



# Pentair Water

## Fleck 6700XTR Upflow

### Service Manual

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#### 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. 56XT/6700
- B. Proprietary C

**3. Regenerant Flow:**

- A. Downflow
- B. Upflow
- C. Downflow Double Backwash
- D. Upflow Backwash
- E. Filter
- F. Upflow Variable Flow

**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:** Zero or \_\_\_\_\_ %

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

**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 \_\_\_ : \_\_\_ : \_\_\_

**12. Media Volume:** \_\_\_\_\_ (CuFt or Liter)

**13. Salt Dosage:** \_\_\_\_\_ (lbs/CuFt or grams/Liter)

**14. BLFC Size:** \_\_\_\_\_ gpm

**15. 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

**16. Chemical Pump:**

- A. Enabled
- B. Disabled

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

**18. CPO Aux Relay:** \_\_\_ : \_\_\_ : \_\_\_

**19. Flow Meter Size:**

- A. 0.75" Paddle
- B. 0.75" Turbine

**20. Generic Flow Meter for Maximum Flow Rate:**

Add \_\_\_\_\_ Gallons every \_\_\_

# INSTALLATION

## Water Pressure

A minimum of 20 pounds (1.4 bar) of water pressure is required for regeneration valve to operate effectively.

## Electrical Facilities

An uninterrupted alternating current (A/C) supply is required. Note: Other voltages are available. Please make sure your voltage supply is compatible with your unit before installation.

## Existing Plumbing

Condition of existing plumbing should be free from lime and iron buildup. Piping that is built up heavily with lime and/or iron should be replaced. If piping is clogged with iron, a separate iron filter unit should be installed ahead of the water softener.

## Location Of Softener And Drain

The softener should be located close to a drain to prevent air breaks and back flow.

## By-Pass Valves

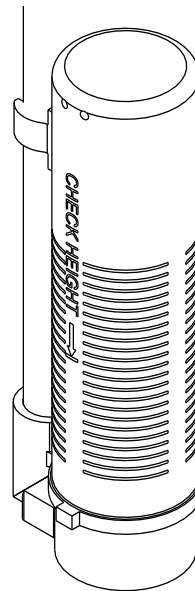
Always provide for the installation of a by-pass valve if unit is not equipped with one.

**CAUTION** Water pressure is not to exceed 125 psi (8.6 bar), water temperature is not to exceed 110°F (43°C), and the unit cannot be subjected to freezing conditions.

## Installation Instructions

1. Place the softener tank where you want to install the unit making sure the unit is level and on a firm base.
2. During cold weather, the installer should warm the valve to room temperature before operating.
3. All plumbing should be done in accordance with local plumbing codes. The pipe size for residential drain line should be a minimum of 1/2" (13 mm). Backwash flow rates in excess of 7 gpm (26.5 Lpm) or length in excess of 20' (6 m) require 3/4" (19 mm) drain line. Commercial drain lines should be the same size as the drain line flow control.
4. Refer to the dimensional drawing for cutting height of the distributor tube. If there is no dimensional drawing, cut the distributor tube flush with the top of the tank.
5. Lubricate the distributor O-ring seal and tank O-ring seal. Place the main control valve on tank. Note: Only use silicone lubricant.
6. Solder joints near the drain must be done prior to connecting the Drain Line Flow Control fitting (DLFC). Leave at least 6" (15 cm) between the DLFC and solder joints when soldering pipes that are connected on the DLFC. Failure to do this could cause interior damage to the DLFC.
7. Teflon tape is the only sealant to be used on the drain fitting. The drain from twin tank units may be run through a common line.
8. Make sure that the floor is clean beneath the salt storage tank and that it is level.
9. Place approximately 1" (25 mm) of water above the grid plate. If a grid is not utilized, fill to the top of the air check (Figure 1) in the salt tank. Do not add salt to the brine tank at this time.
10. On units with a by-pass, place in by-pass position. Turn on the main water supply. Open a cold soft water tap nearby and let run a few minutes or until the system is free from foreign material (usually solder) that may have resulted from the installation. Once clean, close the water tap.

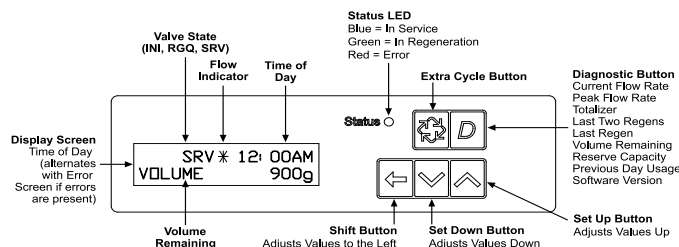
11. Slowly place the by-pass in service position and let water flow into the mineral tank. When water flow stops, slowly open a cold water tap nearby and let run until the air is purged from the unit.
12. Plug unit into an electrical outlet. Note: All electrical connections must be connected according to local codes. Be certain the outlet is uninterrupted.



60002 Rev E

Figure 1 Residential Air Check Valve

# TIMER OPERATION



## 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 service, press the Extra Cycle 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.

## TIMER OPERATION *continued*

### 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	Day override parameter is reached
	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	Volume remaining has been depleted to the fixed reserve volume
	The regeneration time has been reached
Meter Delayed Variable Reserve	Volume remaining has been depleted to the variable reserve volume
	The regeneration time has been reached
Meter Delayed Weekly Reserve	Volume remaining has been depleted to the weekly variable reserve volume
	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 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.**

### 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, displays a blue LED light, and resumes normal operation.

### 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.**

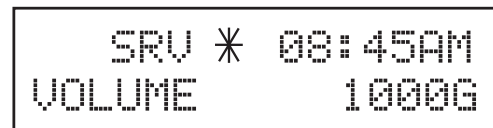


Figure 2 Volume Remaining (Less Reserve)

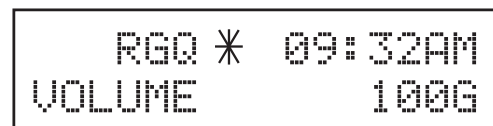


Figure 3

**⚠ WARNING:** Transformer must be grounded and ground wire must be terminated to the backplate where grounding label is located before installation.

# MASTER PROGRAMMING MODE FLOW CHART

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

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

## To Set Time Of Day:

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



## Entering Master Programming Mode.

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

OR

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.



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: 56XT/6700

**Options:** 56XT/6700 (Default)  
PROPRIETARY C

REGENERANT FLOW: DOWN FLOW

**Options:** Down Flow [DOWN FLOW] (Default)  
Filter [FILTER]  
Up Flow [UP FLOW]  
Downflow Double Backwash [DOWNFLOW DB BW]  
Up Flow Backwash [UF BACKWASH]  
Up Flow Variable Fill [UF VARIABLE FILL]

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: 30 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: 00%

**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

VOLUME OVERRIDE: 1000g

**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: 02:00AM

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

CYCLE BACK WASH: 0:10:00

**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

MEDIA VOLUME: 000.00 CuFt

**Options:** Cubic Feet [CuFt] (Default)  
Liter [ltr]

**Range:** .25 to 999 cubic feet or 1 to 9999 liters

**NOTE:** Only shown when Regenerant Flow is UF Variable Fill

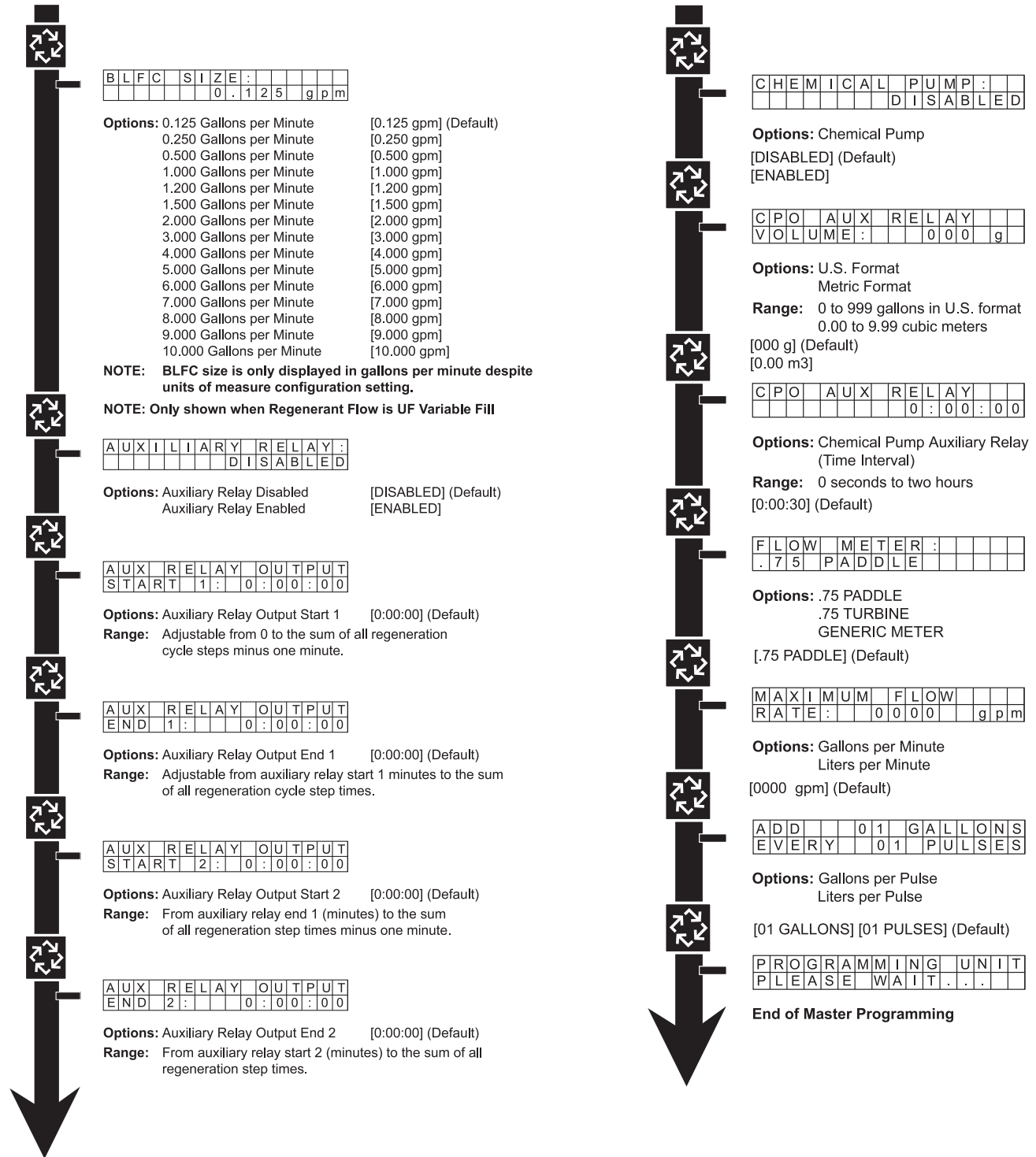
SALT DOSAGE: 00.0 lb/CuFt

**Options:** Pounds per Cubic Foot [lb/CuFt] (Default)  
Grams per Liter [g/ltr]

**Range:** 0.1 to 99.9 pounds per cubic foot for U.S. values and 0.1 to 99.9 grams per liter for Metric values.

**NOTE:** Only shown when Regenerant Flow is UF Variable Fill

# MASTER PROGRAMMING MODE FLOW CHART *continued*





# 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

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

OR

Set the Time of Day display to 12:01 P.M. or 12:01HR. (See the User Programming section to learn how to set the 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

Press the Extra Cycle button once per display until all are viewed. Master Programming Mode is exited and the normal display screen appears.

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 Shift 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:
56XT/6700
```

## 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 g
```

# 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 5. 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
Down Flow	Back Wash	10 Min	Brine & Slow Rinse	60 Min	Rapid Rinse	10 Min
Back Wash Filter	Back Wash	15 Min	Draw	0	Settling Rinse	10 Min
UF Back Wash	Back Wash	10 Min	Brine & Slow Rinse	60 Min	Rapid Rinse	10 Min
Down Flow Double Back Wash	Back Wash	10 Min	Brine & Slow Rinse	60 Min	Back Wash	10 Min
Up Flow	Brine Rinse	60	Back Wash	10	Rapid Rinse	10 Min
Upflow Variable Fill	Brine Rinse	Variable	Pause	60 Min	Brine Rinse	60 Min

Regenerant Flow	Cycle 4	Time	Cycle 5	Time
Down Flow	Brine Tank Fill	12 Min	N/A	N/A
Back Wash Filter	Refill	0	N/A	N/A
UF Back Wash	Brine Tank Fill	12 Min	N/A	N/A
Down Flow Double Back Wash	Rapid Rinse	10 Min	Brine Tank Fill	12 Min
Up Flow	Brine Tank Fill	12 Min	N/A	N/A
Upflow Variable Fill	Back Wash	12 Min	Rapid Rise	10 Min

## 12. Media Volume

This program step sets the volume of the media in the resin tank.

- 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.

## 13. Salt Dosage

This program step sets the salt dosage in 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.

## 14. Brine Line Flow Control Size

This program step allows the selection of the desired brine line flow control size in the unit (must match physical brine line flow control).

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

## 15. 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
    
```

# MASTER PROGRAMMING MODE

*continued*

- 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.



## 16. 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.



## 17. 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.

## 18. Pulses per Gallon/Liter

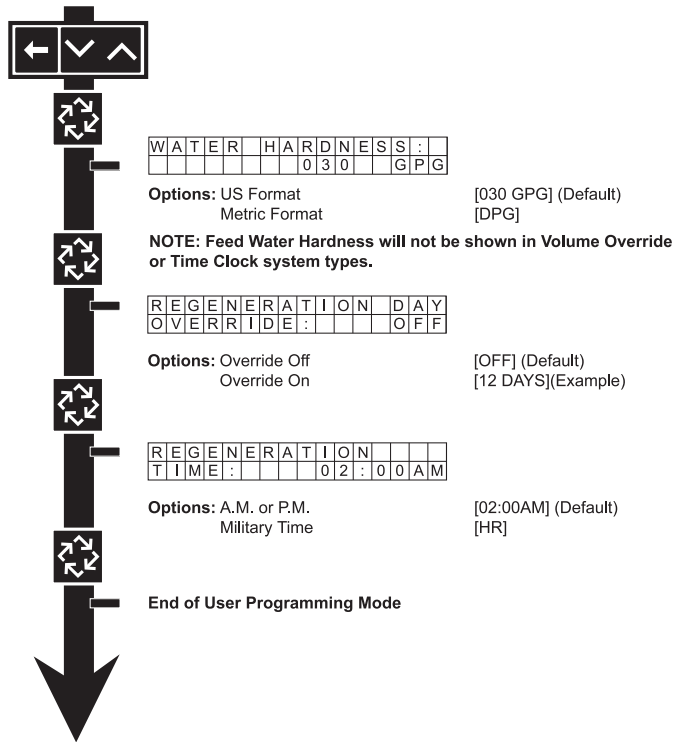
- This program step sets the pulses per gallon/liter for generic flow meters.
- Press the Shift button to select the digit you want to modify.
  - Press the Up or Down buttons to adjust this value.
  - Press the Extra Cycle button.

## 19. End of Master Programming Mode

Press the Extra Cycle button to save all settings and exit Master Programming Mode.

# USER PROGRAMMING MODE & FLOW CHART

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



## 1. Enter User Mode

- Press the Up or 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

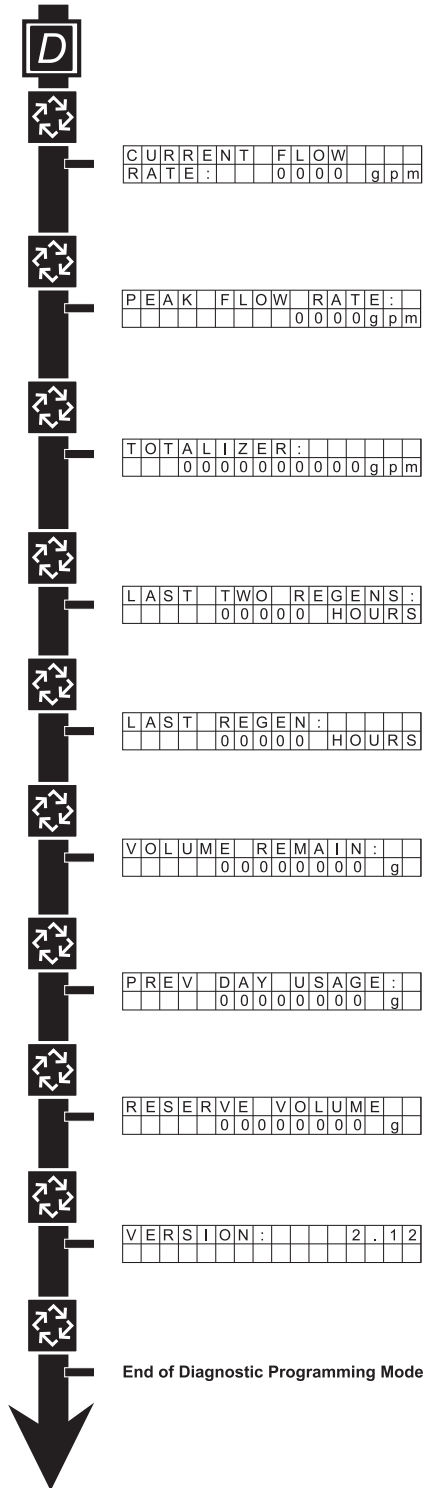
- Press the Shift, Up, and Down buttons to move the cursor and change the value of the numbers.
- Press the Extra Cycle button to proceed to the next step.

## 5. End of User Programming Mode



# DIAGNOSTIC PROGRAMMING MODE FLOW CHART

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

### **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.

.75” Paddle: 15 gpm (0.06 m<sup>3</sup>/m)

.75” Turbine: 15 gpm (0.06 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**

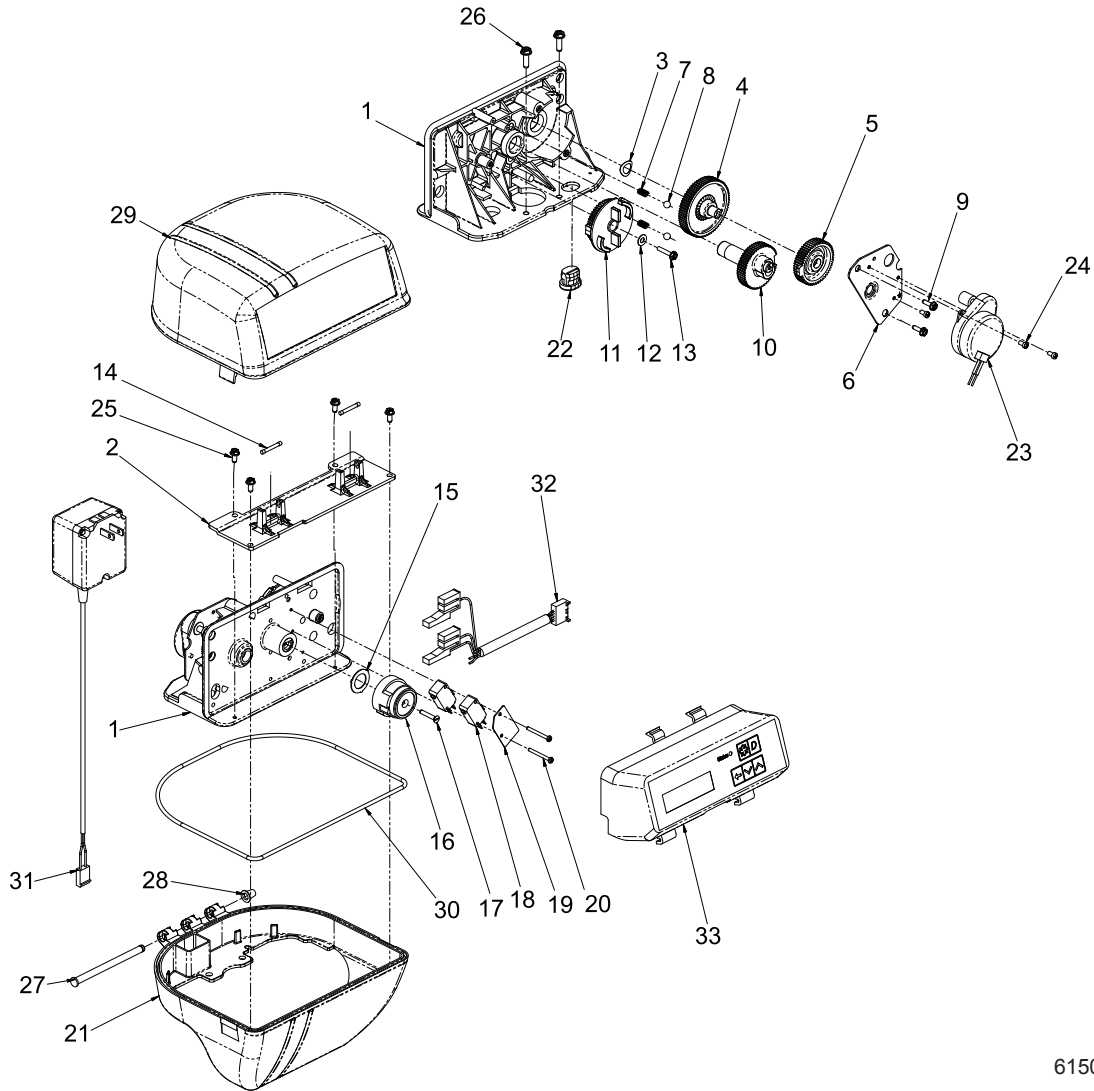
This program step displays the timer’s software program version number.

- Press the Extra Cycle button to exit.

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

#### **10. End of Diagnostic Programming Mode**

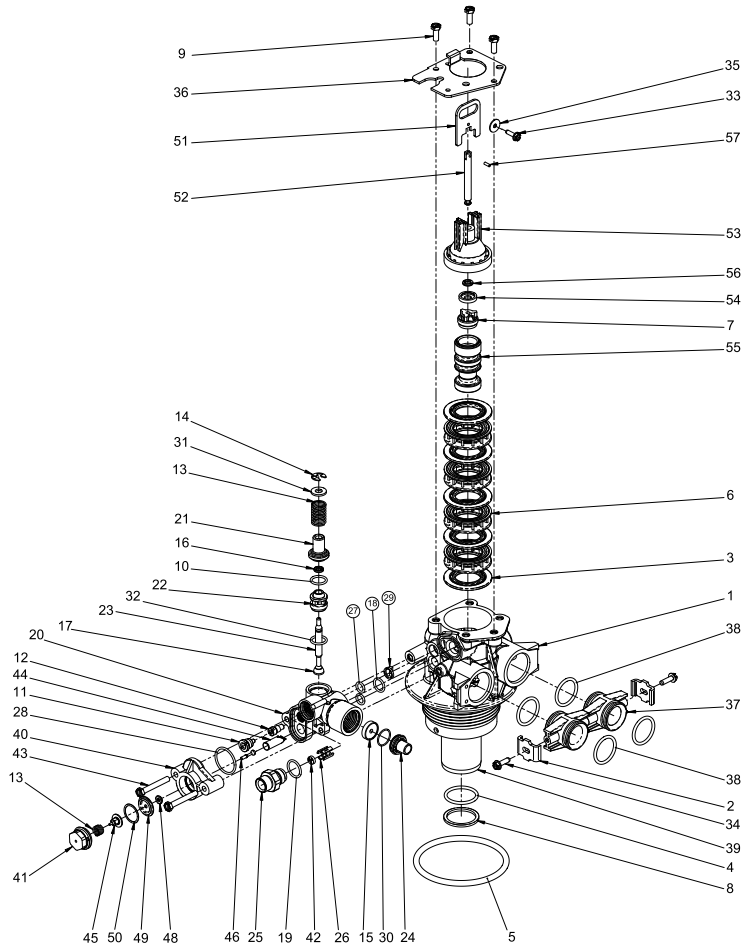
# 6700XTR POWERHEAD ASSEMBLY



61501-6700 Rev C

Item No.	QTY	Part No.	Description	Item No.	QTY	Part No.	Description
1	1	15494-04	Drive Panel Assy, 6700	18	2	10218	Switch, Micro
2	1	17844	Bracket, Support, 6700	19	1	10302	Insulator, Limit Switch
3	1	13299	Washer, Spring, 3/8	20	2	17876	Screw, Phil Pan, 4-40 x 1 1/8
4	1	13017	Gear, Idler	21	1	17841-XXX	Cover, Bottom, 6700
5	1	23045	Gear, Drive, 6700	22	1	13547	Strain Relief, Flat Cord
6	1	13175	Plate, Motor Mounting	23	1	16944	Motor Drive, 24V, 60 Hz, 2RPM
7	2	19080	Spring, Compression, 6700	24	3	11384	Screw, Phil, 6-32 x 1/4
8	2	13300	Ball, 1/4" Stainless Steel	25	4	17798	Screw, Slot Hex Hd
9	2	13296	Screw, Hex Wsh, 6-20 x 1/2	26	2	12473	Screw, Hex Wsh, 10-24 x 5/8
10	1	42933-10	Gear, Main Drive, Upflow	27	1	17845	Pin, Hinge, 6700
11	1	18722	Cam, Brine Valve, 6600/6700, Blk	28	1	18679	Cap, Tapered, Black
	1	19025	Cam, Brine Valve, Variable	29	1	17842-XX	Cover, Top 6700
12	1	12037	Washer, Plain, #10	30	1	18615	Seal, Neoprene, .125
13	1	40214	Screw, Hex Wsh, 6-20 x 3/4	31	1	40981	Transformer, 24V, 9.6VA, 6700/7000
14	2	18754	Pin, 6700		1	41086	Transformer, 24V, 9.6VA, European, 6700/7000
15	1	19079	Washer, Friction	32	1	42115	Harness Assy, 5066/6600/6700
16	1	17885	Cam, Brining, 6600, U/F, Red	33	1	42274	Timer Assy, 6700XTR
	1	17919	Cam, Variable Brining, Gray				
	1	24598	Cam, Cycle U/F, Yellow				
17	1	15151	Screw, Flat Head St, 6-20 x 3/4				

# CONTROL VALVE ASSEMBLY



61500-6600-6700 UF Rev B

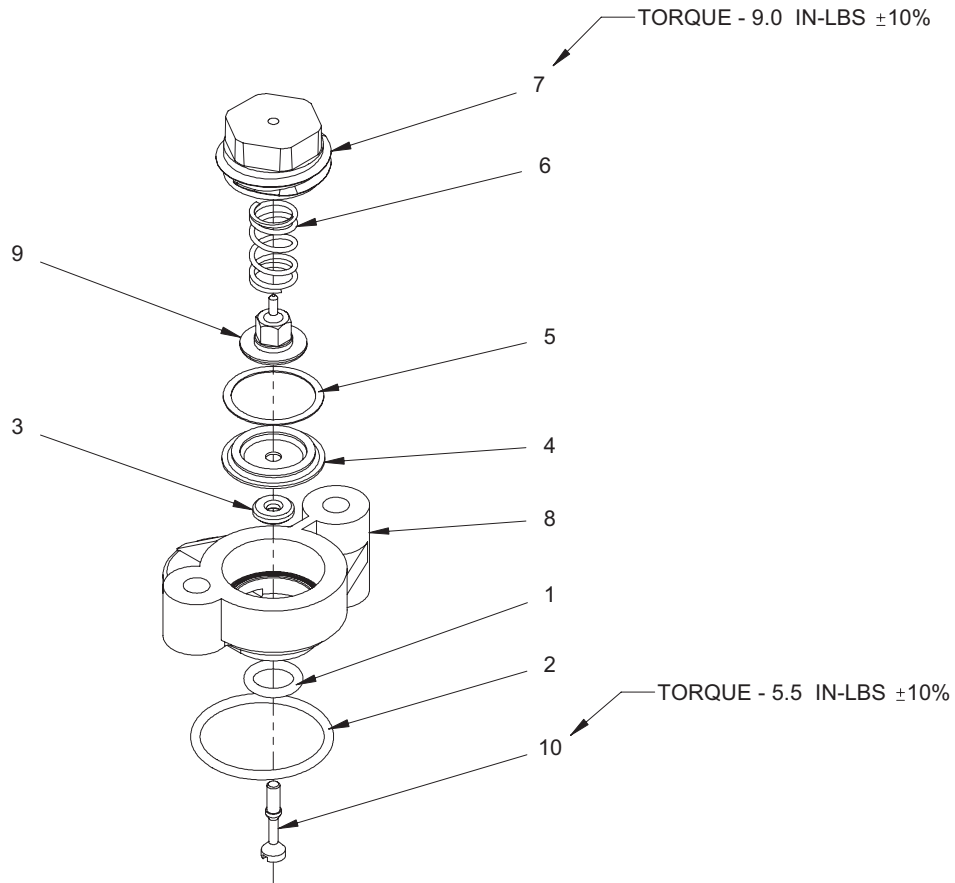
Item No.	QTY	Part No.	Description
1	1	19707-30	Valve Body, 5600 Upflow, Bayonet
2	1	13255	Clip, Mounting
3	5	13242	Seal, 5600
4	1	13304	O-ring, -121
5	1	12281	O-ring, -338
6	4	14241	Spacer, 5600
7	1	14309	Retainer, Piston Rod
8	1	13030	Retainer, Dist Tube, O-ring
9	3	12112	Screw, Hex Hd Mach, 10-24 x 1/2
10	1	13302	O-ring, -014
11	1	10913-XX	Nozzle, Injector (specify size)
12	1	10914-XX	Throat, Injector (specify size)
13	1	11973	Spring, Brine Valve
14	1	11981-01	Ring, Retaining
15	1	12088	Washer, Flow 2.4 gpm
16	1	12550	Quad Ring, -009
17	1	12626	Seat, Brine Valve
18	1	12638	O-ring, -013, Injector
19	1	12977	O-ring, -015
20	1	13163	Body, Injector
21	1	13165	Cap, Brine Valve
22	1	13167	Spacer, Brine Valve
23	1	13172	Brine Valve Stem
24	1	13173	Retainer, DLFC Button
25	1	13244	Adapter, BLFC
26	1	13245	Retainer, BLFC
27	2	13301	O-ring, -011, Injector
28	1	13303	O-ring, -021

Item No.	QTY	Part No.	Description
29	1	13497	Dispenser, Air, 5600
30	1	15348	O-ring, -563
31	1	16098	Washer, Nylon Brine
32	1	13302-01	O-ring, -014, 560CD
33	1	13296	Screw, Hex Wsh, 6-20 x 1/2
34	2	13314	Screw, Slot Ind Hex, 8-18 x .60
35	1	13363	Washer, Plain, .145 ID Stainless Steel
36	1	13546	Retainer, End Plug
37	2	19228	Coupling, Adapter
38	4	13305	O-ring, -119
39	1	14067	Adapter, Upflow Brine
40	1	15449	Body, Regulator
41	1	14851	Cap, Regulator
42	1	17307	Washer, Flow, .125 gpm
43	2	15607	Screw, Hex Hd Mach, 10-24 x 1 3/8
44	1	15548	Screen, Pressure Regulator
45	1	23391	Seat, Regulator Spring
46	1	23393	Poppet, Regulator
47	1	14850	Spring, Compression
48	1	14846	Washer, Pressure Regulator
49	1	14847	Diaphragm, Regulator
50	1	14848	Ring, Slip, Regulator, Stainless Steel
51	1	24602	Link, Piston Rod
52	1	15558	Rod, Piston, Upflow

**Not Shown:**

1	1	13301	O-ring, -001 (See "INJECTOR CAP REGULATED, 20 PSI" on page 13)
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# INJECTOR CAP REGULATED, 20 PSI

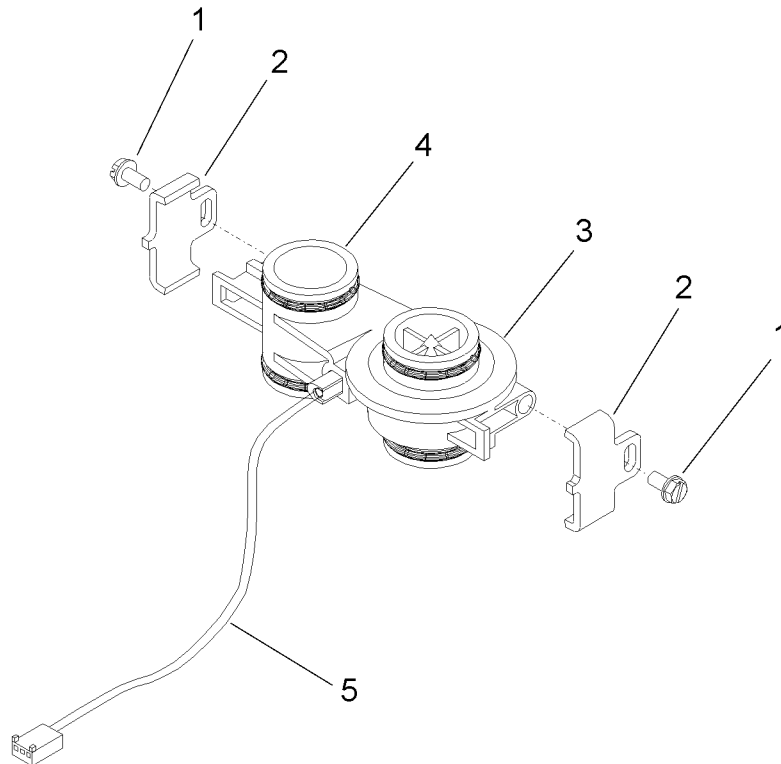


60286-20 Rev B

Item No.	QTY	Part No.	Description
1.....	1 .....	13301.....	O-ring, -011
2.....	1 .....	13303.....	O-ring, -021
3.....	1 .....	14846.....	Washer, Pressure Regulator
4.....	1 .....	14847.....	Diaphragm, Regulator
5.....	1 .....	14848.....	Ring, Slip, Regulator, SS
6.....	1 .....	14850.....	Spring, Compression
7.....	1 .....	14851.....	Cap, Regulator
8.....	1 .....	15449.....	Body, Regulator
9.....	1 .....	23391.....	Seat, Regulator
10.....	1 .....	23393.....	Poppet, Regulator



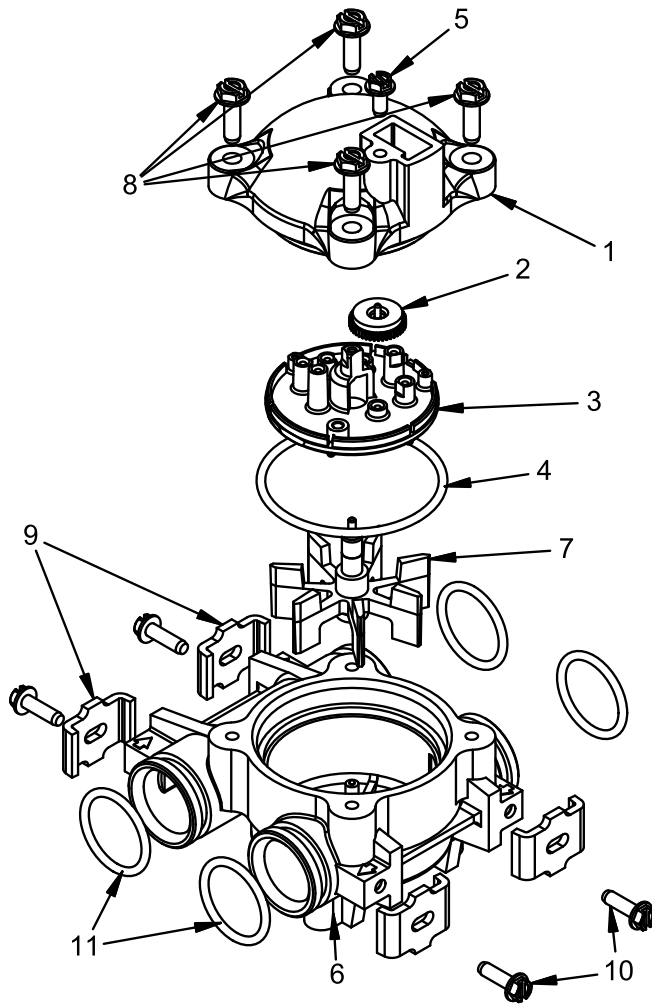
# 3/4" TURBINE METER ASSEMBLY



60626 Assy Rev A

Item No.	QTY	Part No.	Description
1.....	2 .....	13314.....	Screw, Hex Washer, 8-18 x 5/8
2.....	2 .....	19569.....	Clip, Flow Meter
3.....	1 .....	19797.....	Meter Body Assembly, 3/4" Turbine
4.....	4 .....	13305.....	O-ring, 119
5.....	1 .....	19791-01.....	Harness Assembly, Flow Meter
6.....	1 .....	14613.....	Flow Straightener (not shown)

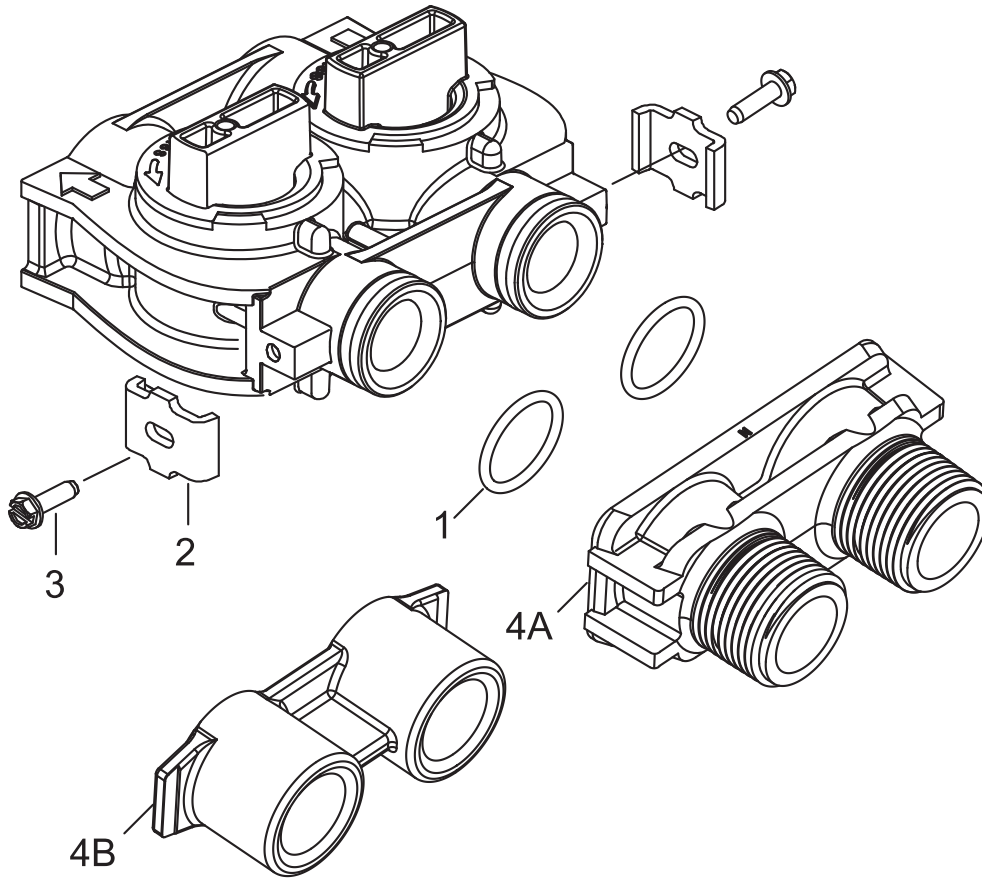
# BYPASS VALVE ASSEMBLY, BRASS



60086 Rev D

Item No.	QTY	Part No.	Description
1.....	1 .....	13874.....	Cap, Meter, Electronic
2.....	1 .....	14715.....	Gear Assy, Electronic Meter Cap
3.....	1 .....	41055.....	Plate, Intermediate
4.....	1 .....	13847.....	O-ring, -137, Std, Meter
5.....	5 .....	17798.....	Screw, Slot Hex Wsh Hd
6.....	1 .....	13821.....	Body, Meter, 5600
7.....	1 .....	13509.....	Impeller, Meter
8.....	4 .....	12473.....	Screw, Hex Wsh, 10-24 x 5/8
9.....	4 .....	13255.....	Clip, Mounting
10.....	4 .....	13314.....	Screw, Slot Ind Hex, 8-18 x .60
11.....	4 .....	13305.....	O-ring, -119
12.....	1 .....	14613.....	Flow Straightener

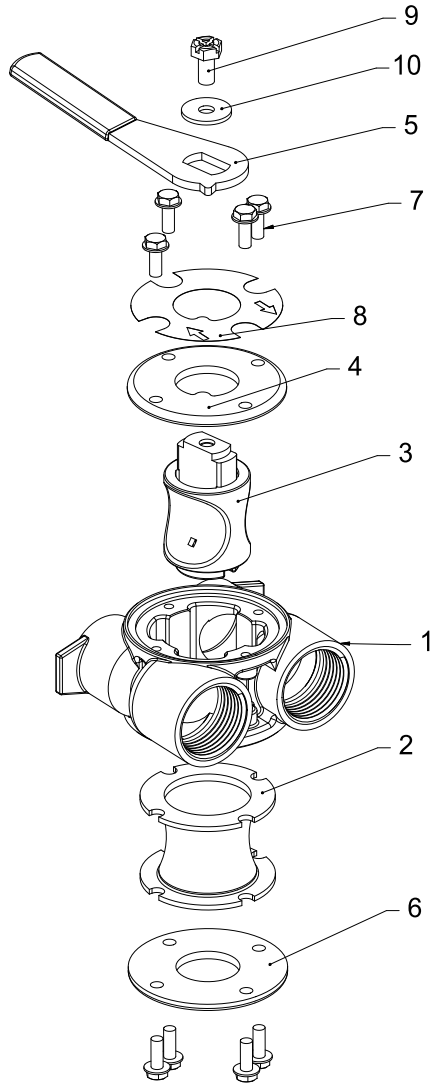
# BYPASS VALVE ASSEMBLY, NON-METALLIC



60049 Rev G

Item No.	QTY	Part No.	Description
1.....2	.....2	13305.....	O-ring, -119
2.....2	.....2	13255.....	Clip, Mounting
3.....2	.....2	13314.....	Screw, Slot Ind Hex, 8-18 x .60
4A.....1	.....1	18706.....	Yoke, 1", NPT, Plastic
		..... 18706-02.....	Yoke, 3/4", NPT, Plastic
4B.....1	.....1	41027-01.....	Yoke, 3/4", NPT, Cast, Machd
		..... 41026-01.....	Yoke, 1", NPT, Cast, Machd, Stainless Steel

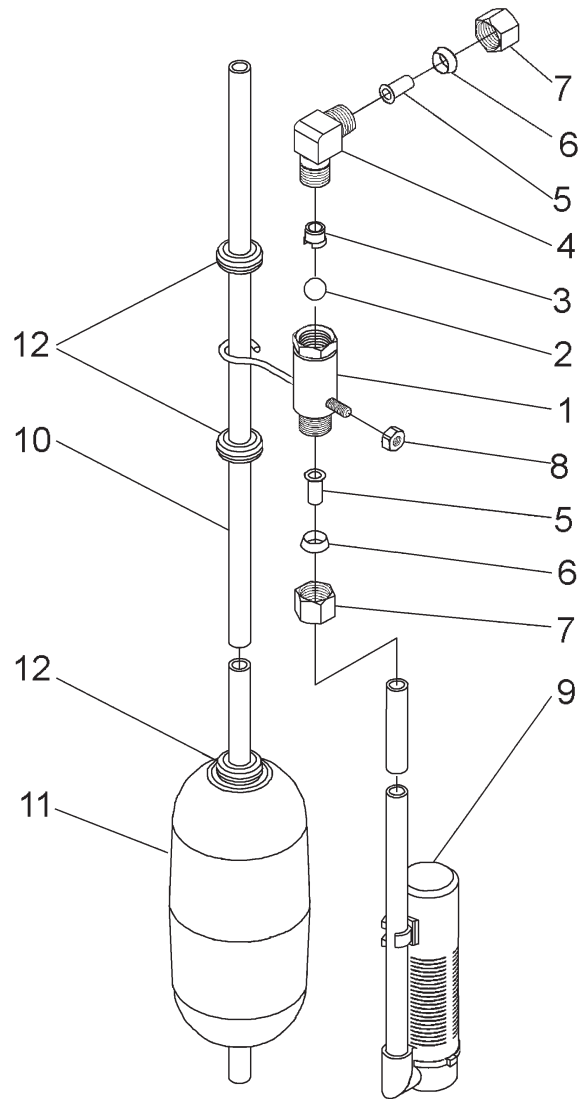
# BYPASS VALVE ASSEMBLY, BRASS



60040SS Rev R  
60041 Rev T

Item No.	QTY	Part No.	Description
1.....	1	40614.....	Bypass Body, 3/4"
		40634.....	Bypass Body, 1", Stainless Steel
2.....	1	14105.....	Seal, Bypass, 560CD
3.....	1	11972.....	Plug, Bypass
4.....	1	11978.....	Plate, Bypass, Top
5.....	1	11979-02.....	Lever, Bypass, Black
6.....	1	11986.....	Plate, Bypass, Bottom
7.....	8	15727.....	Screw, Hex Wsh Hd, 10-24 x 1/2
8.....	1	13604-03.....	Label, Bypass, Standard Mount
		13604-04.....	Label, Bypass, Reverse Mount, Blue
9.....	1	40974.....	Washer, Plain, 3/8"
10.....	1	40973.....	Screw, Phil Hd, Indented Hex Hd 1/4-14 x .50

# 2300 SAFETY BRINE VALVE

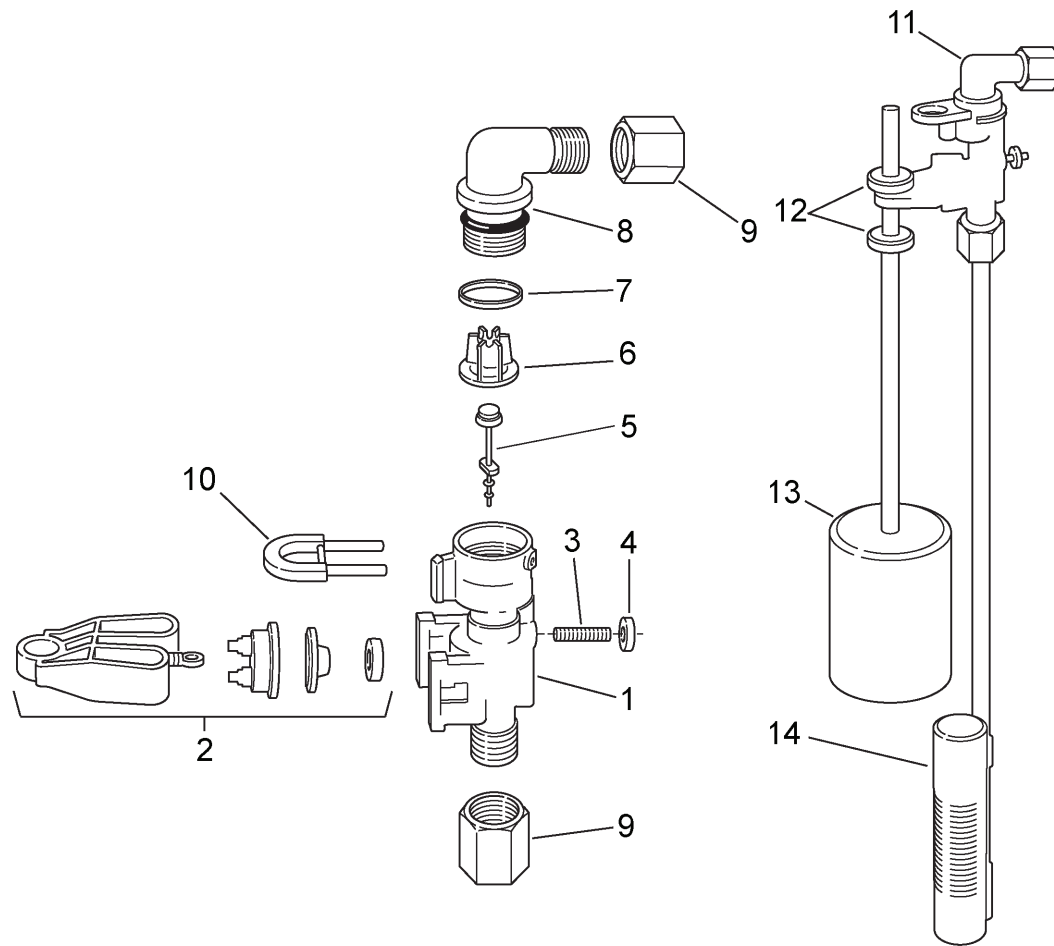


60027 Rev D

Item No.	QTY	Part No.	Description
1.....	1	60027-00.....	Safety Brine Valve, 2300 Less Elbow
2.....	1	10138.....	Ball, 3/8" Brass
3.....	1	11566.....	Ball Stop, Slow-Fill
4.....	1	10328.....	Fitting, Elbow, 90 Deg. 1/4 NPT x 3/8 T
5.....	2	10332.....	Fitting, Insert, 3/8
6.....	2	10330.....	Fitting, Sleeve, 3/8 Celcon
7.....	2	10329.....	Fitting, Tube, 3/8 Nut, Brass
8.....	1	10186.....	Nut, Hex, 10-32 Nylon
9.....	1	60002.....	Air Check, #500
10.....	1	10149.....	Rod, Float
11.....	1	10700.....	Float Assy, Blue/White
12.....	4	10150.....	Grommet, .30 Dia.



## 2310 SAFETY BRINE VALVE



42112 Rev A

Item No.	QTY	Part No.	Description
1.....	1	19645.....	Body, Safety Brine Valve, 2310
2.....	1	19803.....	Safety Brine Valve, Arm Assy
3.....	1	19804.....	Screw, Sckt Hd, Set, 10-24 x .75
4.....	1	19805.....	Nut, Hex, 10-24, Nylon Black
5.....	1	19652-01.....	Poppet Assy, SBV w/o O-ring
6.....	1	19649.....	Flow Dispenser
7.....	1	11183.....	O-ring, -.017
8.....	1	19647.....	Elbow, Safety Brine Valve
9.....	2	19625.....	Nut Assy, 3/8" Plastic
10.....	1	18312.....	Retainer, Drain
11.....	1	60014.....	Safety Brine Valve Assy, 2310 (includes items 1-10)
12.....	2	10150.....	Grommet, .30 Dia (included with item 13)
13.....	1	60068.....	Float Assy, 2310, w/30" Rod
14.....	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
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 Display Screen Examples

```

ERROR CODE:
SERVICE UNIT
    
```

```

ERROR CODE:
PROGRAM UNIT
    
```

```

ERROR CODE:
REPLACE UNIT
    
```

### Error Codes

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.**

## TROUBLESHOOTING - CONTROL VALVE

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.
	Excessive water in brine tank.	See "Excessive water in brine tank".
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
	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.

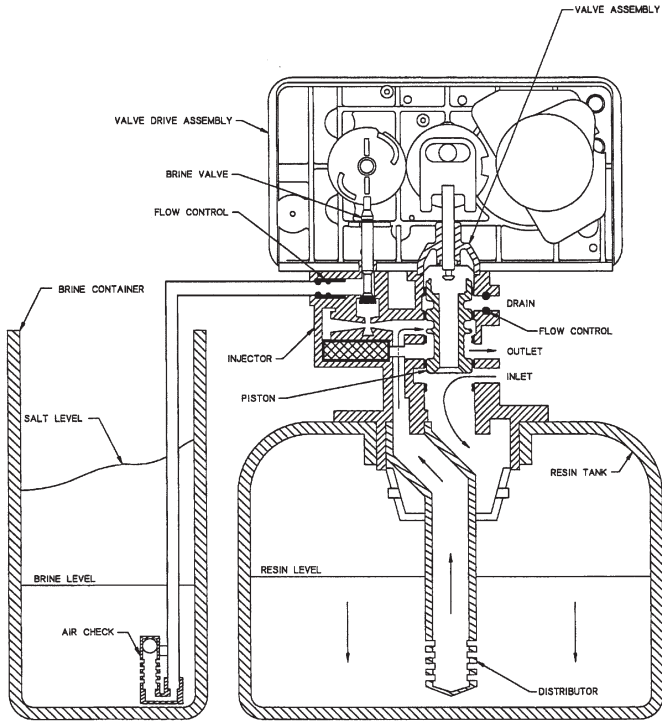
## GENERAL SERVICE HINTS FOR METER CONTROL

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<b>Problem</b>	<b>Cause</b>	<b>Correction</b>
Softener delivers hard water.	Reserve capacity has been exceeded.	Check salt dosage requirements and reset program wheel to provide additional reserve.
	Meter is not measuring flow.	Check meter with meter checker.

# WATER CONDITIONER FLOW DIAGRAMS

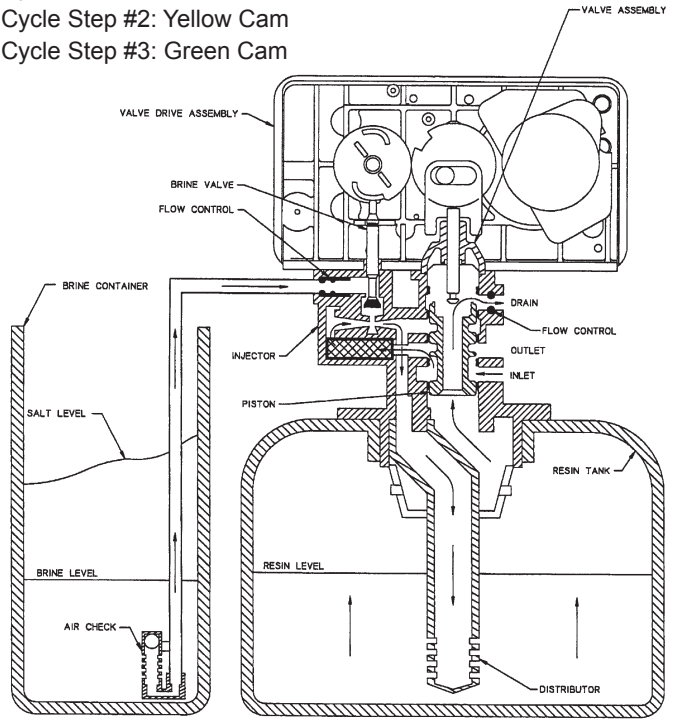
## Service Position



61500-56XT-6700 Upflow Rev A

## Brine/Slow Rinse Position

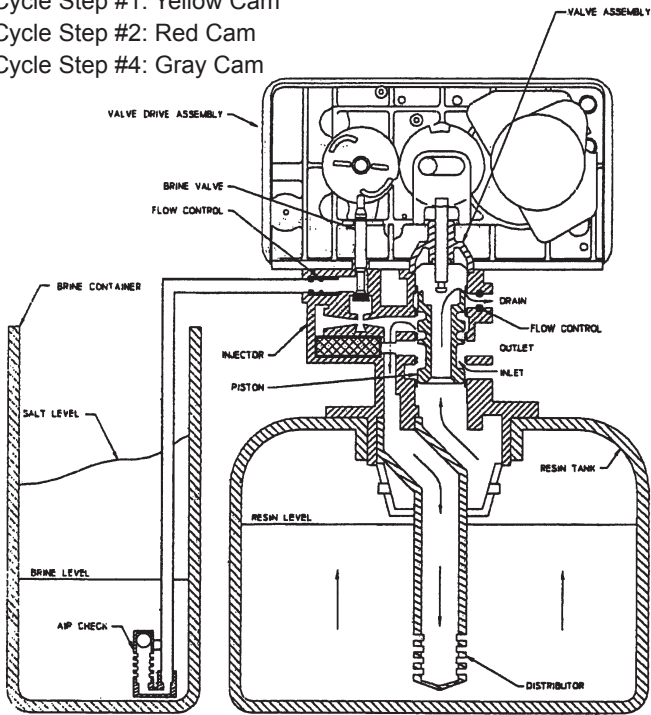
- Cycle Step #1: Red Cam
- Cycle Step #2: Yellow Cam
- Cycle Step #3: Green Cam



61500-56XT-6700 Upflow Rev A

## Backwash Position

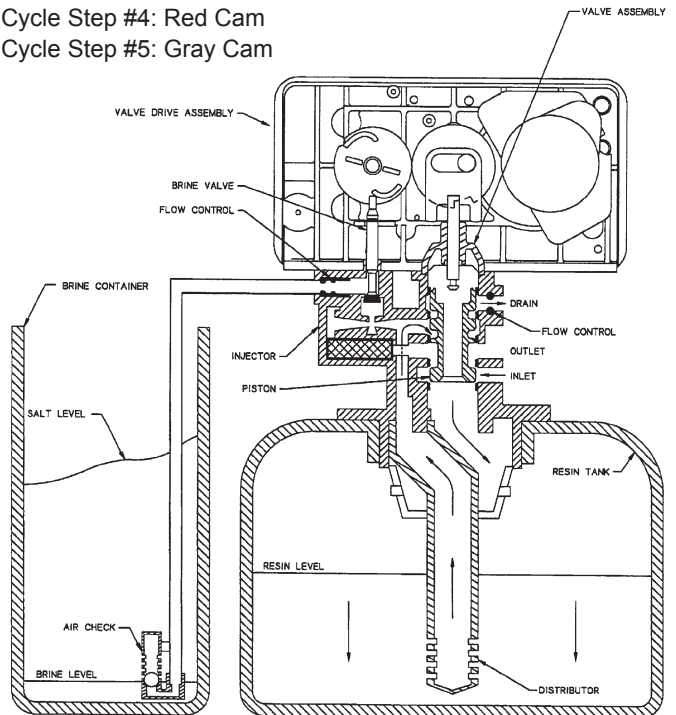
- Cycle Step #1: Yellow Cam
- Cycle Step #2: Red Cam
- Cycle Step #4: Gray Cam



61500-56XT-6700 Upflow Rev A

## Rapid Rinse

- Cycle Step #3: Yellow Cam
- Cycle Step #4: Red Cam
- Cycle Step #5: Gray Cam



61500-56XT-6700 Upflow Rev A



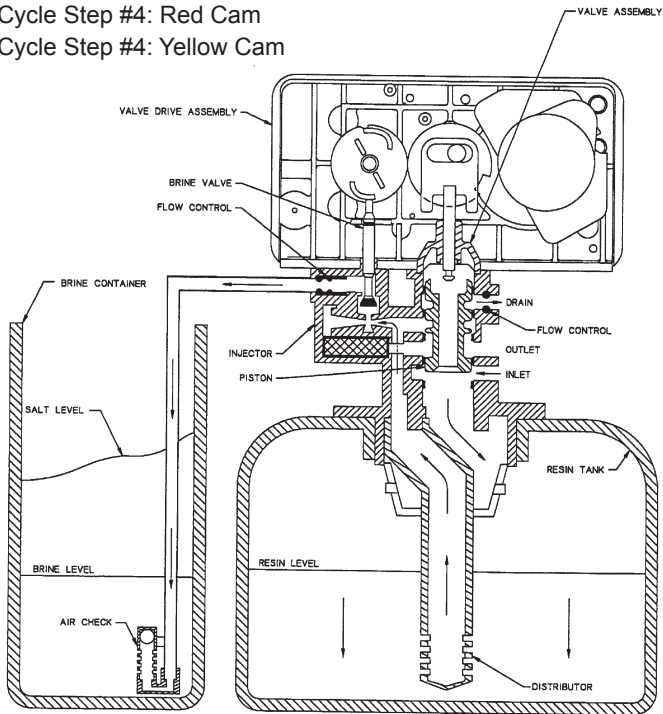
# WATER CONDITIONER FLOW DIAGRAMS *continued*

## Brine Tank Fill Position

Cycle Step #1: Gray Cam

Cycle Step #4: Red Cam

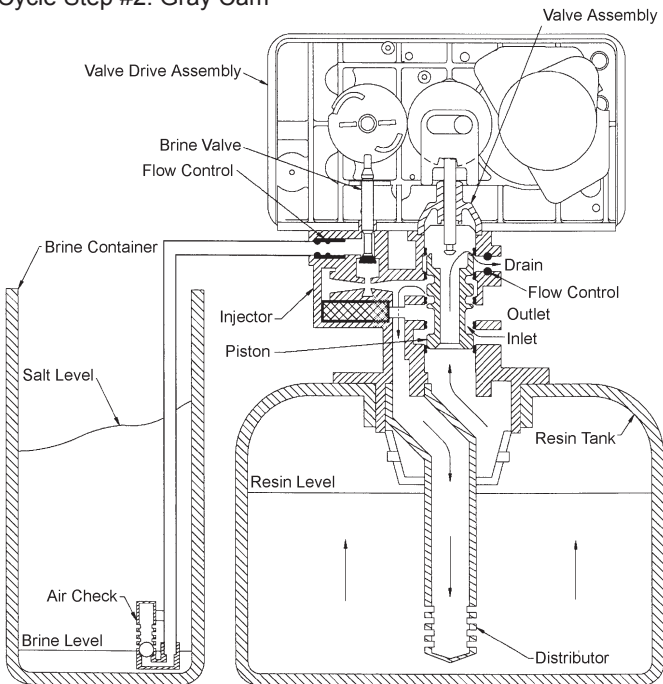
Cycle Step #4: Yellow Cam



61500-56XT-6700 Upflow Rev A

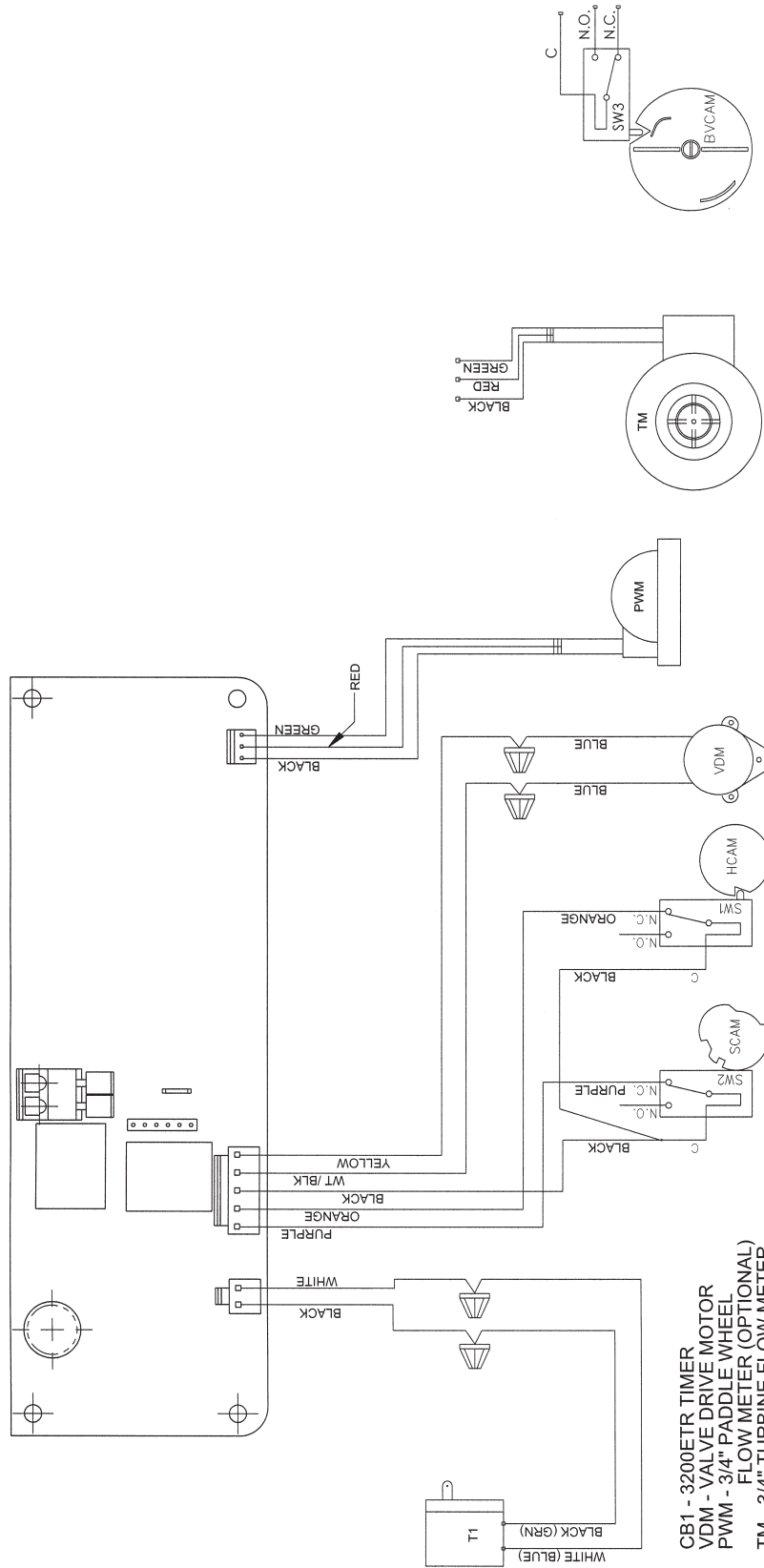
## Brine Making Position

Cycle Step #2: Gray Cam



61500-56XT-6700 Upflow Rev A

# VALVE WIRING DIAGRAM



- CB1 - 3200ETR TIMER
- VDM - VALVE DRIVE MOTOR
- PWM - 3/4" PADDLE WHEEL
- TM - 3/4" TURBINE FLOW METER (OPTIONAL)
- T1 - 24V TRANSFORMER (OPTIONAL)
- SW1 - HOMING SWITCH (OPTIONAL)
- SW2 - STEP SWITCH
- HCAM - HOMING CAM
- SCAM - STEP CAM

## SERVICE ASSEMBLIES

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### Air Check:

60002-34 .....Air Check, #500, 34" Long

### Timer:

42274.....Timer Assy, 6700XTR

### Brine Line Flow Control:

60022-12 .....BLFC, .125 GPM, 5000/5600/9000  
60022-25 .....BLFC, .25 GPM, 5000/5600/9000  
60022-50 .....BLFC, .50 GPM, 5000/5600/9000  
60022-100 .....BLFC, 1.0 GPM, 5000/5600/9000  
17307.....Washer, Flow, .125 GPM  
12094.....Washer, Flow, .25 GPM  
12095.....Washer, Flow, .50 GPM  
12097.....Washer, Flow, 1.0 GPM  
12977.....O-ring, -015  
13244.....Adapter, BLFC  
13245.....Retainer, BLFC  
60032.....Brine Valve, 4600/5600

### Yokes:

18706.....Yoke, 1", NPT, Plastic  
18706-02 .....Yoke, 3/4", NPT, Plastic  
41026-01 .....Yoke, 1", NPT, SS  
41027-01 .....Yoke, 3/4" NPT

### Bypass:

60040SS.....Bypass Assy, 3/4" NPT SS  
60041SS.....Bypass Assy, 1" NPT SS  
60049.....Bypass Plastic Assy

### Control Valve:

11973.....Spring, Brine Valve  
11981-01.....Ring, Retaining  
12550.....Quad Ring, -009  
13165.....Cap, Brine Valve  
13167.....Spacer, Brine Valve  
13302.....O-ring, -014  
16098.....Washer, Nylon Brine  
13172.....Brine Valve Stem  
12626.....Seat, Brine Valve

### Floats:

60028-XX.....2300 Blue/White Float  
60068-XX.....2310 Blue/White Float

### Injector:

60084-XX.....Injector, Module Assembly

### Meter:

60086-50 .....Meter Assy, 3/4", Electronic

### Pistons:

60102-62 .....Piston Assy, 6600/6700, Upflow  
14309.....Retainer, Piston Rod  
13001-03 .....Piston Rod Assy, 6600, Upflow  
15561.....End Plug Assy, 6600  
18848.....Piston, 6600, Upflow

### Safety Brine Valve:

60014.....2310 Safety Brine Valve Assy  
60027-FFA.....2300 Safety Brine Valve Assy  
60027-FFS.....2300 Safety Brine Valve Assy

### Seal & Spacer Kit:

60125.....Seal & Spacer Kit, 5600/9000 Top  
13242.....Seal, 5600  
14241.....Spacer, 5600



