

Autotrol® ReadySoft System

**ReadySoft Alternating and ReadySoft HighFlow
Water Conditioning Control System
Installation, Operation and Maintenance Manual**

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Introduction

The ReadySoft System provides sophisticated, demand-based water conditioning by incorporating a microprocessor based control and a water meter to electronically monitor the amount of water used daily. This fully programmable control allows you to fine-tune the conditioners' operation to meet your customer's application. The Twin Alternating System ensures an uninterrupted supply of softened water, while the HighFlow system provides for higher flow rates through parallel operation with multiple options for delayed regeneration. The Series 255 valve combines design simplicity with reinforced Noryl* construction to provide an uncommonly reliable appliance. The inherent reliability of the system means a long life of efficient, trouble-free water conditioning. If maintenance becomes necessary, the Series 255/ReadySoft Water Conditioning System offers a unique separation capability illustrated in this manual, allowing isolation of one valve while providing softened water with the other.

*NORYL is a Trademark of General Electric Company.

Special Features

- **Redundant Twin System.** The Alternating system provides continuous soft water while the HighFlow system produces higher flow rate capabilities. Both systems make it possible to operate each tank independent of the other.
- **Twin Alternating System and the HighFlow System can be setup to provide round-the clock softened water.**
- **Memory Retention.** During a power outage, critical operating information in the control's memory is stored in NOVRAM*. This information includes the time of day, water usage amounts, daily average water usage, all programming data and the number of days since the last regeneration. 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. If an outage occurs, the time of day should be reset, but no other reprogramming is necessary.
- **HighFlow System displays the capacity remaining in each unit and the flow rate through the system.**

- **Twin Alternating System** clearly displays unit in service and alternates between **Capacity Remaining** and **Flow Rate** while on line.
- **Fully programmable regeneration cycle times.** The control allows the Backwash, Rinse, and Purge cycle times to be set by the installer to fine-tune the conditioners' operation.
- **Optional Remote Regeneration.**
- **WQA S-101 Features.** The control can be programmed to lock the values for Salt Amount and Capacity so the customer cannot alter them after installation (see Parameter P18, Table 2).
- **Soft Water Backwash.**
- **Selectable 12 or 24 hour clock.** (see Parameter P13, Table 2).
- **Delayed Regeneration Option.** The HighFlow System offers multiple options for initiation of demand regeneration including delayed regeneration.
- **Selectable U.S. or Metric units of measure.** Use grains per gallon of hardness, pounds of salt, and kilograins of capacity for U.S. units. Use milligrams per liter of hardness, kilograms of salt and kilograms of capacity for metric units (see Parameter P12, Table 2).
- **Design Reliability.** Solid-state electronics assure trouble-free performance. The metering system has only one moving part, the rotating turbine that measures water usage and generates electrical pulses that are counted by the microprocessor to determine the need to regenerate.
- **Simple Non-Solenoid Operation.** System contains no solenoid valves. Flapper technology regulates the on- and off-line status of the tanks.

Operation

- For HighFlow Systems the unit in regeneration returns to service upon completion of regeneration.
- For Twin Alternating Systems the unit in Standby automatically fast rinses to drain before coming on-line.
- Direct acting flapper system functions independent of water pressure.
- Five-cycle regeneration operation provides for downflow conditioned water, upflow backwash, downflow brining and slow rinse, downflow fast rinse after standby, (Twin Alternating Systems only) and refill of the brine tank. In the Twin Alternating Systems, after regeneration the tank remains in standby until it is required for use.
- Valve discs are held closed by water pressure and are leak tight. Valve seats are in a vertical position, which is the position least vulnerable to fouling.
- Conditioned water is used for backwash. This eliminates hardness carryover and contamination of the resin bed with precipitated materials.
- The ReadySoft System is easy to service and familiar to you and your customers.
- Manual regeneration can be accomplished on either tank by pressing the **REGEN** button on the front of the control. Sequential manual regenerations without waiting for the first unit to finish are also possible.
- Each tank and valve pair can operate alone to provide soft water if the other is taken off-line for service or maintenance. This is achieved through the use of the 256 Bypass (Figure 3).

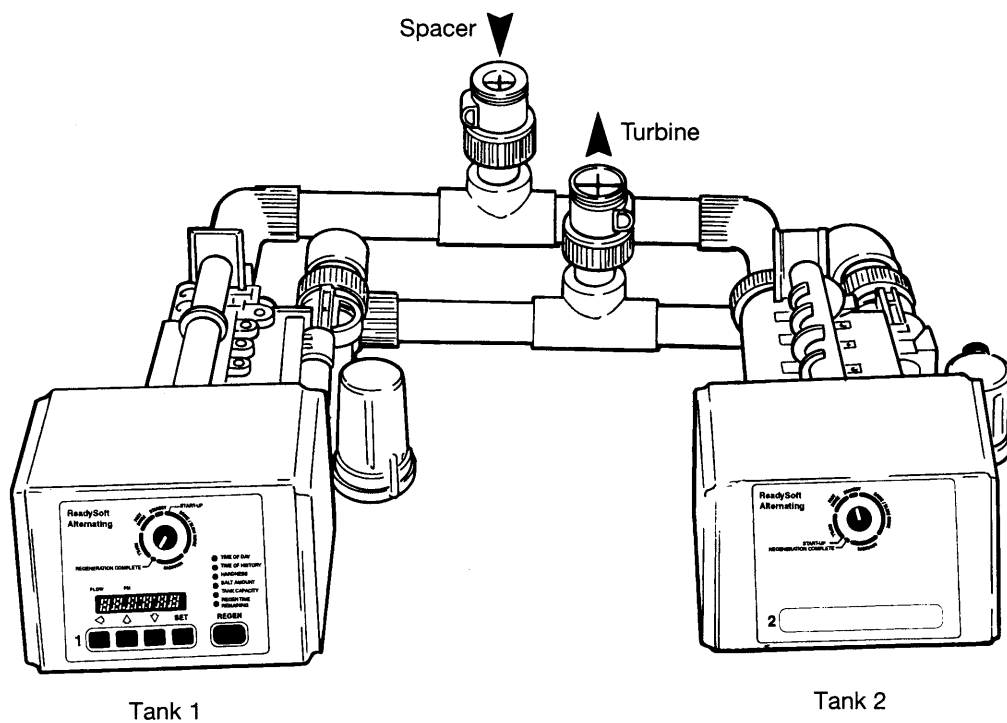


Figure 1 ReadySoft Twin Alternating System

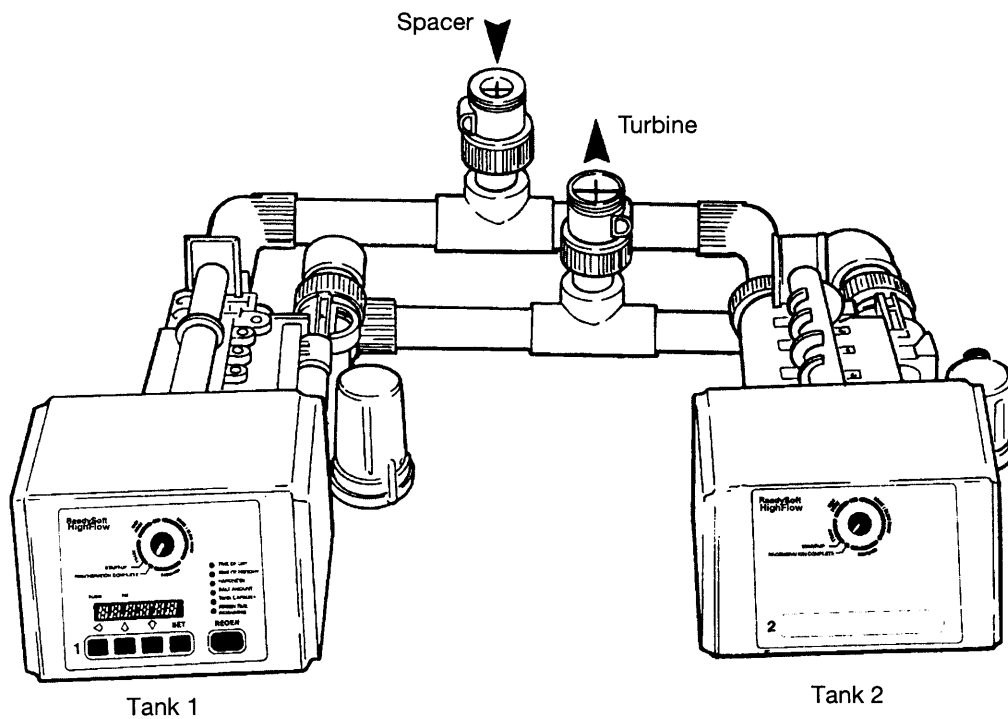


Figure 2 ReadySoft HighFlow System

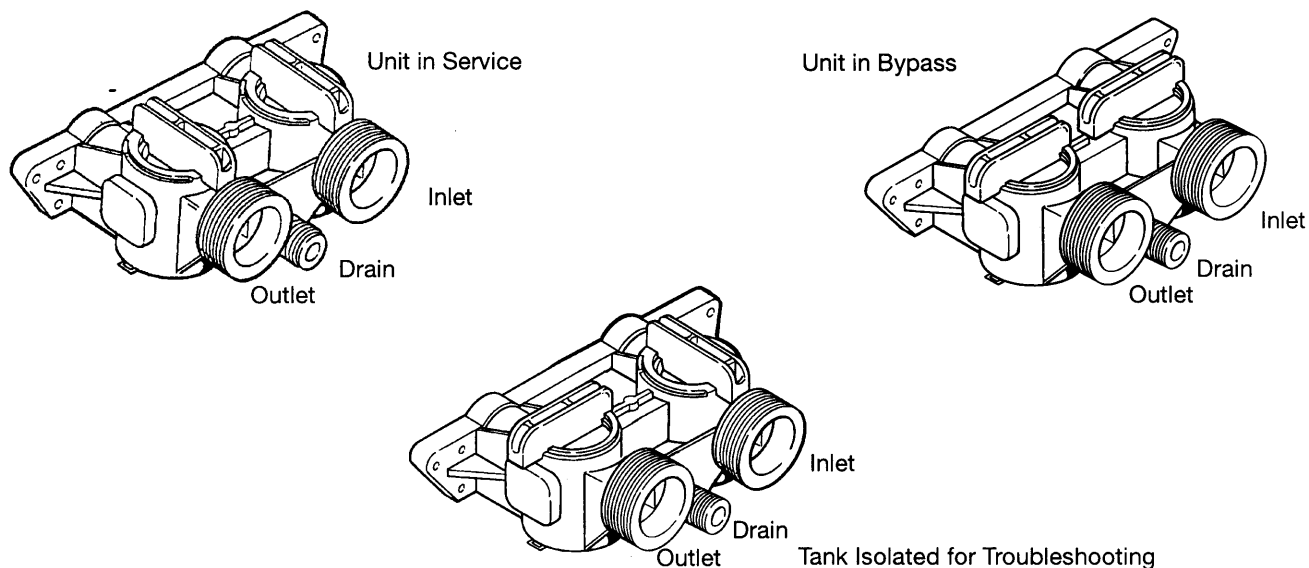


Figure 3

Installation

All plumbing must conform to local codes. Inspect the unit carefully for shipping damage. **Note:** The phrases “water conditioning unit” and “water conditioning system” refer to the complete ReadySoft System including two tanks and two controls. The two tanks should be plumbed to an interconnecting manifold. **It is highly recommended that separate brine lines be used for each tank.** It is critical for the resin, resin volume, inlet piping, etc. to be identical for the HighFlow system to reach optimum performance.

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 system with less than 10 feet (3 m) of piping between the outlet of the conditioners and the inlet of the water heater. Water heaters can transfer heat down the cold water pipe into the control valve. Hot water can severely damage the conditioners.

A ten-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 conditioners is to install an expandable accumulator tank before the hot water heater. **Always conform to local codes.**

- Do not locate the unit in an area where the ambient temperature is ever below 34°F (1°C) or over 120°F (49°C).
- Maximum allowable water temperature is 100°F (38°C).
- Do not install the unit near acid or acid fumes.
- Do not expose the unit to petroleum products.

Water Line Connection

A bypass valve system must be installed to accommodate occasions when the water conditioning system must be bypassed for supplying hard water or servicing. The most common bypass systems are the Autotrol 256 Bypass valve, Figure 4, and plumbed in gate or ball valves, Figure 5. Though both are similar in function, the Autotrol Bypass offers simplicity and ease of operation.

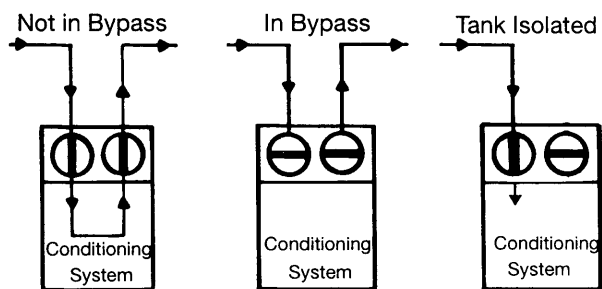


Figure 4

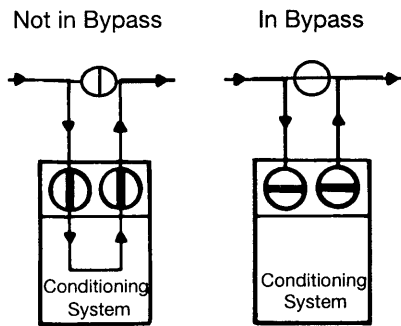


Figure 5

Drain Line Connection

The system should be above, and not more than 20 feet (6.1 m) from a drain. Connect an appropriate fitting and 1/2-inch (1.3-cm) plastic tubing to the drain line connection on the rear of the control valve.

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). Also, purchase appropriate fitting to connect the 3/4-inch tubing to the 1/2-inch NPT drain connection.

If unit is located where the drain line must be elevated, you may elevate the line up to 5 feet (1.5 m) providing the run does **not** exceed 15 feet (4.6 m) and water pressure at the conditioners is not less than 40 psi (2.8 bar).

Where drain line is elevated but empties into a drain below the level of the control valve, form a 7-inch (18-cm) loop at the far 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.

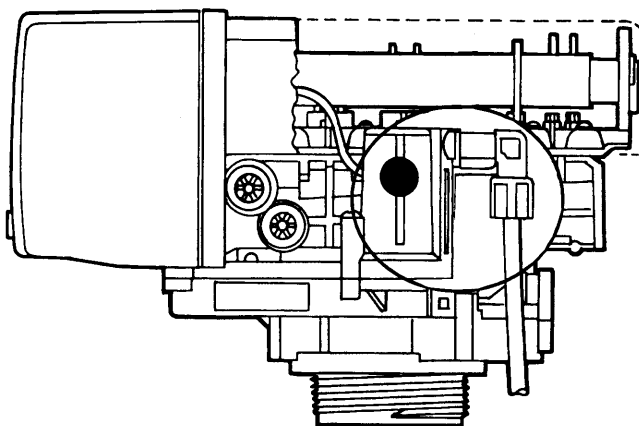


Figure 6

Where a drain empties into an overhead sewer line, a sink-type trap must be used.

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

Brine Line Connection

It is highly recommended that separate brine lines be used for each tank.

Install an appropriate fitting onto the 1/4-inch male NPT connection on the air check (Figure 6), and install a length of 3/8-inch polyethylene tubing between the air check fitting and the brine pick-up tube at the brine tank. If you are using a brine valve remove the ball in the air check to avoid possible premature checking.

Note: Make sure that all fittings and connections are vacuum 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 brine 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 7.

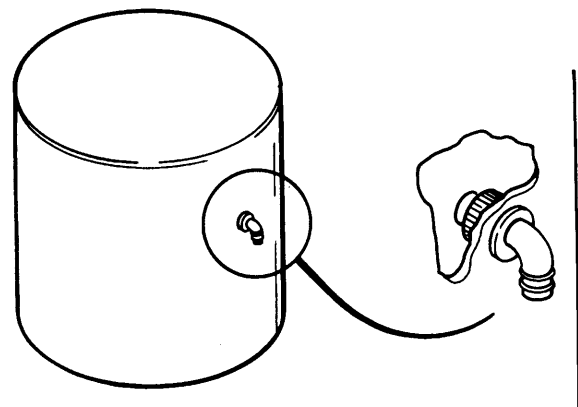


Figure 7

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 8.

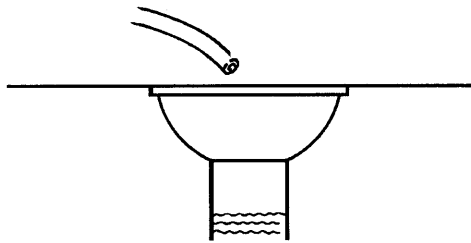


Figure 8

Brine Tank

Normally only one brine tank is needed. The use of block salt or rock salt is not recommended. If a brine shelf is used, two brine tanks are required. This is due to the increased time needed to produce a concentrated brine solution when using a salt shelf. If rapid multiple exhaustions and regenerations are anticipated, do not use a salt shelf even if two brine tanks are used.

Turbine Connection

Install the turbine assembly (Figure 9) on the outlet plumbing within 2.5 feet (76.3 cm) of the water-conditioning valve so that the turbine probe may reach the turbine. Observe the flow direction arrow on the turbine housing, it should be pointing in the same direction as the water flow in the piping.

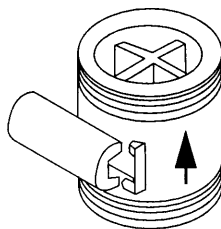


Figure 9

The turbine may be mounted either in the horizontal or the vertical position. However, be certain that there is a full pipe condition at all times. The preferred orientation is either the upflow or horizontal direction (Figure 9). Do not mount the turbine in a vertical orientation with a downflow condition.

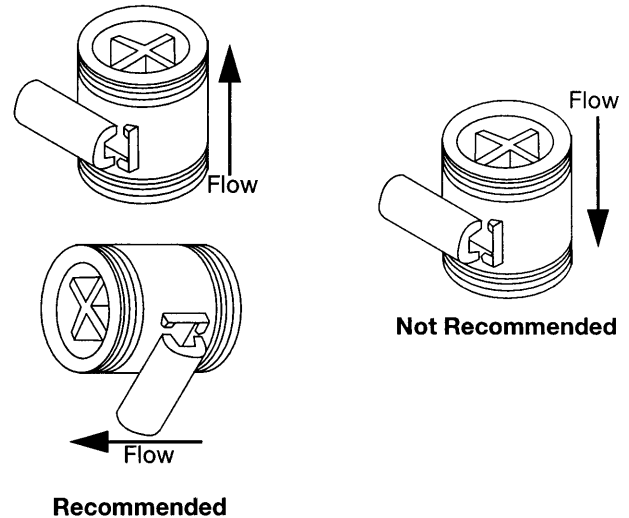


Figure 10

Do not overtighten the turbine housing adapter nuts or the threads may be damaged. The probe will “click” into place when inserted the proper depth into the housing receptacle.

Connection of Optional Interconnecting Manifold

The ReadySoft System is available with or without an interconnecting manifold. If you are using the Autotrol interconnecting manifold, follow the instructions that are supplied with the kit. If you are using the system without the Autotrol interconnecting manifold, an example of an appropriate manifold connection is shown in Figure 11. Brass or Noryl piping bosses can be purchased separately.

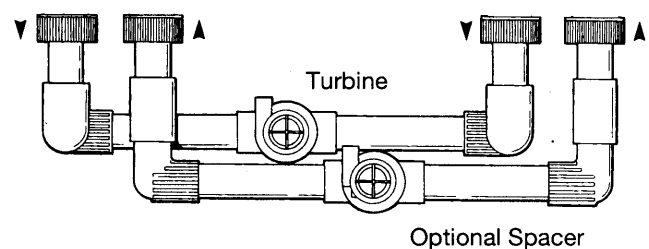


Figure 11

Placing Conditioners into Operation

Initial Start-Up

After the water conditioning system is installed, the conditioners should be disinfected before they are used to treat potable water. Refer to the **Disinfection of Water Conditioners** section in this manual.

The following steps should be followed to place the system into operation. **The ReadySoft System is shipped with a clip on #4 bypass flapper of each valve. After the start up is completed, remove the clip and save as a maintenance part.**

1. Remove the rear valve cover by pushing back on the tab located on the lower rear edge of the cover and lift the cover off the control, Figure 14 Page 19.
2. Rotate the #1 tank camshaft COUNTERCLOCKWISE (as viewed from the front of the control) until the indicator points directly to the **Backwash** position. Repeat with #2 tank camshaft.
3. With the bypass valves in the “service” position, very slowly open the inlet water supply to approximately 1/4 turn open position. This will prevent the media from lifting into the control valve.
4. 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 clear.
5. Add water to the brine tank(s) (initial fill). With a bucket or hose, add approximately 1 gallon (3 liters) of water to the brine tank, enough to cover the brine line pick up screen. **Note:** Salt shelves should not be used in systems with only 1 brine tank.
6. Carefully rotate the tank 1 camshaft, followed by the tank 2 camshaft, COUNTERCLOCKWISE until the indicator on the regeneration cycle indicator points directly to the center of the **Refill** position. Hold there until the air checks (Figure 6) fill with water and water flows through the brine line into the brine tank. Do not refill for more than two minutes.
7. Rotate the tank 1 camshaft to **Regeneration Complete** and the tank 2 camshaft to the **Brine/Slow Rinse** position and check that water is being drawn from the brine tank. The water level in the brine tank will recede slowly. Observe the water level for at least three minutes. If the water level does not recede, goes up, or air enters the transparent air check chamber and the ball falls and seats, refer to the **Troubleshooting** section in this manual.

8. Repeat step 7 checking brine draw of tank 1 by rotating the tank 1 camshaft to **Brine/Slow Rinse** and the tank 2 camshaft to **Regeneration Complete**.
9. When both tanks have been checked for brine draw, rotate both tank camshafts to the **Start-up** position indicated on the front of the control. Apply power to controls and proceed to “Programming the ReadySoft Control”. Follow instructions indicated in “ReadySoft Control Start-up” tables to complete system set up.

Important: Remove the bypass flapper clip after initial set up is complete.

Programming the ReadySoft Control

This section covers all aspects of programming the control. Note: Settings cannot be changed when either tank is in regeneration. The ReadySoft Secondary Control (tank 2 control) always works in conjunction with the ReadySoft Main Control (tank 1 control) for twin unit applications. The operating values for the Secondary Control are the same as those for the Main Control. An adhesive installation label is provided with each ReadySoft control. It is recommended that this be filled out with programming parameters on start-up and placed on the inside of the cam cover. This will allow the control to be reprogrammed in the case of control replacement.

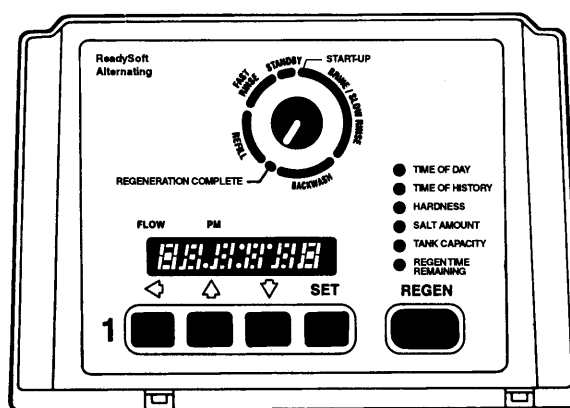


Figure 12

Note that some parameters have a single unit of measure option such as Rinse Time, which is only entered in minutes. Other parameters have dual units such as Salt Amount, which can be entered in pounds or kilograms. To select which units are active, look for a comment in the NOTES column of Tables 1 and 2. It will reference another parameter that selects which units

are active. For example, Parameter P12 (Table 2) selects U.S. units if it is set to “0” and metric units if it is set to “1”.

Connecting the Control

The Capacity, Hardness, and Brine Draw values are set to 0 at the factory and must be changed to appropriate values before the control will operate. “Err 4” will be displayed until valid input is entered for each of these items. Determine from Tables 1 and 2 what these values should be before applying power to the control. When the conditioners are operational, complete the following steps to connect the ReadySoft Control.

- Connect the control to the wall transformer cable. The power connection is located on the underside of the main control (tank 1) on the left side (refer to Figure 1). Insert the barrel style connector into the power plug.
- Plug the wall mount transformer into an electrical outlet that is not controlled by a wall switch.
- If the cord length of the transformer is too short, an optional 15-foot low voltage extension cord may be purchased (contact your original equipment dealer for details).

Level I Parameters (Table 1)

Level I Parameters have an LED indicator on the front panel. The green indicator illuminates next to the active control setting. Pressing the down arrow button displays the Level I Parameters in the following order:

- Time of Day
- Time of History/Time of Regeneration
- Hardness
- Salt Amount
- Capacity

If you continue to press the down arrow button, the parameters will start over with Time of Day. Pressing the up arrow button displays the parameters in reverse order. Refer to Table 1 for a description of these parameters and the available ranges for each parameter.

Press the **SET** button and the far right number on the display starts flashing. If you want to change this number, press the up arrow button to increase the number or the down arrow button to decrease the number. To skip the number without changing, press the left arrow button. When you reach the far left digit, pressing the left arrow button will return you to the far right digit.

ReadySoft Twin Alternating Control Start-up

Note: Do not power controls until Step 3.

Task	Tank 1 Control Position	Tank 2 Control Position
1. Manually rotate camshafts counterclockwise to startup positions indicated.	TANK 1 START UP POSITION (Slow Rinse)	TANK 2 START UP POSITION (Refill)
2. Connect the Tank 1 and Tank 2 Controls with factory-installed 4-pin connector.	TANK 1 START UP POSITION (Slow Rinse)	TANK 2 START UP POSITION (Refill)
3. Connect the 12 VAC power supply to the Tank 1 Control.	TANK 1 START UP POSITION (Slow Rinse)	TANK 2 START UP POSITION (Refill)
4. Program the Control as indicated in the programming section.	TANK 1 START UP POSITION (Slow Rinse)	TANK 2 START UP POSITION (Refill)
5. Exit the Programming Mode. The LED display shows “Err3” indicating the controls are not in their proper position.	Moving to STAND-BY	Moving to REGENERATION COMPLETE
6. Wait for the “Err3” message to clear indicating the controls have reached their proper position.	STAND-BY	REGENERATION COMPLETE
7. Observe the display alternating between the Capacity Remaining and flow on tank 2. Press any button to get the flow reading if the display is alternating between Capacity Remaining and Time of Day.	STAND-BY	REGENERATION COMPLETE
8. The system is now ready for operation.	STAND-BY	REGENERATION COMPLETE

ReadySoft HighFlow Control Start-up

Note: Do not power controls until Step 3.

Task	Tank 1 Control Position	Tank 2 Control Position
1. Manually rotate camshafts counterclockwise to startup positions indicated.	TANK 1 START UP POSITION (Refill)	TANK 2 START UP POSITION (Refill)
2. Connect the Tank 1 and Tank 2 Controls with factory-installed 4-pin connector.	TANK 1 START UP POSITION (Refill)	TANK 2 START UP POSITION (Refill)
3. Connect the 12 VAC power supply to the Tank 1 Control.	TANK 1 START UP POSITION (Refill)	TANK 2 START UP POSITION (Refill)
4. Program the Control as indicated in the programming section.	TANK 1 START UP POSITION (Refill)	TANK 2 START UP POSITION (Refill)
5. Exit the Programming Mode. The LED display shows "Err3" indicating the controls are not in their proper position.	Moving to REGENERATION COMPLETE	Moving to REGENERATION COMPLETE
6. Wait for the "Err3" message to clear indicating the controls have reached their proper position.	REGENERATION COMPLETE	REGENERATION COMPLETE
7. Observe display alternating between the Capacity Remaining Tank 1, Capacity Remaining Tank 2, and Flow. Press any button to get the flow reading if the display is alternating between Capacity Remaining and Time of Day.	REGENERATION COMPLETE	REGENERATION COMPLETE
8. The system is now ready for operation.	REGENERATION COMPLETE	REGENERATION COMPLETE

Note: If you press and hold either the up arrow button or the down arrow button for more than one second, the flashing number will **increase or decrease** at the rate of 10 counts per second.

When the number is correct, press the left arrow button. The first number stops flashing and the next number starts flashing. You can change only the flashing number. Continue changing numbers until you reach the desired setting. Press the **SET** button. The numbers stop flashing and the control accepts the new setting. After approximately 30 seconds, the Twin Alternating control starts alternating between Time of Day and Capacity. The HighFlow System will alternate between flow rate, capacity of tank 1 and capacity of tank 2. Tank 1 capacity is identified by a hash mark next to the "Tank 1" identifier or the far left of the LED display. Tank 2 capacity is indicated the same way using the "Tank 2" identifier, Page 33.

Note: If a beep sounds, the new setting was not accepted because it was outside the allowable range. The old value will be displayed.

Time of Day

Press the **SET** button. The display will show the Time of Day with the minutes digit blinking. If you want to change the number press the up arrow button to increase the number or the down arrow button to decrease the number. To skip the number without

changing, press the left arrow button. The first number stops flashing and the next number starts flashing. When you have reached the far left digit, pressing the left arrow returns you to the far right digit. Continue changing the numbers until you reach the desired setting. Press the **SET** button to enter the value.

Time of History (Alternating Unit)

The Time of History has a default setting of 2:00 a.m. This parameter does not need to be altered because it is used to establish the 24-hour data collection period. The Time of History does not affect regeneration as the ReadySoft System regenerates immediately when capacity is exhausted.

Time of Regeneration (HighFlow Unit)

The default value for Time of Regeneration is 2:00 a.m. If this is not acceptable, press the SET button and change the numbers using the up and down arrow buttons. Once the desired time is displayed, press the SET button to enter the time. If 2:00 a.m. is acceptable, press the down arrow to move to the next parameter. The Time of History will be altered to reflect the 24-hour period beginning and ending with the Time of Regeneration.

Hardness

The Hardness value is the water hardness expressed in grains per gallon (milligrams per liter). Determine the

appropriate value and press the **SET** button to enter the new value. Any value between 3 and 250 grains per gallon (30 and 2500 milligrams per liter) is allowed. Press the **SET** button to enter the new value. The default setting is "0". **This value must be changed.**

Salt Amount

Salt Amount is the next value displayed. The default value for Salt Amount is 6 pounds (2.5 kilograms). Refer to Chart 1 for appropriate value.

Note: This is the total amount of salt per regeneration, not pounds per cubic foot.

Capacity

Capacity is set in kilograins (kilograms). Refer to Chart 1 for the capacity setting that corresponds to the resin bed volume and salt amount. The default setting is "0". **This value must be changed.**

If Parameters P6 and P7 have not been previously programmed the control will step to P6 at this time. The default setting for P7 is "0". **This value must be changed.** See Level II parameters for additional information.

If you wish to fine-tune the operation of this control, refer to Table 2 for details concerning allowable values, defaults and parameter descriptions. The programming procedure is the same for all of these parameters.

Level II Parameters (Table 2)

The Level II Parameters are P6 through P20 in Table 2. To access Level II Parameters, simultaneously press and hold the down arrow button and the up arrow button for 3 seconds. If the control was alternating between Time of Day and Capacity when the buttons are pushed, the display shows P1. If a different Level I Parameter was displayed, the display shows the "P" number for that parameter. Refer to Table 2 to find the "P" number associated with each parameter.

Use the up arrow button or the down arrow button to move from one parameter to the next. The display cycles through the "P" numbers shown in Tables 1 and 2. When you reach P20, the next P number will be P1.

When the parameter number you want to change is on the display, press the left arrow button to display the data assigned to that parameter. Press the SET button and the far right number on the display starts flashing. If you want to change this number, press the up arrow button or the down arrow button. To skip the number without changing, press the left arrow button. When the setting is correct, press the SET button. The number stops flashing, the control accepts the new setting, and automatically goes to the next "P" number. If a beep sounds the new setting was not in the allowed range. Refer to Table 2 for allowable values for each parameter.

Table 1
Level 1 Program Values - ReadySoft Twin Unit Alternating Controls

Parameter		Range of Values	Minimum Increments	Default Value	Units of Measure	Notes
Name	Description					
P1	Time of Day AM or PM	1:00 to 12:59 00:00 to 23:59	1	None	Hour:Minute	Range depends on P13 value. Enter the current time.
P2	Time of History/Time of Regeneration	1:00 to 12:59 AM or PM 00:00 to 23:59	1	2:00 AM	Hour:Minute	Range depends on P13 value. This parameter does not need to be changed.
P3	Hardness of Water	3 to 250 30 to 2500	1 10	0 0	Grains/gallon mg/L	Units of measure depend on P12 value. Test water hardness and enter that value.
P4	Salt Amount	0.5 to 125.0 0.1 to 25.0	0.5 0.1	6 2.5	Pounds Kilograms	Units of measure depend on P12 value. Refer to Chart 1.
P5	Capacity of Unit	0.1 to 260.0 0.01 to 26.0	0.1 0.01	0 0	Kilograins Kilograms	Capacity of one tank. Units of measure depend on P12 value. Refer to Chart 1.

**Chart 1: Suggested Salt/Capacity Settings
(Pounds of Salt for Various Size Conditioners)**

Capacity of Unit (P5)	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
12	4.5	-	-	-	-	-	-	-	-
16	9.0	5.0	-	-	-	-	-	-	-
20	-	8.5	6.0	-	-	-	-	-	-
24	-	14.0	8.5	7.0	-	-	-	-	-
30	-	-	15.0	11.0	9.0	-	-	-	-
32	-	-	18.5	12.5	10.0	9.0	-	-	-
35	-	-	-	16.0	12.0	10.0	9.0	-	-
40	-	-	-	23.0	17.0	14.0	12.0	-	-
48	-	-	-	-	28.0	21.0	17.0	14.0	18.0
60	-	-	-	-	-	-	30.0	23.0	26.0
72	-	-	-	-	-	-	-	35.0	30.0
78	-	-	-	-	-	-	-	-	36.0

To change or view other parameters, press the left arrow to have the display show the “P” numbers. Then use the up arrow button or the down arrow button to go to the parameter number you wish to change.

To exit the Level II programming mode, simultaneously press and hold the down arrow and up arrow buttons for 3 seconds or wait 30 seconds without pressing a button. The control starts alternating the display between Capacity Remaining and flow of the tank in the **Regeneration Complete** position.

Settings for all parameters should be written on the label provided for the control. The label has an adhesive backing so it can be attached inside the cam cover for future service reference.

Special Notes for Level II Parameters

The programming parameters in Level II can be used to fine tune the operating performance of the ReadySoft system and optimize its efficiency.

Refill Control Value

Parameter P6 sets the refill value. The correct value is molded into the end of the refill controller as seen in Figure 13, which has the number 33. The default value in P6 is 33. If the value in P6 is larger than the number on the refill control, not enough brine will be made. If the value in P6 is smaller than the correct value, too much brine will be made. Press the **SET** button and enter the correct value.

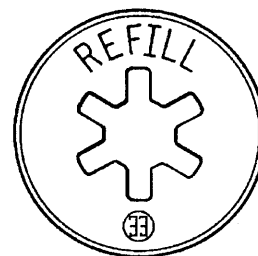


Figure 13

Brine Draw Value

Parameter P7 is used to calculate the brine draw time. The default value in P7 is “0”. Refer to Chart 2 for the correct value. The appropriate value must be entered for the control to operate properly. Find the injector used in the 255 valve. The injector cap is labeled with the injector letter and the injector is color coded for easy identification. Next, determine the typical water pressure for the installation. The Brine Draw Value is an estimate of the flow rate of brine through the injector. The control calculates the brine draw time using this value and the salt amount. The brine draw time is added to the Rinse Time (P10) to determine the total Brine Draw/Slow Rinse Time.

Chart 2: Brine Draw Values (P7)

Injector	Color	Value at 30 psi	Value at 50 psi	Value at 70 psi
A	White	19	26	31
B	Blue	24	30	37
C	Red	29	37	40

Chart 3: Backwash Values (P8)

Tank Diameter	P8 Value
6	9
7	12
8	16
9	20
10	25
12	35
13	42
14	49
*16	60

* 16 inch tank requires an external 6 gpm drain line flow control

Table 2
Level II Program Values - Readysoft Twin Tank Alternating Controls (P17 = 4)

Parameter	Description	Range of Values	Minimum Increments	Default Value	Units of Measure	Notes
P6	Refill Controller	1 - 99	1	33		Use Value Molded on Refill Cap
P7	Brine Draw Rate	1 - 99	1	0		Select Setting from Chart 2
P8	Backwash Values	1-99	1	25		Select Setting from Chart 3
P9	Backwash Time	3 - 30	1	14	Minutes	
P10	Slow Rinse	8 - 125	1	40	Minutes	
P11	Fast Rinse	2 - 19	1	4	Minutes	
P12	Units of Measure	0 - 1	1	0		0 = US 1 = Metric
P13	Clock Mode	0 - 1	1	0		0 = 12 hour AM/PM 1 = 24 hour
P14	Calendar Override	0 - 30	1	0	Days	0 = No Calendar Override
P15		0 - 1	1	0		Not Used in Twin Alternating Mode
P16		0 - 70	1	30	Percent of Total Capacity	Not Used in Twin Alternating Mode
P17	Operation Type	3 - 4	1	4		4 = 5 Cycle Co Current Twin Alternating
P18	Salt/Capacity Change Lock Out	0 - 1	1	0		0 = None 1 = Salt/Capacity Change Locked Out
P19	Turbine Size	1.0, 2.0	0.5	1.0		1.0 = 1" Autotrol Turbine
P20	Factory Default Configuration	0 - 7	1	9		Factory Use Only - DO NOT CHANGE

Demand Initiated Regeneration Modes for HighFlow Systems

Parameter P15 is used to determine the method for demand initiated regeneration. Four regeneration modes are possible.

- P15 = 0, Delayed Regeneration with a Smart Reserve Regenerations will start only at the Time of Regeneration entered in P2. A tank is regenerated if the capacity remaining in that tank is below the minimum required capacity needed to meet the next days calculated water usage requirement. The next days water usage number is based on the daily average water usage held in NOVRAM plus a 20% reserve. If necessary both tanks will be regenerated sequentially beginning with the most exhausted tank.

This option allows the control to vary the reserve, and therefore the decision to regenerate, based on the actual daily water usage pattern for the location at which it is installed. See Chart 4.

- P15 = 1, Delayed Regeneration with a Fixed Reserve Regenerations will start only at the Time of Regeneration entered in P2. A tank is regenerated if the capacity remaining in that tank is below the percentage entered in P16. If either tank's capacity is overrun by 50% a regeneration will take place. The control will also cause both tanks to be regenerated sequentially the next Time of Regeneration regardless of how much water is used during that 24 hour period. This feature is to help recover a severely exhausted bed. See Chart 5.

- P15 = 2, Immediate Regeneration - Fixed Reserve/DelayedRegeneration-Smart Reserve This option uses the features of both option 0 and option 3. This is the most versatile of regeneration options. Option number 2 provides all the advantages of variable reserve based on the actual amount of water that is used each day plus the capability to react to the excessive water usage days that occur occasionally. See Chart 6.

- P15 = 3, Immediate Regeneration - Fixed Reserve Regenerations are started immediately when a tank reaches zero or when the system capacity remaining (capacity remaining in both tanks) drops below the reserve capacity programmed in P16. To prevent hard water this reserve should be set large enough to provide conditioned water during the regeneration of the most exhausted tank. See Chart 7.

Chart 4 (P15 = 0)

Priority	Flow Rate	Continuous Soft Water	Efficiency
High	●		
Ave		●	●
Low			

Chart 5 (P15 = 1)

Priority	Flow Rate	Continuous Soft Water	Efficiency
High	●		
Ave		●	
Low			●

Chart 6 (P15 = 2)

Priority	Flow Rate	Continuous Soft Water	Efficiency
High		●	
Ave	●		●
Low			

Chart 7 (P15 = 3)

Priority	Flow Rate	Continuous Soft Water	Efficiency
High		●	●
Ave			
Low	●		

Table 3
Level II Program Values - ReadySoft Twin Tank HighFlow Controls (P17 = 3)

Parameter	Description	Range of Values	Minimum Increments	Default Value	Units of Measure	Notes
P6	Refill Controller	1 - 99	1	33		Use Value Molded on Refill Cap
P7	Brine Draw Rate	1 - 99	1	0		Select Setting from Chart 2
P8	Backwash Values	1-99	1	25		Select Setting from Chart 3
P9	Backwash Time	3 - 30	1	14	Minutes	
P10	Slow Rinse	8 - 125	1	40	Minutes	
P11	Fast Rinse	2 - 19	1	4	Minutes	
P12	Units of Measure	0 - 1	1	0		0 = US 1 = Metric
P13	Clock Mode	0 - 1	1	0		0 = 12 hour AM/PM 1 = 24 hour
P14	Calendar Override	0 - 30	1	0	Days	0 = No Calendar Override
P15	Demand Regeneration Initiation Mode	0 - 3	1	0		See Demand Initiated Modes for HighFlow systems, page 15
P16	Fixed Reserve Capacity or Initial Average Usage Value	0 - 70	1	30	Percent of Total Capacity	See Parameter P16, page 17
P17	Operation Type	3 - 4	1	3		3 = Parallel HighFlow
P18	Salt/Capacity Change Lock Out	0 - 1	1	0		0 = None 1 = Salt/Capacity Change Locked Out
P19	Turbine Size	1.0, 2.0	0.5	1.0		1.0 = 1" Autotrol Turbine
P20	Factory Default Configuration	0 - 7	1	9		Factory Use Only - DO NOT CHANGE

When a regeneration has been started on the HighFlow system, the control display will indicate this. During regeneration the display alternates between flow rate, time remaining in regeneration, and capacity of the tank in service. When regeneration time remaining is displayed, the "REGEN TIME REMAINING" LED will be lit. The tank in service is designated by an indicator mark at either the "Tank 1" or "Tank 2" identifiers when capacity is displayed. See Page 33.

Other Parameters

- Parameter P8 is used to calculate backwash volume.
- Parameter P9 selects the backwash time. The default value is 14 minutes with values of 3 to 30 minutes possible.
- Parameter P10 selects the slow rinse time. The default setting is 40 minutes with values of 8 to 125 minutes possible. Recommended 15 to 19 gallons per cubic foot of cation resin (2 - 2.5 bed volumes).
- Parameter P11 selects the fast rinse time. The default value is 4 minutes with values of 2 to 19 minutes possible. Recommended 22.5 to 37.5 gallons per cubic foot of cation resin (3 - 5 bed volumes).
- Parameter P12 selects the units of measure. Be sure this is set to the correct value before entering any data for P3, P4, or P5.

- Parameter P13 selects the clock display mode. If the 12 hour mode is selected, a PM indicator is used. The PM indicator is not used in 24 hour mode.
- Parameter P14 selects the calendar override. The default setting is 0 days with values of 0 to 30 days possible. No change is required for the Twin Alternating system. For the HighFlow Systems both tanks will regenerate sequentially, starting with the tank having the least capacity, when the days since the last regeneration equals the non-zero number programmed in P14.
- Parameter P15 is not used with the Twin Alternating System. See Special notes for level II Parameters for HighFlow System.
- Parameter P17 must be set to 4 to operate the Twin Alternating System, and set to 3 to operate the HighFlow System.
- Parameter P18 allows the installer to lock the Salt Amount and the Capacity values so they cannot be changed. When Parameter 18 is set to 1, those two settings can only be viewed when the control is in the Level II mode. The settings will be skipped when the control is in Level I mode.

Table 4
Level III Historical Data

Location	Range	Description
L1	1 - 7	Day
L2	0 - 255	Days since last regeneration
L3	1:00 - 12:59 AM/PM 0:00 - 23:59	Time of day that peak flow occurred
L4	0 - 200 (0 - 50.0)	Peak flow in gallons per minute (m ³) since location reset
L5	0 - 65536 (0 - 655.36)	Water used today in gallons (m ³) since time of regeneration
L6	0 - 65536 (0 - 655.36)	Water used since last regeneration in gallons (m ³)
L7	0 - 65536 (0 - 655.36)	Average water usage for Day 1 in gallons (m ³)
L8	0 - 65536 (0 - 655.36)	Average water usage for Day 2 in gallons (m ³)
L9	0 - 65536 (0 - 655.36)	Average water usage for Day 3 in gallons (m ³)
L10	0 - 65536 (0 - 655.36)	Average water usage for Day 4 in gallons (m ³)
L11	0 - 65536 (0 - 655.36)	Average water usage for Day 5 in gallons (m ³)
L12	0 - 65536 (0 - 655.36)	Average water usage for Day 6 in gallons (m ³)
L13	0 - 65536 (0 - 655.36)	Average water usage for Day 7 in gallons (m ³)
L14	0 - 999999 (0 - 99999.9)	Total water used since controller installed in gallons (m ³) (least significant digits)
L15	0 - 167 (0 - 16)	Total water used since controller installed in gallons x 10 ⁶ or (m ³ x 10 ⁶) (most significant digits)

When Parameter P18 is set to zero, these two values can be viewed and changed in either Level I or Level II.

- Parameter P19 denotes the size turbine used. This parameter should be set at 1.0 for a 1-inch turbine.
- Parameter P20 is used at the factory to enter default values. **This parameter must not be changed.** Using this parameter will erase the values for all other parameters and replace them with default values.
- Parameter P16 is used only with the HighFlow System. P16 sets the Fixed Reserve capacity and is used to calculate initial average water usage until water usage establishes new averages.

Level III Memory Locations (Table 4)

To assist in troubleshooting the Water Conditioning System, the contents of the controller memory can be examined to determine the status of the control and the history of water usage. To view the controller's memory locations "L1" to "L15" described in Table 3, the location-viewing mode must be selected. This mode can be selected by holding the left and up arrow buttons down simultaneously for 3 seconds. The controls will then show "L1" on the display. Locations can be stepped through in the same method as described in Level II programming. However, the **SET** button is inactive except for L4.

If SET is pressed when L4 is displayed, Peak Flow is reset to zero. If **SET** is pressed when any other location is displayed, the control will beep.

Regeneration

When the control begins a regeneration, the display will alternate between Flow of the tank in the **Regeneration Complete** position and Regen Time Remaining. (In the event of a power outage, the display will alternate between Time of Day and Regen Time remaining when power is restored). The Regen Time Remaining is shown in minutes. The control will start and stop an internal motor, which drives the camshaft through the various regeneration positions. The control uses the information entered in the parameters shown in Table 2 to determine how long each part of the cycle should last. The control will stop the camshaft at the correct location for each part of the regeneration cycle.

If power fails during a regeneration cycle, the cycle continues when the power is restored. Water flow is not metered during power failures.

Note: The REGEN button is not active when programming Level I or II parameters. Settings cannot be changed when either tank is in regeneration.

Conditioned water is available from the on-line tank when the other tank is in regeneration.

Manual Regeneration (Alternating Unit)

- To initiate a regeneration of the on-line tank, press the REGEN button for 3 seconds.
- To initiate a regeneration on the standby tank, first use the left arrow button to select the tank and then press the REGEN button for 3 seconds.
- To initiate a regeneration on both tanks, press and hold the REGEN button for 3 seconds then wait at least 1 minute after the regeneration has begun and press and hold the REGEN button again for 3 seconds. A regeneration will start on the second tank immediately after the first tank is completed. Display will lock on "REGEN TIME REMAINING" to indicate back to back regenerations were requested.

Manual Regeneration (HighFlow Unit)

- To initiate a regeneration on both tanks, press and hold the REGEN button for 3 seconds. The tanks will be regenerated sequentially starting with the tank having the least capacity.
- If the REGEN button is activated one or more minutes after a regeneration is started, both tanks will be regenerated twice.
- To regenerate a single tank, use the left arrow button to select the tank. Pressing the left arrow button once will cause the number "1" to appear as the left most digit. Pressing the button again will display a "2". Pressing the REGEN button when the desired tank is displayed will cause that tank to regenerate. If no key is pressed for 30 seconds, the

display will revert to alternating between Flow and Capacity.

Remote Regeneration

A set of terminals is provided as a standard feature of the ReadySoft control that allows for regeneration to be initiated from a remote location. This feature can be used to facilitate manual regeneration requirements or assist in further automating the control system.

Service

To leave one tank in the system operational while the other is being serviced, it is necessary to have a bypass at the valve. If the bypass is remote from the valve, the whole system will have to be bypassed to service either of the valves.

Note: The tank on-line cannot be regenerated while the other unit is isolated. When one valve/tank is isolated there is no water available for backwash. Power should be removed from control to prevent an automatic regeneration.

Start-Up Procedure After Servicing (Alternating Unit)

Follow the procedure in Chart 8 anytime either cam is rotated. This procedure will synchronize the position of the valve cams with the control. The softener may block all service flow when an automatic regeneration is started if the control is not synchronized with the cam positions. This procedure will also determine if there are any hardware failures in the controls.

Chart 8: Post-Service Start-Up Procedure (Alternating Unit)

Task	Tank 1 Control Position	Tank 2 Control Position
1. Manually rotate camshafts counterclockwise to the positions indicated.	TANK 1 START UP POSITION (Slow Rinse)	TANK 2 START UP POSITION (Refill)
2. Connect the 12 VAC power supply to the Tank 1 Control. Verify the LED display shows "Err3" indicating the controls are not in their home position.	Moving to STAND-BY	Moving to REGENERATION COMPLETE
3. Wait for the "Err3" message to clear indicating the controls have reached their home position.	STAND-BY	REGENERATION COMPLETE
4. Observe the display alternating between the Capacity Remaining and flow on Tank 2. Press any button to get the flow reading if the display is alternating between Capacity Remaining and Time of Day.	STAND-BY	REGENERATION COMPLETE
5. Initiate a manual regeneration on both tanks if either tank had been exhausted before servicing.	STAND-BY	REGENERATION COMPLETE

Removing the Control

Complete the following steps to remove the control module for servicing:

1. Unplug the wall mount transformer.
2. Shut off the water supply or put the bypass valve(s) into bypass position. **Note:** Placing the 256 valve in the bypass position allows hard water to pass to process. Refer to Figure 3.
3. Remove the rear cover by pushing back on the tab provided on the cover, Figure 14, and lift the rear cover off the valve.

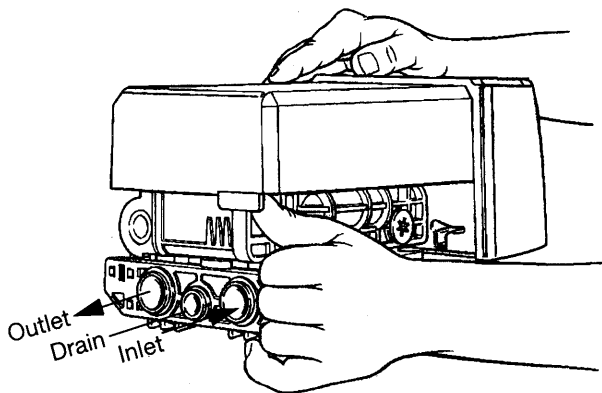


Figure 14

4. Relieve system pressure by opening the drain flapper (the fifth flapper back from the control) with a screwdriver, Figure 15.

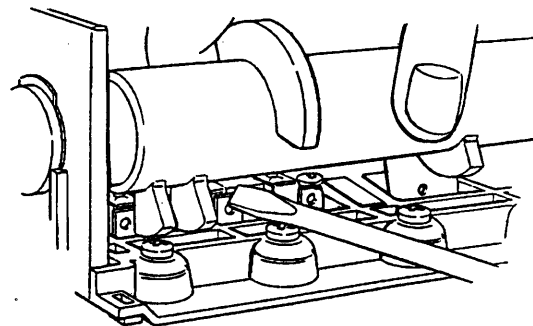


Figure 15

5. To remove the camshaft or re-install it, the rib on the shaft must be pointing straight up. This occurs when the indicator knob is rotated to the refill position. Press down on the back of the camshaft to disengage it from the rear "hoop" of the top plate, Figure 16.

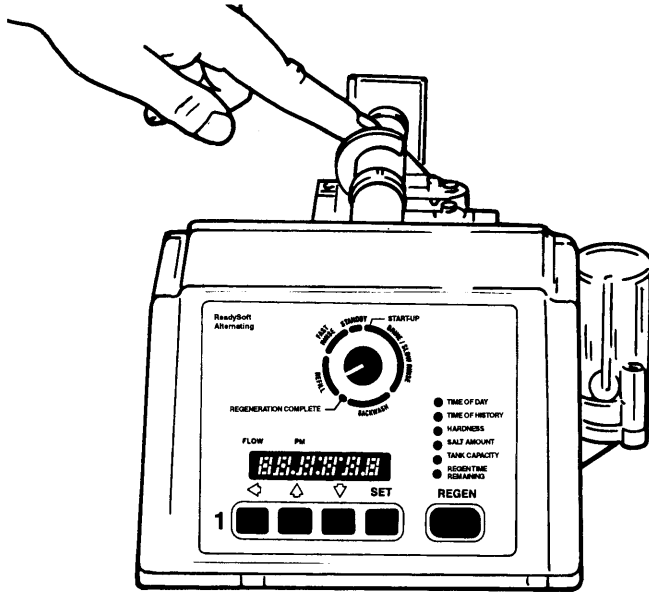


Figure 16

6. Slide the camshaft back to disengage it from the control, Figure 17.

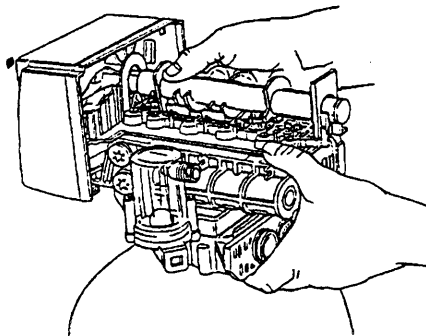


Figure 17

7. Disconnect the turbine probe from the turbine assembly.
8. Lift the control off the valve, Figure 18. To replace the control, reverse the above procedure. Note that the camshaft needs to be positioned correctly before it can be inserted into the back of the control. There is a locating rib on the camshaft. Position the rib on the top of the shaft and slide the camshaft into the control. Engage the camshaft back into the rear "hoop" of the top plate.

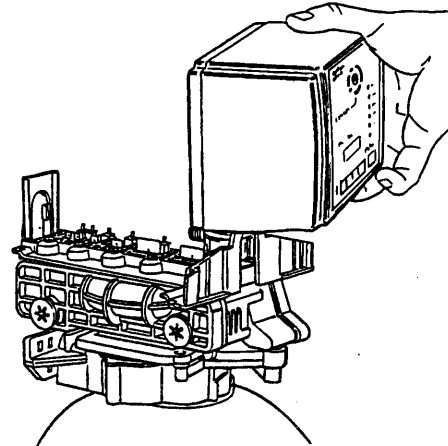


Figure 18

9. To remove the valve, remove the locking bar screw, Figure 19.

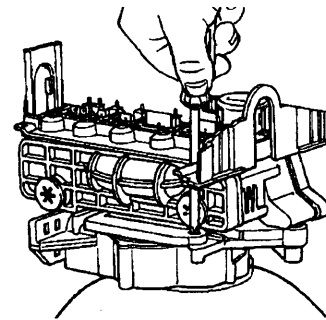


Figure 19

10. Apply downward hand pressure on the valve and pull the locking bar out, Figure 20.

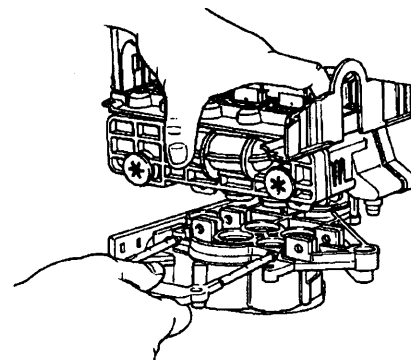


Figure 20

11. Using a rocking motion, lift the valve from the tank adapter. 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 (Autotrol part number 1013501).

Preventative Maintenance

Injector Screen and Injector

The injector is the component which creates the vacuum necessary to draw brine into the water conditioner. Clean the injector and injector screen once a year in order to maintain proper water conditioning. Some locations may require more frequent injector and screen maintenance. Refer to Figure 21 and complete the following steps to clean the injector screen and injector:

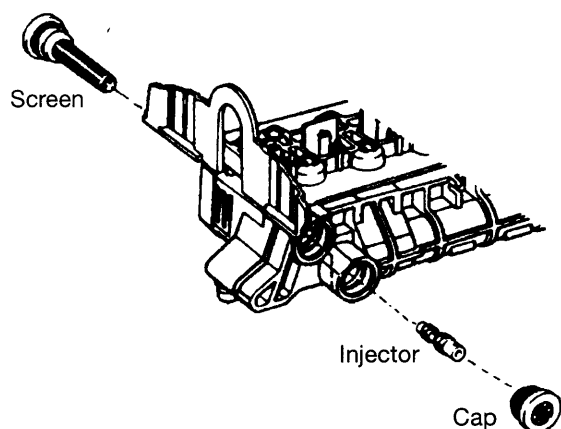


Figure 21

1. Unplug the wall mount transformer.
2. Shut off the water supply or put the bypass valve(s) into the bypass position and remove the rear cover.
3. Relieve system pressure by opening the drain flapper (the fifth flapper back from the control), Figure 14.
4. Rotate caps counterclockwise to 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.
9. Lubricate all O-rings with silicone lubricant.
10. Reinstall the injector, injector cap, and injector screen.
11. Reinstall cover, reconnect electric power, and reset the time of day.
12. Slowly open the water supply valve or return the bypass valve(s) to the "service" position.

Water Meter

Under normal conditions, the turbine requires no maintenance. To replace the turbine, the water supply must be shut off and the system depressurized prior to any work being done.

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 5.25%

Sodium Hypochlorite solutions can be used with polystyrene resin, synthetic gel zeolite, greensand, and bentonites and are available under trade names such as Clorox, 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

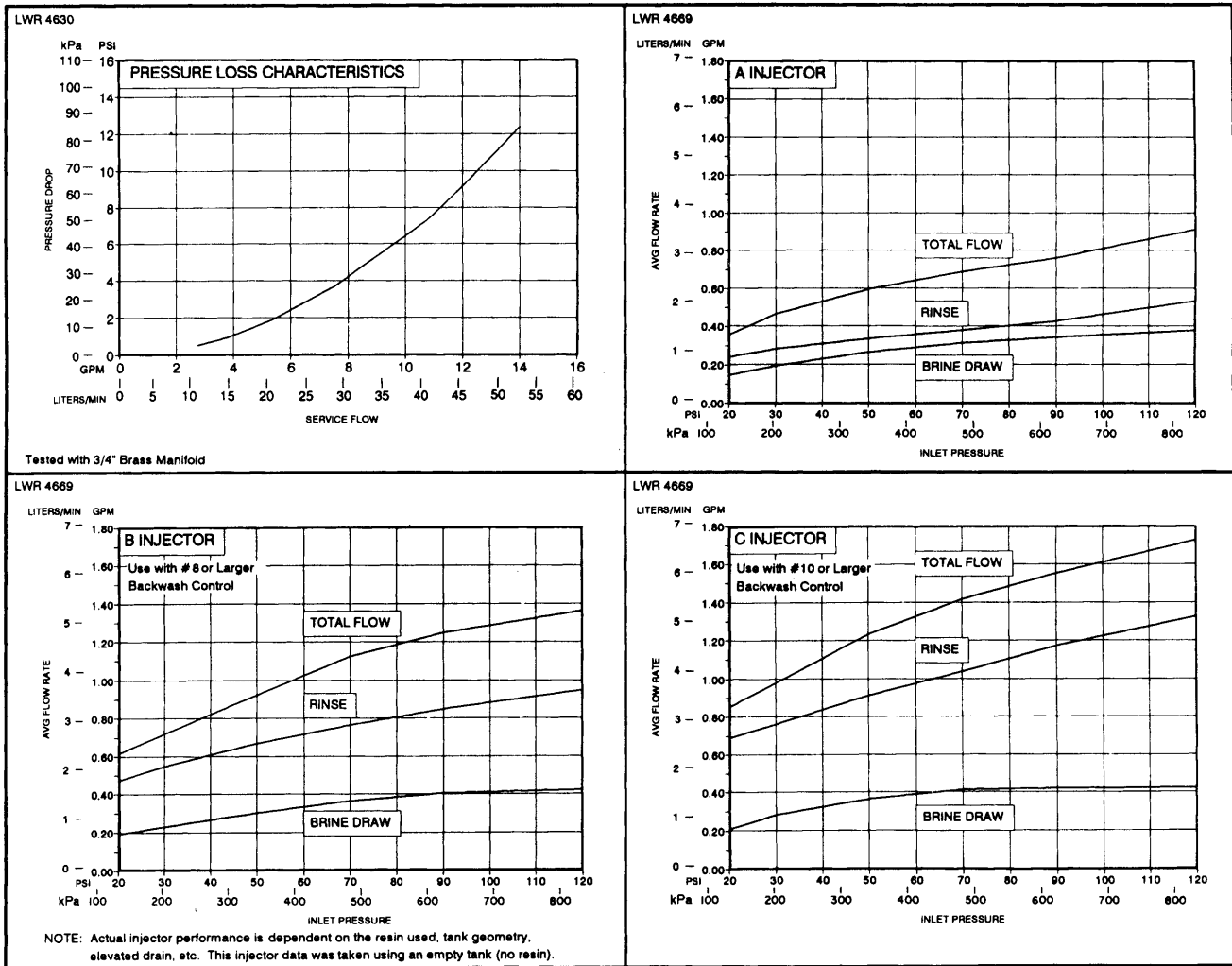
Calcium hypochlorite, 70% available chlorine, is available in several forms including tablets and granules. These solid materials can be used directly without dissolving before application.

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.

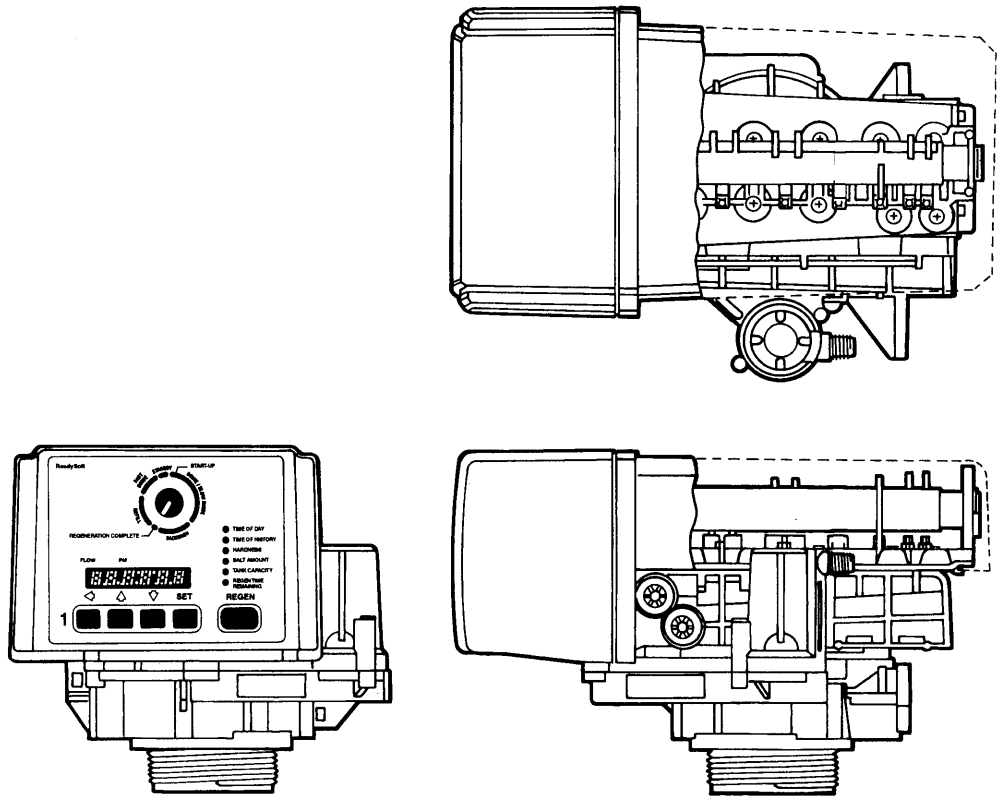
Pressure Graphs

Pressure loss data is representative of a single 255 Valve.



Specifications

255 Valve with ReadySoft Control



Hydrostatic Test Pressure	300 psi (20.7 bar)
Working Pressure	20 to 127 psi (1.38 to 8.76 bar), 100 psi max in Canada
Voltage	85 to 110 VAC 50/60 Hz, 102 to 132 VAC 60 Hz, 204 to 264 VAC 50 Hz, 187 to 242 VAC 50 Hz
Power	4.5 volt-amps
Operating Ambient Temperature	34 to 120°F (1 to 49°C)
Maximum Water Temperature	100°F (38°C)
Humidity	10 to 100% condensing allowed
Transformer	Wall mount with plug options
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) or 1.05-inch OD (26.7-mm)
Distributor Tube Length	1-1/4 inch (31.8 mm) higher than top of mineral tank
Valve Module, Tank Adapter, Optional Bypass Valve	Reinforced Noryl
Optional Single-Valve 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

Backwash Controller	7	8	9	10	12	13	14
GPM	1.2	1.6	2.0	2.5	3.5	4.2	4.8
LPM	4.5	6.0	7.6	9.5	13.2	15.5	18.2

Wiring Diagram

Connecting the ReadySoft Twin Alternating Control

The main and secondary controls are used for twin unit alternating applications. Four standard connections are required for operation; the power transformer, the flow sensor, feedback switches, and the connection

between the main and secondary controls. Figure 22 outlines these standard features.

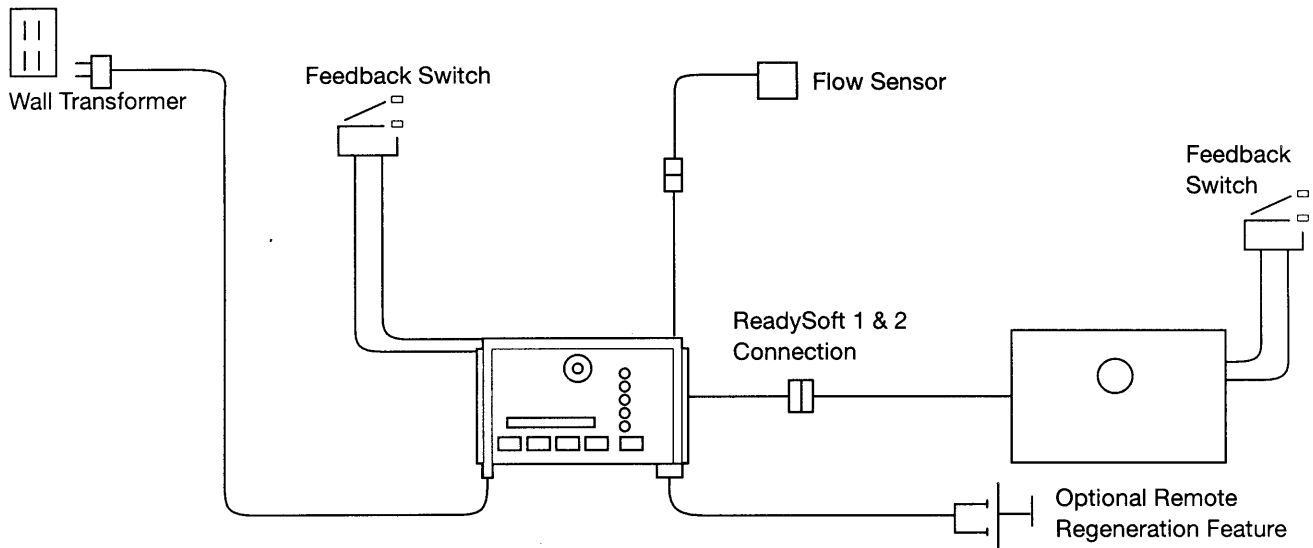


Figure 22

Connecting the ReadySoft HighFlow Control

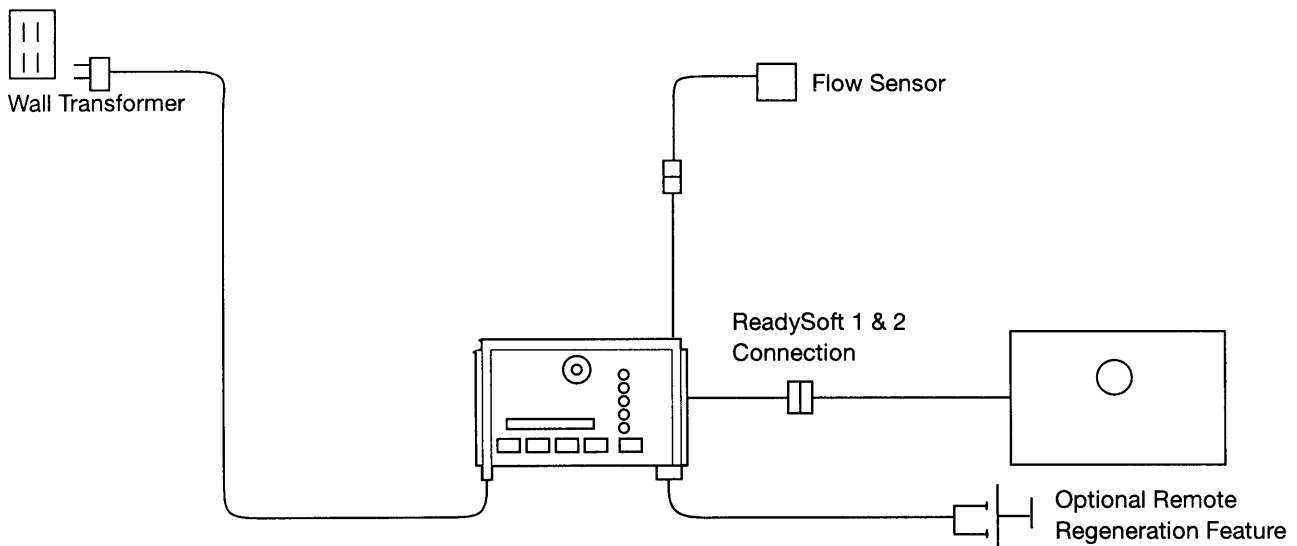
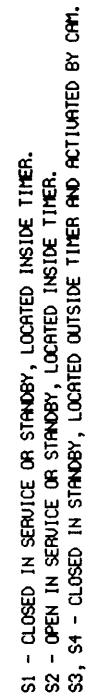


Figure 23

Main and Secondary Wiring Schematic



Alarms

The ReadySoft continuously monitors itself and sounds an alarm if it detects something wrong. The alarm is a beep that is on for one second and then off for nine seconds until corrected.

When the alarm sounds, the display shows the letters "Err" with a number from 1 to 4. Table 4 lists Err

numbers, a description of each error, the cause of the error, and the solution. To silence the alarm, press any button on the control. If the error still exists, the control will go back to the alarm condition after 30 seconds.

Table 5
ReadySoft Alarms

Indication	Description	Cause	Solution
Err1	Electronics Failure	Control settings need reprogramming.	Press any key to load default values. Refer to "Programming the ReadySoft Control".
Err2	Control is in Regeneration Complete or Standby position when it should be in regeneration	Valve camshaft had been manually rotated during a regeneration. Faulty motor. Faulty motor drive. Faulty switch.	Press any button to clear the error. Verify the controls are in the correct position. Replace the control. Replace the control. Replace the control.
Err3	Control is in regeneration when it should be in the Standby or Regeneration Complete position	Valve camshaft has been manually rotated out of Regeneration Complete position. Faulty motor. Faulty motor drive. Faulty switch.	The control will turn the motor on and drive the camshaft to the proper location. Replace the control. Replace the control. Replace the control.
Err4	Improper Control Settings (one or more settings out of the allowable range)	One or more settings out of the allowable range.	Program proper values. Refer to "Programming the ReadySoft Control".

Troubleshooting

The Water conditioning System is designed and manufactured for efficient, low maintenance service. However, if problems do occur, this section provides a list of possible causes and solutions. The control is easily serviced. The control module can be quickly



replaced or adjustments can be made at installation. Refer to the exploded views of the **Replacement Parts** section of this manual for specific parts.

Problem	Cause	Solution
Water Conditioner fails to initiate regeneration	<ul style="list-style-type: none"> a. Power supply to control has been interrupted b. Improper or no initial programming c. Defective control 	<ul style="list-style-type: none"> a. Determine reason for power interrupt and correct. Reset Time of Day. b. Check programming values and correct as needed. c. Replace control.
Water Conditioner regenerates but does not recharge bed	<ul style="list-style-type: none"> a. Water pressure lost b. Improper or no initial programming c. Defective control d. No salt in brine tank e. Manual bypass valve is open f. Leak at riser pipe seal g. Insufficient brine h. Plugged injector or injector screen 	<ul style="list-style-type: none"> a. Restore water pressure. b. Check programming values and correct as needed. c. Replace control. d. Add salt and regenerate. e. Close manual bypass valve. f. Ensure that riser pipe is properly sealed at tank adapter O-ring. Inspect pipe for cracks. g. Check refill control and clean if necessary. Check control settings. Check flow rate capabilities of safety float and air check assembly. h. Clean injector and/or injector screen.
No Brine Draw	<ul style="list-style-type: none"> a. Plugged injector or injector screen b. Insufficient water pressure c. Obstructed drain line d. Leak in connection between air check and brine tank 	<ul style="list-style-type: none"> a. Clean injector and/or injector screen. b. Increase water pressure above 25 psig (1.72 bar) minimum. c. Remove obstruction. d. Check brine line connection for leaks.
Insufficient Brine Draw	<ul style="list-style-type: none"> a. Partially clogged injector or injector screen b. Restricted flow rate in brine line c. Insufficient water pressure d. Excessive back pressure on injector due to elevated drain line e. Partially restricted drain line f. Leak in connection between air check and brine tank 	<ul style="list-style-type: none"> a. Clean injector and/or injector screen. b. Check flow rate capabilities of safety float/air check assembly. c. Increase water pressure above 25 psig (1.72 bar) minimum. d. Reduce drain line elevation to height of valve. e. Remove restriction. f. Check brine line connection for leaks.
Insufficient Refill to Brine Tank	<ul style="list-style-type: none"> a. Restricted flow in brine line b. P6 (Refill) value incorrectly set c. P7 (Brine Draw) value incorrectly set 	<ul style="list-style-type: none"> a. Check flow rate capabilities of the Safety float/air check assembly. b. Reprogram P6. c. Reprogram P7.

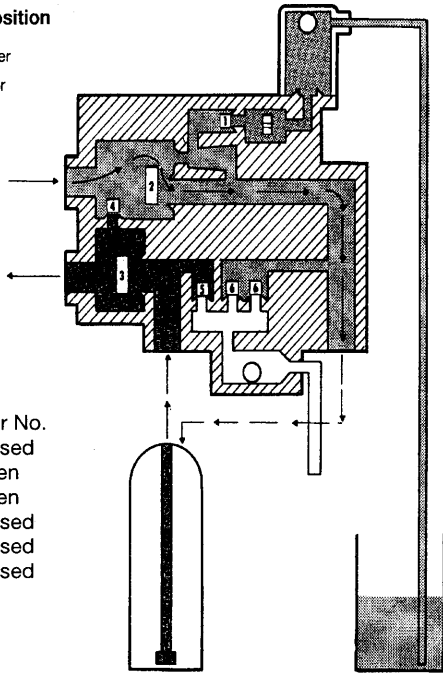
Excessive Water in Brine Tank	<ul style="list-style-type: none"> a. Restricted drain line b. Plugged injector and/or injector screen c. Incorrect refill control d. Insufficient brine draw/no brine draw 	<ul style="list-style-type: none"> a. Remove drain line restriction. b. Clean injector and/or injector screen. c. Install correct control. d. See Insufficient Brine Draw or No Brine Draw.
Leak to Drain	<ul style="list-style-type: none"> a. Foreign object blocking #6 flapper from closing 	<ul style="list-style-type: none"> a. Manually actuate #6 drain flapper to flush clear
Loss of Media to Drain	<ul style="list-style-type: none"> a. No backwash ball (nos. 7-12) b. Incorrect backwash control 	<ul style="list-style-type: none"> a. Install backwash ball. b. Install correct backwash control.
Loss of Water Pressure	<ul style="list-style-type: none"> a. Fouled resin bed due to iron accumulation b. Slots in riser pipe or laterals are filled with resin fines 	<ul style="list-style-type: none"> a. Clean valve and resin bed. b. Inspect and clean distributor pipe slots as needed.
Salt in Water to Service After Regeneration	<ul style="list-style-type: none"> a. Injector is too small for system size b. Brine draw time excessively long due to low water pressure c. Restricted drain line d. Insufficient rinse volume e. Plugged injector and/or injector screen f. Backwash control too small for system 	<ul style="list-style-type: none"> a. Install correct injector. b. Increase water pressure above 25 psig (1.72 bar) minimum. c. Remove drain line restriction. d. Increase slow rinse time, fast rinse time, or both. e. Clean injector and/or injector screen. f. Install correct backwash control.
Err1, Err2, Err3, Err4	<ul style="list-style-type: none"> a. See Table 4 	<ul style="list-style-type: none"> a. See Solution in Table 4
Both Tanks in Standby	<ul style="list-style-type: none"> a. Defective cam switch b. Miswired cam switch 	<ul style="list-style-type: none"> a. Replace cam switch. b. Replace wiring.
Flow Indicated for Tank in Standby	<ul style="list-style-type: none"> a. Cams were turned manually 	<ul style="list-style-type: none"> a. Synchronize control. See Start-up Procedure After Servicing.
No Flow Indicated for Tank On-Line	<ul style="list-style-type: none"> a. Meter probe disconnected or not fully connected to housing b. Restricted meter turbine rotation due to foreign material in meter c. Defective meter probe d. Defective circuit board 	<ul style="list-style-type: none"> a. Fully insert probe into meter housing. b. Remove meter housing, free up turbine and flush with clean water. Turbine should spin freely. c. Replace control. d. Replace control.
Control Displays only Regen Time Remaining	<ul style="list-style-type: none"> a. Back to back regenerations were requested 	<ul style="list-style-type: none"> a. Refer to Manual Regeneration.
Control does not Regenerate Automatically or When Regen Button is Pushed	<ul style="list-style-type: none"> a. Defective motor b. Broken gear c. Binding in gear train d. Defective control switch 	<ul style="list-style-type: none"> a. Replace control. b. Replace control. c. Replace control. d. Replace control.
No Display	<ul style="list-style-type: none"> a. Transformer unplugged b. No electric power at outlet 	<ul style="list-style-type: none"> a. Connect power. b. Repair outlet or use working outlet.
No Flow Indicated	<ul style="list-style-type: none"> a. Probe not receiving power b. Turbine defective c. Probe not inserted fully into turbine housing 	<ul style="list-style-type: none"> a. Replace control. b. Replace turbine. c. Replace turbine.
No Water (Alternating System)	<ul style="list-style-type: none"> a. Cams out of sync 	<ul style="list-style-type: none"> a. Synchronize cams following directions in Start-up Procedure After Servicing.

Flow Diagrams

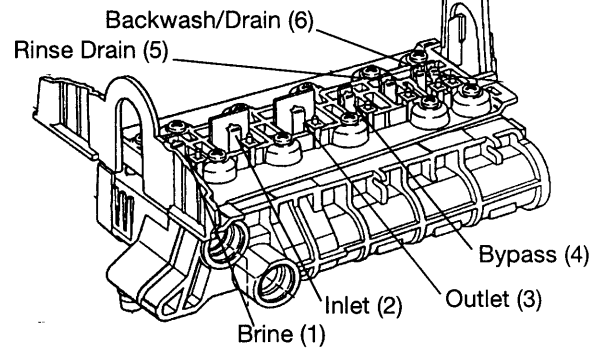
1 Service Position

-  Hard Water
-  Soft Water

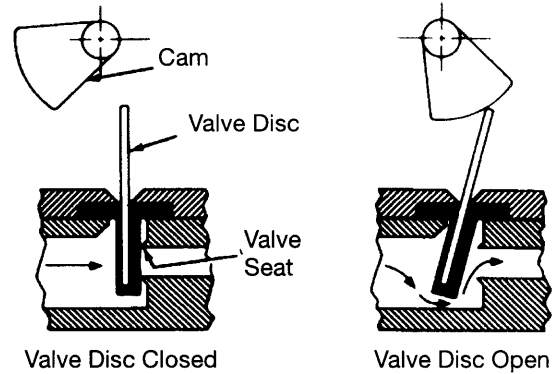
- Flapper No.
- 1 - Closed
 - 2 - Open
 - 3 - Open
 - 4 - Closed
 - 5 - Closed
 - 6 - Closed





Control Valving Identification



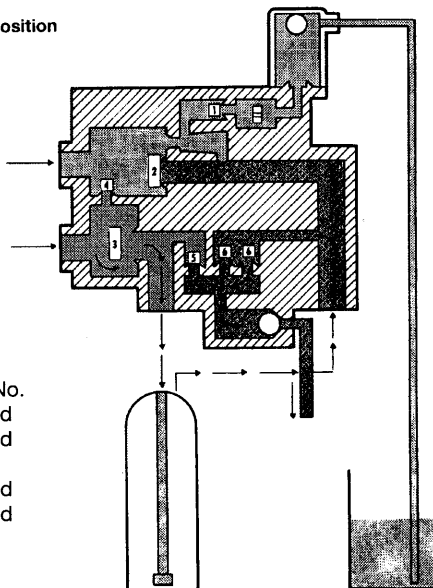
Valve Disc Operation





2 Backwash Position

-  Hard Water
-  Backwash

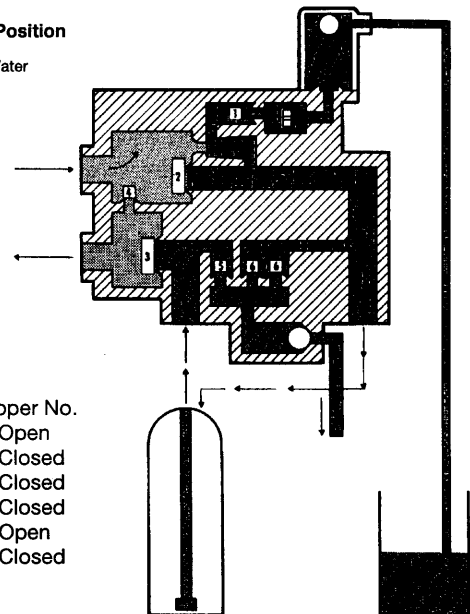
- Flapper No.
- 1 - Closed
 - 2 - Closed
 - 3 - Open
 - 4 - Closed
 - 5 - Closed
 - 6 - Open



3 Brining Position

-  Hard Water
-  Brine

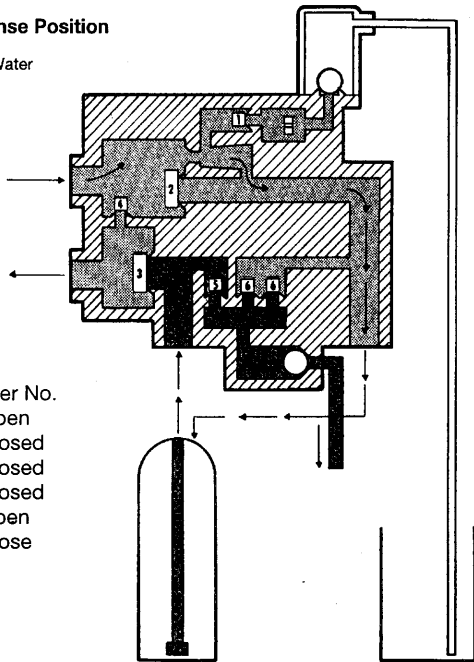
- Flapper No.
- 1 - Open
 - 2 - Closed
 - 3 - Closed
 - 4 - Closed
 - 5 - Open
 - 6 - Closed



4 Slow Rinse Position

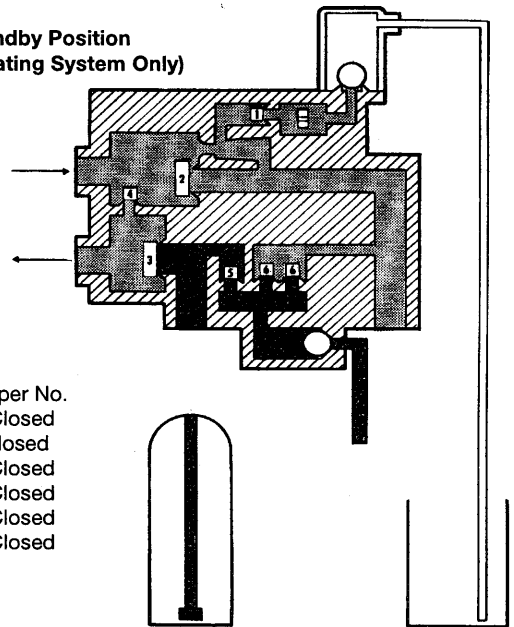
- Hard Water
- Brine

- Flapper No.
- 1 - Open
 - 2 - Closed
 - 3 - Closed
 - 4 - Closed
 - 5 - Open
 - 6 - Close



4A Standby Position (Alternating System Only)

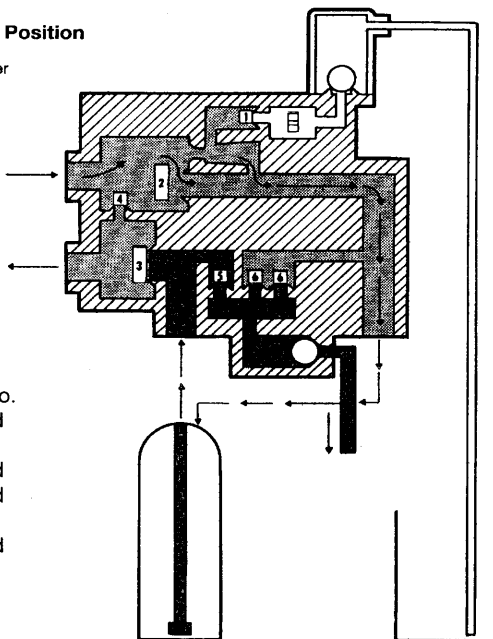
- Flapper No.
- 1 - Closed
 - 2 - Closed
 - 3 - Closed
 - 4 - Closed
 - 5 - Closed
 - 6 - Closed



5 Fast Rinse Position

- Hard Water
- Rinse

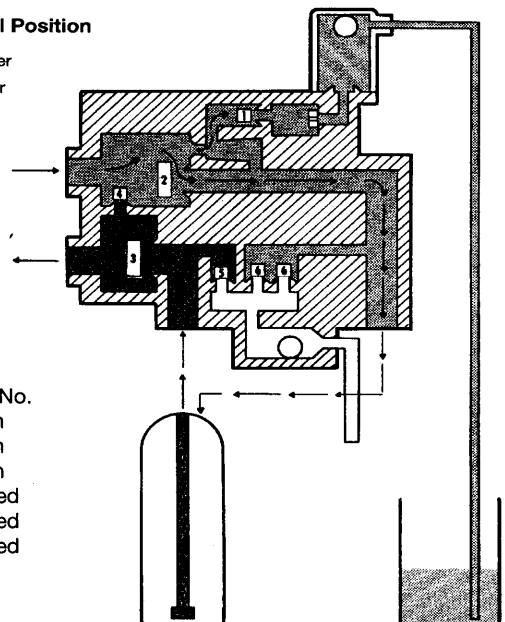
- Flapper No.
- 1 - Closed
 - 2 - Open
 - 3 - Closed
 - 4 - Closed
 - 5 - Open
 - 6 - Closed



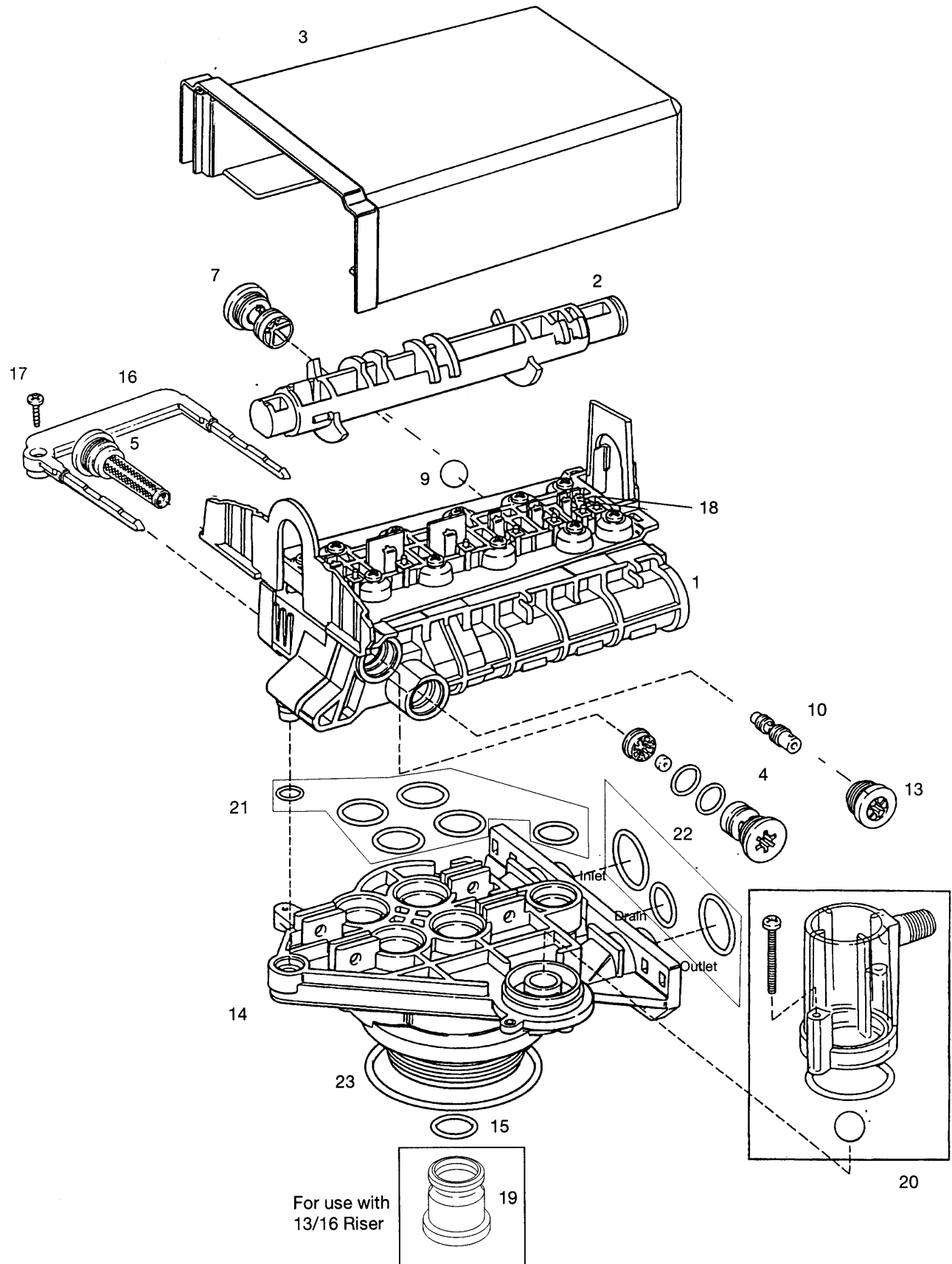
6 Brine Refill Position

- Hard Water
- Soft Water

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



Replacement Parts

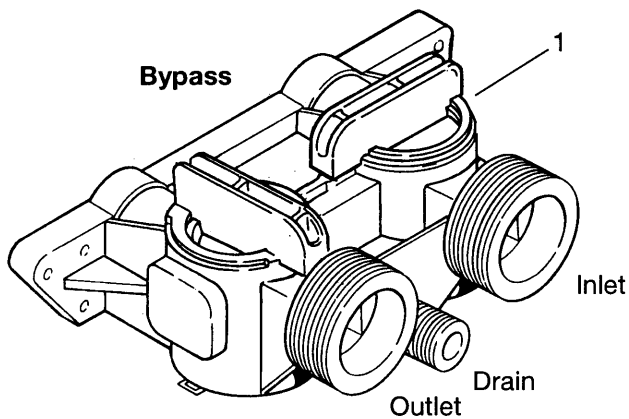


Valve Body and Tank Adapter Module

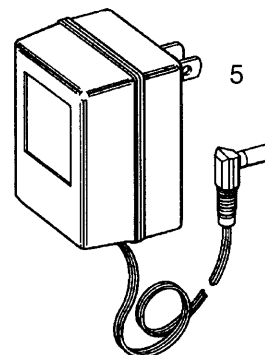
Code	Part No.	Description	Qty.	Code	Part No.	Description	Qty.
1	1000238	Valve Assembly w/o Flow Controls	1	13		Injector Cap with O-Ring	1
2	1035635	Camshaft, ReadySoft, One-Piece	1		1000217	"A" Cap	
*	1035636	Auxiliary Cam			1000218	"B" Cap	
3	1000827	Valve Cover, Black	1		1000219	"C" Cap	
4		Brine Refill Flow Control Assembly:	1	14	1033784	Tank Adapter Assembly	1
	1000221	0.14 GPM		15	1010128	O-Ring, 3/4 x 1 x 1/8 EP	1
	1000222	0.33 GPM - Standard		16	1031402	Locking Bar: English Language	1
	1000223	0.40 GPM		17	1006093	Screw, No. 8 x 9/16 inch	1
5	1000226	Screen/Cap Assembly with O-Ring	1	18	1001581	Spring, Valve Flappers	9
7		Drain Control Assembly with O-Rings:	1	19	1041010	13/16 Rubber Insert	9
	1000209	No. 7 for 7-inch Diameter Tank				Kits:	
	1000210	No. 8 for 8-inch Diameter Tank					
	1000211	No. 9 for 9-inch Diameter Tank		20	1032417	Air Check Assembly	1
	1000212	No. 10 for 10-inch Diameter Tank		21	1001404	O-Ring Group: Tank Adapter	
	1000213	No. 12 for 12-inch Diameter Tank		22	1040459	O-Ring Group: Piping Boss	
	1000214	No. 13 for 13-inch Diameter Tank**		23	1010429	O-Ring, 3/16 x 3-1/8 x 3-1/2	
	1000215	No. 14 for 14-inch Diameter Tank**		*	1000250	Valve Flapper Replacement	
9	1030502	Ball, Flow Control	1	*	1033317	1-inch Turbine	
10		Injector Assembly with O-Rings:	1				
	1032970	"A" Injector – White					
	1032971	"B" Injector – Blue					
	1032972	"C" Injector – Red					

* Not Shown

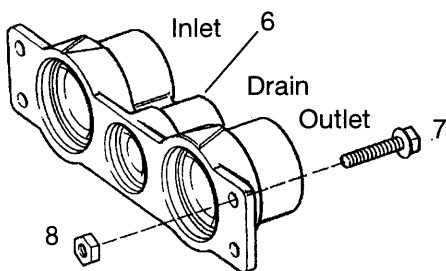
**No Ball Required



Wall Mount Transformer



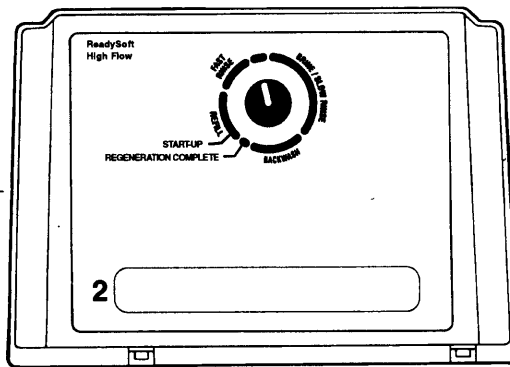
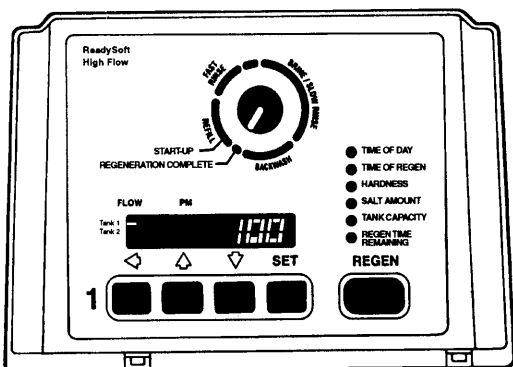
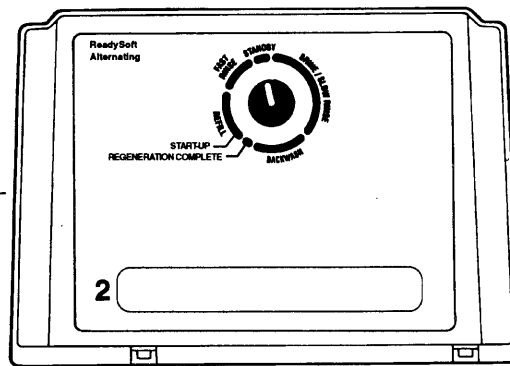
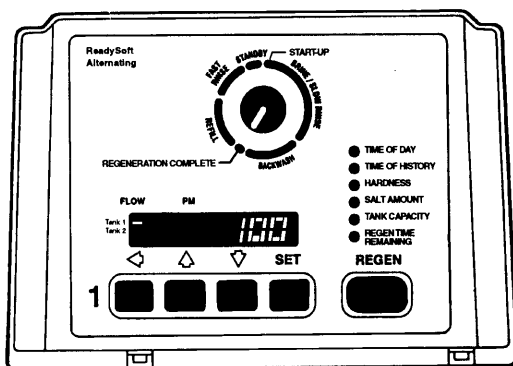
Piping Boss



Note: Do not use pipe joint compound when threading pipe into the Noryl piping boss. Use only Teflon* pipe tape. Do not overtighten pipe into Noryl piping boss.

*Teflon is a registered Trademark of E.I. DuPont and Co.

ReadySoft Controls



Transformer, Bypass Valve, Piping Boss and Interconnecting Manifold

Code	Part No.	Description	Qty.	Code	Part No.	Description	Qty.
1	1040769	256 Bypass	1	5		Wall Mount Transformer	1
*	1034301	Kit, 256 Rotor Replacement	2	1000810		100V Japanese Plug	
*	1034302	Kit, 256 Rotor Seals (2), O-Rings (4), Clips (2)		1000811		120V North American Plug	
				1000812		220V Australian Plug	
2	1035640	Deluxe Interconnecting Manifold Kit	1	1000813		220V British Plug	
*	1030206	Interconnecting Manifold Kit, without 256 bypasses		1000814		220V European Plug	
*	1030129	Interconnecting Manifold Kit, PVC piping/fittings only		6		Kit, Piping Boss (includes hardware):	1
				1040278		1-inch NPT, Brass	
3	1035651	ReadySoft Alternating Electronic Main Control	1	1040282		1-inch BSPT, Brass	
	1035664	ReadySoft HighFlow Electronic Main Control		1040280		1-inch NPT, NORYL	
4	1035652	ReadySoft Alternating Electronic Secondary Control	1	1040284		1-inch BSPT, NORYL	
	1035665	ReadySoft HighFlow Electronic Main Control	1	7	1005550	Screw, No. 10-24 x 3/4 inch	
				8	1005102	Nut, No. 10-24	
				9	1030541	Gasket	4
				*	1041086	Auxiliary Switch Kit (Twin Alternating)	

*Not Shown

