



**Water Treatment Controls**

*- A Division Of Aquion Water Treatment Products*

**2200 SERIES  
DEMAND SOFTENER VALVE**

**Installation  
& Service  
Manual**



The 2200 valve has been certified according to NSF/ANSI 44 by the Water Quality Association for material safety and structural integrity only.

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# Operational Specifications

## Water Pressure

- 20 psi–120 psi (1.38 bar–8.27 bar)

## Operating Temperature Range

- 40° F–100° F (4.4° C–37.8° C)

## Storage Temperature Range

- 4° F–158° F (-15.6° C–70° C)

## Humidity Range

- 10% to 95%, non-condensing

## Electrical Requirements

- The computer board receives power from an external wall mount or plug-in transformer. The voltage required is 24 VAC and the line frequency is 50 Hz or 60 Hz.

## Environmental Requirements

- The water softener and control cannot be exposed to outdoor elements, such as direct sunlight or atmospheric precipitation. The system must be installed in a covered, open-air structure.

## Bypass Valve

- A manually operated bypass valve enables the conditioner to be isolated from the water service line for maintenance and service.

## Additional Specifications

- Do not install this system where water is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.
- This system must be installed in accordance with all applicable state and local laws and regulations.
- The selected installation area must be adequate for easy service and accessibility.
- The installation must be on a cold water supply.

## Agency Approvals

The 2200 Series is certified according to NSF/ANSI 44 by the Water Quality Association for material safety and structural integrity only.

The control meets international standards for electromagnetic compatibility (EMC). It has been tested by an independent laboratory in compliance with CE requirements. It is resistant to electrical noise and will not emit levels of RFI (Radio Frequency Interference) that could disturb nearby electronic devices.

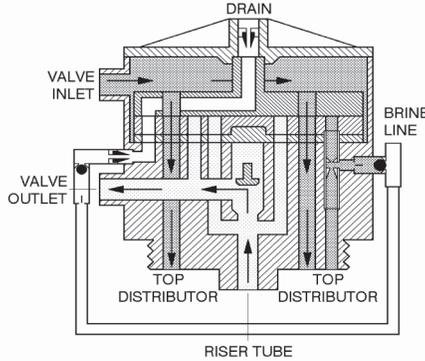
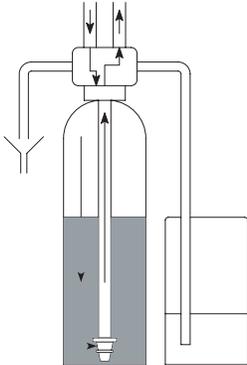
 **Helpful Tip: Weather covers can be purchased through the Erie Order Department, part number 72370.**

 **Helpful Tip: Bypass valves can be purchased through the Erie Order Department, part number 70706.**

# Regeneration Cycles

## Service

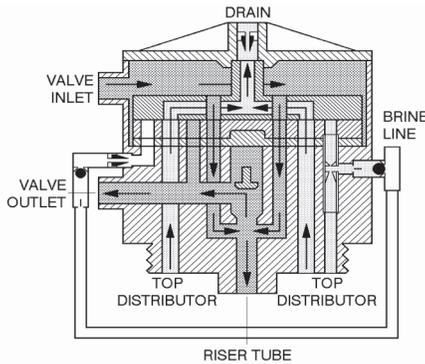
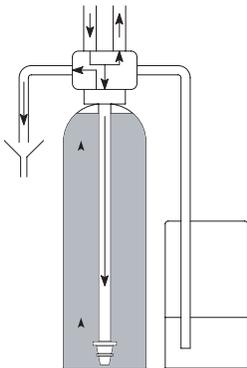
Untreated water flows down through the resin bed and up through the riser tube to drain. The water is conditioned when passing through the resin. The throughput is dependent on the maximum permissible pressure drop for the complete water conditioner and the maximum permissible specific load of the resin.



-  SOFT WATER
-  BRINE / RINSE WATER
-  HARD WATER

## Backwash

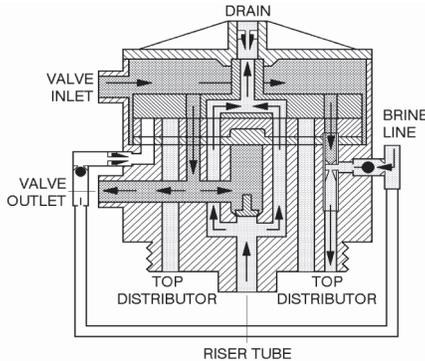
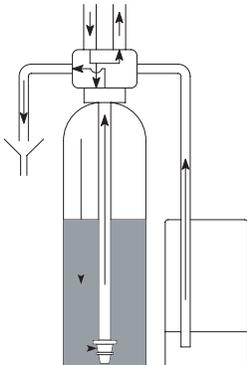
Water flows down through the riser tube and up through the resin bed to drain. The resin bed is fully expanded and all foreign materials are thoroughly washed from the resin, allowing a good brine cycle to occur.



-  SOFT WATER
-  BRINE / RINSE WATER
-  HARD WATER

## Brine

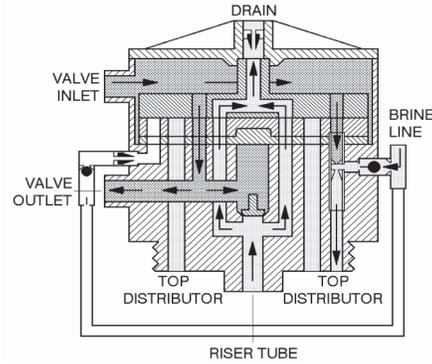
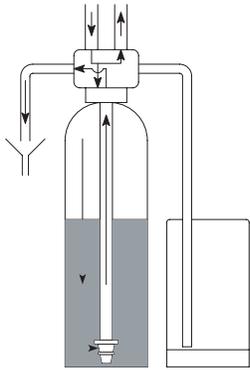
Salt brine, drawn from the brine tank by the injector, slowly flows down through the resin bed and up through the riser tube to drain. The resin is being regenerated when the salt brine passes through the bed. The brine cycle is terminated when the air-check seats in the brine valve.



-  SOFT WATER
-  BRINE / RINSE WATER
-  HARD WATER

## Slow Rinse

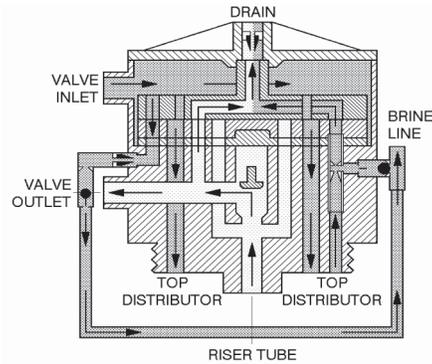
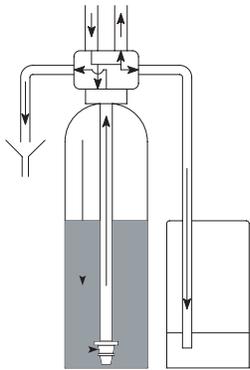
Slow rinse continues for the remainder of the brine cycle. The water slowly flows down through the resin bed and up through the riser tube to drain. The brine is slowly washed from the resin tank.



-  SOFT WATER
-  BRINE / RINSE WATER
-  HARD WATER

## Fast Rinse/Brine Refill

Water flows to the brine tank, down through the resin bed and up through the riser tube to drain. All traces of brine are washed from the resin tank. The resin bed is now compacted and ready for the next service cycle.



-  SOFT WATER
-  BRINE / RINSE WATER
-  HARD WATER

# Injector & Flow Control Selections

## Injector

The injector determines the brine concentration (ratio between brine suction and rinse water) and the brine flow through the resin bed. Injector performances vary significantly with inlet pressure.

TANK		INJECTOR	
Inches	Millimeters	Number	Color
7	178	4	Purple
8	203	4	Purple
9	229	4	Purple
10	254	1-4	Red-Purple
12	305	1	Red
13	330	1	Red
14	356	1-2	Red-Yellow
16	406	2-5	Yellow-Green

**! Important Note: The table (left) is only a recommendation, valid for an inlet pressure of 40 psi/3 bar with a bed height of 30 inches.**

**The injector recommendations are based on general tank sizes.**

## Backwash Flow Control

The backwash flow control determines the resin bed expansion during backwash, independent of the inlet pressure.

TANK		BACKWASH FLOW CONTROL		
Inches	Millimeters	Number	Gallons per Minute	Liters per Minute
7	178	4	1.6	6.1
8	203	4	1.6	6.1
9	229	4	2.0	7.6
10	254	1-4	2.6	9.8
12	305	1	3.5	13.2
13	330	1	4.0	15.1
14	356	1-2	5.0	18.9
16	406	2-5	6.0	22.7

**! Important Note: The backwash flow control recommendations are based on general tank sizes.**

## Brine Refill Flow Control

The brine refill flow control, with the time of fast rinse/brine refill cycle, determines the quantity of refill to the brine tank, independent of the inlet pressure.

**Example: Brine refill flow control X Cycle time = Quantity of refill**

BRINE REFILL FLOW CONTROL			CYCLE 3 TIME	QUANTITY OF REFILL	
Number	Gallons per Minute	Liters per Minute	Minutes	Gallons (± 10%)	Liters (± 10%)
A	0.25	1.0	4	1.0	3.8
A	0.25	1.0	6	1.5	5.7
A	0.25	1.0	8	2.0	7.6
A	0.25	1.0	10	2.5	9.5
B	0.5	1.9	6	3.0	11.4
B	0.5	1.9	8	4.0	15.1
B	0.5	1.9	10	5.0	18.9
D	1.0	3.8	6	6.0	22.7
D	1.0	3.8	8	8.0	30.3
D	1.0	3.8	10	10.0	37.9
D	1.0	3.8	12	12.0	45.4

**! Important Note: Fast rinse/brine refill cycle can only be set in one minute increments.**

TANK		BRINE REFILL FLOW CONTROL
Inches	Millimeters	Number
7	178	A-B
8	203	A-B
9	229	B
10	254	B-D
12	305	D
13	330	D
14	356	D
16	406	-

**! Important Note: The brine refill flow control recommendations are based on general tank sizes.**

# Installation Instructions

## 1. Safety Precautions

- To prevent accidents and/or injuries, do not hoist the equipment over your shoulder; use a hand truck.
- Wear safety glasses and work gloves during installation and service.

## 2. Test the Raw Water

- Test the raw water for hardness, iron, and/or any other element that could affect the performance of the system.

## 3. Check the Water Pressure

- Use a pressure gauge to confirm that the water pressure does not exceed 120 psi. If the water pressure does exceed this limit, install a pressure regulator on the inlet pipe of the system. The minimum water pressure for a conditioner is 20 psi; 60 psi is the optimum operating pressure.

## 4. Locate a Site for the System

- There are three primary requirements needed for a site: the main water source, a drain, and an electrical connection. Locate the system as close to these items as practical; avoid drain lines over 25 feet long.
- Place the system in the desired location. The location should have a level, smooth, and clean surface.
- If the system is located outdoors, protect the unit from direct sunlight; direct sunlight can damage the fiberglass and other system components. If necessary, build a box or shed.

 **Helpful Tip:** The drain may be a floor drain, a sewer trap, utility sink, vent stack, dry well, etc., depending on local plumbing codes.

## 5. Install the Control Valve

- Rinse the resin tank well before use.
- Attach the lower distributor to the riser tube.
- Lower the riser tube into the resin tank until it touches the bottom. Cut the riser tube  $\frac{1}{2}$  inch below the top of the tank threads and chamfer the tube to prepare for insertion into the control valve.
- Temporarily plug the top of the riser tube (to prevent resin from entering the tube) and fill the tank with resin ( $\frac{3}{4}$  full maximum).
- Make sure the O-ring in the riser insert is correctly positioned, then screw the upper distributor onto the control valve.
- Lubricate the threads, top of the riser tube, and tank O-ring.
- Lower the control valve straight down onto the riser tube and screw it onto the tank.

 **Important Note:** The system can only be installed outdoors in climates that do not reach freezing levels.

## 6. Turn Off the Water and Drain the Plumbing

- Turn off the water at the meter or the pressure tank.
- To drain the plumbing system, open all faucets in the house and flush the toilets. The water will drain out of the lowest faucet or outlet and air will enter the plumbing system.

 **Important Note:** Do not over-tighten the valve to the tank.

## 7. Bypass the Outside Faucets

- Install plumbing pipes to bypass the outside faucets. If the plumbing is not accessible, provide an untreated hose bib on the inlet pipe.

## 8. Install a Bypass Valve

- A three valve bypass system must be installed to isolated the conditioner from the water service line during maintenance and service. It also maintains the continuity of the water supply when the conditioner is disconnected.
- Do not use teflon tape when connecting the fitting kit to the integral bypass connections.
- If the fitting kit provides a sweat connection, care must be taken to prevent the bypass manifold and the fitting kit union from melting. Do not connect the fitting kit to the bypass valve prior to sweat-fitting the copper adapter.
- Place a wet rag over the copper tube and the Noryl nut prior to heating the tube.

 **Helpful Tip: Bypass valves can be purchased through the Erie Order Department, part number 70706.**

## 9. Connect the Plumbing

- Do not sweat pipes with water in them or while attached to the system; steam will damage the plastic parts in the valve.
- Do not point the soldering torch directly at the mineral tank or valve. These composite materials will last a lifetime, but cannot withstand the intense heat from a torch.
- Avoid short connections of pipe between the system outlet and water heater inlet. If you can't avoid a short connection, move the system to another location. As a last resort, install a heat trap or check valve. If this causes "water hammer", install a "water hammer" suppressor.
- Connect the raw water pipe to the inlet pipe connection of the bypass valve. When looking at the front of the system, the inlet is the pipe connection on the LEFT side of the valve.
- Connect the treated water pipe to the outlet pipe connection on the bypass valve. When looking at the front of the system, the outlet is the pipe connection on the RIGHT side of the valve.

 **Important Note: Do not install the system too close to a water heater; water heaters can sometimes transmit heat back down the cold pipe into the control valve.**

## 10. Install the Drain Line and Air Gap

- For all drain lines, use at least a 1/2 inch ID line.
- Connect the drain line to the drain elbow. Verify that the drain line is secure and free of kinks.
- Run the drain line to the air gap. The air gap must be installed between the end of the drain line and the drain to prevent possible back-siphoning.

 **Important Note: The air gap should be two times the diameter of the drain line or a minimum of two inches. Please check your local plumbing codes to ensure compliance.**

## 11. Install the Brine Line

- An air-check is required for proper brining during regeneration.
- If a safety float is used for additional security, it must be set high enough to prevent premature shut-off during the brine fill cycle.
- 3/8 inch polytube must be used to connect the brine system to the valve; do not over-tighten the nut during installation.

## 12. Attach the Electrical Connection

- Plug the transformer's output lead into the power input socket on the back side of the control.
- Plug the transformer into an active electrical socket. Make sure the power source carries the same rating as the transformer.

## System Start Up

- Move the bypass valve handles to the bypass position and turn the water back on at the meter or pressure tank.
- Check the system for leaks. If a leak is present, drain the plumbing again before soldering.
- Open a cold water faucet and allow the water to run for a few minutes or until all foreign material from the installation is washed out; close the faucet.
- Slowly move the bypass valve handles to the Service position and allow the water to completely fill the resin tank.
- To set the resin bed and to purge any air trapped in the system, open a cold water faucet and allow the water to run for at least 2 minutes; close the faucet.
- To flush any remaining hard water from the hot water heater, open a hot water faucet and allow the water to run for a few minutes; close the faucet.
- Program the control according to the specific installation. Please refer to the programming information on pages 12–13.
- Push the **Scroll Button** 3 times; the control will display:

**Regen in 10 sec**

- The timer will countdown from 10 to 0, initiating a regeneration at 0.
- The motor will start and the computer will display:

**Rgn: \_ Cyc1: \_**

- Allow water to run to the drain until all air is purged from the system (approximately 3 to 4 minutes).
- Fill the brine tank with water, higher than the air-check level.
- Push the **Scroll Button**; the motor will start and the computer will display:

**Rgn: \_ Cyc2: \_**

- Allow the system to draw water from the brine tank until the air-check closes.
- Push the **Scroll Button**; the motor will start and the computer will display:

**Rgn: \_ Cyc3: \_**

- Allow water to run to the drain and the brine tank for the entire cycle time. The brine tank will fill to the programmed level and the control will return to the Service position automatically.
- Add the appropriate amount of salt to the brine tank.

## Sanitizing the System

- Mix a  $\frac{3}{4}$  cup of common (unscented) 5.25% household bleach with 1 quart of water. Pour this solution into the brine well.
- Press the **Scroll Button** 3 times to initiate a manual regeneration.
- After the regeneration is complete, the conditioner is sanitized and ready for use.

 **Important Note: Do not pour undiluted bleach into the water conditioner.**

 **Helpful Tip: The bleach solution will be drawn into the conditioner during the regeneration process.**

# Understanding the Control

## Power On LED

When power is applied to the control and the microprocessor is operating properly, a green LED will be “on”.

## Service Required

If the “service required” message displays in the window of the control, a fault has occurred on the computer board (also known as a corrupt signal). In most cases, reprogramming the computer board will clear this message from the window. If the window does not clear, other checks must be made to the switches, boards, and parts.

## Blinking Items

Digits blinking at the rate of 0.5 seconds “on” and 0.5 seconds “off” can be changed by pressing and releasing the **Up** or **Down Arrow**. The values can be increased or decreased by pressing the two arrow keys.

A message blinking at the rate of 1 second “on” and 1 second “off” cannot be changed.

## Real-Time Clock

A real-time clock maintains the time of the day when line power is applied to the control. The time of day is maintained by a super capacitor for a minimum of 2 hours following the loss of line power.

If line power is lost for an extended period of time, the super capacitor will lose its charge and the real-time clock will stop operating. When line power returns the clock will blink, indicating that it needs to be reset. The clock will activate from 8:00 A.M. until it is set to the correct time. A flashing colon indicates that the clock is operating properly.

## Non-Volatile Memory

The computer board configuration parameters are saved in non-volatile (E2PROM) memory. The non-volatile memory has a minimum of 100,000 erase/write-cycle capability and stores settings such as: hardness, capacity, and volume.

In the occurrence of a power outage, the non-volatile memory will hold this important setting information. The time of day, however, will need to be reset if the power interruption has lasted longer than 2 hours. See “Real-Time Clock” for more information.

## Corrupt Programming Parameters

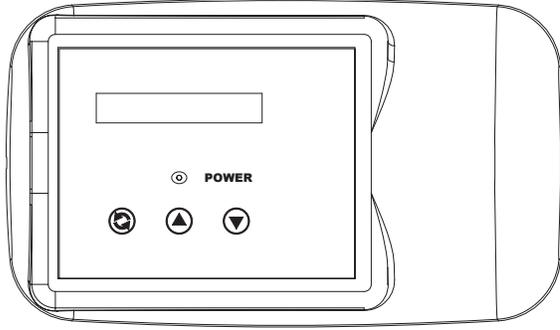
This corrupt mode signifies that somehow the computer board received an incorrect signal and rejected that signal. The corrupt memory will register and record the error to non-volatile memory.

## Regeneration

Once an immediate regeneration is requested, a complete regeneration must occur to clear the request. Once the regeneration starts, it must finish or the computer board will not clear. Manually scroll the control through regeneration to clear the computer board. If the regeneration is aborted and the request is not cleared, another immediate regeneration will occur.

To activate high-speed motor operation, press the **Scroll Button** while the control is in regeneration.

# Programming the Control



- ⌂ **Scroll Button:** Used to advance through the parameters
- ▲ **Up Arrow:** Used to adjust the value of the parameters
- ▼ **Down Arrow:** Used to adjust the value of the parameters

## Installer Settings

To begin programming, the control must be in the Service position. The Service position is displayed as:

**Time of Day    Gallons (US) or Liters (Metric) Remaining**

To access the Installer Settings, press and hold the **Scroll Button** for 5 seconds; the control will display:

**System Check**

- Within 10 seconds, press the **Up Arrow**; the control will display:

**HardUnit: grains (US) or °F (Metric)**

- Press the **Scroll Button** to advance to the next setting; the control will display:

**ExCap: 30000gr/CF (US) or 5.2 °F M3 (Metric)**

- Press the **Up** or **Down Arrow** to change the capacity of softened water between regenerations. US setting range for grains: 1000–45000; Metric setting range for °F: 0.1–9.9.
- Press the **Scroll Button** to advance to the next setting; the control will display:

**Resin: 1.0 CuFt (US) or 20 Liters (Metric)**

- Press the **Up** or **Down Arrow** to change the resin amount. US setting range for cubic feet: 0.1–6.5; Metric setting range for liters: 1–150.
- Press the **Scroll Button** to advance to the next setting; the control will display:

**Override: OFF (US) or 4 days (Metric)**

- Press the **Up** or **Down Arrow** to change the number of days between regenerations. The setting range is OFF–30 days.
- Press the **Scroll Button** to advance to the next setting; the control will display:

**Cycle 1: 10 min**

- Press the **Up** or **Down Arrow** to change the length of the backwash cycle. The setting range is 0–20 minutes.

- Press the **Scroll Button** to advance to the next setting; the control will display:

**Cycle 2: 60 min**

- Press the **Up** or **Down Arrow** to change the length of the brine/slow rinse cycle. The setting range is 0–120 minutes.
- Press the **Scroll Button** to advance to the next setting; the control will display:

**Cycle 3: 5 min**

- Press the **Up** or **Down Arrow** to change the length of the fast rinse/brine refill cycle. The setting range is 0–65 minutes.
- Press the **Scroll Button** to advance to the next setting; the control will display:

**Regen @ 2:00 AM (US) or 2:00 (Metric)**

- Press the **Up** or **Down Arrow** to change the time of regeneration. US setting range: 12:00 A.M. – 11:59 P.M.; Metric setting range: 0:00 – 23:59.
- Press the **Scroll Button**; the control will display:

**Exit**

- Press the **Up** or **Down Arrow** to exit the Installer Settings.

### Customer Settings

To begin programming, the control must be in the Service position. The Service position is displayed as:

**Time of Day    Gallons (US) or Liters (Metric) Remaining**

- Press the **Scroll Button** to advance to the next setting; the control will display:

**Set: 8:00 AM (US) or 8:00 (Metric)**

- Press the **Up** or **Down Arrow** to set the time of day.
- Press the **Scroll Button** to advance to the next setting; the control will display:

**Set Hardn.: 10 grn (US) or 20 °F (Metric)**

- Press the **Up** or **Down Arrow** to change the setting. US setting range for grains: 1–99; Metric setting range for °F: 1–99.
- Press the **Scroll Button** to advance to the next setting; the control will display:

**Regen in 10 sec**

- If the control is left in this position, the timer will countdown from 10 to 0, initiating a regeneration at 0. To avoid a regeneration, press the **Scroll Button** before the timer reaches 0.
- Press the **Scroll Button** to exit the Customer Settings.

## Understanding the Diagnostics

To check the Diagnostics, the control must be in the Service position. The Service position is displayed as:

**Time of Day    Gallons (US) or Liters (Metric) Remaining**

To access the Diagnostics, press and hold the **Scroll Button** for 5 seconds; the control will display:

**System Check**

- Within 10 seconds, press the **Down Arrow**; the control will display the number of days the system has been in service.

**In Srvc \_ days**

- Press the **Scroll Button** to advance to the next diagnostic; the control will display the number of regenerations since installation.

**# of Regens: \_**

- Press the **Scroll Button** to advance to the next diagnostic; the control will display the total volume of water used since installation.

**TotVol: \_ GL (US) or \_ L (Metric)**

- Press the **Scroll Button** to advance to the next diagnostic; the control will display the average water consumption per day.

**AvgVol: \_ GL/d (US) or \_ L/d (Metric)**

- Press the **Scroll Button** to advance to the next diagnostic; the control will display the maximum volume of water to be used.

**Capacity: \_ GL (US) or \_ L (Metric)**

- Press the **Scroll Button** to advance to the next diagnostic; the control will display the number of computer board resets (used for factory purposes only).

**MP Resets: \_**

- Press the **Scroll Button** to advance to the next diagnostic; the control will display the number of corrupt memory start-ups (used for factory purposes only).

**Memory Resets: \_**

- Press the **Scroll Button** to advance to the next diagnostic; the control will display the computer board software program.

**EZ6UDa uBASICr01 (US) or EZ6MDa uBASICr01 (Metric)**

- Press the **Scroll Button**; the control will display:

**Exit**

- Press the **Up** or **Down Arrow** to exit the Diagnostics.

## Annual Maintenance

The following service procedures must be performed annually:

- Clean out the injector.
- Clean the brine refill flow control.
- Clean the backwash flow control.
- Check the operation of the flow meter; clean the impeller if necessary.
- Check the computer program; reprogram if necessary.
- Verify the correct execution of the program. Please refer to the “Fast System Check” below.
- Test the raw water; reprogram the computer if necessary.
- Verify the minimum (20 psi) and maximum (120 psi) water pressure; install a pressure regulator if necessary.

## Fast System Check

To check if the system is operating properly, proceed as follows:

- Confirm that the system is plugged into an active power supply.
- Confirm that the bypass valve and control are in the Service position.
- Push the **Scroll Button** 3 times; the control will display:

**Regen in 10 sec**

- The timer will countdown from 10 to 0, initiating a regeneration at 0.
- The motor will start and the computer will display:

**Rgn: \_ Cyc1: \_**

- Check the drain line for clear water flow.
- Push the **Scroll Button**; the motor will start and the computer will display:

**Rgn: \_ Cyc2: \_**

- Check the brine line for suction.
- Push the **Scroll Button**; the motor will start and the computer will display:

**Rgn: \_ Cyc3: \_**

- Check the drain line for water flow.
- Push the **Scroll Button**; the motor will start and the computer will display:

**Rgn: 0 Cyc: 0**

- The control will return to the Service position automatically.

 **Helpful Tip: Push the Scroll button to switch the motor to full speed, which will shorten the transfer time to the next cycle.**

# Troubleshooting Guide

Symptom	Cause	Solution
1. <b>Hard (untreated) water to service</b>	<ol style="list-style-type: none"> <li>1. Bypass valve is open.</li> <li>2. Loss of resin.</li> <li>3. Valve is in regeneration.</li> <li>4. Excessive water use.</li> <li>5. Change in raw water hardness.</li> <li>6. System fails to regenerate.</li> <li>7. Valve fails to draw brine.</li> <li>8. Decreasing exchange capacity of resin.</li> <li>9. No salt in the brine tank.</li> <li>10. Leak between the rotor and seal disk.</li> <li>11. Leak at the riser tube.</li> <li>12. Valve body and control head are not synchronized.</li> </ol>	<ol style="list-style-type: none"> <li>1. Close the bypass valve.</li> <li>2. See <b>Symptom 9</b>.</li> <li>3. Wait for the regeneration to complete.</li> <li>4. Check the frequency of regenerations.</li> <li>5. Adjust the settings accordingly.</li> <li>6. See <b>Symptom 2</b>.</li> <li>7. See <b>Symptom 3</b>.</li> <li>8. Clean or replace the resin bed.</li> <li>9. Add salt to the brine tank.</li> <li>10. Check the rotor and seal disk; replace if necessary.</li> <li>11. Verify that the riser tube is seated correctly. Check for cracks in the riser tube; replace if necessary.</li> <li>12. Synchronize the valve body and control head. See page 31 for more information.</li> </ol>
2. <b>System fails to regenerate</b>	<ol style="list-style-type: none"> <li>1. Power supply is plugged into intermittent or dead power source.</li> <li>2. Control is not set properly.</li> <li>3. Drive motor is defective.</li> <li>4. Flow meter is defective.</li> <li>5. Microswitches are defective.</li> <li>6. Computer board is defective.</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect to a constant power source.</li> <li>2. Verify the correct regeneration schedule and reset the control.</li> <li>3. Replace the drive motor.</li> <li>4. Replace the flow meter.</li> <li>5. Replace the microswitches.</li> <li>6. Replace the computer board.</li> </ol>
3. <b>Valve fails to draw brine</b>	<ol style="list-style-type: none"> <li>1. Low inlet pressure.</li> <li>2. Injector and/or injector filter is plugged.</li> <li>3. Drain line or brine line is restricted.</li> <li>4. Leak in the brine line.</li> <li>5. Not enough water in the brine tank.</li> </ol>	<ol style="list-style-type: none"> <li>1. Operating pressure must exceed 20 psi.</li> <li>2. Clean the injector and/or injector filter.</li> <li>3. Remove any kinks or restrictions.</li> <li>4. Check the brine line and connections; replace if necessary.</li> <li>5. See <b>Symptom 7</b>.</li> </ol>
4. <b>Valve cycles continuously</b>	<ol style="list-style-type: none"> <li>1. Defective or shorted microswitches.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the microswitches.</li> </ol>
5. <b>System is using too much salt</b>	<ol style="list-style-type: none"> <li>1. Excessive water in the brine tank.</li> <li>2. System regenerates too frequently.</li> </ol>	<ol style="list-style-type: none"> <li>1. See <b>Symptom 6</b>.</li> <li>2. Check the capacity settings and frequency of regenerations.</li> </ol>

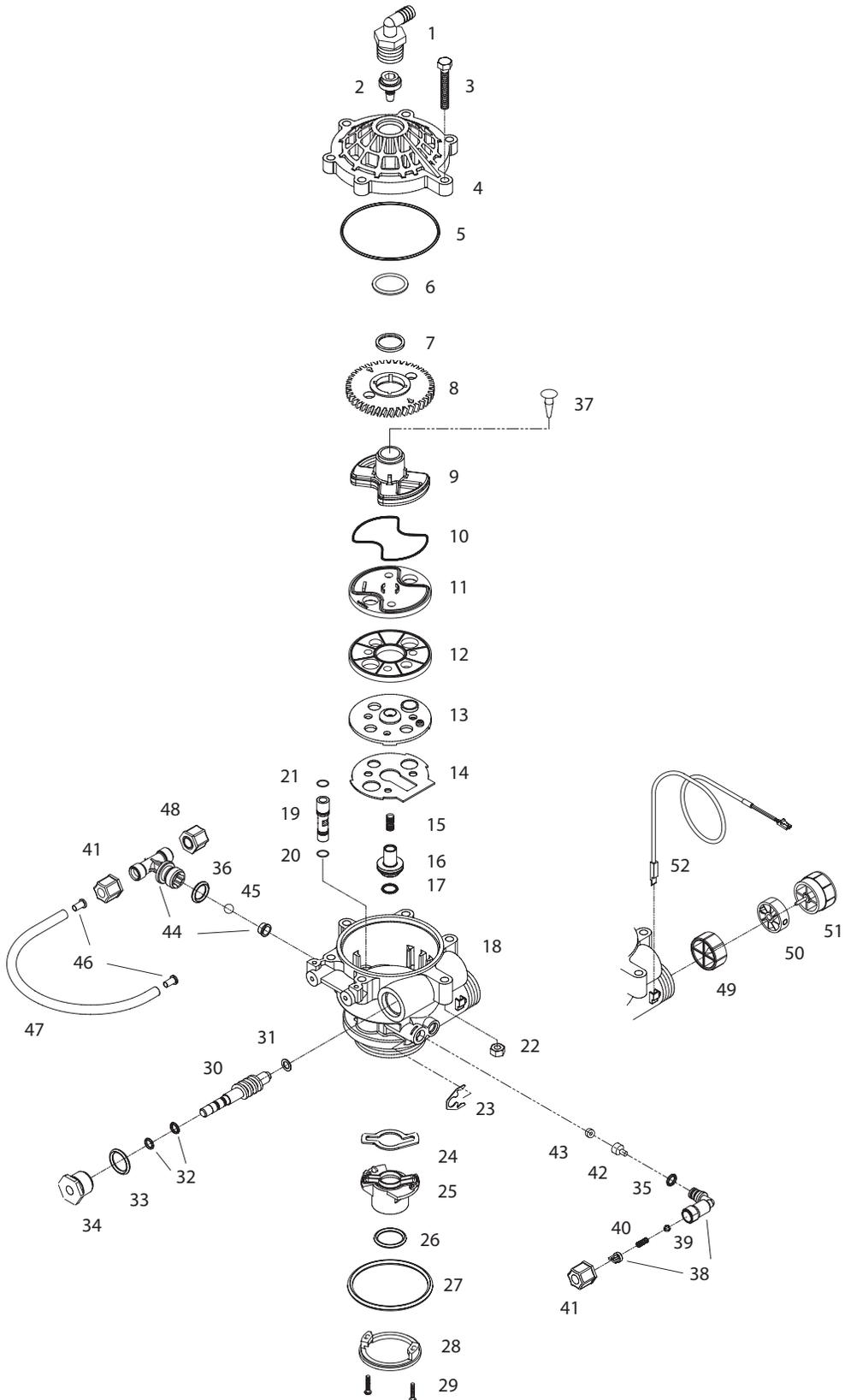
For additional assistance, please contact Erie Technical Support at 800-811-3498/847-758-5910.

# Troubleshooting Guide

Symptom	Cause	Solution
<b>6. Excessive water in the brine tank</b>	<ol style="list-style-type: none"> <li>1. Valve fails to draw brine.</li> <li>2. Improper fast rinse/brine refill time.</li> <li>3. Improper or missing brine refill flow control.</li> <li>4. Leak between the rotor and seal disk.</li> </ol>	<ol style="list-style-type: none"> <li>1. See <b>Symptom 3</b>.</li> <li>2. Verify that the fast rinse/brine refill time corresponds with the salt and resin levels.</li> <li>3. Verify that the brine refill flow control is installed and properly sized. See page 7 for more information.</li> <li>4. Check the rotor and seal disk; replace if necessary.</li> </ol>
<b>7. Valve fails to refill the brine tank</b>	<ol style="list-style-type: none"> <li>1. Blockage in the brine line or brine safety float.</li> <li>2. Improper fast rinse/brine refill time.</li> <li>3. Improper or missing brine refill flow control.</li> <li>4. Plugged brine refill flow control.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove the blockage.</li> <li>2. Verify that the fast rinse/brine refill time corresponds with the salt and resin levels.</li> <li>3. Verify that the brine refill flow control is installed and properly sized. See page 7 for more information.</li> <li>4. Remove the debris.</li> </ol>
<b>8. Salt water to service</b>	<ol style="list-style-type: none"> <li>1. Excessive water in the brine tank.</li> <li>2. Low water pressure.</li> <li>3. Improper brine/slow rinse time.</li> <li>4. Improper fast rinse/brine refill time.</li> </ol>	<ol style="list-style-type: none"> <li>1. See <b>Symptom 6</b>.</li> <li>2. Verify the injector size and rinse time.</li> <li>3. Verify that the brine/slow rinse time corresponds with the salt and resin levels.</li> <li>4. Verify that the fast rinse/brine refill time corresponds with the salt and resin levels.</li> </ol>
<b>9. Loss of resin through the drain line</b>	<ol style="list-style-type: none"> <li>1. Excessive backwash or fast rinse water flow.</li> <li>2. Lower and/or upper distributor is damaged.</li> <li>3. Leak between the riser tube and upper distributor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Verify that the backwash flow control is installed and properly sized. See page 6 for more information.</li> <li>2. Replace the distributor(s).</li> <li>3. Verify that the riser tube is seated correctly. Check for cracks in the riser tube; replace if necessary.</li> </ol>
<b>10. Loss of water pressure</b>	<ol style="list-style-type: none"> <li>1. Mineral or iron build-up in the resin tank.</li> <li>2. Plugged lower and/or upper distributor.</li> <li>3. Crushed lower and/or upper distributor.</li> <li>4. Plugged riser tube.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean the resin bed and control valve. Increase the regeneration frequency.</li> <li>2. Remove the debris.</li> <li>3. Replace the distributor(s).</li> <li>4. Remove the debris and clean the riser tube.</li> </ol>
<b>11. Constant water flow to the drain</b>	<ol style="list-style-type: none"> <li>1. Drive motor failure.</li> <li>2. Computer board failure.</li> <li>3. Defective microswitches.</li> <li>4. Valve body and control head are not synchronized.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the drive motor.</li> <li>2. Replace the computer board.</li> <li>3. Replace the microswitches.</li> <li>4. Synchronize the valve body and control head. See page 31 for more information.</li> </ol>

For additional assistance, please contact Erie Technical Support at 800-811-3498/847-758-5910.

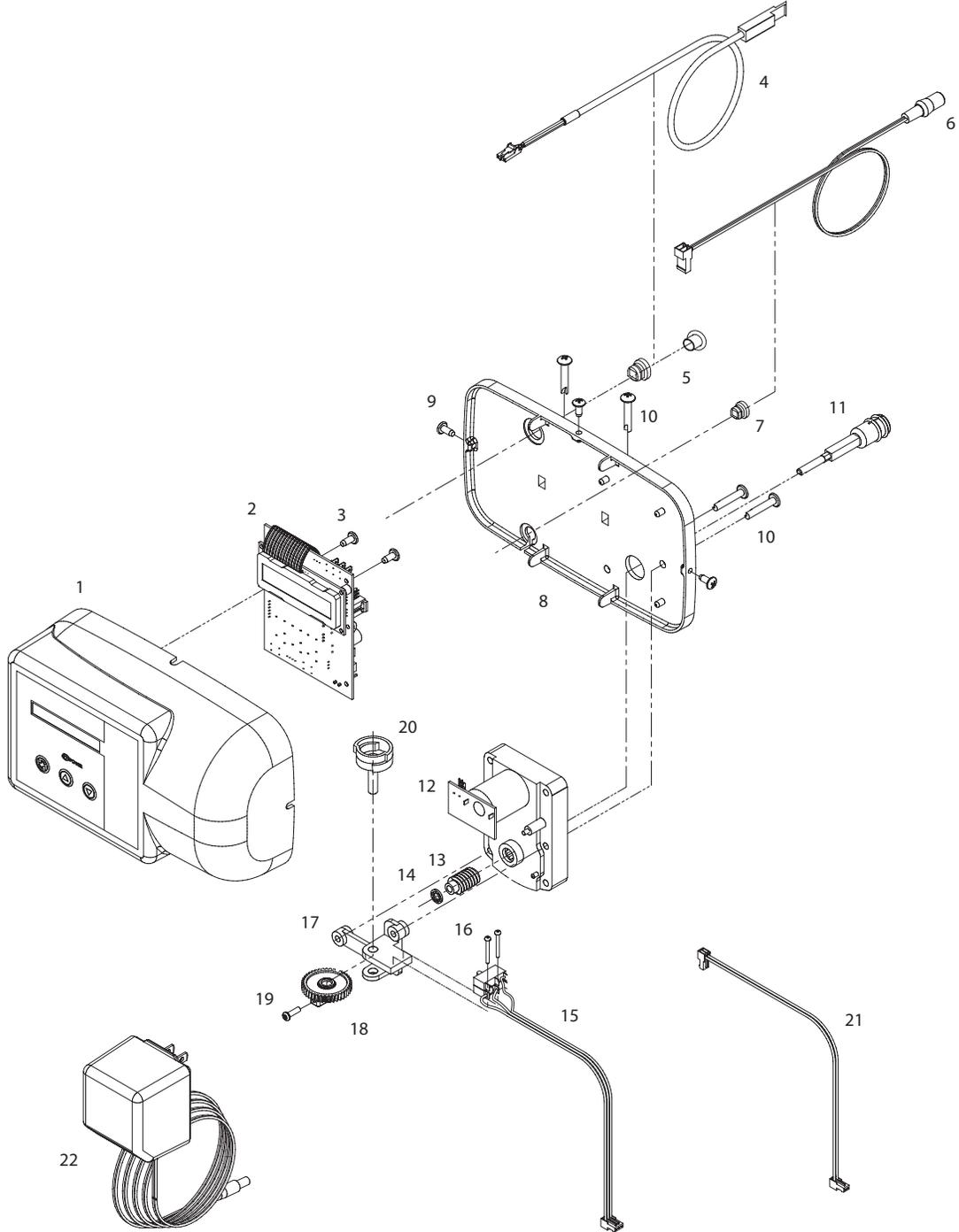
# Valve Exploded View



# Valve Parts List

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	70793	3/4 NPTF TO 1/2 ID MALE ELBOW (OPTIONAL)
2	1	75050, 75051 72174 75052, 75053 71099 72175 75265 75074-75078 72173	<b>BACKWASH FLOW CONTROL</b> 1.6 GPM "E", 1.8 GPM "F" 2.0 GPM "G" 2.2 GPM "H", 2.5 GPM "J" 3.0 GPM "T" 3.5 GPM "K" 4.0 GPM "L" 5.0 GPM "M", 6.0 GPM "N", 7.0 GPM "P", 8.0 GPM "Q", 9.0 GPM "R" 10.0 GPM "S"
3	1	71070	HEX HEAD BOLT 5/16-18 X 2 LG, SS
4	1	71083	VALVE BODY COVER
5	1	70658	VALVE COVER O-RING
6	1	72327	TEFLON WASHER
7	1	70665	TEFLON O-RING
8	1	71089	GEAR
9	1	71087 71088	CAM SHAFT <b>OR</b> CAM SHAFT SPOKELESS
10	1	70656	ROTOR O-RING
11	1	71132	ROTOR PLATE, COATED
12	1	71084	SEAL PLATE COATED
13	1	71182	INSERT PLATE
14	1	71183	INSERT PLATE SEAL
15	1	71006	FLOAT VALVE SPRING
16	1	71127	FLOAT VALVE
17	1	70660	FLOAT VALVE O-RING
18	1	71202	VALVE BODY W/BRINE REFILL TUBE SUBASSEMBLY
19	1	71063, 71064 71066, 71067	<b>INJECTOR</b> #1 RED, #2 YELLOW #4 PURPLE, #5 GREEN
20	1	70655	INJECTOR O-RING, LOWER
21	1	70664	INJECTOR O-RING, UPPER
22	6	71071	HEX NUT 5/16-18, SS
23	1	71947	SPRING CLIP
24	1	71344	RISER INSERT GASKET
25	1	71118	RISER INSERT
26	1	70662	RISER INSERT O-RING
27	1	70663	TANK O-RING
28	1	71010	UPPER BASKET ADAPTER RING
29	2	70630	SCREW #6-19 X 3/4 LG, SS
30	1	71060	WORM DRIVE SHAFT
31	1	70616	WORM DRIVE SHAFT TEFLON WASHER
32	2	70666	WORM DRIVE SHAFT O-RING
33	1	70661	PACKING GLAND O-RING
34	1	71069	PACKING GLAND NUT 15/16-12 THREAD
35	1	70667	O-RING
36	1	70659	O-RING
37	1	70932	UMBRELLA CHECK VALVE (FOR OVERHEAD DRAINS)
38	1	71124	BRINE REFILL ELBOW & RETAINER
39	1	71961	BRINE REFILL CHECK BALL
40	1	70984	BRINE REFILL ELBOW SPRING
41	2	13490	COMPRESSION NUT FOR 3/8 TUBE, JACO C-0-6-BLK
42	1	71184	BRINE REFILL FLOW CONTROL INSERT
43	1	71728, 70994, 70995	<b>BRINE REFILL FLOW CONTROL WASHER</b> 0.25 GPM, 0.50 GPM, 1.0 GPM
44	1	71129	BRINE TEE & RETAINER
45	1	70871	BRINE TEE CHECK BALL
46	2	12625	3/8 TUBE SUPPORT
47	1	13604	TUBING, 3/8 O.D. X 0.25 I.D. X 12L, LLDPE
48	1	70797	COMPRESSION NUT FOR 3/8 TUBE, JACO PG-6-N-BLK
49	1	72548	FLOW METER DIFFUSER
50	1	72544	FLOW METER IMPELLER ASSEMBLY W/BUSHING
51	1	72545	FLOW METER HUB ASSEMBLY
52	1	72519	FLOW METER SENSOR & CABLE (INCLUDED IN CONTROL HEAD)

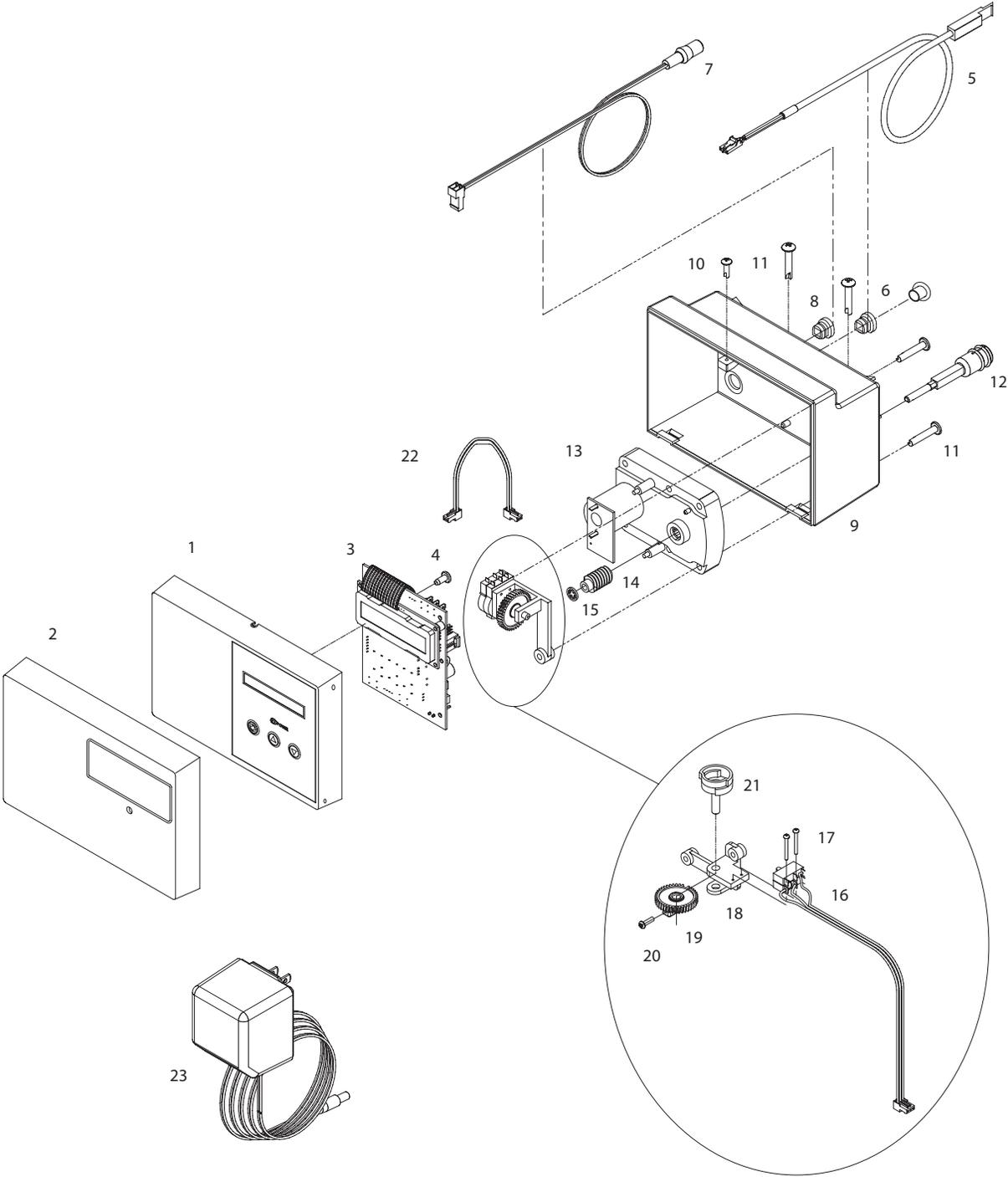
# Control Exploded View — Standard Cover



## Control Parts List — Standard Cover

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	72614 72635	FRONT COVER SUBASSEMBLY, BLACK <b>OR</b> FRONT COVER SUBASSEMBLY, WHITE
2	1	72624 72627	NGC BOARD ASSEMBLY, PROGRAM EZ6UDA <b>OR</b> NGC BOARD ASSEMBLY, PROGRAM EZ6MDA
3	2	70618	SCREW #4-24 X 3/8 LG SELF-THREADED (INCLUDED IN ITEM 1)
4	1	72519	FLOW METER SENSOR & CABLE
5	1	72134	BUSHING, HEYCO SR5P-4
6	1	70971	POWER LEAD
7	1	70312	BUSHING, HEYCO SR2P-4
8	1	70962 72340	BACK PLATE, BLACK <b>OR</b> BACK PLATE, WHITE
9	3	71502	SCREW #8-18 X 3/8 LG SELF-THREADED
10	4	71497	SCREW #10-16 X 1 LG BT SS SELF-THREADED
11	1	70720	DRIVE SHAFT
12	1	72261	DRIVE MOTOR SUBASSEMBLY
13	1	71075	WORM
14	1	70668	RETAINING RING
15	1	72451	MICROSWITCHES SUBASSEMBLY
16	2	70622	SCREW #2-28 X 3/4 LG SELF-THREADED
17	1	71185	BRACKET
18	1	71106	HUB & GEAR
19	1	70625	SCREW #6-32 X 7/16 LG
20	1	70965	CAM & SHAFT
21	1	71679	MOTOR LEAD
22	1	72138	TRANSFORMER 120VAC, 833 MA
-	1	70876	CABLE CLAMP (ATTACHED TO BACK PLATE ITEM 8)
-	1	72168	SERIAL NUMBER LABEL (ATTACHED TO BACK PLATE ITEM 8)

# Control Exploded View — Flip Cover



## Control Parts List — Flip Cover

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	72254	FLIP COVER SUBASSEMBLY, WHITE
2	1	72237	HINGE COVER (INCLUDED IN ITEM 1)
3	1	72624 72627	NGC BOARD ASSEMBLY, PROGRAM EZ6UDA <b>OR</b> NGC BOARD ASSEMBLY, PROGRAM EZ6MDA
4	1	70618	SCREW #4-24 X 3/8 LG SELF-THREADED (INCLUDED IN ITEM 1)
5	1	72519	FLOW METER SENSOR & CABLE
6	1	72134	BUSHING, HEYCO SR5P-4
7	1	70971	POWER LEAD
8	1	72250	BUSHING, HEYCO SR4K-4
9	1	72497	CONTROL HOUSING
10	1	70618	SCREW #4-24 X 3/8 LG SELF-THREADED
11	4	71497	SCREW #10-16 X 1 LG BT SS SELF-THREADED
12	1	70720	DRIVE SHAFT
13	1	72261	DRIVE MOTOR SUBASSEMBLY
14	1	71075	WORM
15	1	70668	RETAINING RING
16	1	72451	MICROSWITCHES SUBASSEMBLY
17	2	70622	SCREW #2-28 X 3/4 LG SELF-THREADED
18	1	71185	BRACKET
19	1	71106	HUB & GEAR
20	1	70625	SCREW #6-32 X 7/16 LG
21	1	70965	CAM & SHAFT
22	1	71679	MOTOR LEAD
23	1	72138	TRANSFORMER 120VAC, 833 MA
-	1	70876	CABLE CLAMP (ATTACHED TO HOUSING ITEM 9)
-	1	72168	SERIAL NUMBER LABEL (ATTACHED TO HOUSING ITEM 9)

# Disassembly Instructions

## Before Servicing the Equipment

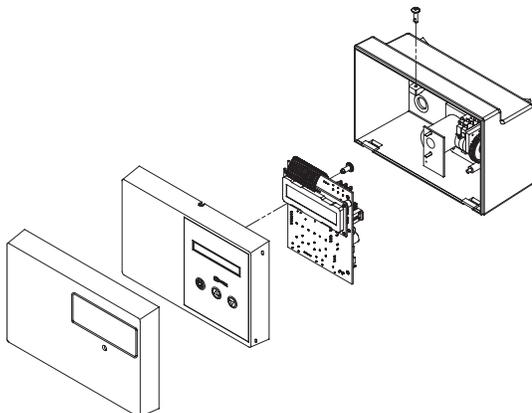
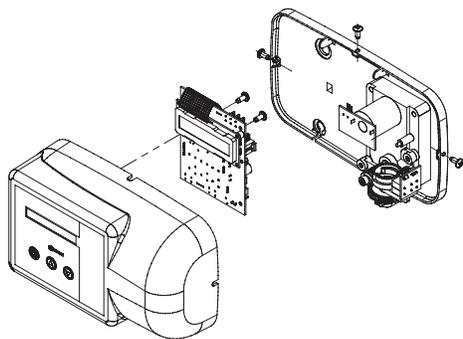
- The control must be in the Service position.
- Disconnect all electrical power to the unit.
- Bypass or disconnect the water supply.
- Relieve the water pressure.

## Required Tools for Service

- Phillips screwdriver
- Needle-nose pliers
- Adjustable wrench
- Small standard screwdriver
- $\frac{3}{8}$  inch Allen wrench

## Replacing the Computer Board

- Disconnect all electrical power to the unit.
- Loosen the screw(s) and remove the front cover.
- Disconnect all wire connections from the computer board.
- Remove the membrane strip from the push-in connection on the computer board.
- Remove the screw(s) holding the computer board in place.
- Push aside the clips holding the computer board in place (standard cover) and remove the computer board.
- Reverse the procedure for reassembly.



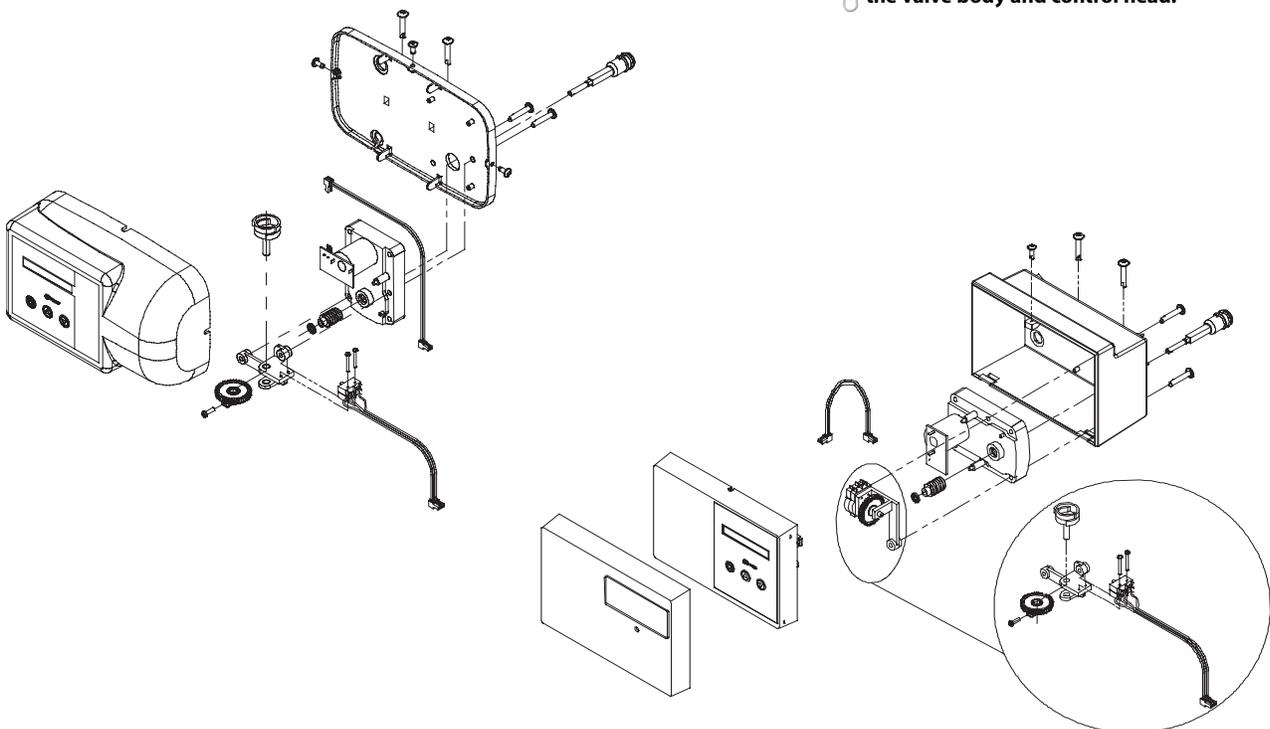
## Replacing the Drive Components

- Disconnect all electrical power to the unit.
- Remove the screw holding the flow meter sensor in place and remove the flow meter sensor.
- Remove the control mounting screws and take away the control head assembly. Loosen the front cover screws and remove the front cover.
- Disconnect the wires from the drive motor assembly and micro-switch assembly.
- From the back plate housing, remove the screws holding the drive motor assembly in place and remove the microswitch assembly and drive motor assembly.
- Remove the retaining ring (securing the worm) and the worm from the drive shaft. Pull the drive shaft out of the drive motor assembly.
- To replace the cam shaft and/or hub gear, remove the screw and lift out the parts. To replace the microswitch assembly, remove the screws from the top of the assembly.
- Reverse the procedure to reassemble the cam shaft, hub gear, and microswitch assembly.
- Reinstall the drive shaft into the drive motor assembly with the flat side on the drive shaft pointing down (mark on the drive shaft pointing up).
- Reinstall the worm onto the drive shaft and install the retaining ring to secure the worm.
- Put the microswitch assembly onto the drive motor assembly.
- Install the microswitch assembly and drive motor assembly onto the back plate housing and secure it with the screws.
- Connect the wires to the drive motor assembly and microswitch assembly.
- Reverse the remaining steps for reassembly (see **Helpful Tip**).

 **Helpful Tip:** The small PCB board is soldered onto the drive motor assembly.

 **Important Note:** The microswitch assembly and cam shaft must be in the Service position.

 **Helpful Tip:** See page 31 to re-synchronize the valve body and control head.

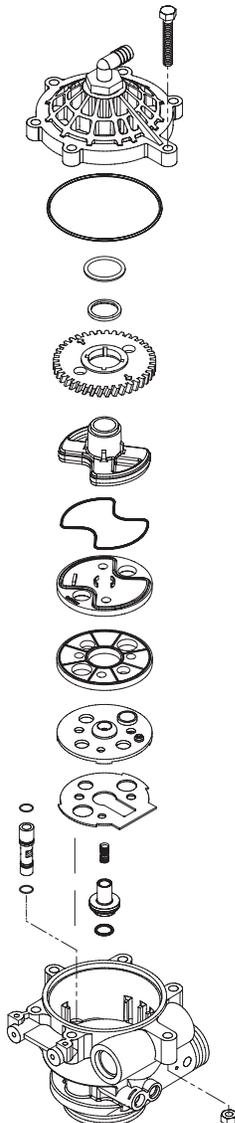


## Replacing the Rotor, Seal Disk, Float Valve, Gasket, & Injector

- Remove the drain hose from the drain elbow.
- Remove the bolts and nuts holding the valve body and cover together; lift the valve cover away from the valve body.
- Remove the worm gear and cam shaft from the valve cover.
- Remove the rotor plate from the valve body and inspect the surface. The rotor plate surface should be smooth and free of any circular grooves or scratches; replace if necessary.
- Remove the seal disk from the valve body. Inspect the seal disk to ensure the raised ribs are intact; replace if necessary.
- Use Dow 111 silicone-based lubricant or equivalent to lubricate the green side of the seal disk.
- Remove the insert plate from the valve body. Inspect the insert plate to ensure the ribs are intact; replace if necessary.
- Remove the gasket from the valve body. Inspect the gasket for wear or damage; replace if necessary.
- Using needle-nose pliers, grasp one side of the injector and pull it straight out of the valve body.

 **Helpful Tip:** The white teflon O-ring will remain in the valve cover.

 **Important Note:** The green teflon coating may be worn off, but this will not affect the sealing performance of the seal disk.

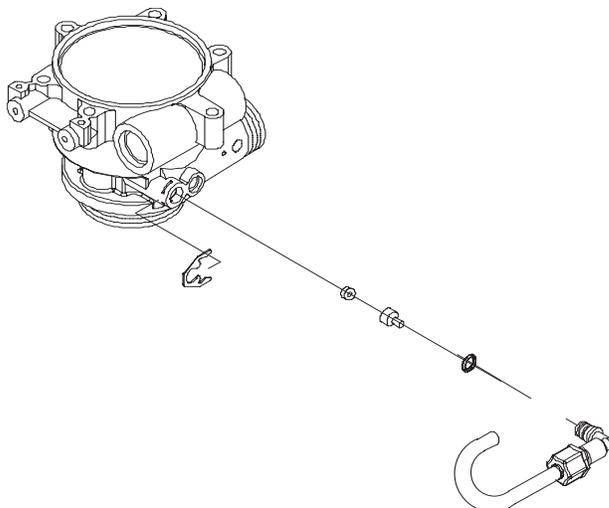


- Clean the inside surface of the valve body.
- Lift the float valve straight out of the float chamber of the valve body and remove the spring from the float valve shaft.
- Clean all sealing surfaces inside the float chamber and reinstall the float valve. Make sure the float valve is straight up in the float chamber of the valve body.
- Reinstall the gasket and insert plate into the valve body.
- Lightly lubricate the O-rings and the new injector with a soapy water solution.
- Install the new injector. Make sure one of the rectangular openings on the injector is facing directly towards the center of the valve body and push down firmly.
- Reinstall the seal disk into the valve body with the green side facing up.
- Reinstall the rotor assembly into the valve body, ensuring that the arrow on the worm gear is pointing directly towards the second tooth on the worm drive shaft (facing the front of the control valve). The 2 holes in the rotor assembly should now be exactly aligned with the corresponding holes in the seal disk.
- Center the washer onto the worm gear.
- Make sure the valve cover O-ring is clean and securely installed around the raised rib of the valve cover.
- Lower the valve cover straight down onto the valve body and press down firmly and evenly to seat the valve cover.
- Reinstall the bolts and nuts; tighten them in a cross pattern.
- Reinstall the drain hose to the drain line elbow.

### Replacing the Brine Refill Flow Control

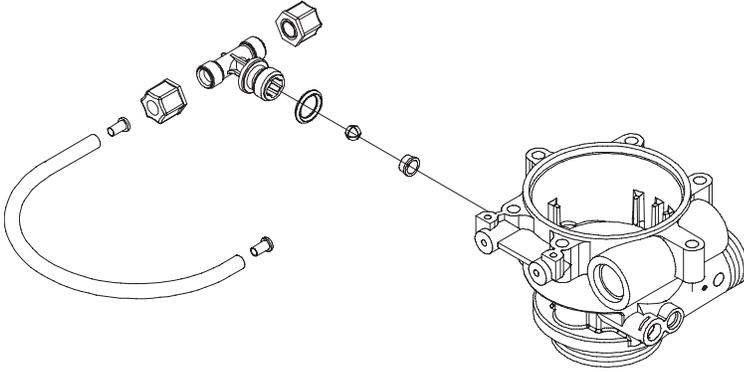
- Remove the spring clip securing the brine refill elbow.
- Remove the brine refill flow control from the brine refill elbow. Inspect the brine refill flow control and washer for blockage and/or debris; clean or replace if necessary.
- Reverse the procedure for reassembly.

 **Helpful Tip: If the spring clip seems loose after reassembly, remove and squeeze it back on with pliers.**



## Replacing the Brine Tee

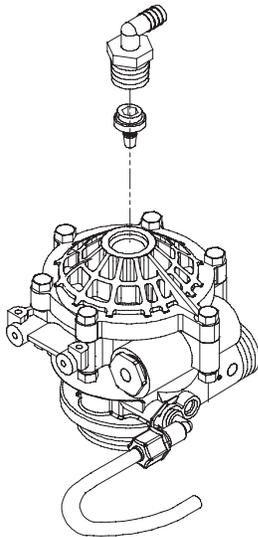
- Remove the compression nut and brine refill tube from the brine tee.
- Remove the brine tee by turning it counter-clockwise.
- Remove the brine tee retainer, O-ring, and check ball from the brine tee. Inspect the parts for wear and/or debris; replace if necessary.
- Reverse the procedure for reassembly.



## Replacing the Backwash Flow Control

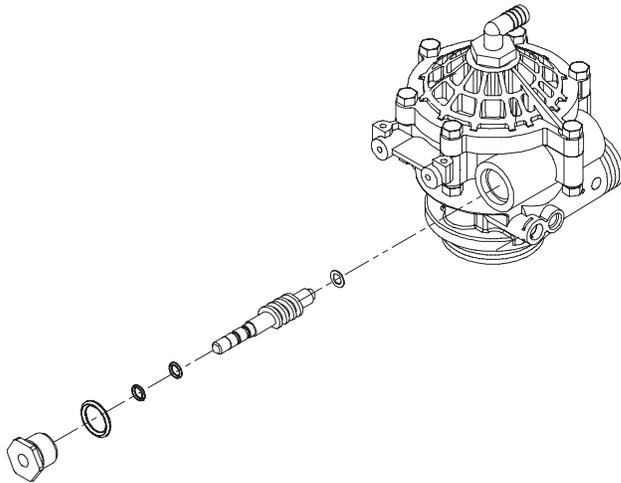
- Remove the drain hose from the drain elbow.
- Unscrew and remove the drain elbow.
- Unscrew the backwash flow control with a  $\frac{3}{8}$  inch Allen wrench. Inspect for wear and/or debris; replace if necessary.
- Reverse the procedure for reassembly (**see Helpful Tip**).

 **Helpful Tip:** See page 31 to re-synchronize the valve body and control head.



## Replacing the Worm Drive Shaft

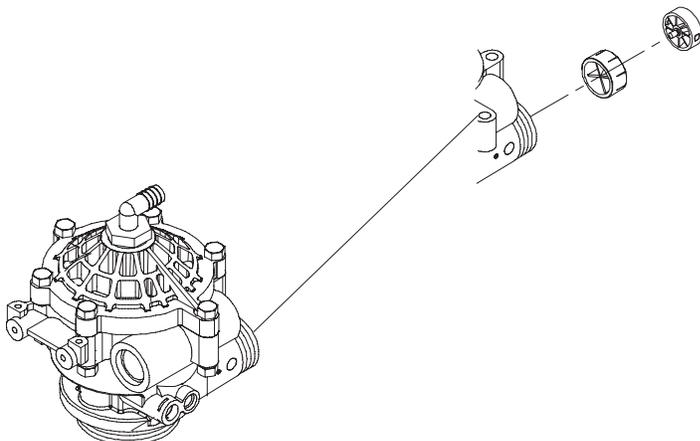
- Disconnect all electrical power to the unit.
- Remove the screw holding the flow meter sensor in place and remove the flow meter sensor.
- Remove the back plate mounting screws and remove the control head assembly.
- Unscrew and remove the packing gland nut/worm drive shaft from the valve body. Separate the packing gland nut from the worm drive shaft.
- Inspect the worm drive shaft. The threads on the worm drive shaft should not be deformed or damaged; replace if necessary.
- Check the worm drive shaft washer for wear and/or damage; replace if necessary.
- Lubricate the O-rings and install the worm drive shaft into the valve body by turning it clockwise.
- Install the packing gland nut over the worm drive shaft and screw it into the valve body.
- Reverse the remaining steps for reassembly.



## Replacing the Impeller

- Remove the bypass valve assembly from the valve body.
- Separate the impeller assembly from the hub with a slot screwdriver. Inspect the impeller assembly; replace if necessary.
- Reverse the procedure for reassembly.

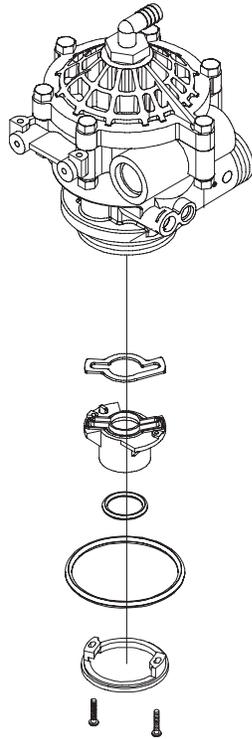
 **Helpful Tip:** The impeller hub will remain pressed into the valve body.



## Replacing the Riser

- Move the bypass valve handles to the Bypass position.
- Relieve the system pressure.
- Disconnect the unit from the bypass connections.
- Remove the unit from the resin tank.
- Remove the adapter screws and the adapter ring.
- Separate the riser assembly from the valve body.
- Clean the riser O-rings and wipe out the valve body cavity.
- Use Dow 111 silicone-based lubricant or equivalent to lubricate the riser O-rings and valve body cavity.
- Reverse the procedure for reassembly.

**! Important Note: Do not use the control head assembly as a handle while rotating the valve.**



## Synchronizing the Control Head & Valve Body

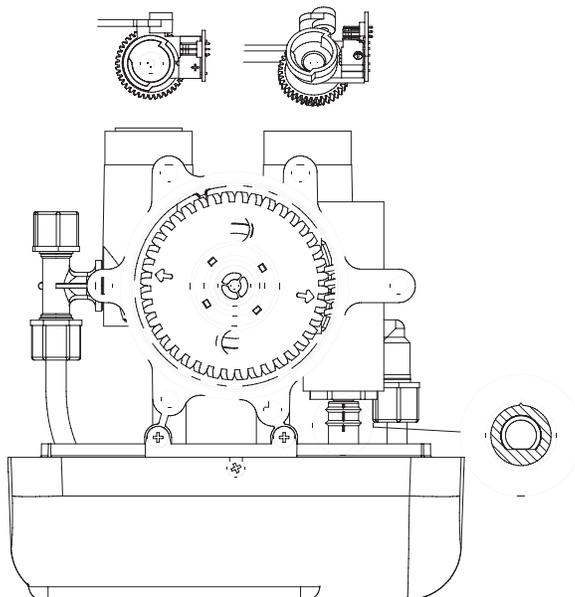
To ensure proper operation of the system, the valve body and control head must be synchronized in the Service position. To achieve synchronization, proceed as follows:

### Control Head

- Loosen the front cover screws and remove the front cover.
- Make sure the switch cam is with the service mark (an arrow) in front; the upper microswitch should be deactivated by the service opening on the upper part of the switch cam. If this is not the case, (1) Loosen the locking screw from the switch cam, (2) Turn the switch cam right, to the correct position, and (3) Secure the locking screw.
- Make sure the flat side on the worm drive shaft is pointing down and the mark on the drive shaft is pointing up. If this is not the case, see “Replacing the Drive Components” on page 25.

### Valve Body

- Remove the drain hose from the drain elbow.
- Remove the bolts and nuts holding the valve body and cover together; lift the valve cover away from the valve body.
- Make sure the arrow on the worm gear is pointing directly towards the second tooth on the worm drive shaft (facing the front of the control valve). The 2 holes in the rotor assembly should now be aligned exactly with the corresponding holes in the seal disk.
- Make sure the valve cover O-ring is clean and installed securely around the raised rib on the valve cover.
- Lower the valve cover straight down onto the valve body and press down firmly and evenly to seat the valve cover.
- Reinstall the bolts and nuts; tighten them in a cross pattern.
- Reinstall the drain hose to the drain line elbow.



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