



Greensand Plus Iron Filter Manual

Installation / Operation
Manual

SIGNATURE 2 SERIES

Filter Specifications.....	Page 2
Installation.....	Page 3
Control Start-Up Procedures.....	Page 8
Utilizing Bluetooth.....	Page 11
Master Programming.....	Page 12
Powerhead Assembly.....	Page 13
Valve Body Assembly.....	Page 14
Bypass Assembly.....	Page 15
Additional Information.....	Page 16
Troubleshooting.....	Page 17
Error Codes.....	Page 19
Warranty.....	Page 20

Register Your Product

Online at

www.csiwater.com



General Specifications	IF10-S2	IF15-S2	IF20-S2	IF25-S2
Filter Media	Greensand Plus™			
Filter Media Capacity (cu ft)	1.00	1.50	2.00	2.50
Garnet Sand Underbed (lbs)	20	30	50	50
Mineral Tank (Vortech™)	9 x 48	10 x 54	12 x 52	13 x 54
Potassium Permanganate Solution Tank Size	10 x 16			
Removal Capacities Iron / Sulfur	10 ppm / 3 ppm	10 ppm / 3 ppm	10 ppm / 3 ppm	10 ppm / 3 ppm
Service Flow Rate - Continuous (gpm)	4	5	6	8
Service Flow Rate - Intermittent (gpm)	6	7	8	10
Backwash Flow Rate (gpm)	5.0	5.0	6.0	7.0
Gallons Used / Regeneration	128	130	173	193
Space Required	9 x 21 x 57	10 x 22 x 62	13 x 24 x 60	12 x 25 x 62
Approximate Shipping Weight (lbs)	157	215	305	362

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.

SIGNATURE 2 SERIES

Installation

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 3ppm. 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.

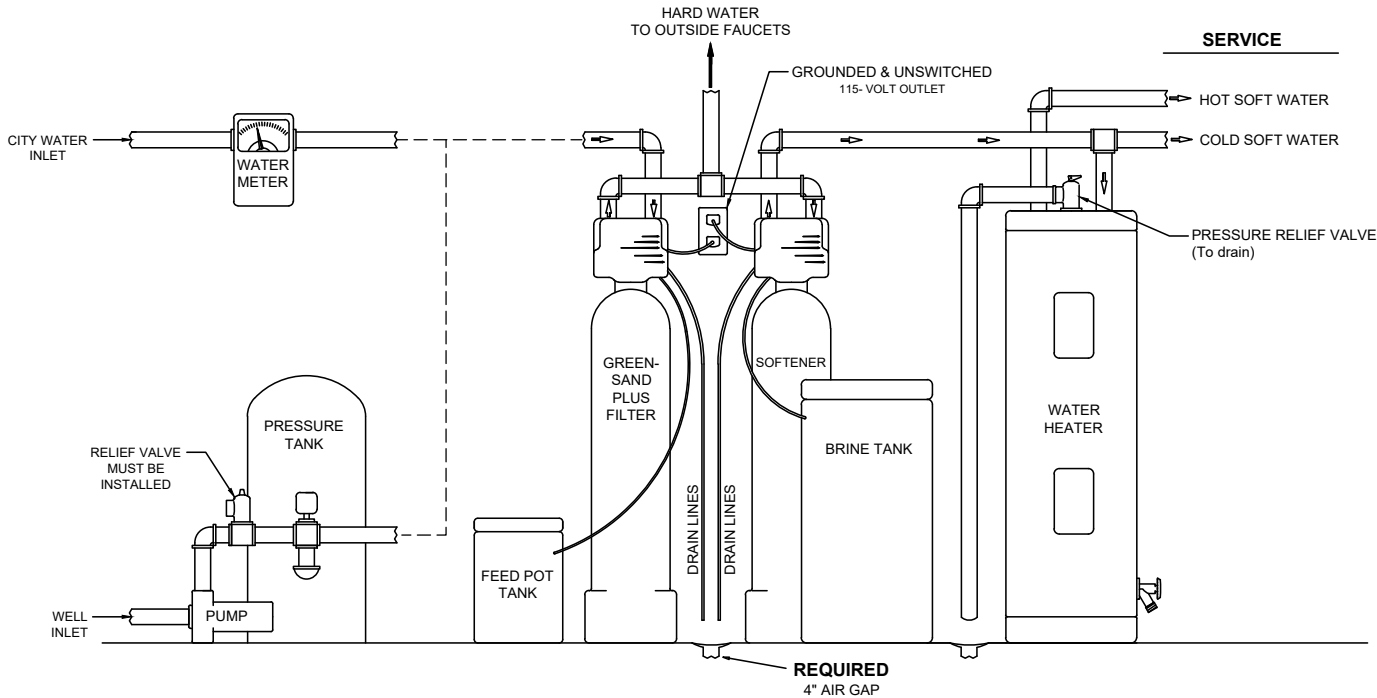
When the oxidizing capacity of the filter media becomes exhausted, regeneration is necessary. First the filter valve bypasses the raw water to the system to provide uninterrupted service. The valve then reverses the flow of the water through the filter bed to produce a backwash to the drain. Because of the density of the media bed, it is very important to size the filter to the pump volume thus insuring 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 manganese dioxide coating on the filter material renewing it for further service. A fast rinse then follows to settle the media and insure 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.

GREENSAND PLUS FILTER

(Incoming Water from Left-Side)



-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.)

SIGNATURE 2 SERIES Installation

-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 cap provided 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 cap 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. It is recommended that a vacuum breaker be installed on the inlet plumbing.

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!

-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:

Model #	Float Setting	Media Amount
IF-10-S2	4 1/4"	1.0 cu. ft.
IF-15S2	4 1/2"	1.5 cu. ft.
IF-20-S2		
IF-25-S2	5 1/2"	2.0 cu. ft.

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 overflow. 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.

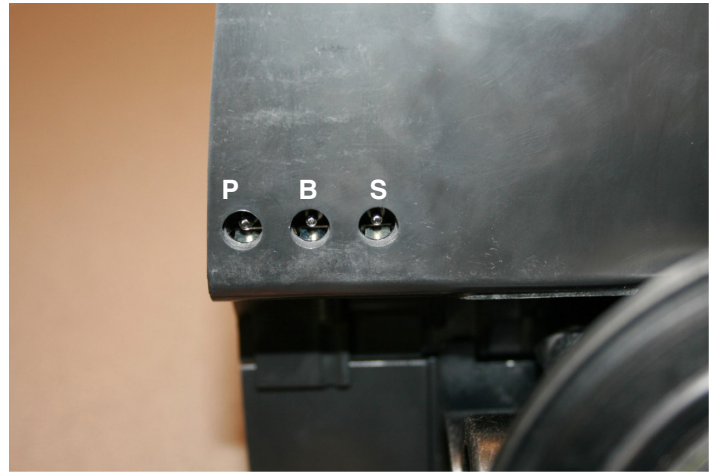
SIGNATURE 2 SERIES Installation

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 seated 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 from 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.

- Final Checkout -

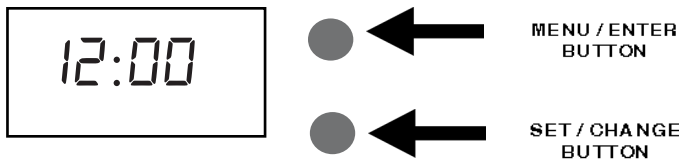
1. Be certain that the bypass valve is in Service position and main valve is completely on.
2. Check electrical supply to be certain the cord is connected to an uninterrupted 115 volt outlet.
3. Be sure to REGISTER YOUR PRODUCT online at www.csiwater.com
4. Leave this manual with the homeowner.

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. Example (A)
 - 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.
4. a. To set the **Number of Days between Backwash Cycles (A)**, press the **Set/Change** button. - Example (A - 06)
Repeat instructions from step (2).
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.

SIGNATURE 2 SERIES

Control Start-Up Procedures



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 Signature 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 Signature 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)

Filters		Default (Min)
Step 1	Backwash	10
Step 2	Brine Draw	60
Step 3	Rapid Rinse	10
Step 4	Refill	4

To take advantage of the Bluetooth interface this feature must be set up on a compatible Bluetooth enabled smart phones or tablets.

Note: Valves with a revision number greater or equal to “C2.00” are only compatible with Bluetooth 4.0+ (a.k.a. Bluetooth LE) Smartphones and tablets. If you have an Android or Apple device with a compatible Bluetooth radio it can be used to connect to the valve. Valves with a revision number less than “C2.00” are only compatible with Android devices and these valves use a Bluetooth 2.0 radio. In the rest of this section valves with a revision number greater or equal to “C2.00” will be referred to as BTLE, valves with a revision number less than “C2.00” will be referred to as BT.

(The firmware revision of the valve can be viewed on the valve display for 2 seconds after the valve is powered up.)

Unfortunately due to changing Bluetooth and Tablet / Phone manufacturing standards, not all tablets and smart phones are compatible with all valve versions. In general, the below table should guide you in compatibility.

	BT Legacy View Valve	BTLE Legacy View Valve
Android Device with BT 4.0+	Yes	Yes
Android Device with older BT	Yes	No
Apple Device with BT 4.0+	No	Yes

1. Download and install the Legacy View app from the Google Play Store, Apple App Store or www.ChandlerSystemsInc.com
2. If your valve revision is a BTLE valve you can skip this step. Otherwise, if it is a BT valve the following steps must be followed to pair your 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 you want to connect to under the list of available Bluetooth devices.
 - Select the device and pair (Default password is: 1234)
3. 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.
4. 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.

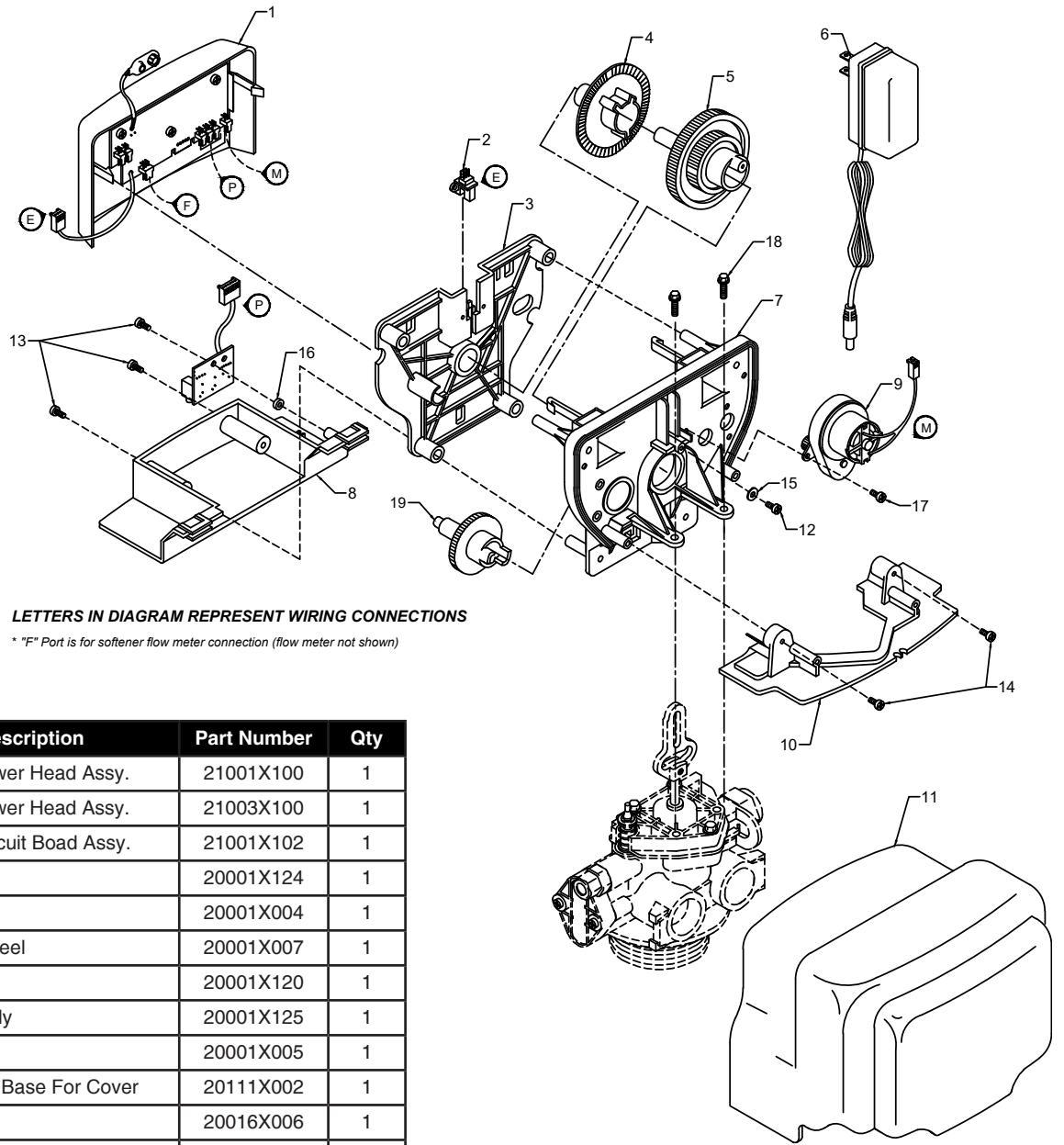


FCC ID: SWPLV-019 or SWPEV-019-BLE
 Name of Grantee: CHANDLER SYSTEMS, INC.
 Equipment Class: Part 15 Low Power Communication Device
 Notes: Legacy View Valve

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.

SIGNATURE 2 SERIES Control Valve Powerhead Assembly



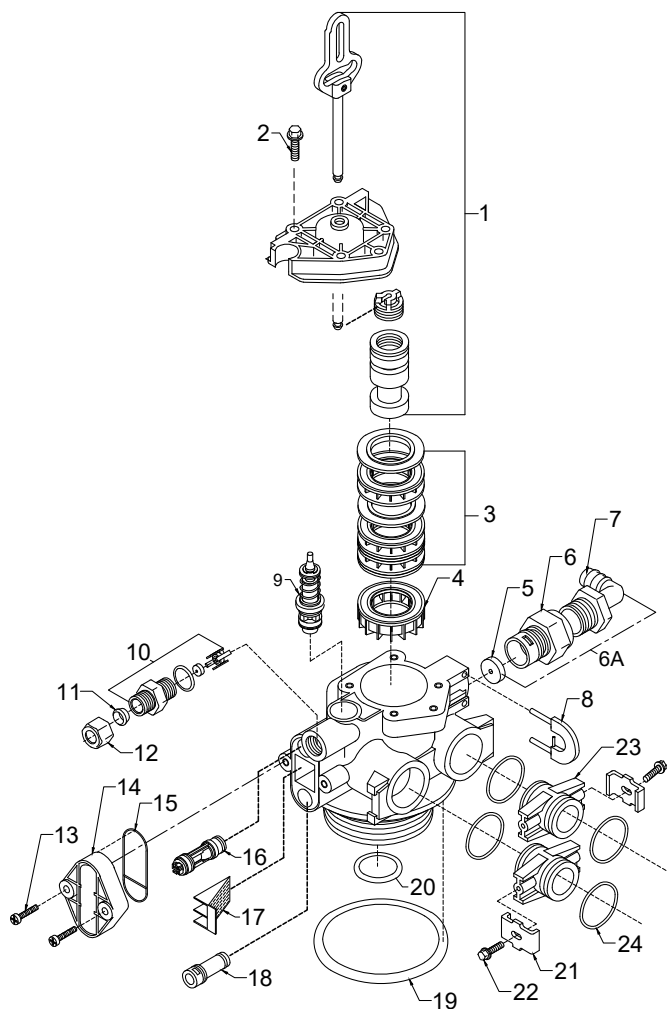
LETTERS IN DIAGRAM REPRESENT WIRING CONNECTIONS

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

Ref	Description	Part Number	Qty
0	Timered Power Head Assy.	21001X100	1
0	Metered Power Head Assy.	21003X100	1
1	Softener Circuit Boad Assy.	21001X102	1
2	Encoder	20001X124	1
3	Front Plate	20001X004	1
4	Encoder Wheel	20001X007	1
5	Main Gear	20001X120	1
6	Power Supply	20001X125	1
7	Back Plate	20001X005	1
8	Lower Front Base For Cover	20111X002	1
9	Motor	20016X006	1
10	Lower Back Base for Cover	20111X003	1
11	Valve Cover	20111X000	1
12	Piston Screw	20001X003	1
13	Screw	SC10	3
14	Screw	SC9	3
15	Piston Washer	20001X002	1
16	Washer Circuit Board	20111X014	1
17	Screw Motor	SC2	1
21	Valve Hex Screw	20001X001	2

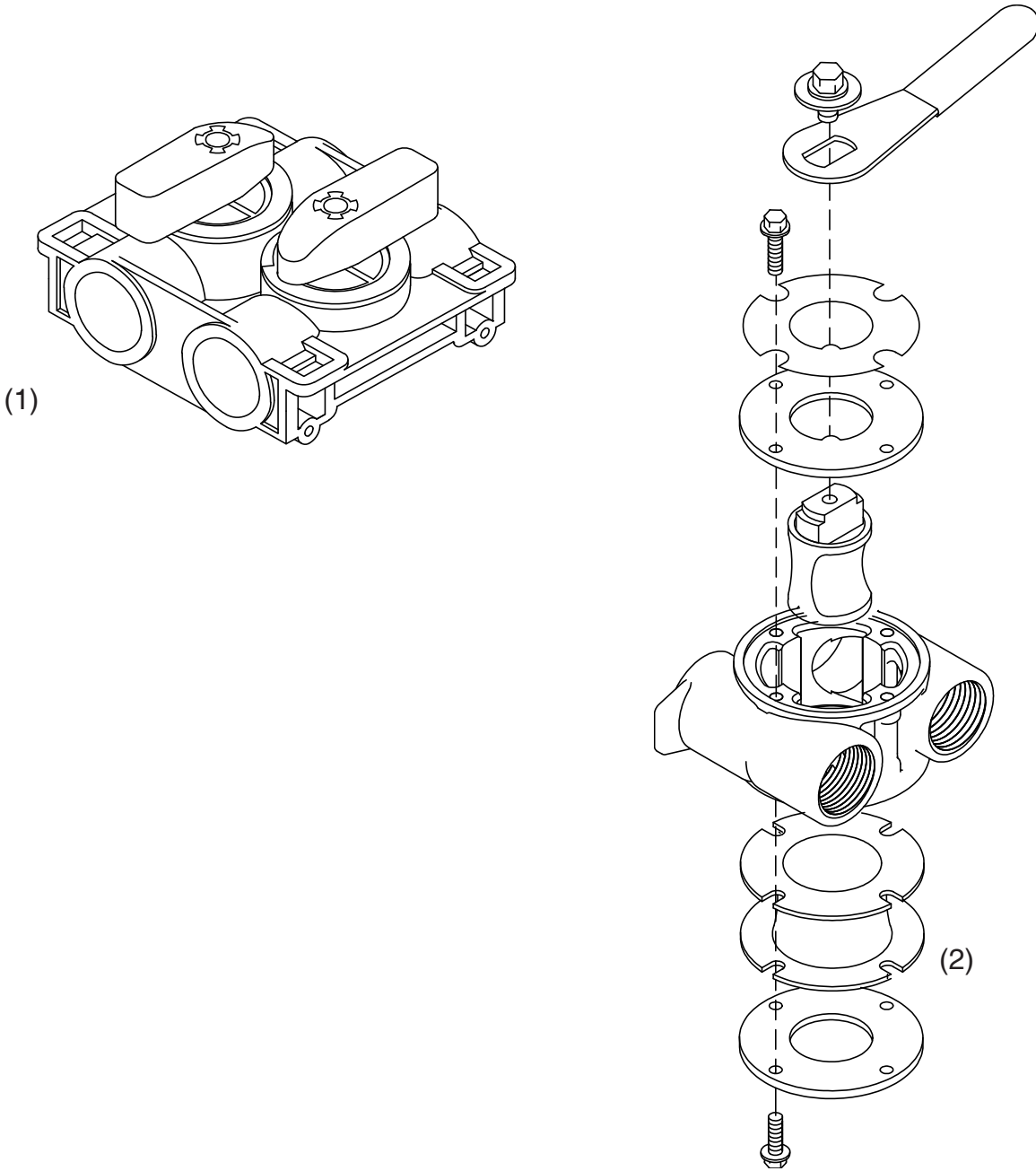
SIGNATURE 2 SERIES Valve Body Drive Assy.

Ref #	Description	Part #	Qty.
1	Piston Assembly	20001X231	1
2	10-24 x 13/16 Screw	20001X226	3
3	Seal & Spacer Kit	20561X253	1
4	End Spacer	N/S	1
5	Flow Control Button 1.5 GPM	20251X266	1
	Flow Control Button 2.0 GPM	20251X267	1
	Flow Control Button 2.4 GPM	20251X268	1
	Flow Control Button 3.0 GPM	20251X269	1
	Flow Control Button 3.5 GPM	20251X270	1
	Flow Control Button 4.0 GPM	20251X271	1
	Flow Control Button 5.0 GPM	20251X272	1
	Flow Control Button 7.0 GPM	20251X274	1
6	Plastic Flow Control Housing	20251X100	1
6a	Flow Control Assembly – Specify GPM Incl. (1) each #20 thru #23		
	Flow Control Assy. 1.5 GPM-PVC	20251X256	1
	Flow Control Assy. 2.0 GPM-PVC	20251X257	1
	Flow Control Assy. 2.4 GPM-PVC	20251X258	
	Flow Control Assy. 3.0 GPM-PVC	20251X259	1
	Flow Control Assy. 3.5 GPM-PVC	20251X260	1
	Flow Control Assy. 5.0 GPM-PVC	20251X262	1
	Flow Control Assy. 7.0 GPM-PVC	20251X264	1
7	Drain Line Fitting 90° Elbow 1/2" NPT X 1/2" Tubing	20251X255	1
8	Drain Retainer	20001X214	1
9	Brine Assembly	20561X225	1
10	BLFC Assembly .5 GPM	20001X228	1



Ref #	Description	Part #	Qty.
11	Brine Line Ferrule	20251X305	1
12	Brine Line Compression Nut	N/S	1
13	10-24 X 1 Hex Screw	20001X226	1
14	Injector Cap	20001X223	1
14a	Injectory Kit-Specify Size- Inc. (1) ea #14, #15, #16, #17 & (2) #13	20001X220	1
15	Injector Seal	20001X224	1
16	Injector Assy. Specify Size	20001X219	1
17	Injector Screen	20001X222	1
18	Injector Plug & O-Ring Assy.	20001X217	1
19	O-Ring	2000X215	1
20	O-Ring	20561X204	1
Items #21 thru #24 used ONLY with clock regeneration			
21	Mounting Clip	20561X201	2
22	8-18 X 5/8" Screw	20561X217	2
23	Adapter Coupling	N/S	2
23a	Adapter Coupling & O Ring Assy. Incl. (1) #40 & (2) # 41	20561X215	1
24	O-Ring	20561X216	4

**SIGNATURE 2 SERIES
Bypass Assembly**



Ref #	Description	Part #	Qty
1	Plastic Bypass Valve Assembly	20561X292	1
2	Bypass Valve 3/4" Stainless Steel	20561X270	1
	Bypass Valve 1" Stainless Steel	20561X283	1

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.
10. Follow steps **D9 - D14**.

F. To Replace Seals and Spacers

1. Follow steps **A1 - A3**.
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 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.
9. Follow steps **D9 - D14**.

SIGNATURE 2 SERIES
Troubleshooting Guide

SYMPTOM	PROBABLE CAUSE	CORRECTION
1. Softener Fails to Regenerate Automatically	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
2. Regeneration at Wrong Time	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
3. Loss of Capacity	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.
4. Poor Water Quality	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.
5. High Salt Usage	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.
6. Loss of Water Pressure	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

SYMPTOM	PROBABLE CAUSE	CORRECTION
7. Excessive Water in Brine Tank and / or Salty Water to Service	Plugged drain line or drain line control	Check flow to drain. Clean drainline 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 psig minimum)
	Excessive brine refill cycle time	Lower brine refill time.
8. Softener Fails to Use Salt	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.
9. Continuous Flow to Drain	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.

SIGNATURE 2 SERIES

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.

1. Check encoder connection. If the encoder is plugged in and snapped into place, skip to step #2 below. If encoder is disconnected, reconnect it and cycle power to clear the error.
2. Disconnect powerhead from valve body, cycle power to clear the error code. Manually cycle the powerhead through the regeneration cycle steps to verify that the motor can cycle properly while the powerhead is disconnected from the valve body. If the error 3 does not reappear, skip to step #3 below. If the error 3 does reappear, order a board & motor kit to replace the circuit board & motor.
3. Remove piston and seals from the valve body and inspect valve body for debris. Replace the seal & spacer kit. Inspect piston and replace piston if Teflon coating is worn

Error 4 - Unable to find homing slot.

1. Check encoder wheel for debris.
2. Cycle power. Valve should either find home or go to a different error code. If error 4 returns, replace powerhead assembly.

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

1. Disconnect powerhead from valve body and cycle power to clear the error code.
2. If the error 5 returns, replace the motor. Otherwise, manually cycle the powerhead through the regeneration cycle steps to verify that the motor can cycle properly while the powerhead is disconnected from the valve body. Either way, proceed to the next step.
3. Remove piston and seals from the valve body and inspect valve body for debris. Replace the seal & spacer kit. Inspect piston and replace piston if Teflon coating is worn.

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

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 CSI Water Treatment 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 CSI Water Treatment 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 CSI Water Treatment 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?

CSI Water Treatment 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
REVERE Wireless Low Salt Alarm	90 Days

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

Additional Terms & Conditions

What CSI Water Treatment Systems will do if you have a covered warranty claim CSI 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. CSI 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 CSI), 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 CSI 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 CSI Dealer or to CSI 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 CSI 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 CSI 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 CSI or seller be liable for any special, incidental, contingent or consequential damages. Special, incidental, contingent and consequential damages for which CSI 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 CSI. Contact the person from whom you purchased the product, who must receive authorization from a CSI Dealer .

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

SIGNATURE 2 SERIES

CSI WATER TREATMENT SYSTEMS

710 Orange St, Ashland, OH 44805 | PH 419-281-6829 | FAX 419-281-2375
www.csiwater.com