



# Signature 2 Series Softener Manual

Installation / Operation Manual

Fully Automatic & Demand  
Water Softeners

**SIGNATURE 2 SERIES**

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General Specifications	Cabinet		Two Tank					
	CT24-S2 CM24-S2 CT24V-S2 CM24V-S2	CT32-S2 CM32-S2 CT32V-S2 CM32V-S2	TS24-S2 MS24-S2 TS24V-S2 MS24V-S2	TS32-S2 MS32-S2 TS32V-S2 MS32V-S2	TS48-S2 MS48-S2 TS48V-S2 MS48V-S2	TS64-S2 MS64-S2 TS64V-S2 MS64V-S2	TS96V-S2 MS96V-S2	TS128V-S2 MS128V-S2
Grains Capacity - Regeneration / Lbs Salt Used	24,000 / 12 20,250 / 7.5 15,000 / 4.5	32,000 / 15 27,000 / 9 20,000 / 6	24,000 / 12 20,250 / 7.5 15,000 / 4.5	32,000 / 15 27,000 / 9 20,000 / 6	48,000 / 24 40,500 / 15 30,000 / 9	64,000 / 30 54,000 / 18 40,000 / 12	96,000 / 45 81,000 / 27 60,000 / 18	128,000 / 60 108,000 / 36 80,000 / 24
Maximum Raw Water Hardness (grains)	50	75	50	75	100	100	100	100
Maximum Clear Iron / Manganese	3	5	3	5	5	5	5	5
Exchange Resin (cu ft per tank)	.75	1.0	.75	1.0	1.5	2.0	3.0	4.0
Mineral Tanks (polyglass)	8 x 35	10 x 35	8 x 44	9 x 48	10 x 54	12 x 52	14 x 65	16 x 65
Brine Tank (polyethylene w grid & safety)	N/A	N/A	18 x 33	18 x 33	18 x 33	18 x 33	18 x 40	24 x 50
Service Flow Rate (gpm per active tank)*	8.0	11.0	8.0	10.0	11.0	12.0	14.0	16.0
Backwash Flow Rate (gpm)	1.5	2.4	1.5	2.0	2.4	3.5	4.0	5.0
Gallons Used / Regeneration	79	98	79	90	101	140	164	189
Backwash Flow Rate (gpm) <b>Vortech (V) Units</b>	<b>1.2</b>	<b>2.0</b>	<b>1.2</b>	<b>1.5</b>	<b>2.0</b>	<b>2.4</b>	<b>3.5</b>	<b>40</b>
Gallons Used / Regeneration <b>Vortech (V) Units</b>	<b>69</b>	<b>88</b>	<b>69</b>	<b>78</b>	<b>90</b>	<b>117</b>	<b>148</b>	<b>161</b>
Space Required	23x14x 45	23x14x45	18x26x53	18x27x 56	18x28x 62	18x30x 60	18x32x 74	24 x 40 x 74
Approximate Shipping Weight (lbs)	88	100	88	100	133	164	285	378

## 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 Softener Specifications

PLEASE NOTE THESE SPECIFICATIONS BEFORE PROCEEDING

OPERATING PRESSURE RANGE : 20 - 125 PSI  
OPERATING TEMPERATURE RANGE : 33° F - 120° F  
INLET / OUTLET PIPE SIZE : 3/4" FNPT

PLEASE COMPLY WITH ALL APPLICABLE PLUMBING CODES

PROTECT THE SOFTENER AND PIPING FROM FREEZING TEMPERATURES

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Please read the entire Owner's Manual and Instruction before installation.  
This Owner's Manual must stay with the unit.

### -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. **Rapid Rinse** - The control valve directs the water flow downward, settling and recompacting the resin bed.
4. **Brine Refill** - The control valve directs fresh water into the salt compartment to create new brine solution for the next scheduled regeneration.
5. **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**

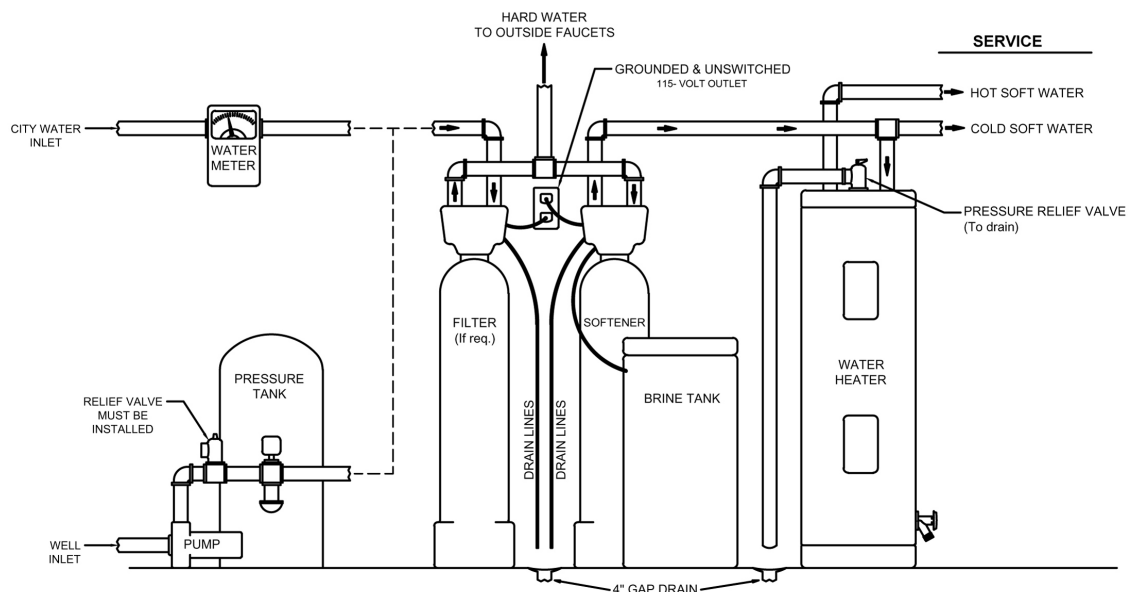
- A level floor position ahead of piping into water heater.
- Unit must be installed at least 10' ahead of the inlet to a water heater to prevent damage due to back-up of hot water.
- DO NOT install the unit in an area of direct sunlight or where freezing temperatures may occur! (See Installation Diagrams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

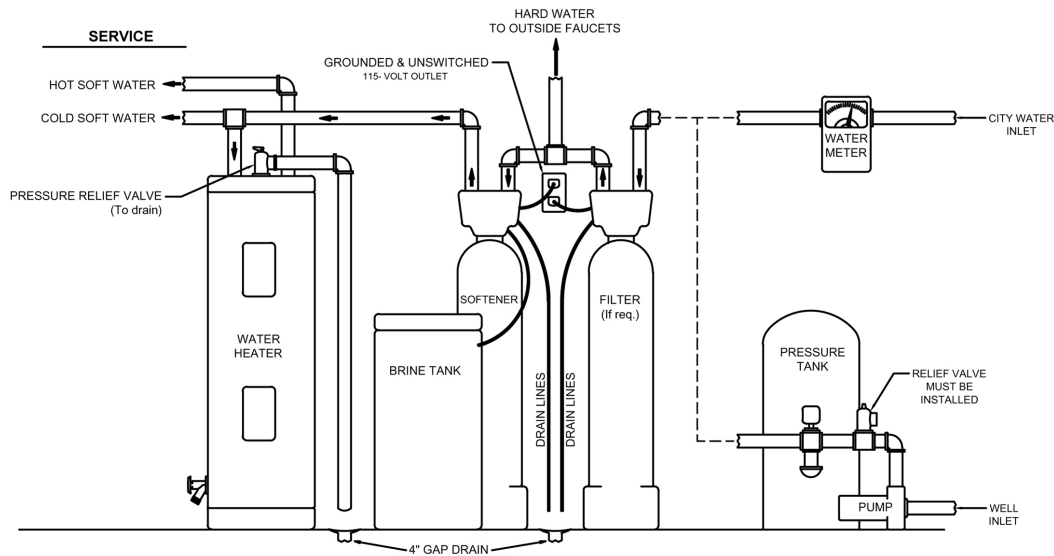
## **TWO TANK SETUP**

(Incoming Water from Left-Side)



## TWO TANK SETUP

(Incoming Water from Right-Side)



### **-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**

- If household plumbing is galvanized and you intend to make the installation with copper (or vice versa), obtain di-electric unions to prevent dissimilar metal corrosion.
- 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 overfill. 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**

- 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.
- 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 Diagrams.)
2. **For TS96V, TS128V, MS96V & MS128V Units ONLY** - The resin material is shipped separately from the mineral tank. Remove the valve by unscrewing from center hole. Use a cork or tape to place over top of distributor tube to prevent material from entering tube while filling. Place funnel in hole. Pour several gallons of water in the tank.

**No gravel is required.** Pour in the resin material. Remove funnel and cork or tape from distributor tube. Clean tank threads and fill the mineral tank completely with water. Replace the valve, being careful to position the distributor tube into the distributor tube pilot hole.

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

3. Turn OFF main water supply and OPEN nearest faucet to relieve pressure.
4. Cut main line and install appropriate elbows and extensions. Inlet and outlet connections on the control valve are 3/4" FNPT. (1" FNPT for TS96V, MS96V, TS128V & MS128V units.)

**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.

6. Rotate bypass valve to the bypass position (position of lever is at right angle to inlet / outlet piping).
7. Turn the main supply line on to restore water service to the home.
8. OPEN nearest faucet to evacuate air and repressurize plumbing lines.
9. 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. drain 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.

## **SIGNATURE 2 SERIES**

### **Installation**

#### **-Brine Line and Overflow Connection-**

1. Position brine tank on a smooth, level surface near the softener resin tank. If necessary, the brine 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. brine line tubing (included with unit) to compression fitting located on left side of control valve.
3. Remove brine tank cover.
4. Remove cap from brine well.
5. Insert opposite end of brine line through outer hole in brine tank.
6. Connect brine line to compression fitting on safety brine valve located inside brine well. Replace brine well cap.
7. Install 1/2" I.D. drain line tubing (not included) to the overflow fitting on brine tank located just below the brine line.
8. Run the opposite end of brine tank drain line to a suitable drain.

#### **- Electrical Connection -**

1. Connect the power cord 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

Electronic Connections

**P = Power Supply**

**B = Powered in Backwash Cycle Only**

**S = Powered in Entire Regen. Cycle**





### **- Pressurizing The System -**

1. Make certain Signature Series Control Valve is in **SERVICE** position.
2. Slowly rotate bypass valve to the **SERVICE** position. (Position of bypass lever is parallel to inlet / outlet piping.)
3. Open the nearest faucet to evacuate air from plumbing lines.
4. Check for leaks! If water is observed leaking from bottom of bypass, close and open bypass lever several times to seat o-rings.
5. After air is evacuated from plumbing lines, close bypass (position of bypass lever is perpendicular to the direction of inlet pipe) on bypass valve.

### **- Programming The Control Valve For “TS” Units -**

1. Set time of day.
2. Set a.m. or p.m.
3. Set number of days between regeneration. (Refer to Regeneration Charts below.)
4. Follow along the line indicating the number of persons in the family to the column that corresponds with the hardness range. This will indicate how many days between regeneration should be programmed. (Refer to Figure 1.)

**Note :** Salt settings are pre-set at the factory for the maximum shown on the capacity charts.

**Warning :** Do not reduce salt settings below 9 lbs. as the water level in the brine tank will not reach the grid plate.

### **- How To Use The Capacity Charts -**

<b>EXAMPLE</b>			
HARDNESS = 20 gpg	20 gpg	UNIT SELECTED	32,000 GRAIN
IRON = 3 ppm X 4	12 gpg	NUMBER OF PERSONS	4
MANGANESE = 1 ppm X 4	4 gpg	COMPENSATED HARDNESS	36 gpg
TOTAL COMPENSATED HARDNESS	36 gpg		

## SIGNATURE 2 SERIES

### Capacity

Figure 1

9# cu. ft. salt setting

Capacity = 27,000 grains

Model	Nominal 32,000 Grain Units (-32)								
# of People	1	2	3	4	5	6	7	8	9
Hardness Range	Regeneration Frequency (# Days)								
3 - 10	29	21	14	10	8	7	6	5	4
11 - 20	21	10	7	5	4	3	3	2	2
21 - 30	14	7	4	3	2	2	2	1	1
31 - 40	10	5	3	2	2	1	1	1	1
41 - 50	8	4	2	2	1	1	1	1	-
51 - 60	7	3	2	1	1	1	1	-	-
61 - 75	5	2	1	1	1	-	-	-	-

**Example :** The regeneration frequency should be programmed for every two (2) days.

**Note :** If the water contains iron and / or manganese, increase regeneration frequency to a minimum of every 12 days to assure adequate cleaning of the resin. Use of resin cleaners or iron inhibiting salt is encouraged.

Model	TS24-S2 & TS24V Models - Capacity = 20,250 Grains								
# of People	1	2	3	4	5	6	7	8	9
Hardness Range	Regeneration Frequency (# Days)								
3 - 10	26	12	8	6	4	4	3	2	2
11 - 20	13	6	4	2	2	1	1	1	-
21 - 30	9	4	2	1	1	-	-	-	-
31 - 40	6	2	1	1	-	-	-	-	-
41 - 50	4	2	1	-	-	-	-	-	-

**Note :** All charts assume 75 gallons per person per day usage.

# SIGNATURE 2 SERIES

## Capacity

Model	TS32-S2 & TS32V Models - Capacity = 27,000 Grains								
# of People	1	2	3	4	5	6	7	8	9
Hardness Range	Regeneration Frequency (# Days)								
3 - 10	29	17	11	8	6	6	4	4	3
11 - 20	17	8	6	4	3	2	2	1	1
21 - 30	11	5	3	2	1	1	1	1	1
31 - 40	8	4	2	1	1	1	-	-	-
41 - 50	6	3	1	1	-	-	-	-	-
51 - 60	5	2	1	1	-	-	-	-	-
61 - 75	4	1	1	-	-	-	-	-	-

Model	TS48-S2 & TS48V Models - Capacity = 40,500 Grains								
# of People	1	2	3	4	5	6	7	8	9
Hardness Range	Regeneration Frequency (# Days)								
3 - 20	26	13	8	6	4	4	3	2	2
21 - 30	17	8	5	4	3	2	2	1	1
31 - 40	12	6	4	2	2	1	1	1	-
41 - 50	10	4	3	2	1	1	1	-	-
51 - 60	8	4	2	1	1	-	-	-	-
61 - 70	7	3	2	1	1	1	-	-	-
71 - 80	6	2	1	1	-	-	-	-	-
81 - 90	5	2	1	-	-	-	-	-	-
91 - 100	4	2	1	-	-	-	-	-	-

Model	TS64-S2 & TS64V Models - Capacity = 54,000 Grains								
# of People	1	2	3	4	5	6	7	8	9
Hardness Range	Regeneration Frequency (# Days)								
3 - 20	29	17	11	8	6	5	4	4	3
21 - 30	23	11	7	5	4	3	2	2	1
31 - 40	17	8	5	4	3	2	2	1	1
41 - 50	13	6	4	3	2	1	1	1	1
51 - 60	11	5	3	2	1	1	1	1	-
61 - 70	9	4	2	2	1	1	-	-	-
71 - 80	8	4	2	1	1	1	-	-	-
81 - 90	7	3	1	1	1	-	-	-	-
91 - 100	6	3	1	1	-	-	-	-	-

## SIGNATURE 2 SERIES

### Capacity

Model	TS96V Models - Capacity = 81,000 Grains								
# of People	1	2	3	4	5	6	7	8	9
Hardness Range	Regeneration Frequency (# Days)								
3 - 20	29	27	17	13	10	8	7	6	5
21 - 30	29	17	11	8	6	5	4	4	3
31 - 40	27	13	8	6	4	4	3	2	2
41 - 50	21	10	6	4	3	3	2	2	1
51 - 60	17	8	5	4	3	3	2	1	1
61 - 70	14	7	4	3	2	2	1	1	1
71 - 80	13	6	4	2	2	1	1	1	1
81 - 90	11	5	3	2	1	1	1	1	-
91 - 100	10	4	3	2	1	1	-	-	-

Model	TS128V Model - Capacity = 108,000 Grains								
# of People	1	2	3	4	5	6	7	8	9
Hardness Range	Regeneration Frequency (# Days)								
3 - 20	29	29	23	17	13	11	9	8	7
21 - 30	29	23	15	11	9	7	6	5	4
31 - 40	29	17	11	8	6	5	4	4	3
41 - 50	28	13	9	6	5	4	3	3	2
51 - 60	23	11	7	5	4	3	2	2	2
61 - 70	20	9	6	4	3	2	2	2	1
71 - 80	17	8	5	4	3	2	2	1	1
81 - 90	15	7	4	3	2	2	1	1	1
91 - 100	13	6	4	3	2	1	1	1	1

### - Programming The Control Valve For “MS” Units -

1. Set time of day.
2. Set a.m. or p.m.
3. Set water hardness in grains per gallon (gpg).

**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.

1. Set regeneration day override if other than (7) days is desired. (This is particularly useful when iron is being treated to prevent fouling of the resin.)
2. Set regeneration time, if other than 2:00 a.m. is desired.

**Note :** Salt settings are pre-set at the factory for the maximum shown on the capacity charts.

**Warning :** Do not reduce salt settings below 9 lbs. as the water level in the brine tank will not reach the grid plate.

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

2. Advance control valve to BRINE REFILL (cycle 4) position and allow the brine tank to fill just over the salt grid plate.

3. Advance control valve to BRINE & RINSE (cycle 2) and allow the control valve to draw water from the brine tank until it stops. If no draw is observed, check tightness of brine line compression fittings.

4. Advance control valve to RAPID RINSE (cycle 3) position and let run to drain for 3 - 4 minutes.

5. Advance control valve to BRINE TANK REFILL (cycle 4) position and allow the control valve to automatically fill the brine tank.

**Note :** Control valve will advance to service position automatically.

### **- Start Up Procedure -**

#### **- Disinfection -**

For disinfection of your unit, please follow the Sani-System Procedure on the back of the packet provided.

#### **- 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.

## **SIGNATURE 2 SERIES**

### **Installation**

#### **- 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 [www.csiwater.com](http://www.csiwater.com)
7. Leave all manuals with unit.

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

When the bypass valve is in the SERVICE position (position of bypass lever is parallel to the inlet / outlet piping), water is directed through the water softener. Water may be bypassed by turning the lever to the bypass position (position of bypass lever 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.

#### **- Extra Regeneration -**

If soft water demands are unusually heavy, an extra regeneration can be initiated manually :

#### **- 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.

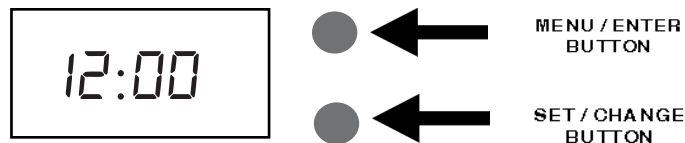
## - Programming The Control Valve For “TS” Units -

1. Set time of day.
2. Set a.m. or p.m.
3. Set number of days between regeneration. (Refer to Regeneration Charts below.)
4. Follow along the line indicating the number of persons in the family to the column that corresponds with the hardness range. This will indicate how many days between regeneration should be programmed. (Refer to Figure 1.)

**Note :** Salt settings are pre-set at the factory for the maximum shown on the capacity charts.

**Warning :** Do not reduce salt settings below 9 lbs. as the water level in the brine tank will not reach the grid plate.

### 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 Regeneration (A)**, press the **Set/Change** button.  
 (Time Clock Softeners) Example [ A - 07 ]
  - Repeat instructions from step (2).

Notes: 1) Maximum value is 29.  
 2) If value set to 0, Regeneration will never occur.  
 3) Default setting is 4 days for softeners.
- b. To set **Hardness (Metered Softeners Only)** an “H” will appear to enter Compensated Hardness in grains per gallon (gpg) Default setting is 25 gpg. Example [ H - 25 ]
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**

### **1. Home Display**

- a. **Time Clock Softeners** -Alternates between the display of Time of Day and Number of Days until the Next Regeneration.
  - Days Remaining until the Next Regeneration will count down from the entered value until it reaches 1 day remaining.
  - A Regeneration Cycle will then be initiated at the next designated regeneration time.
- b. **Metered** models alternate 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.



### **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 Series 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 Series 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 [ / ]
  - If Days Remaining Until Next Regeneration does not read '1', press and hold the **Set/Change** button for 3 seconds until the display reads '1', or '0000' on metered models.
  - Regeneration cycle will initiate at the next designated regeneration time.
2. To start **Immediate Extra Cycle**  First complete above step.
  - With Days Remaining Until Next Regeneration at '1' or '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	Rapid Rinse	10
Step 4	Brine Refill	9 lbs/ cu ft

## 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) – Meter (Demand) Mode Only

- 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, 2, 3, 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. System Capacity in Grains ( c ) – Meter (Demand Mode Only)

- 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 ).

5. **Reserve Capacity Setting %**      Example (*P* - 25)

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

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

8. 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.

## SIGNATURE 2 SERIES Utilizing Bluetooth Control

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.

1. Download the **Legacy View** app from the **Google Play Store** or **www.ChandlerSystemsInc.com**
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.

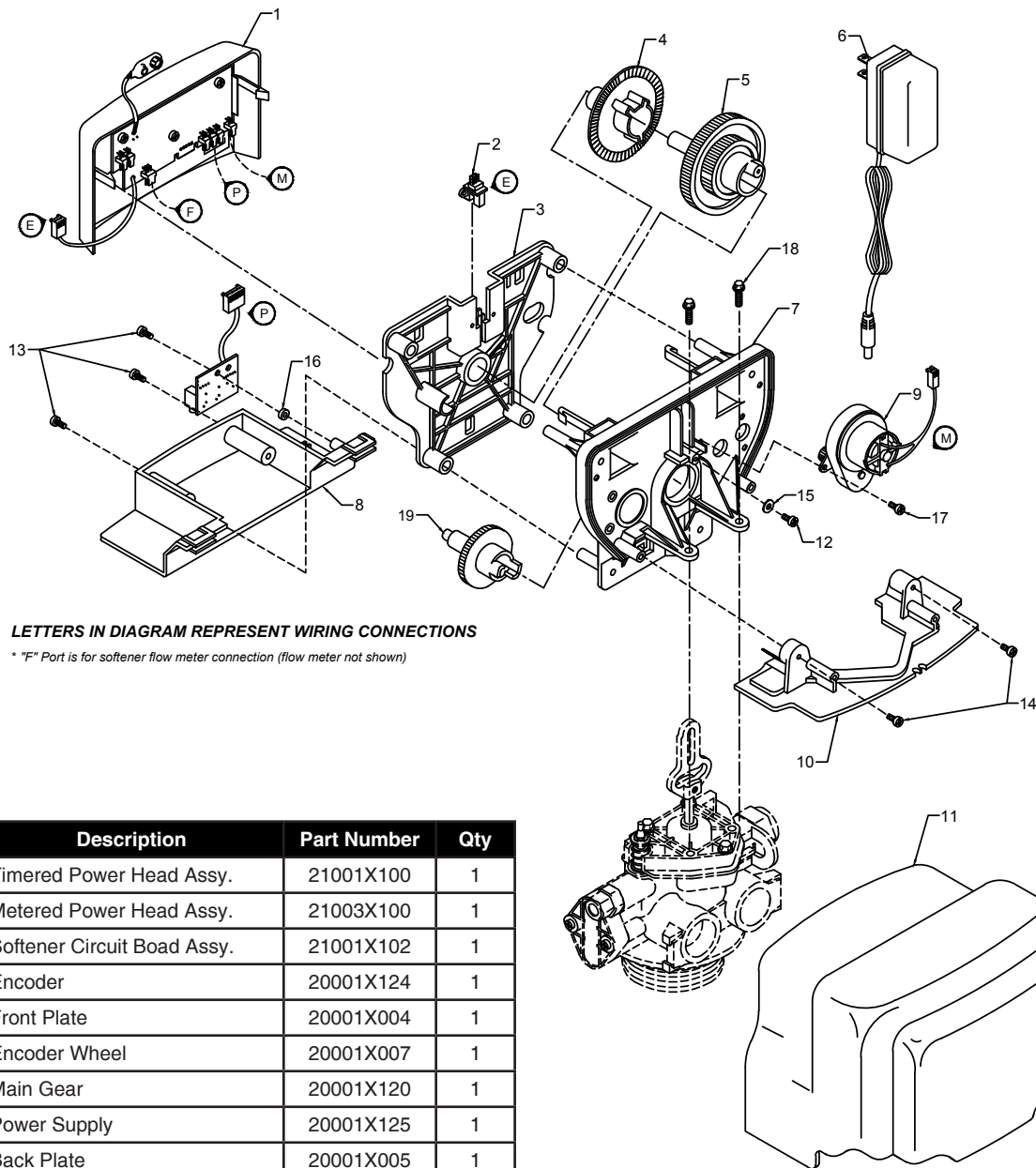


FCC ID:	SWPLV-019
Name of Grantee:	CHANDLER SYSTEMS, INC.
Equipment Class:	Part 15 Low Power Communication Device
Notes:	Legacy View Valve

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:

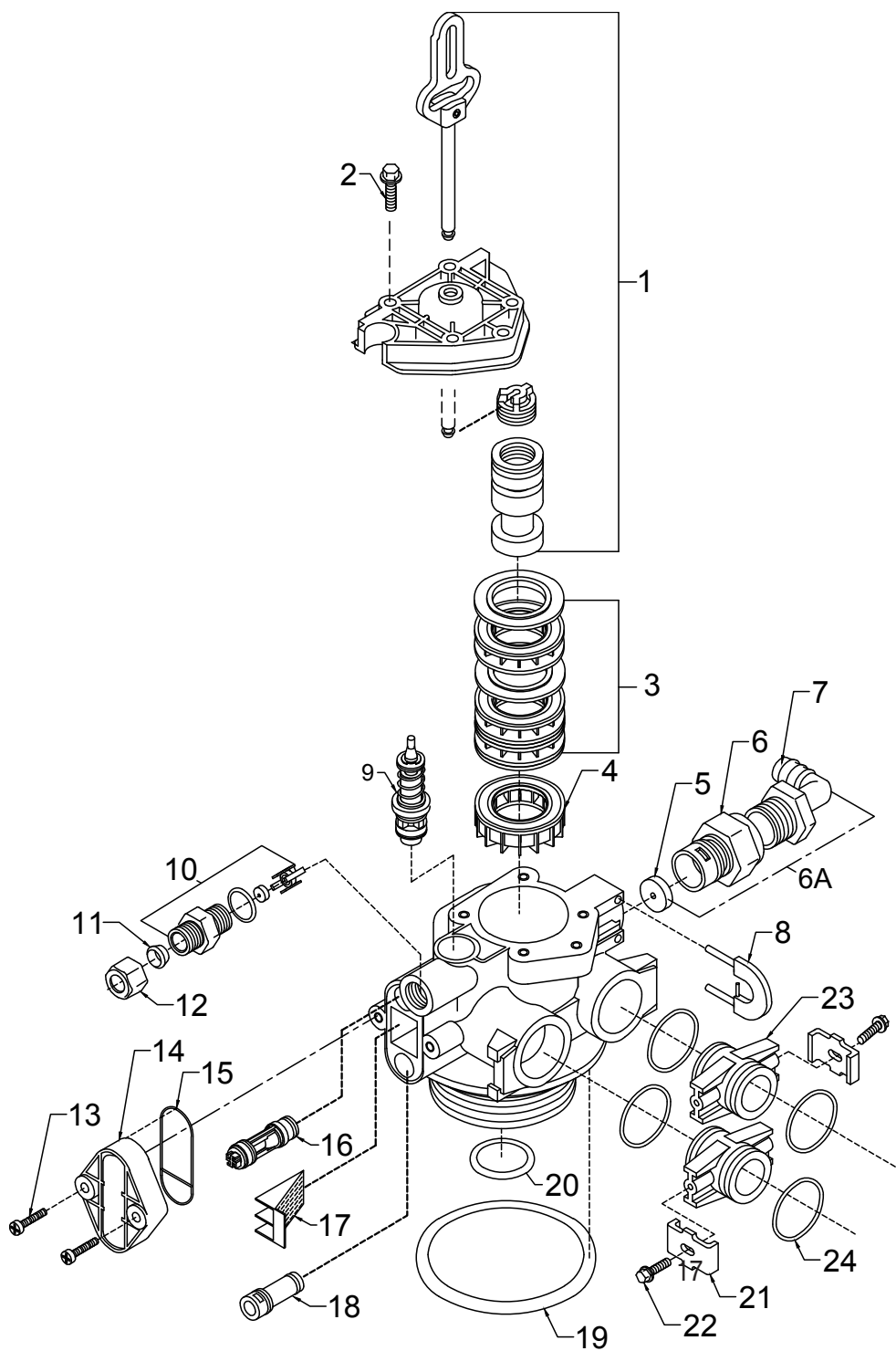
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

# SIGNATURE 2 SERIES Control Valve Assembly



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	21001X113	1
10	Lower Back Base for Cover	20111X003	1
11	Valve Cover	20111X000	1
12	Piston Screw	20001X007	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 Assy. (Softener Version)**



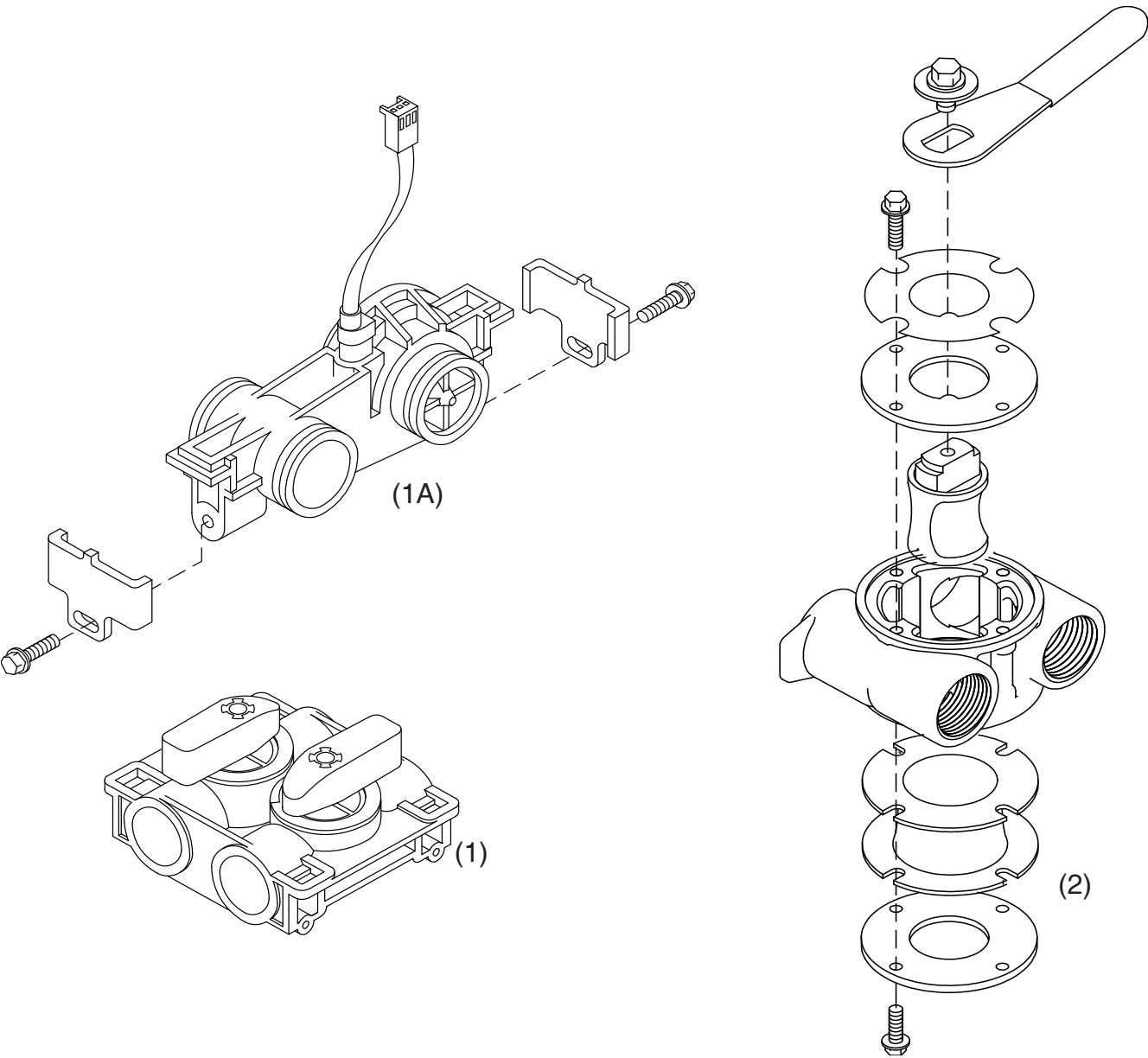
## SIGNATURE 2 SERIES Valve Body Assy. Parts List(Softener Version)

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
<b>Items #21 thru #24 used ONLY with clock regeneration</b>			
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

N/S indicates non-stocked item  
Shaded Ref # indicates assembly or kit

**SIGNATURE 2 SERIES**  
**Meter Assembly**



Ref #	Description	Part #	Qty
1A	Meter Assembly, Turbine Complete	20003X200	1
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 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**.

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.
<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

SYMPTOM	PROBABLE CAUSE	CORRECTION
<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 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.
<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.
<b>Error Codes</b>		

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.