTED BY APPLICABLE LAW, ARE LIMITED TO THE REMEDIES PROVIDED IN THIS WARRANTY. ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY WARRANTY WHICH MIGHT ARISE BY IMPLICATION OR OPERATION OF LAW, WHETHER FROM THE SELLER AND/OR MANUFACTURER OF THIS PRODUCT, IS HEREBY EXCLUDED AND DISCLAIMED, TO THE EXTENT ENFORCEABLE UNDER APPLICABLE LAW, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR NON-INFRINGEMENT, OR ANY WARRANTIES ARISING FROM COURSE OF PERFORMANCE, COURSE OF DEALING, OR FROM USAGES OF TRADE.**

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