

Series 255 Valve / 940 Control

**Water Conditioning Control System
Installation, Operation and Maintenance Manual**

Table of Contents

Introduction	3	Removing the Valve Assembly	
Superior Design		Preventive Maintenance	10
Superior Operation		Injector Screen and Injector	
Installation	3	Specifications	11
Location Selection		Pressure Graphs	12
Water Line Connection		Control Valving Identification	13
Drain Line Connection		Valve Disc Operation	13
Brine Line Connection		Flow Diagrams	13
Brine Tank Overflow Line Connection		Replacement Parts	15
Electrical Connection		Troubleshooting	19
Placing Conditioner into Operation	6	Disinfection of Water Conditioners	20
Adjustment of Timer	7		
Special Features of Timer			
Adjustment of Brine Control	7		
How to Set the Salt Dial			
Service	8		
Removing the Timer Assembly			

Introduction

Thank you for purchasing a water conditioning system featuring the Series 255 with a Model 940 Control.

The Model 940 Control provides dependable time-clock based operation. The Series 255 valve combines design simplicity with reinforced Noryl* construction to provide an uncommonly reliable appliance. The inherent quality of the system means a long life of efficient, trouble-free soft water. If maintenance becomes necessary, the Series 255/940 Control offers a unique separation capability illustrated in the **Service** section of this manual.

Superior Design

- **Single synchronous electric motor** provides all the power for the clock and the operation of the control.
- **Electrical wiring is factory assembled.** System cannot be connected incorrectly.
- **Program clock 940 (timer) and 960 Demand System are interchangeable.** Both units provide guest regeneration capability.
- **System may be indexed manually with or without power** to any one of its service or regeneration positions. Legend on timer face plate indicates control valve position.
- **No moving parts in water stream** means no close tolerance parts subject to fouling. Thus, the system is especially effective on iron-bearing water.
- **No dynamic seals** that could cause leakage through wear or fatigue.
- **Control accepts Noryl* or brass manifold or modular bypass valve without modification,** offering complete versatility and easy plumbing for any installation.
- **Brining control valve built into system** eliminates need for an external brine valve.
- **Drain flow control** is built into the valve to control backwash and fast rinse flow rates.

*Noryl is a Trademark of General Electric Company.

Superior Operation

- **Direct acting system** functions independently of water pressure. No pistons or diaphragms that require a minimum water pressure to operate.
- **Five-cycle operation** provides for downflow service, upflow backwash, downflow brining, downflow slow rinse and downflow fast rinse. A sixth position is included for timed refill of the brine tank.
- **Valve discs are held closed by water pressure** and therefore, are leak tight. The sealing forces are increased as the water pressure is increased. Valve

seals are in a vertical position, which is the design position least vulnerable to plugging.

- **System operation cannot get out of phase** or sequence. The control always returns to a fixed service position after regeneration regardless of where in the regeneration cycle it was started.
- **Bypass (unconditioned) water is automatically available** during regeneration.

Installation

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

Location Selection

The following considerations must be taken into account when selecting the location for the water conditioning system:

- Locate the system as close to a drain as possible.
- If supplementary water treating equipment is required, make sure that adequate additional space is available. Locate the brine tank in an accessible place so that salt can be easily added.
- Do not install any unit closer than 10 feet (3 m) of piping between the outlet of the water conditioner and the inlet of the water heater. Water heaters can transmit heat back down the cold water pipe into the 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 prevent hot water damage. A positive way to prevent hot water from flowing from a heat source to the conditioner is to install a check valve in the soft water piping from the conditioner. If a check valve is installed, make sure that the water heating unit is equipped with a properly rated temperature and pressure safety relief valve. Always conform to local codes.

- Do not locate the unit in an area where the temperature ever falls below 34°F (1°C) or over 120°F (49°C).
- Do not install the unit near acid or acid fumes.
- Do not expose the unit to petroleum products.

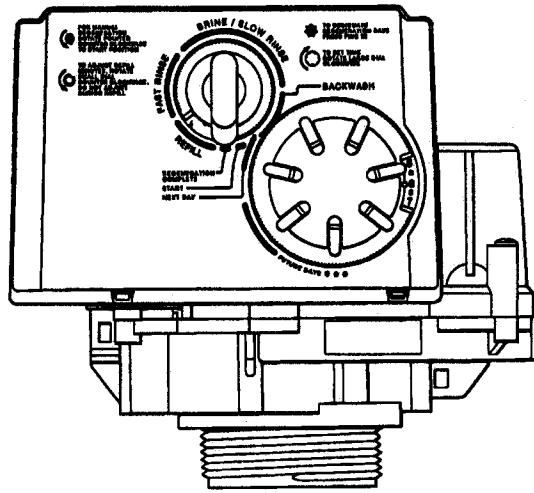


Figure 1 - Control Module

Bypass Valve (Optional)

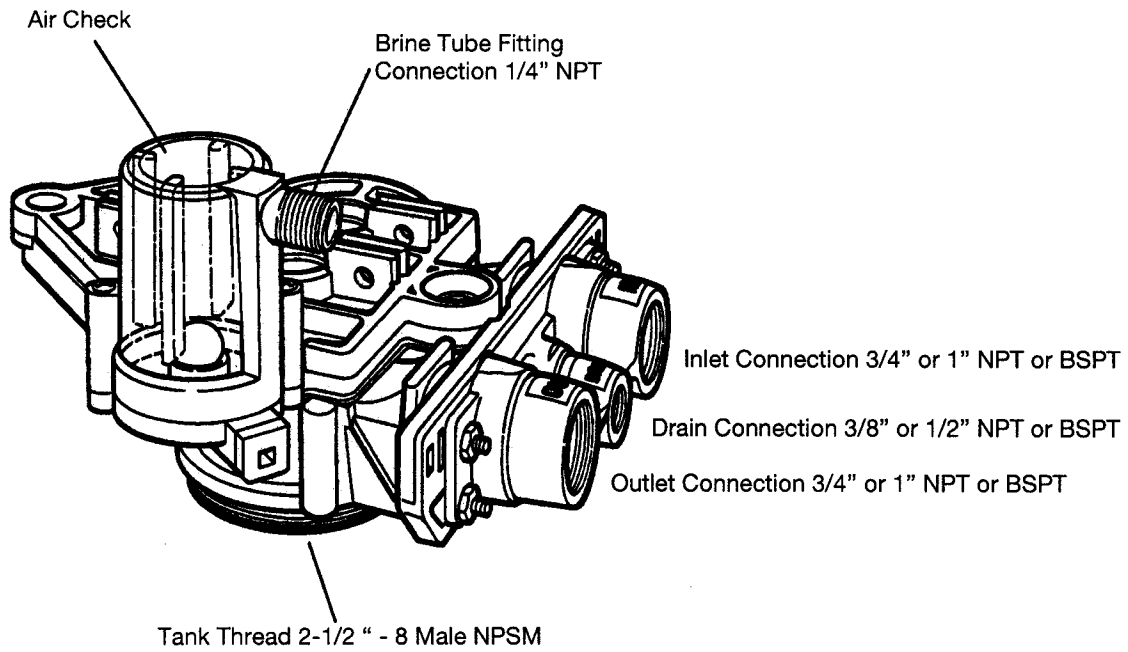
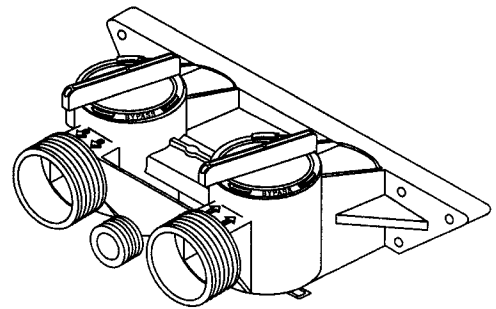


Figure 2 - Tank Adapter

Water Line Connection

A bypass valve system must be installed to provide for occasions when the water conditioner must be bypassed for hard water or for servicing. The most common bypass systems are the Autotrol Series 256 Bypass Valve, Figure 3, and plumbed-in globe valves, Figure 4. Though both are similar in function, the Autotrol Bypass offers simplicity and ease of operation.

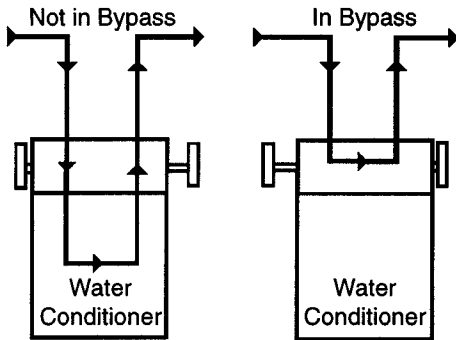


Figure 3 - Autotrol Series 256 Bypass Valve

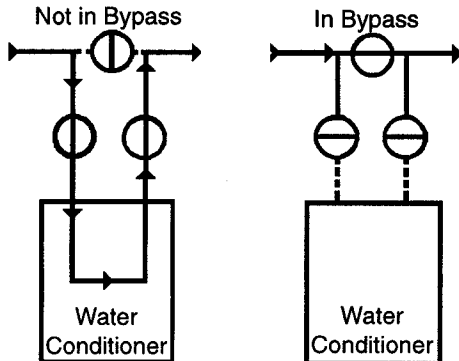


Figure 4 - Typical Globe Valve Bypass System

Drain Line Connection

The drain line discharges water and brine during the regeneration cycles. Typically, the line drains into a floor drain or laundry tub. Plumb the drain line according to local codes, leaving a one or two inch air gap between the end of the drain line and the drain opening, Figure 5.

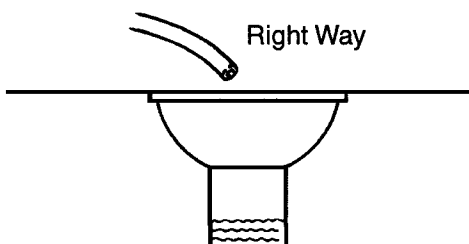


Figure 5 - Air Gap Installation

IMPORTANT: Never connect the 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.

The ideal location for the unit is above and not more than 20 feet (6.1 m) from the drain. For such installations, using the appropriate adapter fitting (not supplied), connect 1/2 inch (1.3 cm) plastic tubing to the drain line connection located at the rear of the control.

If the 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). You may elevate the line up to 6 ft (1.8 m) providing the run does not exceed 15 feet (4.6 m) and the water pressure at the conditioner is not less than 40 psi (2.8 bar). You may elevate an additional 2 feet (61 cm) for each additional 10 psi (.7 bar) of water pressure. When the drain line is elevated and empties into a drain which is below the level of the control valve, form a 7-inch (17 cm) loop at the drain end of the line so that the bottom of the loop is level with the drain line connection. This provides an adequate siphon trap. If the drain empties into an overhead sewer line, a sink-type trap must be used.

Note: The above instructions reflect standard commercial practices. Local codes may require different installation procedures.

Brine Line Connection

Install the brine tube and connect to the fitting connection located on the air check on the tank adapter module, see Figure 2.

Note: Make sure that all fittings and connections are tight so that premature checking does not take place. Premature checking occurs when the ball in the air check falls to the bottom before all brine is drawn out of the brine tank. Refer to the Troubleshooting section in this manual for additional information.

Brine Tank Overflow Line Connection

In the event of a malfunction, the tank overflow connection directs overflow to the drain instead of spilling it on the floor where it could cause water damage. Complete the following steps to connect the overflow fitting to the brine tank:

1. Locate the fitting hole on the side of the brine tank
2. Insert the overflow fitting (not supplied) into the tank and tighten with the plastic thumb nut and gasket as illustrated in Figure 6.

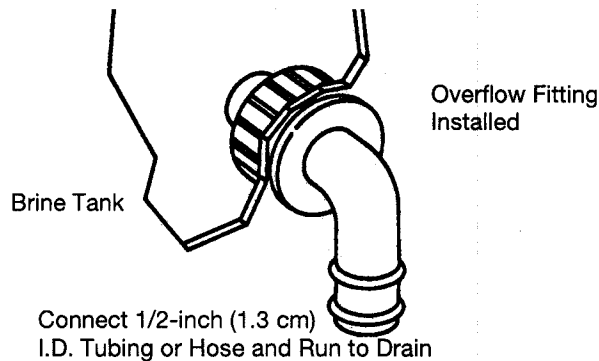


Figure 6 - Overflow Line Connection

3. Attach a length of 1/2-inch (1.3-cm) tubing (not supplied) to the fitting and run to the drain.

Note: Do not elevate the overflow line higher than 3 inches (7.6 cm) below the bottom of the overflow fitting. Do not tie into the drain line of the control unit. The overflow line must be a direct, separate line from the overflow fitting to the drain, sewer, or tub. Allow an air gap as in the drain line connection, Figure 5.

Electrical Connection

Remove the twist tie from the power cord and extend the cord to its full length. Make sure the power source matches the electrical rating of the control. Be sure the outlet you select is not controlled by a wall switch.

Placing Conditioner into Operation

After the water conditioning system is physically installed, we recommend that the conditioner be disinfected before it is used to treat potable water. Refer to the **Disinfection of Water Conditioners** section in this manual. Complete the following steps to place the conditioner into operation:

Grasp the Indicator Knob on the timer (Figure 8) and rotate it **counterclockwise** about 45° to the backwash position. You may find it helpful to remove the rear cover (Figure 10) and rotate the camshaft counterclockwise at the same time.

1. Fill the mineral tank with water by turning the water supply off and placing the bypass valve(s) into the "not in bypass" position. Open the water supply valve very slowly to approximately the 1/4 open position.

IMPORTANT: If the water supply valve is opened too rapidly or too far, resin may be lost. In the **BACKWASH** position, you should hear air escaping slowly from the drain line.

2. When all of the air is purged from the tank (water begins to flow steadily from the drain), slowly open the main supply valve all the way. Allow the water

to run into the drain until the water appears clear. Turn off the water supply and wait for about five minutes to allow all trapped air to escape from the tank.

3. Add water to the brine tank (initial fill). With a bucket or hose, add approximately 4 gallons (15 liters) of water to the brine tank. If the tank has a salt platform above the bottom of the tank, add water until the level is approximately 1 inch (25 mm) above the platform.

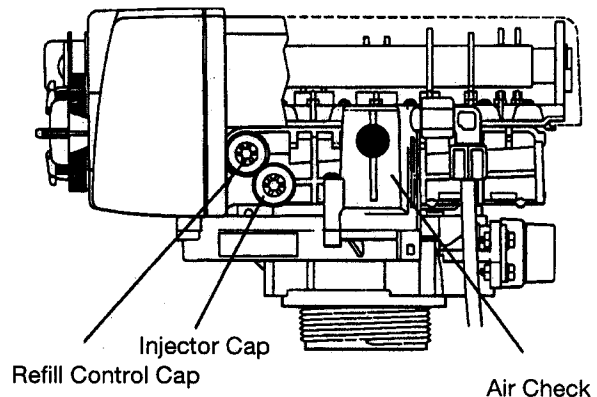


Figure 7

4. To start-up the unit: make sure the water supply valve is in the full open position. Carefully rotate the Indicator Knob, (Figure 8), **counterclockwise** until the indicator points directly to the center of the **REFILL** position and hold there until the air check (Figure 7) fills with water and water flows through the brine line into the brine tank. Do not run the water into the brine tank for more than one or two minutes.

Rotate the Indicator Knob **counterclockwise** until the indicator points to the center of the **BRINE/SLOW RINSE** position.

Check that water is being drawn from the brine tank. The water level in the brine tank will recede very slowly. Observe the water level for at least three minutes. If the water level does not recede, if it goes up, or if air enters the air check sight glass and the ball falls and seats, refer to the **Troubleshooting** section in this manual.

Finally, rotate the Indicator Knob **counterclockwise** until the indicator points to **REGENERATION COMPLETE**. Run water from a nearby cold water faucet until the water is clear and soft.

Adjustment of Timer

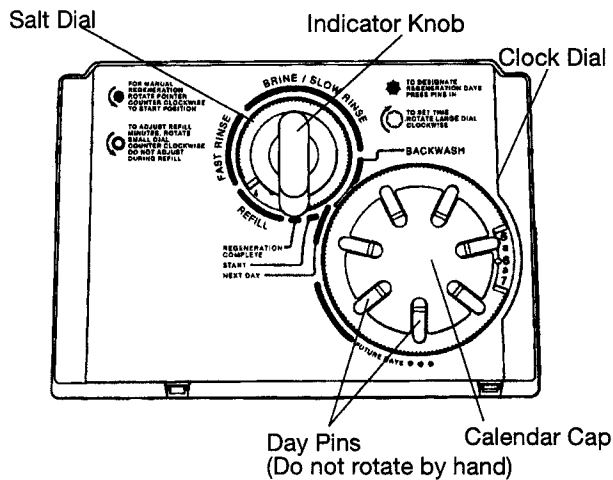


Figure 8

1. Set days of regeneration (Figure 8).

- Pull all day pins outward (away from control).
- Depress day pin(s) for which regeneration is desired.

Note: The NEXT DAY day pin is noted on the timer face. Depressing this pin will insure a regeneration the next day at approximately 2:00 a.m. Since the calendar cap progresses clockwise, depressing the day pin immediately counterclockwise will insure a regeneration the following day at 2:00 a.m. This progression is noted on the timer face as "FUTURE DAYS".

2. Set the Time of day.

- Rotate Clock Dial clockwise until the pointer is directed at the current time.

Note: With the time of day properly set, the conditioner will regenerate at about 2:00 a.m. If you prefer to have the unit regenerate at an earlier or later time, simply set the current time-of-day accordingly. (e.g., To have the unit REGENERATE at 4:00 a.m. - 2 hours later - set the clock 2 hours later than the actual current time).

Note: Do not rotate the Calendar Cap by hand; the clock dial indexes it daily. To manually index the Calendar Cap, rotate the Clock Dial clockwise one complete turn for every day to be indexed.

Special Features of Timer

Guest Cycle. When abnormally high water usage exhausts your water conditioner's capacity ahead of schedule, an extra regeneration can be achieved by turning the Indicator Knob **counterclockwise** to **START**, Figure 8. It will take a few minutes for regeneration to begin. The normal regeneration schedule will not be disrupted.

Manual Regeneration. Electricity is used only to run the timer and to 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 rotating the Indicator Knob counterclockwise. Manual time cycle:

BACKWASH	14 minutes;
BRINE AND SLOW RINSE	52 minutes;
FAST RINSE	6 minutes;
REFILL	Read number of minutes off Salt Dial.

Adjustment of Brine Control

All models may be tuned to produce maximum to minimum conditioning capacities by adjusting the Salt Dial (Figure 9). The Salt Dial controls the amount of salt used per regeneration. When desired, the minimum setting may be used if the frequency of regeneration is increased to compensate for the lower regenerated conditioning capacity. Your installing dealer has set your unit for proper salt usage. Further adjustments are needed only if the hardness of the water supply changes or if water use changes dramatically.

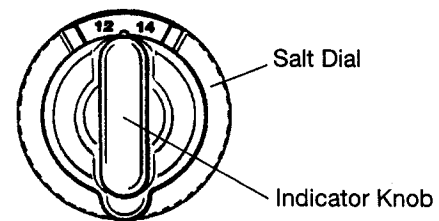


Figure 9

How to Set the Salt Dial

With the Indicator Knob in the REGENERATION COMPLETE position (Figure 8), rotate the Salt Dial counterclockwise at least one full turn to cancel out the previous setting. A light clicking will be replaced by a heavier clicking when the previous setting is cancelled. Then, rotate the Salt Dial to the proper salt setting.

The numbers on the dial are "pounds" of salt when using the .33 gpm refill control. The size of the brine control is embossed on the refill cap. The embossed number corresponds to the gpm flow control. Example: **33** corresponds to .33 gpm flow control. One gallon of water will dissolve 3.0 pounds of salt.

Reference **Table 1** for common settings.

Table 1 - Suggested Salt Settings in Minutes (Pounds of Salt)* for Various Size Conditioners

Capacity Setting Kilograins of Hardness	Resin Bed Volume									
	0.5 ft ³	0.75 ft ³	1.0 ft ³	1.25 ft ³	1.5 ft ³	1.75 ft ³	2.0 ft ³	2.5 ft ³	3.0 ft ³	3.5 ft ³
12	5	-	-	-	-	-	-	-	-	-
16	9	5	-	-	-	-	-	-	-	-
20	-	9	6	-	-	-	-	-	-	-
24	-	14	9	7	-	-	-	-	-	-
30	-	-	15	11	10	-	-	-	-	-
32	-	-	19	13	11	9	-	-	-	-
35	-	-	-	17	13	11	10	-	-	-
40	-	-	-	-	18	14	13	-	-	-
48	-	-	-	-	-	22	18	14	-	-
60	-	-	-	-	-	-	-	-	18	-
72	-	-	-	-	-	-	-	-	-	-
78	-	-	-	-	-	-	-	-	-	-
81	-	-	-	-	-	-	-	-	-	-

*For a .33 gpm brine refill control, labeled as "33" on the brine refill cap.

Service

Removing the Timer Assembly

Complete the following steps to remove the timer assembly for servicing:

1. Unplug the power cord.
2. Remove the rear cover by pushing back on the tab provided on the cover with your thumb, Figure 10. Next, lift the cover off the valve.

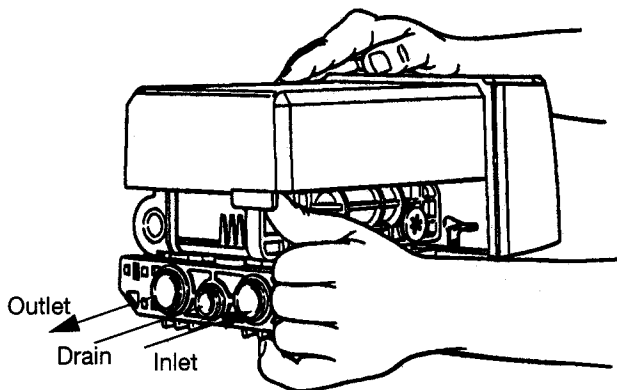


Figure 10

position. Press down on the back of the camshaft to disengage it from the rear "hoop" of the top plate, Figure 11.

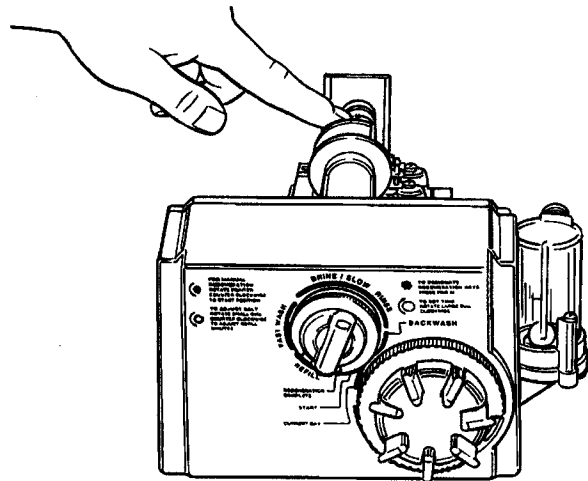


Figure 11

3. To remove the camshaft (or reinstall it), the rib on the shaft must be pointing straight up. This occurs when the Indicator Knob is rotated to the refill

4. Slide the camshaft back, disengage it from the timer, Figure 12.

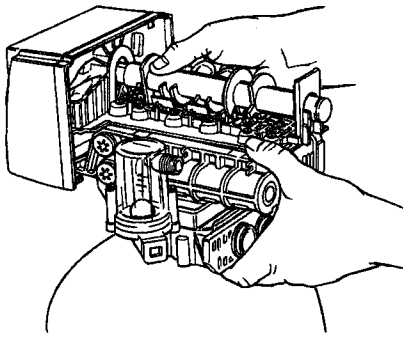


Figure 12

5. Lift the timer off the valve, Figure 13.

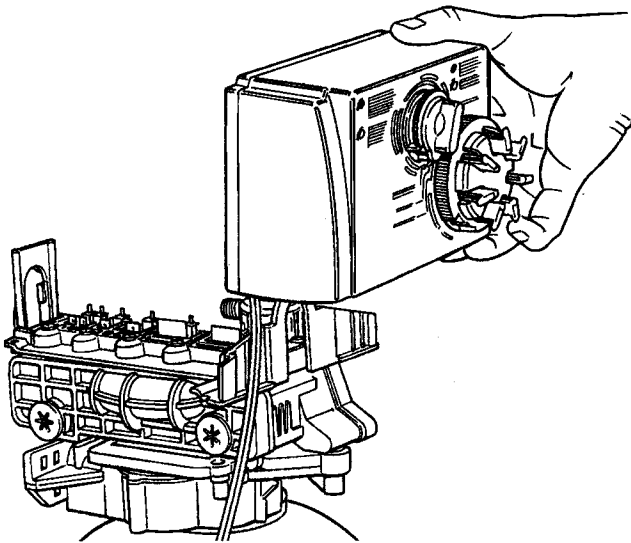


Figure 13

6. To replace the timer, reverse the above procedure.

Note: The camshaft and the timer Indicator Knob need to be positioned correctly before the camshaft can be installed. Rotate the camshaft such that the locating rib is pointing straight up. The timer Indicator Knob must be in the **REFILL** position when installing the camshaft. Slide the camshaft into the timer. It may be necessary to rock the timer slightly to key the camshaft into the timer. When the camshaft is slid into place, lift the back of the camshaft up while rotating the indicator knob to seat the camshaft in the top plate "hoop".

Removing the Valve Assembly

Complete the following steps to remove the valve assembly:

1. Unplug the power cord.
2. Shut off the water supply or place in bypass.
3. Relieve the system pressure by opening the rinse

drain valve (the fifth valve back from the timer) with a screwdriver, Figure 14.

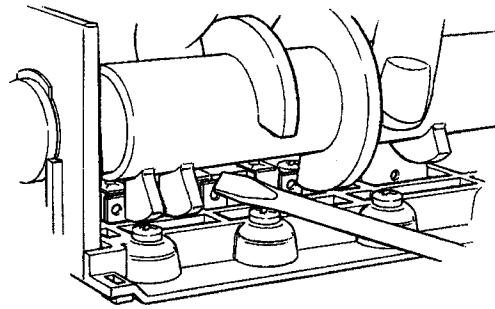


Figure 14

4. Remove the locking bar screw, Figure 15.

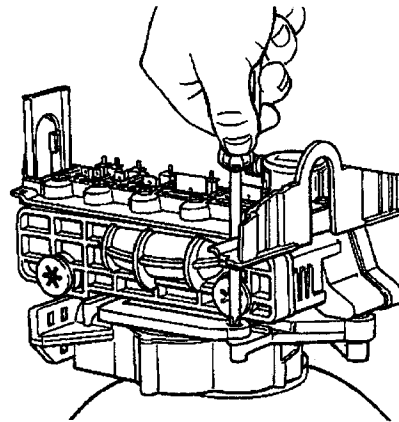


Figure 15

5. Apply downward had pressure on the valve and remove the locking bar, Figure 16.

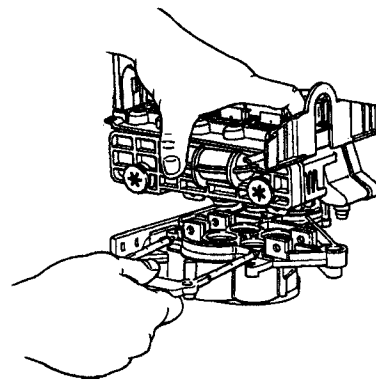


Figure 16

6. Using a rocking motion, lift the valve from the tank adapter, Figure 16. If the o-ring seals come off with the valve, put them back into the tank adapter sockets. Lubricate the o-rings with silicone lubricant.

Note: Petroleum based lubricants will damage the plastic valve and o-rings.

Reverse procedure to replace the valve.

Preventative Maintenance

Injector Screen and Injector

The injector is the component which creates the vacuum necessary to draw the brine into the water conditioner. Clean the injector and injector screen at least once a year in order to maintain proper operation of the water conditioner. Some locations may require more frequent injector and screen servicing. Refer to Figure 17 and complete the following steps to clean the injector screen and injector:

1. Unplug the power cord.
2. Shut off the water supply or put the bypass valve(s) into the bypass position and remove the rear cover, Figure 10.
3. Relieve system pressure by opening the rinse drain valve (the fifth valve back from the control) with a screwdriver, Figure 11.
4. Using a blade screwdriver, unscrew and remove the injector screen and injector cap.
5. Clean screen with a fine brush. Flush with water until clean.
6. Using a needle-nose pliers, pull the 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. Lubricate the o-rings on the injector, injector cap, and injector screen with silicone lubricant.

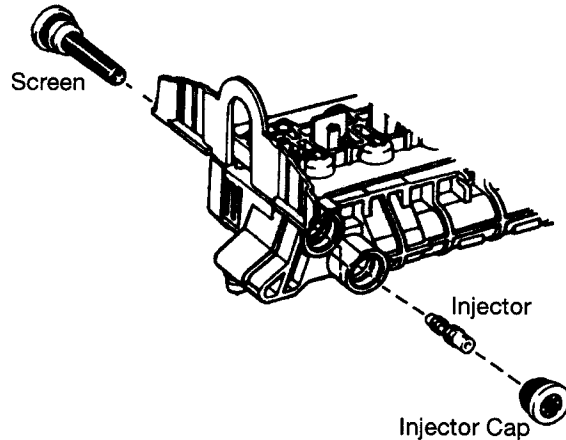
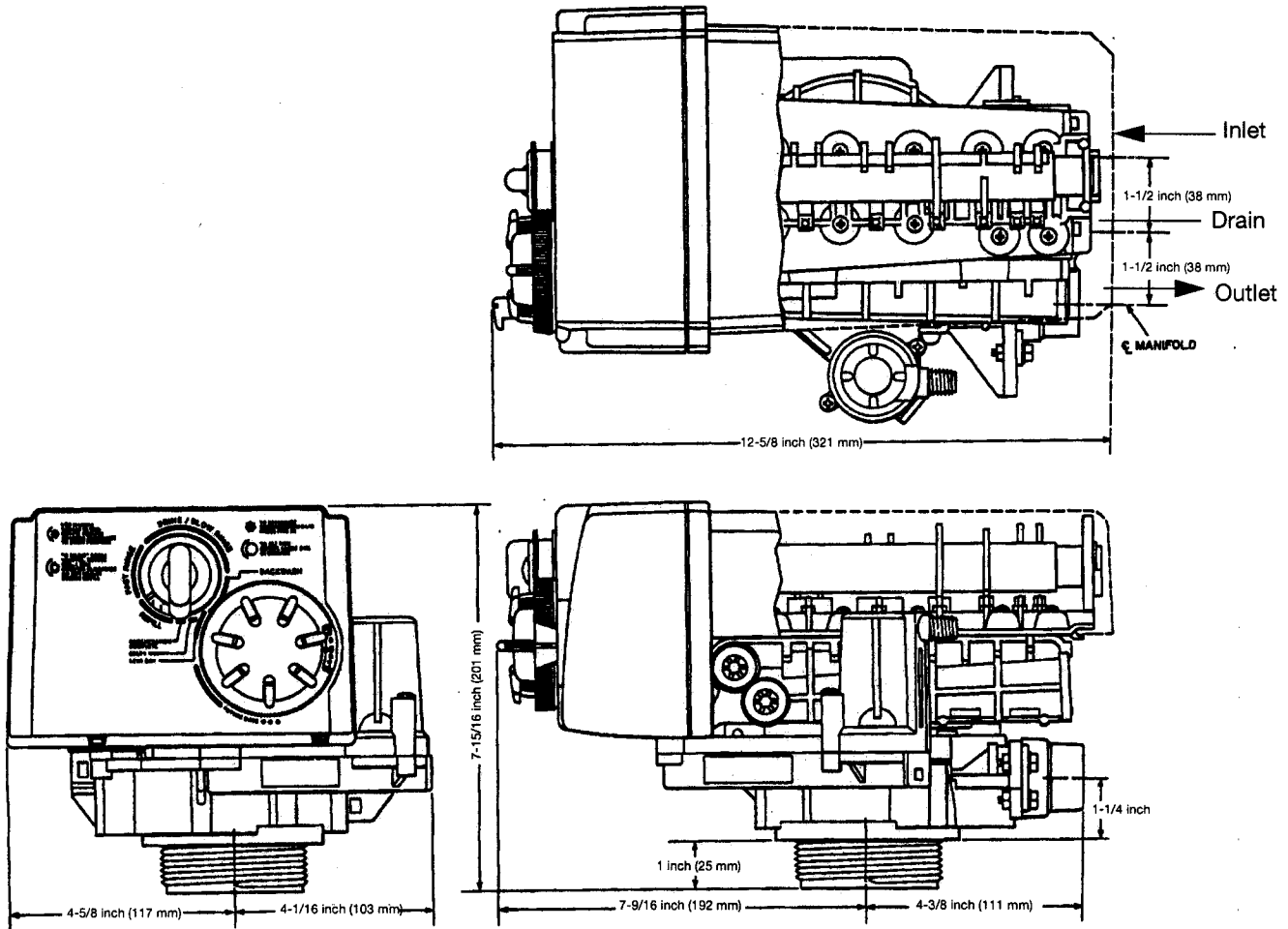


Figure 17

9. Reinstall the injector (small end first), injector cap, and injector screen.
- IMPORTANT:** Do not overtighten the plastic cap. Seat the cap lightly into position. Overtightening can cause breakage of the plastic cap which may not be evident immediately.
10. Slowly open the water supply valve or return the bypass valve(s) to the "not in bypass" position.
 11. Reconnect electric power, and reset the time of day.

Specifications



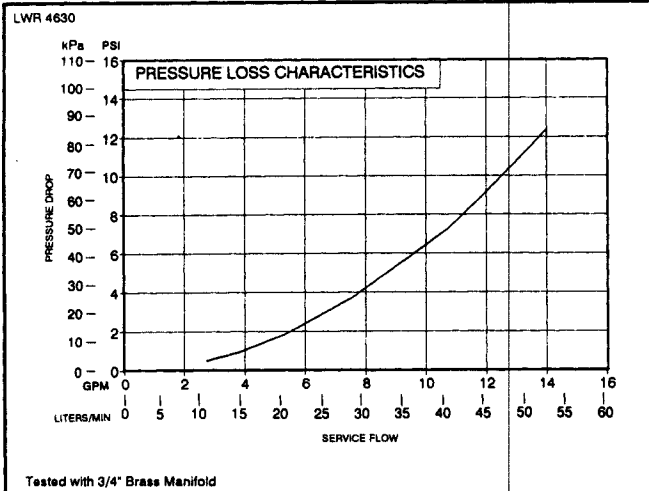
- Hydrostatic Test Pressure 300 psi (20.69 bar)
- Working Pressure. 20 to 127 psi (1.38 to 8.76 bar), 100 psi max in Canada
- Voltage. 24V 50 Hz, 24V 60 Hz, 100V 50 Hz, 100V 60 Hz, 230V 50Hz, 115V 60 Hz
- Current. 50 mA
- Operating Temperature 34 °F (1 °C) to 120 °F (49 °C)
- Humidity 10 to 100%, condensing allowed
- Pressure Tank Thread 2-1/2 inch - 8 male
- Brine Line Thread 1/4 inch NPT male
- Distributor Tube Diameter Required 13/16-inch OD (20.6 mm)
- Distributor Tube Length. 1-1/4 inch (31.8 mm) higher than top of mineral tank
- Inlet-Outlet Manifold (Brass or NORYL). 3/4-inch NPT, 1-inch NPT, 3/4-inch BSPT, 1-inch BSPT
- Valve Module, Tank Adapter, Optional Bypass Valve Reinforced NORYL
- Inlet-Outlet Manifold Brass or reinforced NORYL
- Rubber Parts Compounded for cold water service
- Injector Size "A" White Nozzle 0.042 inch (1.1 mm) diameter, Throat 0.089 inch (2.3 mm) diameter
- Injector Size "B" Blue Nozzle 0.052 inch (1.3 mm) diameter, Throat 0.099 inch (2.5 mm) diameter
- Injector Size "C" Red. Nozzle 0.059 inch (1.5 mm) diameter, Throat 0.099 inch (2.5 mm) diameter
- Backwash Controllers Available for. 7, 8, 9, 10, 12, 13, 14 inch (17.8, 20.3, 22.9, 25.4, 30.5, 33.0, 35.6 cm) dia. mineral tanks

All are sized to flow 4.5 gpm/sq ft (183 L/min/m²) of bed area.

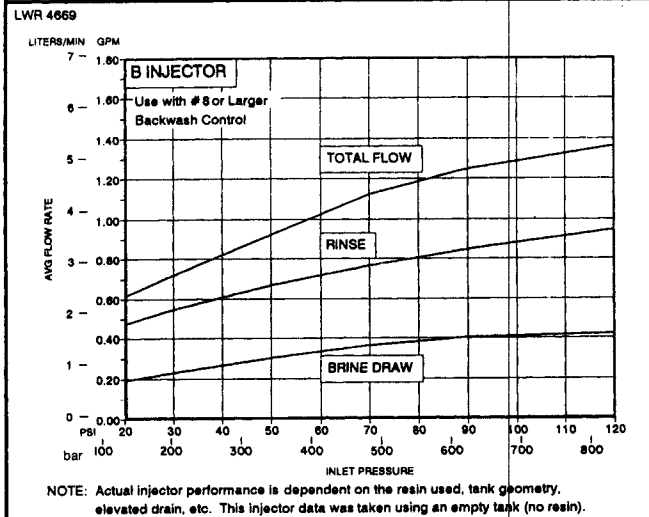
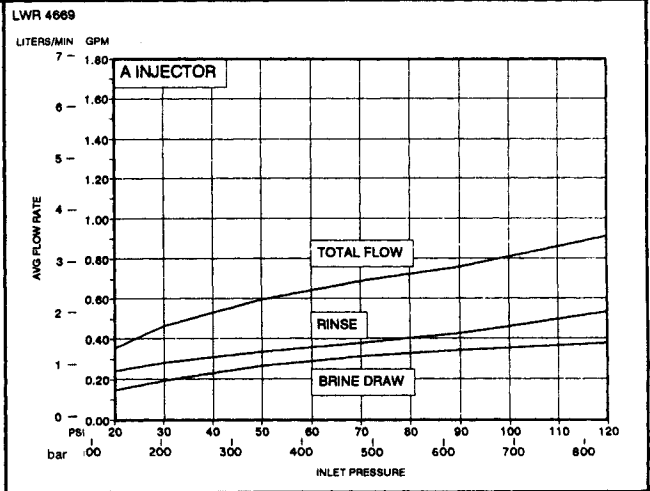
Backwash Number	7	8	9	10	12	13	14
Flow (GPM*)	1.2	1.6	2.0	2.5	3.5	4.1	4.8
Flow (LPM*)	4.5	6.0	7.6	9.5	13.2	15.5	18.2

*Approximate flow rates at 60 psi (4.14 bar)

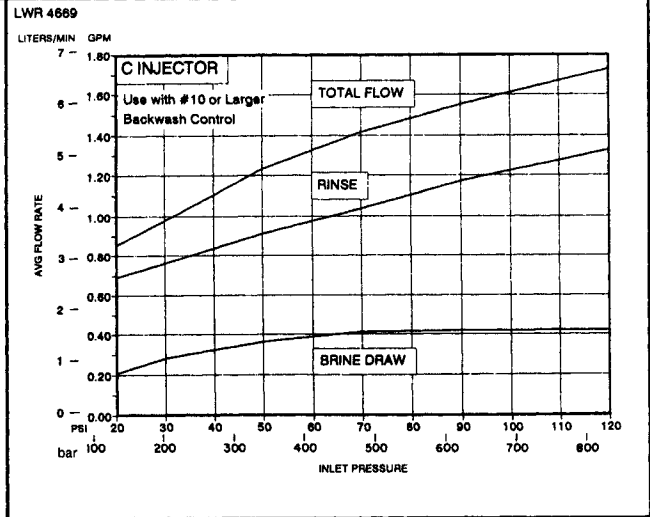
Pressure Graphs



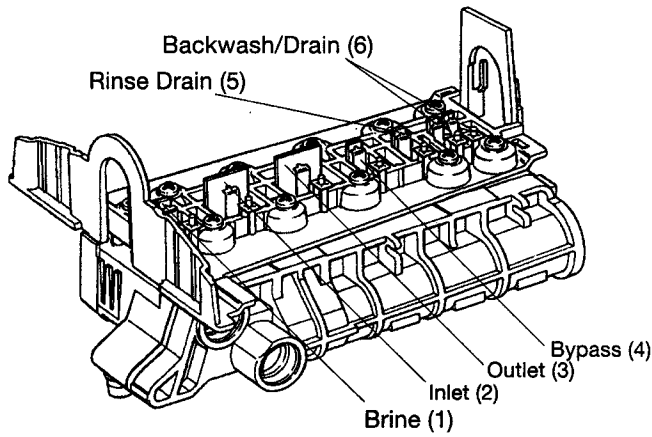
Tested with 3/4" Brass Manifold



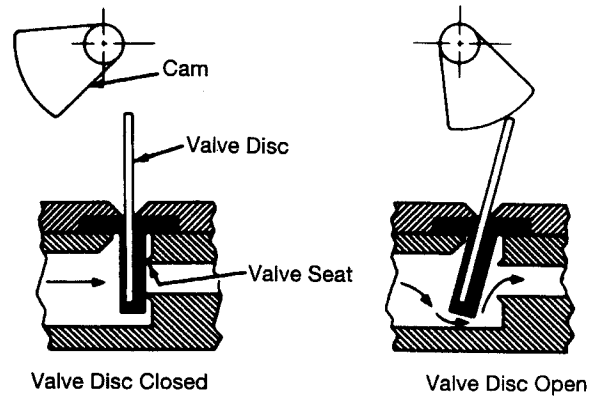
NOTE: Actual injector performance is dependent on the resin used, tank geometry, elevated drain, etc. This injector data was taken using an empty tank (no resin).



Control Valving Identification



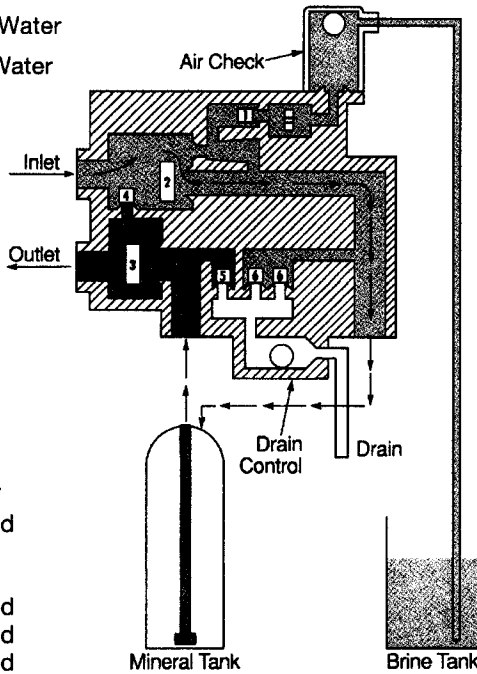
Valve Disc Operation



Flow Diagrams

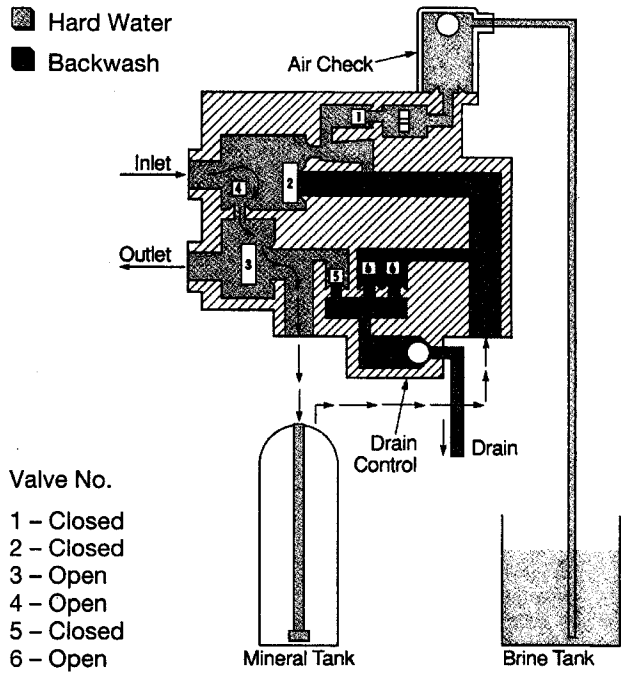
1 Service Position

- Hard Water
- Soft Water



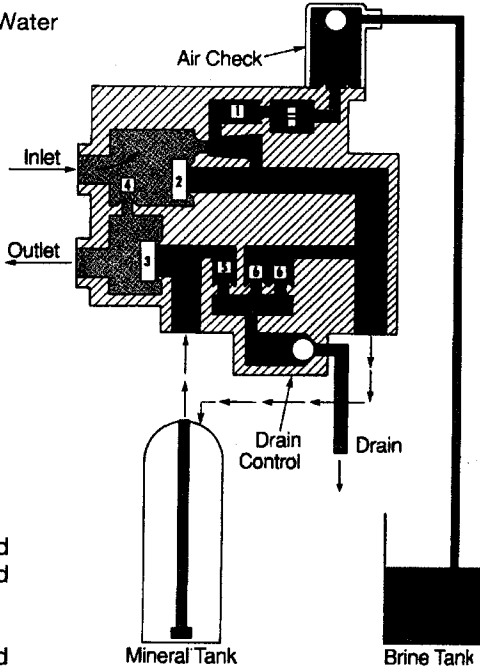
2 Backwash Position

- Hard Water
- Backwash



3 Brining Position

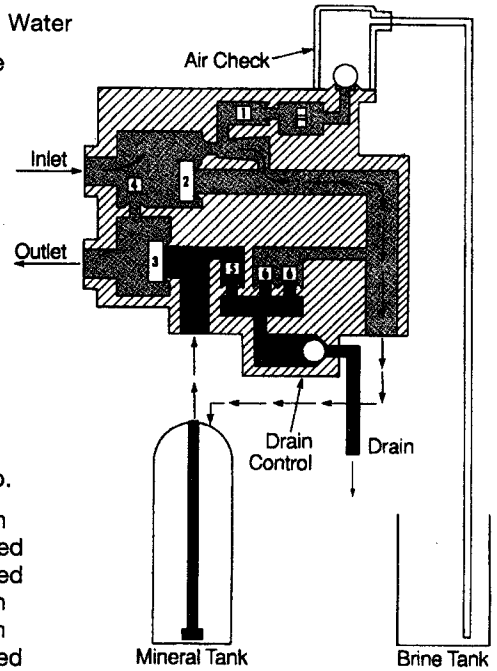
- ▨ Hard Water
- Brine



- Valve No.
- 1 - Open
 - 2 - Closed
 - 3 - Closed
 - 4 - Open
 - 5 - Open
 - 6 - Closed

4 Slow Rinse Position

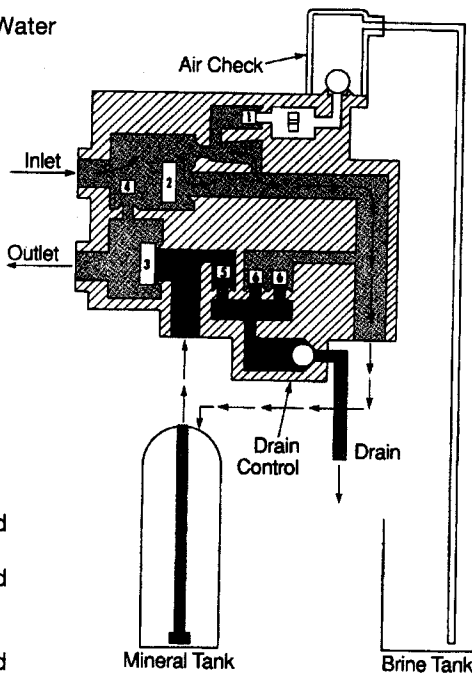
- ▨ Hard Water
- Brine



- Valve No.
- 1 - Open
 - 2 - Closed
 - 3 - Closed
 - 4 - Open
 - 5 - Open
 - 6 - Closed

5 Fast Rinse Position

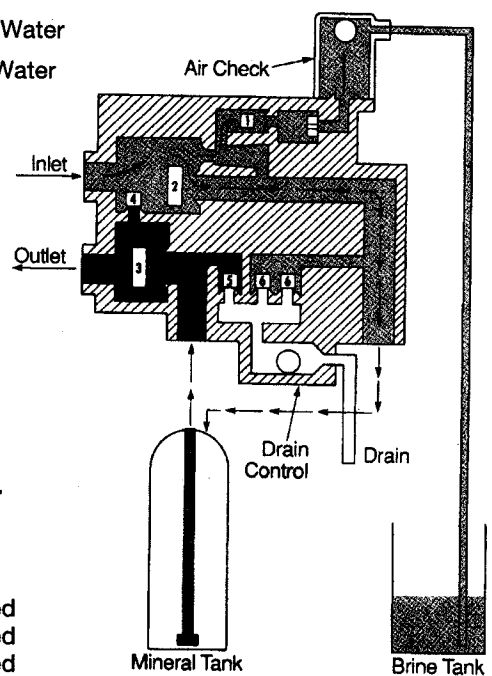
- ▨ Hard Water
- Rinse



- Valve No.
- 1 - Closed
 - 2 - Open
 - 3 - Closed
 - 4 - Open
 - 5 - Open
 - 6 - Closed

6 Brine Refill Position

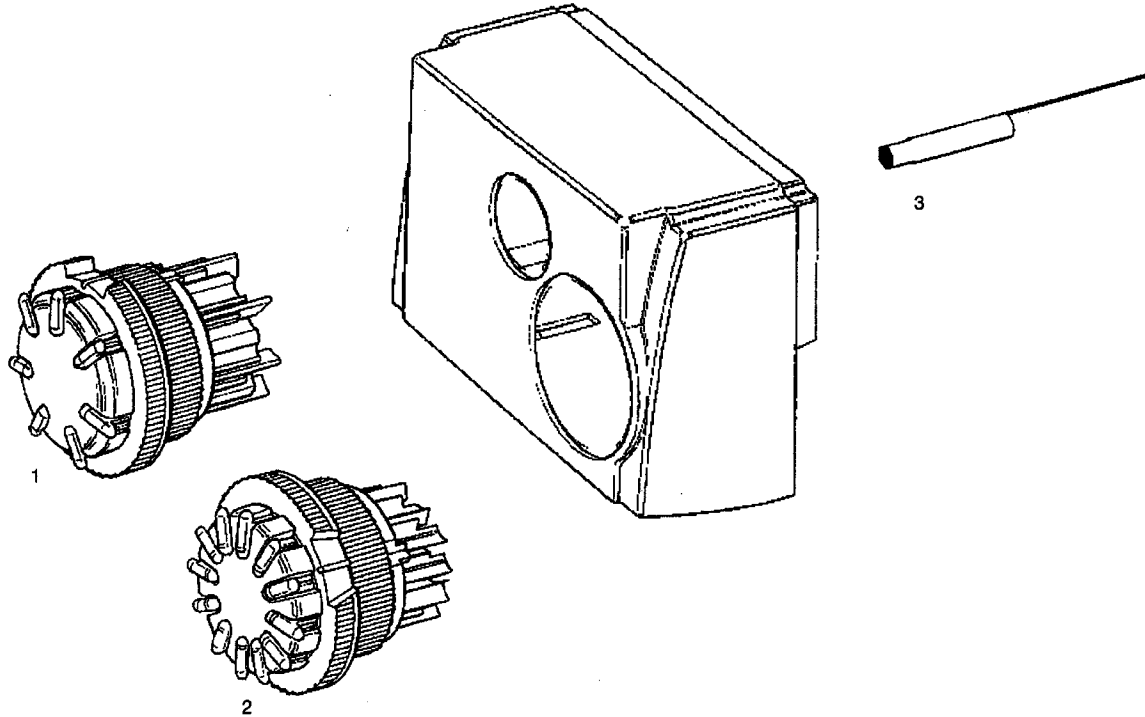
- ▨ Hard Water
- Soft Water



- Valve No.
- 1 - Open
 - 2 - Open
 - 3 - Open
 - 4 - Closed
 - 5 - Closed
 - 6 - Closed

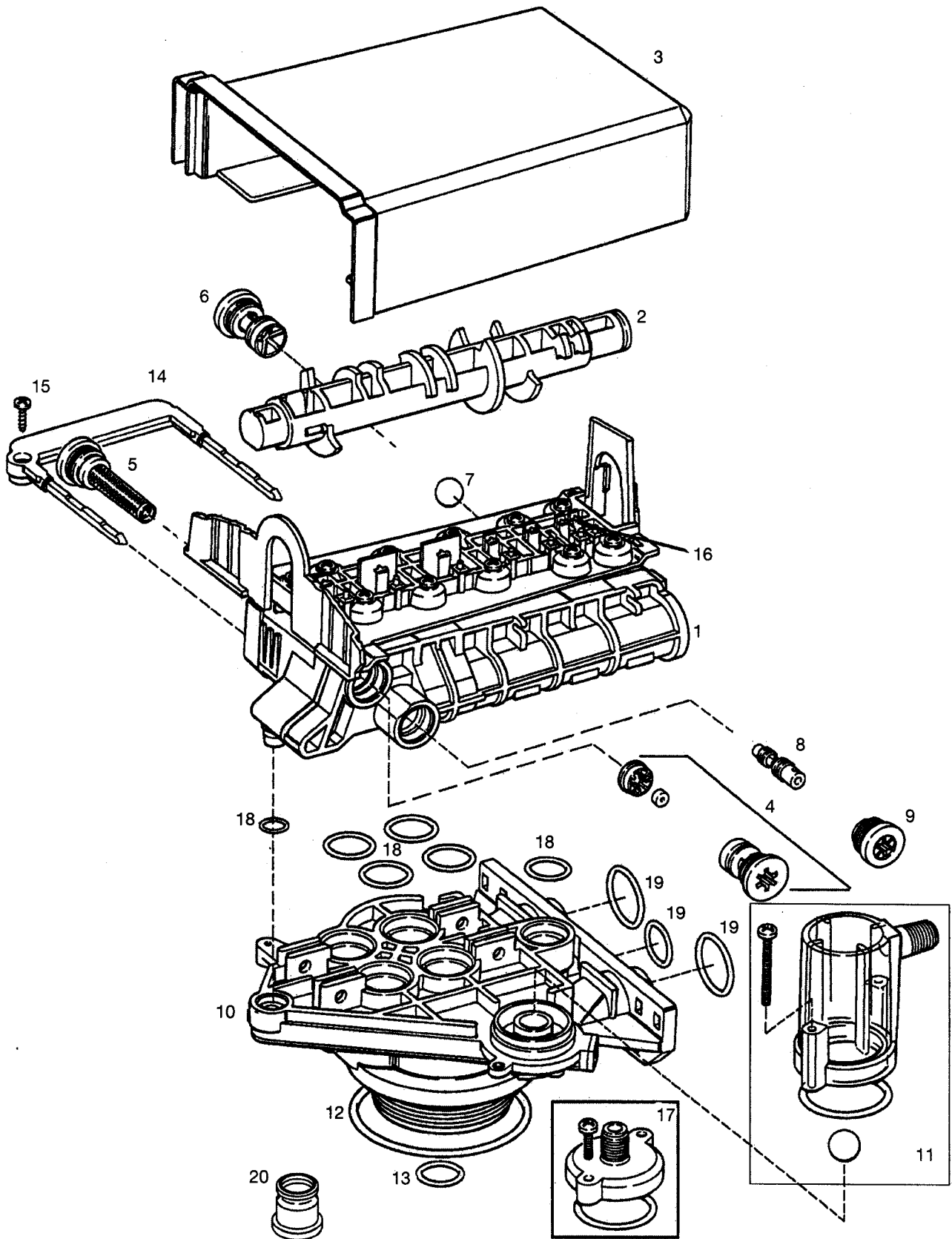
Replacement Parts

940 Timer



Code	Part No.	Description	Qty.	Code	Part No.	Description	Qty.
1	1001984	7-Day Calendar Cap Assembly	1	3	1000939	Retainer, Calendar Cap	
2	1001983	12-Day Calendar Cap Assembly	1				

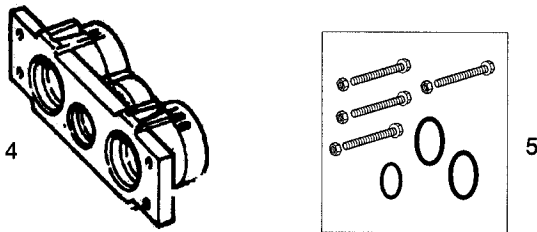
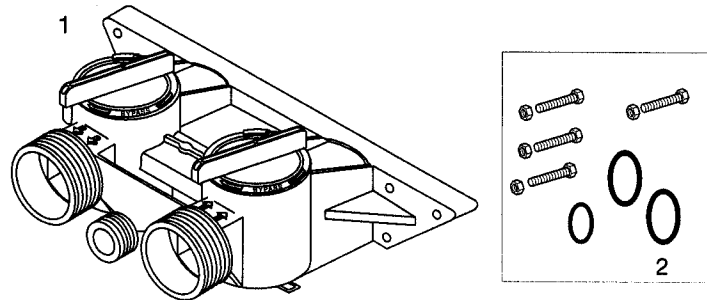
Valve Body and Tank Adapter Module



Code	Part No.	Description	Qty.	Code	Part No.	Description	Qty.
1	1000238	Valve Assembly w/o Flow Controls	1	10	1033784	Tank Adapter Assembly	1
2	1000824	Camshaft, standard, One-Piece	1	11	1032416	Air Check Assembly	1
3	1000827	Valve Cover, Black	1	12	1010429	O-Ring, 3-1/8 x 3-1/2 x 3/16 BN	1
4		Brine Refill Flow Control Assembly:	1	13	1010428	O-Ring, 3/4 x 1 x 1/8 EP	1
	1000221	.14 GPM		14		Locking Bar:	1
	1000222	.33 GPM			1031402	English Language	
	1000223	.40 GPM		15	1006093	Screw, No. 8 x 9/16 in	1
5	1000226	Screen/Cap Assembly with O-ring	1	16	1001580	Spring, Valve Discs	9
6		Backwash Control Assembly with O-rings:	1			Kits:	
	1000209	No. 7 for 7 In Diameter Tank		17	1033066	New to Old Air Check Adapter	
	1000210	No. 8 for 8 In Diameter Tank		*	1000250	Valve Discs Replacement	
	1000211	No. 9 for 9 In Diameter Tank		18	1001404	O-Ring Group: Tank Adapter	
	1000212	No. 10 for 10 In Diameter Tank		19	1040459	O-Ring Group: Piping Boss	
	1000213	No. 12 for 12 In Diameter Tank		*	1000252	Severe Service Valve Discs	
	1000214	No. 13 for 13 In Diameter Tank		20	1041010	Optional Riser Insert 13/16	
	1000215	No. 14 for 14 In Diameter Tank					
7	1030502	Ball, Flow Control	1				
8		Injector Assembly with O-rings:	1				
	1032970	"A" Injector - White					
	1032971	"B" Injector - Blue					
	1032972	"C" Injector - Red					
9	1032972	Injector Cap with O-Ring:	1				
	1000217	"A" Cap					
	1000218	"B" Cap					
	1000219	"C" Cap					

*Not Shown

Bypass Valve and Piping Boss



Code	Part No.	Description	Qty.	Code	Part No.	Description	Qty.
Bypass Valve				Piping Boss			
1	1040769	Bypass Body Assembly	1	4	Kit	Piping Boss (includes Hardware):	1
2	1040524	Installation Kit		1040277		3/4 in NPT, Brass, 3/8 in NPT Drain	
3	1001606	3/4 Inch Copper Tube Adapter Kit	1	1040278		1 in NPT, Brass, 1/2 in NPT Drain	
	1001670	1 Inch Copper Tube Adapter Kit	1	1040281		3/4 in BSPT, Brass, 3/8 in BSPT Drain	
	1001608	22mm Copper Tube Adapter Kit	1	1040282		1 in BSPT, Brass, 1/2 in BSPT Drain	
	1001609	28mm Copper Tube Adapter Kit	1	1040279		3/4 in NPT, Noryl, 1/2 in NPT Drain	
	1001613	3/4 Inch CPVC Tube Adapter Kit	1	1040280		1 in NPT, Noryl, 1/2 in NPT Drain	4
	1001614	1 Inch CPVC Tube Adapter Kit	1	1040283		3/4 in BSPT, Noryl, 1/2 in BSPT Drain	
	1001615	25mm CPVC Tube Adapter Kit	1	1040284		1 in BSPT, Noryl, 1/2 in BSPT Drain	
	1001769	3/4 Inch NPT Plastic Pipe Adapter Kit	1	5	1040339	Piping Boss Installation Kit	
	1001603	1 Inch NPT Plastic Pipe Adapter Kit	1				
	1001604	3/4 Inch BSPT Plastic Pipe Adapter Kit	1				
	1001605	1 Inch BSPT Plastic Pipe Adapter Kit	1				
	1001611	3/4 Inch BSPT Brass Pipe Adapter Kit	1				
	1001610	1 Inch NPT Brass Pipe Adapter Kit	1				
	1001612	1 Inch BSPT Brass Pipe Adapter Kit	1				

Troubleshooting

The technology upon which the Series 255/940 control is based, is well established and proven in service over many years. However, should a problem or question arise regarding the operation of the system, the control can be very easily serviced. The control module can be quickly replaced or adjustments can be made at the installation. For parts mentioned, refer to exploded views in the **Replacement Parts** section of this manual.

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 Rinse Drain Valve (the fifth valve back from the control) with a screwdriver, Figure 11. Restore system water pressure when the service work is completed.

Problem	Cause	Solution
1. Control will not regenerate automatically.	<ul style="list-style-type: none"> a. Electric cord unplugged. b. Defective Timer motor. c. Day pins not down on calendar cap. d. Binding in gear train of timer. 	<ul style="list-style-type: none"> a. Connect power. b. Replace motor. c. Depress pins for days regeneration required. d. Replace timer.
2. Control regenerates at wrong time of day.	<ul style="list-style-type: none"> a. Timer set incorrectly. 	<ul style="list-style-type: none"> a. Correct setting according to instructions.
3. Control will not draw brine.	<ul style="list-style-type: none"> a. Low water pressure. b. Restricted drain line. c. Injector plugged. ! d. Defective Injector. ! e. Valve disc 2 and/or 3 not closed. f. Air check prematurely closed. 	<ul style="list-style-type: none"> a. Water pressure must be 20 psi minimum. 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). Replace if needed. f. Put control momentarily into brine refill. Replace or repair air check if needed. Refer to Brine Line Connection.
4. Brine tank overflow.	<ul style="list-style-type: none"> 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. Improper drain control for injector. 	<ul style="list-style-type: none"> a. Flush out foreign matter holding disc open by manually operating valve stem. b. Remove and clean brine refill flow control. 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 Brine Line connection. e. Too small of a drain control with a "B" or "C" injector will reduce draw rates. Reference Pressure Graphs.
5. System using more or less salt than salt control is set for.	<ul style="list-style-type: none"> a. Inaccurate setting. b. Foreign matter in controller causing incorrect flow rates. c. Defective controller. ! 	<ul style="list-style-type: none"> a. Make correct setting. b. Remove salt controller and flush out foreign matter. Manually position control to brine draw to clean controller. After so doing, position control to "brine/slow rinse" to remove brine from tank. c. Replace defective part.

6. Intermittent or irregular brine draw.	<ul style="list-style-type: none"> a. Low water pressure. b. Defective injector. ! 	<ul style="list-style-type: none"> a. Water pressure must be 20 psi minimum. b. Replace both injector and injector cap.
7. No conditioned water after regeneration.	<ul style="list-style-type: none"> a. Unit did not regenerate. b. No salt in brine tank. c. Plugged injector. ! d. Air check prematurely closed. 	<ul style="list-style-type: none"> a. Check for power. b. Add salt to brine tank. c. Remove injector and injector screen. Flush with water. d. Put control momentarily into brine refill to free air check. Replace or repair air check if needed. Refer to Brine Line Connection.
8. Control backwashes at excessively low or high rate.	<ul style="list-style-type: none"> a. Incorrect backwash controller. ! b. Foreign matter effecting controller operation. ! 	<ul style="list-style-type: none"> a. Replace with correct size controller. b. Remove and clean controller seat and ball.
9. Flowing or dripping water at drain or brine line after regeneration.	<ul style="list-style-type: none"> a. Drain valve (5 or 6) or brine valve (1) held open by foreign matter or particle. b. Weak valve stem return spring on top plate. 	<ul style="list-style-type: none"> a. Manually operate valve stem to flush away obstruction. b. Replace spring.
10. Hard water leakage during service.	<ul style="list-style-type: none"> a. Improper regeneration. b. Leaking of external bypass valve. ! c. O-ring around riser tube damaged. ! d. Leaking past bypass valve disc. ! 	<ul style="list-style-type: none"> a. Repeat regeneration making certain correct salt dosage is used. b. Replace o-ring. c. Replace o-ring. d. Replace valve disc.

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 the conditioners be disinfected after installation and before the conditioners are 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, Linco, Bo Peep, White Sail, and Eagle Brand Bleach. 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 ounces per cubic foot.

Complete the following steps to disinfect the conditioner: Add the sodium hypochlorite solution 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. Proceed with normal regeneration. Refer to the **Manual Regeneration** section in this manual.

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 grains (approximately 0.1 ounce) per cubic foot.

Complete the following steps to disinfect the conditioner: Add the calcium hypochlorite 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. Proceed with normal regeneration. Refer to the **Manual Regeneration** section in this manual.