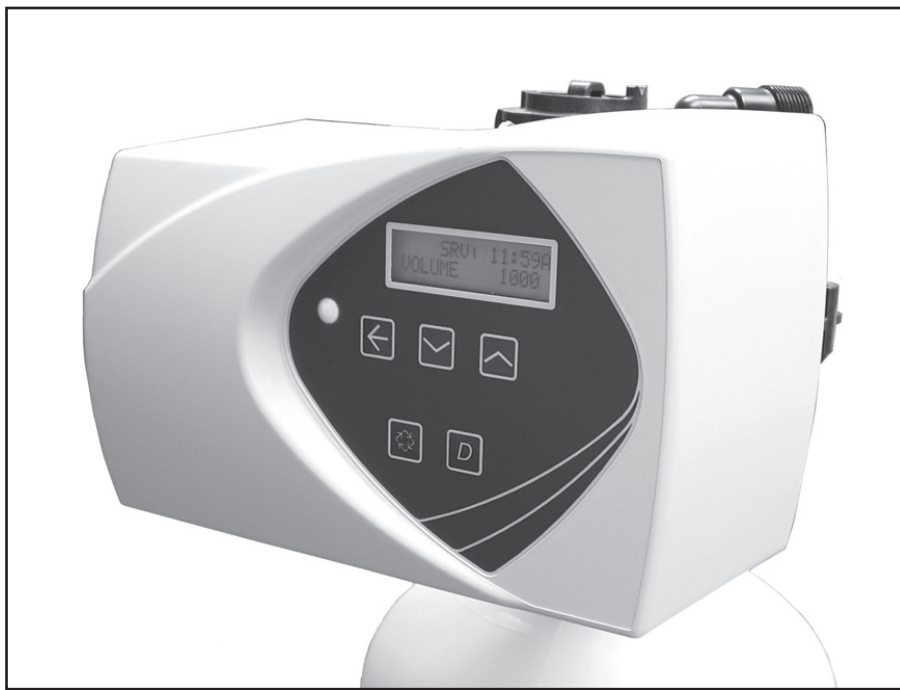


# Model 7000XTR

## *Service Manual*



**IMPORTANT: Fill in Pertinent Information on Page 3 for Future Reference**

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**IMPORTANT PLEASE READ:**

- The information, specifications and illustrations in this manual are based on the latest information available at the time of printing. The manufacturer reserves the right to make changes at any time without notice.
- This manual is intended as a guide for service of the valve only. System installation requires information from a number of suppliers not known at the time of manufacture. This product should be installed by a plumbing professional.
- This unit is designed to be installed on potable water systems only.
- This product must be installed in compliance with all state and municipal plumbing and electrical codes. Permits may be required at the time of installation.
- If daytime operating pressure exceeds 80 psi, nighttime pressures may exceed pressure limits. A pressure reducing valve must be installed.
- Do not install the unit where temperatures may drop below 32°F (0°C) or above 125°F (52°C).
- Do not place the unit in direct sunlight. Black units will absorb radiant heat increasing internal temperatures.
- Do not strike the valve or any of the components.
- Warranty of this product extends to manufacturing defects. Misapplication of this product may result in failure to properly condition water, or damage to product.
- A prefilter should be used on installations in which free solids are present.
- In some applications local municipalities treat water with Chloramines. High Chloramine levels may damage valve components.
- Correct and constant voltage must be supplied to the control valve to maintain proper function.

---

# Job Specification Sheet

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**NOTE: Some options may not be available depending on valve model or other options chosen.**

**Circle and/or Fill in the Appropriate Data for Future Reference.**

**System Type:** Meter Immediate / Time Clock Delayed / Volume Override Delayed  
Volume Override Immediate / Meter Delayed Weekly Reserve  
Meter Delayed Variable Reserve / Meter Delayed Fixed Reserve

**Valve Type:** 7000XTR

**Regenerant Flow:** Down Flow / Filter / Downflow Fill First

**Display Format:** U.S. or Metric (French Degrees, German Degrees, or PPM)

**Unit Capacity:** \_\_\_\_\_ Grains/French Degrees/German Degrees/PPM

**Water Hardness:** \_\_\_\_\_ Grains/French Degrees/German Degrees/PPM

**Capacity Safety Factor:** Zero or \_\_\_\_\_ %

**Volume Override:** \_\_\_\_\_ (Gallons or M<sup>3</sup>)

**Regeneration Day Override:** Off or Every \_\_\_\_\_ Days

**Regeneration Time:** Delayed \_\_\_\_\_ AM/PM or \_\_\_\_\_ Immediate

**Regeneration Cycle Step #1:** \_\_ : \_\_ : \_\_  
**Regeneration Cycle Step #2:** \_\_ : \_\_ : \_\_  
**Regeneration Cycle Step #3:** \_\_ : \_\_ : \_\_  
**Regeneration Cycle Step #4:** \_\_ : \_\_ : \_\_  
**Regeneration Cycle Step #5:** \_\_ : \_\_ : \_\_  
**Regeneration Cycle Step #6:** \_\_ : \_\_ : \_\_

**Auxiliary Relay:** Enabled or Disabled

**Auxiliary Relay Start 1:** \_\_ : \_\_ : \_\_  
**Auxiliary Relay End 1:** \_\_ : \_\_ : \_\_  
**Auxiliary Relay Start 2:** \_\_ : \_\_ : \_\_  
**Auxiliary Relay End 2:** \_\_ : \_\_ : \_\_

**Chemical Pump:** Enabled or Disabled

**CPO Aux Relay Volume:** \_\_\_\_\_ (Gallons or M<sup>3</sup>)

**CPO Aux Relay:** \_\_ : \_\_ : \_\_

**Flow Meter Size:** 1.25" Turbine

**Generic Flow Meter:** Maximum Flow Rate: Add \_\_ Gallons every \_\_ Pulses

---

# Water Softener Control Valve

---

## Water Pressure

A minimum of 20 psi inlet water pressure is required for regeneration valve to operate effectively.

## Electrical Facilities

An uninterrupted alternating current (A/C) supply is required. Make sure:

- Voltage supply is compatible with unit before installation.
- Current supply is always hot and cannot be turned off with another switch.

## Existing Plumbing


Condition of existing plumbing should be free from lime and iron buildup. Replace piping that has heavy lime and/or iron build-up. If piping is clogged with iron, install a separate iron filter unit ahead of the water softener.

## Location of Softener and Drain

Locate the softener close to a clean working drain and connect according to local plumbing codes.


## Bypass Valves

Always provide for the installation of a bypass valve if unit is not equipped with one.

	<p><b>CAUTION</b></p> <ul style="list-style-type: none"><li>•Minimum water pressure 20psig.</li><li>•Maximum water pressure 125psig.</li><li>•Minimum water temperature 34° F.</li><li>•Maximum water temperature 110° F.</li><li>•Ambient temperature 34° to 122° F (1° to 50° C)</li><li>•Disconnect all power sources before servicing.</li><li>•Always operate with cover in place.</li></ul>
---	---

## NOTE:

This product should be installed by qualified personnel.  
Comply with all plumbing codes when installing this product.  
Comply with all electrical codes when installing this product.

	<p><b>WARNING</b></p> <p>The system <b>MUST</b> be depressurized before removing any quick connections for servicing.</p>
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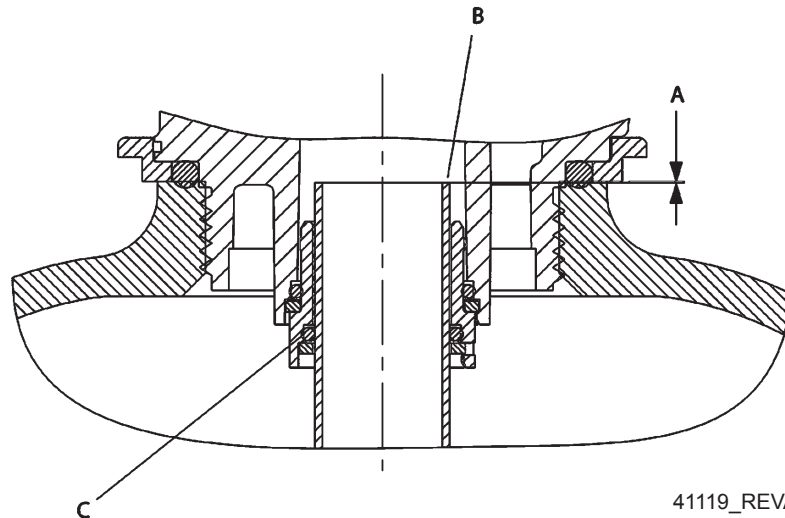
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# Valve Installation and Start-Up Procedures

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## Installation Instructions

1. Place the softener tank where you want to install the unit.  
**NOTE: Be sure the tank is level and on a firm, clean base.**
2. Perform all plumbing according to local plumbing codes.
3. Cut the 1.05" or 32mm distributor tube flush with the top of the tank (A).
  - Deburr the outside of the tube (B) after cutting.
  - Lubricate the o-ring (C) with non-petroleum based grease.
4. Lubricate the distributor O-ring seal and tank O-ring seal.  
Use only non-aerosol silicone lubricant.
5. Load media and place the control valve on the tank.
6. All soldering **MUST** be done on any connections requiring soldering prior to connecting the main control valve.  
The main control valve will be damaged if it is connected at the time of soldering.
7. Apply Teflon tape to all threaded fittings.
8. On units with a bypass, place in **Bypass** position.
  - Turn on the main water supply.
  - Open a cold soft water tap nearby and let water run a few minutes or until the system is free of foreign material (usually solder) resulting from the installation. Close the water tap when water runs clean.
9. Make plumbing connections to valve.
10. Plug the valve into an approved power source.  
**NOTE: Make all electrical connections according to codes.**
11. Place the bypass In Service position. Cycle the valve to the Backwash position, and let the water flow slowly into the mineral tank until the air is purged from the unit.
12. Add water to the brine tank until the top of the air check is covered. Manually step the valve to the Brine Draw Position, and allow the valve to draw water from the brine tank until it stops.  
**NOTE: The air check will check at approximately the midpoint of the screened intake area.**
13. Manually step the valve to the Brine Refill Position, and allow the valve to return to In Service automatically.
14. With the valve In Service, check that there is at least 1" of water above the grid in the brine tank, if used.
15. Fill the brine tank with salt.
16. Allow the control to run automatically. Setup is now complete.

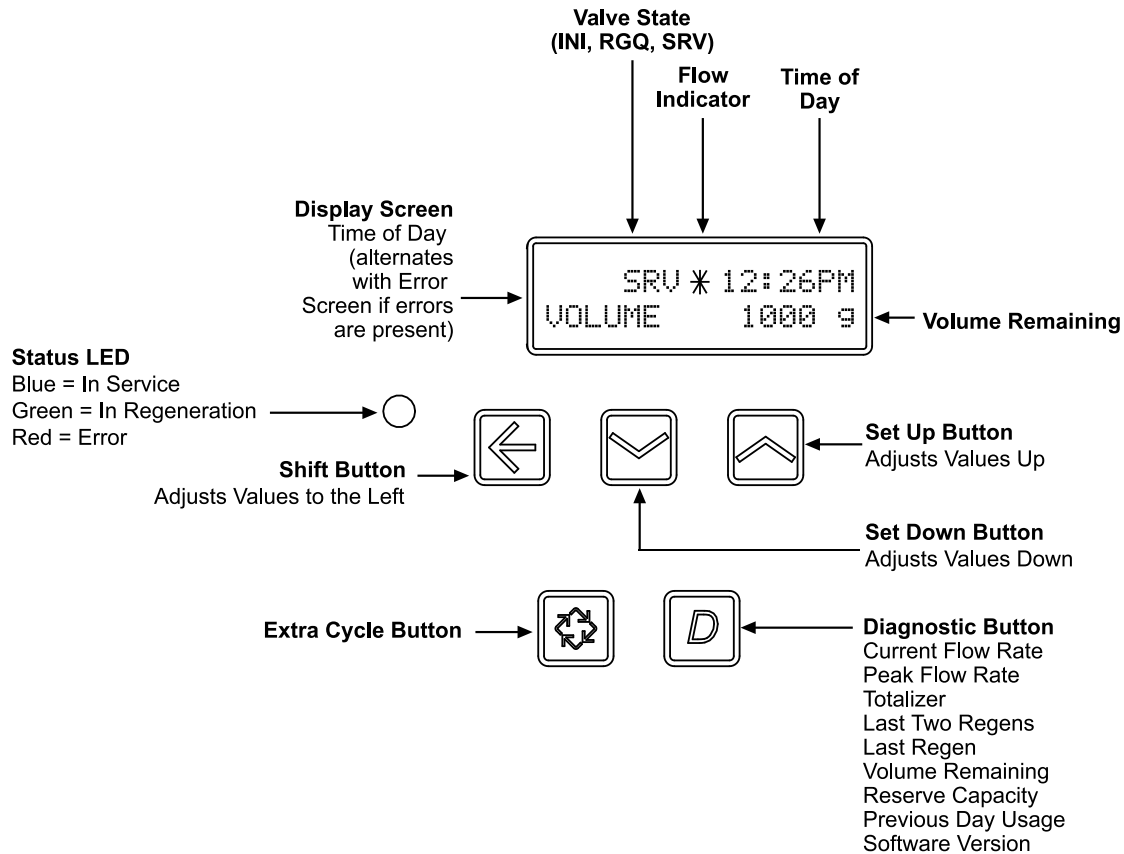


41119\_REVA

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# Timer Operation

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## Valve State:

### INI (Initializing)

INI will display on the screen for 30 to 45 seconds when initializing after a power failure reset or programming.

### RGQ (Regeneration Queued)

RGQ indicates that the reserve has been entered in a delayed system and regeneration has been queued. When in the main screen, press the Shift button to toggle service (SRV) with RGQ.

### Service (SRV)

SRV will display when the unit is in service.

## LED Status Lights:

### Blue LED:

Illuminates while the unit is in service and no errors exist. The unit will always be in service unless a regeneration trigger has occurred (green LED light will be displayed).

### Green LED:

Illuminates when the unit is in Regeneration mode, unless an error condition exists.

### Red LED:

Illuminates when there is an error.

## Flow Indicator:

A rotating line (appearing as a rotating star shape) will display on the screen when flow is going through the meter.

**Regeneration:**

- A time initiated control valve regenerates when the number of programmed days has been reached
- A flow initiated control valve regenerates when the volume count is zero or is below reserve capacity

System Type	Regeneration Trigger
Time Clock Delayed	A) Day override parameter is reached and B) the time of day matches the regeneration day override time
Meter Immediate	Regenerates as soon as the volume remaining has been depleted
Meter Delayed Fixed Reserve	A) Volume remaining has been depleted to the fixed reserve volume and B) the regeneration time has been reached
Meter Delayed Variable Reserve	A) Volume remaining has been depleted to the variable reserve volume and B) the regeneration time has been reached
Meter Delayed Weekly Reserve	A) Volume remaining has been depleted to the weekly variable reserve volume and B) the regeneration time has been reached
Volume Override Immediate	As soon as the programmed volume remaining has been depleted from the tank
Volume Override Delayed	As soon as soon as the programmed volume remaining has been depleted from the tank and the regeneration time has been reached

**Setting the Time of Day**

1. Press and hold the Up or Down button for 2 seconds.
2. Press the Shift button to select the digit you want to modify.
3. Press the Up or Down buttons to adjust the value.
4. Press the Extra Cycle button to return to the normal display screen, or after a 5 second timeout.

**NOTE: The “D” button (Diagnostic) can be pressed to exit without saving.**

**Manually Initiating a Regeneration**

1. When timer is in service, press the Extra Cycle button for 5 seconds on the main screen.
2. The timer advances to Regeneration Cycle Step #1, and begins programmed time count down.
3. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #2 (if active).
4. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #3 (if active).
5. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #4 (if active).
6. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #5 (if active).
7. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #6 (if active).
8. Press the Extra Cycle button once more to advance the valve back to in service.

**NOTE:** A queued regeneration can be initiated by pressing the Extra Cycle button. To clear a queued regeneration, press the Extra Cycle button again to cancel. If regeneration occurs for any reason prior to the delayed regeneration time, the manual regeneration request shall be cleared.

---

# Timer Operation

---

## Queued Regeneration (RGQ)

From the display screen, while the unit is in service, hold down the Extra Cycle button until "RGQ" displays. The valve will regenerate when the set regeneration time has been reached.

## Timer Operation During Regeneration

In the main display screen, the timer shows the current regeneration cycle and the time for that step. The **green LED light** will display when the unit is in regeneration. Once all regeneration steps are complete, the timer returns to in service, and displays a **blue LED light**.

## Timer Operation During Programming

The timer enters program mode (unit must be in service). While in the program mode the timer continues to operate normally, monitoring water usage. Timer programming is stored in memory permanently upon a normal exit from programming mode.

## Timer Operation During A Power Failure

All program settings are stored in permanent memory. Current valve position, cycle step time elapsed, and time of day are stored during a power failure, and will be restored upon power re-application. Time is kept during a power failure, and time of day is adjusted upon power up (as long as power is restored within 12 hours).

**NOTE:** The time of day on the main display screen will flash for 5 minutes when there has been a power outage. The flashing of the time of day can be stopped by pressing any button on the display.

## Regeneration Day Override Feature

If the Day Override option is turned on and the valve reaches the set Regeneration Day Override value, the Regeneration Cycle starts at the programmed regeneration time.

## Flow Meter Equipped Timer

As treated water is used, the Volume Remaining display counts down from the calculated system capacity, less the reserve volume. Once capacity reaches the reserve volume, the system will regenerate based on the set regeneration time. If set for an Immediate system, the unit will regenerate immediately once it reaches zero capacity. If it is a Fixed, Variable, or Weekly reserve, the unit will queue a regeneration (RGQ) and count down Reserve Volume until the set regeneration time.

**NOTE: Reserve Volume is only available in a RGQ system.**

Volume Remaining  
(Less Reserve)

Reserve  
Volume

SRV * 08:45AM
VOLUME 1000G

RGQ * 09:32AM
VOLUME 100G



### WARNING

Transformer must be grounded and ground wire must be terminated to the back plate where grounding label is located before installation.



# Master Programming Mode Flow Chart

NOTE: Depending on current option settings, some displays cannot be viewed or set.



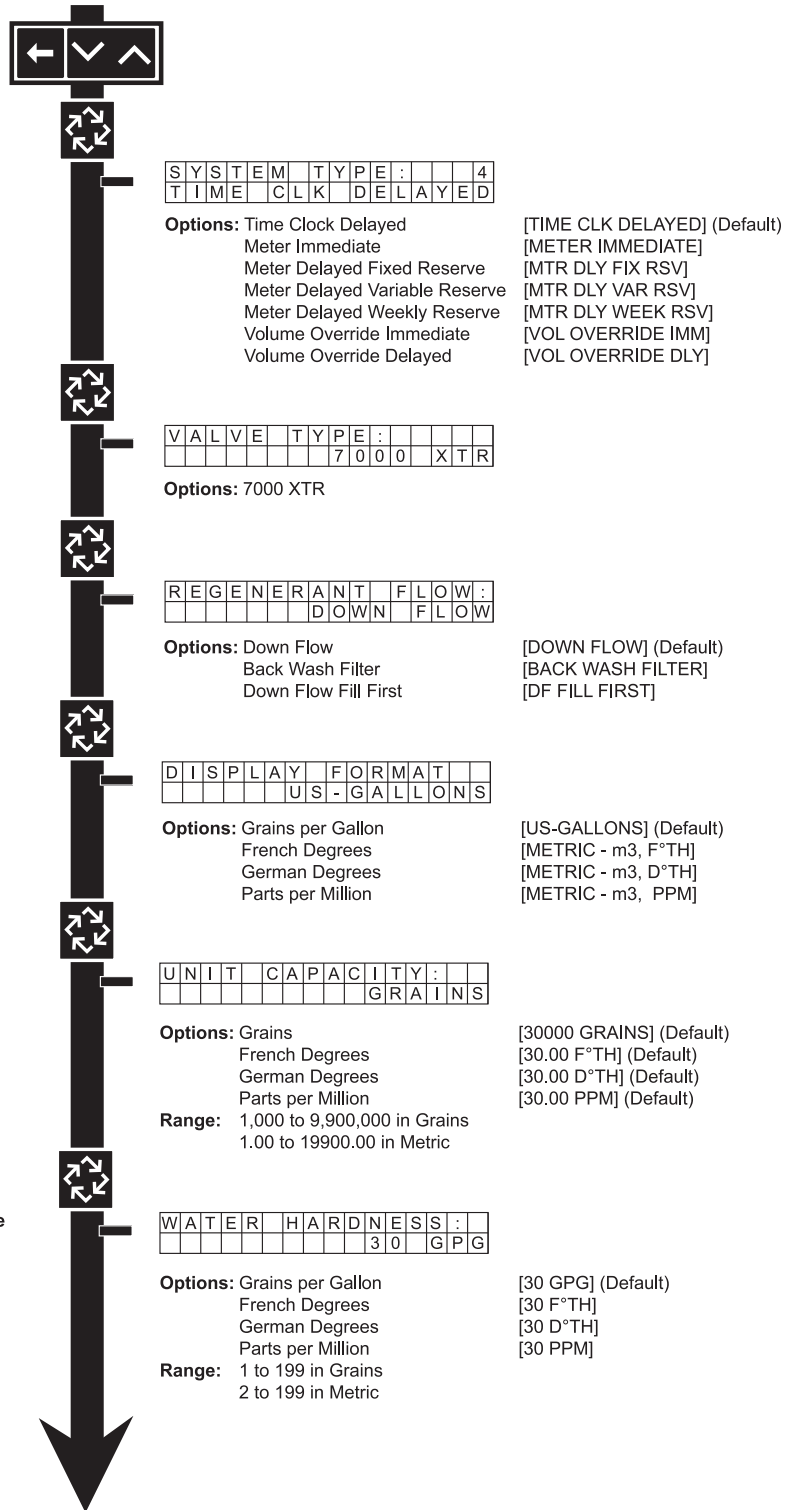
## To Set Time of Day:

Press and hold the Up or Down buttons for 2 seconds. Press the Shift button to select the digit you want to modify.

## Entering Master Programming Mode:

1. Press and hold the Shift and Up buttons for 5 seconds.  
OR
2. Set the Time of Day display to **12:01 P.M. or 12:01HR**. Then go to the main display screen, press the Up and Down buttons at the same time for 5 seconds.

NOTE: Feed Water Hardness will not be shown in Volume Override or Time Clock system types.



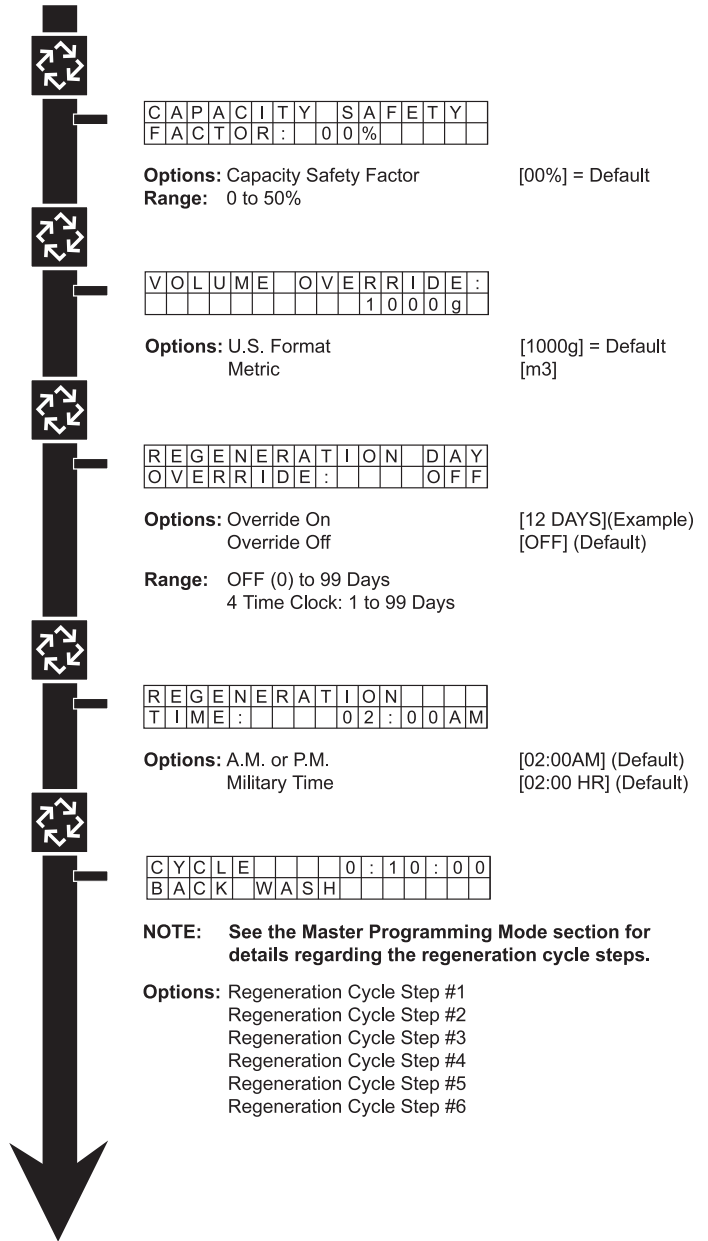
CAUTION: Before entering Master Programming, please contact your local professional water dealer.

# Master Programming Mode Flow Chart

NOTE: Depending on current option settings, some displays cannot be viewed or set.

NOTE: Only shown when System Type is Meter Delayed Fixed Reserve or Volume Override Delayed

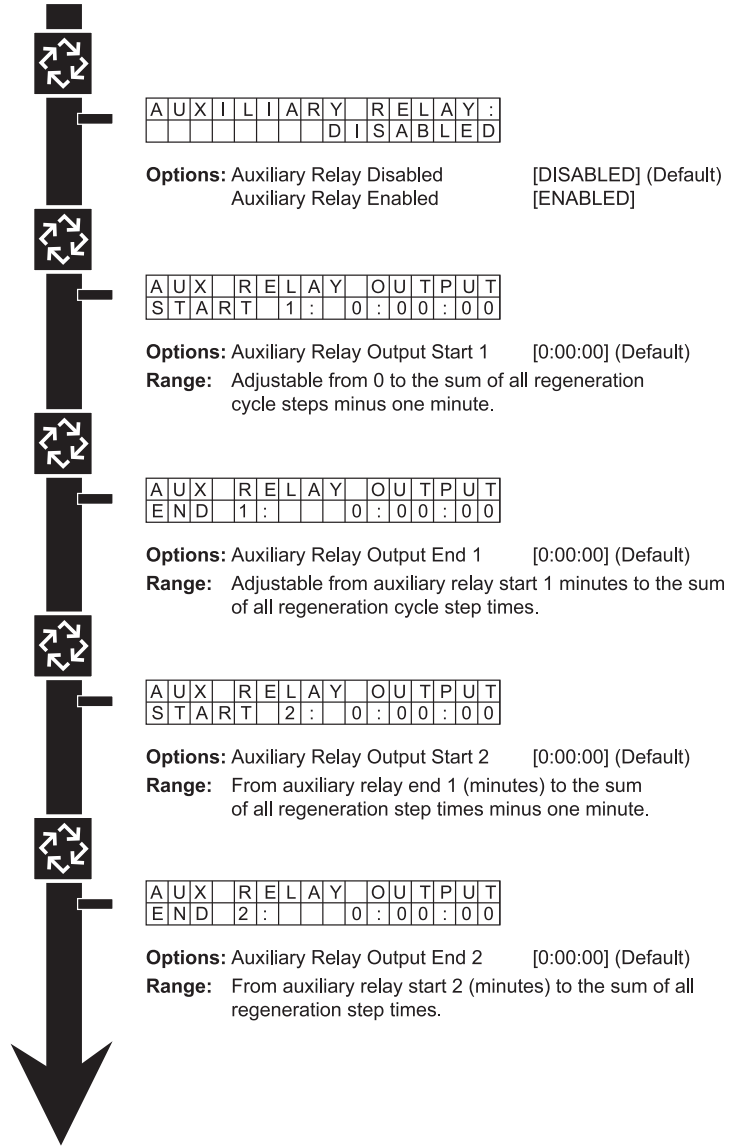
NOTE: Only shown when System Type is Volume Override Immediate or Volume Override Delayed



CAUTION: Before entering Master Programming, please contact your local professional water dealer.

# Master Programming Mode Flow Chart

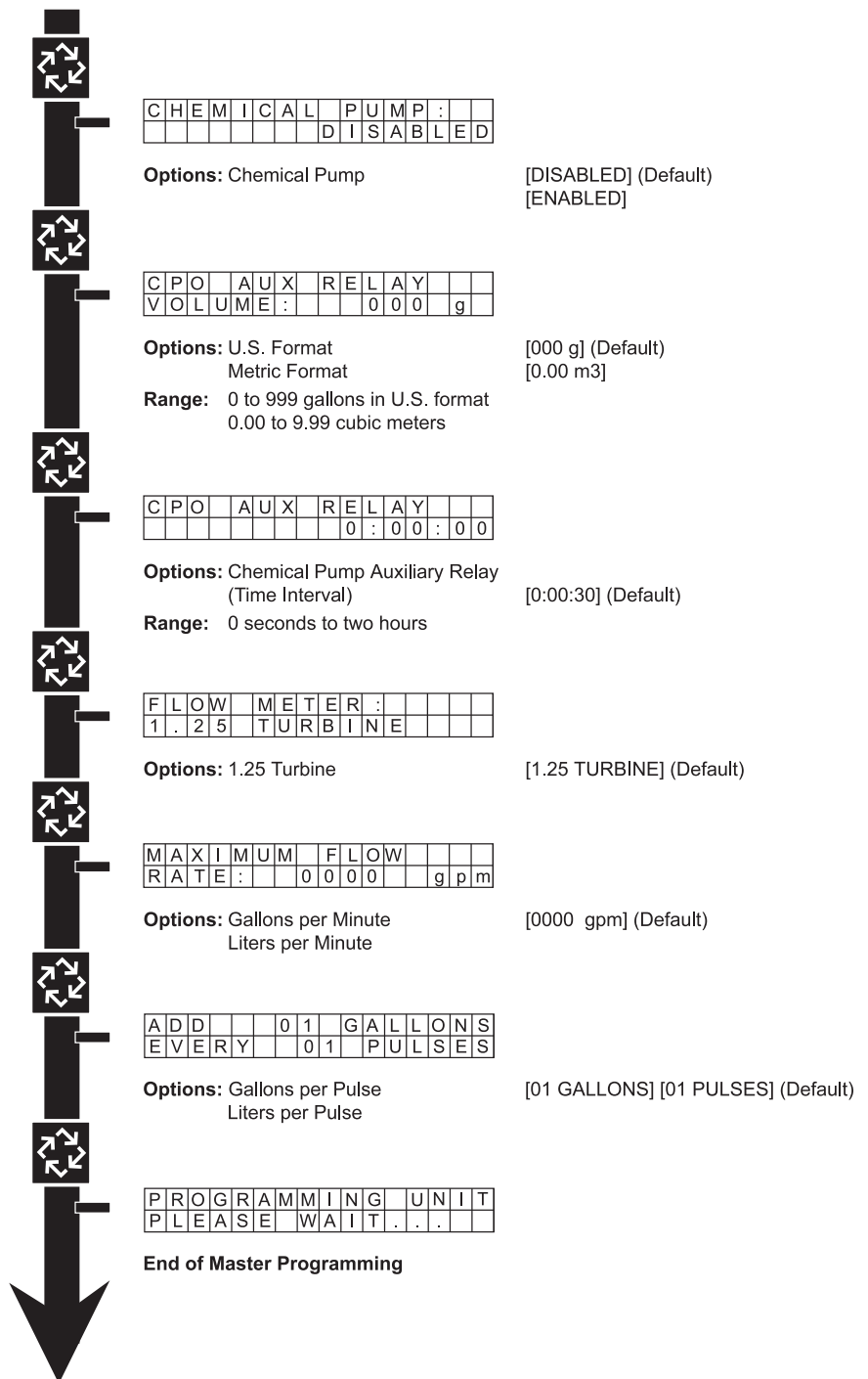
**NOTE:** Depending on current option settings, some displays cannot be viewed or set.



**CAUTION:** Before entering Master Programming, please contact your local professional water dealer.

# Master Programming Mode Flow Chart

NOTE: Depending on current option settings, some displays cannot be viewed or set.



**CAUTION: Before entering Master Programming, please contact your local professional water dealer.**

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# Master Programming Mode

---

When the Master Programming Mode is entered, parameters can be set to make the timer function as needed.

**NOTE: Depending on current option settings, some displays cannot be viewed or set.**

## Entering Master Programming Mode:

1. Press and hold the Shift and Up buttons for 5 seconds.  
OR
2. Set the time of day display to **12:01 PM** or **12:01HR** (See the User Programming section to learn how to set Time of Day). Then go to the main display screen, press the Up and Down buttons at the same time for 5 seconds.

## Exiting Master Programming Mode:

1. Press the Extra Cycle button once per display until all are viewed. Master Programming Mode is exited and the normal display screen appears.
2. To exit the Master Programming Mode without saving, press the Diagnostic button.

**NOTE: If no keypad activity is made for 5 minutes while in the Master Programming Mode, or if there is a power failure, no changes will be made, and the unit will go back to the main display screen.**

## Resets:

**Soft Reset:** Press and hold the Up and Down buttons for 25 seconds until 12:00PM (or 12:00HR) appears. This resets all parameters except for the flow meter totalizer volume.

**Master Reset:** Hold the Extra Cycle button while powering up the unit. This resets all of the parameters in the unit. Check and verify the choices selected in Master Programming Mode.

### 1. System Type

This program step selects the system type.

- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
SYSTEM TYPE:  4
TIME CLK DELAYED
```

### 2. Valve Type

This program step selects the valve type.

- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
VALUE TYPE:
7000 XTR
```

---

**CAUTION: Before entering Master Programming, please contact your local professional water dealer.**

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# Master Programming Mode

---

### 3. Regenerant Flow

This program step selects how the regenerant flows through the tank (must match cam). The selections available will vary depending on the previously chosen valve model.

- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
REGENERANT FLOW:
  DOWN FLOW
```

### 4. Display Format

This program step selects the display format.

- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
DISPLAY FORMAT:
  US - GALLONS
```

### 5. Unit Capacity

This program step selects the timer's total capacity of hardness that can be removed.

- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
UNIT CAPACITY:
  0030000 GRAINS
```

### 6. Feed Water (Hardness)

This program step is used to set the feed water hardness. The system will automatically calculate volume remaining based on the unit capacity, capacity safety factor, and feed water hardness entered.

- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

**NOTE: Feed Water Hardness will not be shown in Volume Override or Time Clock system types.**

```
WATER HARDNESS:
  030 GPG
```

**CAUTION: Before entering Master Programming, please contact your local professional water dealer.**

---

# Master Programming Mode

---

## 7. Capacity Safety Factor

This program step is used to set the reserve capacity of the unit. This is a percentage by which the unit's capacity is reduced.

- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
CAPACITY SAFETY  
FACTOR: 00%
```

## 8. Volume Override

This program step is used to set the volume override of the unit.

- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
VOLUME OVERRIDE:  
0001000 9
```

## 9. Regeneration Day Override

This program step sets the maximum amount of time (in days) the unit can be in service without a regeneration.

- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
REGENERATION DAY  
OVERRIDE: 01 DAYS
```

## 10. Regeneration Time

This program step sets the time of day for the regeneration to occur in delayed systems.

- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
REGENERATION  
TIME: 02:00AM
```

---

**CAUTION: Before entering Master Programming, please contact your local professional water dealer.**

---

# Master Programming Mode

## 11. Regeneration Cycle Step Programming

This program step programs the Regeneration Cycle step times 1 through 6. Please refer to the chart below for regenerant flow default cycle steps and times.

```
CYCLE 1 00:10:00
BACK WASH
```

Regenerant Flow	Cycle 1	Time	Cycle 2	Time	Cycle 3	Time	Cycle 4	Time	Cycle 5	Time
Down Flow	Back Wash	10 Minutes	Brine & Slow Rinse	1 Hour	Rapid Rinse	10 Minutes	Brine Tank Fill	12 Minutes	N/A	N/A

## 12. Auxiliary Relay Output

The next two displays are part of a series of settings used to program the optional relay output. The first setting turns the output on/off during regeneration only. The second turns the output on during service only, every time a set volume of water used has accumulated.

**NOTE: When auxiliary outputs are in the OFF (default) setting, press the Up or Down buttons to set the first setting. Then press the Extra Cycle button to advance to the second setting.**

### a. Timed Auxiliary Relay Output Window (Start & End Time Setting)

This option setting consists of two displays. The first display sets the turn-on time of the output, referenced to the start of the first regeneration cycle. The second display sets the output turn-off time, referenced again to the start of the first regeneration cycle. An OFF setting cancels this setting. All settings are in minutes and output timing is synchronized with regeneration cycle timing.

**Start Time:** Any time during regeneration.

**End Time:** At start time, and anytime during the regeneration cycle.

```
AUXILIARY RELAY:
DISABLED
```

### b. Chemical Pump Auxiliary Relay Output Window

This option setting consists of two displays. The first display sets the volume of water flow at which the output turns on. The second display sets the on time (in seconds) of the output.

- Activate output after volume set is reached.
- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
CHEMICAL PUMP:
DISABLED
```

**CAUTION: Before entering Master Programming, please contact your local professional water dealer.**



---

## Master Programming Mode

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### 13. Flow Meter Size

This program step sets the size of the flow meter.

- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

```
FLOW METER:
  1.25 TURBINE
```

### 14. Maximum Flow Rate

This program step sets maximum flow rate of the generic flow meter.

- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

### 15. Pulses per Gallon/Liter

This program step sets the pulses per gallon/liter for generic flow meters.

- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

### 16. End of Master Programming Mode

**CAUTION:** Before entering Master Programming, please contact your local professional water dealer.

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# User Programming Mode & Flow Chart

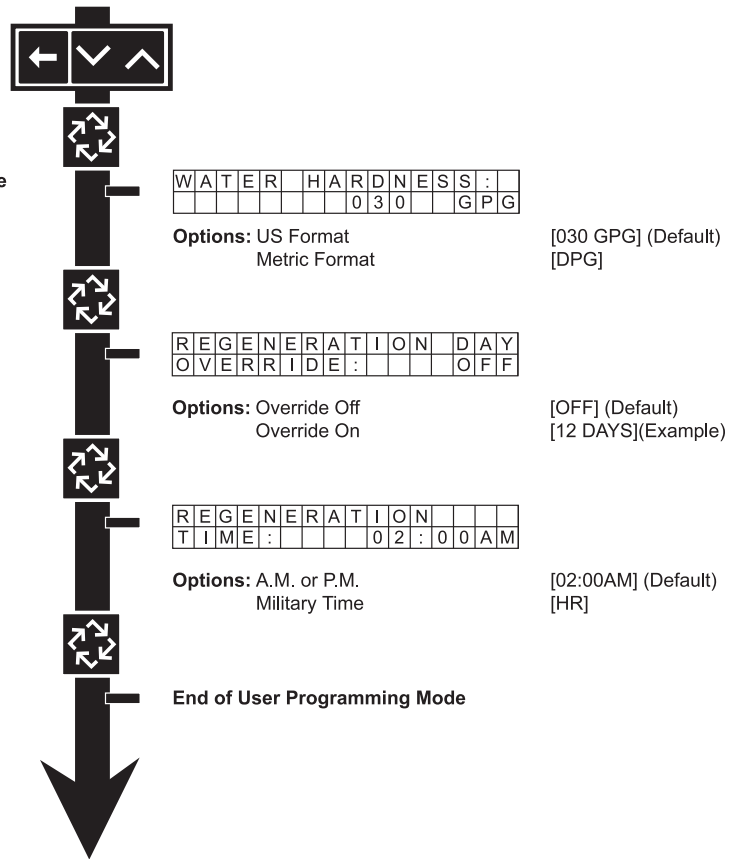
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**NOTE:** Depending on current option settings, some displays cannot be viewed or set.

## Entering User Mode:

Press and hold the Up and Down buttons for 5 seconds.

**NOTE:** Feed Water Hardness will not be shown in Volume Override or Time Clock system types.



**NOTE:** Depending on current option settings, some displays cannot be viewed or set.

### 1. Enter User Mode

- Press and hold the Up and Down buttons for 5 seconds.

### 2. Set Feed Water Hardness

- Press the Shift, Up, and Down buttons to move the cursor and change the value of the numbers.
- Press the Extra Cycle button to proceed to the next step.

**NOTE:** Feed Water Hardness will not be shown in Volume Override or Time Clock system types.

### 3. Set Regeneration Day Override

- To turn on and set the days, press the Down button.
- Press the Shift, Up, and Down buttons to move the cursor and change the value of the numbers.
- Press the Extra Cycle button to proceed to the next step.

### 4. Regeneration Time

- Press the Shift, Up, and Down buttons to move the cursor and change the value of the numbers.
- Press the Extra Cycle button

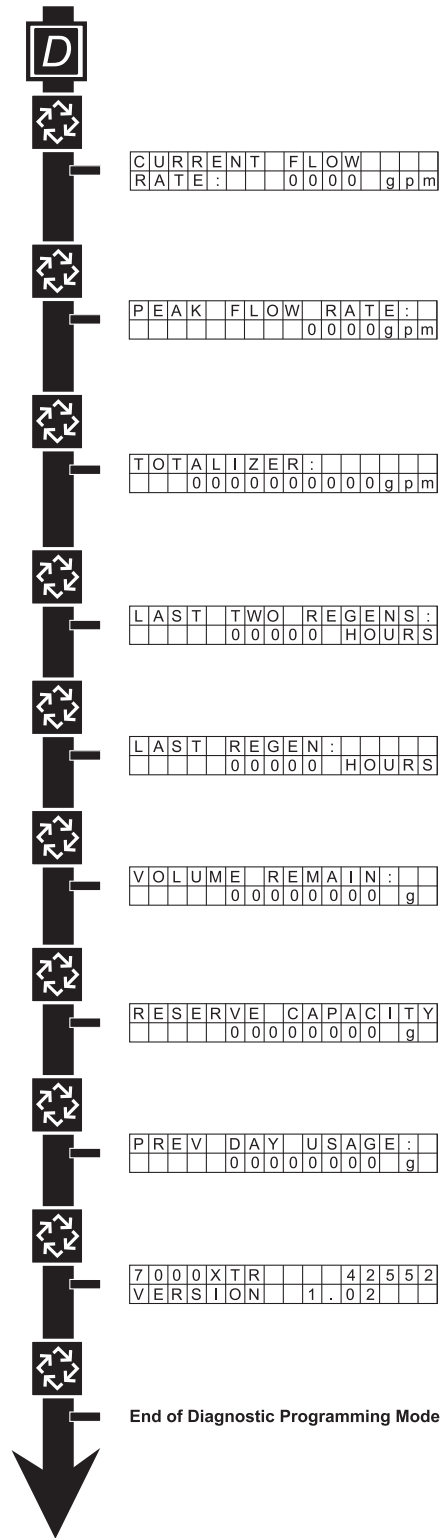
### 5. End of User Programming Mode

# Diagnostic Programming Mode Flow Chart

**NOTE:** Depending on current option settings, some displays cannot be viewed or set.

### Entering Diagnostic Mode:

1. Press and release the "D" button.
2. Press the Extra Cycle button once per display until all displays are viewed and the normal display screen appears.
3. Press and release the "D" button during this mode to exit the Diagnostic Mode.
4. Depending on current option settings, some displays cannot be viewed.



---

# Diagnostic Programming Mode

---

**NOTE:** Depending on current option settings, some displays cannot be viewed.

## Overview Diagnostic Mode

The current Diagnostic Programming Mode screen will display until either the Extra Cycle button is pressed through for each screen, or the Diagnostic button is pressed. In the event of regeneration occurring while in the Diagnostic Programming Mode, the regeneration step and time remaining will be displayed. When regeneration completes, the display will return to the normal time of day display screen.

## Entering and Exiting Diagnostic Mode

Press and release the “D” button to enter the Diagnostic Programming Mode. Pressing the Extra Cycle button will move to the next diagnostic screen. Press the Extra Cycle button once per display until all are viewed. Pressing the Diagnostic button while in Diagnostic Mode will cause the unit to leave the Diagnostic Mode and return to the normal time of day display screen.

### 1. Current Flow Rate

This program step displays the calculated flow rate for the timer. The below flow rates are the maximum flow rate the timer will read for each meter.

**1.25” Turbine:** 90 gpm (0.34 m<sup>3</sup>/m)

— Press the Extra Cycle button.

### 2. Peak Flow Rate

This program step displays the peak flow rate (1 minute average) since the last regeneration.

— Press the Extra Cycle button.

### 3. Totalizer

This program step displays the total volume of treated water that passes through the meter.

— Reset to zero by holding the Up and Down buttons for five seconds while in the totalizer screen.

— Press the Extra Cycle button.

### 4. Hours Between Last Two Regenerations

This program step displays the time between the last two regenerations saved.

— Press the Extra Cycle button.

### 5. Hours Since Last Regeneration

This program step displays the hours since the last regeneration.

— Press the Extra Cycle button.

### 6. Volume Remaining

This program step displays the volume remaining. The timer will regenerate if the volume remaining is set to zero. The maximum ranges are the same as the maximum volume calculated on the main screen.

— Press the Extra Cycle button.

### 7. Reserve Capacity

This program step displays the reserve capacity, ensuring soft water is available at all times.

— Press the Extra Cycle button.

### 8. Previous Day’s Water Usage

This program step displays the previous day’s water usage.

— Press the Extra Cycle button.

### 9. Software Version

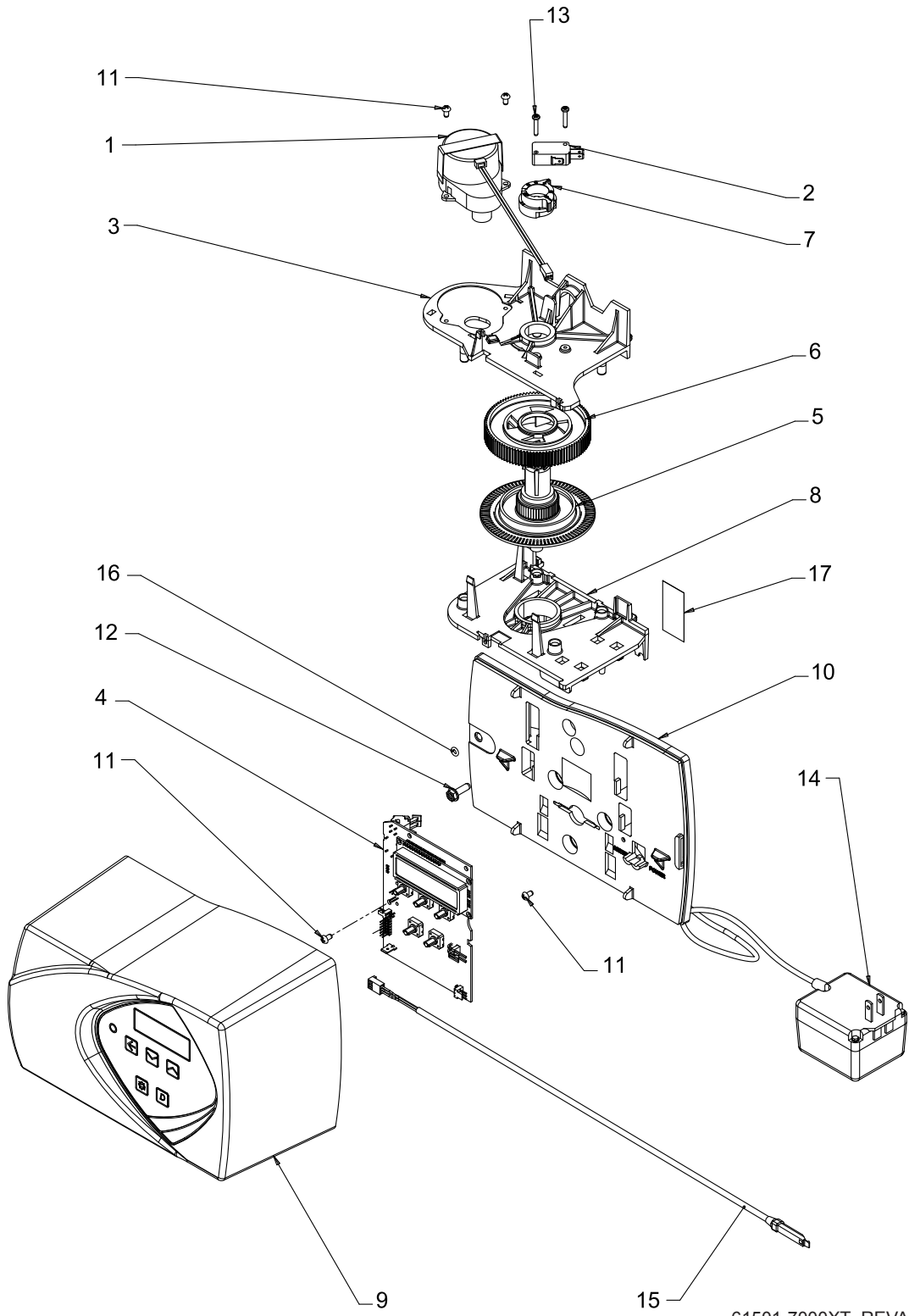
This program step displays the timer’s software program version number.

— Press the Extra Cycle button to exit.

**NOTE:** Diagnostic Programming Mode will stop if the system goes into a regeneration.



# Power Head Assembly



61501-7000XT\_REVA

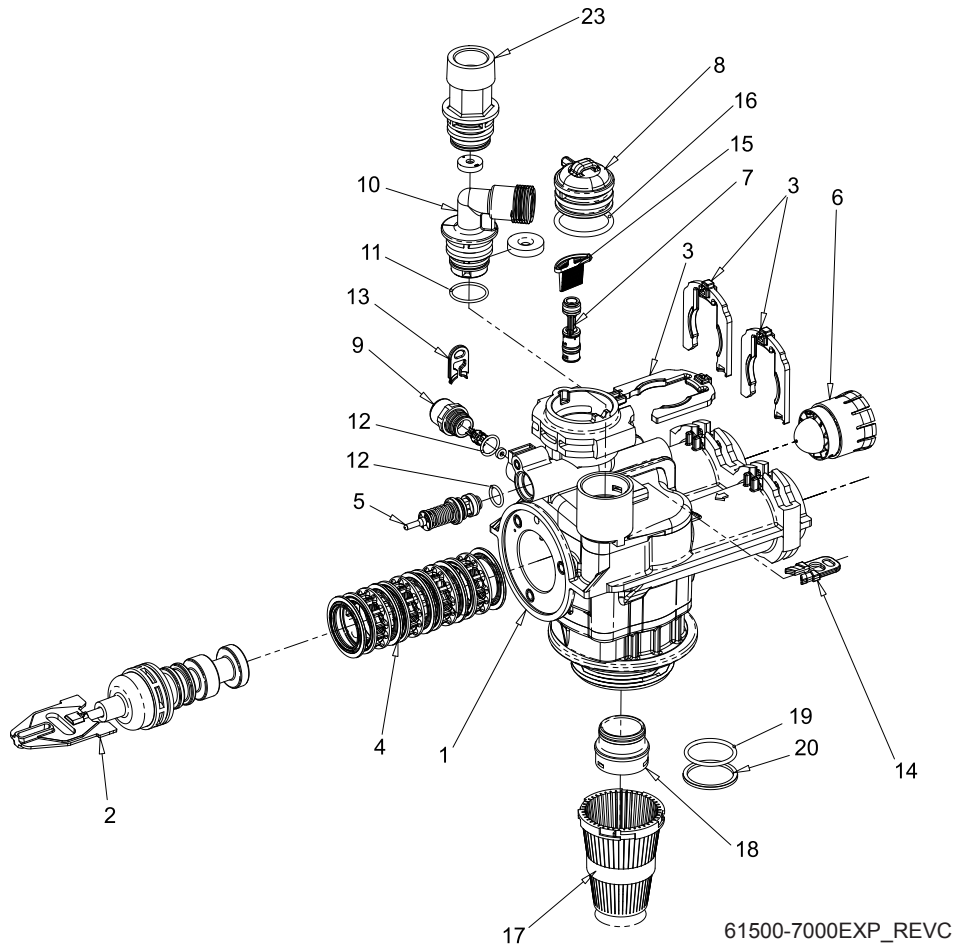
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## Power Head Assembly

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Item No.	Quantity	Part No.	Description
1	1	42349	Motor, 24V, 2 RPM, 7000
2	1	10218	Switch, Micro
3	1	40978	Plate, Upper Support
4	1	42356	Circuit Board Assy, XTR7000
5	1	40702	Shaft, Encoder, 7000
6	1	40703	Gear, Main
7	1	40704	Cam, Brine, Downflow
8	1	40979	Plate, Lower Support
9	1	61635-01	Cover Assy, 7000-II, Black
	1	61634-01	Cover Assy, 7000-II, Gray
10	1	40980	Backplate, 7000
11	4	13602	Screw, Phil Rd Hd, 6-32 x 5/16
12	1	12473	Screw, Hex Wsh, 10-24 x 5/8
13	2	11805	Scerw, Rd Hd, 4-40 x 5/8 Type 1
14	1	40981	Transformer, US 24V, 9.6VA, 7000
15	1	19791-01	Meter Cable Assy, Turbine/SE
16	1	41122	O-ring, -007
17	1	40960-03	Label, UL Nameplate, 7000, US/24

# Control Valve Assembly



Item No.	Quantity	Part No.	Description
1	1	61050	Valve Body Assy, 7000, 32mm Dist
2	1	61542-10	Piston Assy, 7000, Softener, D/F 35GPM
		61453-10	Piston Assy, 7000, Softener, D/F 28GPM
		61452-20	Piston Assy, 7000, Filter 35GPM
3	3	40576	Clip, H, Plastic, 7000
4	1	61438	Seal & Spacer Kit, 7000, D/F
5	1	60016-01	Brine Valve Assy, 7000, 560CD
6	1	40577	Turbine Meter Assy, 7000
7	1	61XXX	Injector Assy, 7000

Part Number	Injector Number
61454-000	#000
61454-00	#00
61454-0	#0
61454-1	#1
61454-2	#2
61454-3	#3
61454-4	#4
61454-5	#5



# Control Valve Assembly

Item No.	No. Req'd	Part Number	Description
8.....	1 .....	40556.....	Cap, Injector
9.....	1 .....	61XXX.....	BLFC Assemblies

Part No.	BLFC Size	GPM
61450-00.....	3/8" .....	Blank
61450-12.....	3/8" .....	0.125
61450-25.....	3/8" .....	0.25
61450-50.....	3/8" .....	0.50
61450-100.....	3/8" .....	1.0
61451-00.....	1/2" .....	Blank
61451-12.....	1/2" .....	0.125
61451-25.....	1/2" .....	0.25
61451-50.....	1/2" .....	0.50
61451-100.....	1/2" .....	1.0

10..... 1 .....

Part No.	DLFC Size	GPM
61455-00.....	3/4" .....	Blank
61455-17.....	3/4" .....	1.7
61455-20.....	3/4" .....	2.0
61455-24.....	3/4" .....	2.4
61455-30.....	3/4" .....	3.0
61455-35.....	3/4" .....	3.5
61455-40.....	3/4" .....	4.0
61455-45.....	3/4" .....	4.5
61455-50.....	3/4" .....	5.0
61455-60.....	3/4" .....	6.0
61455-70.....	3/4" .....	7.0

11.....	1 .....	13303-01.....	O-ring, -021, 560CD
12.....	2 .....	13302-01.....	O-ring, -014, 560CD
13.....	1 .....	40946.....	Clip, Brine Retaining
14.....	1 .....	40945.....	Clip, Drain Retaining
15.....	1 .....	40950.....	Screen, Injector, 7000
16.....	1 .....	40951.....	O-ring, -220
17.....	1 .....	18280.....	Collector, Top, 1" x .011, Gray
18.....	1 .....	61419.....	Kit, 1.05" Distributor, Adapter
19.....	1 .....	19054.....	O-ring, -124
20.....	1 .....	18303-01.....	O-ring, -336, 560CD
23.....	1 .....	61XXX.....	DLFC Kits

Part Number	DLFC Size	GPM
61456-00.....	1" .....	Blank
61456-8.0.....	1" .....	8.0
61456-9.0.....	1" .....	9.0
61456-10.....	1" .....	10.0
61456-12.....	1" .....	12.0
61456-15.....	1" .....	15.0
61456-20.....	1" .....	20.0
61456-25.....	1" .....	25.0
61456-30.....	1" .....	0.0

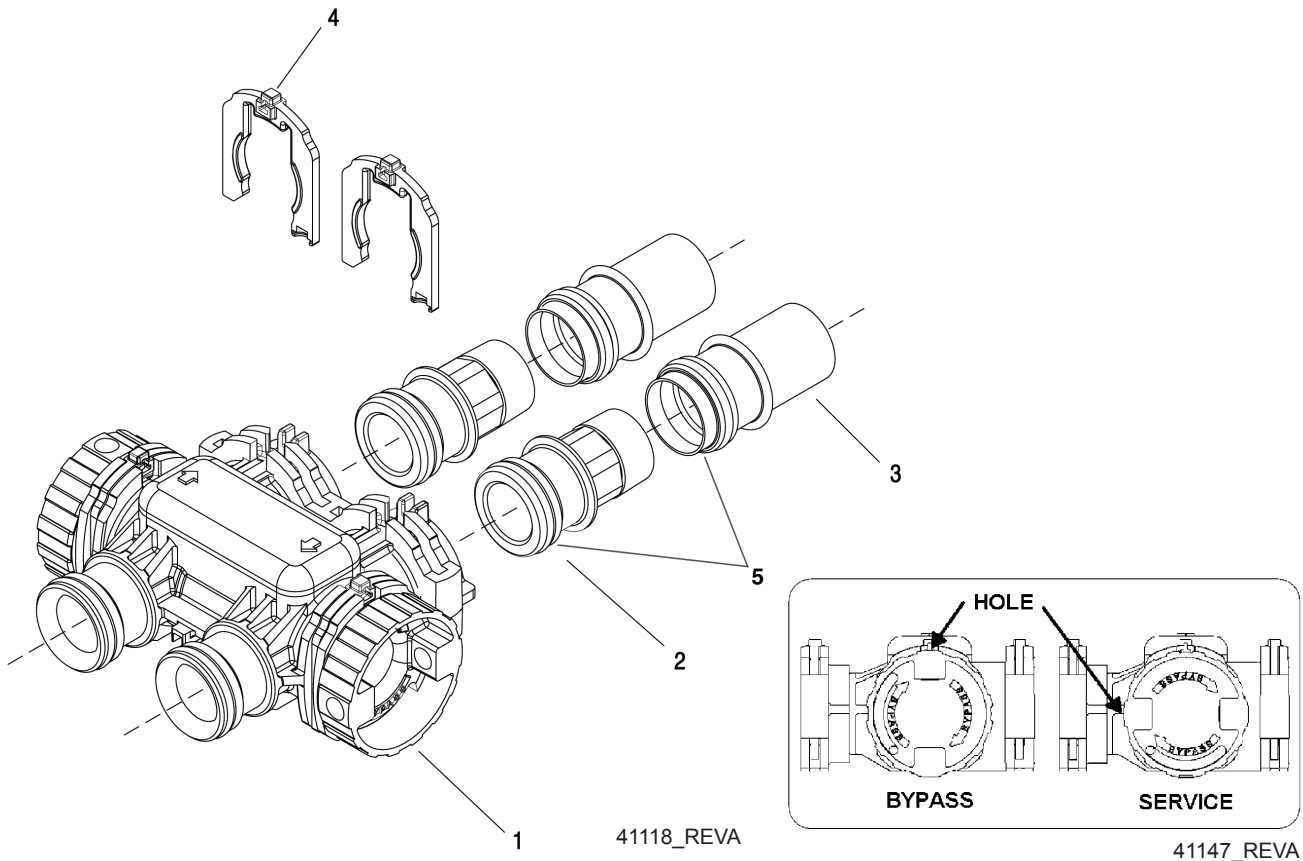
**Not Shown:**

40677.....	Tube, Distributor, 32MM
40924.....	Distributor, 32MM
40697-02.....	Collector, 32MM Bayonet
12763-10.....	Stuffer Tool Assy, 7000

**Filter Valves**

40947-01.....	Plug, Brine Valve, w/O-ring
40990-01.....	Plug, Injector, w/O-ring

# Bypass Assembly



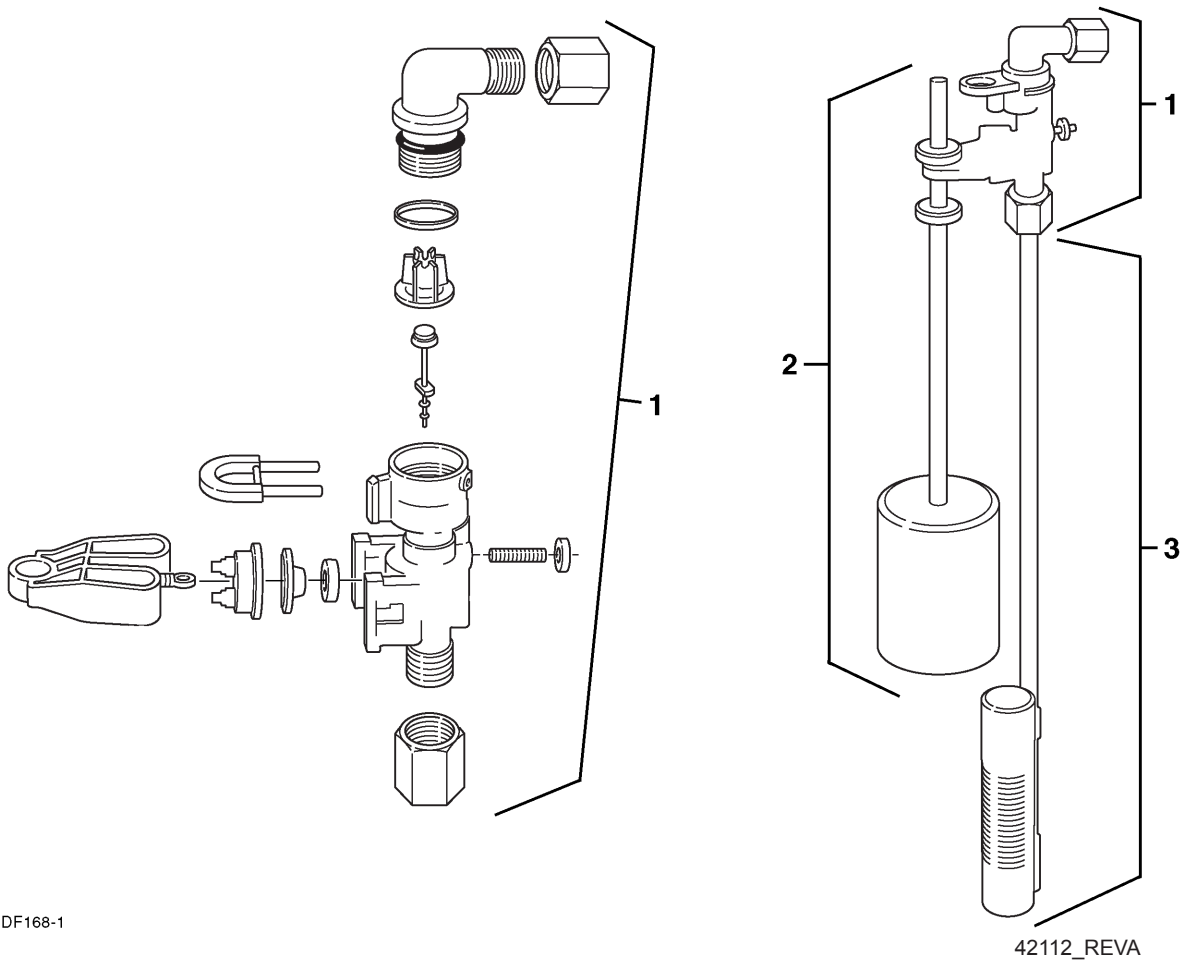
**IMPORTANT**

To bypass the valve, turn bypass knob on both sides of the valve to bypass position.

When returning to service, put the inlet into service before the outlet.

Item No.	Quantity	Part No.	Description
1	1	40569	Bypass Assembly, 7000, Less Clip
2	2	40563-01	Connector Assy, 1" NPT, w/O-ring
		40563-11	Connector Assy, 1" BSP, w/O-ring
		40565-01	Connector Assy, 1 1/4" NPT w/O-ring
		40565-11	Connector Assy, 1 1/4" BSP w/O-ring
3	2	41242-01	Connector Assy, 1" & 1/4" Sweat, w/O-ring
		41243-01	Connector Assy, 1 1/4" & 1 1/2" Sweat, w/O-ring
4	2	40576	Clip, H, Plastic, 7000
5	1	40951	O-ring, -220
Not Shown	1	61462	By-Pass Service Kit, 7000 (Includes all internal parts for 7000 bypass assembly - bypass body not included)

# 2310 Safety Brine Valve



DF168-1

42112\_REVA

Item No.	Quantity	Part No.	Description
1	1	60014	Safety Brine Valve Assy, 2310
2	1	60068	Float Assy, 2310, w/30" Rod
3	1	60002	Air Check, #500

# Troubleshooting - Timer

If an error is detected, an error screen will alternate with the main display screen every few seconds, and the **LED light will be red**.

During an error condition, the unit continues to monitor the flow meter and update the remaining capacity. Once an error condition is corrected, the unit returns to the operating status it was in prior to the error, and regeneration resumes according to normal programming. If an error is cleared by reprogramming the unit in the Master Programming Mode, the volume remaining may be reset to the full unit capacity (as though it had just regenerated). If an error is present, a regeneration can only occur manually by pressing and holding the Extra Cycle button for 5 seconds. If the unit was in regeneration when the error occurred, it will complete the regeneration cycle and go into service.

When the problem is corrected, and the error no longer displays (it may take several seconds for the unit to stop displaying the error message), the unit will return to normal operation. The **LED light** will no longer be **red**, and will turn **Green** if the unit is regenerating, or **Blue** if the unit is in service.

Problem	Correction
A. Flashing/blinking display	A. Power outage has occurred. Either wait 5 minutes for blinking to stop, or press any key on the keypad.
B. Unit not responding after going into regeneration	B. Verify the unit is configured correctly (ex: wiring valve type). Perform a Master Reset by holding the Shift button and cycling power. Check and verify the choices selected in Master Programming Mode.
C. Unit displays "ERROR CODE: REPLACE UNIT" (corrupted UAP)	C. Contact your local water treatment professional.

Error Code	Display Message	Correction
01	ERROR CODE: PROGRAM UNIT	Go through all screens in Master Programming Mode.
02	ERROR CODE: PROGRAM UNIT	Go through all screens in Master Programming Mode.
03	ERROR CODE: SERVICE UNIT	Perform a Master Reset by holding the Shift button and cycling power. Go through all screens in Master Programming Mode. Manually initiate a regeneration cycle by pressing the Extra Cycle button for 5 seconds.
04	ERROR CODE: SERVICE UNIT	Perform a Master Reset by holding the Shift button and cycling power. Go through all screens in Master Programming Mode. Manually initiate a regeneration cycle by pressing the Extra Cycle button for 5 seconds.
05	ERROR CODE: SERVICE UNIT	Call your local water treatment professional as soon as possible. Leave the unit running (do not unplug).

**NOTE: If the above corrections do not work, please contact your local water treatment professional.**


### Error Display Screen Examples

E	R	R	O	R	C	O	D	E	:				
S	E	R	V	I	C	E	U	N	I	T			

E	R	R	O	R	C	O	D	E	:				
P	R	O	G	R	A	M	U	N	I	T			

E	R	R	O	R	C	O	D	E	:				
R	E	P	L	A	C	E	U	N	I	T			

## Troubleshooting - Control Valve

	<p><b>WARNING</b></p> <p>The controller <b>MUST</b> be depressurized before removing any quick connection clips for servicing. The connector should be pushed toward the control while removing clips.</p>
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Problem	Cause	Correction
1. Water conditioner fails to regenerate.	A. Electrical service to unit has been interrupted	A. Assure permanent electrical service (check fuse, plug, pull chain, or switch)
	B. Timer is defective.	B. Replace timer.
	C. Power failure.	C. Reset time of day.
2. Hard water.	A. By-pass valve is open.	A. Close by-pass valve.
	B. No salt is in brine tank.	B. Add salt to brine tank and maintain salt level above water level.
	C. Injector screen plugged.	C. Clean injector screen.
	D. Insufficient water flowing into brine tank.	D. Check brine tank fill time and clean brine line flow control if plugged.
	E. Hot water tank hardness.	E. Repeated flushings of the hot water tank is required.
	F. Leak at distributor tube.	F. Make sure distributor tube is not cracked. Check O-ring and tube pilot.
	G. Internal valve leak.	G. Replace seals and spacers and/or piston.
3. Unit used too much salt.	A. Improper salt setting.	A. Check salt usage and salt setting.
	B. Excessive water in brine tank.	B. See problem 7.
4. Loss of water pressure.	A. Iron buildup in line to water conditioner.	A. Clean line to water conditioner.
	B. Iron buildup in water conditioner.	B. Clean control and add mineral cleaner to mineral bed. Increase frequency of regeneration.
	C. Inlet of control plugged due to foreign material broken loose from pipes by recent work done on plumbing system.	C. Remove piston and clean control.
5. Loss of mineral through drain line.	A. Air in water system.	A. Assure that well system has proper air eliminator control. Check for dry well condition.
	B. Improperly sized drain line flow control.	B. Check for proper drain rate.
6. Iron in conditioned water.	A. Fouled mineral bed.	A. Check backwash, brine draw, and brine tank fill. Increase frequency of regeneration. Increase backwash time.

## Troubleshooting - Control Valve

Problem	Cause	Correction
7. Excessive water in brine tank.	A. Plugged drain line flow control.	A. Clean flow control.
	B. Plugged injector system.	B. Clean injector and screen.
	C. Timer not cycling.	C. Replace timer.
	D. Foreign material in brine valve.	D. Replace brine valve seat and clean valve.
	E. Foreign material in brine line flow control.	E. Clean brine line flow control.
8. Softener fails to draw brine.	A. Drain line flow control is plugged.	A. Clean drain line flow control.
	B. Injector is plugged.	B. Clean injector
	C. Injector screen plugged.	C. Clean screen.
	D. Line pressure is too low.	D. Increase line pressure to 20 P.S.I.
	E. Internal control leak	E. Change seals, spacers, and piston assembly.
	F. Service adapter did not cycle.	F. Check drive motor and switches.
9. Control cycles continuously.	A. Misadjusted, broken, or shorted switch.	A. Determine if switch or timer is faulty and replace it, or replace complete power head.
10. Drain flows continuously.	A. Valve is not programming correctly.	A. Check timer program and positioning of control. Replace power head assembly if not positioning properly.
	B. Foreign material in control.	B. Remove power head assembly and inspect bore. Remove foreign material and check control in various regeneration positions.
	C. Internal control leak.	C. Replace seals and piston assembly.

## General Service Hints For Meter Control

**Problem:** Softener delivers hard water

**Reason:** Reserve capacity has been exceeded.

**Correction:** Check salt dosage requirements and reset reserve capacity to provide additional reserve.

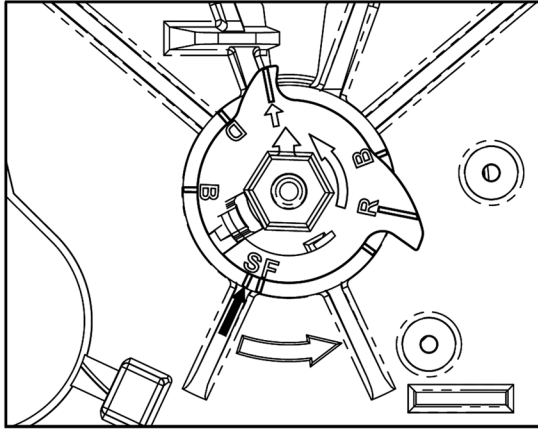
**Reason:** Meter is not measuring flow.

**Correction on Mechanical Meter:** Check with meter checker kit. If volume is not registering, check the meter cap and impeller for debris, and ensure they can move freely.

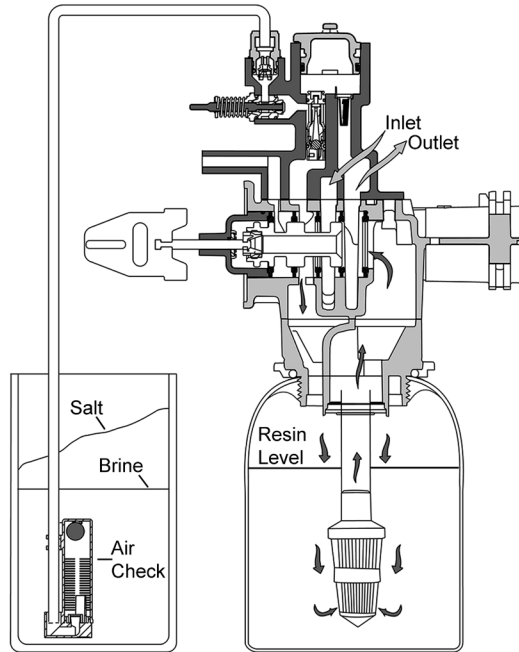
**Correction for Electronic Meter:** Check for a short in the meter cable. Ensure that it is programmed as a meter, and that the turbine and impeller can move freely.

# Water Conditioner Flow Diagrams

## In Service Position

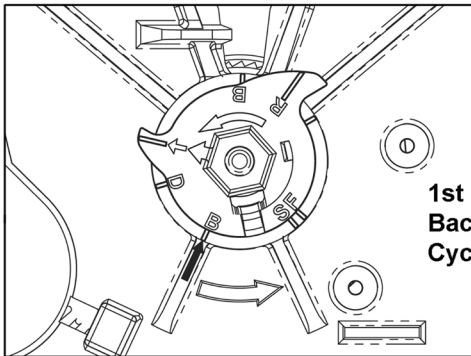


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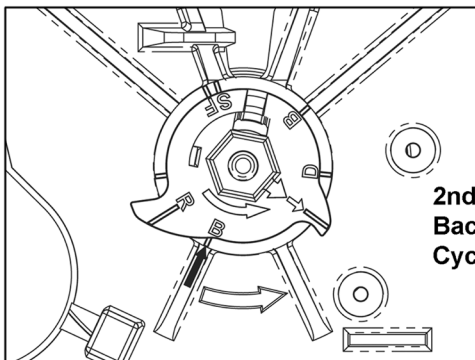


41121\_REVA

## Backwash Position

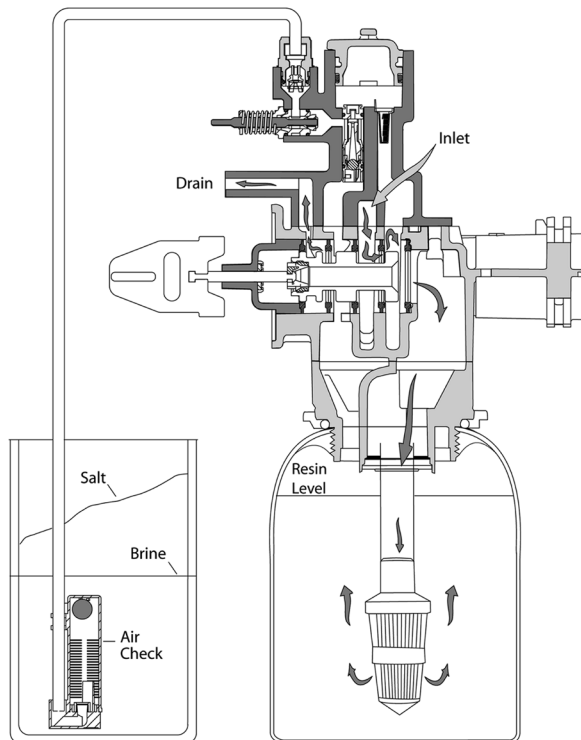


1st  
Backwash  
Cycle



2nd  
Backwash  
Cycle

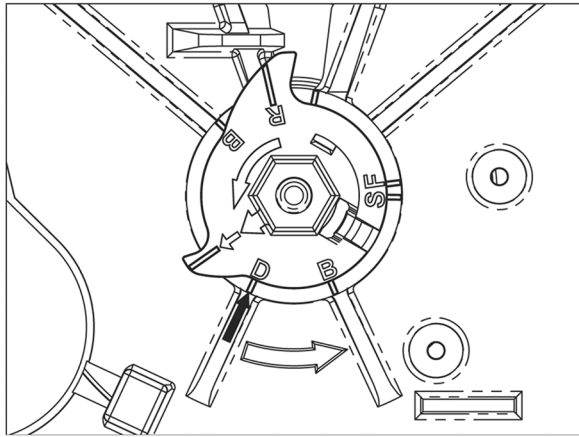
40988\_REVA



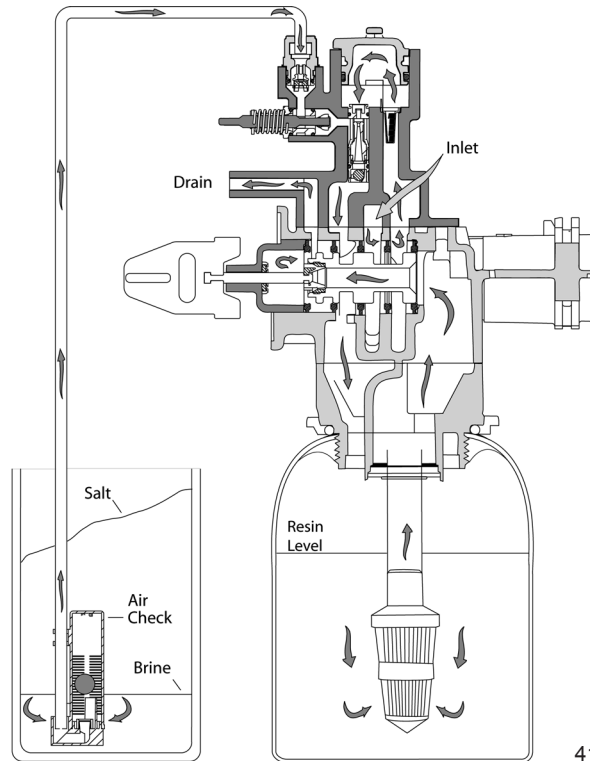
41121\_REVA

# Water Conditioner Flow Diagrams

## Brine Position

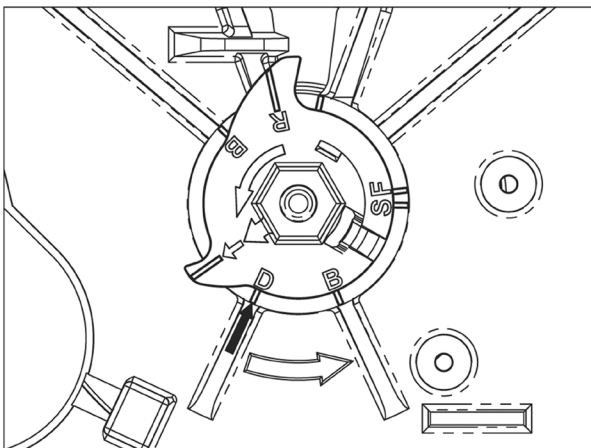


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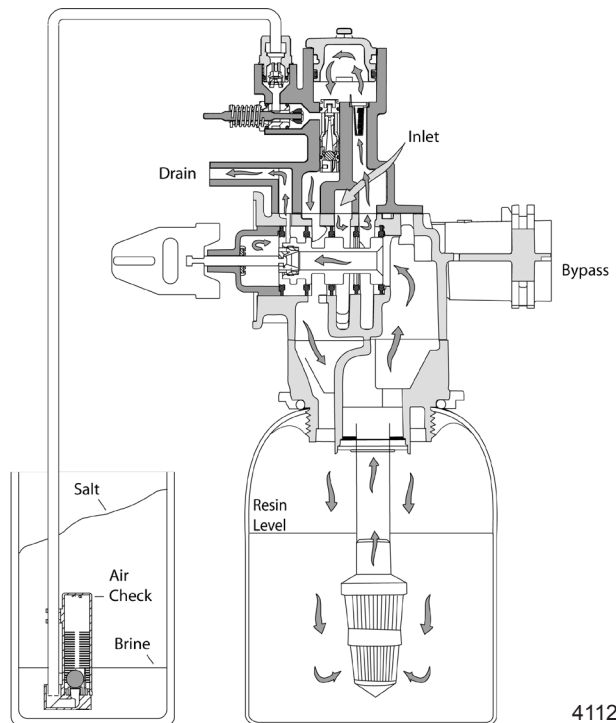


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## Slow Rinse Position



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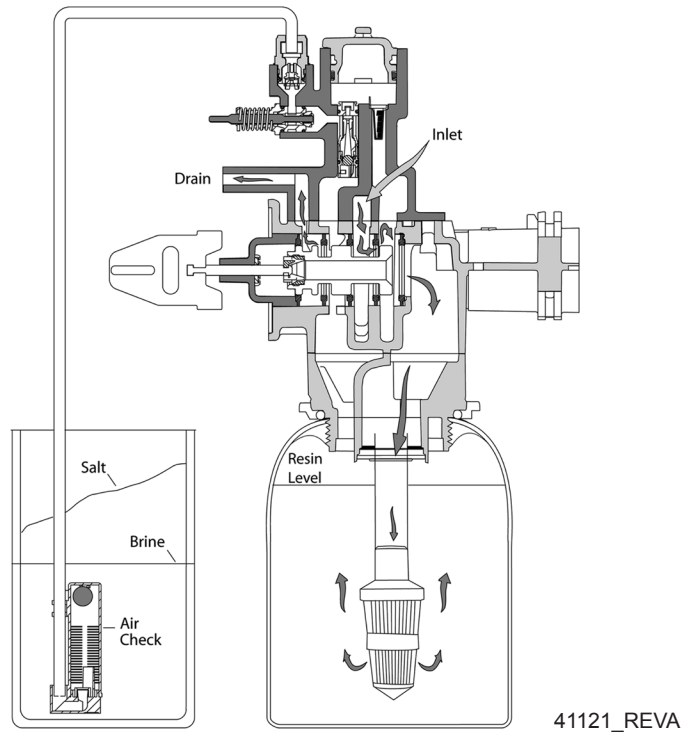
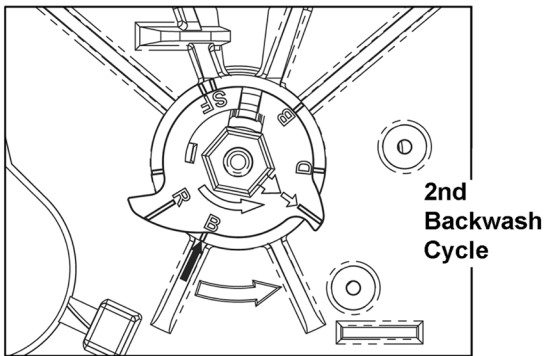


41121\_REVA

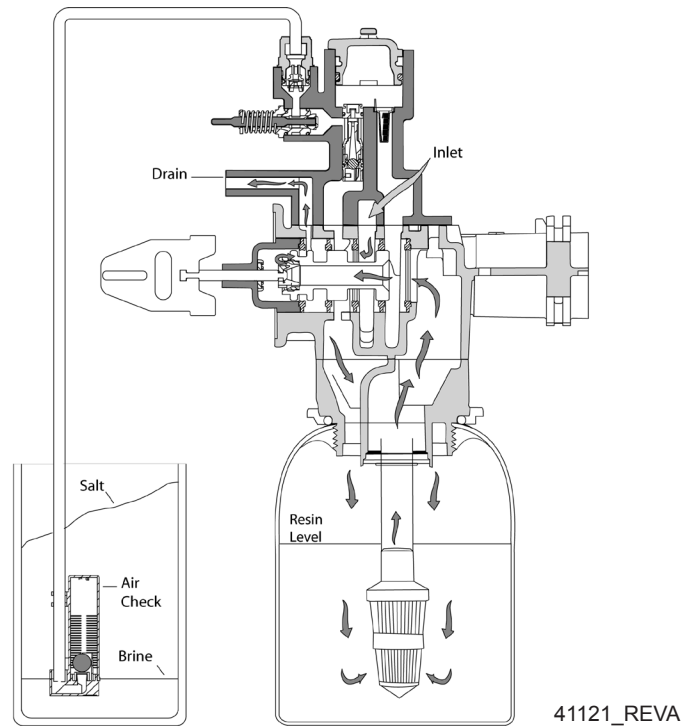
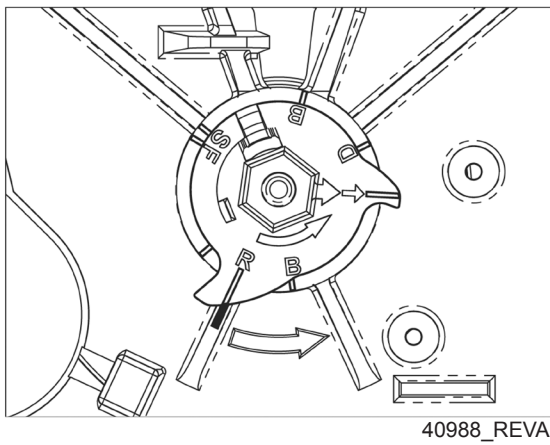


# Water Conditioner Flow Diagrams

## Second Backwash Position



## Rapid Rinse Position

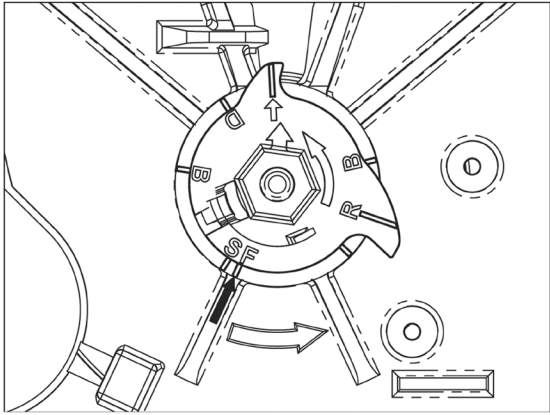


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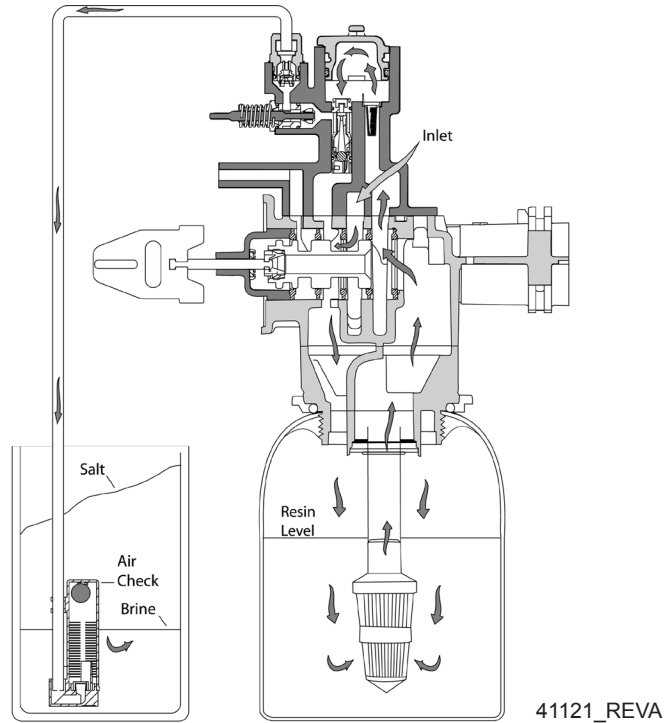
# Water Conditioner Flow Diagrams

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## Brine Tank Refill Position



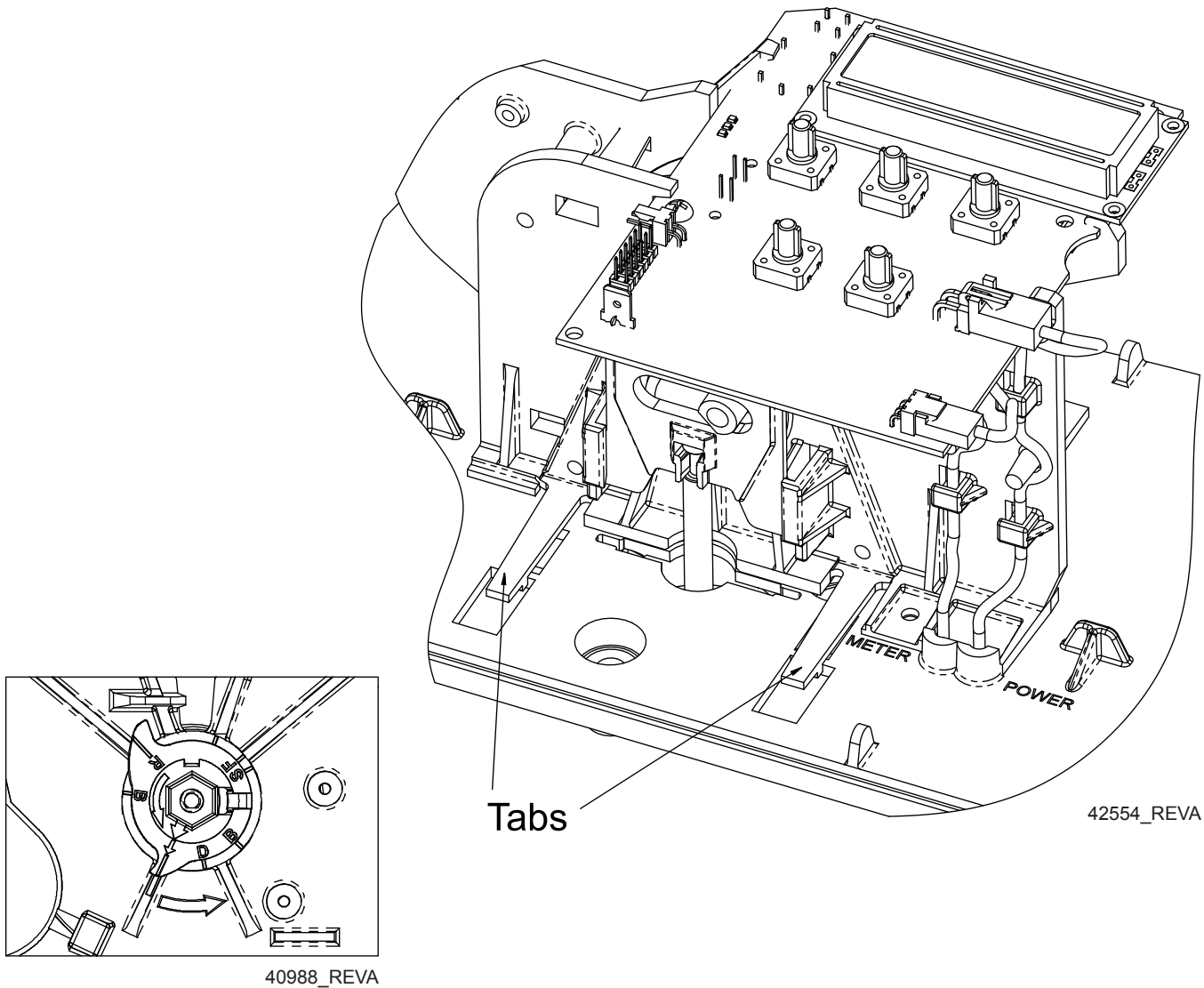
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## Removing the Gear Box Assembly

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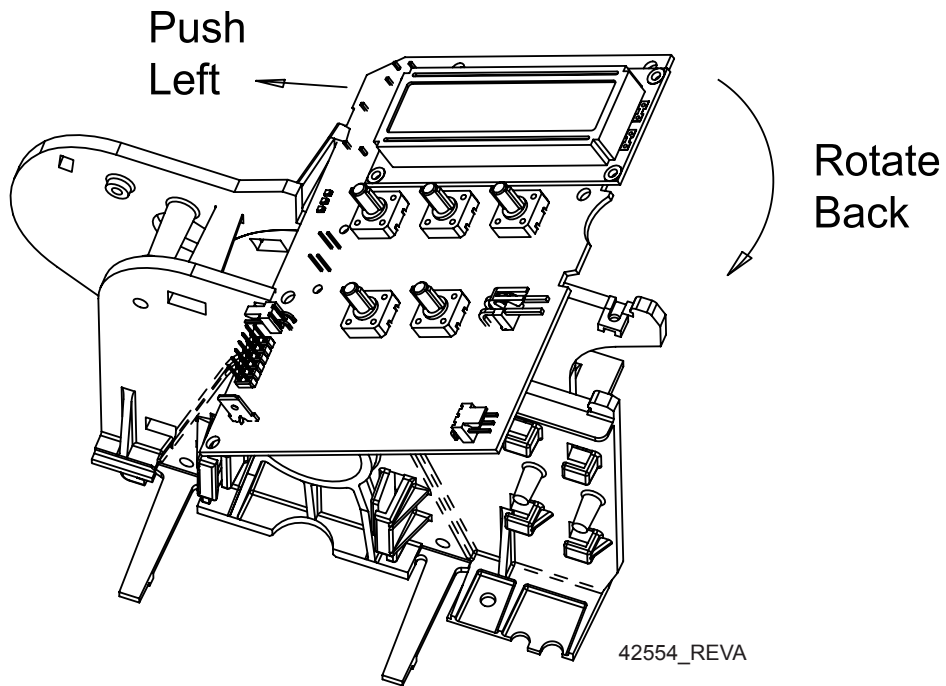


1. Unplug the power source.
2. With a 3/8" nut driver, turn the cycle cam counter-clockwise to the position shown in the illustration above.
3. Slightly pull the two tabs outward and push the gearbox slightly upward to remove.
4. When returning the valve to service after powerhead disassembly, manually step valve through regeneration using the extra cycle button until the valve is in service.

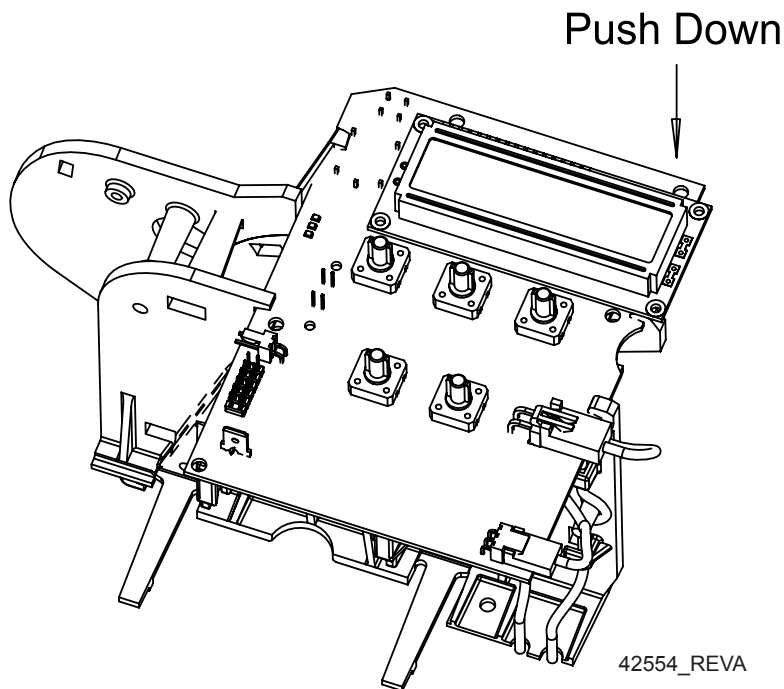
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## Inserting the Circuit Board

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1. To insert circuit board, align notches on left side of board with flexible finger on power head. Apply pressure to left while rotating the board back.

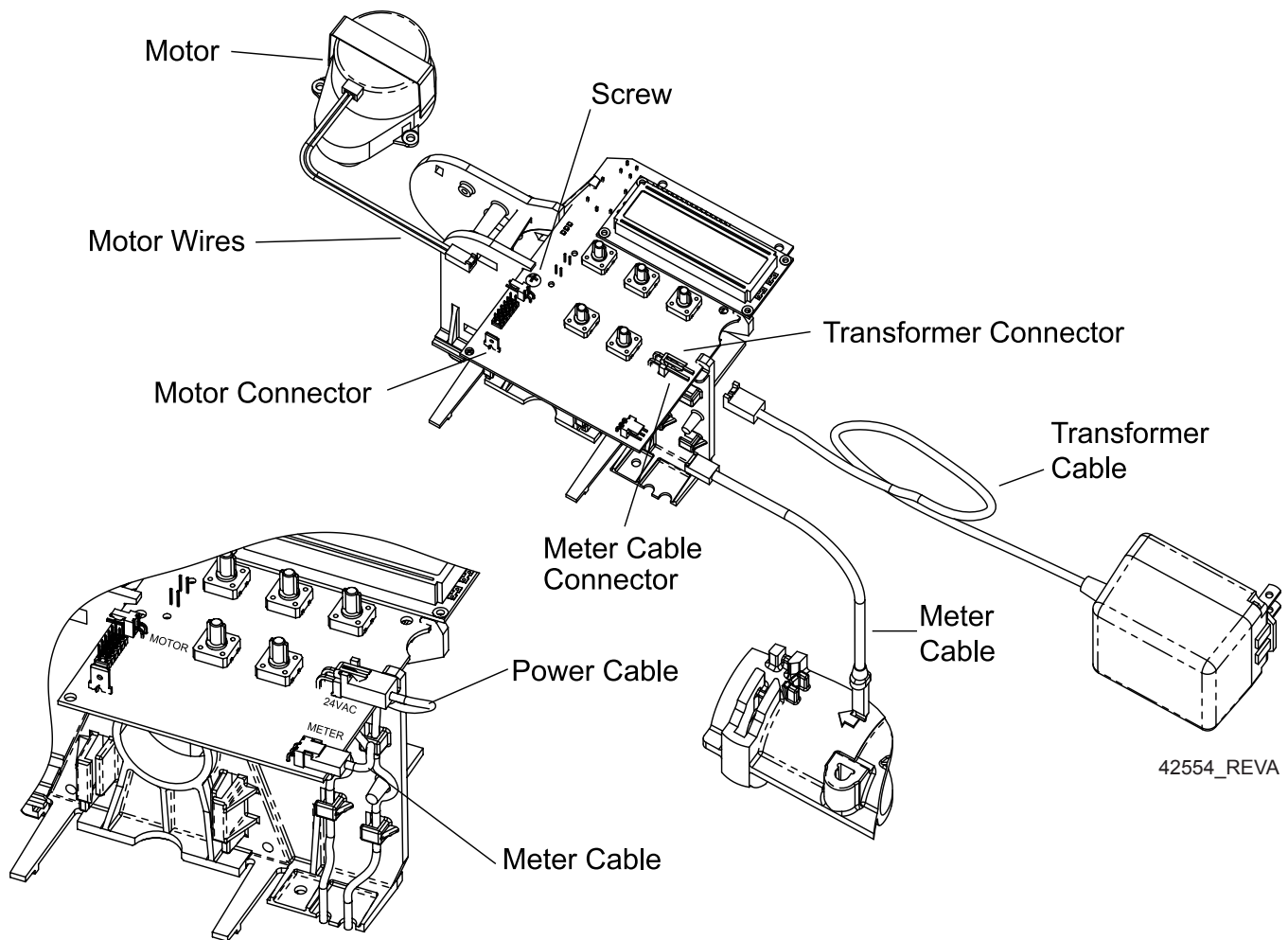


2. When all the way down, snap the circuit board into place under the notches on the right.

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## Connecting the Circuit Board

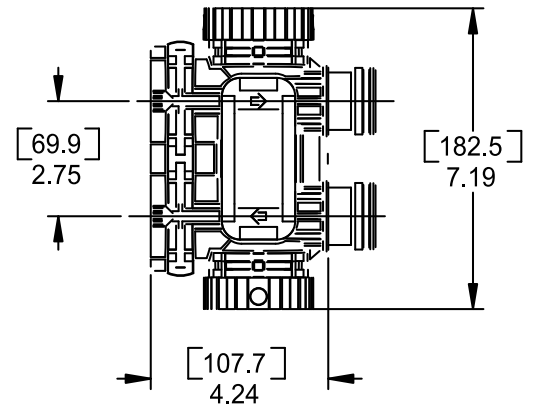
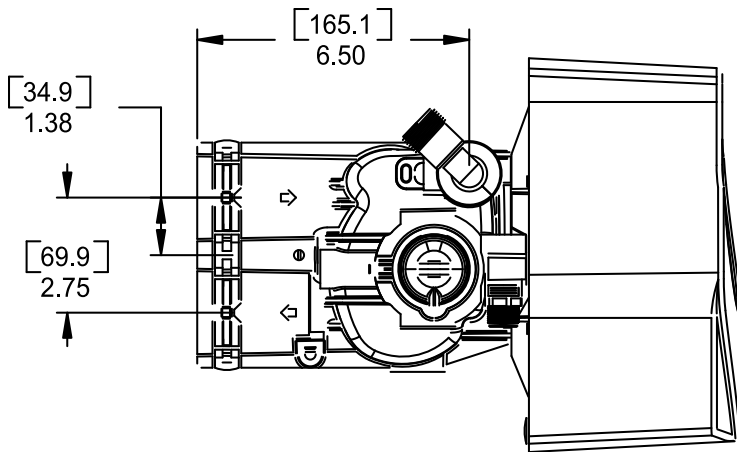
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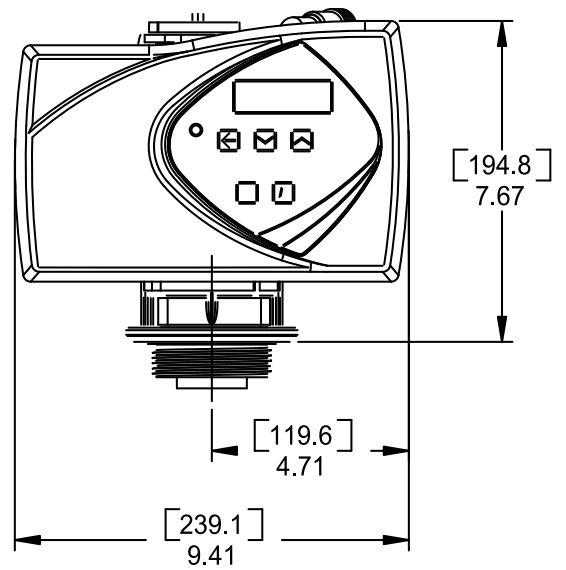
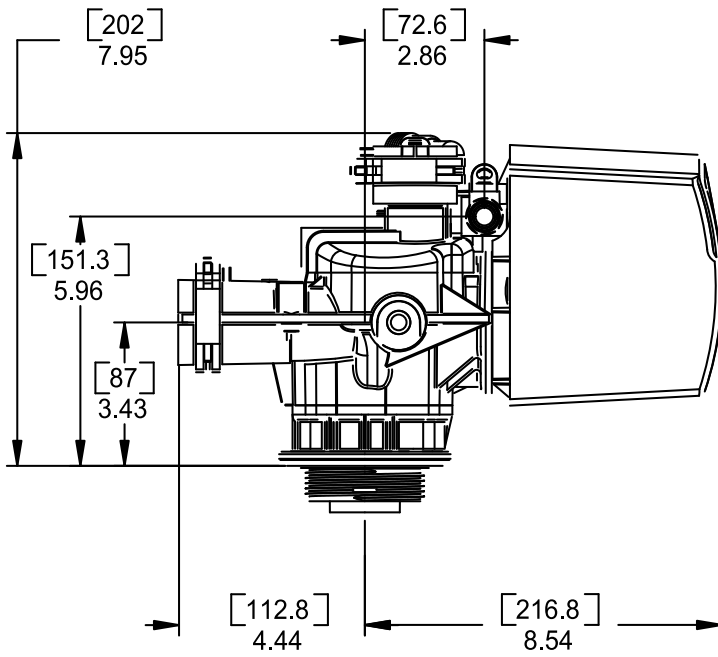
After the circuit board is installed:

1. Connect the motor wires to the motor connector on the circuit board.
2. Connect the transformer cable to the transformer connector on the circuit board.
3. Connect the meter cable to the meter cable connector on the circuit board.
4. Connect the meter cable sensor end to the opening on the valve body.
5. Thread the meter cable and power cable along the path shown in the above illustration.
6. Insert screw to secure circuit board.

# Dimensional Drawings

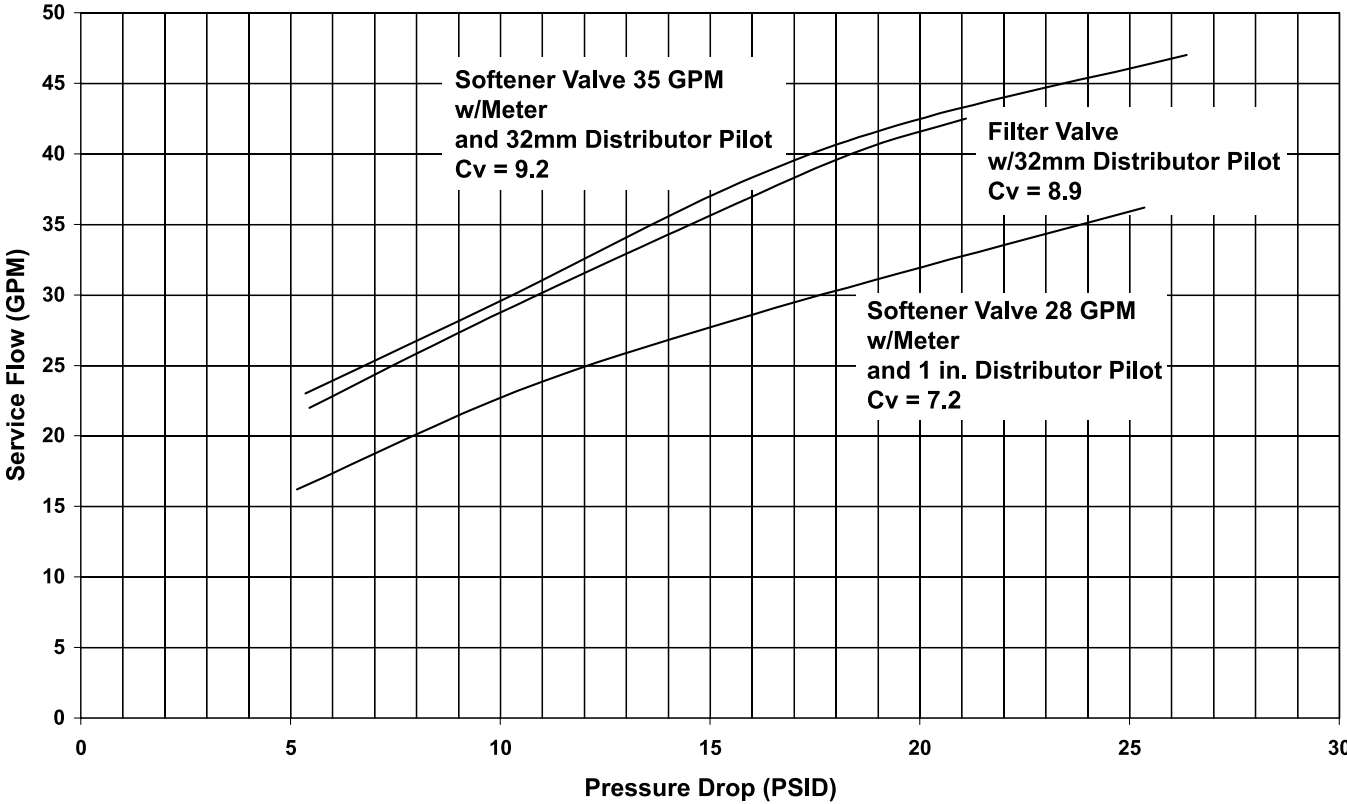


BYPASS



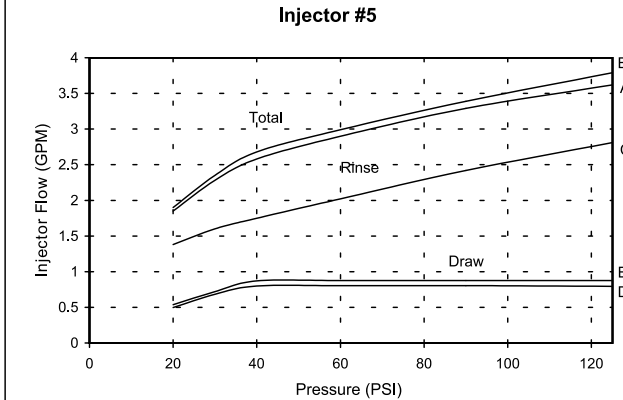
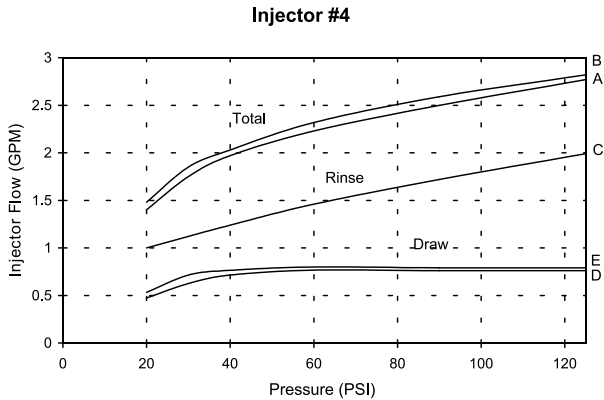
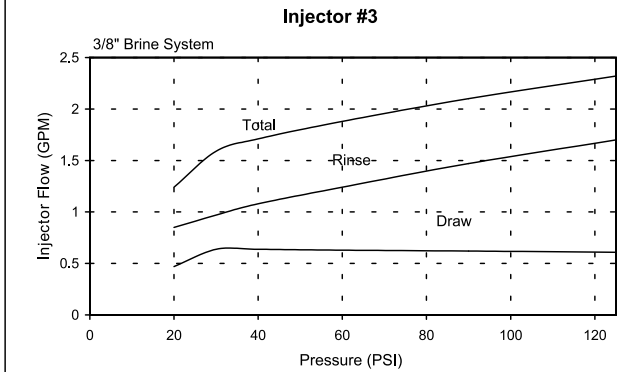
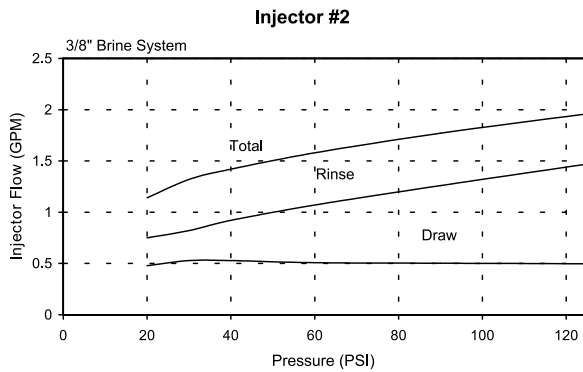
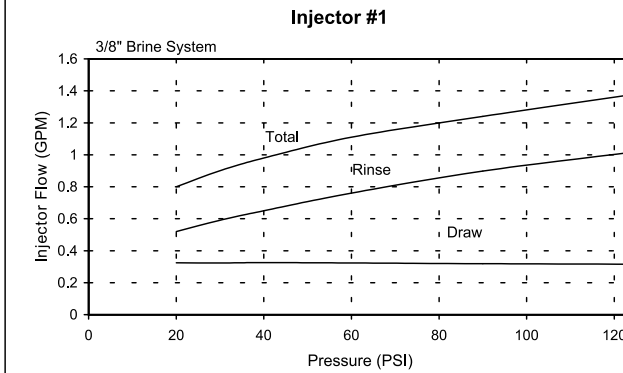
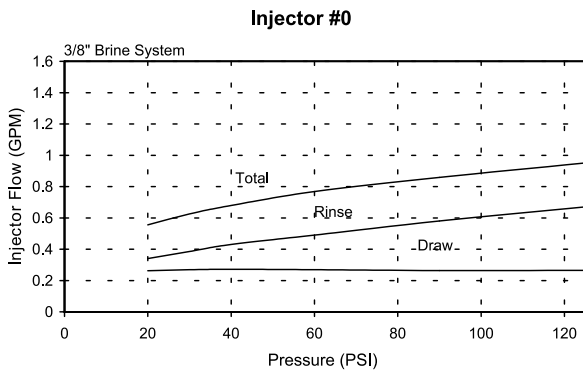
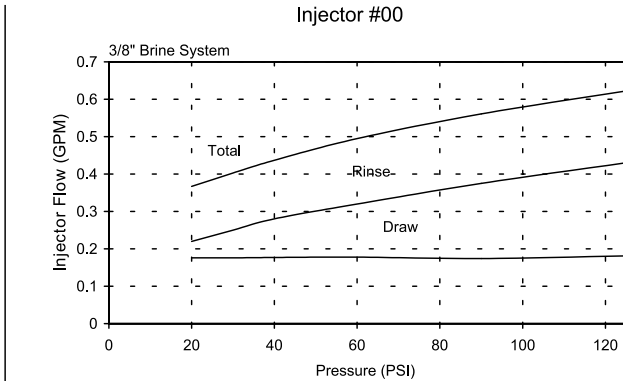
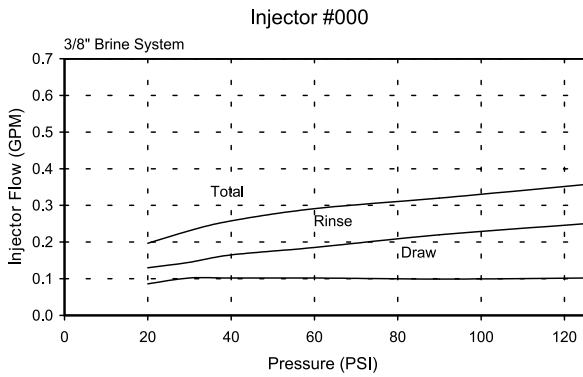
61500-7000XTR-LNE\_REVA

7000XTR Valve



TR18753 Softener  
TR18688 Filter  
41140-02\_REVA

# Injector Flow Data



A) Total Flow, 3/8" Brine System B) Total Flow, 1/2" Brine Line C) Rinse D) Brine Draw, 3/8" Brine System E) Brine Draw, 1/2" Brine Line

**NOTE: All data taken with 2310 Safety Brine Valve and 500 Air Check**

TR18755\_REV8





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**Notes**

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