



# Nitrate / Sulfate Manual

Installation / Operation Manual

For all DN Models





WaterSoft remains dedicated to the same enthusiasm and commitment to innovation that made them successful in the 1980's. With the always evolving line of Isobar control valves, the industry-leading Centuri & Sidewindr iron filters, and many new products on the horizon, WaterSoft remains focused on providing clean, safe water for your residential and commercial needs.

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# Table of Contents

|                                               |    |
|-----------------------------------------------|----|
| <b>Benefits of Soft Water</b>                 | 4  |
| <b>Precautions</b>                            | 5  |
| <b>Installation</b>                           | 6  |
| How a Softener Works                          | 6  |
| Pre-Installation Checklist                    | 7  |
| Installation Requirements                     | 7  |
| Major System Components                       | 7  |
| Nitrate System Set-up                         | 7  |
| Softener Location / Other Requirements        | 8  |
| Installation / Procedure                      | 8  |
| Drain Line Connection                         | 8  |
| Electrical Connection                         | 9  |
| Battery Back-Up Features                      | 9  |
| <b>Pressurizing The System</b>                | 9  |
| <b>Calculating Hardness Sett</b>              | 9  |
| <b>System Set-Up</b>                          | 10 |
| <b>Programming w. Legacy View App</b>         | 13 |
| Dashboard                                     | 13 |
| Advanced Settings                             | 14 |
| Status and History                            | 15 |
| <b>Manually Programming The Control Valve</b> | 17 |
| Normal Operation                              | 17 |
| Starting Extra Regeneration Cycle             | 17 |
| <b>Control Start-Up Procedure</b>             | 19 |
| Start-Up Procedure                            | 19 |
| Filling the Brine Tank with Salt              | 19 |
| <b>Master Programming Mode</b>                | 20 |
| Final Check                                   | 21 |
| Operation, Care and Cleaning                  | 21 |
| Skip A Regeneration                           | 21 |
| General Care and Cleaning                     | 22 |
| <b>Troubleshooting</b>                        | 23 |
| <b>Error Codes</b>                            | 25 |
| <b>Warranty</b>                               | 26 |

# Enjoying the Benefits of Soft Water

## *Use less soap, detergent and household cleaners.*

Hardness minerals in water interfere with soap's cleaning ability. That's why most leading brands of soap, shampoo, laundry detergent and household cleaners contain chemicals that aren't necessary with soft water.

**You can significantly reduce the amount of these products that you use. You may find you can use as little as one quarter of the amount you were using before you had soft water! Even though you'll use less soap, you'll get more suds and better cleaning results.**



## *Reduce your use of soaps and shampoos by half or more.*

Adjust according to your preference and results.



**After bathing in soft water, your skin will feel "silky." What you'll feel is your own smooth skin without any leftover soap residue. When you bathed in hard water, you were never able to rinse this residue completely. The soap curd that left a ring on your bathtub also remained on your skin and hair, possibly causing drying and cracking. Now that you have soft water, you'll feel soft, smooth and clean. And you'll promote healthier skin and hair by eliminating the drying effects of hard water.**

## *Reduce or eliminate the use of fabric softeners.*

Fabrics washed in hard water retain soap residue making them "crackle" when removed from the dryer or stiff if air-dried. Fabric softeners are necessary with hard water to keep your clothing soft, but with soft water, you can reduce your use of fabric softeners or eliminate them altogether.

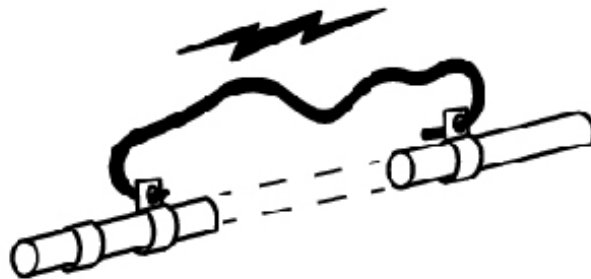
**It's especially important to reduce the amount of laundry detergent you use by half or more. Washing clothes in soft water means you'll need less soap to get your clothes clean and it will rinse completely. Washing in soft water makes your clothes look whiter and brighter, and they'll last longer, too.**



# Precautions



[Read the Instruction Manual](#)



[If existing plumbing is copper, install grounding strap before creating plumbing gaps.](#)

## WARNING

### Lubricants

Do NOT use Vaseline, oils, hydrocarbon lubricants or spray silicone anywhere! Petroleum base lubricants will cause swelling of o-rings and seals. The use of other lubricants may attack plastic Noryl®. It is recommended that Dow Corning® silicone grease be used as a lubricant for all control valves. Dow Corning® 7 Release Compound is used in the manufacture of Chandler Systems control valves. (Part # LT-150)

### Sealants

Pipe dope and liquid thread sealers may contain a carrier that attacks some plastic materials. It is recommended that Teflon® tape be used to seal plastic Noryl® threaded fittings.

# Installation

**PLEASE NOTE THESE SPECIFICATIONS BEFORE PROCEEDING**

**OPERATING PRESSURE RANGE : 20 - 125 PSI**

**OPERATING TEMPERATURE RANGE : 33° F - 120° F**

**INLET / OUTLET PIPE SIZE : 1" MNPT**

**PLEASE COMPLY WITH ALL APPLICABLE PLUMBING CODES**

**PROTECT THE SOFTENER AND PIPING FROM FREEZING TEMPERATURES**

Please read the entire Owner's Manual and Instruction before installation.

## **-How A Water Softener Works-**

Water hardness is derived from Calcium and Magnesium minerals that have been dissolved into the water under the earth's surface. These minerals are found in limestone deposits and are the source of hard water. The amount of hardness in a given water supply is dependent upon the quantity of Calcium and Magnesium present and the length of time water has been in contact with them. This can vary dramatically from well-to-well and, for this reason, a water analysis is imperative in order to determine the proper treatment method. The degree of hardness increases as the concentration of Calcium and Magnesium "ions" increase and is measured in **Grains Per Gallon (gpg)**.

The problem of hard water in the home / business comes to light in many facets of daily use. Water spots and scum left behind on bathtubs, fixtures and showers; wear and tear on appliances; calcium build-up in hot water heaters and piping; and, greater amounts of soap and detergents being used are just a few examples.

The modern water softener is designed to reduce hardness ions and their unpleasant side effects. Special resin beads in the softener mineral tank are used to change hard water into soft water. The surfaces of these beads are covered with sodium ions. As hard water enters the mineral tank and comes into contact with the resin, an exchange of ions takes place as dissolved Calcium and Magnesium ions cling to the resin surface and sodium ions take their place, thus softening the water. This process is called **Ion Exchange**. Over time, the sodium ions used for the exchange process become depleted and must be replenished.

The water softener provides a **Regeneration** process whereby brine solution enters the mineral tank, driving-off the collected hardness ions and replenishes the surface of the resin beads with more sodium ions. This process is automatically initiated by the control valve on the mineral tank. The regeneration process has five basic cycles as follows:

1. **Backwash** - The control valve directs the water flow in a reverse direction through the mineral tank, separating the resin beads and flushing any accumulated particles to a waste drain.
2. **Brine & Rinse** - In the first part of this cycle, the control valve directs brine solution downward through the mineral tank, driving-off collected hardness ions and replenishing the resin beads with sodium ions. The second part of the cycle rinses hardness ions and excess brine from the mineral tank to the waste drain
3. **Second Backwash**
4. **Rapid Rinse** - The control valve directs the water flow downward, settling and recompacting the resin bed.
5. **Brine Refill** - The control valve directs fresh water into the salt compartment to create new brine solution for the next scheduled regeneration.
6. **Service** - This is the normal "operating" cycle where hard water enters the mineral tank, comes into contact with the resin beads and exchanges hardness ions for sodium ions - the water then becomes "soft" and ready for use.

## -Pre-Installation Check List-

A water test should always be performed in order to determine total water hardness (in gpg) and total dissolved iron (in parts per million - ppm). This is critical for proper equipment selection, sizing and for determining the program for regeneration frequency. If heavy concentrations of iron (above 5 ppm), iron coloration, iron bacteria or sediment are present, filtration prior to the softener will most generally be required. Certain states may require a licensed plumber for installation.

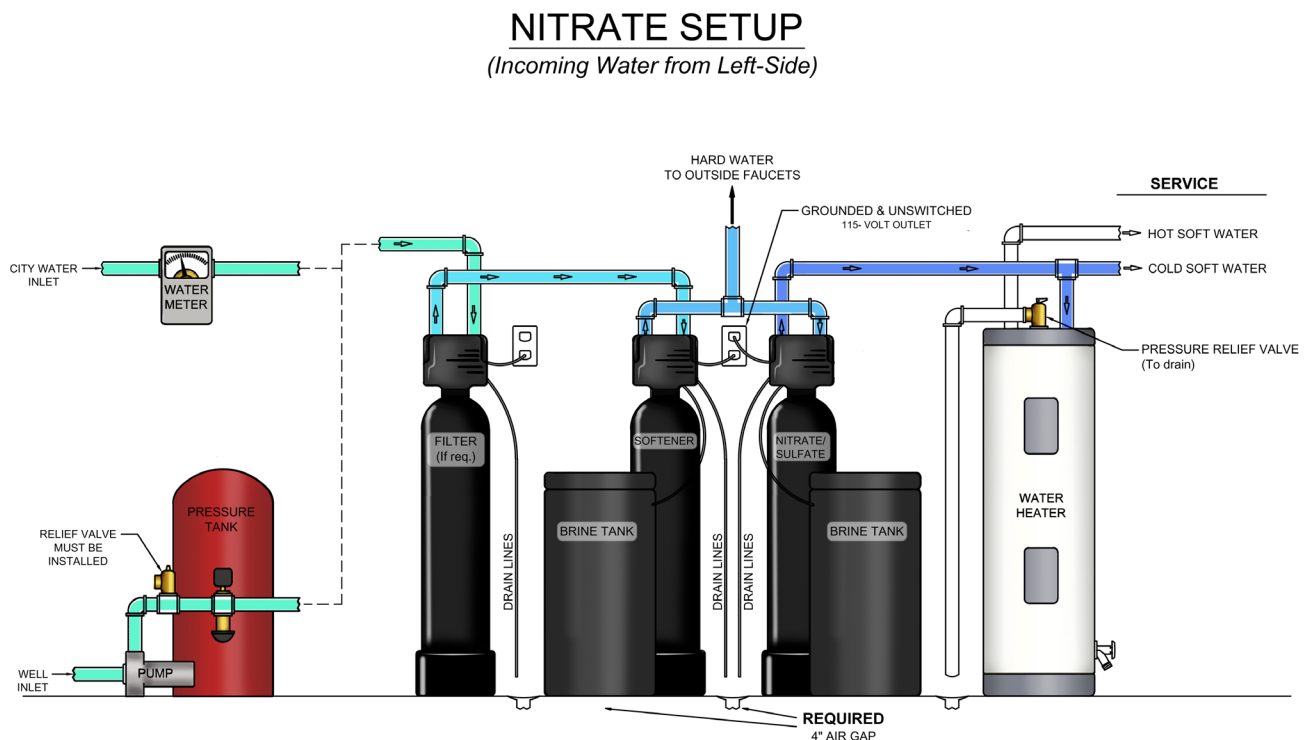
**Note:** Flexible water supply connectors and flexible drain line tubing may not be allowed in you locale. Please check with local plumbing code officials prior to installation.

## -Installation Requirements-

- A level floor position ahead of piping into water heater.
- Unit must be installed at least 10' ahead of the inlet to a water heater to prevent damage due to back-up of hot water. If this is not possible, a thermal expansion tank should be installed at the water heater inlet.
- **DO NOT** install the unit in an area of direct sunlight or where freezing temperatures may occur! (See Installation Diagrams for proper placement and plumbing connections)

## -Major System Components-

1. **Brine Tank** - This tank holds the salt that is added to the softener. This salt is dissolved with water to form a brine solution used in the softener regeneration process.
2. **Resin Tank** - This tank contains the ion exchange resin media. Water flows through the resin tank under pressure to come into contact with the resin for water softening.
3. **Control Valve** - The valve directs water through the resin tank for water softening and controls the flow of water / brine for the regeneration process.



**Note:** Due to the Nitrate System abilities to remove bi-carbonate (alkalinity) from the water, a dramatic reduction in pH of the treated water may be experienced. If this occurs, a whole house or upflow filter with neutralizer or Neu-Cor media may be required.

## **-Softener Location / Other Requirements-**

- Locate the unit near an unswitched, 120 volt / 60 Hz grounded electrical outlet.
- Check for distance and proper drain installation (e.g. floor drain, washing machine standpipe).
- Determine type and size of piping required for softener connection (e.g. copper, galvanized, PVC plastic).

### **Note:**

- Where the drain line is elevated above the control valve or exceeds 20 feet in length to reach the drain, use 3/4" I.D. drain line tubing instead of 1/2" I.D. Drain line tubing is not included.
- All plumbing lines not requiring "soft" water should be connected "upstream" of the softener.
- The brine tank drain line is gravity flow and must discharge below the overflow fitting.
- The brine overflow is provided as a back-up in the event the safety float shut-off should fail, allowing the brine tank to overflow. This drain connection would then carry the excess water to the drain and prevent flooding of the floor. Therefore, no liability will or can be assumed by the manufacturer of the softener should this occur.

### **Caution:**

- Do not "TEE" to the main drain line from control valve.

## **-Installation Procedure-**

### **- Water Supply Connections and Bypass Valve -**

To allow for softener servicing, swimming pool filling or lawn sprinkling, a manual bypass valve has been installed at the factory. The bypass allows hard water to be manually routed around the softener.

1. Position softener at desired location for installation. (See Installation Diagram)

**Note:** If rebedding an existing unit and the system utilizes a standard tube & basket style distributor, gravel underbedding will be required.

2. Turn **OFF** main water supply and **OPEN** nearest faucet to relieve pressure.
3. Cut main line and install appropriate elbows and extensions.

### **Caution:**

Raised arrows located on the sides of control valve body and bypass valve indicate proper direction of water flow. Install inlet and outlet piping in direction of arrows. It is recommended that a vacuum breaker be installed on the inlet plumbing.

4. Rotate bypass valve to the bypass position (position of knobs is perpendicular to inlet / outlet piping).
5. Turn the main supply line on to restore water service to the home.
6. OPEN nearest faucet to evacuate air and repressurize plumbing lines.
7. Check for leaks!

### **- Drain Line Connection -**

Install 1/2" I.D. drain line tubing (not included) from hose barb to an open drain. A 4" gap between end of the drain line and the open drain is required to prevent waste water backflow. Keep the drain line as short as possible. An overhead drain line can be used if necessary, but should discharge below the control valve. A syphon trap (taped loop) at the outlet of the drain line is advisable to keep the drain line full and assure correct flow during backwash. Elbows or other fittings must be kept at a bare minimum.

**Note:** Where the drain line is elevated above the control valve or exceeds 20 feet in length, 3/4" I.D. drain line tubing should be used.

## - Electrical Connection -

Connect the power cord to the control valve and plug power supply into a 115 volt / 60 Hz receptacle.

**Note:** Do not plug into an outlet controlled by a wall switch or pull chain that could inadvertently be turned off

## -Battery Back-Up Features-

(Uses a standard 9-volt alkaline battery.)

- During power failures, the battery will maintain the time of day as long as the battery has power. The display is turned off to conserve battery power during this time. To confirm that the battery is working, press either button on the circuit board. The display will turn on for five (5) seconds.
- If power failure occurs while system is regenerating, the valve will motor to a shut off position prevent constant flow to drain. Depending upon system pressure and other factors, it is possible to observe a reduced flow to drain during this step. After power is restored, the valve will return and finish the cycle where it left off prior to the power interruption.
- When used without battery back-up, during a power failure, the unit stops at its current point in the regeneration position and then restarts at that point when the power is restored. The time will be offset by the increment of time the unit was without power, so it is necessary to reset the time of day on the unit. No other system will be affected.

## - Pressurizing The System -

1. Make certain **S4** Valve is in **SERVICE** position.
2. Slowly rotate bypass valve to the **SERVICE** position.  
(Position of bypass knobs is parallel to inlet / outlet piping.)
3. Allow tanks to pressurize. Check for leaks!
4. Open the nearest faucet to evacuate air from plumbing lines.
5. After air is evacuated from plumbing lines, close bypass (position of both bypass knobs is perpendicular to the direction of inlet pipe).

## -How To Calculate the Hardness Setting-

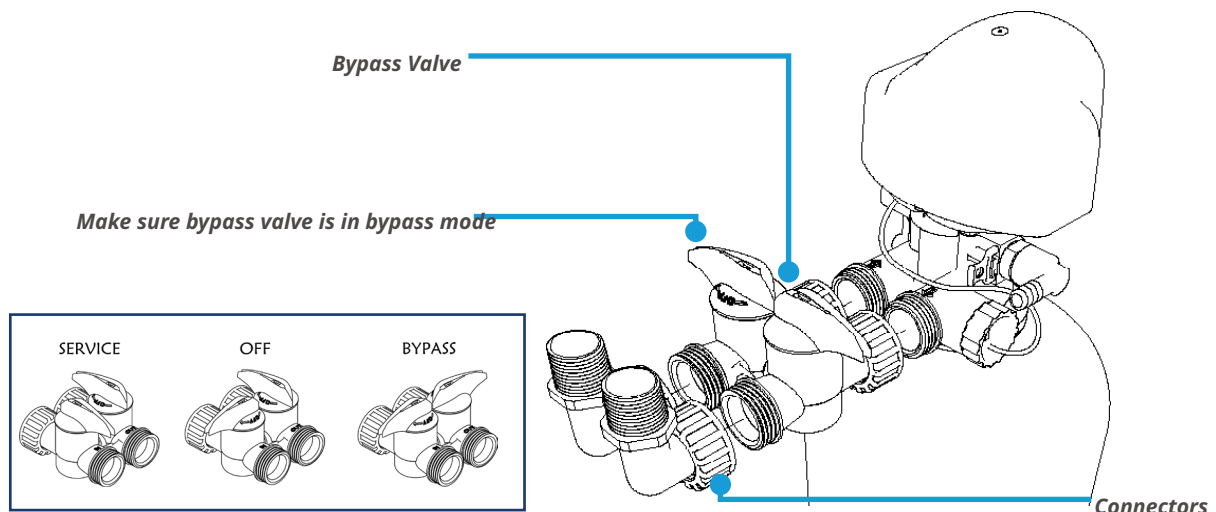
While the Nitrate / Sulfate system is not treating hardness, the control valve uses a "hardness" setting to calculate the regeneration frequency. To determine the proper hardness setting, the amounts of nitrate and sulfate in the raw water must be known. They must be expressed as equivalents as calcium carbonate ( $\text{CaCO}_3$ ). Use the test results and follow these steps:

- Sulfate as  $\text{SO}_4$  ppm  $\times 1.04 =$  Sulfate ppm as  $\text{CaCO}_3$
- Nitrate as N ppm  $\times 3.56 =$  Nitrate as  $\text{CaCO}_3$
- Nitrate as  $\text{NO}_3$  ppm  $\times 0.81 =$  Nitrate as  $\text{CaCO}_3$

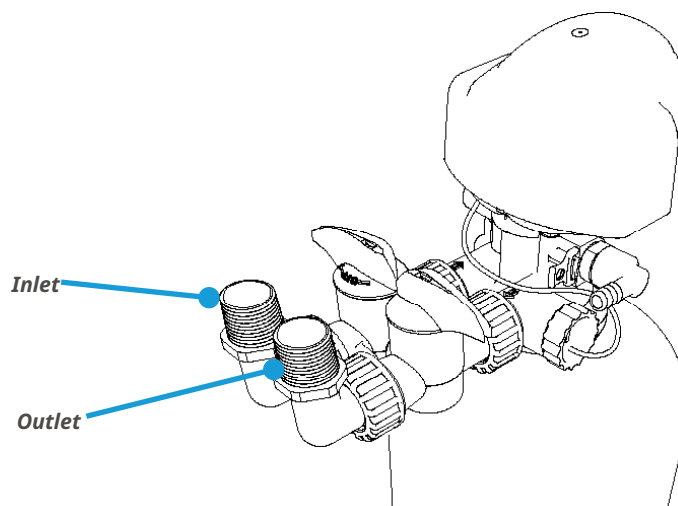
Add all  $\text{CaCO}_3$  quantities together and divide by 17.1 to find equivalent grains per gallon (GPG) and set the hardness setting to this number.

# System Set-Up

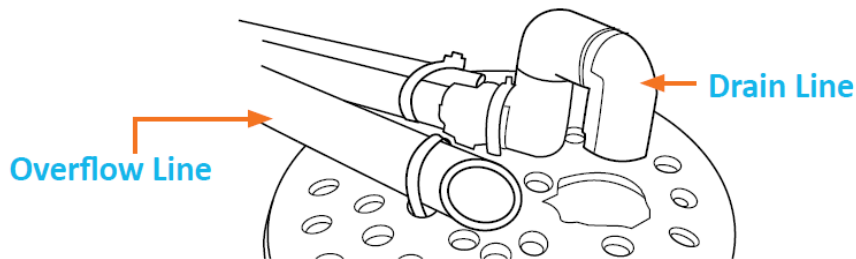
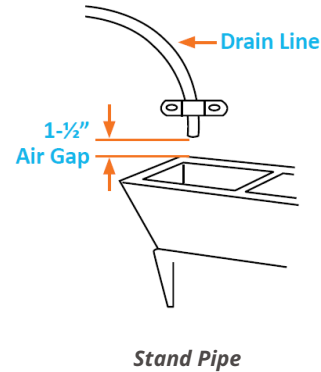
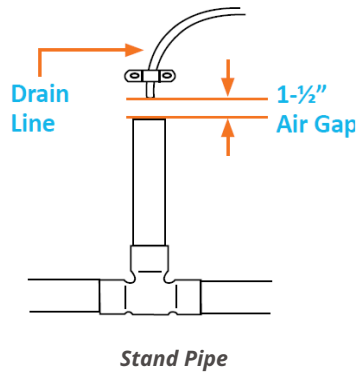
*Unpack equipment. Connect bypass valve, connectors. Attach components by pushing the adapters together and tightening the nuts by hand until they feel snug. Position system on a hard level surface with access to inlet plumbing, drain and electrical outlet.*



*Turn off main water supply and open nearest cold faucet to relieve pressure. Cut water supply line, and connect plumbing to the inlet and outlet accordingly.  
Note: Inlet and outlet connections are 1" NPT.  
Additional piping and / or fittings may be necessary*

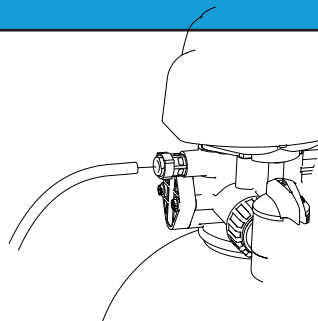


Connect drain line to barbed drain adapter and run to appropriate discharge point. Use a 1/2" minimum pipe size for the drain. Use a 3/4" drain line for runs that exceed 20 feet. Make connection to a sanitary waste system through an air gap of 2 pipe diameters or 1", larger. Do not tee into any other drain lines.

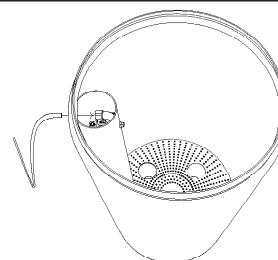


Feed one end of brine line to brine line connection on control valve. Firmly insert it all the way into the push lock fitting. When the tubing is fully inserted, the fitting will grab the tubing and hold it in place. A compression insert is NOT needed.

Inside the brine tank, remove the cap from the top of the brine well. Feed the other end of the brine tubing through the hole in the side of the brine tank, and firmly insert it all the way into the push-lock elbow fitting inside the brine well. When this tubing is fully inserted, the fitting will grab the tubing and hold it in place.

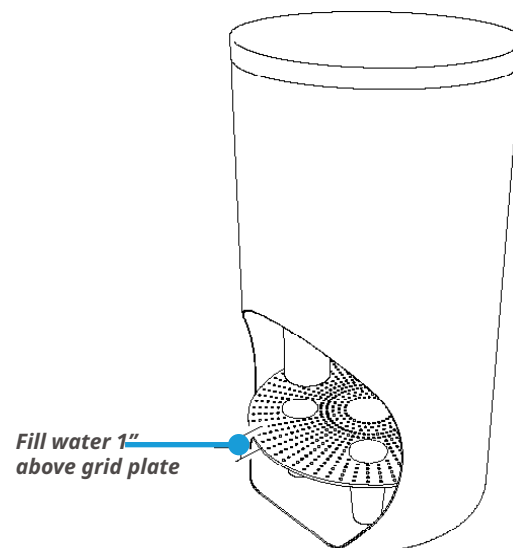
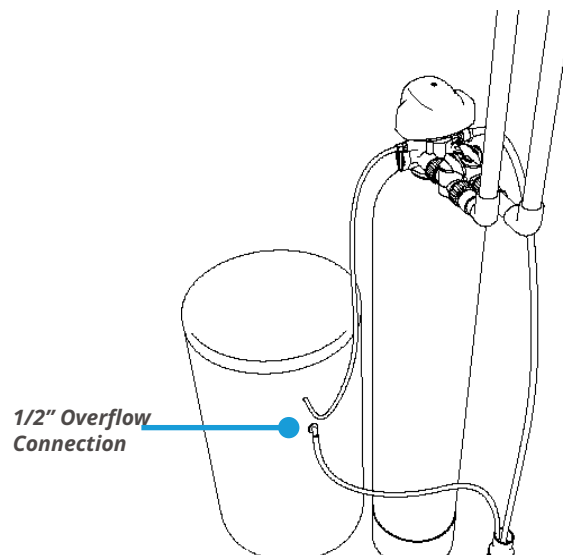


Brine Line Connection to Control Valve



Brine Line Connection to Brine Tank

*Attach safety overflow line (1/2" tubing) to barbed fitting on side of brine tank and run to appropriate discharge point that is lower than the overflow connection on the brine tank. Do not tee into any other drains.*



# Programming w. Legacy View App



For simplified set up and control, please install the **Legacy View** on a compatible Bluetooth 4.0+ enabled smart phone or tablet.



1. Download and install the **Legacy View** app from the Google Play Store, Apple App Store
2. Open the Legacy View app
  - Choose a valve device at any time from the list of available devices to connect to by clicking on it.
  - If the valve you want to connect to doesn't show up, or there is a problem connecting to a device you can press the "Scan for Devices" button or the Legacy View logo at any time to refresh the list and start the process over.
  - If the valve device is a BTLE valve and it has a password other than the default password, the first time you connect to it the app will ask you to enter the password. After entering it the first time you should not need to enter it again unless it changes.
3. BTLE Valve devices can be updated by the App. When the app is updated from the Google Play Store or the Apple App Store, it may contain an updated firmware program for the valve devices. These updates could contain new features or operational improvements. It is up to the user to allow these updates to be sent to the valve device. Uploading a new program takes approximately 1 minute.

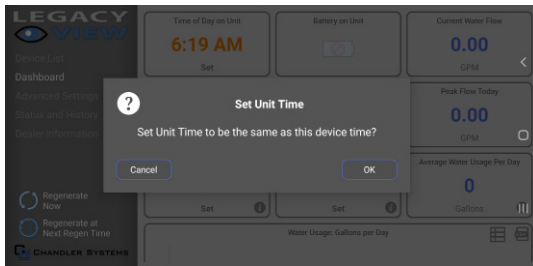
## -Dashboard-

**NOTE:** Consult your dealer before making any changes

From the **Dashboard**, all items in **ORANGE** can be changed, while blue fields are informational only.

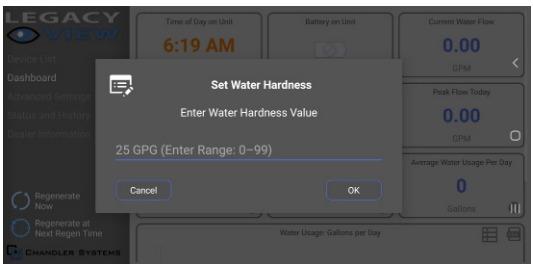


If you are unsure about the function of the field click the ⓘ for more information.



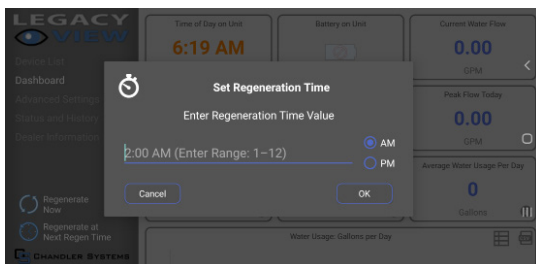
### *Change Time of Day*

*Press “SET” to set time automatically based on device.*



### *For Softeners:*

### *Set Hardness*



### *Set Regeneration Time*

*Example: For 2a.m. just type 2, choose a.m., and press ‘OK’*

*Note: If you have a filter and a softener the valves should be set to regenerate at different times. Factory default times are 12a.m. for filters, and 2 a.m. for softeners.*

## -Status and History-

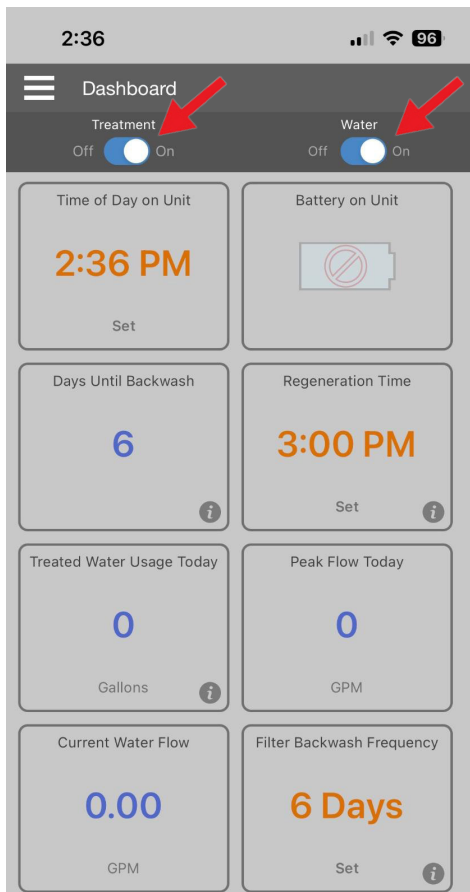
From the **Status and History**, all items in **ORANGE** can be reset.



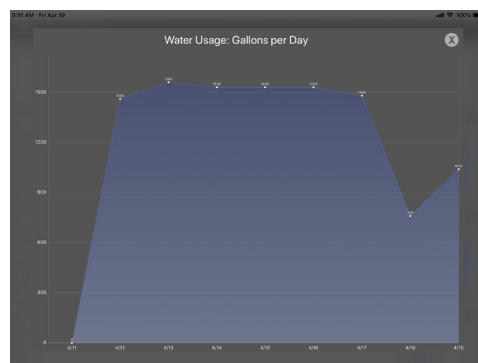
Pressing this icon will show a list of the data that is in the graph.

Touch any graph to enlarge and see details. Enlarged graphs are able to be zoomed in by pinching with two fingers. (Enlarged graph shown below)

Pressing the .csv logo in the corner will allow the graph data to be exported and shared.



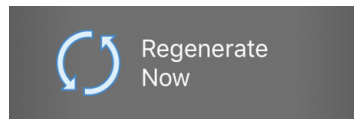
- **Treatment** button can initiate the bypass on and off.
- **Water** button can turn the main water on and off downstream from the unit.



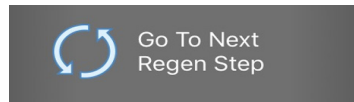
Enlarged graph showing water usage

## Starting a regeneration or backwash cycle

### Option 1:

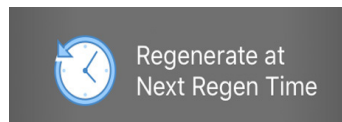


***Click the "Regenerate Unit Now."***



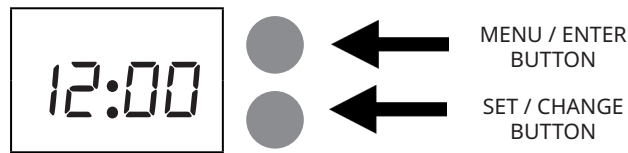
***Once a regeneration has been started, if you would like to force the unit into the next cycle step click "Go to Next Regeneration Step".***

### Option 2:



***"Regenerate Unit at Next Regen Time" button. This will take the system into a backwash cycle at the next regeneration time.***

# Manually Programming the Control Valve



1. To enter Main Menu, press the **Menu/Enter** button.  
(Time of Day will flash)

2. To set the **Time of Day**, press the **Set/Change** button.  
(First digit will flash)

Example [ 12-00 ]

- To change digit value, press the **Set/Change** button.
- To accept the digit value, press the **Menu/Enter** button.
- Next digit will flash to begin setting.
- Once the last digit display is accepted, all digits will flash.

3. To set **A.M.** or **P.M.**, press the **Menu/Enter** button.

- To change digit value, press the **Set/Change** button.
- To accept the digit value, press the **Menu/Enter** button.
- Once A.M. or P.M. is accepted, the next menu item will flash.

Example [ A ]

4. To set **Hardness** an "H" will appear to enter Compensated  
Hardness in grains per gallon (gpg) Default setting is 25 gpg.

Example [ H - 25 ]

## Note:

If the water contains iron and / or manganese, multiply the total parts per million (ppm) by "four" (4) and then add to the grains per gallon (gpg) of hardness. Use this COMPENSATED HARDNESS level when programming the regeneration frequency.

5. To Exit Main Menu, press the **Menu/Enter** button.

## Note:

If no buttons are pressed for 60 seconds, the Main Menu will be exited automatically.

## -Normal Operation-

**Home Display** - The home display will alternate between the Time of Day and Gallons left until the next regeneration. The meter will count down to zero (0000) and then regenerate at the scheduled time set.

## -Starting Extra Regeneration Cycle-

1. To Start **Delayed Extra Cycle**

Example [ 1 ]

- If Days Remaining Until Next Regeneration does not read '000', press and hold the **Set/Change** button for 3 seconds until the display reads '0000'
- Regeneration cycle will initiate at the next designated regeneration time.

2. To start **Immediate Extra Cycle** → First complete above step.

- With Gallons Remaining Until Next Regeneration at '0000',
- Press and hold the Set/Change button.
- After 3 seconds, the regeneration cycle will begin.

3. To **Fast Cycle** thru regeneration  First complete above 2 steps.

**Note:**

Press and hold the **Set/Change** button for 3 seconds to advance to the next cycle step. Fast Cycle is not necessary unless desired to manually step through each cycle step. (Repeat until valve returns to the home display)

| Softeners |                 | Default (min) |
|-----------|-----------------|---------------|
| Step 1    | Backwash        | 10            |
| Step 2    | Brine & Rinse   | 60            |
| Step 3    | Second Backwash | 6             |
| Step 4    | Rapid Rinse     | 10            |
| Step 5    | Brine Refill    | 9 lbs/ cu ft  |

**Note:**

Salt settings are pre-set at the factory for the maximum efficiency. **Do not** reduce salt settings below 9 lbs. per cu ft. as the water level in the brine tank will not reach the grid plate.

# Control Start-Up Procedure

## - Start Up Procedure -

1. Put unit in bypass using the handles behind the control valve.
2. Start a regeneration by pressing and holding the set change button for 3 seconds.
  - a. The display may show zeros or a 1, repeat holding the set change button.
3. Display on unit should read 1-10 (Step 1-10 min). Very slowly open the inlet bypass to remove any remaining air.
4. After the inlet bypass has been fully opened slowly, open the outlet bypass and let unit backwash for 2 minutes or until water is clear. Verify water is going to drain.
5. Fill the brine tank with a 5-gallon bucket of water and add the provided Sani pack.
  - a. If you have already added salt, then pour the water and Sani pack down the white 4in brine well cylinder.
6. Advance unit to next regeneration cycle (Step 2-Brine draw) by holding the set change button for 3 seconds.
7. Stay in (step 2- Brine draw) for an additional 10 minutes and verify all water has been drawn out of the brine tank.
8. Advance unit to next regeneration cycle (Step 3-Second Backwash) by holding the set change button for 3 seconds. Stay in this step for 2 minutes. Verify water is going to drain.
9. Advance unit to next regeneration cycle (Step 4-Rapid Rinse) by holding the set change button for 3 seconds. Stay in this step for 2 minutes. Verify water is going to drain.
10. Advance unit to next regeneration cycle (Step 5- Brine fill) by holding the set change button for 3 seconds. Let this step continue until minutes remaining are zero and the time of day appears on display.
  - a. When finished the brine tank should have water above the salt grid.
11. Lastly, add salt to the brine tank. Do not fill salt higher than the brine well.

## - Filling The Brine Tank With Salt -

To expect a high level of performance and reliability, a salt manufactured specifically for water softeners must be used. Salt of this grade is virtually free from dirt and other particulates that would eventually cause the softener to malfunction. A pellet type salt is recommended, although any high quality water softener salt (such as solar salt) will suffice. If iron is present in raw water, use of iron inhibiting salt is recommended. The salt level will decrease after each regeneration cycle. Consequently, the salt compartment will need to be checked and replenished periodically.

1. Fill the brine tank or salt compartment with water softener salt as described above. This will be approximately 250 pounds of salt. (150 lbs. for cabinet models.)

### **Warning:**

Do not fill salt above level of the brine well.

2. Replace brine tank lid.

# Master Programming Mode

To enter Master Programming Mode, press and hold both buttons for 5 seconds.

**Note:** All Master Programming functions have been preset at the factory. Unless a change is desired, it is **NOT** necessary to enter Master Programming Mode.

## 1. Regeneration Time ( r )

Example [ r - 2A ]

- The time of day at which regeneration may take place is designated by the letter "r".
- Default regeneration time setting for **SOFTENERS is 2a**
- The first display digit indicates A.M. or P.M. To change the value, press the **Set/Change** button.
- Press **Menu/Enter** button to accept the value and move to the next digit.
- The second and third display digits indicate the hour at which the regeneration will occur.
- Change the digits with the **Set/Change** button and accept with the **Menu/Enter** button.
- After the entire display flashes, press the **Menu/Enter** button to move to the next menu item.

## 2. Regeneration Day Override (A)

- Press **Menu/Enter** button. This display is used to set the maximum amount of time (in days) the unit can be in service without regeneration. This setting is identified by the letter "A" in the left digit. Regeneration will begin at the scheduled time. A setting of zero will cancel this feature.
- **Example:** Override every 7 days [A-07], default setting, or cancel setting [A-00]. Maximum is 29.

## 3. Regeneration Cycle Step Times (Steps 1-4)

Example [ 3 - 10 ]

- The next 4 displays set the duration of time in minutes for each regeneration cycle step.
- The step number which is currently modifiable is indicated on the far left of the display screen.
- The number of minutes allotted for the selected backwash step is displayed on the far right.
- Change the digit values using the **Set/Change** and **Menu/Enter** buttons as described above.

## 4. Salt Setting

- Default is 9 lbs. per cu. ft.

## 5. System Capacity in Grains ( c )

- Press the **Menu/Enter** button. This display is used to set the system capacity in grains and is used in conjunction with the hardness setting to calculate total gallons of treated water available between regenerations. This option is identified by the letter "c" in the left digit. The maximum value for this item is 399.

**Example:** 32,000 grain capacity (c 032 )

## 6. Reserve Capacity Setting %

Example [P - 25]

## 7. Bluetooth Enabled

bE - 1 (ON)  
bE - 0 (OFF)

## 8. Bluetooth Password

bbPP is displayed for one second, then password is displayed.

## 9. Prefill Enable:

PE-0 - Default setting brine refill will occur at the end of each regeneration cycle.  
PE-1 - Prefill is enabled. Brine tank will be filled prior to each regeneration cycle.

-When this is enabled, the next setting shown will be Pd-3, which means that the prefill will occur 3 hours before the regeneration time. This can be adjusted anywhere between 1-4 hours.

#### 10. Display Off:

do-0 - Default setting. Display is always on

do-1 - "Display Off" is enabled. Display will go to sleep when not in use.  
Display will turn on for 3 seconds when a button is pushed.

11. To Exit the Master Programming Mode, press the **Menu/Enter** button until time of day returns.

#### **Note:**

If no buttons are pressed for 60 seconds, the Master Programming Mode will be exited automatically.

### **- Final Check -**

1. Be certain the bypass valve is in the SERVICE position.
2. Make sure the power supply is connected to an uninterrupted 115-volt outlet.
3. Check that the time of day is set
4. Double check regeneration schedule.
5. Make final check for leaks.
6. Fill out warranty card online at <https://watersoftinc.com/register-your-product/>
7. Leave all manuals with unit.

### **- Operation, Care and Cleaning -**

When the bypass valve is in the **SERVICE** position (position of bypass knobs is parallel to the inlet / outlet piping), water is directed through the water softener. Water may be bypassed by turning the knobs to the bypass position (position of bypass knobs is at right angles to inlet / outlet piping). Water to the home will bypass the softener and be untreated.

*You should manually bypass the softener if:*

1. The outside lines do not bypass the water softener and water is to be used for lawn sprinkling or other similar uses.
2. Servicing the water softener.
3. A water leak from the water softener is evident.
4. Shock treating water well and piping with chlorine or other disinfectant.

### **- To Skip A Regeneration -**

1. For vacations or extended periods of absence, the power supply can be disconnected from the control valve. It is recommended that the 9-volt battery be removed.
2. Upon return, plug in cord and reset the time of day. Replace 9-volt battery.

### **- General Care and Cleaning -**

1. Do not place heavy or sharp objects on water softener or cabinet.
2. Use only mild soap and warm water to clean exterior of the unit. Never use harsh, abrasive cleaners.
3. Protect the water softener and drain line from freezing.
4. Reset time for daylight saving time periods.
5. Replace 9-volt battery once a year.
6. Inspect and clean the brine tank when sediment appears in the bottom of the salt compartment.
7. Always keep the brine tank supplied with good quality salt, a type designed for use in water softeners.

# Troubleshooting

| SYMPTOM                                              | PROBABLE CAUSE                                              | CORRECTION                                                                                                                                   |
|------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Softener Fails to Regenerate Automatically</b> | Power supply plugged into intermittent or dead power source | Connect to constant power source                                                                                                             |
|                                                      | Disconnected meter cable                                    | Reconnect cable                                                                                                                              |
|                                                      | Improper control valve programming                          | Reset program settings                                                                                                                       |
|                                                      | Defective power supply                                      | Replace power supply                                                                                                                         |
|                                                      | Meter is dirty or defective                                 | Clean or replace meter assembly                                                                                                              |
|                                                      | Defective Drive motor                                       | Replace motor                                                                                                                                |
| <b>2. Regeneration at Wrong Time</b>                 | Time of day improperly set, due to power failure            | Reset time of day programming and install 9-volt battery.                                                                                    |
|                                                      | Regeneration time set improperly                            | Reset regeneration time programming                                                                                                          |
| <b>3. Loss of Capacity</b>                           | Increased raw water hardness                                | Increase hardness setting or decrease days between regeneration                                                                              |
|                                                      | Brine concentration and or / quantity                       | Keep brine tank full of salt at all times. Clean it yearly. Salt may be bridged. If using a salt grid plate, ensure refill water is over it. |
|                                                      | Resin fouling                                               | Call dealer. Find out how to confirm it. Clean the resin and prevent future fouling.                                                         |
|                                                      | Poor distribution, channeling (uneven bed surface)          | Call dealer. Check backwash flow. Regenerate more frequently                                                                                 |
|                                                      | Internal valve leak                                         | Call dealer. Replace spacers, seals and / or piston                                                                                          |
|                                                      | Resin age                                                   | Call dealer. Check for resin oxidation caused by chlorine. Mushy resin.                                                                      |
|                                                      | Resin loss                                                  | Call dealer. Check for correct bed depth. Broken distributor tube. Air or gas in bed: well gas eliminator. Loose brine line.                 |
| <b>4. Poor Water Quality</b>                         | Check items listed in #1, #2, and #3                        |                                                                                                                                              |
|                                                      | Bypass valve open                                           | Close bypass valve.                                                                                                                          |
|                                                      | Channeling                                                  | Check for too slow or high service flow. Check for media fouling.                                                                            |
| <b>5. High Salt Usage</b>                            | High salt setting                                           | Lower brine tank refill time                                                                                                                 |
|                                                      | Excessive water in brine tank                               | See symptom #7                                                                                                                               |
|                                                      | Constant flow through the unit                              | Indicates plumbing leak (e.g. toilet tank)                                                                                                   |
|                                                      | Regenerating too frequently                                 | Lower hardness setting or increase days between regeneration.                                                                                |

| SYMPTOM                                                                 | PROBABLE CAUSE                                          | CORRECTION                                                                                   |
|-------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <b>6. Loss of Water Pressure</b>                                        | Scaling / fouling of inlet pipe                         | Clean or replace pipeline. Pretreat to prevent.                                              |
|                                                                         | Fouled resin                                            | Clean resin. Pretreat to prevent.                                                            |
|                                                                         | Improper backwash setting                               | Backwash more frequently                                                                     |
| <b>7. Excessive Water in Brine Tank and / or Salty Water to Service</b> | Plugged drain line or drain line control                | Check flow to drain. Clean drain line flow control button                                    |
|                                                                         | Dirty or damaged brine valve                            | Clean or replace brine valve.                                                                |
|                                                                         | Plugged injector or screen                              | Clean or replace injector screen.                                                            |
|                                                                         | Low inlet pressure                                      | Increase pressure to allow injector to perform properly. (20 psi minimum)                    |
|                                                                         | Excessive brine refill cycle time                       | Lower brine refill time.                                                                     |
| <b>8. Softener Fails to Use Salt</b>                                    | Check items listed in #1                                |                                                                                              |
|                                                                         | Improper control valve programming                      | Check and reset programming                                                                  |
|                                                                         | Plugged / restrict drain line                           | Clean drain line and / or flow control button                                                |
|                                                                         | Injector and / or screen is plugged                     | Clean or replace injector and screen                                                         |
|                                                                         | No water in brine tank                                  | Check for restriction in BLFC. Ensure safety float is not stuck. Check brine tank for leaks. |
|                                                                         | Water pressure is too low                               | Line pressure must be at least 20 psi.                                                       |
|                                                                         | Brine line injects air during brine draw                | Check brine line connections for air leaks                                                   |
|                                                                         | Internal control leak                                   | Call dealer. Check piston, seals and spacers for scratches and dents.                        |
| <b>9. Continuous Flow to Drain</b>                                      | Foreign material in control piston and seals            | Call dealer. Clean valve and replace piston and seals.                                       |
|                                                                         | Internal control leak                                   | Same as above.                                                                               |
|                                                                         | Valve jammed in backwash, brine or rapid rinse position | Same as above.                                                                               |
|                                                                         | Motor stopped or jammed                                 | Check for jammed piston. Replace piston and seals. Replace motor if motor is unresponsive.   |

# Error Codes

## Control Valve Error Code Diagnosis

Under normal operating conditions, when your control valve is in the “in service” position, the display should alternate between the current time of day and the number of days remaining (for filters and time clock softeners) or gallons remaining (for metered softeners) until the next regeneration. This is the “home display.” If the valve is currently going through a regeneration cycle, the display will show the cycle step on the left side of the display and the number of minutes remaining in that step on the right side of the display. If any other information is being displayed, then the valve is informing you of an issue. There are five error codes which could indicate an issue with the control valve. When an error is being displayed, the valve will be in a stopped position, and the buttons will not respond to being pressed. Even if the cause of the error code is corrected, the error code will not clear until the power supply has been disconnected and reconnected (this will be referred to as “cycling” the power). All error codes are displayed as the letters “Err” followed by a flashing number 2-6:

**Error 2** - Valve is searching for homing slot.

Allow valve to continue running. If the homing slot is found, the valve will return to the home display, otherwise, another error code will appear.

**Error 3** - No encoder slots are being seen.

This occurs when the motor is running, but the encoder is not seeing any of the slots in the encoder wheel. This can happen if the encoder has been disconnected, but most commonly occurs when debris in the valve body has stopped the piston, causing the encoder wheel to be unable to turn.

**Error 4** - Unable to find homing slot.

**Error 5** - Motor overload.

This occurs when the motor current is too high. This could be caused by an issue with the motor itself, but is typically caused by friction in the valve body

**Error 6** - No motor current.

This typically occurs if the motor cable has come unplugged from the circuit board. Check that the motor cable is plugged into the circuit board and attached to the motor. If this is not the issue, the motor or circuit board may need to be replaced.

## No Display

If your display is blank, there is no power going to the circuit board due to one of the following factors:

- The electrical outlet is not powered or is switched off
- The power cable has come unplugged from the circuit board
- The power supply has come unplugged from your electrical outlet
- The power supply has come unplugged from the control valve
- The power supply is not working

# Warranty

## WATER TREATMENT EQUIPMENT

This warranty cannot be transferred - it is extended only to the original purchaser or first user of the product. By accepting and keeping this product, you agree to all of the warranty terms and limitations of liability described below.

**Important Warning:** Read carefully the WaterSoft Systems Equipment Installation, Operating and Maintenance Instructions Manual to avoid serious personal injury and property HAZARDS and to ensure safe and proper care of this product.

Model Numbers Covered:  
Water Softeners, Media Filters and Upflow Filters

\*FOR AS LONG AS YOU OWN AND LIVE IN YOUR SINGLE FAMILY HOME, this warranty covers your water treatment equipment, if you are the first user of this WaterSoft Systems equipment and purchased it for single family home use - subject to all of the conditions, limitations and exclusions listed below. Purchasers who buy the WaterSoft Systems equipment for other purposes, and other component parts are subject to more limited warranties and you should read all of the terms included in this form to make sure you understand your warranty.

What is covered by this warranty?

WaterSoft Systems warrants that at the time of manufacture, the water treatment equipment shall be free from defects in material and workmanship as follows :

| Product                                | Warranty |
|----------------------------------------|----------|
| Residential Mineral Tank               | 10 Years |
| Proprietary Control Valves             | 7 Years  |
| Other Softener / Filter Control Valves | 5 Years  |
| Brine Tank                             | 5 Years  |
| Residential Reverse Osmosis System     | 5 Years  |
| Other Accessories and Parts            | 1 Year   |
| Brine Tank Components                  | 1 Year   |

\* This warranty does not include media and/or cartridge filter elements.

### Additional Terms & Conditions

What WaterSoft Systems will do if you have a covered warranty claim WaterSoft will at its option either make repairs to correct any defect in material or workmanship or supply and ship either new or used replacement parts or products. WaterSoft will not accept any claims for labor or other costs.

### Additional Exclusions and Limitations

This warranty is non-transferable and does not cover any failure or problem unless it was caused solely by a defect in material or workmanship. In addition, this warranty shall not apply :

- If the water treatment equipment is not correctly installed, operated, repaired and maintained as described in the Installation, Operating & Maintenance Instructions Manual provided with the product.
- Defects caused as a direct result of the incoming water quality

- If the tank is not the size indicated for the supply line size of the installation, as described in the manual.
- To any failure or malfunction resulting from abuse (including freezing), improper or negligent; handling, shipping (by anyone
- If the unit has not always been operated within the factory calibrated temperature limits, and at a water pressure not exceeding 125 psi other than WaterSoft), storage, use, operation, accident; or alteration, lightning, flooding or other environmental conditions;
- To any failure or malfunction resulting from failure to keep the unit full of potable water, free to circulate at all times; and with the tank free of damaging water sediment or scale deposits;
- This warranty does not cover labor costs, shipping charges, service charges, delivery expenses, property damage, administrative fees or any costs incurred by the purchaser in removing or reinstalling the water treatment equipment.
- The warranty does not cover any claims submitted to WaterSoft more than 30 days after expiration of the applicable warranty, and does not apply unless prompt notice of any claim is given to an authorized WaterSoft Dealer or to WaterSoft or a designated contractor is provided access to the installation and to the water treatment equipment.

THESE WARRANTIES ARE GIVEN IN LIEU OF ALL OTHER EXPRESS WARRANTIES. NO WaterSoft REPRESENTATIVE OR ANY OTHER PARTY IS AUTHORIZED TO MAKE ANY WARRANTY OTHER THAN THOSE EXPRESSLY CONTAINED IN THIS WARRANTY AGREEMENT.

### Additional Warranty Limitations

ANY IMPLIED WARRANTIES THE PURCHASER MAY HAVE, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE APPLICABLE TIME PERIODS SPECIFIED ABOVE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

### Limitations of Remedies

The remedies contained in this warranty are the purchaser's exclusive remedies. In no circumstances will WaterSoft or the seller of the product be liable for more than, and purchaser-user's remedies shall not exceed, the price paid for the product. In no case shall WaterSoft or seller be liable for any special, incidental, contingent or consequential damages. Special, incidental, contingent and consequential damages for which WaterSoft is not liable include, but are not limited to, inconvenience, loss or damage to property, consequential mold damage, loss of profits, loss of savings or revenue, loss of use of the products or any associated equipment, facilities, buildings or services, downtime, and the claims of third parties including customers. Some states do not allow the exclusion or the limitation of incidental or consequential damages, so the above limitations or exclusion may not apply to you.

### What to do if you have a problem covered by this warranty

Any warranty coverage must be authorized by WaterSoft. Contact the person from whom you purchased the product, who must receive authorization from a WaterSoft Dealer .

If your product is new and not used and you wish to return it, contact your WaterSoft Dealer.



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