Greensand Plus
Iron Filter Manual
Installation / Operation
Manual
**General Specifications**

<table>
<thead>
<tr>
<th></th>
<th>G9I</th>
<th>G10I</th>
<th>G12I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter Media</td>
<td>Greensand Plus™</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filter Media Capacity (cu ft)</td>
<td>1.00</td>
<td>1.50</td>
<td>2.00</td>
</tr>
<tr>
<td>Garnet Sand Underbed (lbs)</td>
<td>20</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>Mineral Tank (Vortech™)</td>
<td>9 x 48</td>
<td>10 x 54</td>
<td>12 x 52</td>
</tr>
<tr>
<td>Potassium Permanganate Solution Tank Size</td>
<td>10 x 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal Capacities Iron / Sulfur</td>
<td>10 ppm / 3 ppm</td>
<td>10 ppm / 3 ppm</td>
<td>10 ppm / 3 ppm</td>
</tr>
<tr>
<td>Service Flow Rate - Continuous (gpm)</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Service Flow Rate - Intermittent (gpm)</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Backwash Flow Rate (gpm)</td>
<td>5.0</td>
<td>5.0</td>
<td>6.0</td>
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<tr>
<td>Gallons Used / Regeneration</td>
<td>128</td>
<td>130</td>
<td>173</td>
</tr>
<tr>
<td>Space Required</td>
<td>9 x 21 x 57</td>
<td>10 x 22 x 62</td>
<td>13 x 24 x 60</td>
</tr>
<tr>
<td>Approximate Shipping Weight (lbs)</td>
<td>157</td>
<td>215</td>
<td>305</td>
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</tbody>
</table>

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**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.
Greensand Plus Iron Filter is capable of removing dissolved iron, manganese and hydrogen sulfide from water through oxidation and filtration. The maximum practical limit of iron (Fe) and manganese (Mn) in raw water is 10 ppm. The maximum practical limit of hydrogen sulfide (H₂S) is 3 ppm. Raw water pH should be 6.8 to 8.8.

Manganese treated greensand works as an oxidizing filter to remove the dissolved minerals above. The manganese oxides convert the soluble ferrous minerals in the water into ferric (or floating particles) minerals. As the ferric hydroxide forms, it is filtered from the water by the granular material in the tank.

When the oxidizing capacity of the filter media becomes exhausted, regeneration is necessary. First the filter valve bypasses the raw water to the system to provide uninterrupted service. The valve then reverses the flow of the water through the filter bed to produce a backwash to the drain. Because of the density of the media bed, it is very important to size the filter to the pump volume thus ensuring adequate supply for backflushing.

The valve then brings in dissolved potassium permanganate from the small feeder tank and rinses it slowly through the greensand media. The introduction of this oxidizing agent replaces the oxygen lost during normal service and restores the managanese dioxide coating on the filter material renewing it for further service. A fast rinse then follows to settle the media and ensure that the chemical is rinsed away. The valve then refills the potassium permanganate tank to make solution for the next time. Service flow is downward through the filter media and up through the distributor tube in the center of the tank.

It is recommended that the greensand media be vigorously regenerated when new and that it be regenerated before it is exhausted while it is in service.
-Installation Requirements-

**Feed Pot Tank**
- A level floor position between the well pump and pressure tank. (See Typical Installation Diagram.)
- DO NOT install in an area of direct sunlight or where freezing temperatures may occur!

**Filter Tank**
- 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.
- DO NOT install the unit in an area of direct sunlight or where freezing temperatures may occur! (See Typical Installation Diagram.)
-Filter 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 of 1/2” I.D. Drain line tubing is not included.

**Caution:** If sweat soldering copper pipe, (remember to always use lead free solder and flux) cover yoke and bypass valve with wet rags to prevent heat damage to connections and control valve! If using PVC or plastic pipe, primers and solvent cements specifically recommended for use with potable water are required.

**Note:** All plumbing lines not requiring soft water should be connected upstream of the filter. (See Typical Installation Diagrams.)

-Installation Procedure-

-Water Supply Connection and Bypass Valve-

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

1. Position filter at desired location for installation. If a water softener is to be installed, the filter should be positioned first and then the softener. (See Installation Diagrams.)

2. The filter material is shipped separately from the mineral tank. The tank must be loaded with material after tank has been placed at the desired location.
   a. Remove the control valve by unscrewing from the tank.
   b. Remove and inspect distributor tube and bottom basket.
   c. Replace distributor tube and use a cork or tape to place over top of distributor tube to prevent mineral from entering tube while filling.
   d. Place mineral funnel in hole on top of tank.
   e. Pour several gallons of water in the tank.

   **Caution:** Not following this procedure can cause damage to distributor tube or basket when loading material!
   f. First pour in the filter material.

   **Note:** The required quantity of gravel is in the tank already.
   g. After filling the tank with material, use a garden hose or several buckets to fill the tank with water.

   **Note:** This will permit the filtering material to become soaked while preparing the installation and will prevent the control valve from being plugged with floating material on initial backwash.
   h. Remove funnel and clean filter material from tank threads.
   i. Remove cork or tape from distributor tube.
   j. Replace control valve on mineral tank.

   **Caution:** Be extremely careful to position distributor tube into control valve distributor tube pilot hole.

3. Turn off main water supply and open nearest faucet to relieve pressure.

4. Cut main line and install elbows and extensions. Inlet and outlet connections on the control valve are 3/4” FNPT.

   **Note:** An optional 1” FNPT bypass is available.

   **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.

5. Rotate handle on bypass valve to the bypass position (position of handle is across inlet/outlet piping).

6. Turn the main supply line on to restore water service to the home.

7. Open nearest faucet to evacuate air and repressurize plumbing lines.

8. Check for leaks!
Installation

-Drain Line Connection-

1. Pull out clip and remove drain line assembly located on the left side of control valve. Remove drain line hose barb and wrap threads with Teflon tape. Reinstall drain line hose barb. Caution: Hand tighten only!! Replace drain line assembly and reinstall clip.

2. Install 1/2" I.D. line tubing (not included) from hose barb to an open drain. A 4" gap between the 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 regeneration. 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’ in length, 3/4” I.D. drain line tubing should be used.

-Potassium Permanganate Feed Rate-

The amount of potassium permanganate fed during regeneration is automatically controlled by the float assembly located inside the feed tank. This is an adjustable float, which must be set at a minimum of 4 1/4", but not higher than 5 1/2". This distance is measured between the bottom of chemical feed valve and the bottom of the float with the valve closed (float UP position). The float settings for each model are as follows:

<table>
<thead>
<tr>
<th>Model #</th>
<th>Float Setting</th>
<th>Media Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>G9I</td>
<td>4 1/4&quot;</td>
<td>1.0 cu. ft.</td>
</tr>
<tr>
<td>G10I</td>
<td>4 1/2&quot;</td>
<td>1.5 cu. ft.</td>
</tr>
<tr>
<td>G12I</td>
<td>5 1/2&quot;</td>
<td>2.0 cu. ft.</td>
</tr>
</tbody>
</table>

1. To measure and set the float, remove the chemical well cap and float assembly.
2. Remove rubber band from float valve.
3. Measure distance from bottom of chemical feed valve to the bottom of float with the float in the UP position. To move float, slide rubber grommets up and down float shaft. Make certain both upper and lower grommets are tightly against float body. Replace float assembly and chemical well cap.

WARNING: After adjustment, ensure that the float maintains proper up and down travel, otherwise, overfilling of the feed tank could occur!

-Chemical Feed Line and Overflow Connections-

1. Position Potassium Permanganate Tank (KMNO4) on a smooth, level surface near the filter media tank. If necessary, the KMNO4 tank can be placed at a higher level than the resin tank, but never at a lower level.
2. Install one end of 3/8" O.D. by 1/4" I.D. chemical line tubing (included with unit) to compression fitting located on right side of control valve, behind backplate.
3. Remove KMNO4 tank cover.
4. Insert opposite end of chemical line through outer hole in KMNO4 tank.
5. Connect chemical line to compression fitting on float valve located on top of chemical well.
6. Install 1/2" I.D. drain line tubing (not included) to the overflow fitting on KMNO4 tank located just below the chemical line.
7. Run the opposite end of KMNO4 tank drain line to a suitable drain.

Note: The KMNO4 tank drain is gravity flow and must discharge below the overflow fitting.
Caution: Do not tee to the main drain line from control valve.

NOTICE: The KMNO4 overflow is provided as a back-up in the event the float shut-off should fail, allowing the KMNO4 tank to overfill. This drain connection would then carry the excess chemical to the drain and prevent flooding of the floor, which could be hazardous to health or damage furniture or carpets. Therefore, no liability will or can be assumed by the manufacturer of the filter should this occur.
Electronic Connections

P - Power Supply
B - Powered in Backwash Cycle Only
S - Powered in Entire Regeneration Cycle

- Electrical Connection -

1. Connect the power supply to the control valve and plug 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.

-Pressurizing The System -

2. Slowly rotate handle of the bypass valve to the SERVICE position.
3. Open the nearest faucet to evacuate air from plumbing lines.
4. Check for leaks! If water is observed leaking from bypass, o-rings on valve body may not be seat-
ed properly.
5. After air is evacuated from plumbing lines, turn off faucet.

- Initial Control Valve Operation -

1. Advance control valve to BACKWASH (cycle 1) position and allow water to run to drain for 3 to 4 minutes.

Warning: Close handle on bypass prior to selecting the backwash position. After backwash position has been established, slightly open valve on bypass to evacuate air from the media tank. Fully open bypass valve when all air is depleted. This procedure will prevent media form being uplifted into control valve.

2. Advance control valve to RAPID RINSE (cycle 3) position and allow water to run to drain for 3 to 4 minutes.
3. Advance control valve to SERVICE (cycle 0) position.
Control Start-Up Procedures

- Final Checkout -

1. Be certain that the bypass valve is in Service position and main valve is completely on.
2. Check electrical supply to be certain the cord is connected to an uninterrupted 115 volt outlet.
3. Be certain the warranty card is filled out and mailed in.
4. Leave this manual with the homeowner.

Important Notice - The plumbing system, piping, pressure tank, hot water tanks, softeners, etc. that have been exposed to iron bearing water may need to be cleaned of the precipitated iron that has been collected in them or iron bleed thru may be a problem. We suggest all tanks be drained and flushed thoroughly.

- Programming The Control Valve -

1. Set time of day.
2. Set a.m. or p.m.
3. Set number of days between backwash. (This generally will be every 4 to 6 days.)

1. Set regeneration time if other than 12:00 a.m. is desired.

Main Menu

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. Example (R)
   - To accept the digit value, press the Menu/Enter button.
   - Once A.M. or P.M. is accepted, the next menu item will flash.
4. a. To set the Number of Days between Backwash Cycles (A), press the Set/Change button.
   - Repeat instructions from step (2). Example (R - 06)
   Notes: 1) Maximum value is 29.
   2) If value set to 0, Automatic Backwash will never occur.
   3) Default setting is 6 days for filters.
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.

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Normal Operation

1. **Home Display**
   a. Alternates between the display of Time of Day and Number of Days until the Next Backwash. (Metered Softeners will alternate between time of days and gallons remaining until next regeneration)
      - Days Remaining until the Next Backwash will count down from the entered value until it reaches 1 day remaining.
      - A Backwash Cycle will then be initiated at the next designated regeneration time.

2. **Battery Back-Up** (Uses a standard 9-volt alkaline battery.)

   **Features of Battery Back-Up:**
   - 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 and the display will turn on for five (5) seconds.

   - If power failure occurs while system is regenerating, the Isobar 2 will motor to a shut off position to 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 Isobar 2 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.
Starting Extra Regeneration Cycle

1. To Start **Delayed Extra Cycle** (Example (1))
   - If Days Remaining Until Next Backwash does not read ‘1’, press and hold the *Set/Change* button for 3 seconds until the display reads ‘1’.
   - Backwash cycle will initiate at the next designated backwash time.

2. To start **Immediate Extra Cycle**
   - First complete above step.
   - With Days Remaining Until Next Regeneration at ‘1’.
   - Press and hold the *Set/Change* button.
   - After 3 seconds, the backwash 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)

<table>
<thead>
<tr>
<th>Filters</th>
<th>Default (Min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Backwash</td>
</tr>
<tr>
<td>Step 2</td>
<td>Brine Draw</td>
</tr>
<tr>
<td>Step 3</td>
<td>Rapid Rinse</td>
</tr>
<tr>
<td>Step 4</td>
<td>Refill</td>
</tr>
</tbody>
</table>
To take advantage of the Bluetooth interface this feature must be set up on a Bluetooth enabled device.

**Note:** At the time of this release Bluetooth control only works on Android devices with a compatible version of Bluetooth.


2. **Pair the smart phone or tablet to the control valve**
   - Open the settings menu on your smart phone or tablet and click on Bluetooth.
   - Look for the softener or filter valve under the list of available Bluetooth devices.
   - Select the device and pair (Default password is: 1234)

3. Once the devices are paired open the **Legacy View** app
   - Click the Legacy View logo in the top left corner to refresh the list of connected paired control valves and select which valve you would like to view.

**FCC ID:** SWPLV-019
**Name of Grantee:** CHANDLER SYSTEMS, INC.
**Equipment Class:** Part 15 Low Power Communication Device
**Notes:** Legacy View Valve

This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment. NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
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 12A)  
   - The time of day at which backwash may take place is designated by the letter “r”.  
   - Default regeneration time settings is 12a  
   - 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 backwash 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 Cycle Step Times (Steps 1, 2, 3, 4)**  
   Example (3 10)  
   - The next 4 displays set the duration of time in minutes for each backwash 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.

3. **Bluetooth Enabled**  
   - bE - 1 (ON)  
   - bE - 0 (OFF)

4. **Bluetooth Password**  
   - bbPP is displayed for one second, then password is displayed.

5. 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.
**Control Valve Powerhead Assembly**

**LETTERS IN DIAGRAM REPRESENT WIRING CONNECTIONS**

* "F" Port is for softener flow meter connection (flow meter not shown)

<table>
<thead>
<tr>
<th>Ref</th>
<th>Description</th>
<th>Part Number</th>
<th>Qty</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>Timered Power Head Assy.</td>
<td>20941X100</td>
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<tr>
<td>0</td>
<td>Metered Power Head Assy.</td>
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<td>1</td>
<td>Softener Circuit Boad Assy.</td>
<td>20941X102</td>
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<tr>
<td>2</td>
<td>Encoder</td>
<td>20001X124</td>
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<td>3</td>
<td>Front Plate</td>
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<td>4</td>
<td>Encoder Wheel</td>
<td>20001X007</td>
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<td>5</td>
<td>Main Gear</td>
<td>20001X120</td>
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<td>6</td>
<td>Power Supply</td>
<td>20001X125</td>
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<td>7</td>
<td>Back Plate</td>
<td>20001X005</td>
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<td>Lower Front Base For Cover</td>
<td>20111X002</td>
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<td>9</td>
<td>Motor</td>
<td>21001X113</td>
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<td>10</td>
<td>Lower Back Base for Cover</td>
<td>20111X003</td>
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<td>11</td>
<td>Valve Cover</td>
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<td>12</td>
<td>Piston Screw</td>
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<td>13</td>
<td>Screw</td>
<td>SC10</td>
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<td>14</td>
<td>Screw</td>
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<td>Washer Circuit Board</td>
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<td>Screw Motor</td>
<td>SC2</td>
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<td>21</td>
<td>Valve Hex Screw</td>
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# Valve Body Drive Assy.

<table>
<thead>
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<th>Ref #</th>
<th>Description</th>
<th>Part #</th>
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<tbody>
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<td>1</td>
<td>Piston Assembly</td>
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<tr>
<td>2</td>
<td>10-24 x 13/16 Screw</td>
<td>20001X226</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Seal &amp; Spacer Kit</td>
<td>20561X253</td>
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</tr>
<tr>
<td>4</td>
<td>End Spacer</td>
<td>N/S</td>
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<tr>
<td>5</td>
<td>Flow Control Button 1.5 GPM</td>
<td>20251X266</td>
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<tr>
<td></td>
<td>Flow Control Button 2.0 GPM</td>
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<td>Flow Control Button 2.4 GPM</td>
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<td>Flow Control Button 3.0 GPM</td>
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<td></td>
<td>Flow Control Button 4.0 GPM</td>
<td>20251X271</td>
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</tr>
<tr>
<td></td>
<td>Flow Control Button 5.0 GPM</td>
<td>20251X272</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Flow Control Button 7.0 GPM</td>
<td>20251X274</td>
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<td>6</td>
<td>Plastic Flow Control Housing</td>
<td>20251X100</td>
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<tr>
<td>6a</td>
<td>Flow Control Assembly – Specify GPM Incl. (1)</td>
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<td></td>
<td>each #20 thru #23</td>
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<td></td>
<td>Flow Control Assy. 1.5 GPM-PVC</td>
<td>20251X256</td>
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<td>Flow Control Assy. 2.0 GPM-PVC</td>
<td>20251X257</td>
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<td>Flow Control Assy. 2.4 GPM-PVC</td>
<td>20251X258</td>
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<td>Flow Control Assy. 3.0 GPM-PVC</td>
<td>20251X259</td>
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<td></td>
<td>Flow Control Assy. 3.5 GPM-PVC</td>
<td>20251X260</td>
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<td></td>
<td>Flow Control Assy. 5.0 GPM-PVC</td>
<td>20251X262</td>
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<td>Flow Control Assy. 7.0 GPM-PVC</td>
<td>20251X264</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Drain Line Fitting 90º Elbow 1/2&quot; NPT X 1/2&quot; Tubing</td>
<td>20251X255</td>
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</tr>
<tr>
<td>8</td>
<td>Drain Retainer</td>
<td>20001X214</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Brine Assembly</td>
<td>20561X225</td>
<td>1</td>
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<tr>
<td>10</td>
<td>BLFC Assembly .5 GPM</td>
<td>20001X228</td>
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<tr>
<td>11</td>
<td>Brine Line Ferrule</td>
<td>20251X305</td>
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<tr>
<td>12</td>
<td>Brine Line Compression Nut</td>
<td>N/S</td>
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<tr>
<td>13</td>
<td>10-24 X 1 Hex Screw</td>
<td>20001X226</td>
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<tr>
<td>14</td>
<td>Injector Cap</td>
<td>20001X223</td>
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<tr>
<td>14a</td>
<td>Injector Kit-Specify Size- Inc. (1) ea #14, #15, #16, #17 &amp; (2) #13</td>
<td>20001X220</td>
<td>1</td>
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<td>15</td>
<td>Injector Seal</td>
<td>20001X224</td>
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<tr>
<td>16</td>
<td>Injector Assy. Specify Size</td>
<td>20001X219</td>
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<tr>
<td>17</td>
<td>Injector Screen</td>
<td>20001X222</td>
<td>1</td>
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<tr>
<td>18</td>
<td>Injector Plug &amp; O-Ring Assy.</td>
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<td>1</td>
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<tr>
<td>19</td>
<td>O-Ring</td>
<td>2000X215</td>
<td>1</td>
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<tr>
<td>20</td>
<td>O-Ring</td>
<td>20561X204</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>Mounting Clip</td>
<td>20561X201</td>
<td>2</td>
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<tr>
<td>22</td>
<td>8-18 X 5/8&quot; Screw</td>
<td>20561X217</td>
<td>2</td>
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<tr>
<td>23</td>
<td>Adapter Coupling</td>
<td>N/S</td>
<td>2</td>
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<tr>
<td>23a</td>
<td>Adapter Coupling &amp; O Ring Assy. Incl. (1) #40 &amp; (2) # 41</td>
<td>20561X215</td>
<td>1</td>
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<tr>
<td>24</td>
<td>O-Ring</td>
<td>20561X216</td>
<td>4</td>
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*Items #21 thru #24 used ONLY with clock regeneration*
<table>
<thead>
<tr>
<th>Ref #</th>
<th>Description</th>
<th>Part #</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plastic Bypass Valve Assembly</td>
<td>20561X292</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Bypass Valve 3/4” Stainless Steel</td>
<td>20561X270</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Bypass Valve 1” Stainless Steel</td>
<td>20561X283</td>
<td>1</td>
</tr>
</tbody>
</table>
A. General Preliminary Instructions

**PERFORM BEFORE ALL SERVICING OPERATIONS**

1. Turn off water supply to conditioner.
   - If the conditioner installation has a “three valve” bypass system, first open the valve in the bypass line, then close the valves at the conditioner inlet and outlet.
   - If the conditioner has an integral bypass valve, put it in the bypass position.
   - If there is only a shut off valve near the conditioner inlet, close it.
2. Remove cover and relieve water pressure in the conditioner by stepping the control into the backwash position momentarily. Return the control to the service position.
3. Unplug electrical cord from outlet.

B. To Replace Injectors & Screen

1. Follow steps A1 - A3 (above)
2. Remove injector cap screws and remove cap.
3. Remove injector assembly. Apply silicone lubricant to new injector assembly O rings and install. Be sure to push injector assembly tightly so O rings are seated. Install a new screen.
4. Apply silicone lubricant to new gasket and install on injector cap.
5. Follow D7 - D14.

C. To Replace Powerhead

1. Remove the control valve cover and disconnect the power supply.
2. Disconnect the meter cable from circuit board and feed back through control (if existing meter is being re-used)
3. Remove screw and washer at drive yoke. Remove powerhead mounting screws. The entire powerhead assembly will now lift off easily.
4. Put new powerhead on top of the valve. Be sure the drive pin on main gear engages slot in drive yoke (wide side of drive yoke upright must face to the left away from the motor).
5. Replace powerhead mounting screws. Replace screw and washer at drive yoke.
6. Reconnect meter signal, optical sensor, power supply, and circuit board signal wires.
7. Reinstall cover.
D. To Replace Brine Valve
1. Follow steps A1 - A3
2. Remove the control valve cover. Disconnect the meter cable from the meter assembly.
3. Remove screw and washer at piston drive yoke. Remove powerhead mounting screws. The entire powerhead assembly will now lift off easily.
4. Remove piston retaining plate screws and pull upward on end of piston yoke until assembly is out of valve.
5. Pull brine valve from valve body.
6. Apply silicone lubricant to O ring on new brine valve assembly and press into brine valve hole, shoulder on bushing should be flush with injector body.
7. Reinstall piston and powerhead assembly.
8. Reconnect brine tube and drain line.
9. Return bypass or inlet valving to normal service position. Water pressure should now be applied to the conditioner, and any bypass line shut off.
10. Check for leaks at all seal areas. Check drain seal with the control in the backwash position.
11. Plug electrical cord into outlet.
12. Set time of day and cycle control valve manually to assure proper function. Make sure control valve is returned to the service position.
13. Make sure there is enough salt in the brine tank.
14. Start regeneration cycle manually if water is hard.
15. Replace control valve cover.

E. To Replace Piston Assembly
1. Follow steps A1 - A3
2. Remove control valve back cover. Disconnect the meter signal wire from the meter.
3. Remove screw and washer at piston drive yoke. Remove powerhead mounting screws. The entire powerhead assembly will now lift off easily.
4. Remove piston retaining plate screws.
5. Pull upward on end of piston yoke until assembly is out of valve.
6. Inspect the inside of the valve to make sure that all spacers and seals are in place, and that there is no foreign matter that would interfere with the valve operation.
7. Take new piston assembly and push piston into valve by means of the end plug. Twist drive yoke carefully in a clockwise direction to properly align it with drive gear. Reinstall piston retaining plate screws.
8. Place powerhead on top of valve. Be sure drive pin on main gear engages slot in drive yoke (wide side of drive yoke upright must face to the left away from the motor).
9. Replace powerhead mounting screws. Replace screw and washer at drive yoke.
F. To Replace Seals and Spacers
2. Remove the control valve cover. Disconnect the meter signal wire from the meter.
3. Remove screw and washer at piston drive yoke. Remove powerhead mounting screws.
   The entire powerhead assembly will now lift off easily. Remove piston retaining plate screws.
4. Pull upward on end of piston rod yoke until assembly is out of valve. Remove seals and spacers. (Note: Special end spacer must be reused)
5. Lubricate new seals with silicone lubricant included in the seal and spacer kit. Make sure the special end spacer is properly seated in the valve body. Install new seals and spacers individually, pressing around the outer edge of each seal to make sure it is seated.
   (When all seals and spacers are seated properly, you will have a 1/4” of space between the top seal and the top of the valve body)
6. Follow Steps E7 - E10.

G. To Replace Meter
1. Follow steps A1 - A3
2. Remove two screws and clips at bypass valve or yoke. Pull softener tank away from plumbing connections.
3. Remove meter cable from meter.
4. Remove two screws and clips at meter and pull the meter out of the control valve.
5. Apply silicone lubricant to O rings on new meter.
6. Attach meter to control valve. Note: meter portion of module must be assembled on valve outlet. Install two screws and clips.
7. Plug meter cable into new meter.
8. Attach two clips and screws at bypass valve or yoke. Be sure clip legs are firmly engaged with lugs.
<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBABLE CAUSE</th>
<th>CORRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Softener Fails to Regenerate</td>
<td>Power supply plugged into intermittent or dead power source</td>
<td>Connect to constant power source</td>
</tr>
<tr>
<td>Automatically</td>
<td>Disconnected meter cable</td>
<td>Reconnect cable</td>
</tr>
<tr>
<td></td>
<td>Improper control valve programming</td>
<td>Reset program settings</td>
</tr>
<tr>
<td></td>
<td>Defective power supply</td>
<td>Replace power supply</td>
</tr>
<tr>
<td></td>
<td>Meter is dirty or defective</td>
<td>Clean or replace meter assembly</td>
</tr>
<tr>
<td></td>
<td>Defective Drive motor</td>
<td>Replace motor</td>
</tr>
<tr>
<td>2. Regeneration at Wrong Time</td>
<td>Time of day improperly set, due to power failure</td>
<td>Reset time of day programming and install 9-volt battery.</td>
</tr>
<tr>
<td></td>
<td>Regeneration time set improperly</td>
<td>Reset regeneration time programming</td>
</tr>
<tr>
<td>3. Loss of Capacity</td>
<td>Increased raw water hardness</td>
<td>Increase hardness setting or decrease days between regeneration</td>
</tr>
<tr>
<td></td>
<td>Brine concentration and or / quantity</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Resin fouling</td>
<td>Call dealer. Find out how to confirm it. Clean the resin and prevent future fouling.</td>
</tr>
<tr>
<td></td>
<td>Poor distribution, channeling (uneven bed surface)</td>
<td>Call dealer. Check backwash flow. Regenerate more frequently</td>
</tr>
<tr>
<td></td>
<td>Internal valve leak</td>
<td>Call dealer. Replace spacers, seals and / or piston</td>
</tr>
<tr>
<td></td>
<td>Resin age</td>
<td>Call dealer. Check for resin oxidation caused by chlorine. Mushy resin.</td>
</tr>
<tr>
<td></td>
<td>Resin loss</td>
<td>Call dealer. Check for correct bed depth. Broken distributor tube. Air or gas in bed: well gas eliminator. Loose brine line.</td>
</tr>
<tr>
<td>4. Poor Water Quality</td>
<td>Check items listed in #1, #2, and #3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bypass valve open</td>
<td>Close bypass valve.</td>
</tr>
<tr>
<td></td>
<td>Channeling</td>
<td>Check for too slow or high service flow. Check for media fouling.</td>
</tr>
<tr>
<td>5. High Salt Usage</td>
<td>High salt setting</td>
<td>Lower brine tank refill time</td>
</tr>
<tr>
<td></td>
<td>Excessive water in brine tank</td>
<td>See symptom #7</td>
</tr>
<tr>
<td></td>
<td>Constant flow through the unit</td>
<td>Indicates plumbing leak (e.g. toilet tank)</td>
</tr>
<tr>
<td></td>
<td>Regenerating too frequently</td>
<td>Lower hardness setting or increase days between regeneration.</td>
</tr>
<tr>
<td></td>
<td>Fouled resin</td>
<td>Clean resin. Pretreat to prevent.</td>
</tr>
<tr>
<td></td>
<td>Improper backwash setting</td>
<td>Backwash more frequently</td>
</tr>
<tr>
<td>SYMPTOM</td>
<td>PROBABLE CAUSE</td>
<td>CORRECTION</td>
</tr>
<tr>
<td>---------</td>
<td>---------------</td>
<td>------------</td>
</tr>
<tr>
<td>7. Excessive Water in Brine Tank and / or Salty Water to Service</td>
<td>Plugged drain line or drain line control</td>
<td>Check flow to drain. Clean drainline flow control button</td>
</tr>
<tr>
<td></td>
<td>Dirty or damaged brine valve</td>
<td>Clean or replace brine valve.</td>
</tr>
<tr>
<td></td>
<td>Plugged injector or screen</td>
<td>Clean or replace injector screen.</td>
</tr>
<tr>
<td></td>
<td>Low inlet pressure</td>
<td>Increase pressure to allow injector to perform properly. (20 psig minimum)</td>
</tr>
<tr>
<td></td>
<td>Excessive brine refill cycle time</td>
<td>Lower brine refill time.</td>
</tr>
<tr>
<td>8. Softener Fails to Use Salt</td>
<td>Check items listed in #1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improper control valve programming</td>
<td>Check and reset programming</td>
</tr>
<tr>
<td></td>
<td>Plugged / restrict drain line</td>
<td>Clean drain line and / or flow control button</td>
</tr>
<tr>
<td></td>
<td>Injector and / or screen is plugged</td>
<td>Clean or replace injector and screen</td>
</tr>
<tr>
<td></td>
<td>No water in brine tank</td>
<td>Check for restriction in BLFC. Ensure safety float is not stuck. Check brine tank for leaks.</td>
</tr>
<tr>
<td></td>
<td>Water pressure is too low</td>
<td>Line pressure must be at least 20 psi.</td>
</tr>
<tr>
<td></td>
<td>Brine line injects air during brine draw</td>
<td>Check brine line connections for air leaks</td>
</tr>
<tr>
<td></td>
<td>Internal control leak</td>
<td>Call dealer. Check piston, seals and spacers for scratches and dents.</td>
</tr>
<tr>
<td>9. Continuous Flow to Drain</td>
<td>Foreign material in control piston and seals</td>
<td>Call dealer. Clean valve and replace piston and seals.</td>
</tr>
<tr>
<td></td>
<td>Internal control leak</td>
<td>Same as above.</td>
</tr>
<tr>
<td></td>
<td>Valve jammed in backwash, brine or rapid rinse position</td>
<td>Same as above.</td>
</tr>
<tr>
<td></td>
<td>Motor stopped or jammed</td>
<td>Check for jammed piston. Replace piston and seals. Replace motor if motor is unresponsive.</td>
</tr>
</tbody>
</table>

**Error Codes**

There are five (5) error codes which could indicate a possible problem with the control valve:

**Error 2** - Valve is searching for homing slot.
Allow valve to run until homing slot is found or new error code appears.

**Error 3** - No encoder slots are being seen.
Check encoder connection. If encoder is connected. Check valve body for debris and replace seals. Inspect piston and replace if worn.

**Error 4** - Unable to find homing slot.
Check encoder wheel for debris.

**Error 5** - Motor overload.
Check valve body for debris. Replace seals. Inspect piston and replace if worn.
Check motor operation and replace motor if unresponsive.

**Error 6** - No power to motor. Check motor connections, replace motor if unresponsive.
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 WATER SOFT WATER TREATMENT EQUIPMENT INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS MANUAL**

to avoid serious personal injury and property HAZARDS and to ensure safe use and proper care of this product.

**MODEL NUMBERS COVERED**

Water Softeners, Media Filters, UpFlow Filters, ProvenSrs, UV, RO, Filters, Chemical Feed

**WHAT IS COVERED BY THIS WARRANTY**

WATERSOFT LLC ("WATER SOFT") warrants that at the time of manufacture, the water treatment equipment shall be free from defects in material and workmanship as follows:

- Thermoplastic Mineral Tanks.............................................10 yrs.
- Softener/Filter Control Valves..................................Proprietary ..........7 yrs.
- Brine Tank Assemblies..........................................................5 yrs.
- Reverse Osmosis System.........................................................5 yrs.
- Other Accessories & Parts.......................................................1 yr
- REVERSE Wireless Low Salt Alarm........................................90 days.

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

**ADDITIONAL TERMS & CONDITIONS**

**What WATERSOFT 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 INSTRUCTION Manual provided with the Product;

- If the tank is not the size indicated for the supply line size of the installation, as described in the Manual.

- If the unit has not always been operated within the factory calibrated temperature limits, and at a water pressure not exceeding 150 psi.

- To any failure or malfunction resulting from abuse (including freezing), improper or negligent: handling, shipping (by anyone other than WATER SOFT), 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 time period described in this Warranty, and does not apply unless prompt notice of any claim is given to an authorized WATERSOFT distributor or to WATERSOFT and 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 limitation 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 of the limitation of incidental or consequential damages, so the above limitation 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 an WATERSOFT distributor or WATERSOFT. If you do not receive a prompt response, call WATERSOFT directly at 800-462-3790. Notice of a Warranty claim relating to replacement parts or products should be submitted by the authorized distributor to WATER SOFT at the following address:

**WATERSOFT, 710 Orange Street, Ashland, OH 44805**

If your Product is new and not used and you wish to return it, contact your WATERSOFT distributor.