Pentair Water

Fleck 6700XTR Downflow

Service Manual

TABLE OF CONTENTS

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^3)

9. Regeneration Day Override:
- A. Off
- B. Every _____ Days

10. Regeneration Time:
- A. Delayed _____ AM/PM
- B. Metered 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^3)

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.

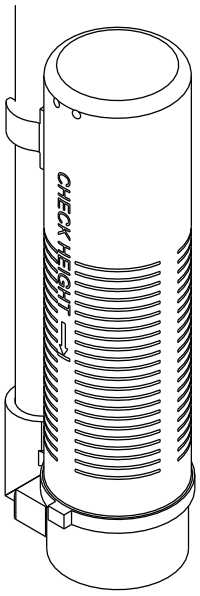
By-Pass Valves

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

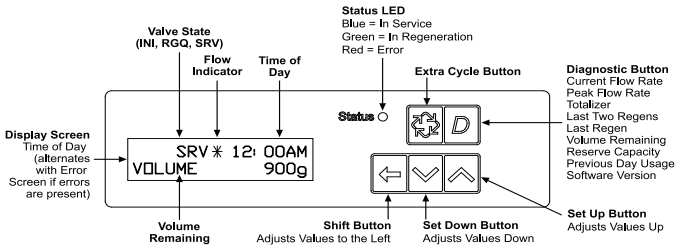
1. Place the softener tank where you want to install the unit making sure the unit is level and on a firm base.
2. During cold weather, the installer should warm the valve to room temperature before operating.
3. All plumbing should be done in accordance with local plumbing codes. The pipe size for residential 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 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.

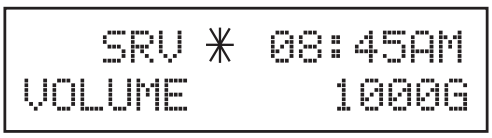


Figure 2 Volume Remaining (Less Reserve)

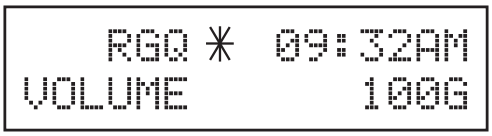


Figure 3

⚠ 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 0:10:00
BACK WASH

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

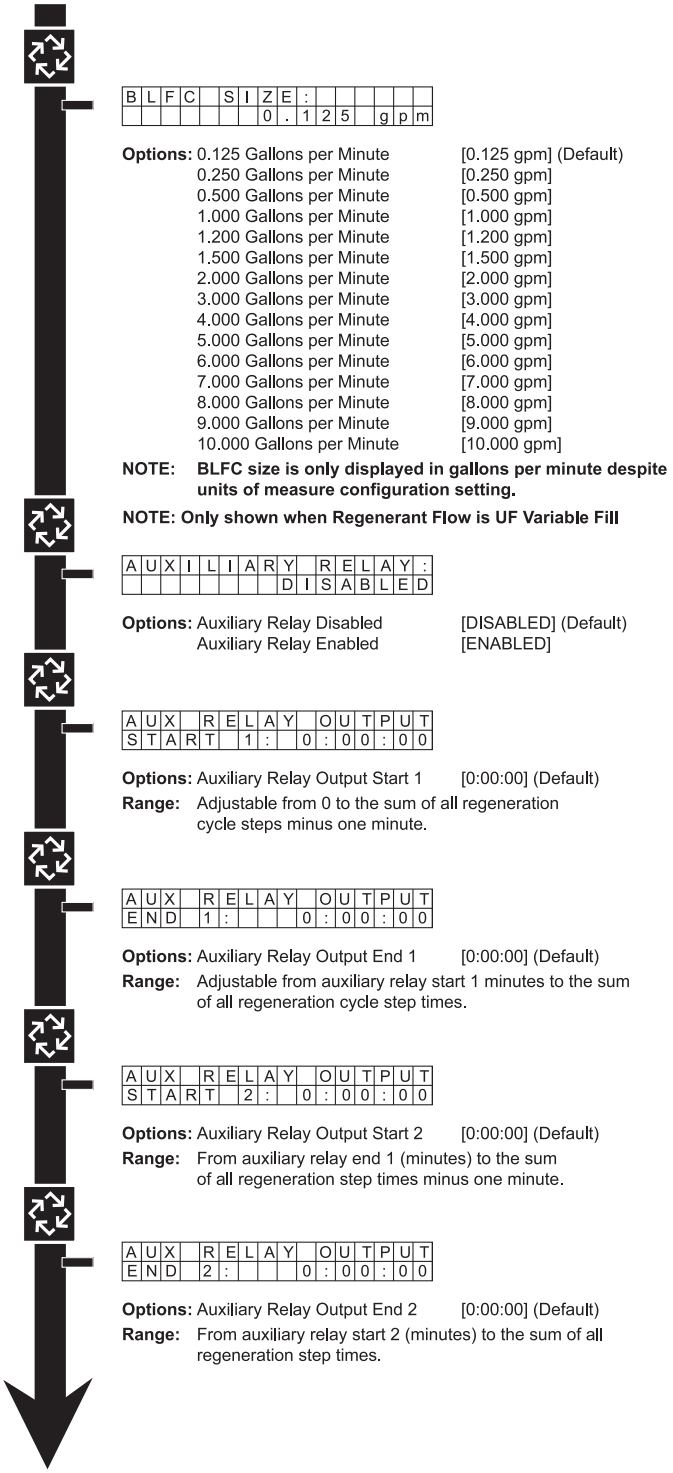
NOTE: Only shown when Regenerant Flow is UF Variable Fill

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*



BLFC SIZE:
0.125 gpm

Options: 0.125 Gallons per Minute [0.125 gpm] (Default)
0.250 Gallons per Minute [0.250 gpm]
0.500 Gallons per Minute [0.500 gpm]
1.000 Gallons per Minute [1.000 gpm]
1.200 Gallons per Minute [1.200 gpm]
1.500 Gallons per Minute [1.500 gpm]
2.000 Gallons per Minute [2.000 gpm]
3.000 Gallons per Minute [3.000 gpm]
4.000 Gallons per Minute [4.000 gpm]
5.000 Gallons per Minute [5.000 gpm]
6.000 Gallons per Minute [6.000 gpm]
7.000 Gallons per Minute [7.000 gpm]
8.000 Gallons per Minute [8.000 gpm]
9.000 Gallons per Minute [9.000 gpm]
10.000 Gallons per Minute [10.000 gpm]

NOTE: BLFC size is only displayed in gallons per minute despite units of measure configuration setting.

NOTE: Only shown when Regenerant Flow is UF Variable Fill

AUXILIARY RELAY:
DISABLED

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

AUX RELAY OUTPUT
START 1: 0:00:00

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: 0:00:00

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: 0:00:00

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: 0:00:00

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: 000 g

Options: U.S. Format
Metric Format
Range: 0 to 999 gallons in U.S. format
0.00 to 9.99 cubic meters
[000 g] (Default)
[0.00 m3]

CPO AUX RELAY
0:00:00

Options: Chemical Pump Auxiliary Relay (Time Interval)
Range: 0 seconds to two hours
[0:00:30] (Default)

FLOW METER:
.75 PADDLE

Options: .75 PADDLE
.75 TURBINE
GENERIC METER
[.75 PADDLE] (Default)

MAXIMUM FLOW
RATE: 0000 gpm

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

ADD 01 GALLONS
EVERY 01 PULSES

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

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.

Notes: 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.

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.

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.

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.

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.

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.

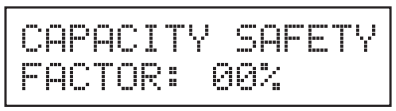
- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

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

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.

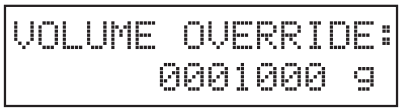
- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.



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.



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.

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.

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.

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.

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.

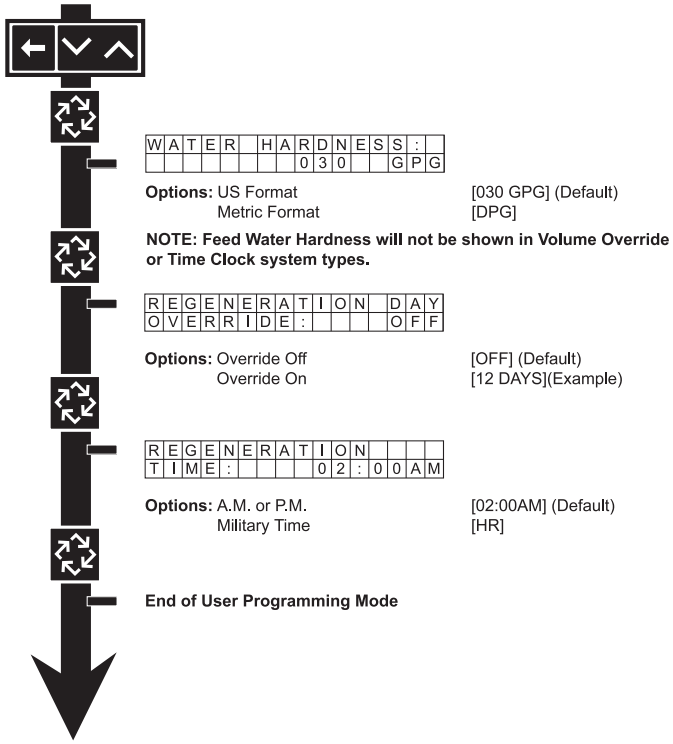
- Press the Shift button to select the digit you want to modify.
- Press the Up or Down buttons to adjust this value.
- Press the Extra Cycle button.

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. Flow Meter Size

This program step sets the size of the flow meter.

- 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 proceede 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 proceede to the next step.

4. Regeneration Time

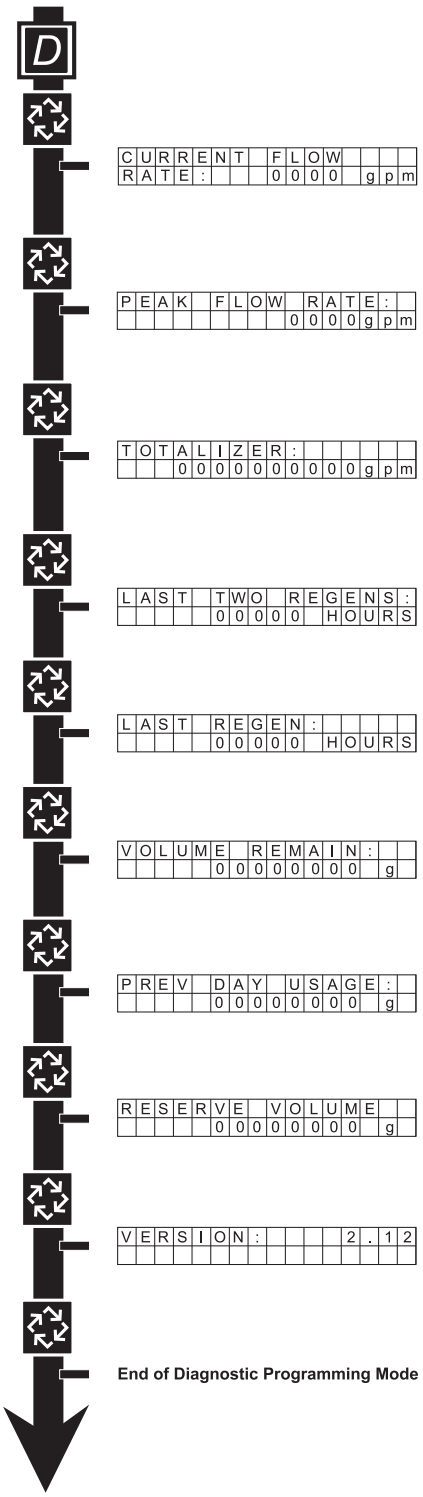
- Press the Shift, Up, and Down buttons to move the cursor and change the value of the numbers.
- Press the Extra Cycle button to proceede to the next step.

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 m3/m)

.75” Turbine: 15 gpm (0.06 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

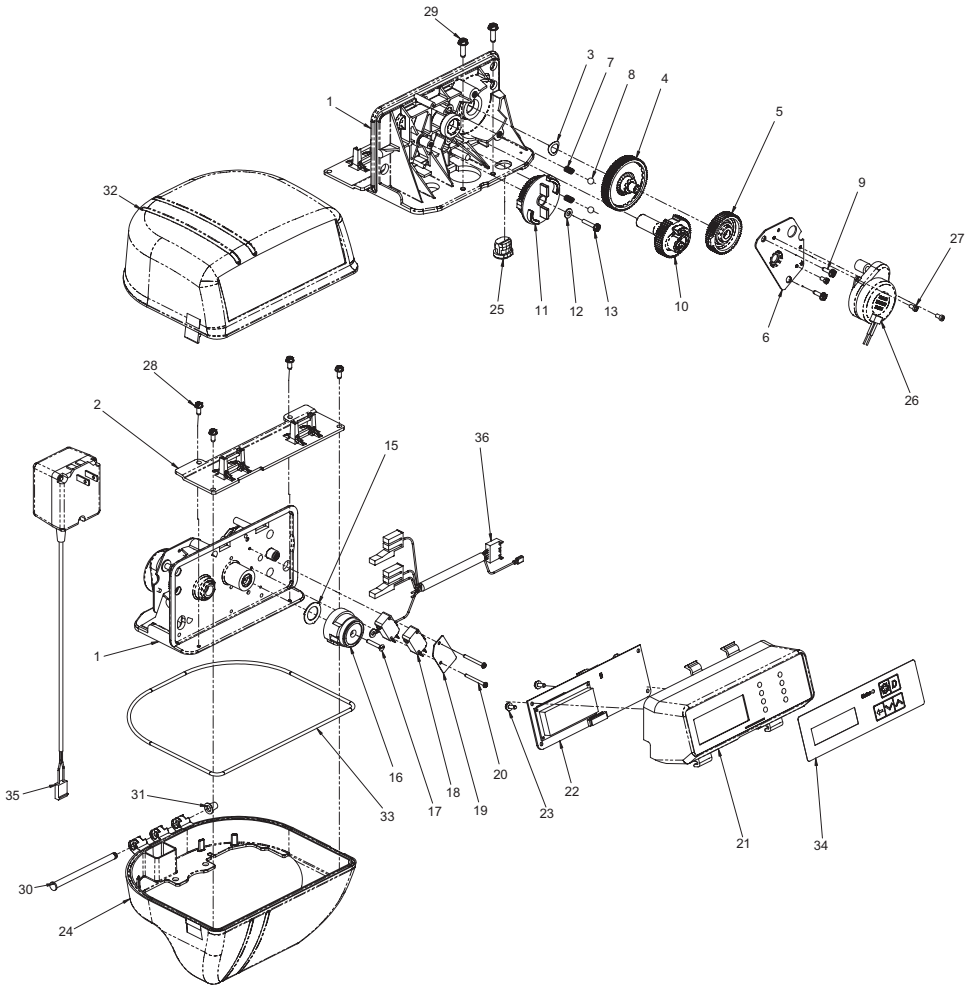
This program step displays the timer’s software program version number.

- Press the Extra Cycle button to exit.

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

10. End of Diagnostic Programming Mode

6700XTR POWERHEAD ASSEMBLY

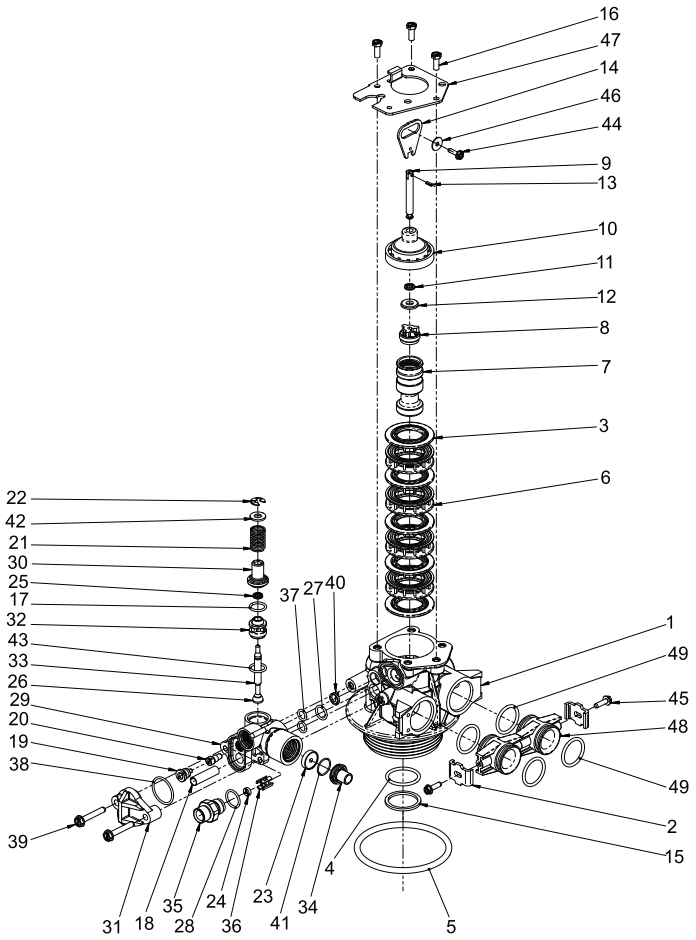


61501-6700 Rev D

Item No.	QTY	Part No.	Description
1	1	15494-04	Drive Panel Assy, 6700
2	2	61692	Bracket Assembly, Support, 6700
3	1	13299	Washer, Spring, 3/8
4	1	13017	Gear, Idler
5	1	23045	Gear, Drive
6	1	13175	Plate, Motor Mounting
7	2	19080	Spring, Compression
8	2	13300	Ball, .250
9	2	13296	Screw, Hex Wsh, 6-20 x 1/2
10	1	42933	Gear, Main Drive, Downflow
11	1	18722	Cam, Brine Valve, 6600/6700, Blk
	1	19025	Cam, Brine Valve, Variable
12	1	12037	Washer, Plain, #10
13	1	40214	Screw, Hex Wsh, #6-20 x .75
14			
15	1	19079	Washer, Friction
16	1	17438	Cam, 6600, Downflow
	1	4069	Cam, Double Backwash, D/F
17	1	15151	Screw, Flat Head St, 6-20 x 3/4
18	2	10218	Switch, Micro
19	1	10302	Insulator, Limit Switch

Item No.	QTY	Part No.	Description
20	2	17876	Screw, Phil Pan, 4-40 x 1 1/8
21	1	42194	Bracket, Circuit Board, 6700 w/Pins
22	1	42050U	Circuit Board, 3200NT
23	2	17020	Screw, Hex Wsh, #6-20 x .38
24	1	17841-XXX	Cover, Bottom, 6700, (Specify Color)
25	1	13547	Strain Relief, Round Cord
26	1	16944	Motor, 24V- 60 Hz, 2 RPM
27	3	11384	Screw, Fillister Head, Phillips, #6-32 x .25
28	4	17798	Screw, Hex Wsh, #8-16 x .38
29	2	12473	Screw, Hex Wsh, #10-24 x .625
30	1	17845	Pin, Hinge
31	1	18679	Tapered Cap
32	1	17842-XX	Cover, Top 6700, (Specify Color)
33	1	18615	Seal, .125 OD
34	1	42122	Switch & Label Assy, 6700
35	1	19674	Transformer, 24V 9.6 VA, Residential Valves
	1	41475	Transformer, 24V 9.6 VA, European
36	1	42115	Harness, Upper Drive

CONTROL VALVE ASSEMBLY

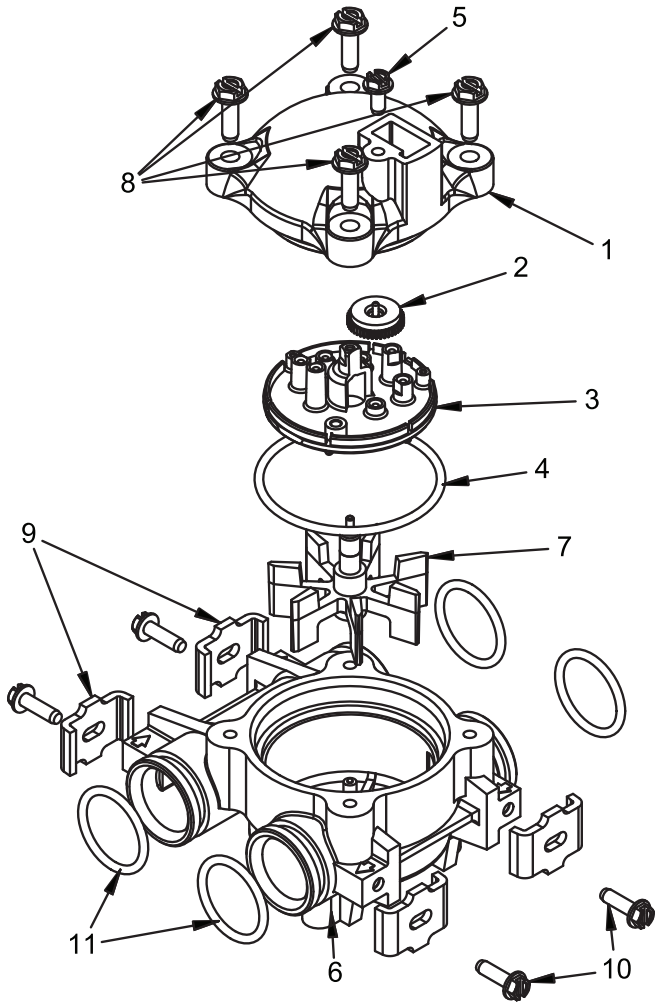


61500-6600-6700 DF Rev B

Item No.	QTY	Part No.	Description
1	1	19700-10	Valve Body, 5600, Downflow
2	2	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	17218	Piston, 6600, Downflow
8	1	14309	Retainer, Piston Rod
9	1	14469	Rod, Piston
10	1	13243-40	Plug, End, 6600, Green
11	1	10209-01	Quad Ring, -010, 560CD
12	1	13008	Retainer, End Plug Seal
13	1	13306	Pin, Roll, 3/32 x 1/4
14	1	13003	Link, Piston Rod, 5600
15	1	13030	Retainer, Dist Tube O-ring
16	3	12112	Screw, Hex Hd Mach, 10-24 x 1/2
17	1	13302	O-ring, -014
18	1	10227	Screen, Injector
19	1	10913-XX	Nozzle, Injector
20	1	10914-XX	Throat, Injector
21	1	11973	Spring, Brine Valve
22	1	11981-01	Ring, Retaining
23	1	12088	Washer, Flow, 2.4 GPM
24	1	12094	Washer, Flow, .25 GPM

Item No.	QTY	Part No.	Description
25	1	12550	Quad Ring, -009
26	1	12626	Seat, Brine Valve
27	1	12638	O-ring, -013, Injector
28	1	12977	O-ring, -015
29	1	13163	Body, Injector
30	1	13165	Cap, Brine Valve
31	1	13166	Cap, Injector, 5600
32	1	13167	Spacer, Brine Valve
33	1	13172	Brine Valve Stem
34	1	13173	Retainer, DLFC Button
35	1	13244	Adapter, BLFC
36	1	13245	Retainer, BLFC
37	2	13301	O-ring, -011, Injector
38	1	13303	O-ring, -021
39	2	13315	Screw, Hex Wsh Hd, 10-24 x 13/16
40	1	13497	Disperser, Air, 5600
41	1	15348	O-ring, -563
42	1	16098	Washer, Nylon Brine
43	1	13302	O-ring, -014
44	1	13296	Screw, Hex Wsh, 6-20 x 1/2
45	2	13314	Screw, Slot Ind Hex, 8-18 x .60
46	1	13363	Washer, Plain, .145 ID SS
47	1	13546	Retainer, End Plug
48	2	19228	Coupling, Adapter
49	4	13305	O-ring, -119

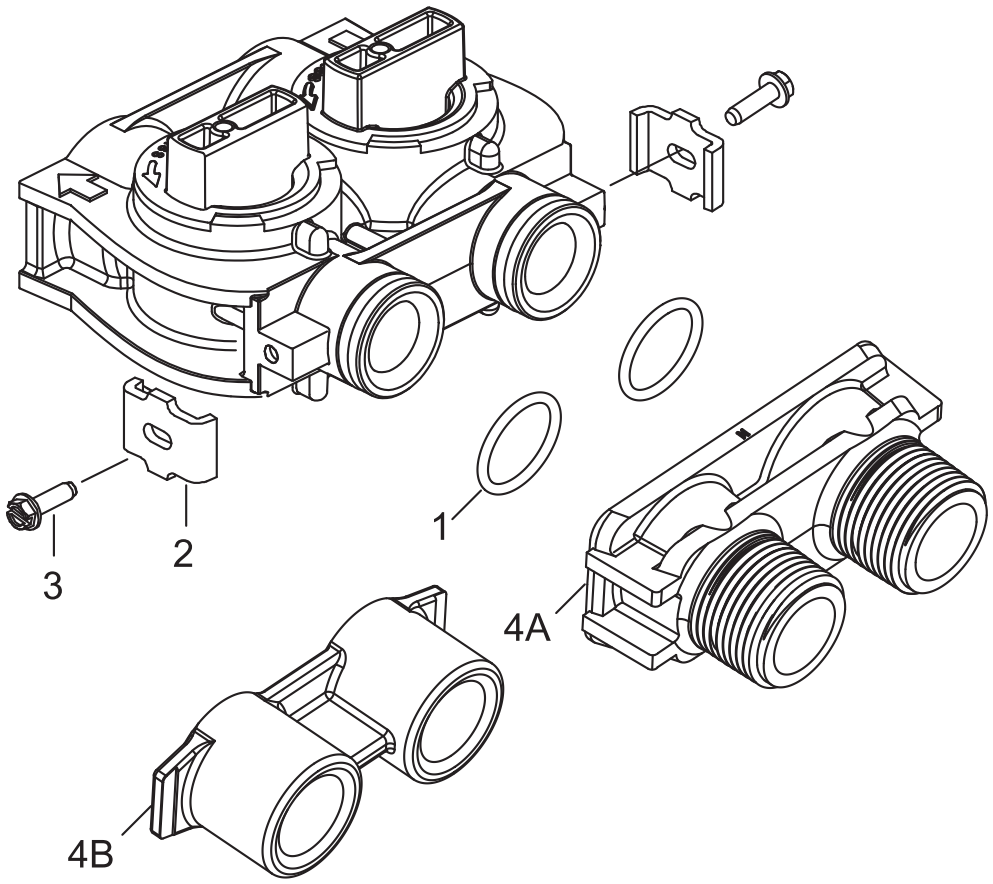
METER ASSEMBLY



60086 Rev D 60086-50

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

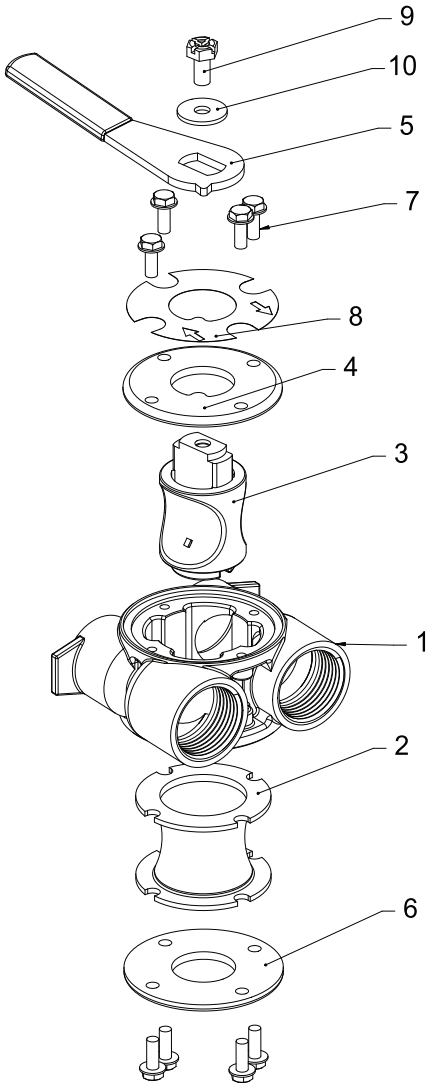
BYPASS VALVE ASSEMBLY, NON-METALLIC



60049 Rev D

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

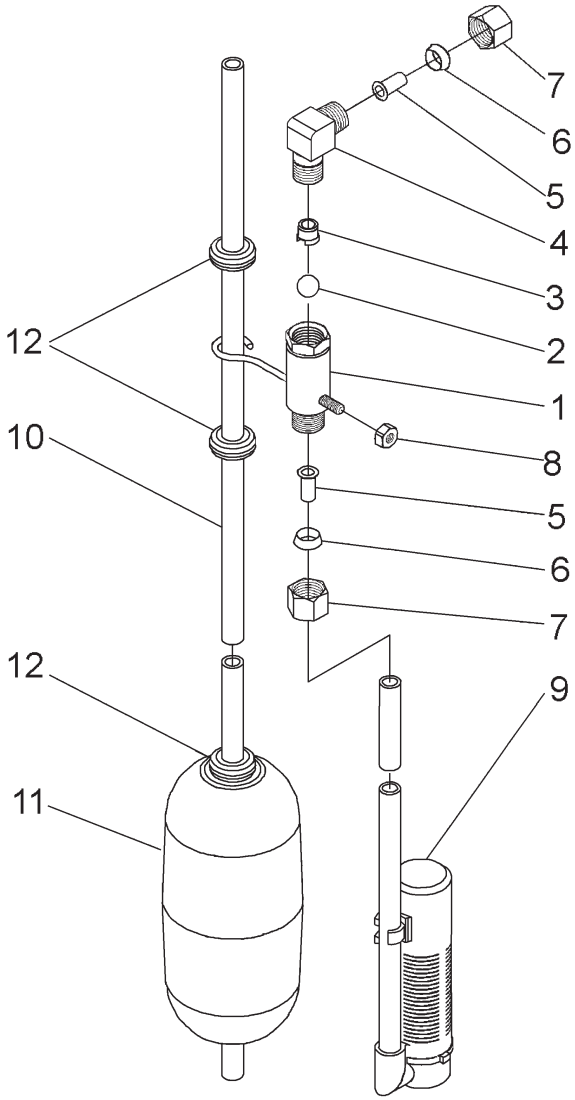
BYPASS VALVE ASSEMBLY, BRASS



60040SS Rev L 60041 Rev K

Item No.	QTY	Part No.	Description
1	1	40614	Bypass Body, 3/4”
		40634	Bypass Body, 1”, SS
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

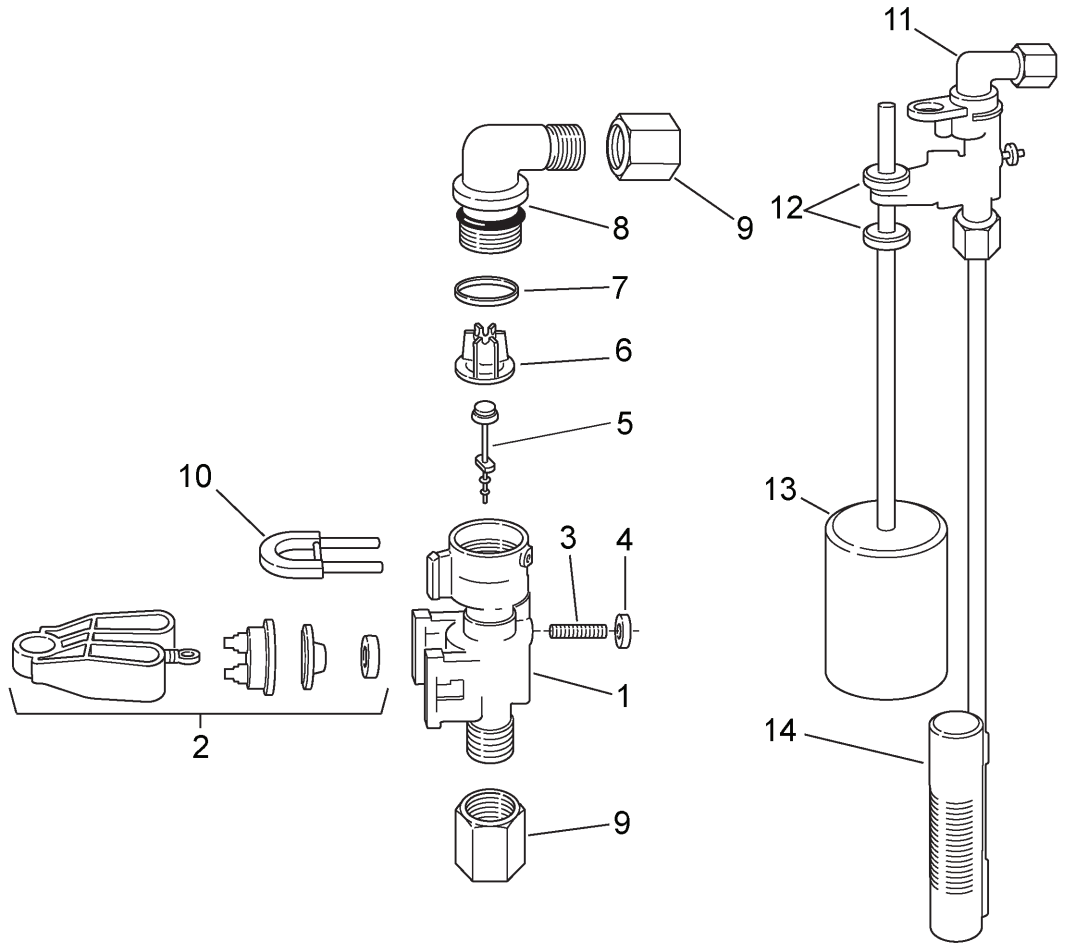
2300 SAFETY BRINE VALVE



60027 Rev A

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.

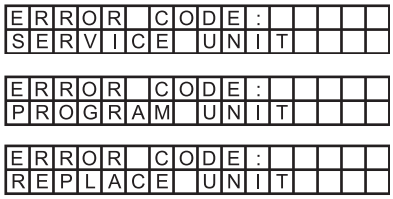
Problem	Correction
Flashing/blinking display	Power outage has occurred. Either wait 5 minutes for blinking to stop, or press any key on the keypad.
Unit not responding after going into regeneration	Verify the unit is configured correctly (ex: wiring valve type). Perform a Master Reset by holding the 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 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.

Error Display Screen Examples



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.

TROUBLESHOOTING - CONTROL VALVE *continued*

Error Codes

NOTE: Error codes appear on the In Service display.

Error Code	Error Type	Cause	Reset and Recovery
0	Cam Sense Error	The valve drive took longer than 6 minutes to advance to the next regeneration position	Unplug the unit and examine the powerhead. Verify that all cam switches are connected to the circuit board and functioning properly. Verify that the motor and drive train components are in good condition and assembled properly. Check the valve and verify that the piston travels freely. Replace/reassemble the various components as necessary. Plug the unit back in and observe its behavior. The unit should cycle to the next valve position and stop. If the error re-occurs, unplug the unit and contact technical support.
1	Cycle Step Error	The control experienced an unexpected cycle input	Unplug the unit and examine the powerhead. Verify that all cam switches are connected to the circuit board and functioning properly. Enter Master Programming mode and verify that the valve type and system type are set correctly with regard to the unit itself. Step the unit through a manual regeneration and verify that it functions correctly. If the error re-occurs unplug the unit and contact technical support.
2	Regen Failure	The system has not regenerated for more than 99 days (or 7 days if the Control Type has been set to Day-of-Week)	Perform a Manual Regeneration to reset the error code. If the system is metered, verify that it is measuring flow by running service water and watching for the flow indicator on the display. If the unit does not measure flow, verify that the meter cable is connected properly and that the meter is functioning properly. Enter a Master Programming Mode and verify that the unit is configured properly. As appropriate for the valve configuration, check that the correct system capacity has been selected, that the day override is set properly, and that meter is identified correctly. If the unit is configured as a Day-of-Week system, verify that at least one day is set ON. Correct the settings as necessary.
3	Memory Error	Control board memory failure	Perform a Master Reset and reconfigure the system via Master Programming Mode. After reconfiguring the system, step the valve through a manual regeneration. If the error re-occurs unplug the unit and contact technical support.

GENERAL SERVICE HINTS FOR METER CONTROL

Problem: Softener delivers hard water

Reason: Reserve capacity has been exceeded.

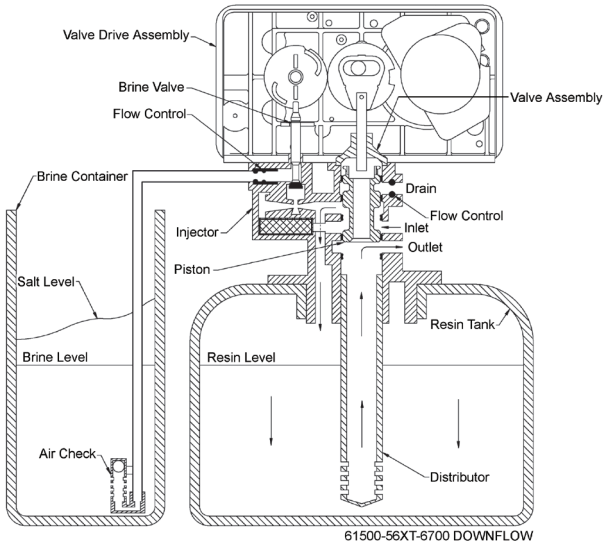
Correction: Check salt dosage requirements and reset program wheel to provide additional reserve.

Reason: Meter is not measuring flow.

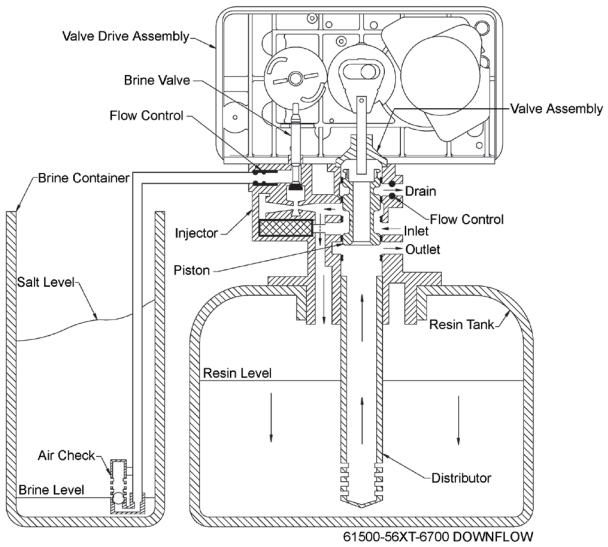
Correction: Check meter with meter checker.

WATER CONDITIONER FLOW DIAGRAMS

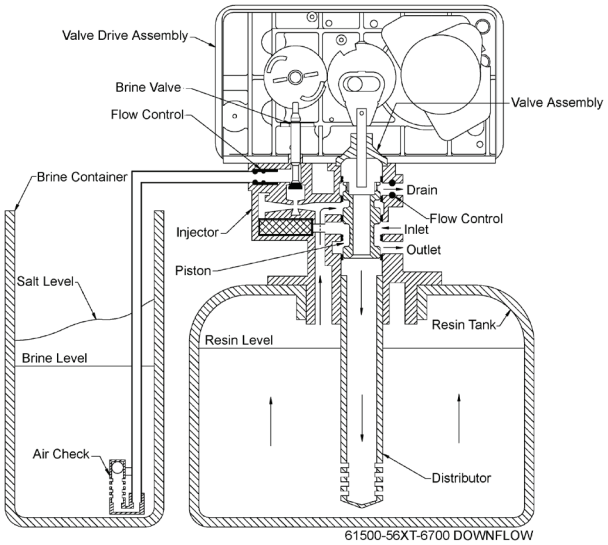
Service Position



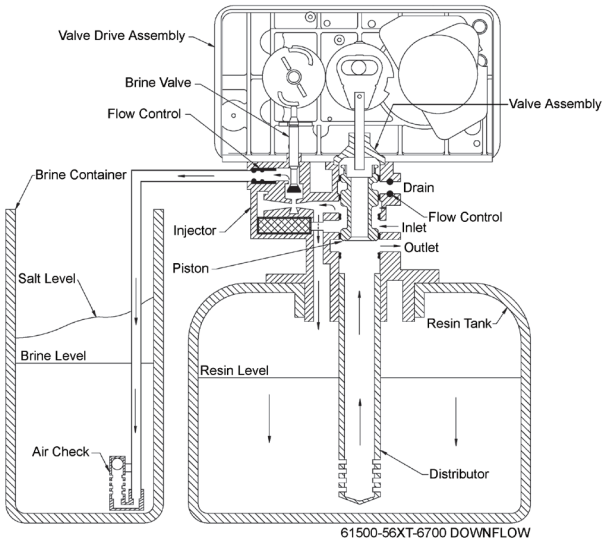
Rapid Rinse



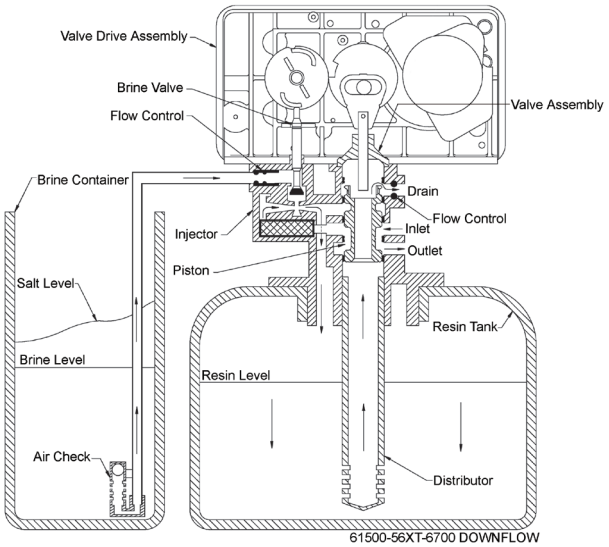
Backwash Position



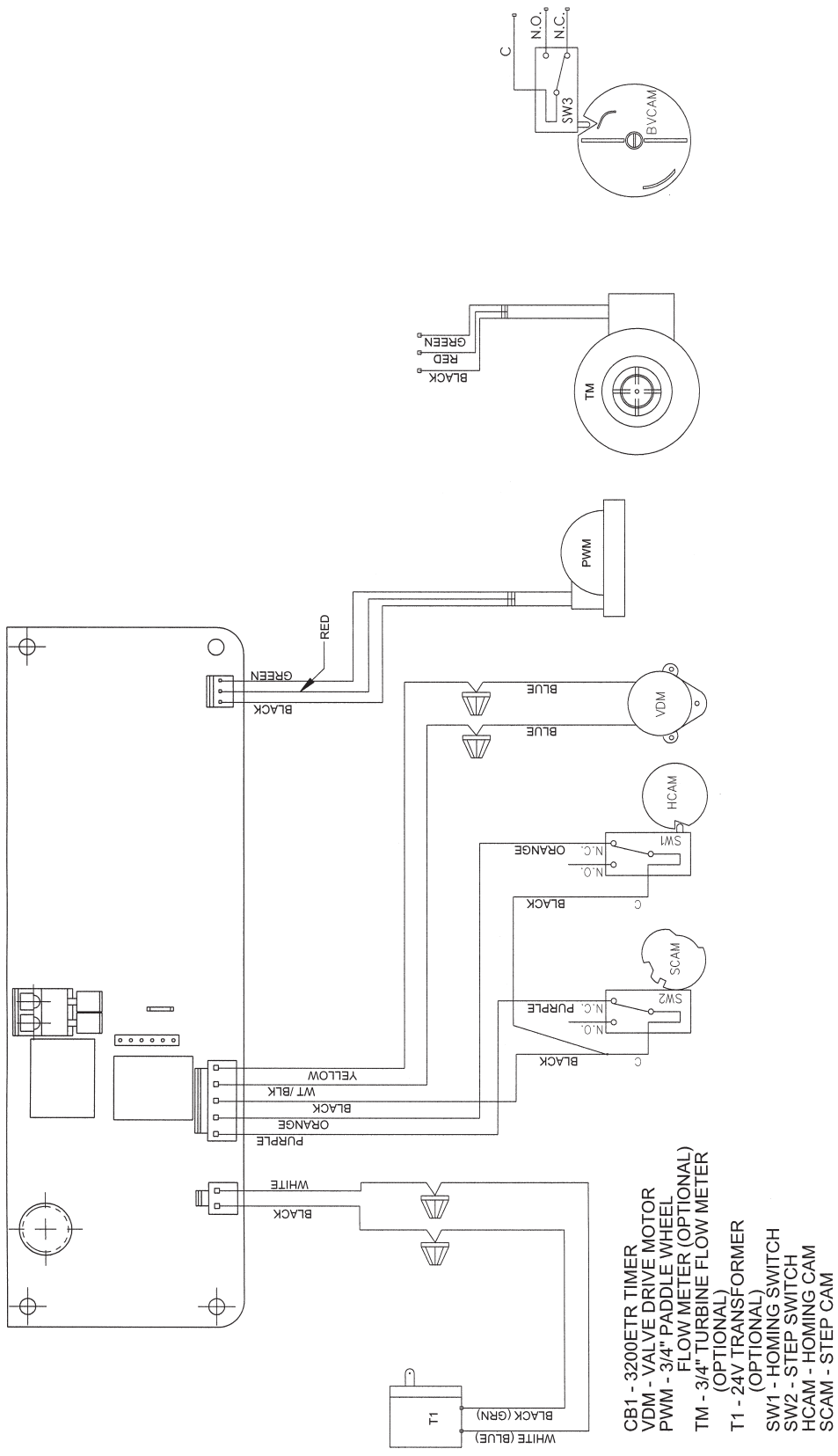
Brine Tank Fill Position



Brine/Slow Rinse Position



VALVE WIRING DIAGRAM



SERVICE ASSEMBLIES

Air Check:
60002-34 .....Air Check, #500, 34” Long

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

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:
60102-71 .....Piston Assy, 6600, Downflow Brining and Rapid Rinse
14309.....Retainer, Piston Rod
13001-04 .....Piston Rod Assy, 6600, Downflow
13446-40 .....End Plug Assy, 6600, Green
17218.....Piston, 6600, Downflow

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

Timer:
42274.....Timer Assy, 6700XTR

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