



FLECK 7000XTR
SERVICE MANUAL



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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.
- It is established that when daytime water pressure is above 80 psi (5.5 bar), the maximum pressure rating of 125 psi (8.6 bar) can be exceeded. A pressure regulator must be installed on this system or warranty is voided.
- 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.

CALIFORNIA PROPOSITION 65 WARNING

⚠ WARNING: This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

JOB SPECIFICATION SHEET

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.

1. System Type:
 - A. Meter Immediate
 - B. Time Clock Delayed
 - C. Volume Override Delayed
 - D. Volume Override Immediate
 - E. Meter Delayed Weekly Reserve
 - F. Meter Delayed Variable Reserve
 - G. Meter Delayed Fixed Reserve
2. Valve Type:
 - A. 7000XTR
- C. Regenerant Flow:
 - A. Downflow
 - B. Filter
 - C. Downflow Fill First
4. Display Format:
 - A. U.S.
 - B. Metric (French Degrees, German Degrees, or PPM)
5. Unit Capacity:
_____ Grains/French Degrees/German Degrees/PPM
6. Water Hardness:
_____ Grains/French Degrees/German Degrees/PPM
7. Capacity Safety Factor:
 - A. Zero
 - B. _____%
8. Volume Override: _____ (Gallons or M³)
9. Regeneration Day Override:
 - A. Off
 - B. Every _____ Days
10. Regeneration Time:
 - A. Delayed _____ AM/PM
 - B. _____ Immediate
11. Regeneration Cycle:
 - A. Step #1 ___ : ___ : ___
 - B. Step #2 ___ : ___ : ___
 - C. Step #3 ___ : ___ : ___
 - D. Step #4 ___ : ___ : ___
 - E. Step #5 ___ : ___ : ___
 - F. Step #6 ___ : ___ : ___
12. Auxiliary Relay:
 - A. Enabled
 - a. Auxiliary Relay Start 1 ___ : ___ : ___
 - b. Auxiliary Relay End 1 ___ : ___ : ___
 - c. Auxiliary Relay Start 2 ___ : ___ : ___
 - d. Auxiliary Relay End 2 ___ : ___ : ___
 - B. Disabled
13. Chemical Pump:
 - A. Enabled
 - B. Disabled
14. CPO Aux Relay Volume: _____ (Gallons or M³)
15. CPO Aux Relay: ___ : ___ : ___
16. Flow Meter Size: 1.25-inch Turbine
17. Generic Flow Meter for Maximum Flow Rate:
Add _____ Gallons every _____ Pulses

WATER SOFTENER CONTROL VALVE

Water Pressure

A minimum of 20 psi (1.3 bar) 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.

CAUTION

- Minimum Water pressure 20 psi.
- Maximum water pressure 125 psi.
- Minimum water temperature 34°F.
- Maximum water temperature 110°F.
- Ambient temperature 34° to 122° F(1° to 50°C).
- Disconnect all power sources before servicing.
- Always operate with cover in place.

NOTE: This product should be installed by qualified personnel.

NOTE: Comply with all plumbing codes when installing this product. Comply with all electrical codes when installing this product.

⚠ WARNING: The system **MUST** be depressurized before removing any connections for servicing.

VALVE INSTALLATION AND START-UP PROCEDURES

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 inch (2.6 cm) 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.

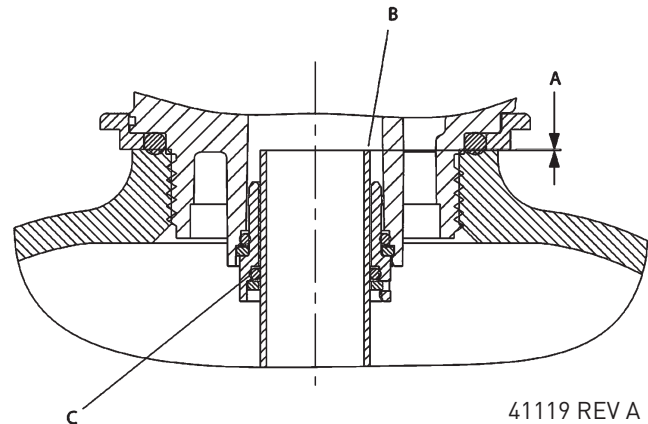


Figure 1

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 plumber 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 inch (2.5 cm) 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.

TIMER OPERATION

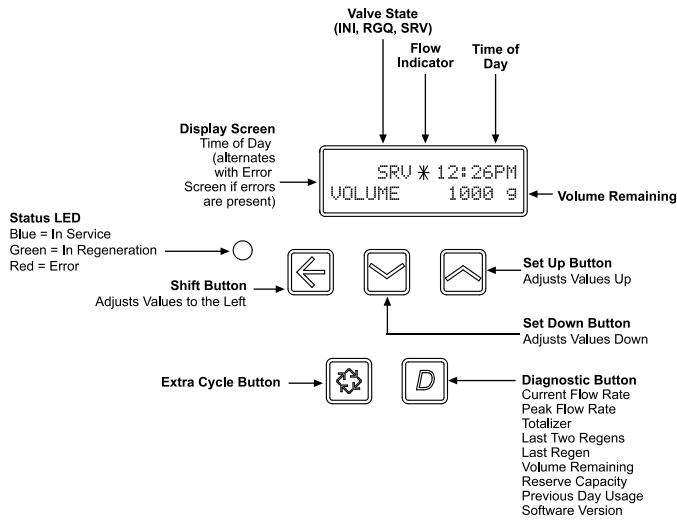


Figure 2

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 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 *CONTINUED*

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

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

To Set Time Of Day:

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

SYSTEM TYPE: [] [] [] [] [] [] [] [] [] [] [] [] 4
TIME CLK DELAYED

Options: Time Clock Delayed [TIME CLK DELAYED] (Default)
 Meter Immediate [METER IMMEDIATE]
 Meter Delayed Fixed Reserve [MTR DLY FIX RSV]
 Meter Delayed Variable Reserve [MTR DLY VAR RSV]
 Meter Delayed Weekly Reserve [MTR DLY WEEK RSV]
 Volume Override Immediate [VOL OVERRIDE IMM]
 Volume Override Delayed [VOL OVERRIDE DLY]

VALVE TYPE: [] [] [] [] [] [] [] [] [] [] [] [] 7 0 0 0 XTR

Options: 7000 XTR

REGENERANT FLOW: [] [] [] [] [] [] [] [] [] [] [] [] DOWN FLOW

Options: Down Flow [DOWN FLOW] (Default)
 Back Wash Filter [BACK WASH FILTER]
 Down Flow Fill First [DF FILL FIRST]

DISPLAY FORMAT: [] [] [] [] [] [] [] [] [] [] [] [] US - GALLONS

Options: Grains per Gallon [US-GALLONS] (Default)
 French Degrees [METRIC - m3, F°TH]
 German Degrees [METRIC - m3, D°TH]
 Parts per Million [METRIC - m3, PPM]

UNIT CAPACITY: [] [] [] [] [] [] [] [] [] [] [] [] GRAINS

Options: Grains [30000 GRAINS] (Default)
 French Degrees [30.00 F°TH] (Default)
 German Degrees [30.00 D°TH] (Default)
 Parts per Million [30.00 PPM] (Default)

Range: 1,000 to 9,900,000 in Grains
 1.00 to 19900.00 in Metric

WATER HARDNESS: [] [] [] [] [] [] [] [] [] [] [] [] 3 0 GPG

Options: Grains per Gallon [30 GPG] (Default)
 French Degrees [30 F°TH]
 German Degrees [30 D°TH]
 Parts per Million [30 PPM]

Range: 1 to 199 in Grains
 2 to 199 in Metric

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

CAPACITY SAFETY: [] [] [] [] [] [] [] [] [] [] [] [] FACTOR: 0 0 %

Options: Capacity Safety Factor [00%] = Default
 Range: 0 to 50%

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

MASTER PROGRAMMING MODE FLOW CHART *CONTINUED*



VOLUME OVERRIDE: 1 0 0 0 g

Options: U.S. Format [1000g] = Default
Metric [m3]

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



REGENERATION DAY OVERRIDE: OFF

Options: Override On [12 DAYS](Example)
Override Off [OFF] (Default)

Range: OFF (0) to 99 Days
4 Time Clock: 1 to 99 Days



REGENERATION TIME: 0 2 : 0 0 AM

Options: A.M. or P.M. [02:00AM] (Default)
Military Time [02:00 HR] (Default)



CYCLE BACK WASH 0 : 1 0 : 0 0

NOTE: See the Master Programming Mode section for details regarding the regeneration cycle steps.

Options: 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: DISABLED

Options: Auxiliary Relay Disabled [DISABLED] (Default)
Auxiliary Relay Enabled [ENABLED]



AUX RELAY OUTPUT START 1 : 0 : 0 0 : 0 0

Options: Auxiliary Relay Output Start 1 [0:00:00] (Default)
Range: Adjustable from 0 to the sum of all regeneration cycle steps minus one minute.



AUX RELAY OUTPUT END 1 : 0 : 0 0 : 0 0

Options: Auxiliary Relay Output End 1 [0:00:00] (Default)
Range: Adjustable from auxiliary relay start 1 minutes to the sum of all regeneration cycle step times.



AUX RELAY OUTPUT START 2 : 0 : 0 0 : 0 0

Options: Auxiliary Relay Output Start 2 [0:00:00] (Default)
Range: From auxiliary relay end 1 (minutes) to the sum of all regeneration step times minus one minute.



AUX RELAY OUTPUT END 2 : 0 : 0 0 : 0 0

Options: Auxiliary Relay Output End 2 [0:00:00] (Default)
Range: From auxiliary relay start 2 (minutes) to the sum of all regeneration step times.



CHEMICAL PUMP: DISABLED

Options: Chemical Pump [DISABLED] (Default)
[ENABLED]



CPO AUX RELAY VOLUME: 0 0 0 g

Options: U.S. Format [000 g] (Default)
Metric Format [0.00 m3]

Range: 0 to 999 gallons in U.S. format
0.00 to 9.99 cubic meters



CPO AUX RELAY 0 : 0 0 : 0 0

Options: Chemical Pump Auxiliary Relay (Time Interval) [0:00:30] (Default)

Range: 0 seconds to two hours



FLOW METER: 1 . 2 5 TURBINE

Options: 1.25 Turbine [1.25 TURBINE] (Default)



MAXIMUM FLOW RATE: 0 0 0 0 g p m

Options: Gallons per Minute [0000 gpm] (Default)
Liters per Minute



ADD 0 1 GALLONS EVERY 0 1 PULSES

Options: Gallons per Pulse [01 GALLONS] [01 PULSES] (Default)
Liters per Pulse



PROGRAMMING UNIT PLEASE WAIT . . .

End of Master Programming



MASTER PROGRAMMING MODE

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

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

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.

```
VALVE TYPE:  
7000 XTR
```

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
```

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
```


MASTER PROGRAMMING MODE

CONTINUED

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
```

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
```

Cycle	Time
1 Back Wash	10 Minutes
2 Brine & Slow Rinse	1 Hour
3 Rapid Rinse	10 Minutes
4 Brine Tank Fill	12 Minutes
5 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.

13. 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
```

14. 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
```

15. 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
```

16. 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.

17. 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.

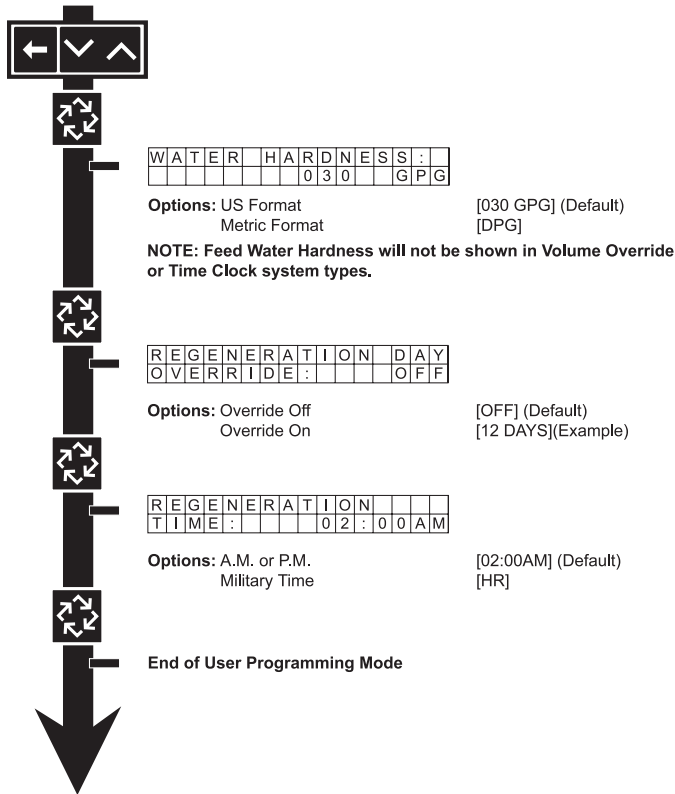
18. End of Master Programming Mode

USER PROGRAMMING MODE FLOW CHART

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

Entering User Mode

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



USER PROGRAMMING MODE

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

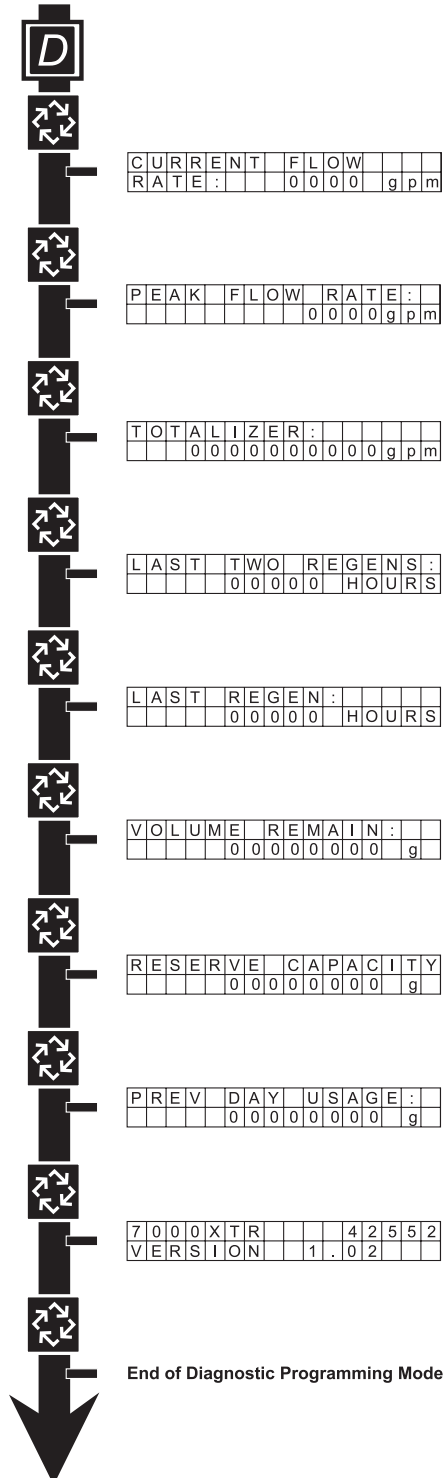
5. End of User Programming Mode

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 inch Turbine: 90 gpm (0.34 m³/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.

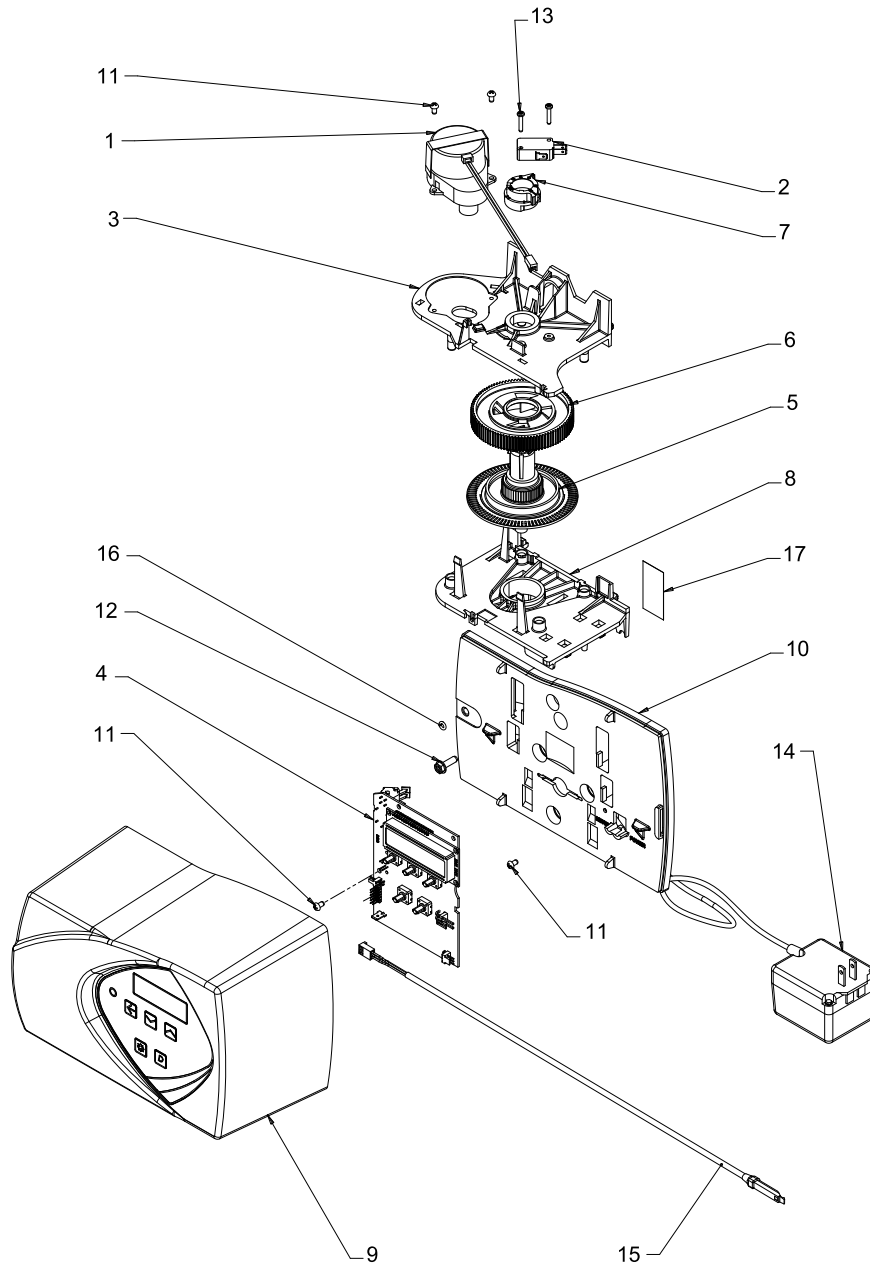
9. Software Version

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.

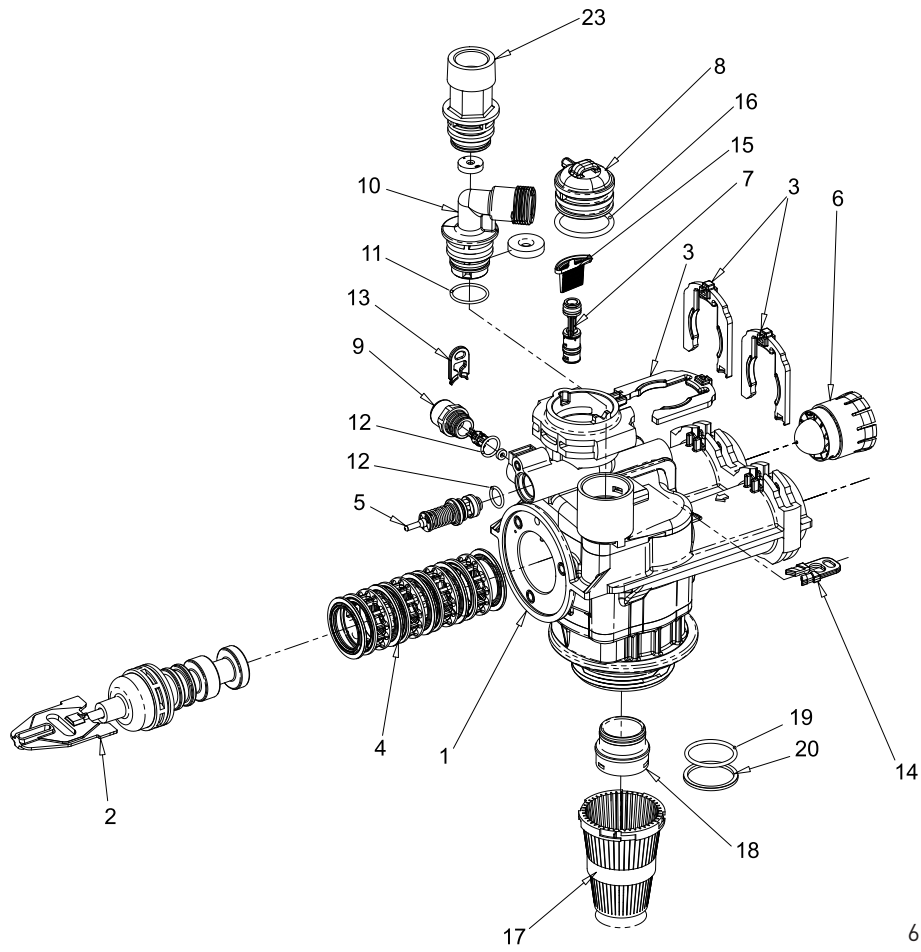
POWER HEAD ASSEMBLY



61501-7000XT REV A

Item No.	QTY	Part No.	Description	Item No.	QTY	Part No.	Description
1	1	42349	Motor, 24V, 2 RPM, 7000	12	1	12473	Screw, Hex Wsh, 10-24 x 5/8
2	1	10218	Switch, Micro	13	2	11805	Scerw, Rd Hd, 4-40 x 5/8 Type 1
3	1	40978	Plate, Upper Support	14	1	40981	Transformer, US 24V, 9.6VA, 7000
4	1	42356	Circuit Board Assy, XTR7000	15	1	19791-01	Meter Cable Assy, Turbine/ SE
5	1	40702	Shaft, Encoder, 7000	16	1	41122	O-ring, -007
6	1	40703	Gear, Main	17	1	40960-03	Label, UL Nameplate, 7000, US/24
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				

CONTROL VALVE ASSEMBLY

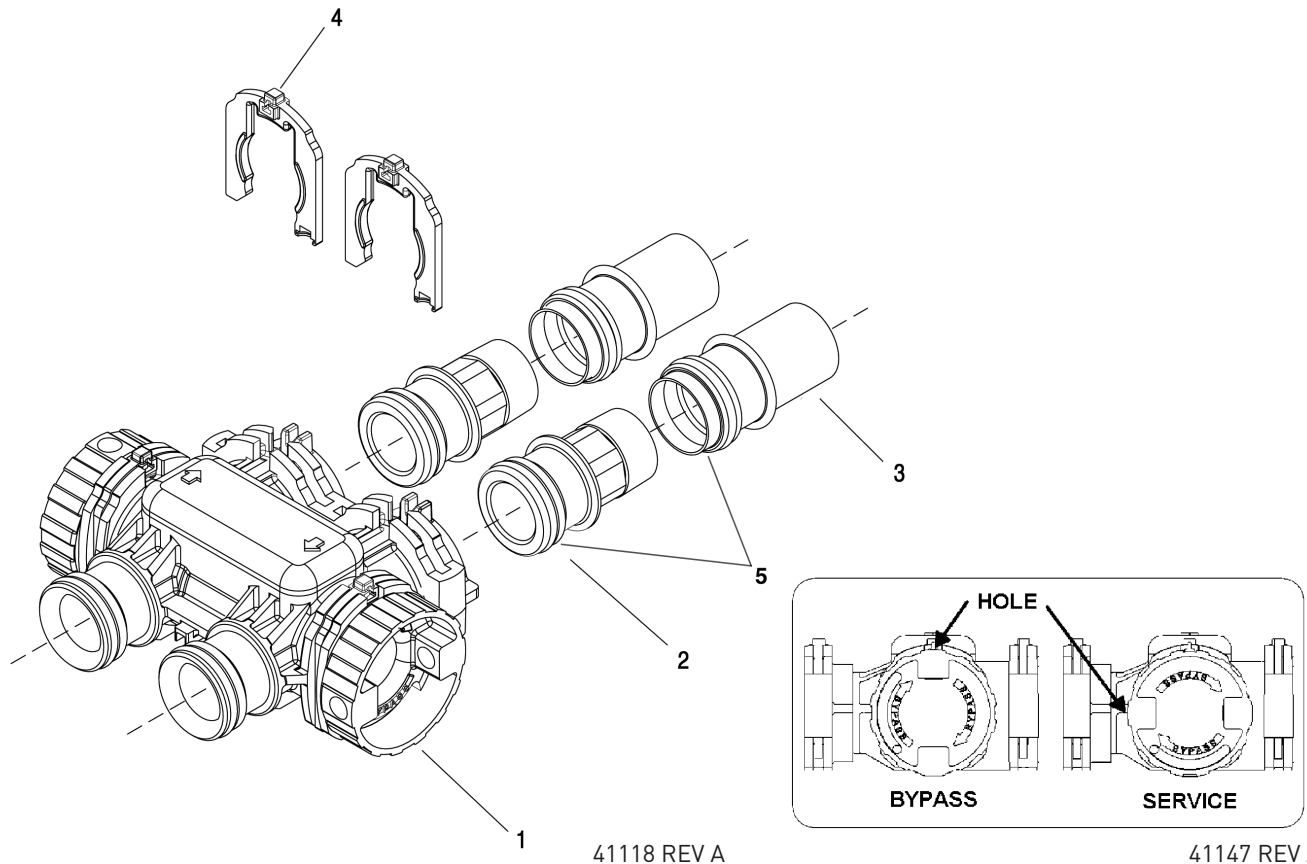


61500-7000EXP REV C

CONTROL VALVE ASSEMBLY *CONTINUED*

Item No.	Qty.	Part No.	Description	Item No.	QTY	Part No.	Description
1	1	61050	Valve Body Assy, 7000, 32 mm Dist	10	1	61XXX	DLFC Assemblies
2	1	61542-10	Piston Assy, 7000, Softener, D/F 35 gpm			61455-00	3/4-inch/Blank
		61453-10	Piston Assy, 7000, Softener, D/F 28 gpm			61455-17	3/4-inch/1.7
		61452-20	Piston Assy, 7000, Filter 35 gpm			61455-20	3/4-inch/2.0
3	3	40576	Clip, H, Plastic, 7000			61455-24	3/4-inch/2.4
4	1	61438	Seal & Spacer Kit, 7000, D/F			61455-30	3/4-inch/3.0
5	1	60016-01	Brine Valve Assy, 7000, 560CD			61455-35	3/4-inch/3.5
6	1	40577	Turbine Meter Assy, 7000			61455-40	3/4-inch/4.0
7	1	61XXX	Injector Assy, 7000			61455-45	3/4-inch/4.5
			Injector Number			61455-50	3/4-inch/5.0
		61454-000	#000	11	1	43776	O-ring, -021, 7000, CSTM
		61454-00	#00	12	2	13302-01	O-ring, -014, 560CD
		61454-0	#0	13	1	40946	Clip, Brine Retaining
		61454-1	#1	14	1	40945	Clip, Drain Retaining
		61454-2	#2	15	1	40950	Screen, Injector, 7000
		61454-3	#3	16	1	40951	O-ring, -220
		61454-4	#4	17	1	18280	Collector, Top, 1-inch x .011, Gray
		61454-5	#5	18	1	61419	Kit, 1.05-inch Distributor, Adapter
8	1	40556	Cap, Injector	19	1	19054	O-ring, -124
9	1	61XXX	BLFC Assemblies	20	1	18303-01	O-ring, -336, 560CD
			BLFC Size/GPM	23	1	61XXX	DLFC Kits
		61450-00	3/8-inch/Blank			61456-00	1-inch/Blank
		61450-12	3/8-inch/0.125			61456-8.0	1-inch/8.0
		61450-25	3/8-inch/0.25			61456-9.0	1-inch/9.0
		61450-50	3/8-inch/0.50			61456-10	1-inch/10.0
		61450-100	3/8-inch/1.0			61456-12	1-inch/12.0
		61451-00	1/2-inch/Blank			61456-15	1-inch/15.0
		61451-12	1/2-inch/0.125			61456-20	1-inch/20.0
		61451-25	1/2-inch/0.25			61456-25	1-inch/25.0
		61451-50	1/2-inch/0.50			61456-30	1-inch/0.0
		61451-100	1/2-inch/1.0				
				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



41118 REV A

41147 REV A

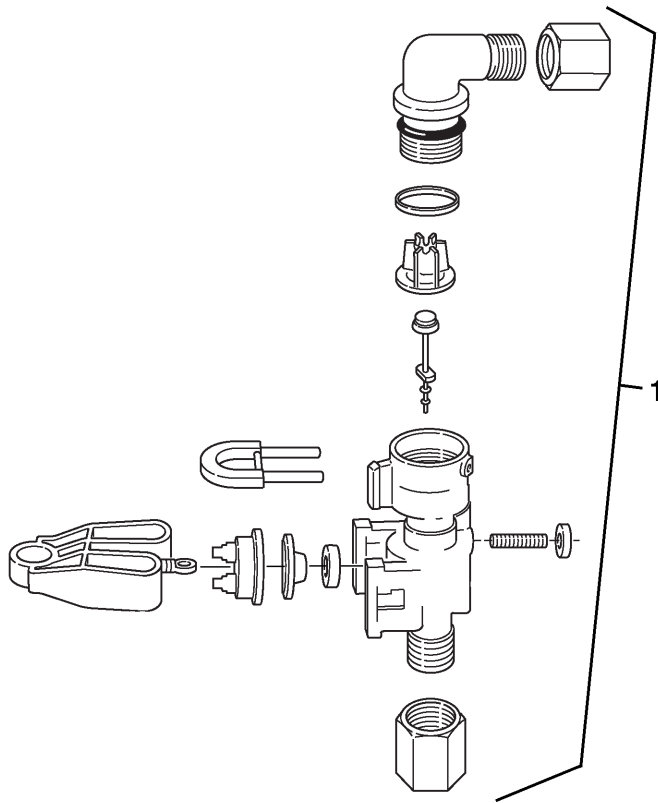
Important: To bypass the valve, turn bypass knob on both sides of the valve to bypass position. When returning to service, put the inlet into service before the outlet.

Item No.	QTY	Part No.	Description
1	1	40569-01	Bypass Assembly, 7000, with Clip
2	2	40563-01	Connector Assy, 1-inch NPT, w/O-ring
		40563-11	Connector Assy, 1-inch BSP, w/O-ring
		40565-01	Connector Assy, 1-1/4 inch NPT w/O-ring
		40565-11	Connector Assy, 1-1/4 inch BSP w/O-ring
3	2	41242-01	Connector Assy, 1-inch & 1/4-inch Sweat, w/O-ring
		41243-01	Connector Assy, 1-1/4 inch & 1-1/2 inch Sweat, w/O-ring
4	2	40576	Clip, H, Plastic, 7000
5	1	40951	O-ring, -220

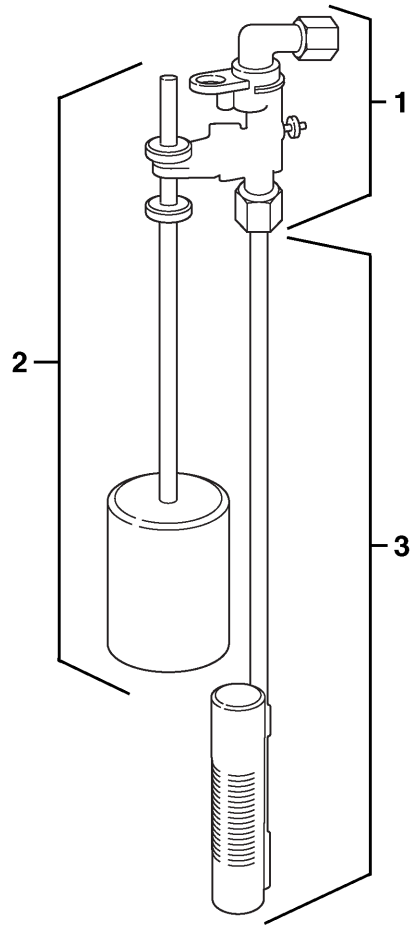
Not Shown

1		61462	By-Pass Service Kit, 7000 (Includes all internal parts for 7000 bypass assembly - bypass body not included)
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2310 SAFETY BRINE VALVE



DF168-1



42112 REV A

Item No.	QTY	Part No.	Description
1	1	60014	Safety Brine Valve Assy, 2310
2	1	60068-30	Float Assy, 2310, w/30-inch Rod
3	1	60002-34	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
Flashing/blinking display	Power outage has occurred. Either wait 5 minutes for blinking to stop, or press any key on the keypad.
Unit not responding after going into regeneration	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.
Unit displays "ERROR CODE: REPLACE UNIT" (corrupted UAP)	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	:					
R	E	P	L	A	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	:					
S	E	R	V	I	C	E		U	N	I	T				

TROUBLESHOOTING *CONTINUED*

Control Valve

⚠ WARNING: The controller **MUST** be depressurized before removing any quick connection clips for servicing. The connector should be pushed toward the control while removing clips.

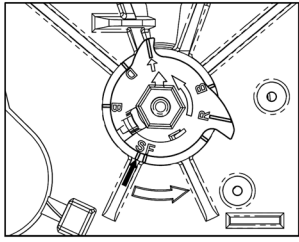
Problem	Cause	Correction
Water conditioner fails to regenerate.	Electrical service to unit has been interrupted	Assure permanent electrical service (check fuse, plug, pull chain, or switch)
	Timer is defective.	Replace timer.
	Power failure.	Reset time of day.
Hard water.	By-pass valve is open.	Close by-pass valve.
	No salt is in brine tank.	Add salt to brine tank and maintain salt level above water level.
	Injector screen plugged.	Clean injector screen.
	Insufficient water flowing into brine tank.	Check brine tank fill time and clean brine line flow control if plugged.
	Hot water tank hardness.	Repeated flushings of the hot water tank is required.
	Leak at distributor tube.	Make sure distributor tube is not cracked. Check o-ring and tube pilot.
	Internal valve leak.	Replace seals and spacers and/or piston.
Unit used too much salt.	Improper salt setting.	Check salt usage and salt setting.
Loss of water pressure.	Iron buildup in line to water conditioner.	Clean line to water conditioner.
	Iron buildup in water conditioner.	Clean control and add mineral cleaner to mineral bed. Increase frequency of regeneration.
	Inlet of control plugged due to foreign material broken loose from pipes by recent work done on plumbing system.	Remove piston and clean control.
Loss of mineral through drain line.	Air in water system.	Assure that well system has proper air eliminator control. Check for dry well condition.
	Improperly sized drain line flow control.	Check for proper drain rate.
Iron in conditioned water.	Fouled mineral bed.	Check backwash, brine draw, and brine tank fill. Increase frequency of regeneration. Increase backwash time.
Excessive water in brine tank.	Plugged drain line flow control.	Clean flow control.
	Plugged injector system.	Clean injector and screen.
	Timer not cycling.	Replace timer.
	Foreign material in brine valve.	Replace brine valve seat and clean valve.
	Foreign material in brine line flow control.	Clean brine line flow control.
Softener fails to draw brine.	Drain line flow control is plugged.	Clean drain line flow control.
	Injector is plugged.	Clean injector
	Injector screen plugged.	Clean screen.
	Line pressure is too low.	Increase line pressure to 20 psi (1.3 bar)
	Internal control leak	Change seals, spacers, and piston assembly.
	Service adapter did not cycle.	Check drive motor and switches.
Control cycles continuously.	Misadjusted, broken, or shorted switch.	Determine if switch or timer is faulty and replace it, or replace complete power head.
Drain flows continuously.	Valve is not programming correctly.	Check timer program and positioning of control. Replace power head assembly if not positioning properly.
	Foreign material in control.	Remove power head assembly and inspect bore. Remove foreign material and check control in various regeneration positions.
	Internal control leak.	Replace seals and piston assembly.

GENERAL SERVICE HINTS FOR METER CONTROL

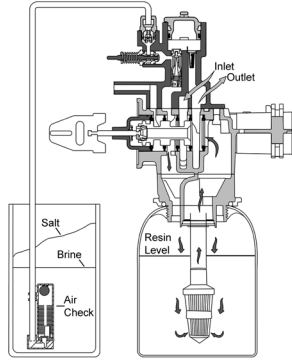
Problem	Cause	Correction
Softener delivers hard water	Reserve capacity has been exceeded.	Check salt dosage requirements and reset reserve capacity to provide additional reserve.
	Meter is not measuring flow.	On Mechanical Meter: Check with meter checker kit. If volume is not registering, check the meter cap and impeller for debris, and ensure they can move freely.
		On 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

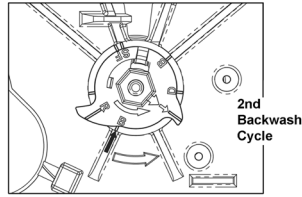


40988 REV A

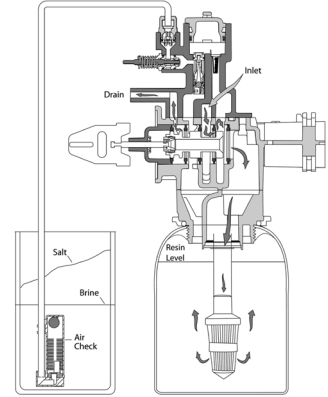


41121 REV A

Second Backwash Position

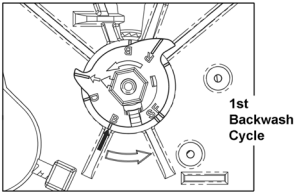


40988 REV A

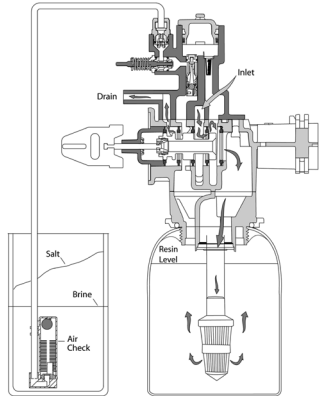


41121 REV A

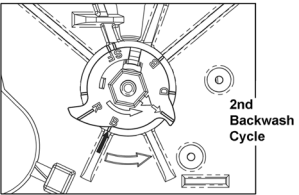
Backwash Position



40988 REV A

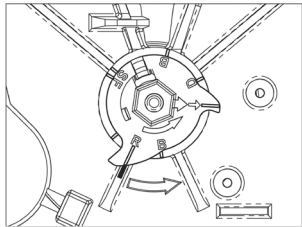


41121 REV A

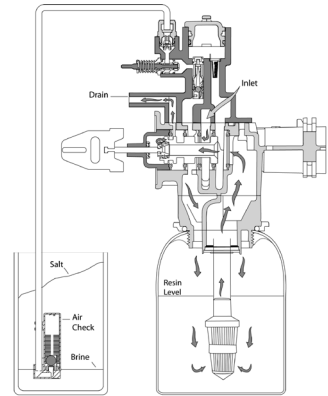


40988 REV A

Rapid Rinse Position

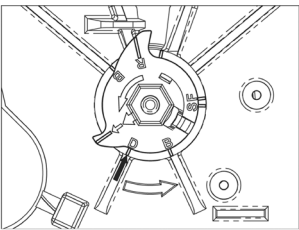


40988 REV A

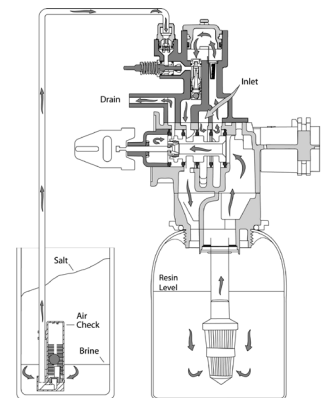


41121 REV A

Brine Position

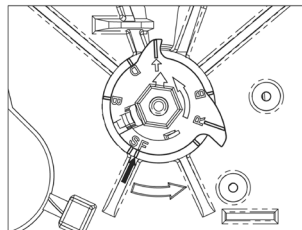


40988 REV A

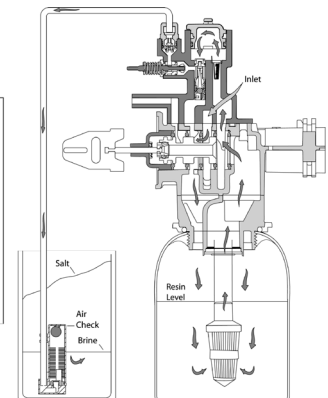


41121 REV A

Brine Tank Refill Position

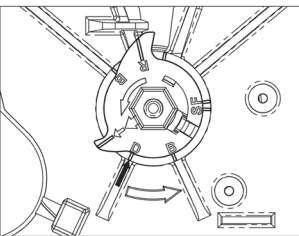


40988 REV A

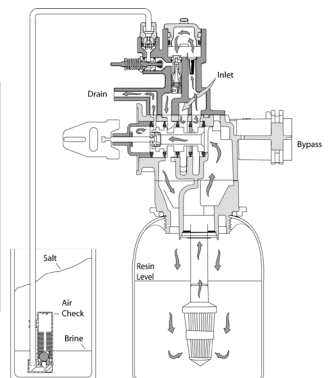


41121 REV A

Slow Rinse Position

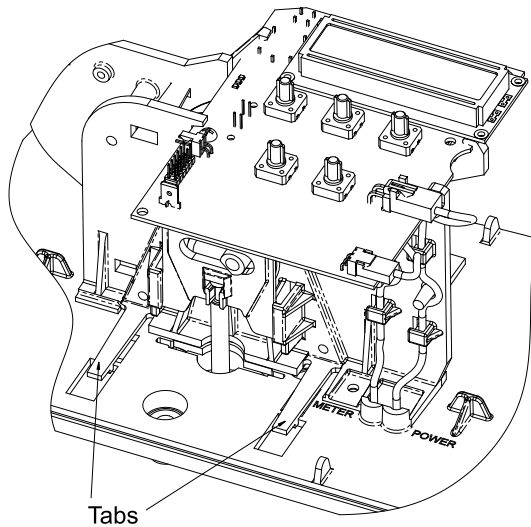


40988 REV A

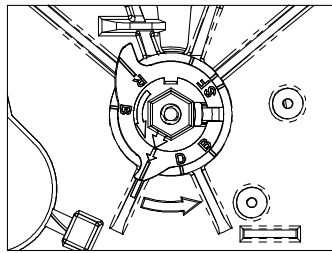


41121 REV A

REMOVING THE GEAR BOX ASSEMBLY



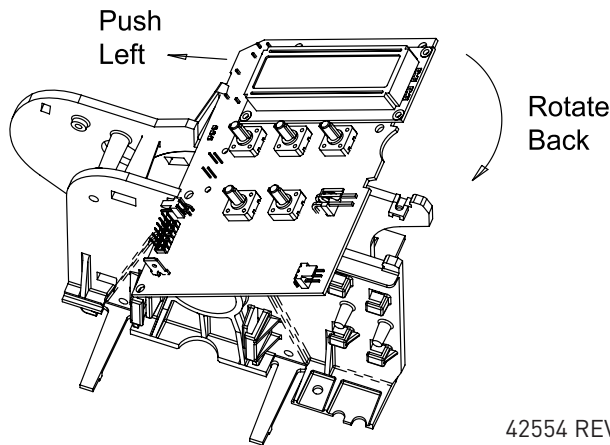
42554 REV A



40988 REV A

1. Unplug the power source.
2. With a 3/8 inch 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.

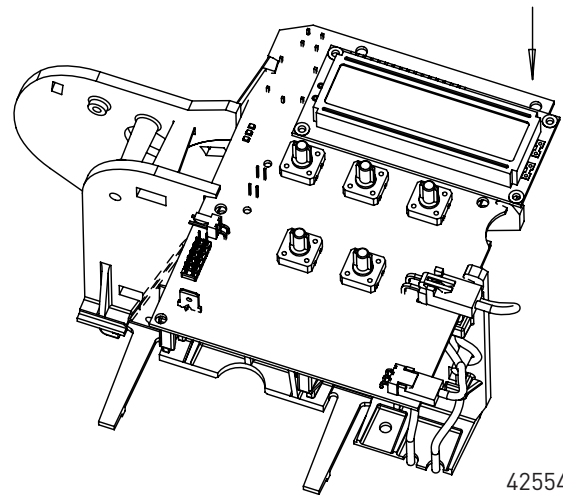
INSERTING THE CIRCUIT BOARD



42554 REV A

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.

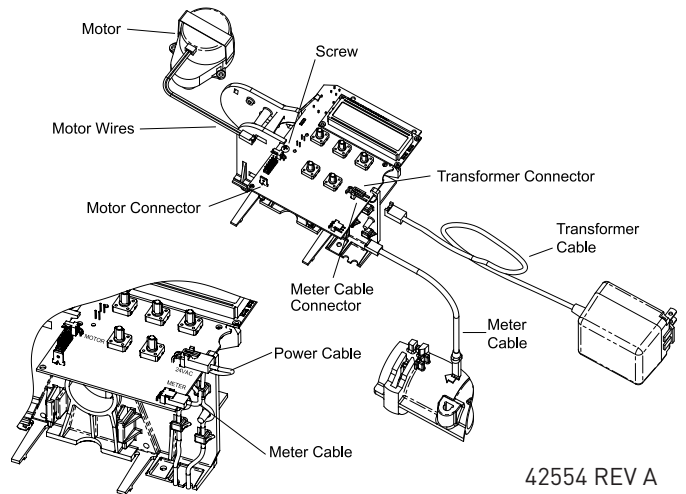
Push Down



42554 REV A

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

CONNECTING THE CIRCUIT BOARD

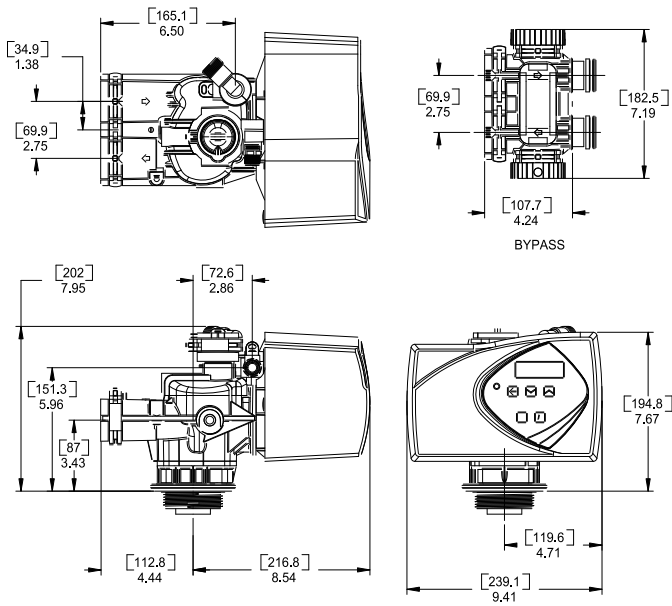


42554 REV A

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.

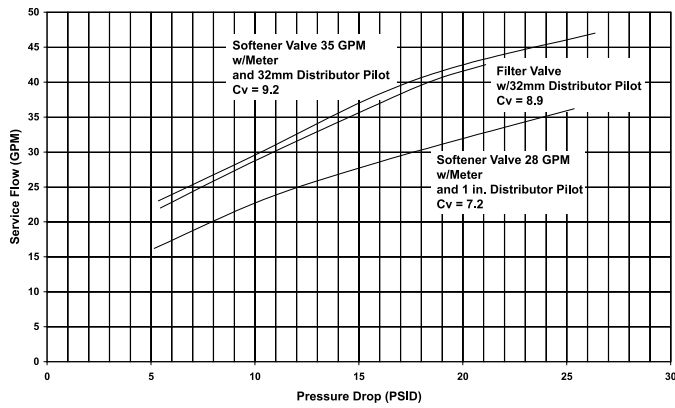
DIMENSIONAL DRAWINGS



61500-7000XTR-LNE REV A

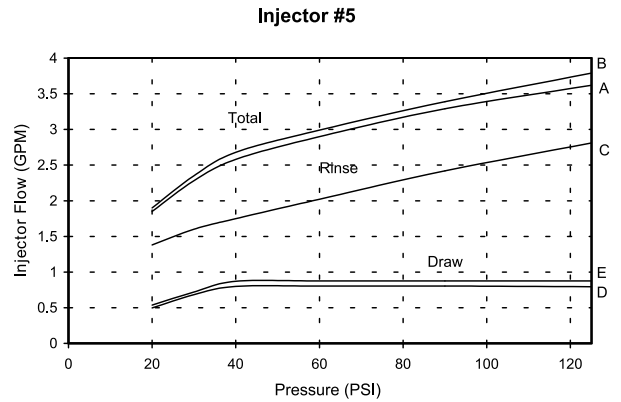
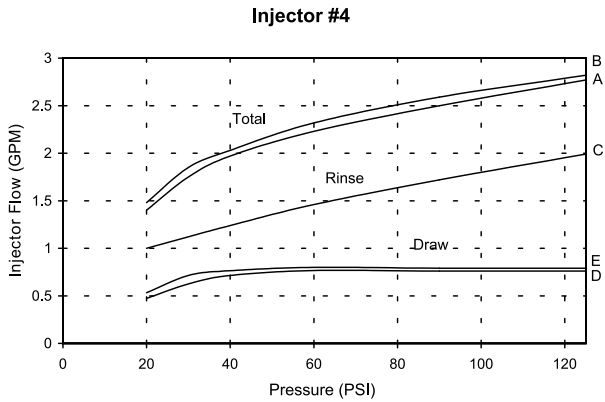
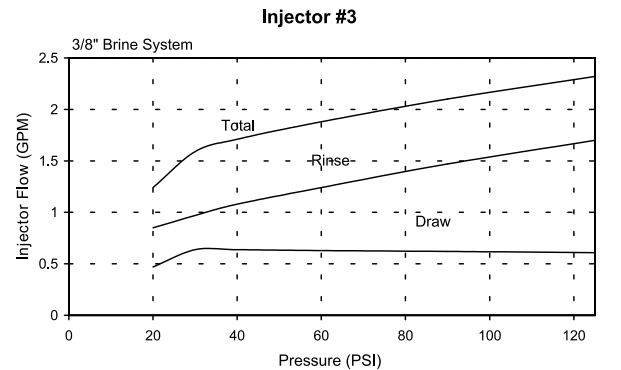
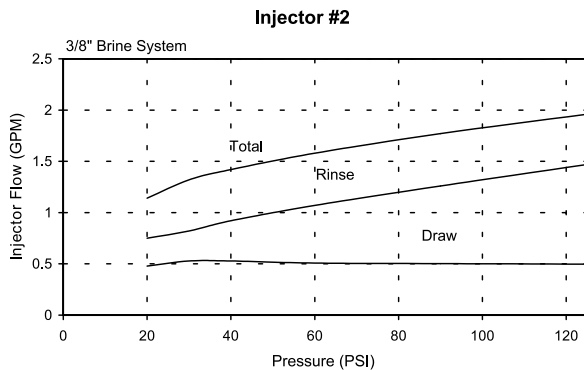
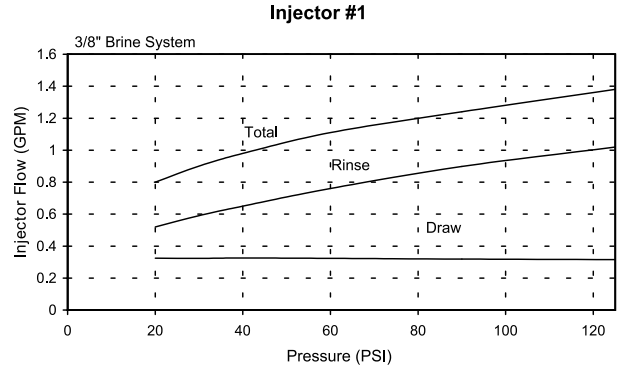
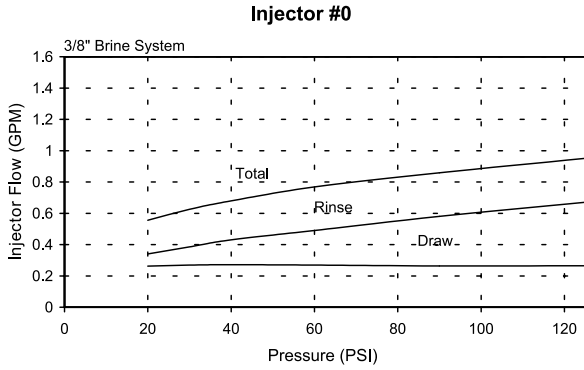
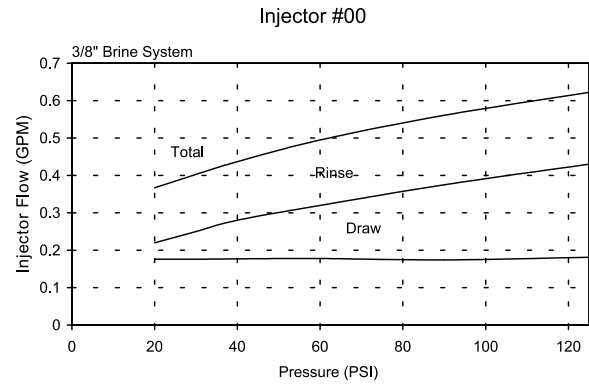
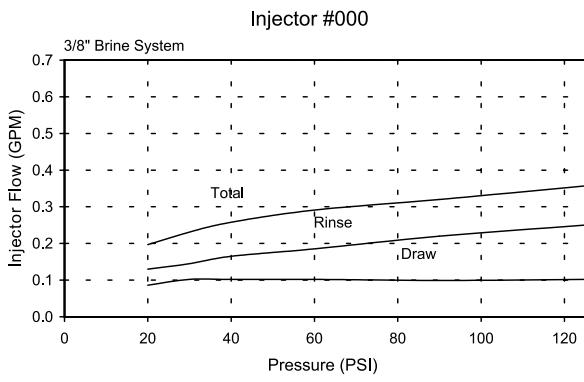
METER FLOW DATA

7000XTR Valve



TR18753 Softener
 TR18688 Filter
 41140-02 REV A

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 REV B

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