Autotrol® Performa™ Ultra

Electronic Control System
Operation and Maintenance Manual

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Performa Ultra 3

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Performa Series Ultra Electronic Demand System

The two key components of the Performa Ultra electronic demand system are the microprocessor, a miniature computer located on the circuit board, and a water meter located at the valve outlet. The flow of conditioned water through the meter generates electrical impulses that tell the computer the amount of water being used.

Every evening, at 2:00 a.m., the past 7 days' water usage is statistically averaged to anticipate the amount of water that will be used the next day. The computer then determines if the water conditioner has enough remaining capacity to supply the next day's needs. If not, the unit will regenerate.

If the water usage pattern changes, the computer automatically compensates for the change and regenerates only when needed. This results in higher operating efficiency and lower salt usage than a conventional conditioner operating on a fixed regeneration schedule.

Special Features

Memory Retention

During a power outage, critical operating information in the control's memory is stored into the NOVRAM. This data includes the time of day, water usage amounts, and the number of days since the last regeneration. The NOVRAM will retain the data in its memory. When power is restored, the information is returned to the microprocessor and operation resumes as if an outage never occurred.

The time of day will be late by the length of the power outage. Most power outages are less than one minute in duration. Therefore, it may be months or years before the time display would require resetting. If an outage of one or more hours occurs, the time of day should be reset...no other reprogramming is necessary.

The microprocessor calculates how much soft water was used and adjusts the reserve capacity accordingly at the end of each day. As a result, the reserve is kept at a minimum for optimum economy.

Proportional Salting

The amount of salt used for each regeneration is proportional to the amount of capacity used in the previous service run. Since countercurrent regeneration is utilized, brine passing through the lower portion of the partially exhausted resin bed will not be exchanged. **The brine is utilized to regenerate only the exhausted portion of the resin bed.**

Self Adjusting Reserve

"Reserve" refers to the amount of soft water that may be needed for the next 24 hours. The microprocessor calculates how much soft water was used and adjusts the reserve capacity accordingly at the end of each day. As a result, the reserve is kept at a minimum for optimum economy. The reserve amount is calculated by multiplying the average past seven days' usage by 1.20. Regeneration decisions are based on the calculated reserve.

In the event of unusually high water usage (twice or more than the current daily average), the high usage amount will be used as the reserve when the computer performs its regeneration computation at 2:00 a.m. This is done in anticipation of a second day of very high usage.

Low or No Water Usage

The Performa Ultra is programmed to recognize a day of very little or no water usage as an abnormality. It will not use data from such a day to compute the average usage. For example, if the family is on vacation for a week, the prior average will be maintained. When household activity resumes, the conditioner will operate as if the vacation had not occurred.

Design Reliability

Solid-state electronics assure many years of trouble-free performance. The metering system has only one moving part... the rotating turbine that measures water usage.

Control Features (Reference Figure 4)

Time Display

The correct time will continually appear in the time display during normal conditioning operation. To change the hour display, press the TIME SET BUTTON until the present hour appears. The PM light will be on when the time is between 12 noon and midnight. The light is off during the a.m. hours.

Flow Indicator

The water flow indicator flashes whenever service water is flowing through the valve. This allows an easy determination of proper meter operation.

Hardness and Capacity Settings

Once the hardness and capacity settings have been set, the information cannot be lost due to a power outage and no reprogramming is necessary.

Guest Cycle

An extra regeneration can be achieved at any time by pressing the INDICATOR KNOB. It will take a few minutes for the regeneration to start and the unit will return to CONDITIONED WATER when regeneration is completed. This feature is beneficial when you expect to use more than the normal amount of water, for example: guest visits, extra heavy laundry days, or if the unit has been operated without salt in the brine tank.

Manual Regeneration

Electricity is used only to run the control and rotate the camshaft. All other functions are operated by water pressure. Therefore, in the event of a power outage, all the various regeneration positions may be dialed manually by pressing the INDICATOR KNOB with a wide-blade screwdriver and turning COUNTERCLOCKWISE.

Manual time cycles:

- Refill...5 minutes
- Brine and Rinse...2 hours
- Backwash...12 minutes
- Fast Rinse...4 minutes

Note: DO NOT advance the INDICATOR KNOB directly to the CONDITIONED WATER position after a manual regeneration or when servicing the conditioner. Advance it short of the CONDITIONED WATER position to just past the FAST RINSE position. The control will then advance itself to the CONDITIONED WATER position where the internal switch will turn the motor off. The internal switch will not be operated and the motor will continue to run if advanced directly to the conditioned water position.

If power fails during a conditioner regeneration, the cycle will be completed normally when the power is restored.

Table 1 - Systems Sizes

System Number	Tank Size-Dia x Ht		Resin Volume		Injector (Bumps)		Brine Control	Backwash Assembly
	Inches	Centimeters	Cubic Feet	Liters	Low Pressure 20 to 60 PSI	High Pressure 61 to 120 PSI		
0	7 x 35	18 x 89	.50	14	1032984(2)	1032976(1)	1033286	1000209
	7 x 40	18 x 101						
1	8 x 35	21 x 89	.66	18.6	1032979(3)	1032984(2)		1000210
2	8 x 40	21 x 101	.75	21				
	8 x 44	21 x 112						
3	9 x 35	23 x 89			1032977(4)	1032979(3)	1000222	1000211
4	9 x 48	23 x 122	1.00	28.3				
5	10 x 35	26 x 89			1032980(5)	1032977(4)		1000212
6	10 x 44	26 x 112	1.25	35.3				
6	10 x 47	26 x 119	1.25	35.3	1032980(5)	1032977(4)		1000212
7	10 x 54	26 x 137	1.50	42				
8	12 x 48	30 x 122	2.00	56.5	1032982(6)	1032980(5)		1000213

Injector Selection

There are two injectors shipped with each valve:

- Low pressure, 20 to 60 psi (1.38 to 4.14 bar)
- High pressure, 61 to 120 psi (4.20 to 8.27 bar)

The low pressure injector has been factory installed in the valve. The high pressure injector is located in a plastic bag included with the valve. Check the water pressure to determine which is the correct injector for your installation.

The injectors are coded according to size by the number of “bumps” molded onto the end of the injector. To determine if you are using the correct injector, check the resin tank diameter from the label on the back of the valve and refer toTable 1. For the location of the injector in the valve refer to item 6 in the **Replacement Parts** section.

Table 2 - Injector Selection

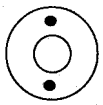
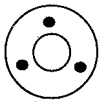
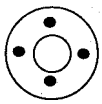
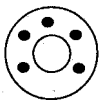
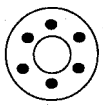
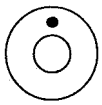
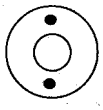
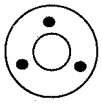
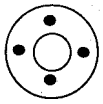
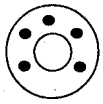
Water Pessure psi, (bar)	Resin Tank Diameter, inches (cm)				
	7 (18)	8 (21)	9 (23)	10 (25)	12 (30)
20 to 60 (1.38 to 4.14)					
61 to 120 (4.20 to 8.27)					

Table 3 - Injector Flow Rates

Injector P/N ("Bumps")	Brine Draw Rate		Rinse Rate	
	gpm	Lpm	gpm	Lpm
1032976 (1)	0.091	0.344	0.09	0.34
1032984 (2)	0.071	0.268	0.14	0.53
1032979 (3)	0.089	0.337	0.17	0.64
1032977 (4)	0.154	0.583	0.20	0.76
1032980 (5)	0.165	0.624	0.35	1.32
1032982 (6)	0.176	0.67	0.45	1.70

Riser Pipe Assembly

The dimensions provided in this section will make it easy for assemblers to cut the riser pipes and to locate the center screen when building the softener.

Outside Diameter

Inner Pipe	1.050	±	0.004 in
	26.670	±	0.100 mm
Outer Pipe	1.315	±	0.005 in
	33.400	±	0.130 mm

Wall Thickness

Inner Pipe	0.060	+	0.020 in
		-	.000 in
	1.520	+	0.510 mm
		-	0.000 mm
Outer Pipe	0.063	+	0.020 in
		-	0.000 mm
	1.600	+	0.510 mm
		-	0.000 mm

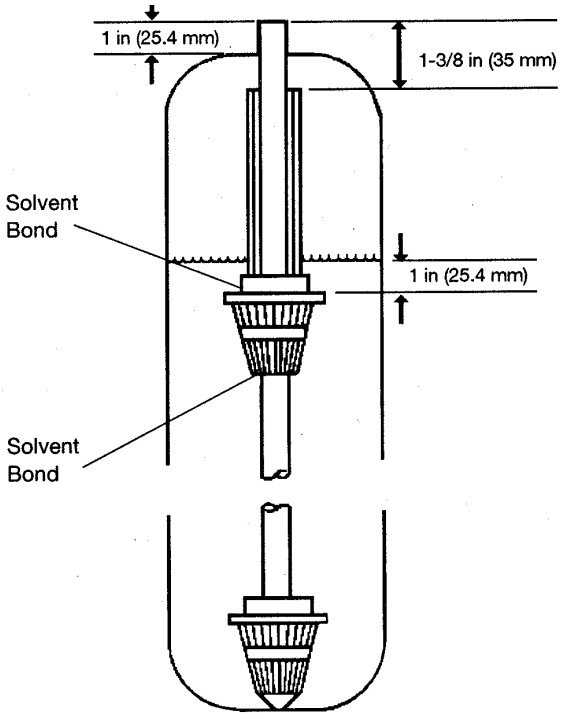


Figure 1

Installation

- **All plumbing and electrical connections must conform to local codes.**
- **Inspect unit carefully for carrier shortage or shipping damage.**

Location Selection

1. The distance between the unit and a drain should be as short as possible.
2. If it is likely that supplementary water treatment equipment will be required, make certain adequate additional space is available.
3. Since salt must be added periodically to the brine tank, the location should be easily accessible.
4. Do not install any unit closer to a water heater than a total run of 10 feet (3 m) of piping between the outlet of the conditioner and the inlet to the heater. Water heaters can sometimes overheat to the extent they will transmit heat back down the cold pipe into the unit control valve.

   Hot water can severely damage the conditioner. A 10-foot (3-m) total pipe run, including bends, elbows, etc., is a reasonable distance to help prevent this possibility. A positive way to prevent hot water flowing from heat source to the conditioner, in the event of a negative pressure situation, is to install a check valve in the soft water piping from the conditioner.

IMPORTANT: If a check valve is installed, make certain the water heating unit is equipped with a properly rated temperature and pressure safety relief valve. Also, be certain that local codes are not violated.

5. Do not locate unit where it or its' connections (including the drain and overflow lines) will ever be subjected to room temperatures under 34°F (1°C) or over 120°F (49°C).

Water Line Connection

The installation of a bypass valve system is recommended to provide for occasions when the water conditioner must be bypassed for hard water or for servicing.

The most common bypass ssytem is the 1265 Bypass Valve, Figure 2.

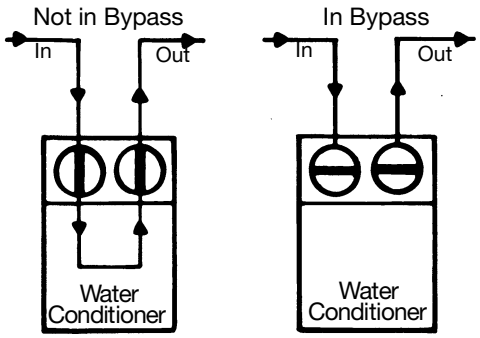


Figure 2

Drain Line Connection

1. If ideally located, the unit will be above the drain and not more than 20 feet (6.1 m) away. For such installations connect an appropriate fitting and 1/2-inch (1.3 cm) tubing to the 3/4-inch NPT drain line connection located on the rear of the valve between the water connections.
2. If unit is located more than 20 feet (6.1 m) from the drain, use 3/4-inch (1.9 cm) tubing for runs up to 40 feet (12.2 m). Also, purchase an appropriate fitting to connect the 3/4-inch tubing to the 3/4-inch NPT female drain line connection fitting.
3. If the unit is located where the drain line must be elevated, you may elevate the line up to 6 feet (1.8 m) providing the run does not exceed 15 feet (4.6 m) and water pressure **at the conditioner** is not less than 40 psi (2.80 bar). You may elevate the line an additional 2 feet (61 cm) for each additional 10 psi (7.0 bar) inlet pressure.
4. Where the drain line is elevated but empties into a drain below the level of the valve, form a 7-inch (18-cm) loop at the end of the line so that the bottom of the loop is level with the DRAIN LINE CONNECTION. This will provide an adequate siphon trap.
5. Where the drain empties into an overhead sewer line, a sink-type trap must be used.

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

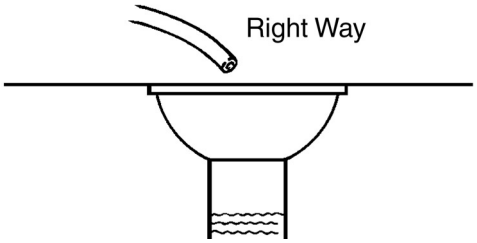


Figure 3

Note: Standard commercial practices have been expressed here. Local codes may require changes to these suggestions.

Brine Line Connection

Install an appropriate length of 3/8-inch OD flexible plastic tubing (polyethylene) between the tube fitting on the brine valve (in the brine tank) and the tube fitting on the valve.

Electrical Connection

Plug the wall mount transformer into a wall outlet that is not controlled by a switch. Plug the male "barrel connector" into the bottom of the control.

Initial Brine Tank Fill

With a bucket or hose, add just enough conditioned water to the brine tank to cover the screen located at the end of the air check assembly at the bottom of the brine tank.

Placing Conditioner into Operation

After all previous steps have been completed, the unit is ready to be placed into operation. Follow these steps carefully.

1. Remove the valve cover.

Note: The following steps will require turning the indicator knob on the control, (Figure 4), to various positions. Insert a wide blade screwdriver into the arrow slot in the indicator knob and press in firmly. With knob held in, rotate **counterclockwise only** until arrow on knob points to desired position. (Rotation is made much easier if you grasp the camshaft with your free hand and turn it at the same time.) Then permit knob to spring back out.

2. Insert screwdriver into slot in the indicator knob. Press in and rotate the knob **counterclockwise** until the arrow points directly to the word **Backwash**.
3. Fill mineral tank with water.
   a. With **water supply off**, place the bypass valve(s) slowly into the **not-in-bypass** position.
   b. Open water supply valve **very slowly** to approximately the 1/4 open position.

IMPORTANT: If opened too rapidly or too far, mineral may be lost. In this position, you should hear air escaping slowly from the drain line.

   c. When all of the air has been purged from the mineral tank (water begins to flow steadily from the drain), close the main supply valve.
   d. With the water supply off, let the unit stand for 5 minutes. This will allow all trapped air to escape from the tank.
4. Open the water supply valve slowly to the fully opened position.
5. Carefully advance the indicator knob **counterclockwise** to the center of the **fast rinse** position and remove the screwdriver. The control will advance to the **conditioned water** position by itself.

Programming the Performa Ultra

1. Plug the wall mount transformer into a functioning electrical outlet that is not controlled by a switch. Plug the transformer plug into the transformer plug receptacle on the control.

Note: If the included transformer cord is not long enough, a 15-foot extension is available.

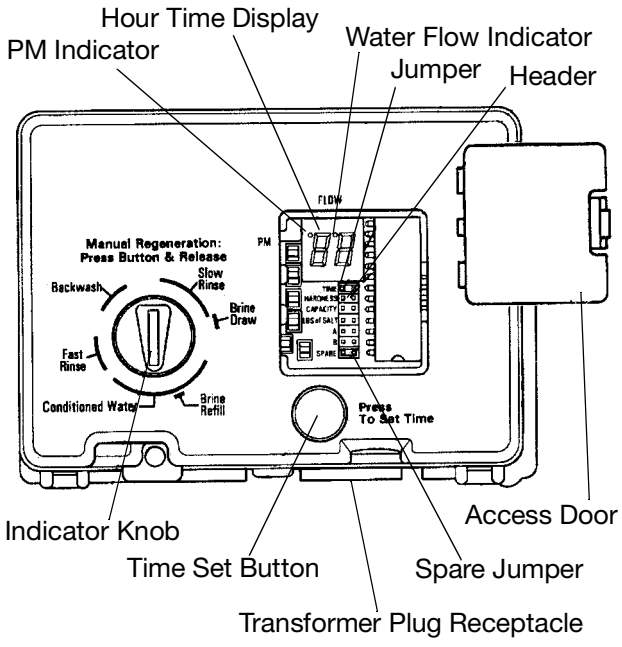


Figure 4

2. Remove the access door by flexing the removal tab to the left (as facing the control) then gently pulling the tab and door out and off the control (Figure 4).
3. With the jumper on the pins marked **TIME** (Figure 5), set the time of day to the closest hour by depressing the black **TIME SET** BUTTON. PM hours are indicated by a light next to the letters **PM** on the display window.

   NOTE: The unit is factory set to regenerate at 2 a.m. If you prefer to have the unit regenerate at an earlier or later time, simply set the current time of day accordingly.

   Example: To have the unit regenerate at 4 a.m., 2 hours later, set the clock 2 hours earlier than the actual current time.
4. Pull the jumper off the **TIME** pins and place it on the pins marked **HARDNESS** (Figure 6). Press the black **TIME SET** BUTTON until the correct hardness is displayed. The hardness range is from 1 to 99 grains per gallon. To change water hardness stated in parts per million (ppm), to grains per gallon (gpg), use this formula:

   $$\frac{\text{Parts Per Million}}{17.1} = \text{Grains Per Gallon}$$
5. Place the jumper on the pins marked **CAPACITY** (Figure 7). Press the black **TIME SET** button until the correct capacity value is displayed. The capacity range is 6 to 47 kilograins. Refer to the Salt and Capacity Setting chart (Table 4).

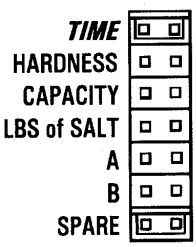


Figure 5

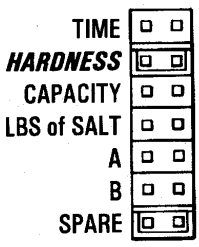


Figure 6

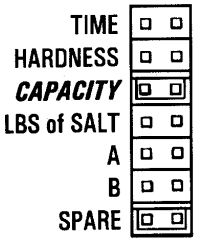


Figure 7

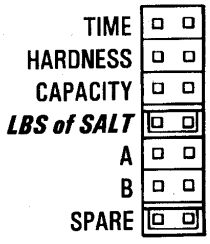


Figure 8

6. Place the jumper on the pins marked **LBS of SALT** (Figure 8). Press the black **TIME SET** button until the correct salt value is displayed. The salt range is 1 to 30 pounds. Refer to the Salt and Capacity Setting chart (Table 4).
7. Return the jumper to the pins marked **TIME** and close the access door. The pins marked **A** and **B** are used for factory testing and are not used in normal operation. **The jumper must NOT be left on any pins other than the pins next to the word TIME. Failure to do this will cause the unit not to operate.** Please note that a spare jumper is located in the position marked **SPARE**.

In the event that the hardness, capacity or salt setting must be changed, simply follow steps 2 through 7.

Calendar Override

The override will initiate a regeneration at the programmed interval if the water usage has not been enough to initiate regeneration. For example, if a 463i unit is programmed with a 10-day calendar override and the home owner goes on vacation, after 10 days of no usage, the system will regenerate automatically.

To set the calendar override:

1. Disconnect the power.
2. Move the jumper from the **TIME** pins to the **A** pins, and reconnect the power.
3. Move the same jumper to the **B** pins. One zero will appear, indicating zero days of calendar override. All 463i units are preprogrammed in this manner.
4. Depress the **TIME SET** button. The numbers will roll from 0 to 15. Release the button at the desired number of days for the calendar override. For example, releasing the button at 10 would program a 10 day calendar override.
5. Disconnect the power.
6. Place the jumper back on the **TIME** pins and reconnect the power.

The calendar override is maintained during power outages by the NOVRAM circuitry. To remove the calendar override, follow the same steps above and program back to 0.

Table 4 - Salt and Capacity Settings *

Salt Setting (lbs.)	System 0	System 1	System 2 & 3	System 4 & 5	System 6	System 7	System 8
2	6,000	8,000	8,000				
3	8,000	9,000	10,000	11,000			
4	10,000	11,000	12,000	14,000	15,000	16,000	
5	10,000	13,000	13,000	16,000	17,000	18,000	21,000
6	11,000	13,000	14,000	18,000	20,000	20,000	23,000
7	12,000	14,000	15,000	19,000	21,000	22,000	24,000
8	13,000	15,000	16,000	21,000	22,000	24,000	26,000
9		16,000	17,000	22,000	24,000	26,000	28,000
10		17,000	18,000	24,000	26,000	28,000	29,000
11				25,000	28,000	30,000	31,000
12				26,000	29,000	31,000	33,000
13					30,000	32,000	34,000
14					31,000	34,000	36,000
15					32,000	36,000	38,000
16					33,000	37,000	39,000
17						38,000	40,000
18						39,000	40,000
19						40,000	41,000
20							41,000
21							42,000
22							42,000
23							43,000
24							44,000
25							44,000
26							45,000
27							45,000
28							46,000
29							46,000
30							47,000

*In most cases, proportional brining will provide higher working efficiencies than standard brining.

Note: Settings other than those listed will result in improper operation of the water conditioner.

1 - Determine the system size based on the tank size and resin volume.

2 - Select the salt setting. Using lower pounds of salt offers greater salt efficiency than higher salt settings.

3 - Determine the capacity of the water conditioner by reading the cross point of the salt setting and system number. **Example: Salt Setting = 4 lbs., System No = 3, Capacity setting = 12,000 grains**

Changing the System Number

1. Place one jumper on **HARDNESS** and one on **LBS of SALT**.
2. Press **TIME SET** Button (Figure 4) until desired system number (Table 1) is displayed.
3. Remove jumpers. Place one jumper on **TIME** pins and one jumper on **SPARE** jumper pins (Figure 5).

Control Valving Indentifications

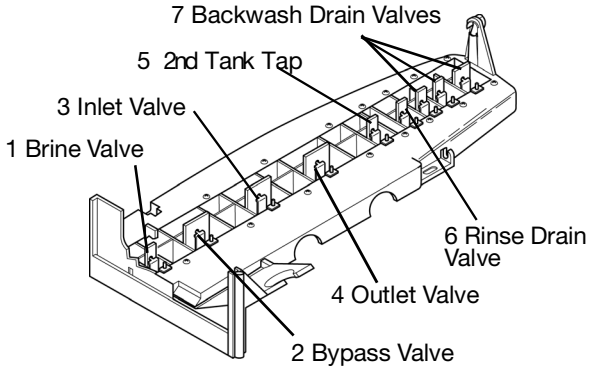


Figure 9

Valve Disc Operation

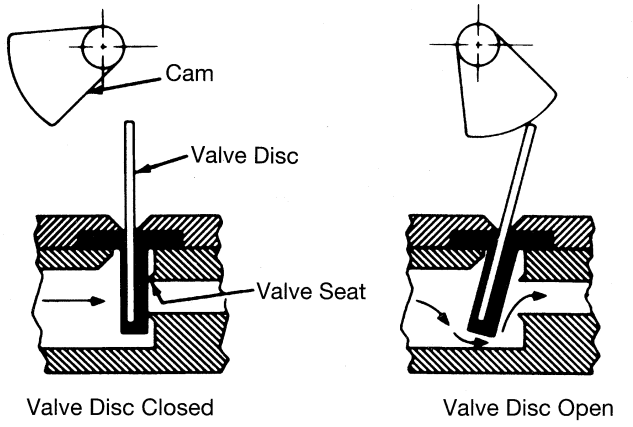


Figure 10

Removing 463i for Servicing

1. Unplug the power cord.
2. Remove cover.
3. Align the indicator arrow on the rear of the camshaft with the top of the rear hoop of the top plate (Figure 11).

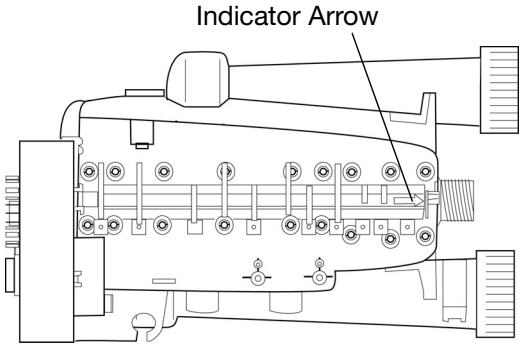


Figure 11

4. Remove the camshaft by carefully pushing the securing tab, located at the rear of the camshaft, away from the camshaft until the tab disengages from the camshaft. Push the back of the camshaft down and out to the inlet side of the valve (Figure 12).

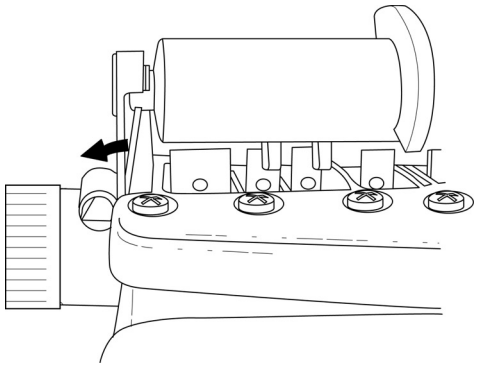


Figure 12

5. Disengage the front of the camshaft from the output gear of the control.
6. Remove the timer locking pin and lift the control straight up and off of the valve.
7. To reinstall the camshaft and control, reverse the above procedures.

Preventive Maintenance

Injector Screen and Injector

Inspect and clean brine tank and screen filter on end of brine pickup tube once a year or when sediment appears in the bottom of the brine tank.

Clean injector screen and injector once a year.

1. Unplug the wall-mount transformer.
2. Shut off water supply or put bypass valve(s) into bypass position.
3. Relieve system pressure by opening valve No. 7 (at rear) with a screwdriver.
4. Using a screwdriver, remove injector screen and injector cap (Figure 13).
5. Clean screen using a fine brush. Flush until clean.
6. Using a needle-nose pliers, pull injector straight out.
7. Flush water into the injector screen recess of the valve body to flush debris out through the injector recess.
8. Clean and flush the injector.
9. Lubricate the O-rings on the injector, injector cap and injector screen with silicone lubricant **only!**
10. Reinstall the injector, injector cap and injector screen.

IMPORTANT: Do not overtigtten the plastic cap. Seat the cap lightly into position. Overtightening may cause breakage of the plastic cap that may not be immediately evident.

11. Plug the wall-mount transformer into outlet; reset clock if necessary.
12. Slowly open water supply valve or return bypass valve(s) to the “service” position.

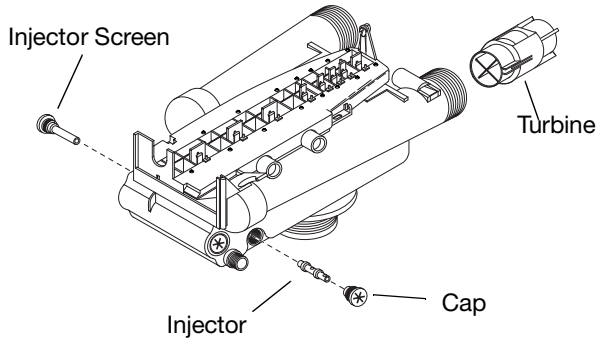
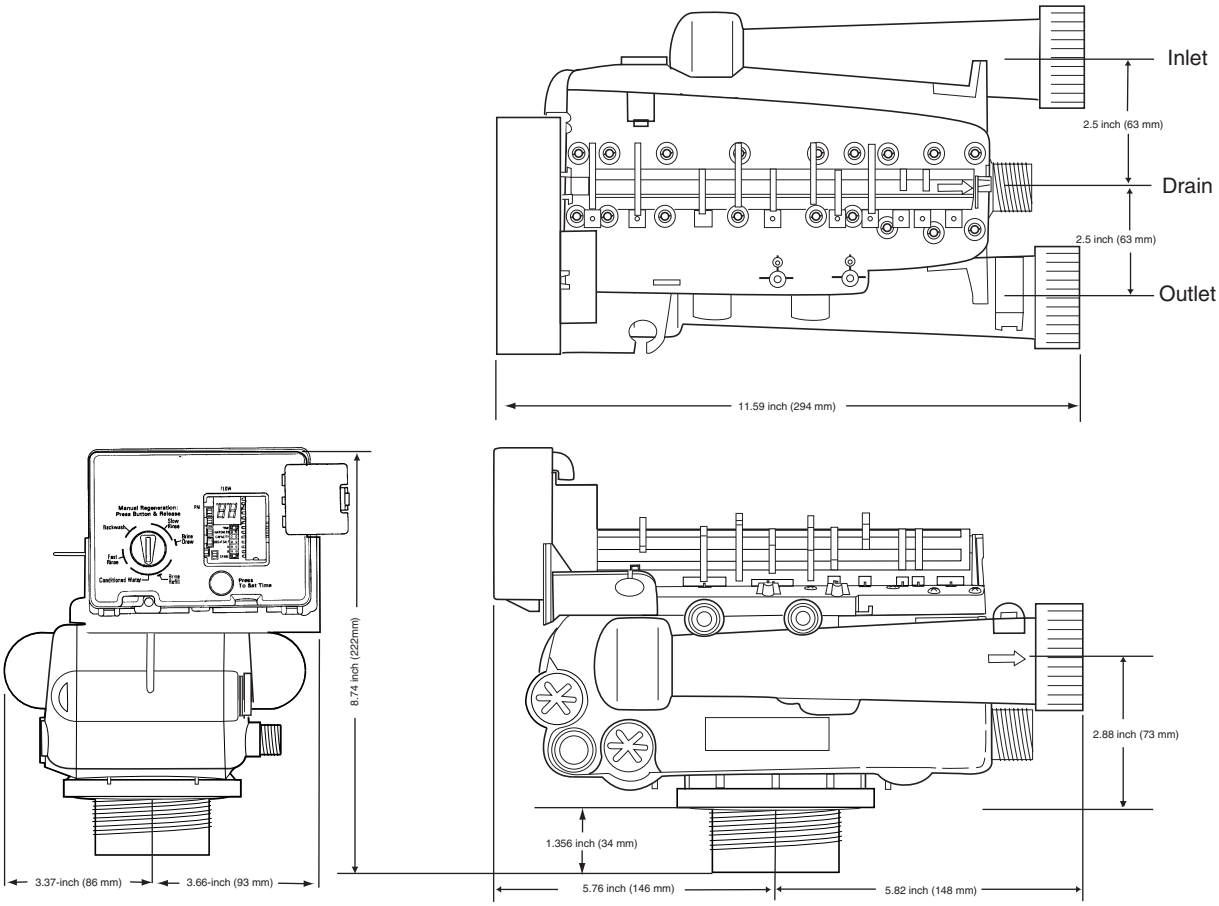


Figure 13

Specifications

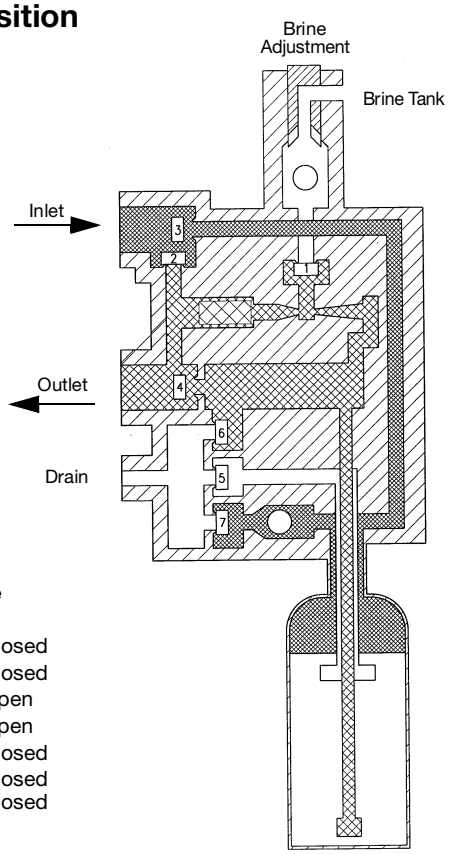


Hydrostatic Test Pressure . . . . . 300 psi (20.69 bar)
Working Pressure. . . . . 20-120 psi (100 psi Canada) (1.38 - 8.62 bar)
Standard Electrical Rating . . . . . 115V 60 Hz
Optional Electrical Rating . . . . . 115V 50 Hz, 230V 50 Hz, 200V 60 Hz, 24V 60 Hz, 24V 50 Hz,
100V 60 Hz, 100V 50 Hz, 12V 50 Hz/transformer, 12V 60 Hz/transformer
Electrical Cord (standard rating) . . . . . 60 inch (1.5 m) 3-wire with plug
Pressure Tank Thread . . . . . 2 1/2 inch-8 male
Riser Pipe Required . . . . . Special, refer to Riser Pipe Assembly section
Standard Connection . . . . . .1-inch (25.4-mm) copper tube adapters
Optional Connections . . . . . .3/4-inch, 22-mm, and 28-mm copper tube adapters
3/4-inch BSPT, 1-inch BSPT, 1-inch NPT brass pipe adapters
3/4-inch, 1-inch, 25-mm CPVC tube adapters
Brine Line Connection . . . . . 3/8-inch NPT male
Drain Line Connection . . . . . 3/4-inch NPT male
Optional Bypass Valve. . . . . Rotating handles, full 1-inch porting, reinforced Noryl*
Control Module, Tank Adapter. . . . . .Reinforced Noryl
Rubber Goods . . . . . Compounded for cold water service
Brine Refill Control. . . . . 0.14 gpm (.53 Lpm), 0.33 gpm (1.25 Lpm), or 0.40 gpm (1.51 Lpm)
Injectors. . . . . Reference Table 1 System Sizes
Internal Backwash Controllers. . . . . 7- through 12-inch (17.8- though 30.5-cm) diameter media tanks
All sizes to flow 4.5 gpm/sq ft (183 L/m/m^2) of bed area

**Noryl is a trademark of General Electric Company.*

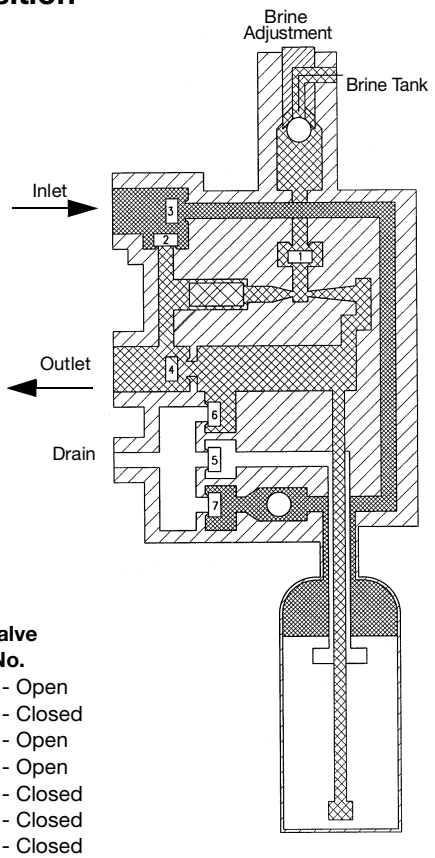
Flow Diagrams

1 Service Position



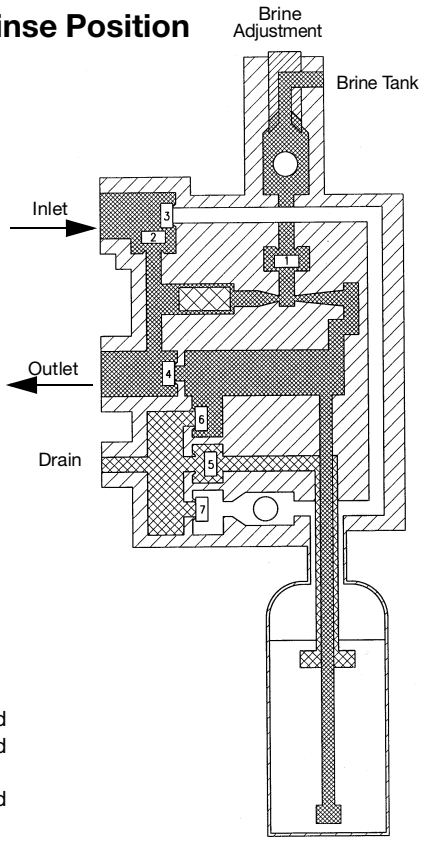
Name	Valve No.
Brine	1 - Closed
By-Pass	2 - Closed
Inlet	3 - Open
Outlet	4 - Open
2nd Tank Top	5 - Closed
Purge	6 - Closed
Backwash	7 - Closed

2 Refill Position



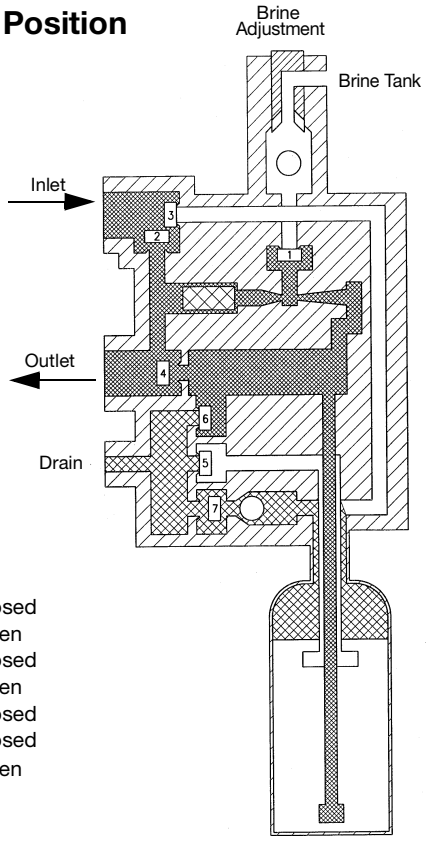
Name	Valve No.
Brine	1 - Open
By-Pass	2 - Closed
Inlet	3 - Open
Outlet	4 - Open
2nd Tank Top	5 - Closed
Purge	6 - Closed
Backwash	7 - Closed

3 Brine/Slow Rinse Position



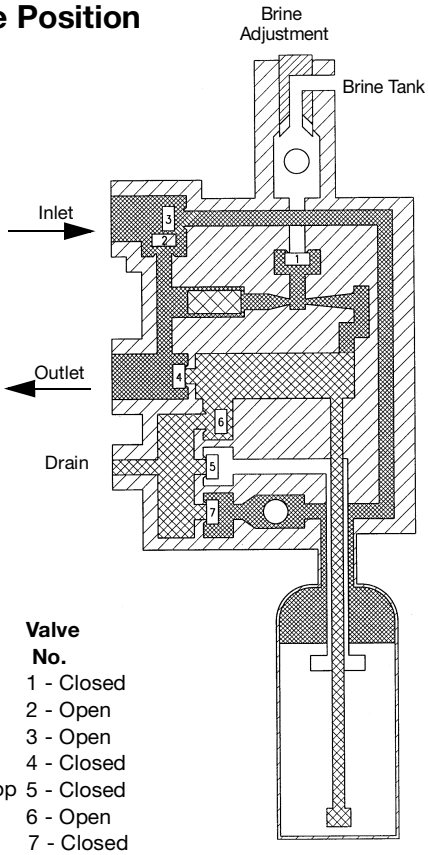
Name	Valve No.
Brine	1 - Open
By-Pass	2 - Open
Inlet	3 - Closed
Outlet	4 - Closed
2nd Tank Top	5 - Open
Purge	6 - Closed
Backwash	7- Closed

4 Backwash Position



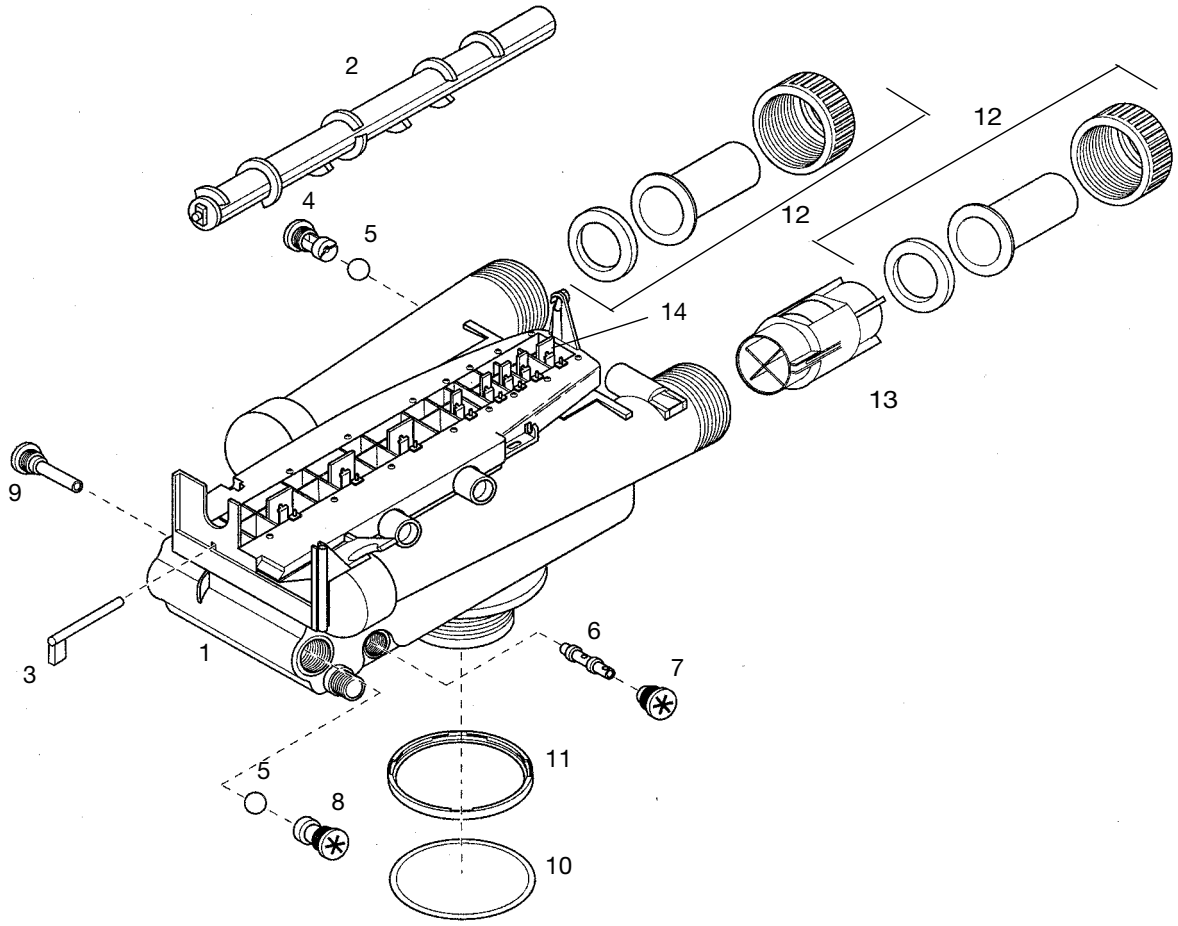
Name	Valve No.
Brine	1 - Closed
By-Pass	2 - Open
Inlet	3 - Closed
Outlet	4 - Open
2nd Tank Top	5 - Closed
Purge	6 - Closed
Backwash	7 - Open

5 Purge Position



Name	Valve No.
Brine	1 - Closed
By-Pass	2 - Open
Inlet	3 - Open
Outlet	4 - Closed
2nd Tank Top	5 - Closed
Purge	6 - Open
Backwash	7 - Closed

Replacement Parts
Valve System Assembly

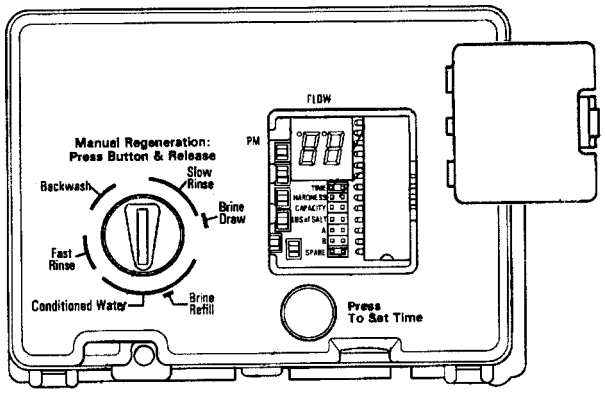


Parts List

Code	Part No.	Description	Qty.
1	1035610	Valve Assembly, w/o Flow Controls	1
2	1035626	Camshaft: Tan	1
3	1031391	Timer Locking Pin	1
4		Drain Control Assembly:	1
	1000209	No. 7 (1.2 gpm; 4.5 Lpm)	
	1000210	No. 8 (1.6 gpm; 6.1 Lpm)	
	1000211	No. 9 (2.0 gpm; 7.6 Lpm)	
	1000212	No. 10 (2.5 gpm; 9.5 Lpm)	
	1000213	No. 12 (3.5 gpm; 13.2 Lpm)	
5	1030502	Ball, Flow Control	2
6		Injector Assembly:	1
	1032976	Reference Table 1-System Sizes for Injector Selection (1 Bump)	
	1032977	Reference Table 1-System Sizes for Injector Selection (2 Bumps)	
	1032979	Reference Table 1-System Sizes for Injector Selection (3 Bumps)	
	1032980	Reference Table 1-System Sizes for Injector Selection (4 Bumps)	
	1032982	Reference Table 1-System Sizes for Injector Selection (5 Bumps)	
	1032984	Reference Table 1-System Sizes for Injector Selection (6 Bumps)	
7	1032985	Injector Cap Assembly	1
8		Brine Refill Control:	1
	1000222	0.33 gpm Flow Control	
9	1000226	Screen/Cap Assembly	1
10	1010429	O-Ring	1
11	1035622	Tank Ring	1
12		Plumbing Adapter Kits:	1
	1001606	3/4-inch Copper Tube Adapter Kit	
	1001670	1-inch Copper Tube Adapter Kit	
	1001608	22-mm Copper Tube Adapter Kit	
	1001609	28-mm Copper Tube Adapter Kit	
	1001613	3/4-inch CPVC Tube Adapter Kit	
	1001614	1-inch CPVC Tube Adapter Kit	
	1001615	25-mm CPVC Tube Adapter Kit	
	1001769	3/4-inch NPT Plastic Pipe Adapter Kit	
	1001603	1-inch NPT Plastic Pipe Adapter Kit	
	1001604	3/4-inch BSPT Plastic Pipe Adapter Kit	
	1001605	1-inch BSPT Plastic Pipe Adapter Kit	
	1001611	3/4-inch BSPT Brass Pipe Adapter Kit	
	1001610	1-inch NPT Brass Pipe Adapter Kit	
	1001612	1-inch BSPT Brass Pipe Adapter Kit	
13	1033444	Turbine Assembly	1
14	1001580	Spring, Flapper Valve	1
*		Valve Disc Kit:	
	1041174	Standard	
	1041175	Severe Service	
*	1000062	I-Lid Cover	1

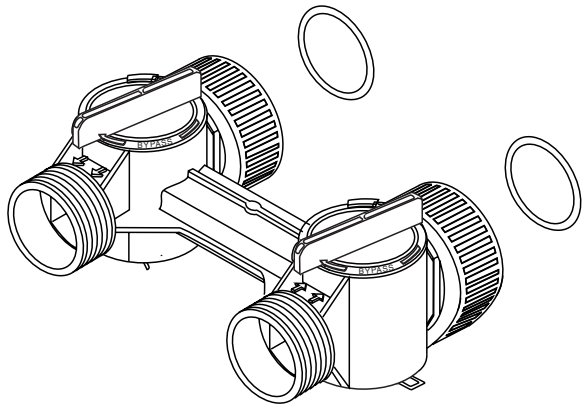
* Not Shown

463i Control



1

1265 Bypass



2

Code	Part No.	Description	Qty.
1	1030070	463i Control	1
2	1040930	1265 Bypass	1
*	1000811	Transformer	1
*	1000907	Transformer Extension Cord 15 feet (4.6 m)	1
*	1034264	Y-Splitter (run 2 units from 1 transformer)	1

*Not Shown

Troubleshooting

Your water conditioning system is designed and manufactured for efficient, low maintenance service. However, if problems occur, this section provides a list of possible causes and solutions.You can solve some problems yourself, such as low salt in the salt storage tank or a blown household fuse. However, some problems require installer or dealer assistance.

IMPORTANT: Service procedures that require the water pressure to be removed from the system are marked with a **!** after the possible cause. To remove water pressure from the system, put the bypass valve or three-valve bypass into the bypass position and open the backwash drain valve (the seventh valve back from the control) with a screwdriver. Restore system water pressure when the service work is completed.

Problem	Possible Cause	Solution
1. Clock does not display time of day.	a. Transformer cord unplugged. b. No electric power at outlet. c. Defective transformer.	a. Connect power. b. Repair outlet or use working outlet. c. Replace transformer.
2. Clock does not display correct time of day.	a. Outlet operated by switch. b. Incorrect voltage or frequency (Hz). c. Power outages.	a. Use outlet not controlled by switch. b. Replace control with one of correct voltage and frequency (Hz). c. Reset clock.
3. Time display shows something other than time of day.	a. Electrical interference.	a. Disconnect power to unit. Restore power and reset time of day display.
4. No water flow display when water is flowing.	a. Bypass valve in bypass. b. Meter probe disconnected or not fully connected to meter housing. c. Restricted meter turbine rotation due to foreign materal in meter **!**	a. Shift bypass valve to not-in -bypass position. b. Fully insert probe into meter housing. c. Remove meter housing, free up turbine and flush with clean water. Do not disassemble turbine from meter housing. Turbine should spin freely. If not, replace meter.
5. Control regenerates at wrong time of day.	a. Power outages. b. Clock set incorrectly.	a. Reset clock to correct time of day. b. Reset clock to correct time of day.
6. Control stalled in regeneration cycle.	a. Coltroller in dwell period. b. No electric power at outlet. c. Air leak in brine connections. d. Binding of camshaft. e. Water pressure greater than 125 psi during regeneration. f. Defective circuit board **!**	a. Wait for period to end. Wait 20 min. for unit to reset. b. Repair outlet or use working outlet. c. Check all junction points and make appropriate corrections. d. Remove obstruction from valve discs or camshaft. e. Install pressure regulator. f. Replace control.
7. Control will not regenerate automatically or when button is pressed.	a. Electric cord or transformer unplugged. b. No electric power at outlet.	a. Connect power. b. Repair outlet or use working outlet.
8. Control will not regenerate automatically but will regenerate when button is pressed.	a. If water flow display is not operative, refer to Item 4. b. Incorrect hardness and capacity settings.	a. Same as Item 4. b. Set to correct values. See Programming section.
9. Run out of soft water between regenerations.	a. Improper regeneration. b. Fouled softener resin. c. Incorrect salt setting. d. Incorrect hardness or capacity settings. e. Water hardness has increased. f. Restricted meter turbine rotation due to foreign material in meter **!** g. Excessive water usage below 1/5 gallon per minute.	a. Repeat regeneration, making certain that correct salt dosage is used. b. Use resin cleaner. See Note 1. c. Set salt control to proper level. See salt setting chart. d. Set to correct values. See programming section. e. Set hardness to new value. See Programming section. f. Remove meter housing, free up turbine and flush with clean water. Do not disassemble turbine from meter housing. Turbine should spin freely, if not, replace meter. g. Repair leaky plumbing and/or fixtures.

10. Valve will not draw brine.	a. Low water pressure. b. Restricted drain line. c. Injector plugged ! d. Injector defective ! e. Valve (2 and/or 3) not closed. f. Air check prematurely closed.	a. Make correct setting according to instructions. b. Remove restriction. c. Clean injector and screen. d. Replace injector and cap. e. Flush out foreign matter holding disc(s) open by manually operating valve stem(s). f. Put control momentarily into brine refill. Replace or repair air check if needed.
11. Brine tank overflow.	a. Brine valve disc 1 being held open by foreign matter. b. Uncontrolled brine refill flow rate. c. Valve disc 2 and/or 3 not closed during brine draw causing brine refill. d. Air leak in brine line to air check. e. Drain flow control clogged with resin or other debris.	a. Manually operate valve stem to flush away obstruction. b. Remove variable salt control to clean it and the ball. c. Flush out foreign matter holding disc(s) open by manually operating valve stem(s). d. Check all connections in brine line for leaks. Refer to instructions. e. Clean drain flow control.
12. System using more or less salt than salt control is set for.	a. Inaccurate setting. b. Foreign matter in controller causing incorrect flow rates ! c. Defective salt control.	a. Make correct setting. b. Remove variable salt control and flush out foreign matter. Manually position control to brine draw to clean salt control (after so doing, position control to “purge” to remove brine from tank). c. Replace defective part.
13. Intermittent or irregular brine draw.	a. Low water pressure. b. Defective injector ! c. Air leak in brine line to air check.	a. Set pump to maintain at least 20 psi at softener. b. Replace both injector and injector cap. c. Check all connections in brine line for leaks. Refer to instructions.
14. No conditioned water after regeneration.	a. Unit did not regenerate. b. No salt in brine tank. c. Plugged injector ! d. Air check closed prematurely.	a. Check for power. b. Add salt to brine tank. c. Remove injector and flush it and injector screen. d. Put control momentarily into refill to free air check. Replace or repair air check if needed.
15. Control backwashes at excessively low or high rate.	a. Incorrect backwash flow control used ! b. Foreign matter affecting flow control operation !	a. Replace with correct size flow control. b. Remove flow control and clean it and the ball.
16. Flowing or dripping water at drain or brine line after regeneration.	a. Drain valve discs (5 or 6) or brine valve disc (1) held open by foreign matter. b. Valve stem return spring on top plate weak.	a. Manually operate valve stem to flush away obstruction. b. Replace spring.
17. Hard water leakage during service.	a. Improper regeneration. b. Leaking of bypass valve ! c. O-ring around riser tube damaged !	a. Repeat regeneration making certain that the correct salt dosage is set. b. Replace O-ring. c. Replace O-ring.

Note 1: The use of resin cleaners in an unvented enclosure is not recommended. This may cause damage to the control.

Disinfection of Water Conditioners

The construction materials of the Water Conditioning System do not support bacterial growth or contaminate the water supply. However, we recommend that your conditioner be disinfected after installation and before the conditioner is used to treat potable water. In addition, a conditioner can become fouled with organic matter during normal usage or with bacteria from the water supply. Periodic disinfection is recommended for all conditioners.

Use one of the following methods of disinfection based on operating conditions, style of conditioner, type of ion exchanger, and disinfectant available.

Sodium Hypochlorite

Sodium Hypochlorite, 5.25% solutions, can be used with polystyrene resin, synthetic gel zeolite, greensand, and bentonites and are available under trade names such as Chlorox*. Adjust the dosage if stronger commercial solutions are used.

The recommended dosage for 5.25% solutions is:

- Polystyrene resin: 1.2 fluid ounces per cubic foot.
- Non-resinous exchangers: 0.8 fluid ounce per cubic foot.

**Clorox is a registered trademark of The Clorox Company.*

Calcium Hypochlorite

Calcium hypochlorite, 70% available chlorine, is available in several forms including tablets and granules. These solid materials can be used directly without dissolving before application. The recommended dosage for calcium hypochlorite is two grams (approximately 0.1 ounce) per cubic foot.

Complete the following steps to disinfect the conditioner:

- Add the disinfectant to the brine well of the brine tank. Make sure that the brine tank has water in it so the solution is carried into the conditioner.
- Initiate a regeneration.

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