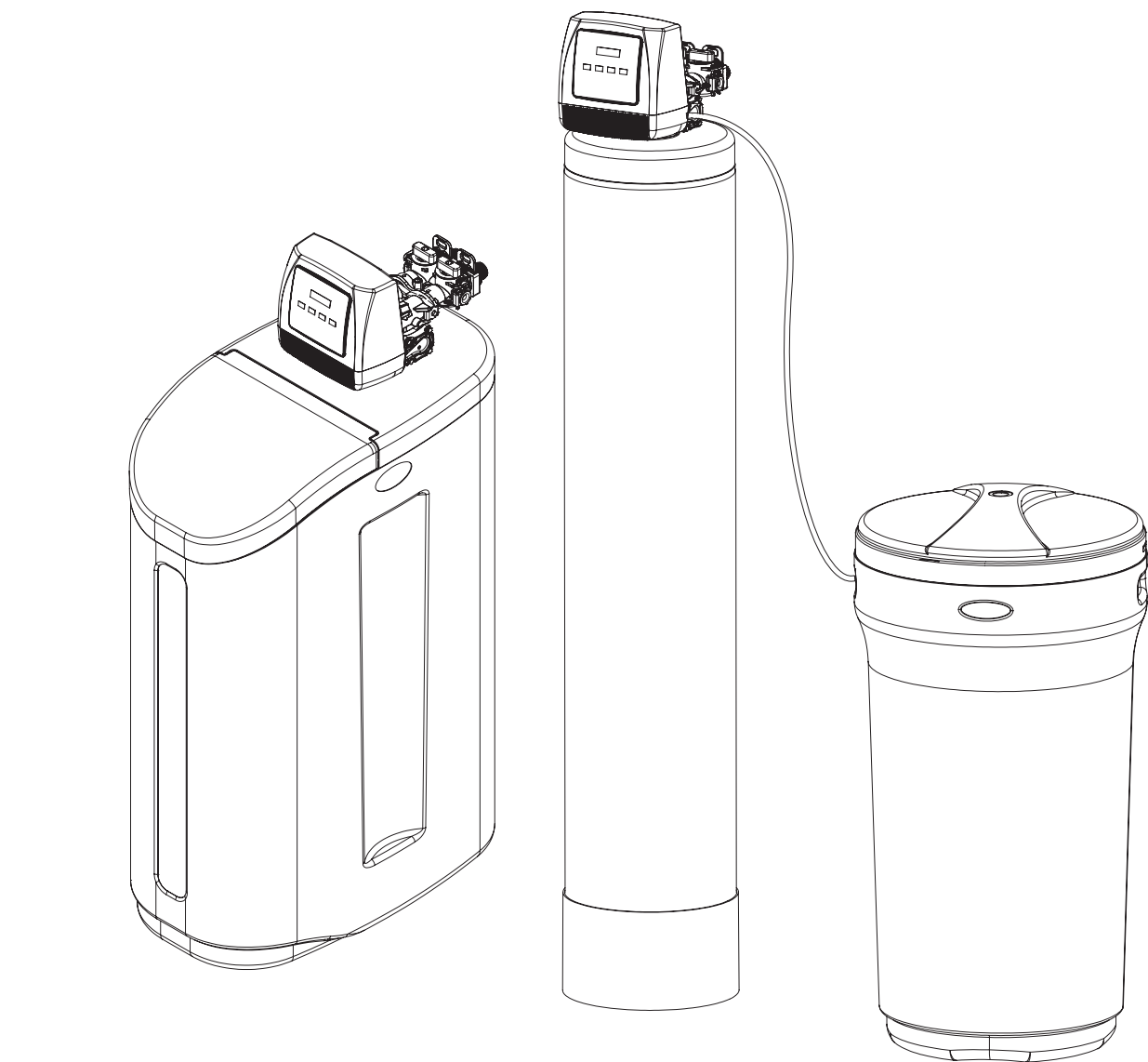




# Owners Manual

## 785UF Series Water Softener



IAPMO R & T Certified  
Against NSF/ANSI 44 and  
CSA B483.1

- 1. Page 22 of this manual contains important maintenance procedures for the continued proper operation of your unit. These MUST be performed regularly for your warranty to remain valid.**
- 2. Read all instructions carefully before operation.**
- 3. Avoid pinched o-rings during installation by applying NSF certified lubricant to all seals (provided with install kit).**
- 4. This system is not intended for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.**

### Canada West

855 Park St.  
Unit 1  
Regina, SK S4N 6M1

### Canada East

490 Pinebush Rd.  
Unit 1  
Cambridge, ON N1T 0A5

### U.S.A.

56 Lightcap Rd.  
Pottstown, PA 19464

9760 Mayflower Park Drive,  
Suite 110  
Carmel, IN 46032

4645 McDowell Rd. W  
Suite 106  
Phoenix, AZ 85035

|                                                                              |           |
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# READ THIS PAGE FIRST

## BEFORE STARTING INSTALLATION

- ▶ Read this manual thoroughly to become familiar with the appliance and its capabilities before installing or operating. Failure to follow instructions could result in personal injury or property damage. This manual will assist you in getting the most out of your new appliance.
- ▶ Installation must comply with all state, provincial or local regulations. Check with your local public works department for plumbing and sanitation codes. In the event that the codes conflict with any content in this manual the local codes should be followed. Professional installation by a licensed plumber or certified water treatment professional is recommended.
- ▶ **WARNING!:** Do not use water that is microbiologically unsafe without adequate disinfection before or after this system.
- ▶ This appliance is capable of operating at temperatures between 40°F and 110°F (4°C - 43°C). Do not use this appliance on hot water supplies.
- ▶ Do not install this appliance where it may be exposed to wet weather, direct sunlight, or temperatures outside of the range specified above.
- ▶ Avoid pinched o-rings during installation by applying IAPMO certified lubricant (provided with install kit) to all seals.
- ▶ This appliance is designed to operate on pressures of 30 psi to 125 psi. If the water pressure is higher than the maximum, use a pressure reducing valve ahead of this appliance.
- ▶ It is not uncommon for sediment, precipitated iron or hardness to be present in water supplies. Precipitated minerals or sediments can cause damage to the seals and piston. This is considered a harsh environment and the seals and piston would not be covered by warranty stated or otherwise.
- ▶ It is recommended to regularly inspect and service the control valve on an annual basis. Cleaning and/or replacement of piston, seals, and or spacers may be necessary depending on the raw water quality. An Annual Maintenance kit is available for this purpose.
- ▶ This publication is based on information available when approved for printing. Continuing design refinement could cause changes that may not be included in this publication. The manufacturer reserves the right to change the specifications referred to in this literature at any time, without prior notice.

### INSTALL NOTES & SAFETY MESSAGES

Watch for the following messages in this manual:

#### NOTE

Do not remove or destroy the serial number. It must be referenced on request for warranty repair or replacement

**NOTE:** used to emphasize installation, operation or maintenance information which is important but does not present a hazard.



#### CAUTION!

Disassembly while under pressure can result in flooding.

**CAUTION:** used when failure to follow directions could result in damage to equipment or property.



#### WARNING!

**ELECTRICAL SHOCK HAZARD! UNPLUG THE UNIT BEFORE REMOVING THE COVER OR ACCESSING ANY INTERNAL CONTROL PARTS**

**WARNING:** used to indicate a hazard which could cause injury or death if ignored.

# EFFICIENCY STATEMENT

This product is efficiency rated according to NSF/ANSI 44. The stated efficiencies are valid only at the specified salt dosages and maximum service flow rate.

## PERFORMANCE DATA SHEET

| Model Number                              | 785HE-75C                            | 785HE-100C          | 785HE-75             | 785HE-100           | 785HE-150           | 785HE-200           | 785HE-300           |
|-------------------------------------------|--------------------------------------|---------------------|----------------------|---------------------|---------------------|---------------------|---------------------|
| Qty High Capacity Resin                   | 0.75 ft <sup>3</sup>                 | 1.0 ft <sup>3</sup> | 0.75 ft <sup>3</sup> | 1.0 ft <sup>3</sup> | 1.5 ft <sup>3</sup> | 2.0 ft <sup>3</sup> | 3.0 ft <sup>3</sup> |
| Rated Service Flow (gpm)                  | 7.5                                  | 12.1                | 7.5                  | 11.0                | 11.2                | 12.4                | 12.9                |
| Pressure Drop at Rated Service Flow (psi) | 7.0                                  | 15.0                | 9.0                  | 15.0                | 15.0                | 15.0                | 15.0                |
| Rated Softening Capacity (grains)         | 9,609 @ 2.25lbs                      | 13,269 @ 3lbs       | 10,222 @ 3lbs        | 13,269 @ 3lbs       | 20,443 @ 4.5lbs     | 27,258 @ 6lbs       | 40,887 @ 9lbs       |
| Efficiency (grains/lb salt)               | 4,271                                | 4,543               | 4,543                | 4,543               | 4,543               | 4,543               | 4,543               |
| Max. Flow Rate to Drain (gpm)             | 2.0                                  | 2.4                 | 1.5                  | 2.0                 | 2.4                 | 3.5                 | 5.0                 |
| Working Pressure                          | Min. 20 - Max. 125 psi               |                     |                      |                     |                     |                     |                     |
| Operating Temperature                     | Min 39 - Max. 100 degrees Fahrenheit |                     |                      |                     |                     |                     |                     |

These softeners conform to NSF/ANSI 44 for the specific performance claims as verified and substantiated by test data. These models are efficiency rated. The efficiency rating is valid only at the stated salt dose and maximum service flow rate. They have a demand initiated regeneration (D.I.R.) feature that complies with specific performance specifications intended to minimize the amount of regenerant brine and water used in their operation. These softeners have a rated softener efficiency of not less than 3350 grains of total hardness exchange per pound of salt (based on sodium chloride) and shall not deliver more salt than their listed ratings. The rated salt efficiency is measured by laboratory tests described in NSF/ANSI Standard 44. These tests represent the maximum possible efficiency that the systems can achieve. Operational efficiency is the actual efficiency after the system has been installed. It is typically less than the efficiency due to individual application factors including water hardness, water usage, and other contaminants that reduce the softener's capacity. These systems are not intended for use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. For best results, use plain, white block salt. Refer to Installation/operation manual and warranty for further details on installation, parts and service, maintenance and further restrictions or limitations to the use of the product.

## HOW YOUR WATER CONDITIONER WORKS

Water softeners remove hardness in the water by exchanging particles in the water, or ions. They remove hard ions such as calcium and magnesium in the water by trading it for sodium ions producing soft water. Unlike the calcium and magnesium, sodium stays dissolved in water and does not form a scale. Sodium also does not interfere with the cleaning action of soaps. The sodium is released by a charged resin contained in the softener, this resin also traps the calcium and magnesium ions. Eventually this resin releases all of its sodium and has filled up with other ions, so it then must be regenerated. Regeneration is accomplished by washing the resin with a salt saturated brine solution that removes the calcium and magnesium while replenishing the sodium. This is why the softener requires a brine tank and salt. The water softener can run for days before running out of sodium, and when it does, the sodium is replenished in only a matter of a few hours

When using a softener to remove both hardness and dissolved iron it is important that it regenerates more frequently than ordinarily would be calculated for hardness removal alone. Although many factors and formulas have been used to determine this frequency, it is recommended that the softener be regenerated when it has reached 50–75% of the calculated hardness alone capacity. This will minimize the potential for bed fouling.

If you are operating a water softener on clear water iron, regular resin bed cleaning is needed to keep the bed from coating with iron. Even when operating a softener on water with less than the maximum of dissolved iron, regular cleanings should be performed. Clean every six months or more often if iron appears in your conditioned water supply. Use resin bed cleaning compounds carefully following the directions on the container.

## Features & Terminology:

**Precision Brining:** Precision brining means that your conditioner calculates the exact amount of brine required to regenerate saving up to 30% more salt.

When your conditioner regenerates it will display two numbers for capacity: one will be total capacity and the other will be 70 % of capacity. The unit counts down to the end of the 70% then calculates how much of the 30% you used (your reserve) it then adjusts the brine amount accordingly and regenerates that evening. This feature means that your capacity will always be different after every regeneration therefore reducing your salt use.

**Soft Water Recharge for High Usage:** Should you reach the 70% capacity and then go beyond the 30% before it is time to regenerate, the conditioner will do a quick regeneration to restore limited capacity to get it through the remainder of the day.

**System Refresh:** If you are away for an extended period of time, stagnant water can cause bacteria growth. To prevent this, the system refresh feature will perform a 10 minute backwash after 7 days of inactivity.

**Adjustable Backwash:** On clean municipal water supply there is no need to backwash and clean the bed with every regeneration. The 85HE saves a significant amount of water by skipping up to 10 backwash cycles.

**Scrolling Diagnostics:** By pressing any button to light the LCD display the unit will automatically begin scrolling important information for diagnostic purposes.

**Soft Water Brine Tank Refill:** Conserves capacity and keeps brine tank cleaner by adding only treated soft water to brine tank rather than raw untreated hard water.

**Total Gallons:** The total amount of soft water the system can produce between regenerations.

**Remaining Gallons:** The amount of soft water capacity until the next regeneration is required.

**Number of People:** In the household as programmed at install.

**Reserve Capacity:** Calculated as 75 gallons per person.

**Estimated Days to Next:** Estimation of days to the next regeneration based on current consumption, hardness and capacity.

**Last Regeneration:** The date of the last regeneration cycle by the conditioner.

**Total Regenerations:** This is the total number of times the conditioner has regenerated.

**Total Gallons:** Total gallons treated by the conditioner.

**Over Run Total:** How many times soft water recharge was required due to high usage.

**Current Flow Rate:** Will only display if treated water is running otherwise it will read 0.

**Peak Flow:** Maximum flow that has gone through the conditioner.

**Delayed Regen OFF:** Generally only used after servicing.

**Regen Time:** Time of day that the conditioner is scheduled to regenerate.

**Refill Time:** The current calculated refill time for makeup brine (displays up to 70% of total brine required).

**Valve Mode:** Current valve setting EG. Softener UF (up flow). You can unlock the board as directed and press the down arrow to stop the scrolling. You can then use the down arrow to go to each of the diagnostics as required.

**System Bypass:** All systems come with a manual bypass valve allowing you to bypass the system, allowing raw untreated water to be used in your home for any reason such as system servicing.

# SPECIFICATION

| Model      | System Capacity Grains |                                 |               | Flow Rate     |                | Regeneration Water Usage (Gallons) |               | Mineral Tank Size | Resin Cu. Ft. | Brine Tank / Cabinet Size Inches | Salt Capacity (Lbs) | Ship Weight (Lbs) |
|------------|------------------------|---------------------------------|---------------|---------------|----------------|------------------------------------|---------------|-------------------|---------------|----------------------------------|---------------------|-------------------|
|            | @ 10 lbs/cu ft         | @ 6 lbs/cu ft (Factory Setting) | @ 3 lbs/cu ft | Service USGPM | Backwash USGPM | Clean Water (Factory Setting)      | Problem Water |                   |               |                                  |                     |                   |
| 785HE*-75  | 22,500                 | 18,750                          | 11,250        | 8.0           | 1.5            | 34.0                               | 49.6          | 8 x 44            | 0.75          | BTS 15.0"x34.7/BTR 18.1x34.7     | BTS 230 /BTR 270    | 93                |
| 785HE-100  | 30,000                 | 25,000                          | 15,000        | 10.0          | 2.0            | 43.4                               | 64.3          | 9 x 48            | 1.00          | BTS 15.0"x34.7/BTR 18.1x34.7     | BTS 230 /BTR 270    | 110               |
| 785HE-150  | 45,000                 | 37,500                          | 22,500        | 12.0          | 2.4            | 62.7                               | 90.3          | 10 x 54           | 1.50          | BTS 15.0"x34.7/BTR 18.1x34.7     | BTS 230 /BTR 270    | 141               |
| 785HE-200  | 60,000                 | 50,000                          | 30,000        | 15.0          | 3.5            | 87.1                               | 124.6         | 12 x 52           | 2.00          | 20.3 x 37.4                      | 385                 | 158               |
| 785HE-250  | 75,000                 | 62,500                          | 37,500        | 15.0          | 4.0            | 108.9                              | 155.8         | 13 X 54           | 2.50          | 20.3 x 37.4                      | 385                 | 198               |
| 785HE-300  | 90,000                 | 75,000                          | 45,000        | 15.0          | 5.0            | 139.2                              | 196.2         | 14 x 65           | 3.00          | 23.0 x 40.5                      | 550                 | 244               |
| 785HE-75C  | 22,500                 | 18,750                          | 11,250        | 8.0           | 2.0            | 40.5                               | 56.1          | 9 x 35            | 0.75          | 13.8 x 23.6 x 43.3               | 225                 | 93                |
| 785HE-100C | 30,000                 | 25,000                          | 15,000        | 10.0          | 2.4            | 48.6                               | 69.5          | 10 x 35           | 1.00          | 13.8 x 23.6 x 43.3               | 225                 | 110               |

\*Choose **HIGH EFFICIENCY** to minimize salt usage. Your system will regenerate a little more often but your salt usage can be reduced by 20% compared to the **STANDARD** setting. Choose **STANDARD** when you need to maximize your capacity but still operate the system with good efficiency. Choose **\*\*IRON & MN** if you have problem water containing Iron, Manganese or hardness in excess of 50 gpg. The high salt setting will be needed since these minerals are more difficult to clean out of the resin bed. Note: A resin cleaner will also need to be periodically added to the brine tank to insure proper operation.

See page 24: Res-Up® Feeder Installation Instructions

**Working Temperature:** This unit must be operated at temperatures between 40°F and 110°F (4°C - 43°C).

**Working Pressure:** This water softener must be operated on pressures between 30 psi to 125 psi. If the water pressure is higher than 125 PSI, use a pressure reducing valve in the water supply line to the softener.

Voltage = 120V / 60 Hz

Pipe Size = 3/4" and 1"

- At the stated service flow rates, the pressure drop through these devices will not exceed 15 psig.
- The manufacturer reserves the right to make product improvements which may deviate from the specifications and descriptions stated herein, without obligation to change previously manufactured products or to note the change.

Peak flow rates intended for intermittent use only (10 minutes or less) and are for residential applications only. Do not use peak flow rate for commercial applications or for a continuous rate when treated water supplies are geothermal heat pump, swimming pool, etc.

For satisfactory operation, the pumping rate of the well system must equal or exceed indicated backwash flow rate.

All units come with plastic bypass

**\*\*Maximum Iron** = 2.0 ppm ferrous (clear water iron)

**Maximum Hydrogen Sulfide** = 0.0 ppm

**Maximum Manganese** = .75 ppm

**pH** = 6.5 to 8.5 with no iron present with iron present 6.5 - 7.5



## CAUTION!

Do not use where the water is microbiologically unsafe or with water of unknown quality without adequate disinfection before or after the unit.

## \*\*NOTE

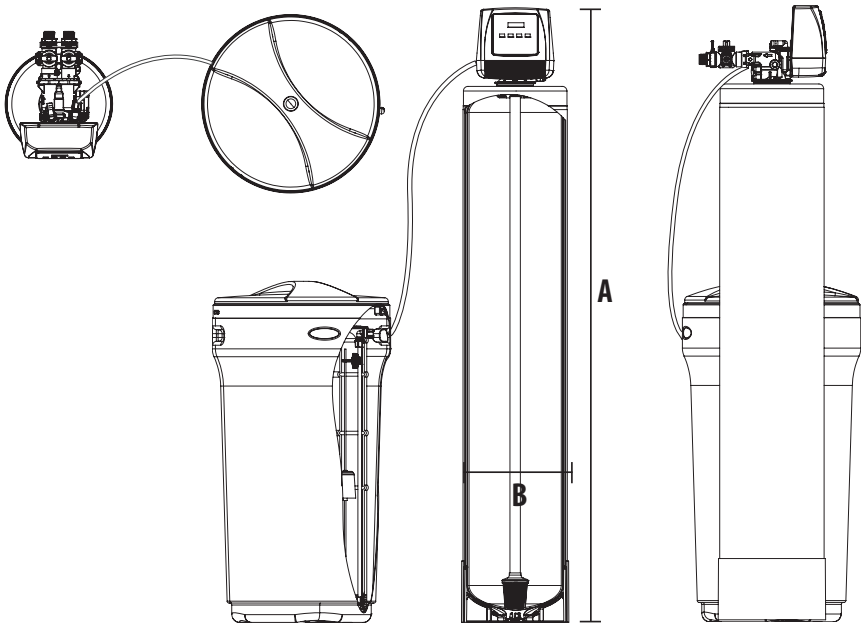
### SET HARDNESS

This value is the maximum compensated water hardness in grains per gallon of the raw water supply. It is used to calculate the system capacity. If Ferrous Iron is present add 4 gpg for every 1 ppm of Ferrous Iron, 8 gpg for Ferrous Manganese.

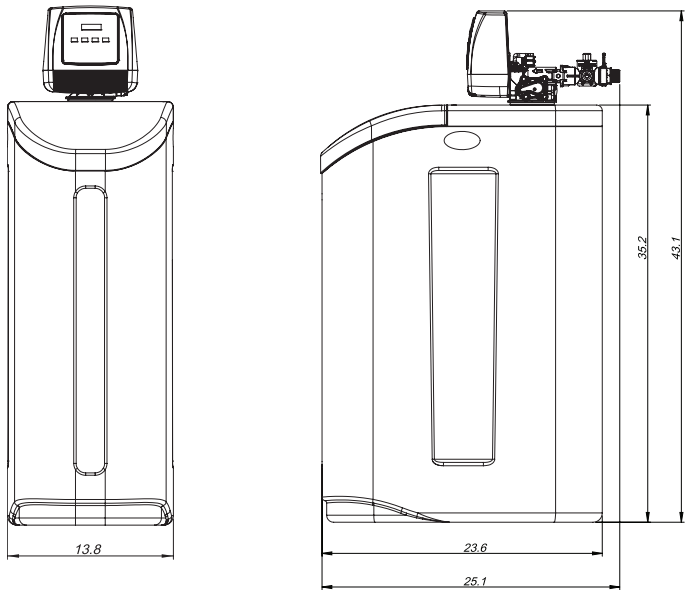
# SYSTEM DIMENSIONS

|           | A   | B   |
|-----------|-----|-----|
| 785HE-75  | 44  | 8"  |
| 785HE-100 | 48" | 9"  |
| 785HE-150 | 54" | 10" |
| 785HE-200 | 52" | 12" |
| 785HE-250 | 54" | 13" |
| 785HE-300 | 65" | 14" |

Twin Tank Model



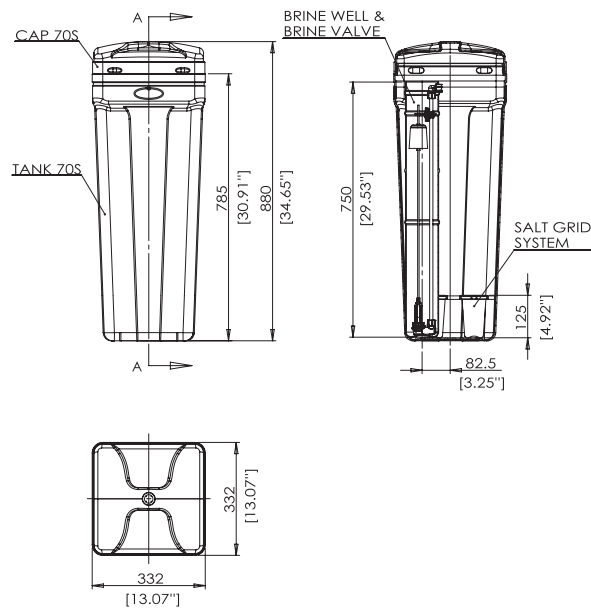
Cabinet Model



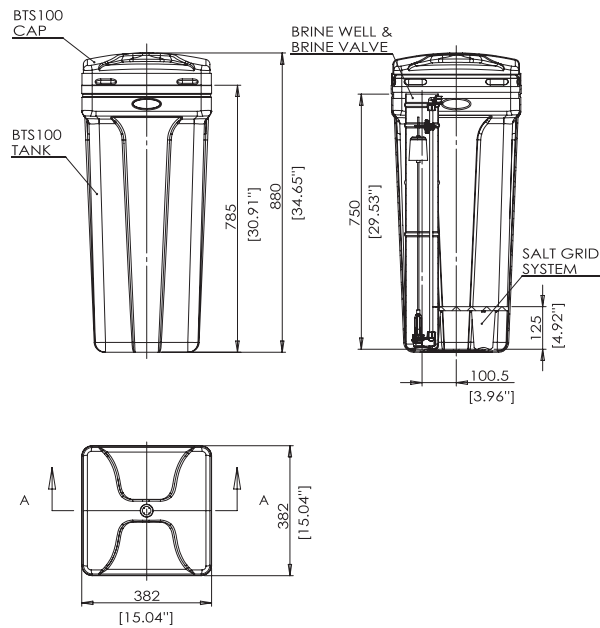
# BRINE TANK DIMENSIONS

| Model                                                              | Color   | Liquid Volume |        | Tank Dimensions<br>(inches) | Salt Capacity |       |
|--------------------------------------------------------------------|---------|---------------|--------|-----------------------------|---------------|-------|
|                                                                    |         | US Gal        | Liters | L x W x H                   | Lbs           | Kg    |
| Brine Tanks                                                        |         |               |        |                             |               |       |
| BTR-70                                                             | Black   | 20.3          | 76.5   | 15.8 x 32.1                 | 185.0         | 92.8  |
| BTR-70                                                             | Blue    | 20.3          | 76.7   | 15.8 x 32.1                 | 185.0         | 92.8  |
| BTR-100                                                            | Vanilla | 29.5          | 111.5  | 18.1 x 34.7                 | 270.0         | 122.2 |
| BTR-100                                                            | Black   | 29.5          | 111.5  | 18.1 x 34.7                 | 270.0         | 122.2 |
| BTR-100                                                            | Blue    | 29.5          | 111.5  | 18.1 x 34.7                 | 270.0         | 122.2 |
| BTR-145                                                            | Black   | 42.3          | 159.7  | 20.3 x 37.4                 | 385.0         | 174.2 |
| BTR-200                                                            | Grey    | 53.0          | 200.3  | 23.0 x 40.5                 | 700.0         | 316.7 |
| BTS-70                                                             | Black   | 19.0          | 71.8   | 13.1 x 13.1 x 34.7          | 175.0         | 92.8  |
| BTS-70                                                             | Blue    | 19.0          | 71.8   | 13.1 x 13.1 x 34.7          | 175.0         | 92.8  |
| BTS-100                                                            | Vanilla | 25.0          | 94.5   | 15.0 x 15.0 x 34.7          | 230.0         | 104.1 |
| BTS-100                                                            | Black   | 25.0          | 94.5   | 15.0 x 15.0 x 34.7          | 230.0         | 104.1 |
| BTS-100                                                            | Blue    | 25.0          | 94.5   | 15.0 x 15.0 x 34.7          | 230.0         | 104.1 |
| * All brine tanks come with salt grid, safety float and brine well |         |               |        |                             |               |       |

## Dimensions BTS70

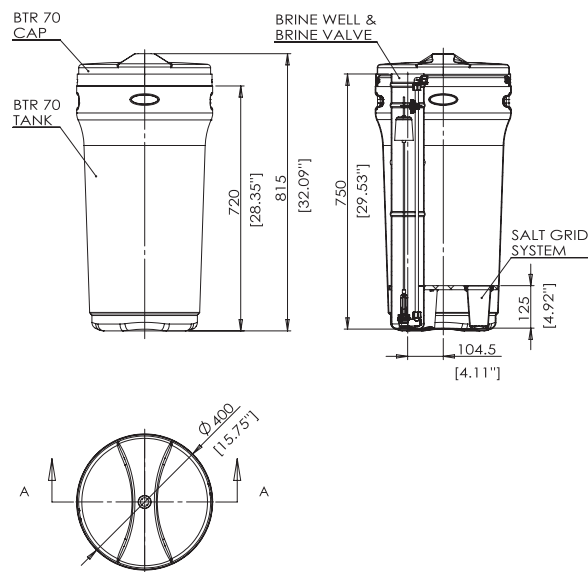


## BTS100

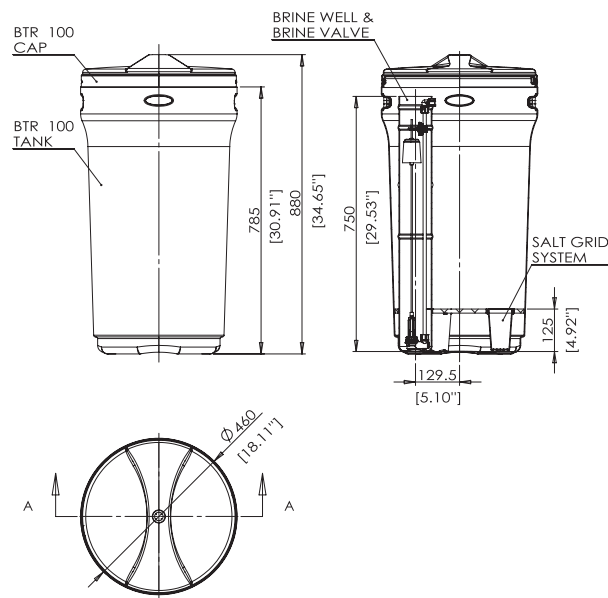


# BRINE TANK DIMENSIONS

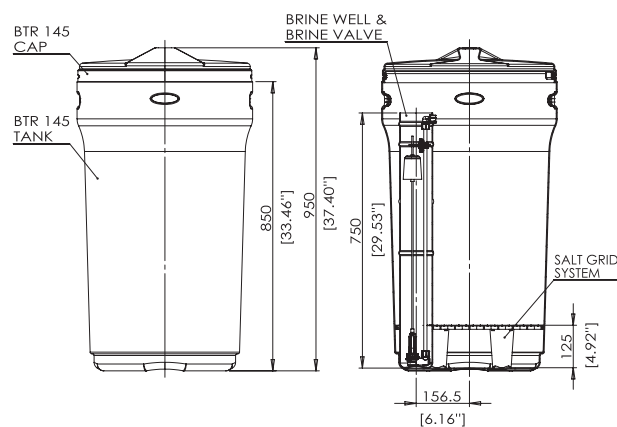
BTR70



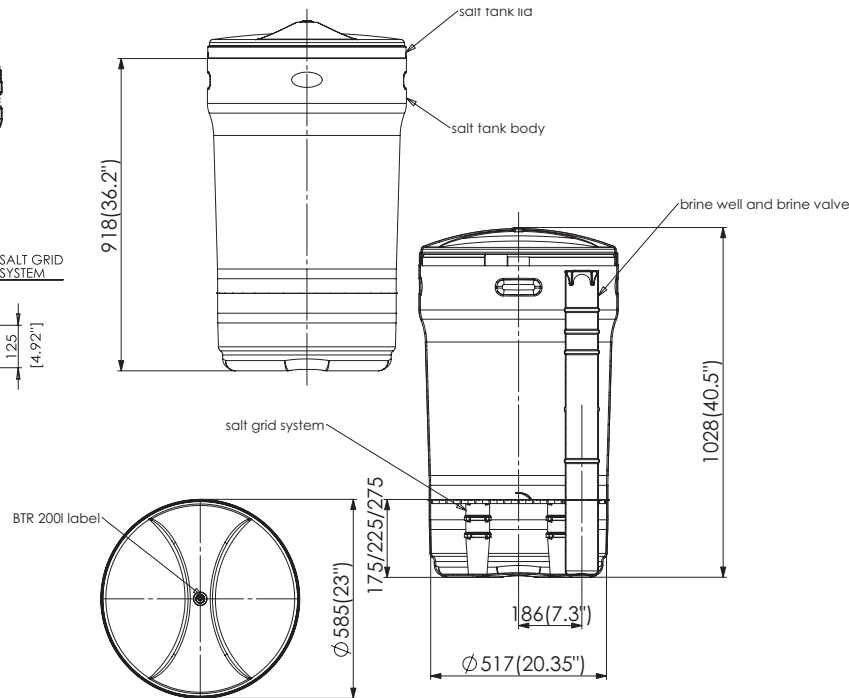
BTR100



BTR145



BTR200



# UNPACKING / INSPECTION OF TWIN TANK MODEL

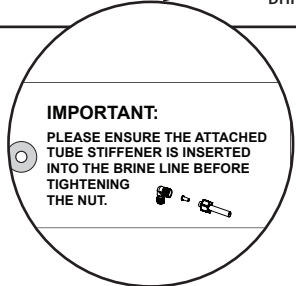
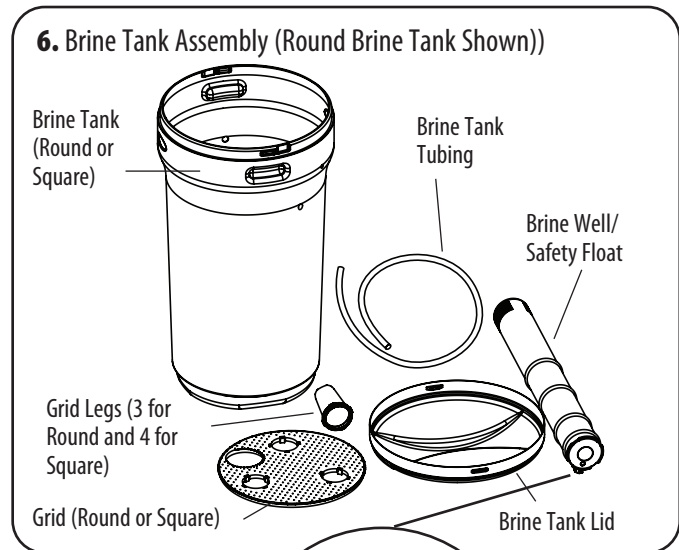
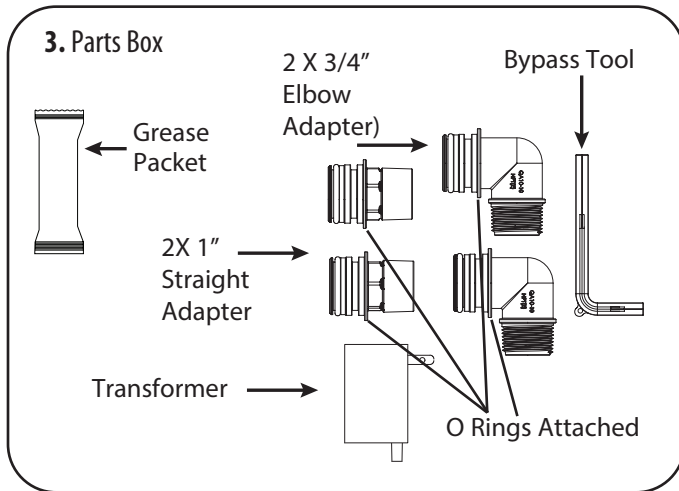
Be sure to check the entire unit for any shipping damage or parts loss. Also note damage to the shipping cartons. Contact the transportation company for all damage and loss claims. The manufacturer is not responsible for damages in transit.

Small parts, needed to install the Softener, are in a parts box. To avoid loss of the small parts, keep them in the parts bag until you are ready to use them.

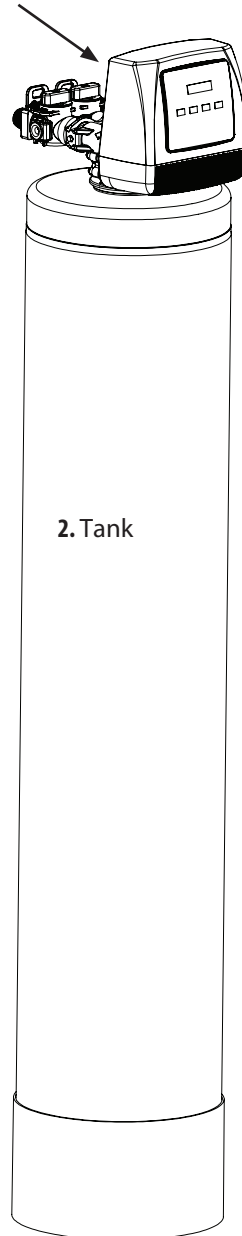
## What is included in the box?

For Models 75,100,150, 200, you will expect the following:

1. Control Valve
2. Tank
3. Parts Box
4. Owners Manual
5. Drain Hose & Clamp (Not included in some brands)
6. Brine Tank Assembly

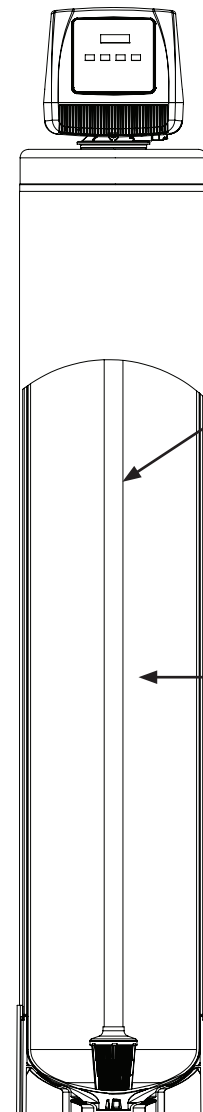
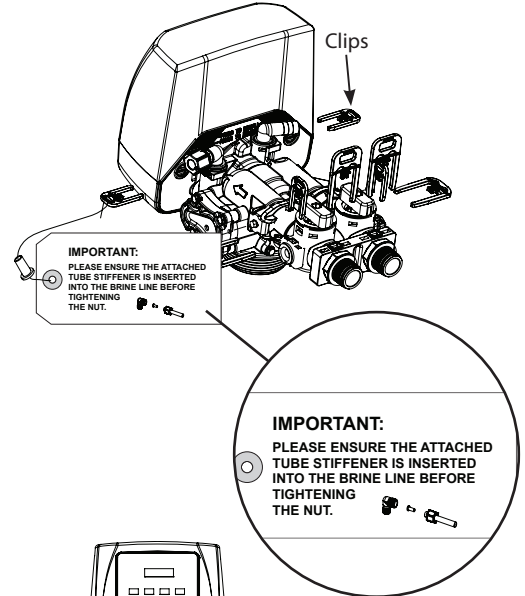


1. Control Valve



2. Tank

There are 8 Red clips. Please check to make sure you have all of them.



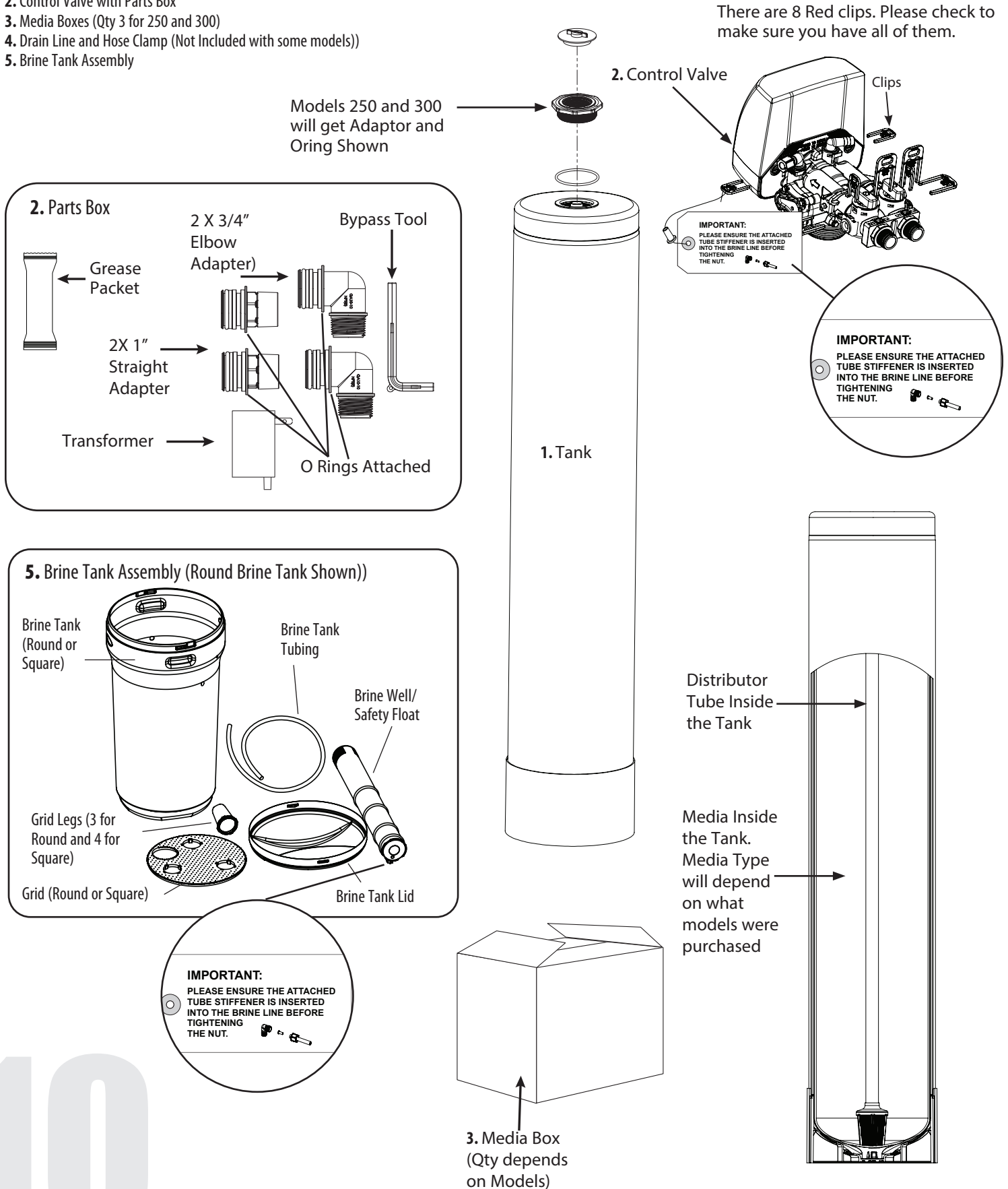
Distributor Tube Inside the Tank

Media Inside the Tank. Media Type will depend on what models were purchased

## For Models 250 and 300 the media and Control Valve is packaged separately in carton and bags

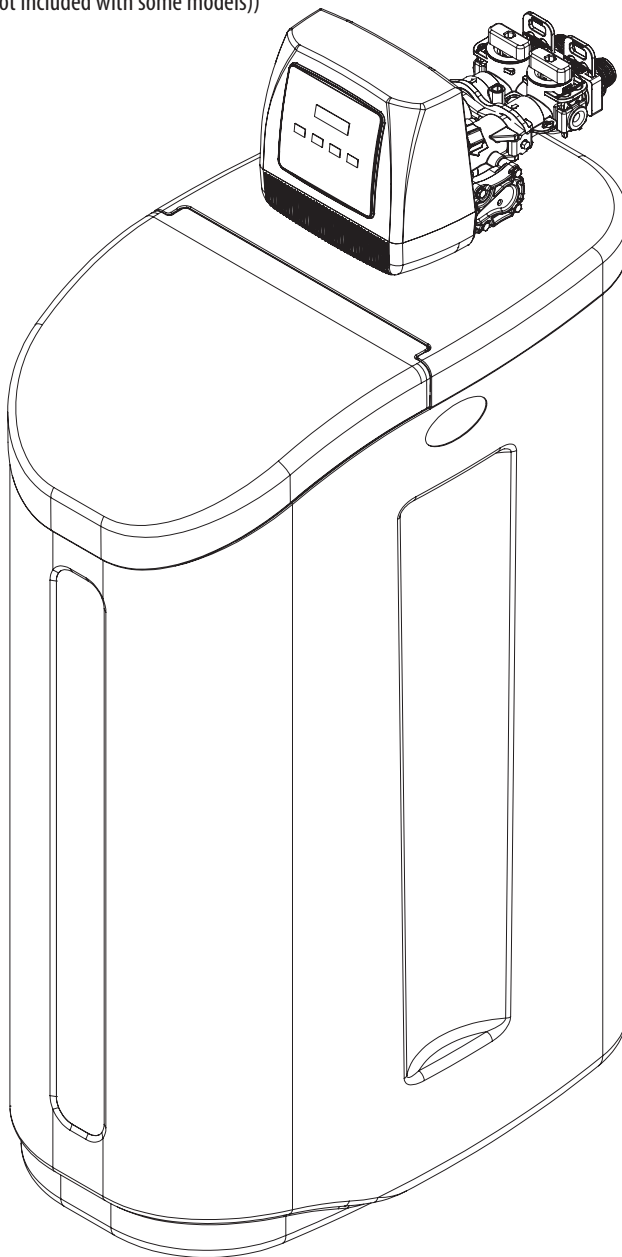
### What is included with 250 and 300 models?

1. Tank (Model 250 and 300 will get an Adapter and Oring attached to the tank)
2. Control Valve with Parts Box
3. Media Boxes (Qty 3 for 250 and 300)
4. Drain Line and Hose Clamp (Not Included with some models)
5. Brine Tank Assembly



# UNPACKING / INSPECTION OF CABINET MODEL

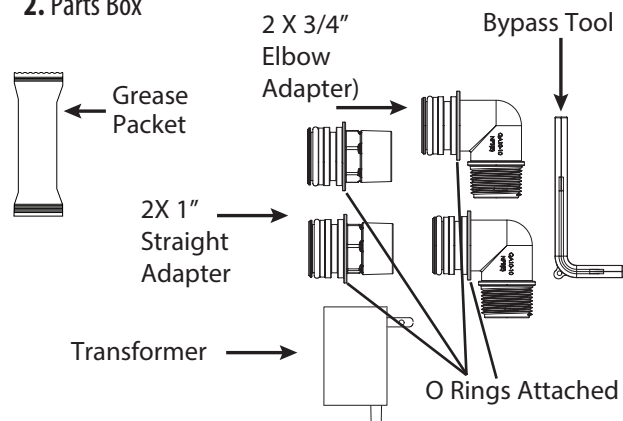
1. Cabinet with Valve attached
2. Parts Box
3. Drain Line and Hose Clamp (Not Included with some models))



## NOTE

Due to transportation and climatic conditions all connections including the valve to the tank need to be checked at time of installation and tightened if necessary.

## 2. Parts Box



# FIND AND RECORD VALVE TYPE & SERIAL NUMBERS

There are two labels located on your Unit: **1)** Control valve label and **2)** Model number label. Find and record your product model number, serial number, and valve serial number in the **Records & Contacts** section as they will be important if you need to troubleshoot.



Valve Serial # \_\_\_\_\_



Model # \_\_\_\_\_

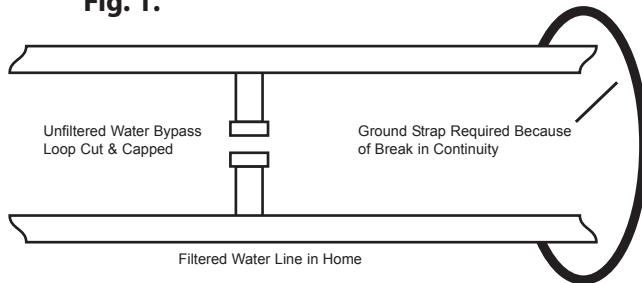
System Serial # \_\_\_\_\_

# BEFORE INSTALLATION

Make sure you have a copy of your most recent water test results. If your water has not been tested previously you can contact your supplier of this product to obtain a water sample bottle to be sent to one of our facilities for a free analysis. **It is important that this product not be installed until you have this information.**

In all cases where metal pipe was originally used and is later interrupted by poly pipe or the Noryl bypass valve or by physical separation, an approved ground clamp with no less than #6 copper conductor must be used for continuity, to maintain proper metallic pipe bonding.

Fig. 1.



## Inspecting and Handling Your 785HE Softener\*

Inspect the equipment for any shipping damage. If damaged, notify the transportation company and request a damage inspection. Damage to cartons should also be noted.

Handle the softener unit with care. Damage can result if it is dropped or set on sharp, uneven projections on the floor.

Do not turn the softener unit upside down.

## To Ensure this Product Functions Properly:

**Your feed water line size to the unit must be a minimum of 1/2 inch with an operating pressure of no less than 30 psi and no more than 125 psi.**

## MECHANICAL:

Do not use petroleum based lubricants such as petroleum jelly, oils or hydrocarbon based lubricants. Use only 100% silicone lubricants (grease packet provided in parts kit). All plastic connections should be hand tightened only. Teflon tape may be used on connections that do not use an O-ring seal. Do not use pliers or pipe wrenches except where indicated by Nut shape (eg. pipe adapters) All plumbing must be completed according to local codes. Soldering connections should be done before connecting any pieces to the pipe as excessive heat can damage them.

## Tools Required for Installation:

**NOTE: We recommend installation only be completed by a competent installer or plumbing professional to insure this product is installed in accordance with local plumbing codes.**

- ▶ Two adjustable wrenches
- ▶ Additional tools may be required if modification to home plumbing is required.
- ▶ Plastic inlet and outlet fittings are included with the softener. To maintain full valve flow, 3/4" or 1" pipes to and from the softener fittings are recommended. You should maintain the same, or larger, pipe size as the water supply pipe, up to the softener inlet and outlet.
- ▶ Use copper, brass, or PEX pipe and fittings.
- ▶ Some codes may also allow PVC plastic pipe.
- ▶ ALWAYS install the included bypass valve, or 3 shut-off valves. Bypass valves let you turn off water to the softener for repairs if needed, but still have water in the house pipes.
- ▶ 5/8" OD drain line is needed for the valve drain. A 10' length of hose is not included with some models.

## NOTE

All government codes and regulations governing the installation of these devices must be observed.



## CAUTION!

If the ground from the electrical panel or breaker box to the water meter or underground copper pipe is tied to the copper water lines and these lines are cut during installation of the Noryl bypass valve and/or poly pipe, an approved grounding strap must be used between the two lines that have been cut in order to maintain continuity. The length of the grounding strap will depend upon the number of units being installed and/or the amount of copper pipe being replaced with plastic pipe.

See Fig. 1.

## NOTE

Check your local electrical code for the correct clamp and cable size.

## NOTE

If a severe loss in water pressure is observed when the filter unit is initially placed in service, the filter tank may have been laid on its side during transit. If this occurs, backwash the filter to "reclassify" the media.

## \*NOTE

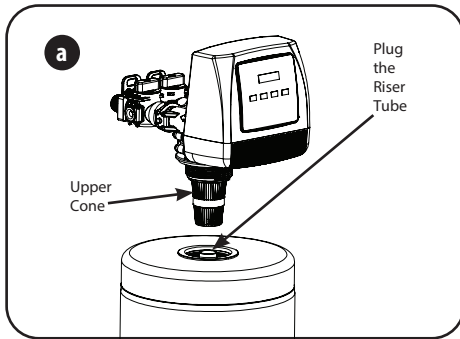
Due to transportation and climatic conditions all connections including the valve to the tank need to be checked at time of installation and tightened if necessary.

# PREPARATIONS

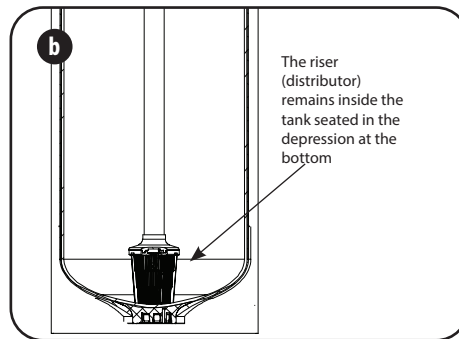
- Media Installation (When Necessary).** Models including and higher than 2 CF (Models 250,300) of media are shipped with separate media in pails or boxes. Models lower than 2 CF of media come loaded with media and this step can be skipped for new installation.



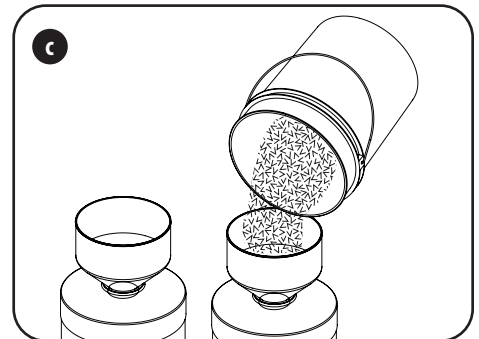
The unit should be depressurized before installing or replacing media



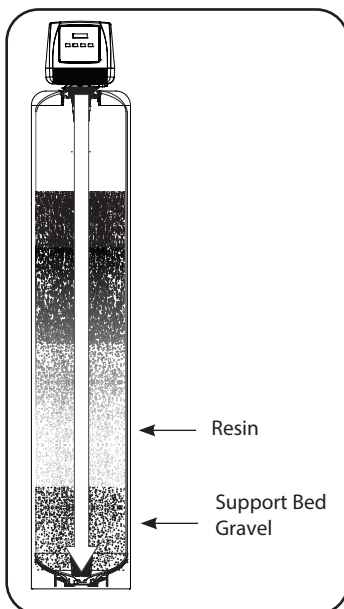
a) Lube the bottom oring (picture d) and attach the upper cone to the valve.



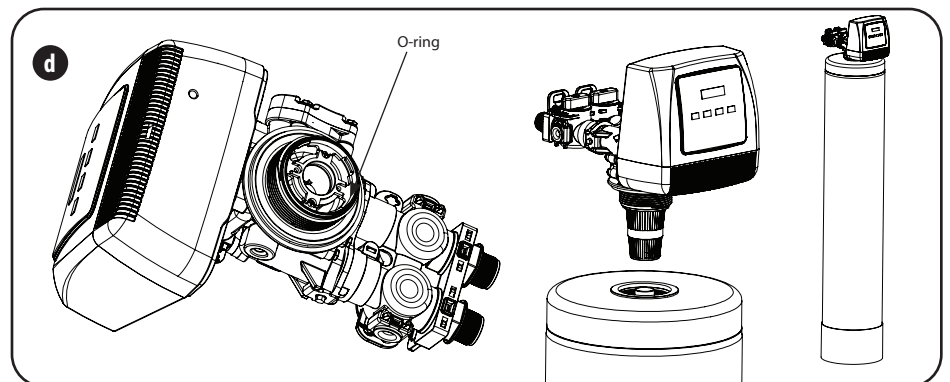
b) Temporarily plug the open end of the riser tube to ensure that no resin or gravel falls down into the distribution. The riser (distributor) remains inside the tank seated in the depression at the bottom. Plug tube with a tape. Remove after media is loaded.



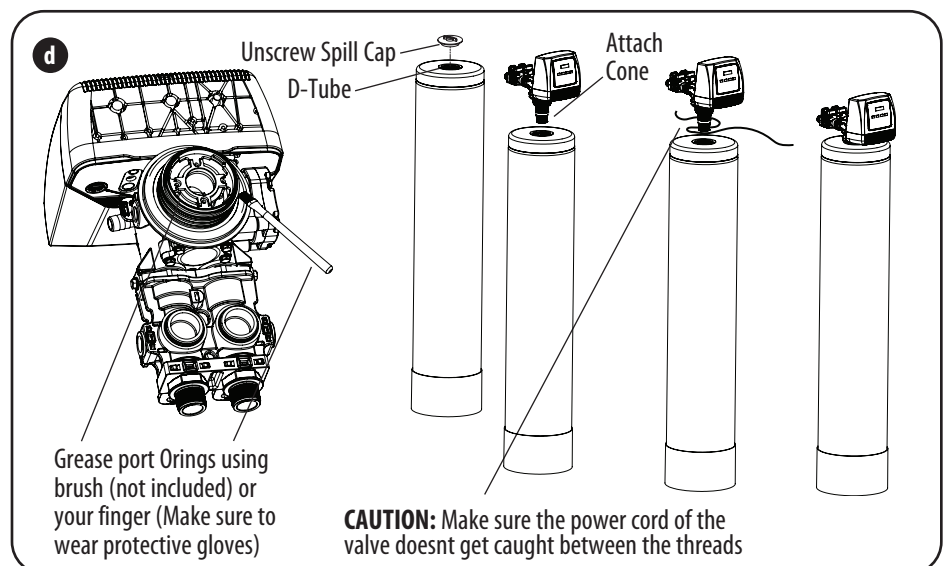
c) Fill support bed first. The media will not always spill down inside the tank and may need to be swept inside. The large funnel (sold separately makes filling the tank easier and neater. (Or an empty 1 gallon or 4 liter container with the bottom cut out makes a good funnel.)



Fill tank one quarter full of water to protect distribution during gravel installation. Place the media into the tank in the order indicated above. Slowly and carefully add the gravel support bed and the filtration media leveling each layer as it is placed into the tank.



d) Unplug the riser tube, carefully position the valve over it and turn the valve into the threads in the fiberglass tank, tightening securely into tank. Note: Ensure that the internal O-ring in the valve fits securely over the riser tube. Silicone grease (part # 92360) or other food grade lubricant may be applied to the O-ring to ease installation of the riser tube.



d) Lube the bottom Valve Orings with the grease supplied, Attach the Upper Cone. Unscrew the spill cap. Carefully Slide the D-Tube inside the Valve and Screw the Valve inside the Tank such that the power cord doesn't get caught between the valve and the tank.



Make sure that the unit is de-pressurized before conducting this task.



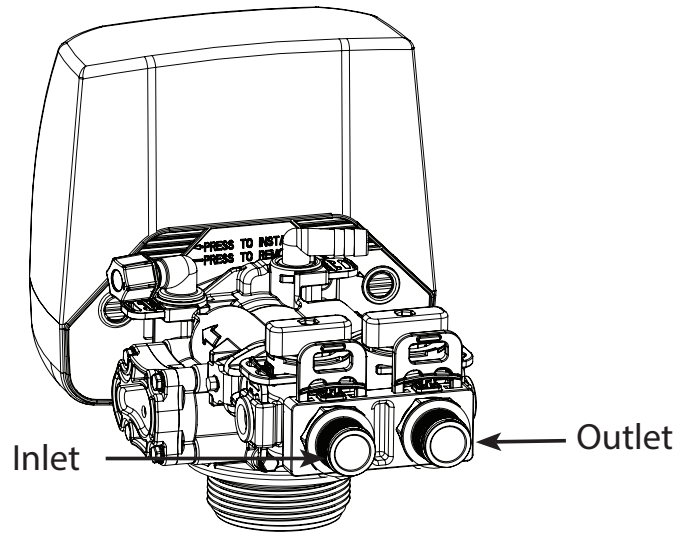
DO NOT use petroleum based lubricants as they will cause swelling of O-ring seals.



# PREPARATIONS

1. Determine the best location for your water filter, bearing in mind the location of your water supply lines, drain line and 120 volt AC electrical outlet. Subjecting the filter to freezing or temperatures above 43°C (110°F) will void the warranty.

Please notice the inlet and outlet valves as shown here to determine the position of the equipment:



## Facts to Remember When Planning Your Installation

1. All installation procedures must conform to local and state or provincial plumbing codes.
2. Outside faucets used to water lawns and gardens should not supply untreated water, replace untreated water with feed water to the unit. If necessary to do this please install check valve, see page 14. A new water line is often required to be connected to supply untreated water to the inlet of the water filter and to the outside faucets.
3. Make sure the bypass is attached well to the control valve. Connect the straight or elbow connectors to the bypass with red clips. Connect the inlet and outlet of the water filter to the plumbing of the house. The control valve must not be submitted to temperatures above 43°C (110°F). When sweat fittings are used, to avoid damaging the control valve, solder the threaded copper adapters to the copper pipe and then, using Teflon tape, screw the assembly into the bypass valve.  
Do not use pipe thread compound as it may attack the material in the valve body.
4. Apply Teflon Tape and Orings to the fittings
5. Connect Filter to the house plumbing. Any solder joints near the valve must be done before connecting any piping to the valve. Always leave at least 6" (152 mm) between the valve and joints when soldering pipes that are connected to the valve. Failure to do this could cause damage to the valve.
6. **Drain Line connection:** Using Teflon tape, screw the 1/2" hose barb and attach oring into the drain port in the valve. Attach 1/2" drain hose (Supplied with some models and brands) to the hose barb and tighten securely with a hose clamp (Supplied with some models and brands). Run the drain line to a floor drain or a laundry drain. Complete any necessary plumbing.
7. Using the Allen Key (included), place the unit in the bypass position. Slowly turn on the main water supply. At the nearest cold treated water tap nearby remove the faucet screen, open the faucet and let water run a few minutes or until the system is free of any air or foreign material resulting from the plumbing work.
8. Make sure there are no leaks in the plumbing system before proceeding. Close the water tap when water runs clean.
9. Open the brine tank / cabinet salt lid and add water until there is approximately 3" (75 mm) of water in the tank. Do not add salt to the brine tank at this time.

### NOTE

If the plumbing system is used as the ground leg of the electric supply, continuity should be maintained by installing ground straps around any nonconductive plastic piping used in installation.

### NOTE

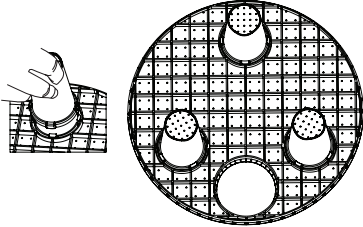
Before starting installation, read page 16, Plumbing System Clean-Up, for instructions that may need to be performed first.

## 2. Water Lines

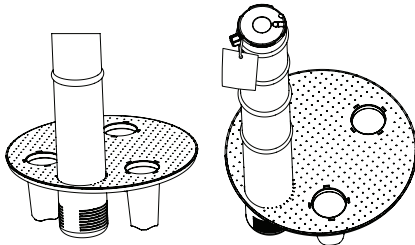
Outside faucets used to water lawns and gardens should not supply softened water. A new water line is often required to be connected to supply hard water to the inlet of the water softener and to the outside faucets. Cut the water line between where it enters the house and before any lines that branch off to feed the hot water heater or other fixtures in the house and as near the desired location of the water softener as possible. Install a tee fitting on the feed end of the cut pipe, and an elbow fitting on the other end. Install piping from the tee to the inlet of the water softener and from the elbow to the outlet of the softener. To sever the water lines which branch off to feed any outside faucets, cut the branch lines approximately two inches from the fitting on the main water line. Install an elbow on the end of the pipe nearest the outside faucet and a cap on the end connected to the existing water line. Install piping from the tee installed on the inlet line to the water softener to the elbow installed on the pipe to the outside faucet. Following this procedure will result in all lines in the house, with the exception of the outside faucets, but including the water heater and therefore the hot water lines, being supplied with soft water.

# INSTALLING BRINE TANK

- a) Attach the three brine grid legs to grid plate. The legs will snap on to the tabs of the salt plate making a "click" sound. For square brine tank there are four legs.)



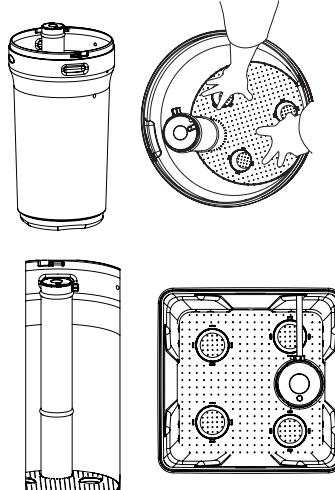
- b) Insert the brine well assembly inside the grid plate as well below.



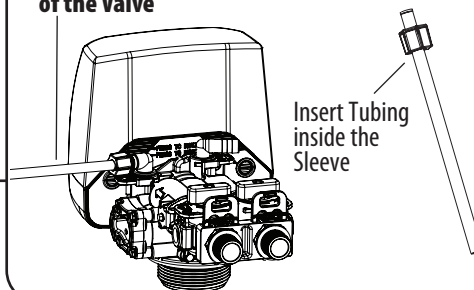
- c) Drop the brine grid with brine well inside the brine tank such that the nut fitting faces the hole on the brine tank. Then press the grid evenly inside the brine tank until the brine grid legs touches the bottom of the brine tank.

**IMPORTANT:**  
IN ROUND  
BRINE TANK, IT  
IS IMPORTANT  
TO ALIGN THE  
HANDLE TO  
THE BRINE  
WELL AS  
SHOWN

The hole in  
the brine tank  
should line up  
with the brine  
line as shown  
for round and  
square brine  
tank.

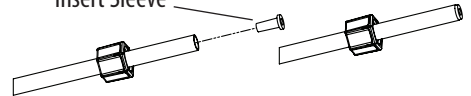


## Attaching Brine Tubing to the Brine Line of the Valve

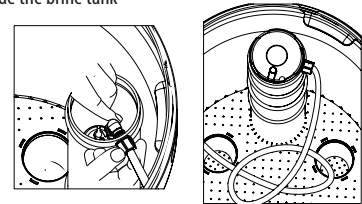


- d) Take the brine tube and insert the nut and plastic sleeve as shown below.

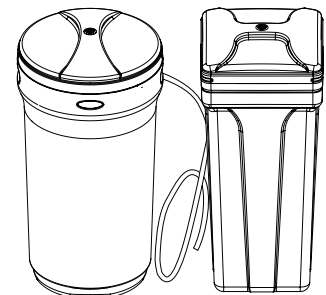
Insert Sleeve



- e) Insert the tube in the float assembly elbow and hand tighten the nut. In many cases the brine line already come installed from the factory. Leave the other end of the brine line tube inside the brine tank



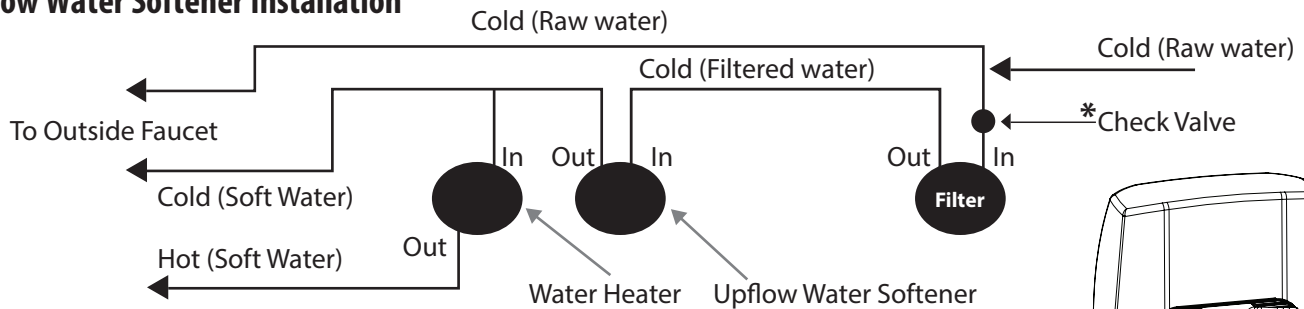
- f) For installation of brine tank at the installation site, pull the other end of the brine tube from the hole on the brine tank. The completed assembly is shown below.



# WATER SOFTENER INSTALLATION

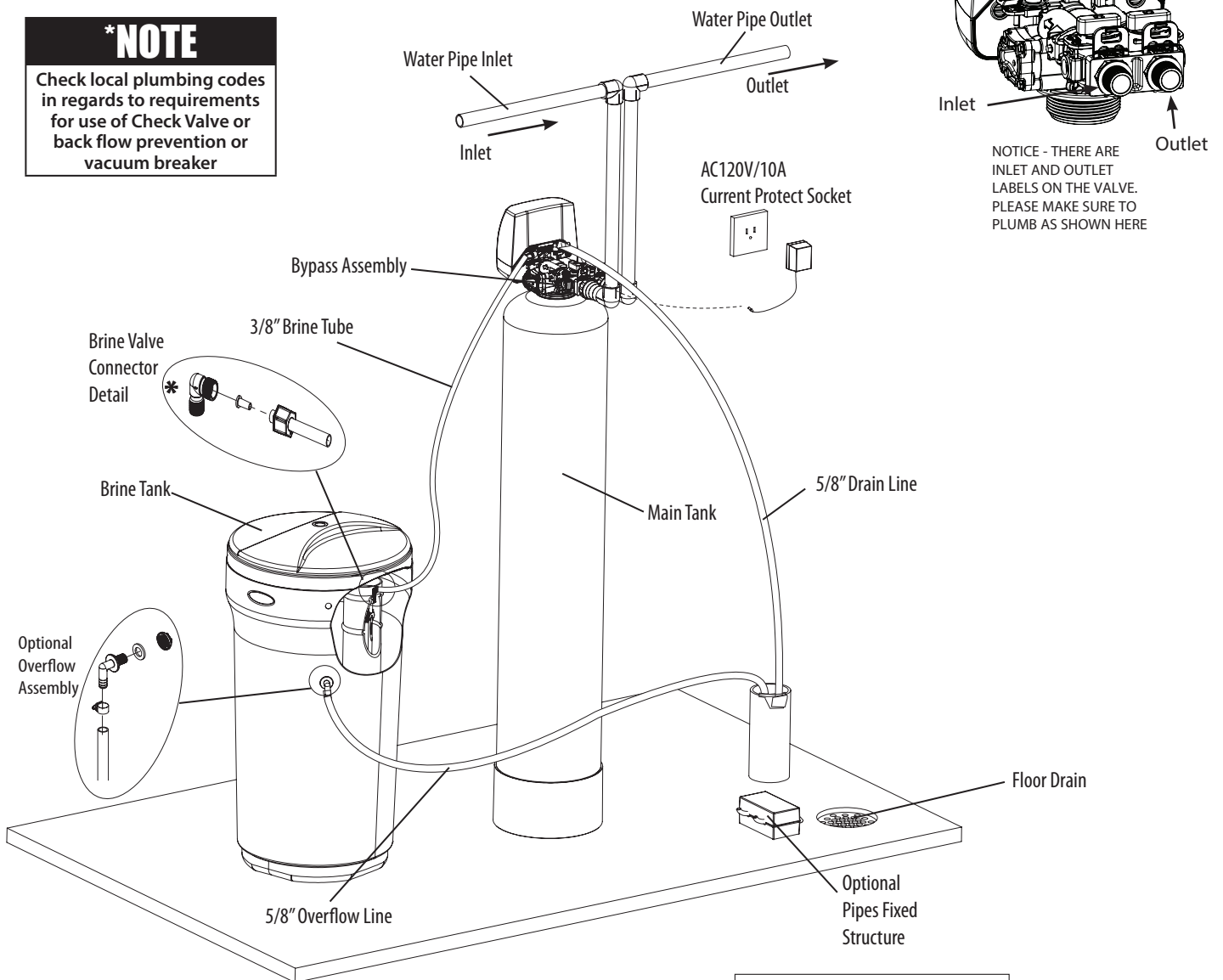
**Connect Softener to the House Plumbing** Any solder joints near the valve must be done before connecting any piping to the valve. Always leave at least 6" (152 mm) between the valve and joints when soldering pipes that are connected to the valve. Failure to do this could cause damage to the valve.

## Upflow Water Softener Installation



### \*NOTE

Check local plumbing codes in regards to requirements for use of Check Valve or back flow prevention or vacuum breaker



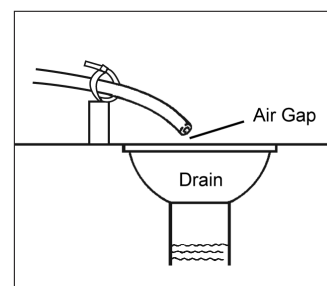
### NOTE

Waste connections or drain outlet shall be designed and constructed to provide for connection to the sanitary waste system through an air-gap of 2 pipe diameters or 1 inch (22 mm) whichever is larger.



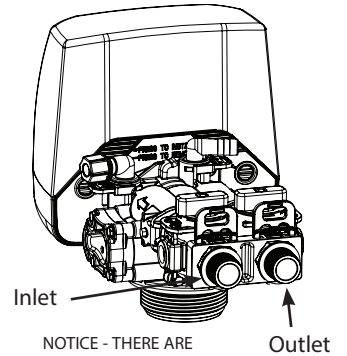
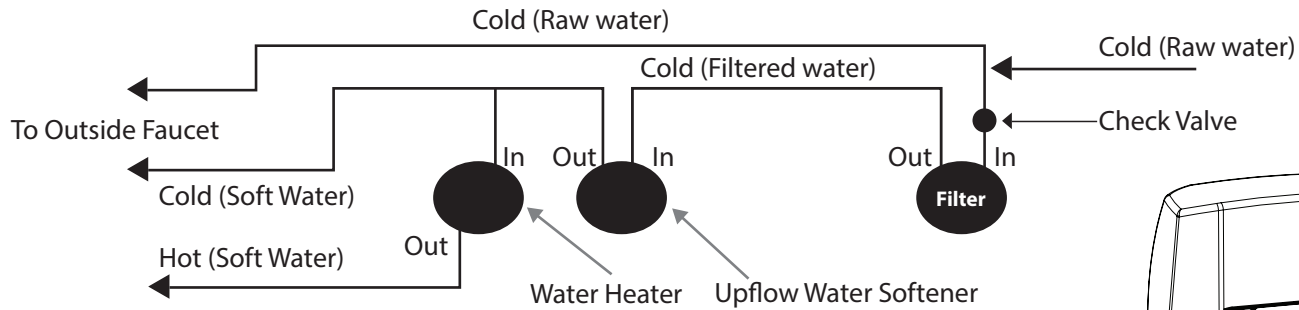
### CAUTION!

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



**Connect Softener to the House Plumbing** Any solder joints near the valve must be done before connecting any piping to the valve. Always leave at least 6" (152 mm) between the valve and joints when soldering pipes that are connected to the valve. Failure to do this could cause damage to the valve.

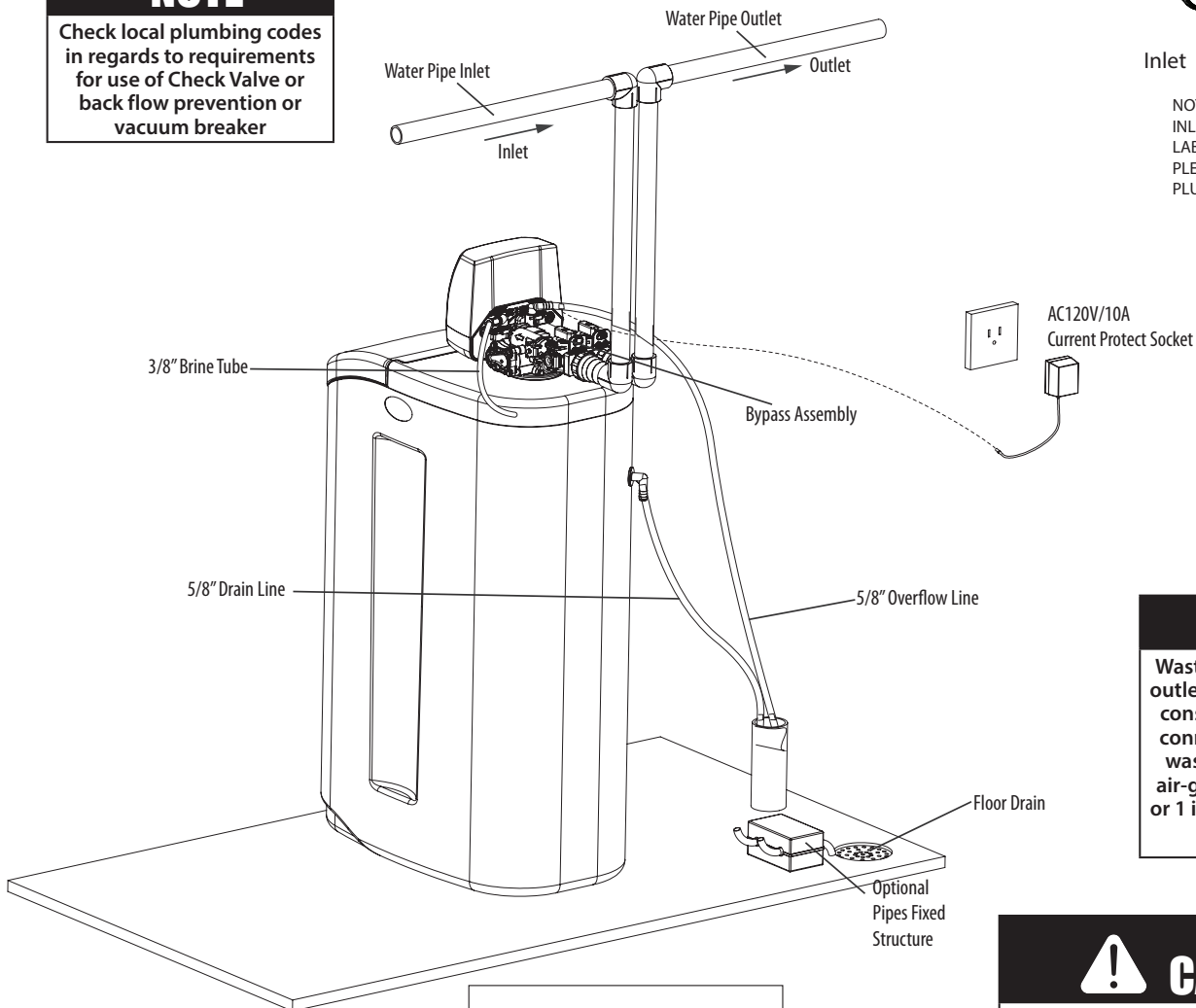
## Upflow Water Softener Installation



NOTICE - THERE ARE  
INLET AND OUTLET  
LABELS ON THE VALVE.  
PLEASE MAKE SURE TO  
PLUMB AS SHOWN HERE

## \*NOTE

**Check local plumbing codes in regards to requirements for use of Check Valve or back flow prevention or vacuum breaker**



## NOTE

**Waste connections or drain outlet shall be designed and constructed to provide for connection to the sanitary waste system through an air-gap of 2 pipe diameters or 1 inch (22 mm) whichever is larger.**



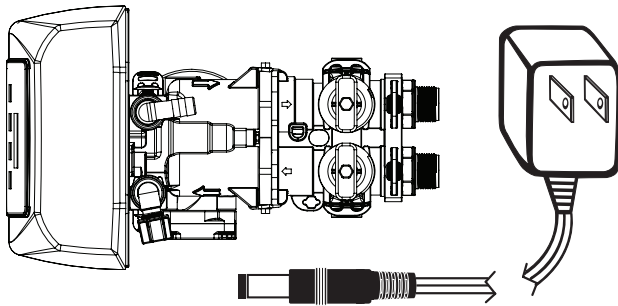
## CAUTION!

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

# STARTUP INSTRUCTIONS

## 1. Connect the Transformer to the Valve

Plug the 12-volt transformer into a 120 VAC 60 Hz outlet.



## 2. Add Water to Brine Tank

Open the brine tank /cabinet salt lid and add water as per the chart below. Do not add salt to the brine tank at this time.

BT-100 - 2.5 US Gallons

BT-145 - 3.25 US Gallons

BT-200 - 5.5 US Gallons

## 3. Manually Regenerate the Valve

Manually step the valve to the BACKWASH position. If screen is locked, press **MENU** Key for 3 seconds to unlock.

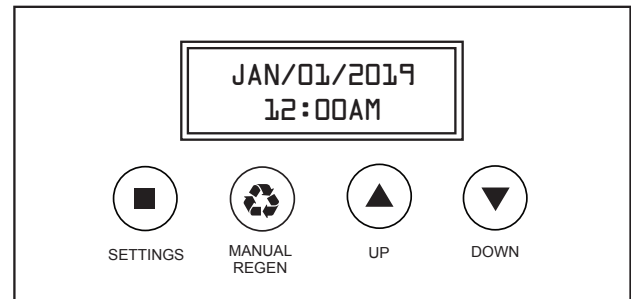
Manually Regenerate the Valve and move it to backwash position.

Press **SET/REGEN** Button for 3 seconds. Press **SET/REGEN** Button once to select delayed or immediate regeneration.

Use Up and Down Arrows  $\wedge \vee$  to Select. Immediate and Press **SET/REGEN** Key Press **MENU** Button to exit and start Regen

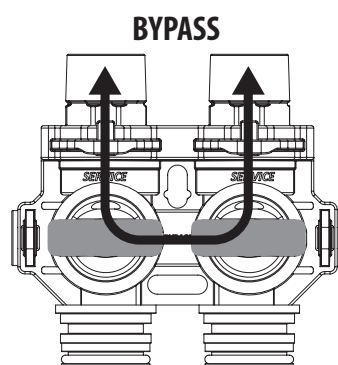
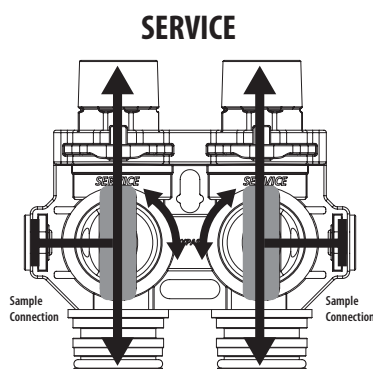
### Screen Display

#### Button Configuration:



#### Key Pad Setting

- SETTINGS** This function is to enter the basic set up information required at the time of installation.
- MANUAL REGEN** This function is to initiate an immediate or delayed manual regeneration.
- DOWN / UP** Increase or decrease the value of the settings while in the programming mode.



**MANUAL REGEN**  
Delay Immediate

**BACKWASH**  
BRINE DRAW  
RINSE (SKIP)  
REFILL (SKIP)

#### BACKWASH

||||| 15 Minutes

#### BRINE DRAW

||||| 50 Minutes

# STARTUP INSTRUCTIONS (CONTINUED)

## 3. Manually Regenerate the Valve (Continued)

- 3a. Open the inlet on the bypass valve slowly and allow water to enter the unit. (The outlet of the bypass should remain closed to prevent any fines or debris from entering the plumbing system. Allow all air to escape from the unit before turning the water on fully then allow water to run until the drain water appears to be clear of any fines or color.
- 3b. Plug in the valve. Allow the valve to continue its cycles until complete and back in service. Allow the valve to stay in each position for 2 - 3 minutes to purge air from the system and the valve. Failure to properly purge the system may result in unsatisfactory performance. This process can be performed more than once if necessary to purge air and color or fines from the system before finishing start up. Once the system is purged properly you can open the outlet of the bypass valve. Because your plumbing system has been disturbed it is advisable to remove screens from faucets and flush all lines until clear. **See Plumbing System Clean-Up on page 21.**
- 3c. The Valve is already programmed from factory. Please set up date and time of day and feedwater hardness and people as shown below: **(See below for Key Pad Configuration)**

## Calculating Compensated Hardness for Water where Iron or Manganese is Present

From your water analysis.

Iron x 4 = grains of hardness and or Manganese x 8 = grains of hardness. These numbers can be found on your water analysis report, and the equivalent grains of hardness should be added to your total hardness number. The new sum of these numbers is the hardness to be entered during programming below.

EG

Iron = 0.5 ppm x 4 = 2.0 gpg

Mang = 0.3 x 8 = 2.4 gpg (always round up) = 3.0 gpg

Hardness = 15 gpg + 2.0 (compensated iron) + 3.0 (compensated manganese) = 20 gpg  
enter 20 as the hardness when programming below.

Iron \_\_\_\_\_ x 4 + Manganese x 8 \_\_\_\_\_ + Hardness = Total Hardness \_\_\_\_\_

### NOTE

All units are factory programmed for the correct size and regeneration cycle, alteration should only be done by a factory trained technician or after consultation with one of our technical representatives if you have any questions please call: **1-877-288-9888**

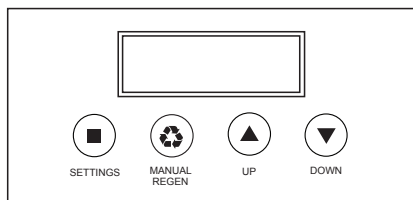
## 4. Power and Program Valve

### Key Pad Configuration

**SETTINGS** This function is to enter the basic set up information required at the time of installation.

**MANUAL REGEN** This function is to initiate an immediate or delayed manual regeneration.

**DOWN / UP** Increase or decrease the value of the settings while in the programming mode.



### Settings

Press **SETTINGS** key  
(3 SECONDS / BEEP)

TIME OF DAY  
12:01 PM

Press **SETTINGS** key

YEAR  
2016

Press **SETTINGS** key

MONTH  
AUGUST

Press **SETTINGS** key

DAY  
21

Press **SETTINGS** key

Press **SETTINGS** key

SET HARDNESS  
20 GRAINS

Press **SETTINGS** key

SET PEOPLE  
4

Press **SETTINGS** key

SALT SETTING  
HIGH EFFICIENCY

STANDARD  
IRON & MN

Press **SETTINGS** key

### SALT SETTING

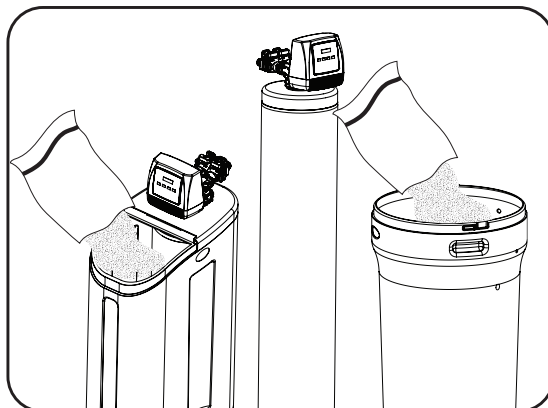
Choose HIGH EFFICIENCY to minimize salt usage. Your system will regenerate a little more often but your salt usage can be reduced by 20% compared to the STANDARD setting. Choose STANDARD when you need to maximize your capacity but still operate the system with good efficiency. Choose IRON & MN if you have problem water containing these minerals. The high salt setting will be needed since these minerals are more difficult to clean out of the resin bed. Note: A resin cleaner will also need to be periodically added to the brine tank to insure proper operation.

### WATER TYPE

This setting will determine if the BACKWASH OVERRIDE function will be on or off. Select MUNICIPAL if the water source is clean (<1NTU turbidity) and the system will skip the back wash cycle based on the setting in BACKWASH OVERRIDE. Select WELL / OTHER if any Iron or Manganese is present or if the water source is not clean (< 1NTU turbidity). The system will back wash every time. his setting determines the time of day to perform a scheduled regeneration.

## 6. Add Salt to the Brine Tank/Cabinet

Put 40 kgs of crystal water softener salt in the brine tank. The unit will automatically fill the water to the correct level when it regenerates.



**Start up and programming complete. Unit is now operational.**

### \*NOTE

#### Resin Cleaner

An approved resin cleaner **MUST** be used on a regular basis if your water supply contains iron.

**See page 24 - Res-Up® Feeder Installation Instructions**

# DURING REGENERATION

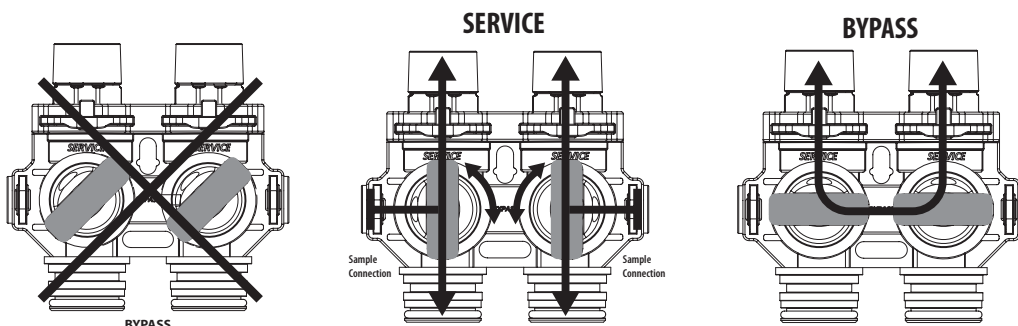
## Automatic Water Bypass

The regeneration cycle lasts approximately 1.5 hours to 3.0 hours depending on the specific model, after which treated water service will be restored. During regeneration, untreated water is automatically bypassed for use in the household. Hot water should be used as little as possible during this time to prevent hard water from filling the water heater.

**IMPORTANT:** This is why the automatic regeneration is set for sometime during the night and manual regenerations should be performed when little or no water will be used in the household.

## Manual Water Bypass

In case of an emergency such as filter maintenance, you can isolate your water filter from the water supply using the bypass valve located at the back of the control. In normal operation the bypass is open with the ON/OFF knobs in line with the INLET and OUTLET pipes. To isolate the filter, simply rotate the knobs clockwise (as indicated by the word BYPASS and arrow) until they lock. You can use your water related fixtures and appliances as the watersupply is bypassing the softener. However, the water you use will be hard. To resume treated service, open the bypass valve by rotating the knobs counterclockwise. **Please make sure bypass knobs are completely open otherwise the unfiltered water could bypass through the valve.**



## New Sounds

You may notice new sounds as your water softener operates. The regeneration cycle lasts approximately 1.5 hours to 3.0 hours depending on the specific model. During this time, you will be able to hear water running intermittently to the drain, depending on proximity of the unit to sleeping area and time of regeneration.

# PLUMBING SYSTEM CLEAN-UP

The following procedures are guidelines only but have proven successful in most instances. Under no circumstances should any procedure outlined below be followed if contrary to the appliance manufacturer's instructions. Should there be any questions concerning the advisability of performing a procedure, it is strongly recommended the manufacturer's authorized service outlet be consulted prior to performing the procedure.

## Water Heater

If the water heater has been exposed to both iron and hardness for a long period of time, replacement of the heater tank maybe the only practical solution to prevent continued staining originating from this source. After completing the installation of the conditioner, clean the water heater by following these instructions:

1. Shut off energy supply to water heater and close heater inlet water valve.
2. Drain hot water tank completely. Open inlet water valve allowing heater tank to be refilled with iron-free water. Continue flushing until water runs clear to drain.
3. If, after approximately 30 minutes flushing, water does NOT clear, terminate flushing operation. Refill hot water heater with water and pour approximately 1/2 gallon of household bleach into top of heater tank. Allow bleach solution to stand in tank for 20 to 30 minutes. Flush tank

## Dishwasher

Consult owners' handbook and follow manufacturer's instructions.

## Toilet Flush Tanks

Prior to commencing installation of the filter system, pour 4 to 6 ounces of resin mineral cleaner Pro-Rust Out or or other suitable cleaner such as CLR that contains a mild acid into flush tanks and bowls and let stand. When installation is completed, flush toilets several times with conditioned water. If stains or deposits return check that lines are connected to treated water. Repeat procedure until clear. again until water is clear at drain. Turn energy supply on.

### NOTE

If water does not clear in approximately 10 minutes, water heater should probably be replaced.

# MAINTENANCE INSTRUCTIONS AND SCHEDULE

## Service Schedule

- The seals and spacers along with the piston assembly should be inspected/cleaned or replaced every year depending on the inlet water quality and water usage on clean municipal supplies every 2 - 3 years should be sufficient but the first check should be done after 1 year. See inspection and replacement of Piston assembly and seal and spacer kit, page 26.
- The injectors should be cleaned/inspected or replaced every year depending on the water quality and use. See Clean Injector Assembly, page 27.
- **Maintenance Kit (60010565)** should be used for servicing control on an annual basis. The maintenance kit consists of piston assembly, seals and spacers, injectors.

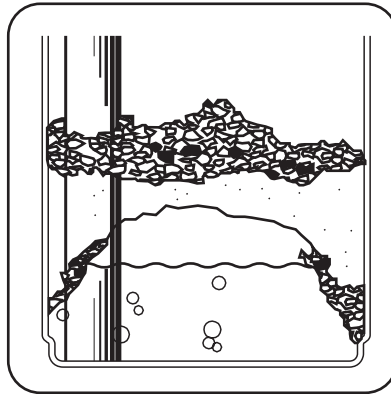
Maintenance of your new water conditioner requires very little time or effort but it is essential. Regular maintenance will ensure many years of efficient and trouble free operation.

**FAILURE TO FOLLOW BASIC MAINTENANCE SCHEDULE WILL RESULT IN THE UNIT FAILING TO OPERATE PROPERLY AND VOID YOUR WARRANTY.**

## Bridging

Humidity or the wrong type of salt may create a cavity between the water and the salt. This action, known as "bridging", prevents the brine solution from being made, leading to your water supply being hard.

If you suspect salt bridging, carefully pound on the outside of the plastic brine tank or pour some warm water over the salt to break up the bridge. This should always be followed up by allowing the unit to use up any remaining salt and then thoroughly cleaning out the brine tank. Allow four hours to produce a brine solution, then manually regenerate the softener.



**CAUTION!**

Liquid brine will irritate eyes, skin and open wounds - gently wash exposed area with fresh water. Keep children away from your water conditioner.

## Cleaning of your Brine / Salt tank

Salt tanks will build up sludge (undissolved salt) in the bottom of them that will continue to increase as time goes by. Every 2 - 3 years the salt tank should be cleaned out completely and re started using the original start up instructions.



**CAUTION!**

Never subject your conditioner to freezing, vacuum or to temperatures above 43°C (110°F).

# MAINTENANCE INSTRUCTIONS AND SCHEDULE

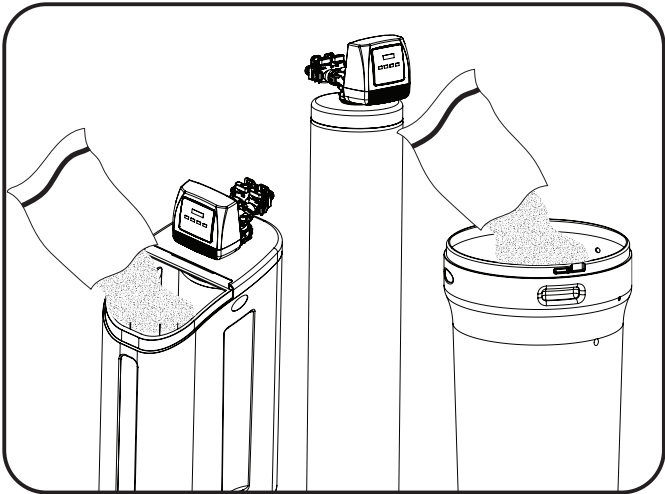
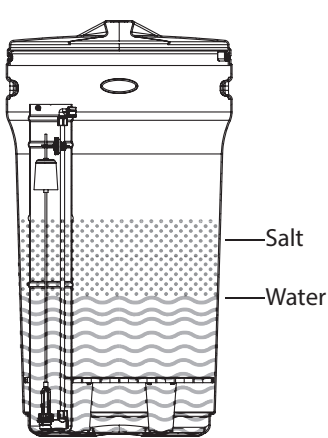
## Checking the Salt Level

Check the salt level monthly. Remove the lid from the cabinet or brine tank, make sure salt level is always above the brine level.

## Add Salt to the Brine Tank

Put 40 kgs of crystal water softener salt in the brine tank. The unit will automatically fill the water to the correct level when it regenerates. Use only clean salt labeled for water conditioner use, such as crystal, pellet, nugget, button or solar. The use of rock salt is discouraged because it contains insoluble silt and sand which build up in the brine tank and can cause problems with the system's operation. Add the salt directly to the tank, filling no higher than the top of the brine well.

**NOTE :THE WATER LEVEL SHOULD BE BELOW THE SALT LEVEL ALL THE TIME**



## CAUTION!

**Incorrect start up, water above the salt level, (not enough salt in tank) will both effect the units capacity and result in hardness slippage. Should either of these situations happen or the unit fails to regenerate for any other reason please first correct the problem. Then regenerate the unit manually 2 times in a row to restore the reserve capacity and bring the media bed back up to specification.**

# IMPORTANT WARRANTY AND MAINTENANCE INFORMATION

**Please have the information below filled out and available when calling in for parts or warranty:**

|                      |
|----------------------|
| Model number:        |
| Serial number:       |
| Valve Serial number: |
| Date installed:      |

## Additional notes:

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## Care of Your Softener

To retain the attractive appearance of your new water softener, clean occasionally with a mild soap solution. Do not use abrasive cleaners, ammonia or solvents. Never subject your softener to freezing or to temperatures above 43°C (110°F).

## Servicing Components

- The injector assembly should be cleaned or replaced every year depending on the inlet water quality and water usage.
- The seals and spacer should be inspected/cleaned or replaced every year depending on the inlet water quality and water usage.

Please refer to the servicing section of this manual for step by step procedure.

Not following the above will void all warranty on the control valve.

## Resin Cleaner

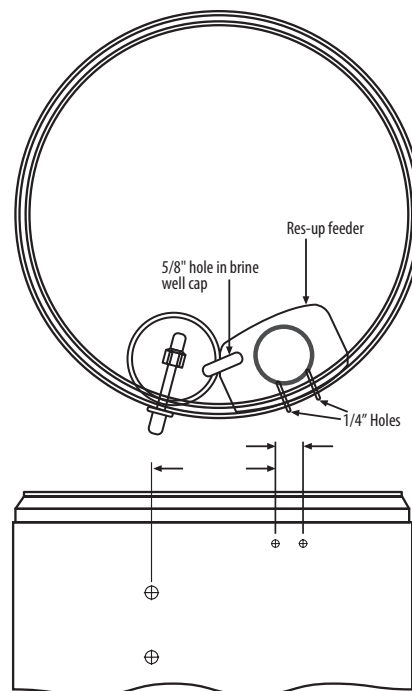
An approved resin cleaner **MUST** be used on a regular basis if your water supply contains iron. The amount of resin cleaner and frequency of use is determined by the quantity of iron in your water (consult your local representative or follow the directions on the resin cleaner package).

## Res-Up® Feeder Installation Instructions (Optional)

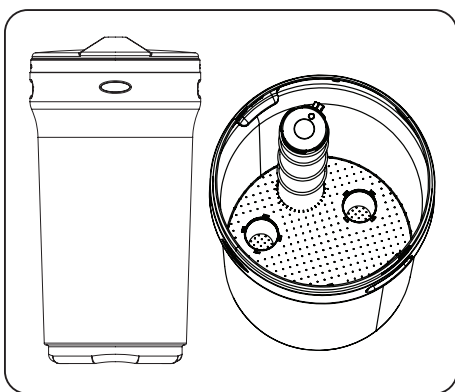
Res-Up Feeders attach to your brine tank and automatically dispense the Res-Up cleaner into the brine solution where it cleans the resin during the regeneration cycle.

The feeder hooks onto the tube inside your brine tank and you just pour some chemical in it and your water conditioner should last significantly longer. A res-up feeder is essential if your raw water contains measurable amounts of iron.

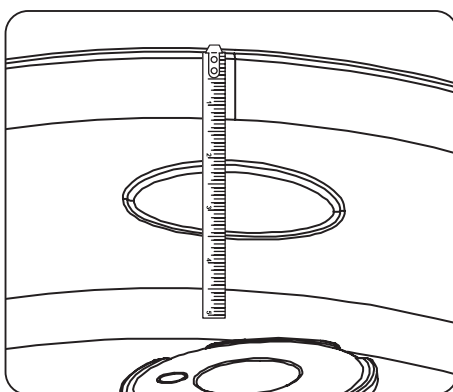
| Res-up Feeder Bottle (Chemical sold Separately)                                           |
|-------------------------------------------------------------------------------------------|
| The 12 cc feeder (Part # 33010) is for conditioners up to 64,000 grains (2 ft3 of resin). |
| The 30 cc feeder (Part # 33018) is for larger conditioners over 64,000 grains.            |
| Pro-Res Care Chemicals                                                                    |
| Item #45147 Pro-ResCare - Gallon                                                          |
| Item #45148 Pro-ResCare - Quart                                                           |



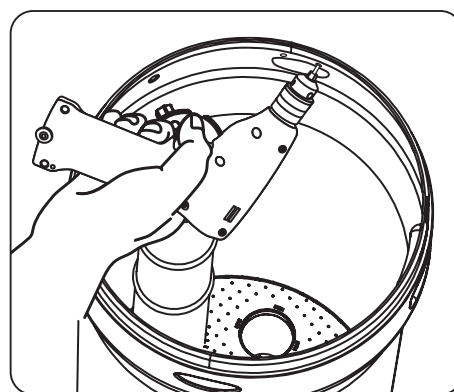
## Install Resup Feeder



1. Install the grid and brine well inside the tank.

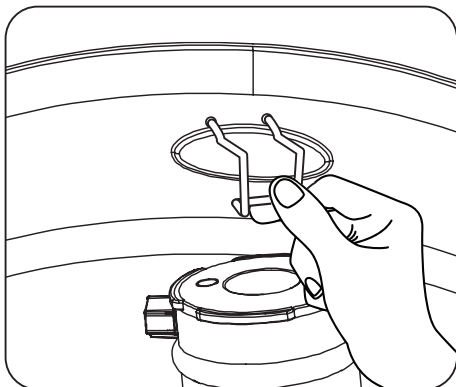


2. Measure 2 inches from the top of the tank beside the oblong molding.

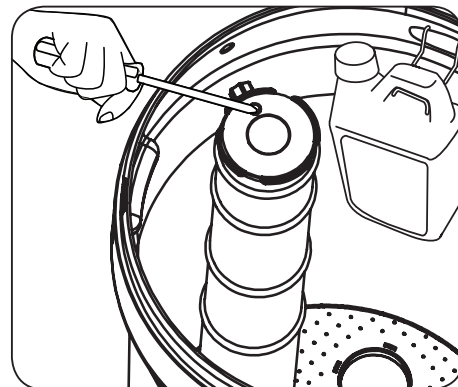
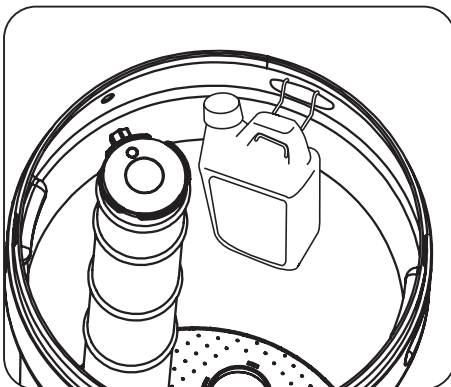


3. Mark the location of the holder and drill.

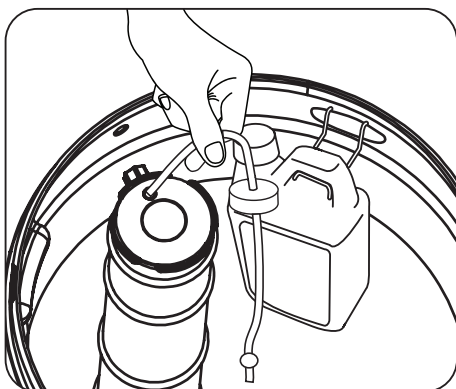
## Res-Up® Feeder Installation Instructions (Optional)



4. Install the holder and the Res Care Solution



5. Take off the small hole cover on the Brine Well lid.



6. Take off the cover of the Res care bottle . Insert the wick, making sure it touches the bottom of the bottle. Insert the other end of the tube completely into the hole in the brine well cap. Automatic feeding will start in a few hours.

## SERVICING 785HE VALVE

### Before Servicing

1. Turn off water supply to conditioner :
  - a. If the conditioner installation has a 3 valve bypass system first open the valve in the bypass line, then close the valves at the conditioner inlet & outlet.
  - b. If the conditioner has an integral bypass valve, put it in the bypass position.
  - c. If there is only a shut-off valve near the conditioner inlet, close it.
2. Relieve water pressure in the conditioner by stepping the control into the backwash position momentarily. Return the control to the In Service position.
3. Unplug Electrical Cord from outlet.
4. Disconnect drain line connection.



**WARNING!**

**ELECTRICAL SHOCK  
HAZARD! UNPLUG THE UNIT  
BEFORE REMOVING THE  
COVER OR ACCESSING ANY  
INTERNAL CONTROL PARTS**



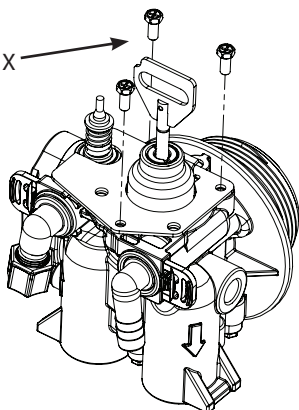
**CAUTION!**

Disassembly while under pressure can result in flooding. Always follow these steps prior to servicing the valve.

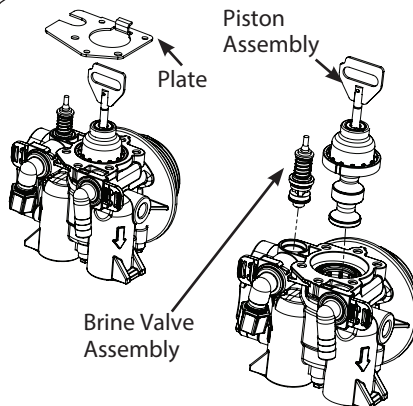
# INSPECTION AND REPLACEMENT OF PISTON ASSEMBLY AND SEAL AND SPACER KIT

**Fig. 2**

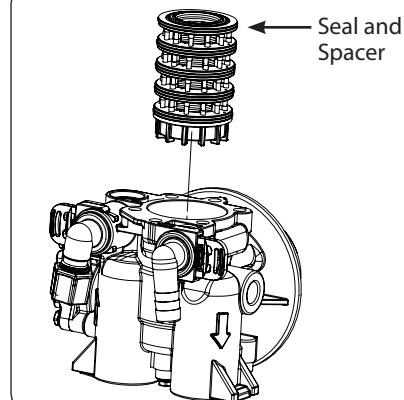
Remove 3 X  
Screws



1. Remove three screws from the plate on the valve body.

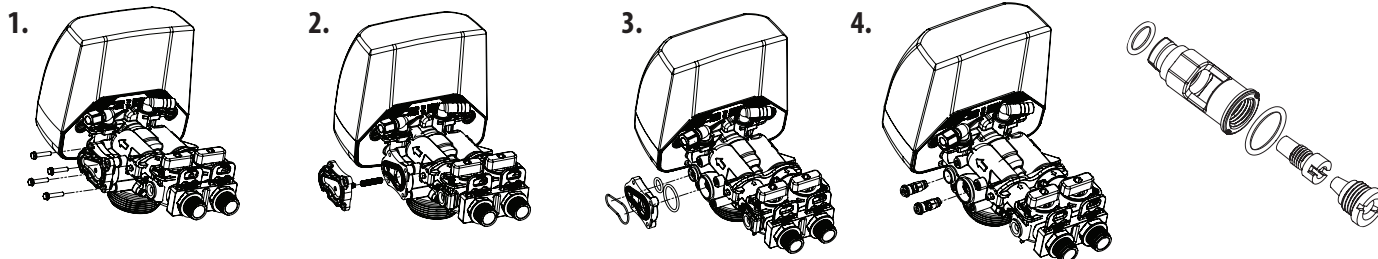


2. Remove the plate from the valve body and pull the Piston Assembly from the valve. The brine valve assembly can also be removed in this stage.  
3. Remove the seal spacer assembly, grease it with silicone lubricant (# 92360) and put back in.



4. Replace piston assembly followed by timer assembly.  
5. Replace the piston assembly and reverse following steps in this section

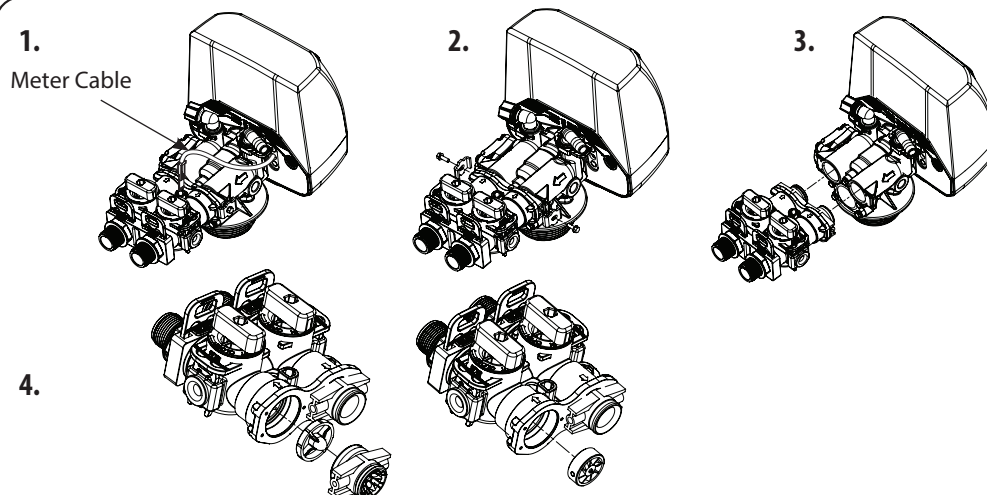
## CLEAN INJECTOR ASSEMBLY



1. Remove four screws of the injector cap.  
2. Pull the Injector Cap Out  
3. Remove the injector assembly, oring and screen  
4. Clean the injectors and replace cap

## REPLACE METER ASSEMBLY

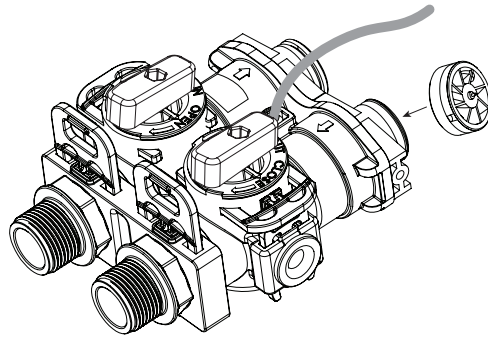
1. Disconnect the meter cable from the meter.  
2. Disconnect the valve from bypass by removing clips  
3. Remove the coupling adapter from the bypass  
4. Remove the meter and meter support from the bypass and replace



# REPLACING THE BYPASS AND METER CABLE

60095101

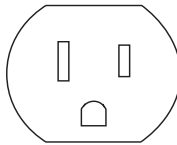
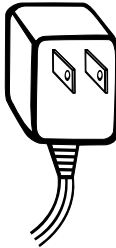
Bypass comes with Meter and Grey Meter Cable



Grey Meter Cable  
60010267

## Step 1

Unplug the power from the wall socket.

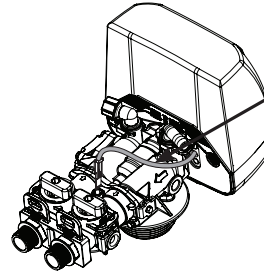


## Step 2\*

Remove 2 screws and clips from bypass.

### \*NOTE

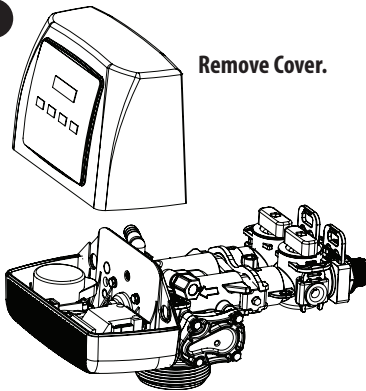
Water to the household needs to be turned off and pressure relieved before Step 2



Disconnect the meter cable from the bypass.

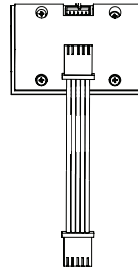
## Step 3

Remove Cover.



## Step 4

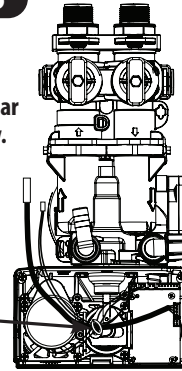
Disconnect the cables from the front PCB display.



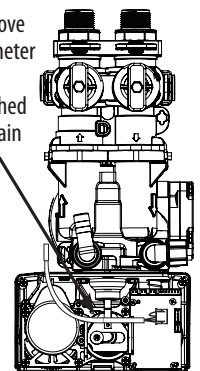
## Step 5

Disconnect the cables from the rear PCB display.

Cut the tie that fastens the wires

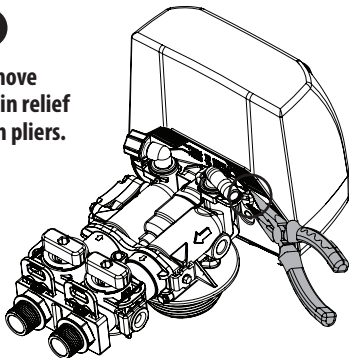


Remove the meter cable attached on Main PCB.



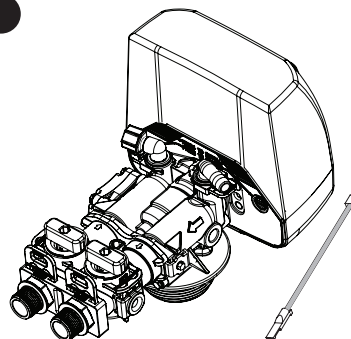
## Step 6

Remove strain relief with pliers.



## Step 7

Replace the old cable with the new Cable.



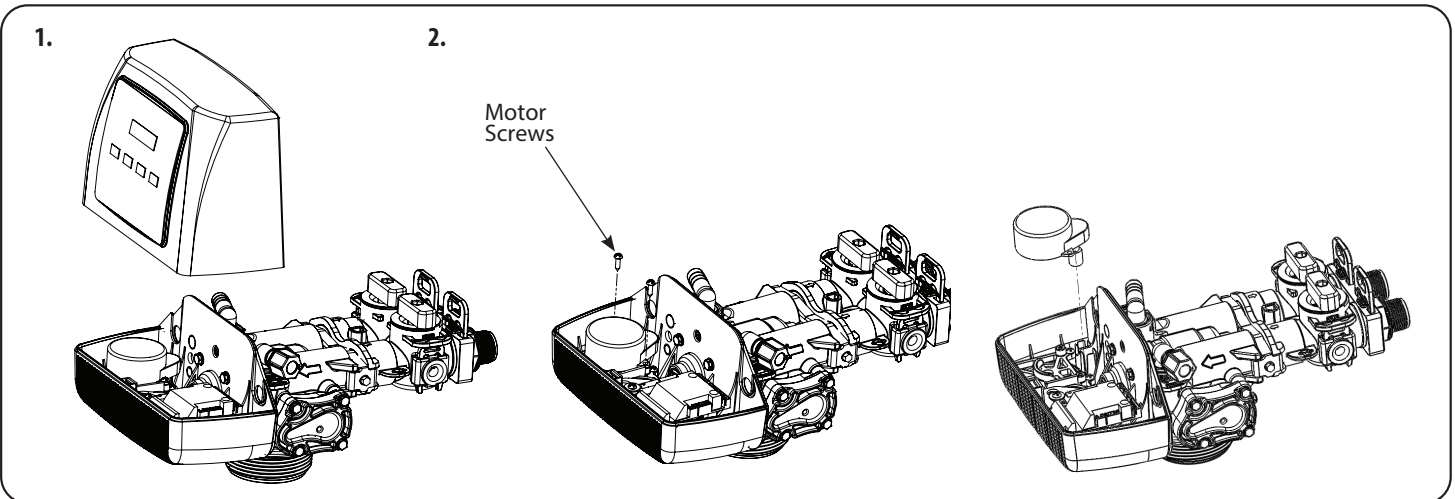
## Step 8

Assemble the valve. Plug the power supply back into the wall socket and follow the programming shown on right:

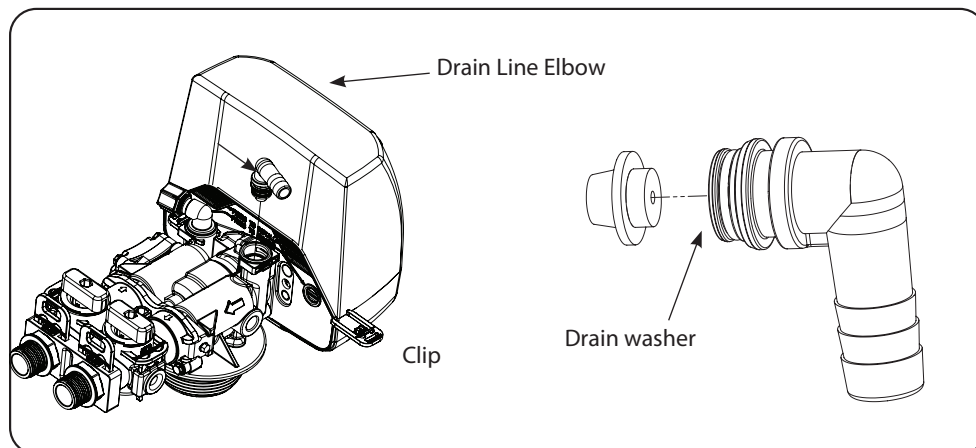
If there are "TB-L" and "TB-H" meter type options in PCB programming, select "TB-H".  
If the valve programming has no "TB-L" and "TB-H" options, change the meter ratio to the new value as per chart on right\*:  
For 85HE Valves press MANUAL REGEN+UP+DOWN for 3 seconds to get to Factory Settings.  
Or:  
To enter the programming press and hold the MENU button for three seconds to unlock the screen. When the screen is unlocked, press and hold the DOWN arrow button for 3s to enter the code entry screen.  
Enter the code number 119 using the UP and DOWN arrows. Press the MANUAL/REGEN to step through the digit. Press the SET to step through to METER RATIO and set as per chart below\*:  
Press the SET to step through to PROGRAMING COMPLETE and past this until TIME OF DAY screen appears.

| * Valve Model | Region     | Meter Ratio |
|---------------|------------|-------------|
| 785HE Series  | U.S Gallon | 5.680       |

# REPLACE MOTOR



# REPLACE DRAIN LINE FLOW CONTROL

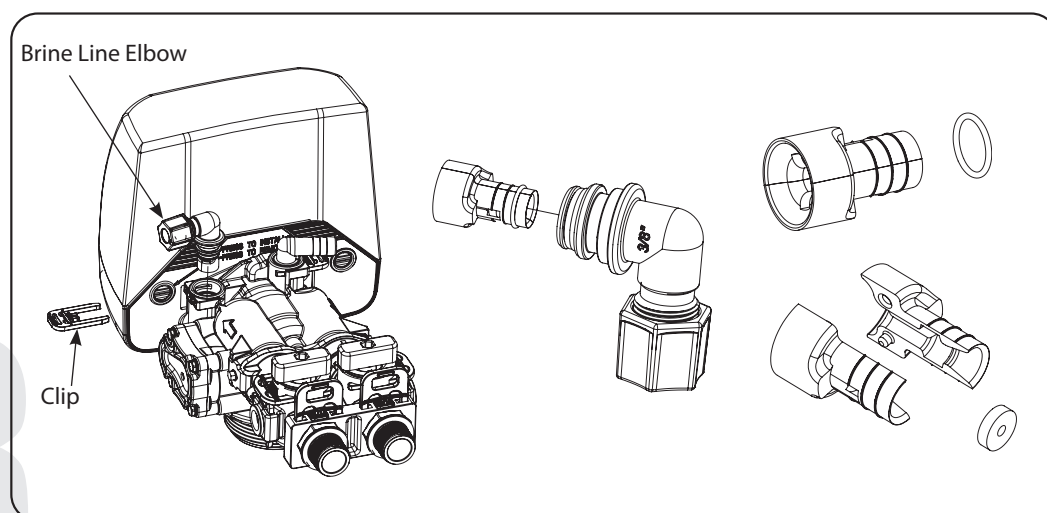


1. Pull the drain line clip and remove the drain line elbow and washer
2. Clean/replace drain line washer

## NOTE

Be sure to shut off any bypass line.

# REPLACE BRINE LINE FLOW CONTROL



# AFTER SERVICING

1. Reconnect drain line

2. Return bypass or inlet valve to normal in service position. Water Pressure will automatically build in the Softener

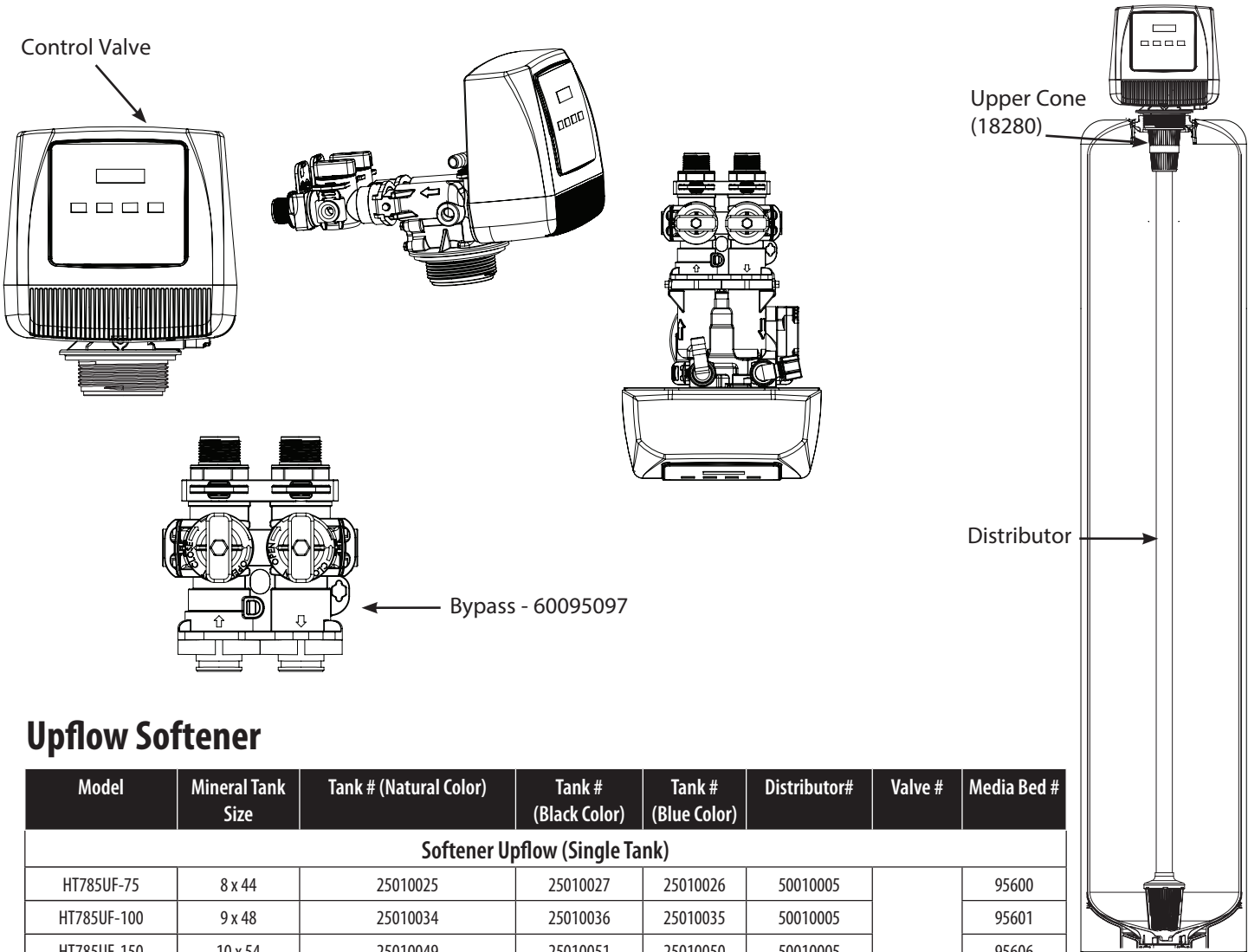
3. Check for leaks at all sealed areas. Check Drain seal with the control in the backwash position

4. Plug electrical cord into outlet

5. Set Time of Day and cycle the control valve manually to assure proper function. Make sure control valve is returned to the In Service position

**NOTE**  
Be sure to shut off any  
bypass line.

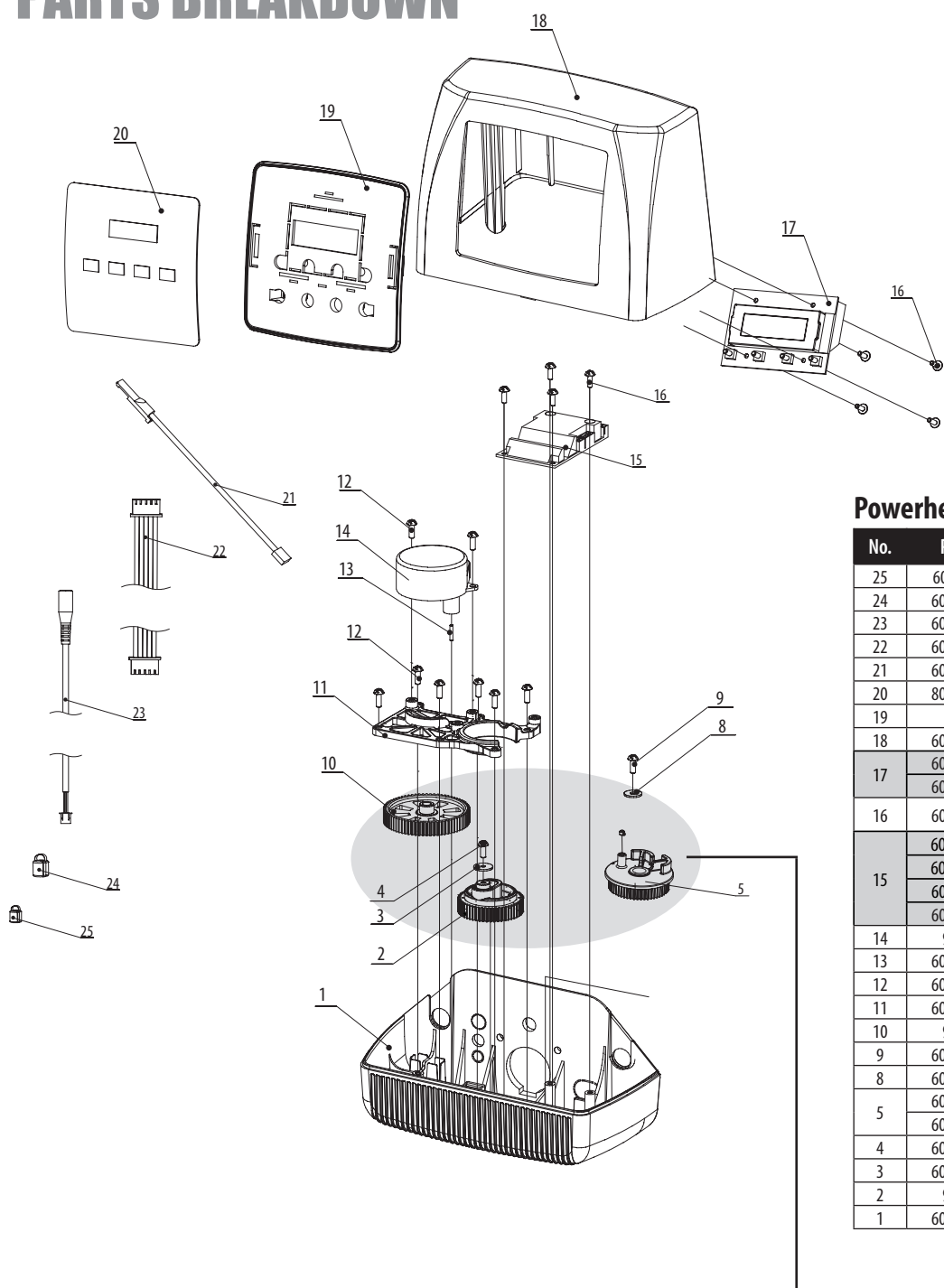
# PARTS BREAKDOWN



## Upflow Softener

| Model                         | Mineral Tank Size | Tank # (Natural Color) | Tank # (Black Color) | Tank # (Blue Color) | Distributor# | Valve #  | Media Bed # |
|-------------------------------|-------------------|------------------------|----------------------|---------------------|--------------|----------|-------------|
| Softener Upflow (Single Tank) |                   |                        |                      |                     |              |          |             |
| HT785UF-75                    | 8 x 44            | 25010025               | 25010027             | 25010026            | 50010005     | 10010109 | 95600       |
| HT785UF-100                   | 9 x 48            | 25010034               | 25010036             | 25010035            | 50010005     |          | 95601       |
| HT785UF-150                   | 10 x 54           | 25010049               | 25010051             | 25010050            | 50010005     |          | 95606       |
| HT785UF-200                   | 12 x 52           | 25010058               | 25010060             | 25010059            | 50010005     |          | 95609       |
| HT785UF-250                   | 13 x 54           | 25010064               | 25010066             | 25010065            | 50010010     |          | 95610       |
| HT785UF-300                   | 14 x 65           | 25030001 and 50040039  | Not Available        | Not Available       | 50010010     |          | 95604       |
| HT785UF-75C                   | 9 x 35            | 25030002 and 50040036  | Not Available        | Not Available       | 50010010     |          |             |
| HT785UF-100C                  | 10 x 35           |                        |                      |                     |              |          |             |

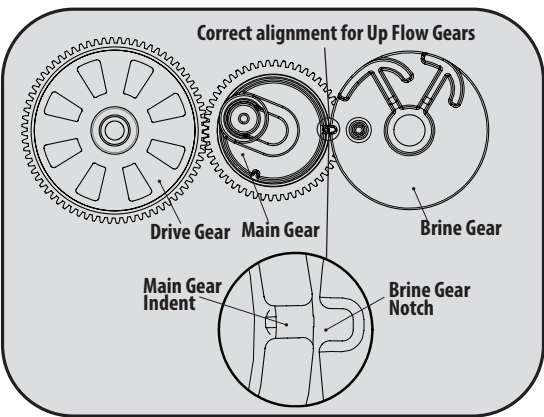
PARTS BREAKDOWN



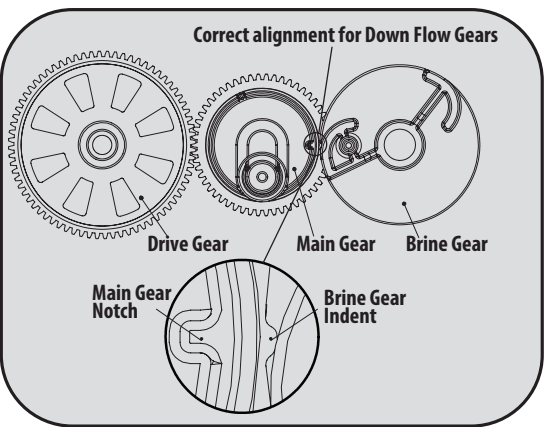
Powerhead Parts List

| No. | Part #   | Description                                 | Qty |
|-----|----------|---------------------------------------------|-----|
| 25  | 60010331 | Power Cable Clip                            | 1   |
| 24  | 60010330 | Meter Cable Clip                            | 1   |
| 23  | 60010124 | Power Cable                                 | 1   |
| 22  | 60010240 | Display-PCB cable                           | 1   |
| 21  | 60010115 | Meter Cable                                 | 1   |
| 20  | 80080130 | 585HE Face Label                            | 1   |
| 19  |          | Bnt585 Display Plate(Black)                 | 1   |
| 18  | 60010286 | Bnt585HE Housing(Black)                     | 1   |
| 17  | 60010180 | Bnt85HE Display (Before Aug. 15, 2019)      | 1   |
|     | 60021979 | Bnt85HE Display (After Aug. 15, 2019)       |     |
| 16  | 60010673 | Screw-ST2.9×10                              | 8   |
| 15  | 60010178 | Bnt85HE Main Pcb(UF) (Before Aug. 15, 2019) | 1   |
|     | 60010179 | Bnt85HE Main Pcb(UF) (After Aug. 15, 2019)  |     |
|     | 60021982 | Bnt85HE Main Pcb(DF) (Before Aug. 15, 2019) |     |
|     | 60021981 | Bnt85HE Main Pcb(DF) (After Aug. 15, 2019)  |     |
| 14  | 92393    | Bnt85 Motor                                 | 1   |
| 13  | 60095658 | Motor Pin                                   | 1   |
| 12  | 60010574 | Screw-ST3.5x13                              | 8   |
| 11  | 60010573 | Bnt85HE Mounting Plate                      | 1   |
| 10  | 92389    | Bnt85 Drive Gear                            | 1   |
| 9   | 60010575 | Screw-4.2×12                                | 1   |
| 8   | 60010661 | Washer-4x12                                 | 1   |
| 5   | 60095102 | Gear, Brine, 85HE(UF)                       | 1   |
|     | 60095103 | Gear, Brine, 85HE(DF)                       |     |
| 4   | 60010099 | Screw-2.9×13                                | 1   |
| 3   | 60010100 | Washer-3x13                                 | 1   |
| 2   | 92391    | Bnt85HE Main Gear                           | 1   |
| 1   | 60095105 | Bnt785HE Base(Black)                        | 1   |

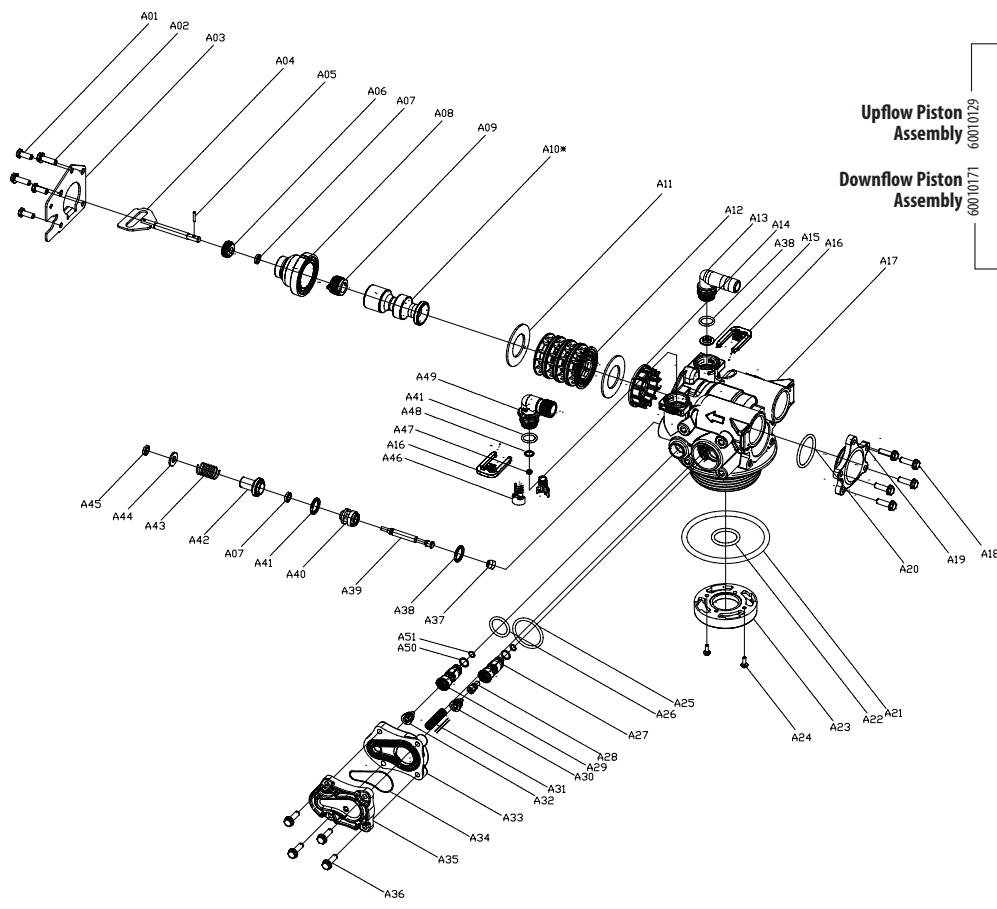
Up Flow Gear Alignment



Down Flow Gear Alignment



PARTS BREAKDOWN



Valve Body Parts List

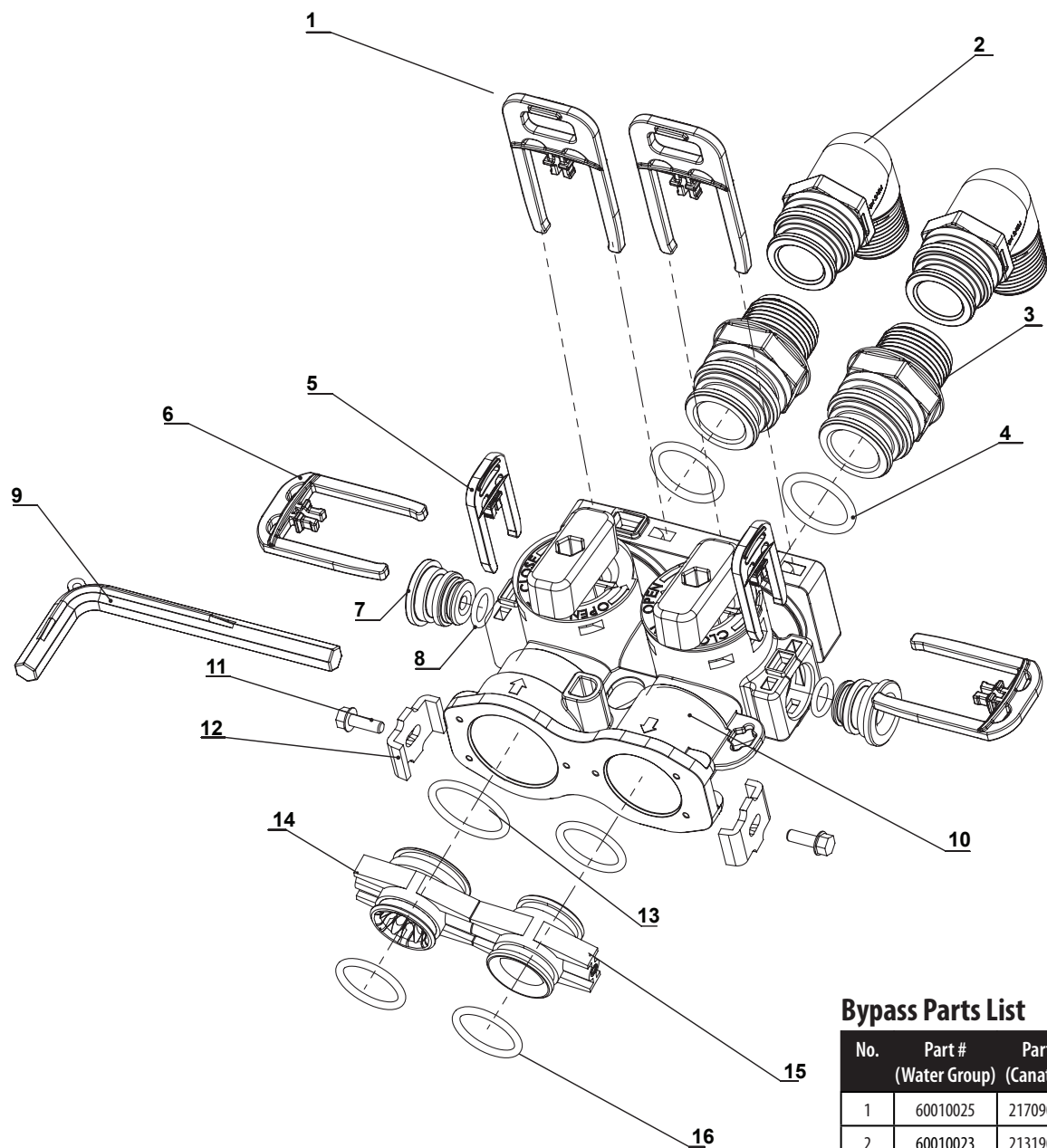
| No. | Part #<br>(WaterGroup) | Part #<br>(Canature) | Description                          | Qty |
|-----|------------------------|----------------------|--------------------------------------|-----|
| A01 | 60010075               | 05056087             | Screw-M5x12(Hexagon)                 | 3   |
| A02 | 60010076               | 05056088             | Screw-M5x16(Hexagon With Washer)     | 2   |
| A03 | 60010645               | 05056047             | End Plug Retainer                    | 1   |
| A04 | 60095056               | 05031032             | BNT85HE Rod                          | 1   |
| A05 | 60010647               | 05056097             | Piston Pin                           | 1   |
| A06 | 60010344               | 05031015             | BNT85HE Quad Ring Plug Cover         | 1   |
| A07 |                        | 05056070             | Quad Ring                            | 2   |
| A08 |                        | 05031011             | BNT85HE End Plug                     | 1   |
| A09 | 60095058               | 05031014             | BNT85HE Piston Retainer              | 1   |
| A10 | 60095075, 60095059     | 05057002, 05057001   | BNT85HE Piston(Up flow and Downflow) | 1   |
| A11 | 13242-02               | 05056073B            | Seal                                 | 5   |
| A12 | 14241                  | 05056204             | Spacer                               | 8   |
| A13 | 60010229               | 05010082             | Drain Fitting-B                      | 1   |
| A14 | 60095060               | 05031005             | BNT85HE Spacer                       | 1   |
| A16 | 60010069               | 05056172             | Secure Clip-s                        | 2   |
| A17 | 60095061               | 05031002             | BNT85HE Valve Body                   | 1   |
| A18 | 60010596               | 05056508             | Screw-M5x12(Hexagon With Washer)     | 5   |
| A19 | 60095063               | 05030004             | BNT85 End Cover                      | 1   |
| A20 | 60095614               | 05030013             | O-Ring-C30x2.65                      | 1   |
| A21 | 60010077               | 05056063             | O-Ring-C78.74x5.33                   | 1   |
| A22 | 60010080               | 26010103             | O-Ring-C25x3.55                      | 1   |
| A23 | 60010599               | 07060007             | Valve Bottom Connector               | 1   |
| A24 | 60010099               | 13000426             | Screw-ST2.9X13(Large Washer)         | 2   |
| A25 | 60010190               | 05031022             | O-Ring-C32x3                         | 1   |
| A26 | 60010189               | 05031021             | O-Ring-C18x3                         | 1   |
| A27 | 60010174               | 05031012             | BNT85HE Injector Fixed Sleeve        | 1   |
| A29 | 60010175               | 05031013             | Injector Plug Body                   | 1   |
| A31 | 10227                  | 05056103             | Injector Screen                      | 1   |
| A32 | 60095076               | 05056156             | Injector Plug                        | 1   |
| A33 | 60010193               | 05031003             | BNT85HE Injector Cover Body          | 1   |
| A34 | 60010195               | 05031018             | O-Ring-C40x2.65                      | 1   |
| A35 | 60010194               | 05031004             | BNT85HE Injector Cover Cap           | 1   |
| A36 | 60010196               | 05031027             | Screw-M5x25(Hexagon with Washer)     | 4   |
| A37 | 92381                  | 05056075             | Seal Mat                             | 1   |
| A38 |                        | 05056134             | O-Ring-C12x2                         | 3   |
| A39 |                        | 05056054             | Injector Stem                        | 1   |
| A40 |                        | 05056031             | Injector Spacer                      | 1   |
| A41 |                        | 05056081             | O-Ring-C12.5x1.8                     | 1   |
| A42 |                        | 05056030             | Injector Cap                         | 1   |
| A43 |                        | 05056093             | Injector Screen                      | 1   |
| A44 |                        | 05010049             | Spacer Washer                        | 1   |
| A45 |                        | 05056105             | Retaining Ring                       | 1   |
| A46 | 60010173               | 05031010             | BNT85HE BLFC Fixed Sleeve            | 2   |
| A47 |                        |                      | BLFC(optional)                       | 1   |
| A48 | 60010188               | 05031033             | O-Ring-C8x1                          | 1   |
| A49 | 60010172               | 30020013             | BNT85HE Brine Line Elbow             | 1   |
| A50 | 60010186               | 05031019             | O-Ring-C12.5x1.5                     | 2   |
| A51 | 60010187               | 05031020             | O-Ring-C8x1.5                        | 2   |
| A52 | 60010191               | 30110012             | Ball, Seal                           |     |

Item #s For All Injector Assemblies and Brine Line and Drain Line Washers

| Part #    | Part Description                |
|-----------|---------------------------------|
| 60010110  | BLFC BUTTON #2 0.3GPM A32       |
| 60010082* | BLFC BUTTON #2 0.7GPM A32       |
| 60010128  | BLFC BUTTON 0.2GPM              |
| 60010601  | INJECTOR SET #0000 BLACK THROAT |
| 60010602  | NOZZLE #0000 BLACK THROAT       |
| 60010603  | INJECTOR SET #000 GREY THROAT   |
| 60010604  | NOZZLE #000 GREY THROAT         |
| 60010605  | INJECTOR SET #00 VIOLET THROAT  |
| 60010606  | NOZZLE #00 VIOLET THROAT        |
| 60010607  | INJECTOR SET #0 RED THROAT      |
| 60010608  | NOZZLE #0 RED THROAT            |
| 60010609* | INJECTOR SET #1 WHITE THROAT    |
| 60010610* | NOZZLE #1 WHITE THROAT          |
| 60010611  | INJECTOR SET #2 BLUE THROAT     |
| 60010612  | NOZZLE #2 BLUE THROAT           |

| Part #   | Part Description              |
|----------|-------------------------------|
| 60010613 | INJECTOR SET #3 YELLOW THROAT |
| 60010614 | NOZZLE #3 YELLOW THROAT       |
| 60010685 | INJECTOR SET #4 GREEN THROAT  |
| 60010686 | NOZZLE #4 GREEN THROAT        |
| 60010131 | DLFC #1 1.5GPM                |
| 60010132 | DLFC #2 2.0GPM                |
| 60010133 | DLFC #3 2.4GPM                |
| 60010135 | DLFC #5 3.5GPM                |
| 60010041 | DLFC #6 4GPM                  |
| 60010169 | DLFC #7 5GPM                  |
| 60010136 | DLFC #A 5.0GPM                |
| 60010137 | DLFC #B 7.0GPM                |
| 60010138 | DLFC #C 11.0GPM               |

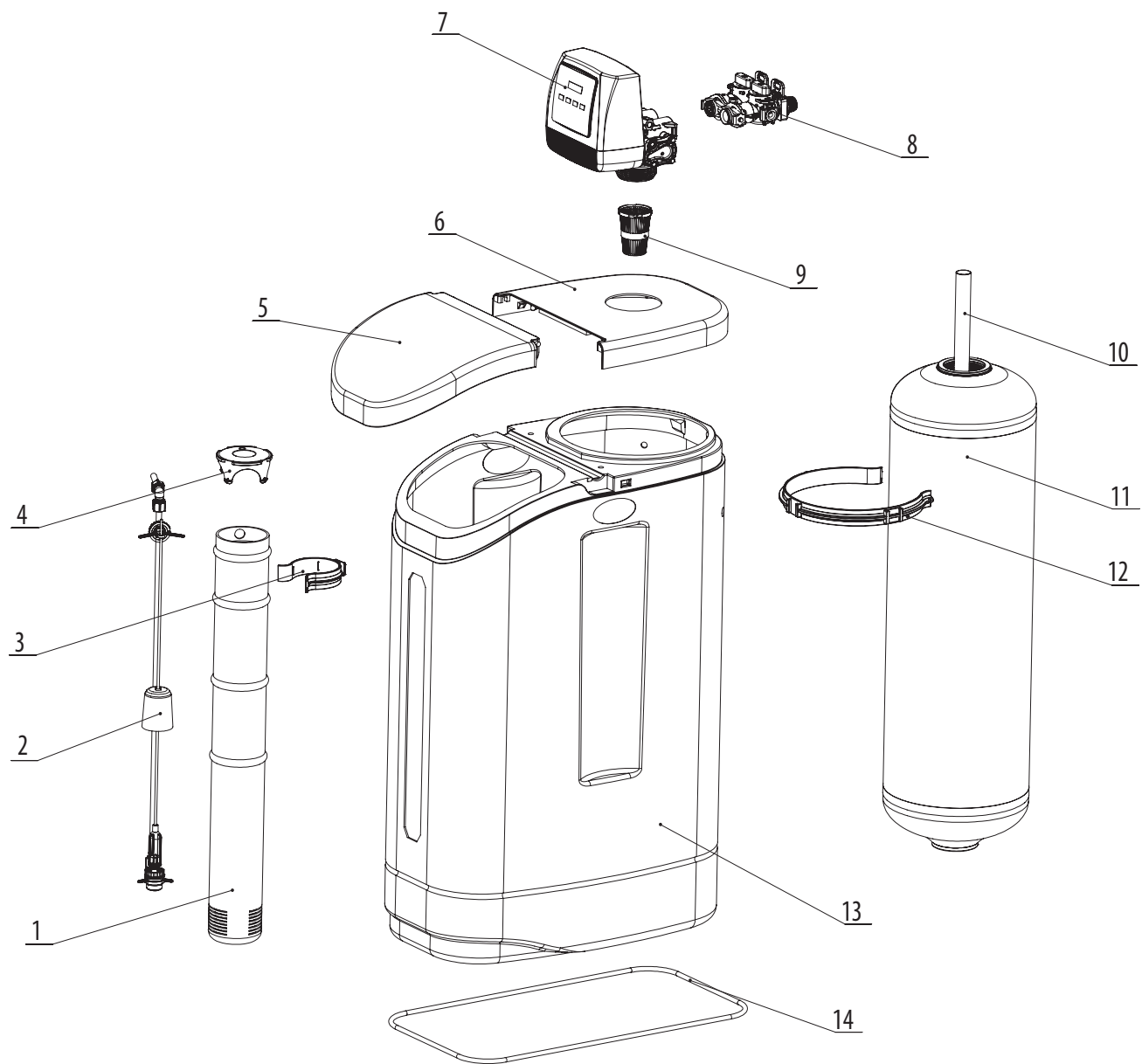
# PARTS BREAKDOWN



Bypass Parts List

| No. | Part #<br>(Water Group) | Part #<br>(Canature) | Description                       | Qty |
|-----|-------------------------|----------------------|-----------------------------------|-----|
| 1   | 60010025                | 21709003N            | Secure Clip Inlet and Outlet      | 2   |
| 2   | 60010023                | 21319036N            | Elbow 3/4" NPT Inlet and Outlet   | 2   |
| 3   | 60010019                | 21319011N            | Straight 1" NPT Inlet and Outlet  | 2   |
| 4   | 60010026                | 26010143             | O-ring on Inlet and Outlet        | 2   |
| 5   | 92846                   | 05056155N            | Plug Clip                         | 2   |
| 6   | 60095090                | 21709004B            | Shaft Clip                        | 2   |
| 7   | 60010209                | 05056146             | Bypass Plug                       | 2   |
| 8   | 60010044                | 05056134             | O-ring on Plug                    | 2   |
| 9   | 60010006                | 70020007             | Bypass Tool                       | 1   |
| 10  |                         | 05056212             | 063 Bypass Body                   | 1   |
| 11  | 60010701                | 13000327             | Screw on SS Clip                  | 2   |
| 12  | 60010046                | 05056044B            | SS Clip                           | 2   |
| 13  | 60010561                | 26010046             | Big O-ring on Connector(Outlet)   | 1   |
| 14  | 60010101                | 05010083N            | Valve-Bypass Connector(Outlet)    | 1   |
| 15  | 60010079                | 05056025M            | Valve-Bypass Connector(Inlet)     | 1   |
| 16  | 60010562                | 05056129             | Small O-ring on Connector(Outlet) | 3   |

# PARTS BREAKDOWN



Cabinet Parts List

| No. | Part #     | Description             | Qty |
|-----|------------|-------------------------|-----|
| 14  |            | Trim Strip              | 1   |
| 13  |            | Softener Cabinet(Grey)  | 1   |
| 12  | 60010361   | Pressure Tank Clamp     | 1   |
| 11  | 25020019   | TANK ASSY 935 NAT       | 1   |
|     | 25020020   | TANK ASSY 1035 NAT      | 1   |
| 10  | 50010020   | Distribution Assy-1035  | 1   |
| 9   | 18280      | Top Cone                | 1   |
| 8   | 60095097-1 | Bypass Valve Assy       | 1   |
| 7   | 10010109   | 785HE(UF) Control Valve | 1   |
| 6   | 55010031   | Softener Low Cover      | 1   |
| 5   | 85010132   | Softener Salt Lid       | 1   |
| 4   | 55020002   | Brine Well Cap          | 1   |
| 3   | 60010362   | Brine Well Clamp        | 1   |
| 2   | 55010023   | 0435 Brine Valve        | 1   |
| 1   | 55010010   | 0435 Brine Well         | 1   |

# TROUBLE SHOOTING GUIDE

## NOTE

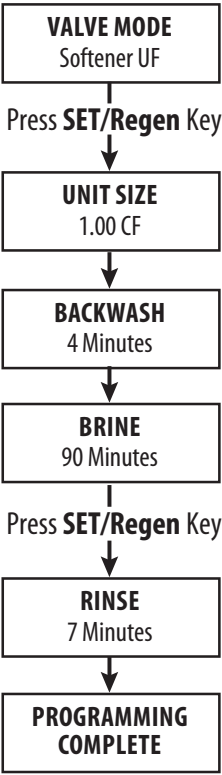
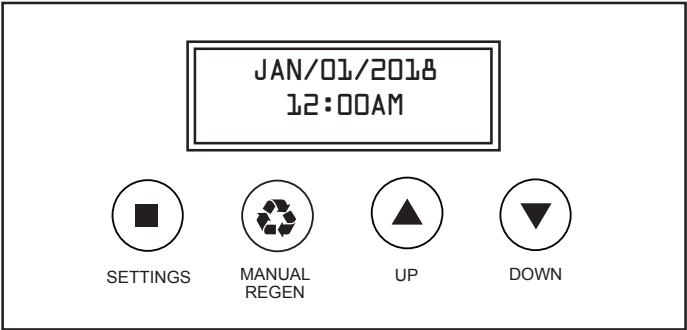
Before doing any service, record the diagnostic information provided by the controller. See page 21

| Problem                                                                                                                                                                                                                                                                                                                                                                                    | Possible Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. CONDITIONER DELIVERS HARD WATER</b><br>A. Bypass valve is open<br>B. No salt in brine tank<br>C. Injector or screen plugged<br>D. Insufficient water flowing into brine tank<br>E. Hot water tank hardness<br>F. Leak at distributor tube<br>G. Internal valve leak<br>H. Flow meter jammed<br>I. Flow meter cable disconnected or not plugged into meter<br>J. Improper programming | A. Close bypass valve<br>B. Add salt to brine tank and maintain salt level above water level<br>C. Replace injectors and screen<br>D. Check brine tank fill time and clean brine line flow tank control if plugged<br>E. Make sure distributor tube is not cracked. Check O ring and tube pilot<br>F. Make sure distributor tube is not cracked. Check O ring and tube pilot<br>G. Replace seals and spacers and/or piston<br>H. Remove obstruction from flow meter<br>I. Check meter cable connection to timer and meter<br>J. Reprogram the control to the proper regeneration type, inlet water hardness, capacity or flow meter size. |
| <b>2. CONDITIONER FAILS TO REGENERATE</b><br>A. Electrical service to unit has been interrupted<br>B. Timer is not operating properly<br>C. Defective valve drive motor<br>D. Improper programming                                                                                                                                                                                         | A. Assure permanent electrical service (check fuse, plug, chain or switch)<br>B. Replace circuit with display<br>C. Replace drive motor<br>D. Check programming and reset as needed                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>3. UNIT USES TOO MUCH SALT</b><br>A. Improper salt setting<br>B. Excessive water in brine tank<br>C. Improper programming                                                                                                                                                                                                                                                               | A. Check salt usage and salt setting<br>B. See 1 - C<br>C. Check programming and reset as needed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>4. LOSS OF WATER PRESSURE</b><br>A. Iron build-up in line to water conditioner<br>B. Iron build-up in water conditioner<br>C. Inlet of control plugged due to foreign material broken loose from pipes by recent work done on plumbing system.                                                                                                                                          | A. Clean line to water conditioner<br>B. Clean control and add resin cleaner to resin bed. Increase frequency of regeneration<br>C. Remove control valve from unit, remove upper cone and clean cone                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>5. LOSS OF RESIN THROUGH DRAIN LINE</b><br>A. Air in water system<br>B. Drain line flow control is too large                                                                                                                                                                                                                                                                            | A. Assure that well system has proper air eliminator control. Check for dry well condition.<br>B. Ensure drain line flow control is sized                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>6. IRON IN CONDITIONED WATER</b><br>A. Fouled resin bed<br>B. Iron content exceeds recommended parameters<br>C. Dirty resin                                                                                                                                                                                                                                                             | A. Check backwash, brine draw and brine tank fill. Increase frequency of regeneration. Increase backwash time.<br>B. Add iron removal filter system<br>C. If cleaning resin does not resolve then replacement of resin is required.                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>7. EXCESSIVE WATER IN BRINE TANK</b><br>A. Plugged drain line flow control<br>B. Brine valve failure<br>C. Improper programming                                                                                                                                                                                                                                                         | A. Clean flow control<br>B. Replace brine valve<br>C. Check programming and reset as needed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>8. SALT WATER IN SERVICE LINE</b><br>A. Plugged injector system<br>B. Timer not operating properly<br>C. Foreign material in brine valve<br>D. Foreign material in brine line flow control<br>E. Low water pressure<br>F. Improper programming                                                                                                                                          | A. Clean injector and replace screen<br>B. Replace circuit c/w display<br>C. Clean or replace brine valve<br>D. Clean brine line flow control<br>E. Water pressure must be above 20 psi<br>F. Check programming and reset as needed                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>9. CONDITIONER FAILS TO DRAW BRINE</b><br>A. Drain line flow control is plugged<br>B. Injector is plugged<br>C. Injector screen is plugged<br>D. Line pressure is too low<br>E. Internal control leak<br>F. Improper programming<br>G. Timer not operating properly                                                                                                                     | A. Clean drain line flow control<br>B. Clean or replace injectors<br>C. Replace screen<br>D. Increase line pressure (line pressure must be at least 20 psi at all times)<br>E. Change seals and spacers and/or piston assembly<br>F. Check programming and reset as needed<br>G. Replace circuit c/w display                                                                                                                                                                                                                                                                                                                              |
| <b>10. CONTROL CYCLES CONTINUOUSLY</b><br>A. Timer not operating properly<br>B. Faulty cycle times                                                                                                                                                                                                                                                                                         | A. Contact customer support for additional trouble shooting information<br>B. Contact customer support for re programming instructions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>11. DRAIN FLOWS CONTINUOUSLY</b><br>A. Foreign material in control<br>B. Internal control leak<br>C. Control valve jammed in brine or backwash position<br>D. Timer motor stopped or jammed teeth                                                                                                                                                                                       | A. Remove piston assembly and inspect bore. Remove foreign material and check control in various regeneration positions<br>B. Replace seals and/or piston assembly<br>C. Replace piston and seals and spacers<br>D. Replace timer motor and check all gears for missing teeth                                                                                                                                                                                                                                                                                                                                                             |

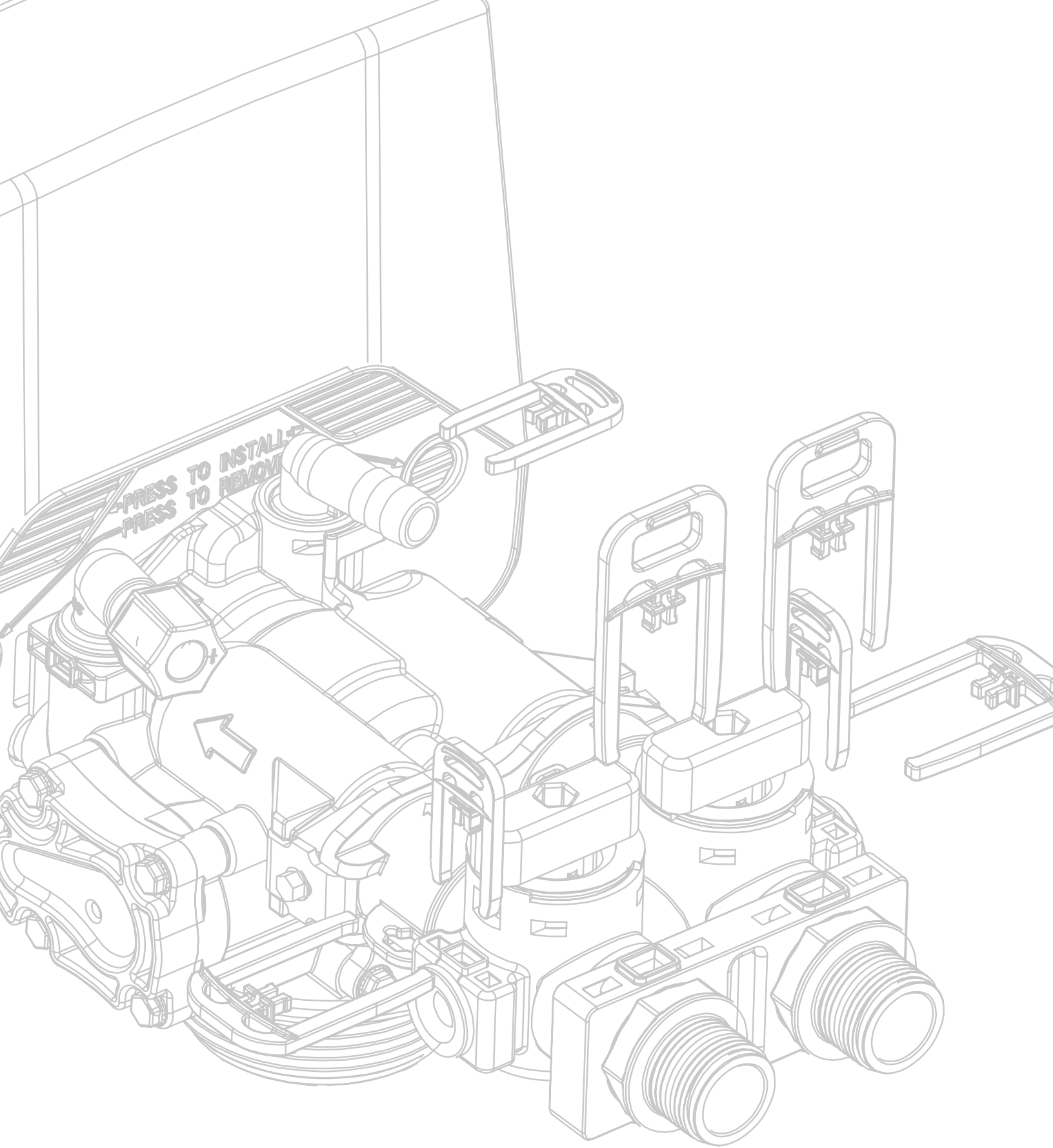
# MASTER PROGRAMMING

Press **Up** and **Down** Button for 5 seconds  
Press **MANUAL REGEN** Button and change value using **Up** and **Down** Buttons

- Key Pad Setting**
- SETTINGS** This function is to enter the basic set up information required at the time of installation.
  - MANUAL REGEN** This function is to initiate an immediate or delayed manual regeneration.
  - DOWN / UP** Increase or decrease the value of the settings while in the programming mode.



| Main Valve Settings |                                                                               |
|---------------------|-------------------------------------------------------------------------------|
| Meter Ratio         | METER RATIO AFTER MAR 20,2018 - 5.68<br>METER RATIO BEFORE MAR 20,2018 - 8.00 |
| Service Delay       | 3.0                                                                           |
| Backwash Delay      | 7.0                                                                           |
| Brine Delay         | 4.0                                                                           |
| Rinse Delay         | 5.0                                                                           |
| Refill Delay        | 4.0                                                                           |



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