

Owner's guide for Puritan compact water softener Model LSSA-10-SE

Design and basic operation

This owner's guide will give you the information needed to keep your water softener in good operating condition. Please read the entire guide to familiarize yourself with the use, care and protection of your water treatment appliance. Service Manual for "Model 5600 SE down flow" will provide additional information on your water softening system.

Below are two questions that are commonly asked about water softeners

A. What will the water softener remove from my water?

Your water softener is designed to remove hardness and dissolved iron from the water entering your LondonAire coach.

B. What is the water softener not designed to remove from water?

Sand, sediment and other particulate matter are not effectively removed with a water softener. If your water source has these items present, make sure your sediment pre-filters are in working order. If the water softener is exposed to these items, the warranty will be void.

The water softener is designed to regenerate (a cleaning process) based on the demand for water within your coach. The meter measures the flow of water that is used. Upon reaching the set volume of usage, the water softener will regenerate. The regeneration process will take approximately 33 to 44 minutes, depending on the actual settings of your system. During the regeneration process, no water will be able to enter the fresh water storage tank. If you need water during this process, you must turn on the water pump. The water pump will supply water from your fresh water storage tank.

Operating specifications – Puritan LSSA-10-SE

Maximum flow rate	5.0 gpm
Resin quantity	.35 cu ft
Maximum capacity	10,000 grains
Electrical requirement	120 volt AC - 60 Hz
Maximum pressure	110 psi
Minimum pressure	20 psi
Maximum temperature	110° F
Minimum temperature	35° F

Feed water limits

Maximum Hardness	45 gpg
Maximum Iron	3.0 ppm
pH range	6.8-12.0
No suspended matter, sand	

Salt types

Solar salt is recommended

Manual regeneration

A manual regeneration is initiated by pressing the left button on the control valve directly below the LED display. See drawing (fig.XX).

A manual regeneration is normally suggested for the following situations:

- The system has been idle for 14 days or more
- The softener has run low or out of salt
- Water quality is poor due to overrun or mechanical problem
- To start the process of winterization

Salt usage and types

The water softener will use 4.5 lbs of salt (factory default) for each regeneration.

Salt should always be kept above the water level to ensure proper brine solution. This also reduces the splash of liquid brine during transport.

During idle times and high humidity conditions, the salt should be monitored for bridging or mushing. It is recommended to stir and agitate salt occasionally to help prevent bridging.

Clean solar salt is recommended for use. Pellet or cube style salt is ok for use. Pellet and cube salt must be monitored closely for mushing.

Manual bypass

In the event there is a malfunction or during shut down of the water softener, you can manually bypass the system. The manual three valve bypass system is located directly behind the water softener. See drawing (fig.XX).

You will find the 3 valves located on the plumbing behind the softener. To actuate the bypass, follow the steps below:

1. Close the inlet and outlet valves (valves “A” and “B” as shown in photo)

2. Open the bypass valve (valve “C” as shown in photo)

This will allow untreated water to go directly to your coach or fresh water tank.

Reverse the process to resume providing treating water.

Cold weather and winterization process

The water softener must not be exposed to temperatures of below 34° F. If the system is exposed to freezing temperatures, significant failure and damage could occur. (Note: the warranty does not include damage due to freezing)

The best option for storage of your water softener and other components in your coach is in an environment above 40° F. If this is not available, follow the directions listed below.

Winterization process

Follow your Newmar owner's manual guidelines for winterization with compressed air.

You must winterize the water softener with compressed air prior to winterizing the rest of the coach.

- 1) Apply compressed air to main (city) water supply hook up.
Important: Air pressure must not exceed 80 psi.
- 2) Place valve on Auto fill mode (this will bypass the fresh water tank??) Open kitchen faucet. Allow the air to force water out of the softening system. Continue until only air flows from the faucet. Turn off the faucet and the air pressure.
- 3) Start a manual regeneration on the water softener by pressing the regeneration button. The button is located on top of the softener controls on the left side (see figure XX). Immediately apply air pressure to the main water supply (not to exceed 80 psi). Allow the air to flow a minimum of 2 minutes in the backwash cycle. Display will read "1---6".
- 4) Press the "regeneration" button again. The softener will advance to brine and rinse cycle. Display will read "2---20". Allow the air to flow for 2 minutes.
- 5) Press the "regeneration" button again. The softener will advance to rinse cycle. The display will read "3---4". Allow the air pressure to flow for 60 seconds
- 6) Press the "regeneration" button again. The softener will advance to the brine refill mode. The display will read "4---3". Allow the air pressure to flow for 60 seconds.

- 7) Place the water softener in the bypass mode.

You will find the 3 valves located on the plumbing behind the softener.
To actuate the bypass follow the steps below:

Close the inlet and outlet valves (valves “A” and “B” as shown in photo)
Open the bypass valve (valve “C” as shown in photo)

- 8) You now have completed the winterization process for your water softener.
Continue the process of winterization of the remaining components and plumbing.

Master Programming and settings for Water softener

The default settings are as follows

Format	Display	Newmar Default setting
1. US/ Metric format	U—1	U—1 for US format
2. Regeneration Type	7—2	7 - -2 Immediate Regeneration
3. Treated water capacity	480	480 gallons based on composite hardness of 25 grains per gallon**
4. Regeneration day override	A - - 0	A - - 0 Zero day override
5. Regeneration cycle step #1	1 - - 6	1 - - 6 Backwash cycle will be 6 min
6. Regeneration cycle step #2	2 - - 20	2 - - 20 Brine & Rinse Cycle for 20 min.
7. Regeneration cycle step #3	3 - - 4	3 - - 4 Rapid Rinse cycle for 4 min.
8. Regeneration cycle step #4	4 - - 3	4 - - 3 Brine tank refill cycle for 3 min.
9. Regeneration cycle step #5	5 off	5 off Cycle 5 not used
10. Meter size	F133	F133 5600 ¾” turbine flow meter
11. Valve type	o - - 1	O - - 1 5600 SE control valve
12. Line Frequency	LF60	LF60 60 Hz line frequency

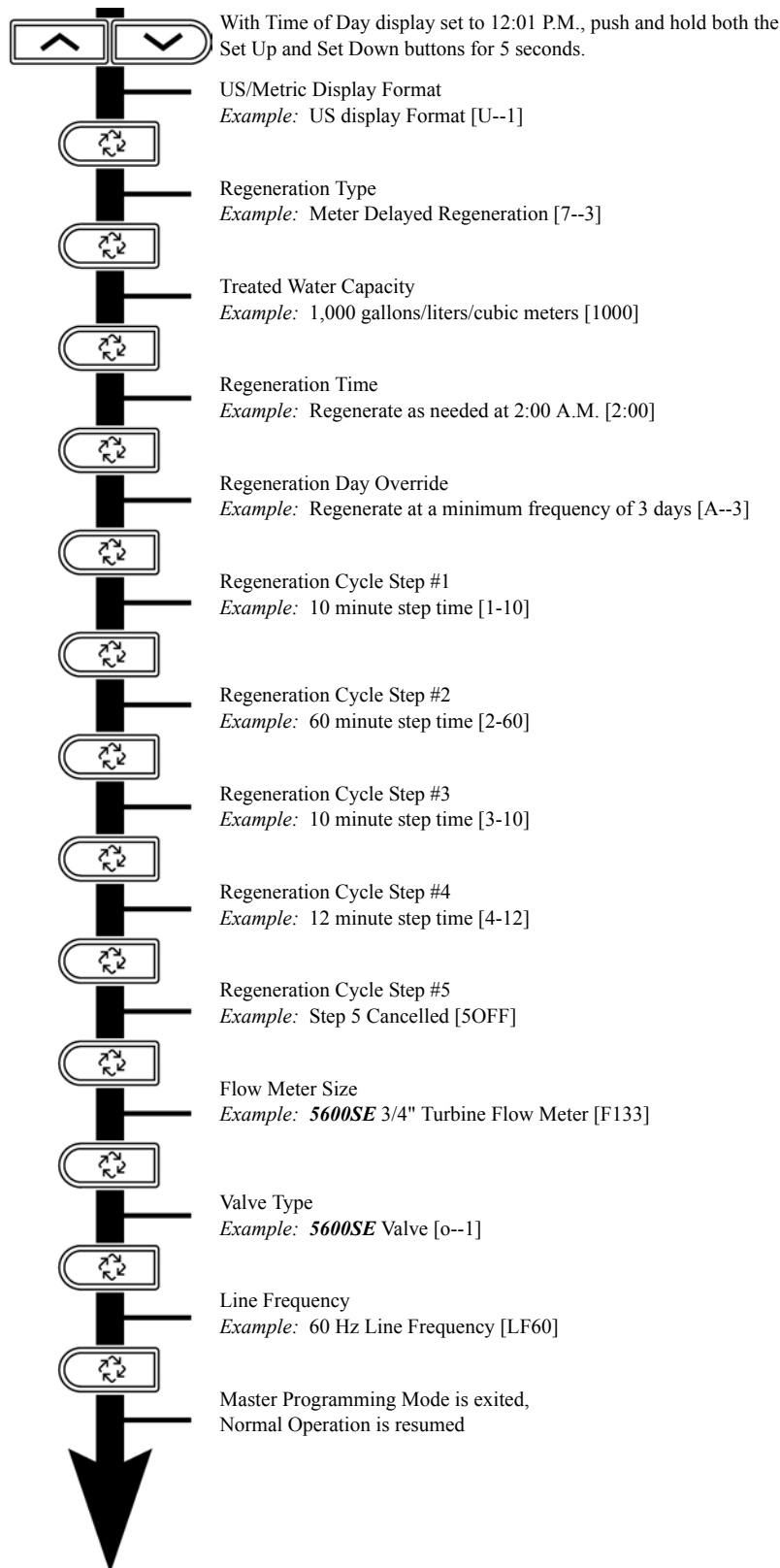
See master programming instruction sheet for information on how to modify the program settings.

** If the feed water hardness is greater than 25 gpg, this regeneration frequency (gallons) will need to be reduced. Consult a local water treatment professional for information about the water in your area.

Master Programming Mode Flow Chart for Single Backwash Valves

NOTE:

1. Set Time of Day display to 12:01 P.M.
2. Push and hold both the Set Up and Set Down buttons for 5 seconds.
3. Push Extra Cycle button once per display until all displays are viewed and Normal Operation is resumed.
4. Option setting displays may be changed as required by pushing either the Set Up or Set Down button.
5. Depending on current valve programming certain displays will not be able to be viewed or set.
6. Reference programming instructions for complete list of available settings.



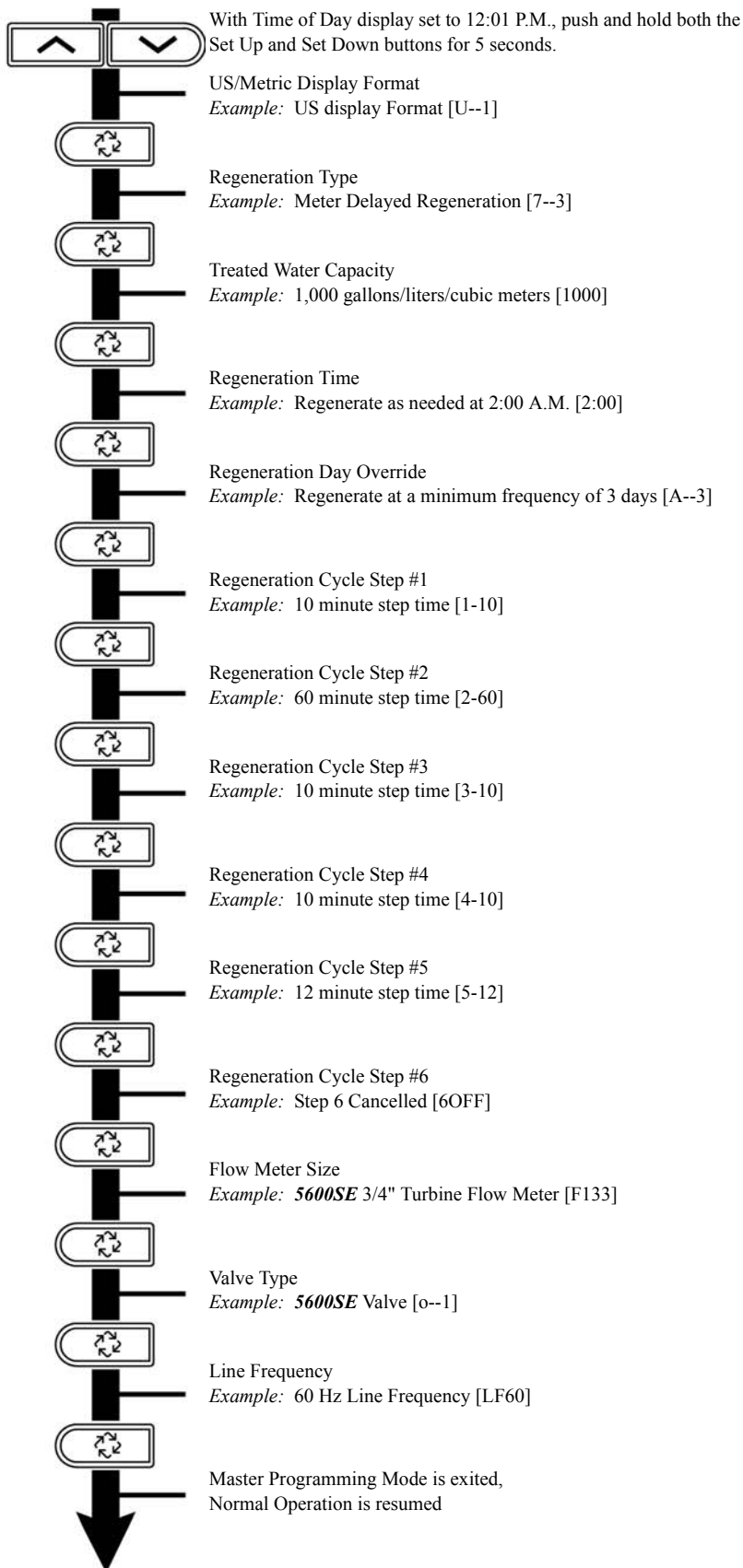
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Master Programming Mode Flow Chart for Double Backwash Valves

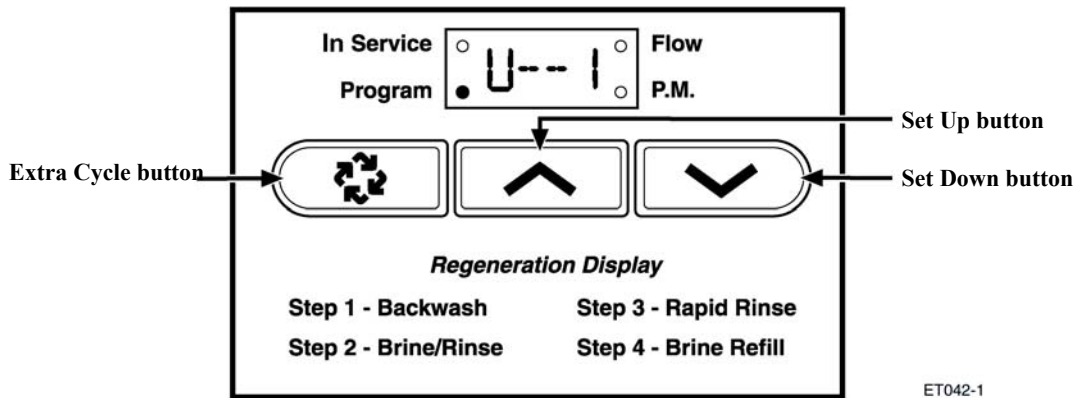
NOTE:

1. Set Time of Day display to 12:01 P.M.
2. Push and hold both the Set Up and Set Down buttons for 5 seconds.
3. Push Extra Cycle button once per display until all displays are viewed and Normal Operation is resumed.
4. Option setting displays may be changed as required by pushing either the Set Up or Set Down button.
5. Depending on current valve programming certain displays will not be able to be viewed or set.
6. Reference programming instructions for complete list of available settings.



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Master Programming Mode



When the Master Programming Mode is entered, all available option setting displays may be viewed and set as needed. Depending on current option settings, some displays cannot be viewed or set.

Entering Master Programming Mode

Set the **Time Of Day** display to 12:01 P.M. Push and hold the **Set Up** and **Set Down** buttons together until the Program Dot turns on (about 5 seconds). Depending on current option settings, some displays cannot be viewed or set.

Exiting Master Programming Mode

Push the **Extra Cycle** button once per display until all are viewed. The Program Mode is exited and normal operation resumes.

Resetting Permanent Programming Memory

Push and hold the **Set Up** and **Set Down** buttons for 25 seconds or until the **Time Of Day** display resets to 12:00 P.M. All option settings reset to default values. Control programming must be reset as necessary.

1. US/Metric Display Format (U)

Push the **Extra Cycle** button. This display is used to set the desired display format. This option setting is identified by the "U" in the first digit. The possible settings are:

US Format uses gallons for volume with a 12-hour timekeeping format. Regeneration timing in minutes.

Example: [U - - 1]

Metric Format uses liters for volume and a 24-hour timekeeping format. Regeneration timing in tenths of minutes. Use the **Set Up** and **Set Down** buttons to adjust this value.

Example: [U - - 2]

Cubic Meter Format uses cubic meters for volume and a 24-hour timekeeping format. Regeneration timing in tenths of minutes. Use the **Set Up** and **Set Down** buttons to adjust this value.

Example: [U - - 4]

2. Regeneration Type (7)

Push the **Extra Cycle** button. Use this display to set the Regeneration Type. This option setting is identified by the number "7" in the first digit. There are three possible settings:

Timeclock Delayed

The control determines the day that a regeneration is required by the **Regeneration Day Override** setting (A). Once this day is reached, a regeneration cycle starts at the set **Regeneration Time**.

Example: [7 - - 1]

Meter Immediate

The control determines that regeneration is required when the available volume of treated water drops to zero. Regeneration begins immediately.

Example: [7 - - 2] (This setting is typically used by the 9000SE)

Meter Delayed

The control determines that a regeneration is required when the available volume of treated water drops to zero. Regeneration begins immediately at the set **Regeneration Time**. Use the **Set Up** and **Set Down** buttons to adjust this value.

Example: [7 - - 3]

3. Treated Water Capacity (No Display Code)

Push the **Extra Cycle** button. Use this display to set the amount of water (gallons/liters/cubic meters) that can be treated by the unit before a regeneration cycle is required. With Meter Delayed Regeneration Type set, it is necessary for the programmer to determine a reserve capacity and subtract that value from the calculated full capacity of the unit. This display cannot be viewed with Timeclock Regeneration Type set. Use the **Set Up** and **Set Down** buttons to adjust this value.

Example: Regenerate every 700 gallons/liters/cubic meters — [7 0 0]

4. Regeneration Time (Clock Display Without a Flashing Colon)

Push the **Extra Cycle** button. The next display that appears is the option setting for **Regeneration Time**. It is identified by a clock display without a flashing colon. Set the desired time of day that a regeneration may occur. This display cannot be viewed with Meter Immediate Regeneration Type set. Use the **Set Up** and **Set Down** buttons to adjust this value.

Example: 2 o'clock A.M. **Regeneration Time** — [2: 0 0] (A.M. Indicator Dot On)

5. Regeneration Day Override (A)

Push the **Extra Cycle** button. Use this display to set the maximum amount of time (in days) the unit can be in service without a regeneration. This option setting is identified by the letter "A" in the first digit.

- With Timeclock or Meter Delayed Regeneration Types selected, regeneration begins at the set **Regeneration Time**.
- With Meter Immediate Regeneration Type selected, regeneration begins at the same time of day that the last regeneration cycle was initiated. An OFF setting cancels this feature with all regeneration types except Timeclock Regeneration where it must be used. Use the **Set Up** and **Set Down** buttons to adjust this value.

Example: Override every 7 days — [A - - 7]

Cancel setting — [A O F F] (Meter Immediate or Delayed Regeneration Types Only)

Master Programming Mode (Cont'd.)

6. Regeneration Cycle Step Programming (1) (2) (3) (4) (5) (6)

Push the **Extra Cycle** button. The next 2–6 displays that appear are part of a series of option settings used to program the Regeneration Cycle. Each display is used to set in minutes (or tenths of minutes - Metric). A step # turns on for the regeneration cycle step being programmed.

- Skip regeneration steps by setting the display to 0
- End a regeneration cycle by setting the step # after the last active step to OFF, as shown below:

Example: Regeneration Cycle Step #1, 8 minutes — **[I - - 8]** (US Format)
 Regeneration Cycle Step #3, skipped — **[3 - - 0]** (US Format)
 Regeneration Cycle Step #4, 8.5 minutes — **[4 - 8.5]** (Both Metric Formats)
 Regeneration Cycle Step #4, cancelled — **[4 O F F]** (All Formats)

Push the **Extra Cycle** button once per display to advance through Regeneration Cycle Step Programming.

Proper softener operation requires the calculation of a brine tank refill time:

(Pounds of Salt Used per Regeneration Cycle ÷ 3) ÷ BLFC Size = Refill Time in Minutes

Example: (10 lbs salt ÷ 3) ÷ 0.25 gpm = 13.3 minute refill
 (Consult valve service manual for actual step location)

Use the **Set Up** and **Set Down** buttons to adjust this value.

7. Flow Meter Size (F)

Push the **Extra Cycle** button. The the next display sets the flowmeter size. Use this display to set the proper amount of pulses generated by the flow meter for each gallon or liter of water flow. This setting cannot be viewed with Timeclock Regeneration Type selected.

Example: **[F I 2 6]** 3/4" Turbine Flow Meter used with the **2510SE** (US Format)
Example: **[F 3 3.2]** 3/4" Turbine Flow Meter used with the **2510SE** (Metric Format)
Example: **[F 1 3 2]** 3/4" Turbine Flow Meter used with the **TwinFlo100E** (US Format)
Example: **[F 3 4.9]** 3/4" Turbine Flow Meter used with the **TwinFlo100E** (Metric Format)
Example: **[F 1 3 3]** 3/4" Turbine Flow Meter used with the **5600SE** or **9000SE** (US Format)
Example: **[F 3 5.1]** 3/4" Turbine Flow Meter used with the **5600SE** or **9000SE** (Metric Format)
Example: **[F - 2 0]** 3/4" Paddle Wheel Flow Meter (US Format)
Example: **[F - 5.3]** 3/4" Paddle Wheel Flow Meter (Metric Format)
Example: **[F - - 8]** 1.0" Paddle Wheel Flow Meter (US Format)
Example: **[F - 2.1]** 1.0" Paddle Wheel Flow Meter (Metric Format)

Use the **Set Up** and **Set Down** buttons to adjust this value.

8. Valve Type (o)

Push the **Extra Cycle** button. Use this display to set the type of valve used with the control. This option setting is identified by the letter "o" in the first digit. When #2 is selected, the current Tank # in Service must be entered in the next display.

Example: **[o - - I]** 2510SE, 2750SE or 5600SE Valve Operation.
Example: **[o - - 2]** 9000SE or TwinFlo100E Valve Operation.
Example: **[o - U I]** Unit #1 Tank in Service. (Viewed with #2 set only)

Use the **Set Up** and **Set Down** buttons to adjust this value.

9. Line Frequency (LF)

Push the **Extra Cycle** button. Use this display to set the frequency of the power applied to the control. When properly set, all timekeeping functions remain accurate. This option setting is identified by the letters "LF" in the first two digits. There are two possible selections.

Example: **[L F 5 0]** 50 Hz Line Frequency Operation.

Example: **[L F 6 0]** 60 Hz Line Frequency Operation.

Use the **Set Up** and **Set Down** buttons to adjust this value.

Push the Extra Cycle button once more to exit this programming mode.

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Service Manual



IMPORTANT: Fill in pertinent information on *page 3* for future reference.

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Job Specification Sheet

Job Number _____

Model Number _____

Water Test _____

Capacity Of Unit _____ Max. _____ Per Regeneration

Mineral Tank Size: Diameter _____ Height _____

Under Bedding _____ Amount _____

Type Of Media _____ Cubic Feet _____

Brine Tank Size _____

Salt Setting Per Regeneration _____

Valve Programming

Treated Water Capacity _____ (Gallons / Liters)

Regeneration Day Override _____ (Max. Days Between Regen.)

Regeneration Time _____ (A.M.) (P.M.)

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General Residential Installation Check List

Water Pressure

A minimum of 25 lbs of water pressure is required for regeneration valve to operate effectively.

Electrical Facilities

An uninterrupted alternating current (A/C) supply is required. Please make sure voltage supply is compatible with unit before installation.

Existing Plumbing

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

Location of Softener and Drain

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

Bypass Valves

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



CAUTION

- **Do not exceed 120 psi water pressure.**
- **Do not exceed 110°F water temperature.**
- **Do not subject unit to freezing conditions.**

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Valve Installation and Start-up Procedures

1. Place the softener tank where you want to install the unit.
NOTE: Be sure the tank is level and on a firm base.
2. During cold weather it is recommended that the installer warm the valve to room temperature before operating.
3. Perform all plumbing according to local plumbing codes.
 - Use a 1/2" minimum pipe size for the drain.
 - Use a 3/4" drain line for backwash flow rates that exceed 7 gpm or length that exceeds 20' (6 m).
4. Cut the 1" distributor tube (1.050 O.D.) flush with top of each tank.
NOTE: Only use silicone lubricant.
5. Lubricate the distributor o-ring seal and tank o-ring seal. Place the main control valve on tank.
6. Solder joints near the drain must be done before connecting the Drain Line Flow Control fitting (DLFC). Leave at least 6" (152 mm) between the DLFC and solder joints when soldering pipes that are connected on the DLFC. Failure to do this could cause interior damage to DLFC.
7. Use only **Teflon** tape on the drain fitting.
8. Be sure the floor under the salt storage tank is clean and 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 in the salt tank. Do not add salt to the brine tank at this time.
10. On units with a bypass, place in **Bypass** position.
 - Turn on the main water supply.
 - Open a cold soft water tap nearby and let water run a few minutes or until the system is free of foreign material (usually solder) resulting from the installation. Close the water tap when water runs clean.
11. Place the bypass in the Service position and let water flow into the mineral tank. When water flow stops, slowly open a cold water tap nearby and let water run until air is purged from the unit. Then close tap.
12. Plug the valve into an approved power source. When the valve has power it drives to the **In Service** position.

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Control Start-up Procedures

Display

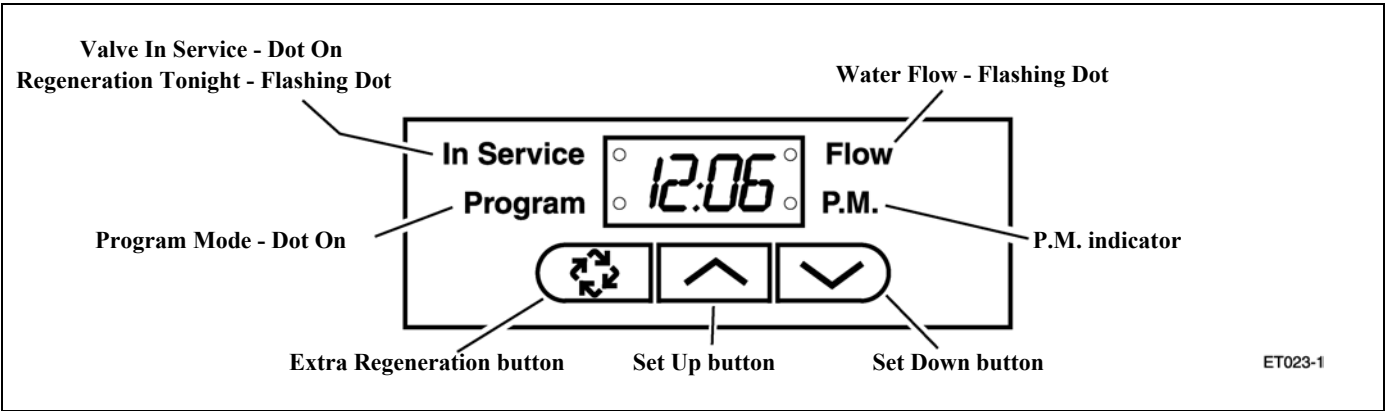


Figure 1: 5600SE Display

In normal operation the **Time Of Day** display alternates with **Volume Remaining** display. As treated water is used, the **Volume Remaining** display counts down (in gallons) from a maximum value to zero or (----). Once this occurs a regeneration cycle initiates immediately or delayed to the set **Regeneration Time**. Water flow through the valve is indicated by the flashing **Flow Dot Indicator**.

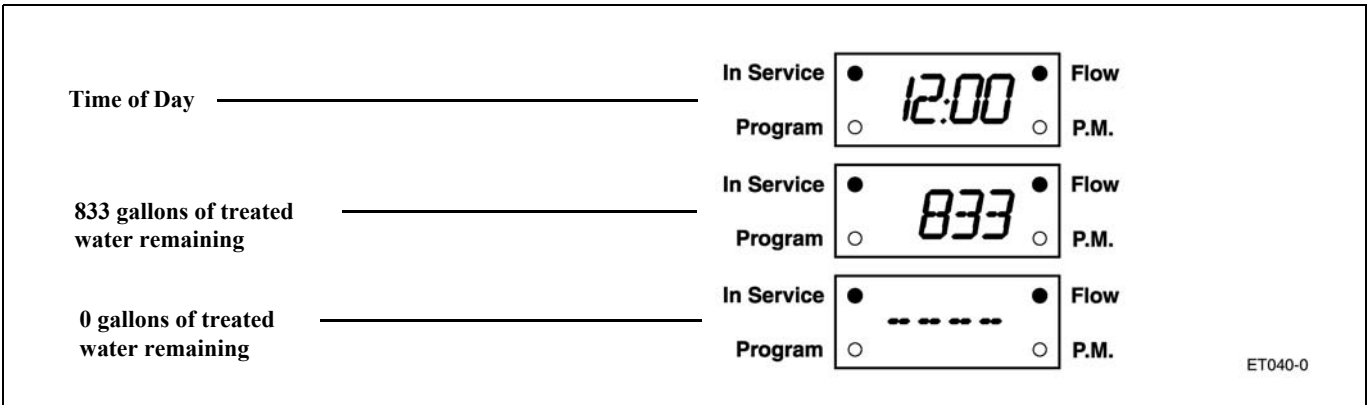


Figure 2: Time of Day and Volume Remaining

Set Time of Day

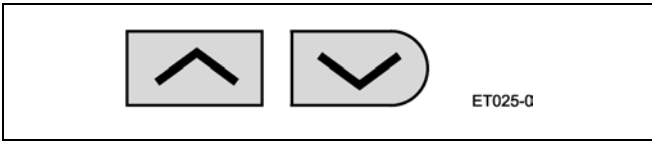


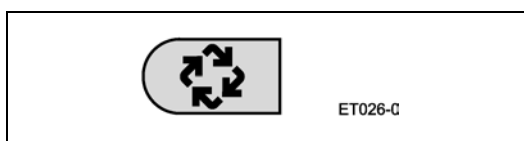
Figure 3: Set Up and Set Down Buttons

When the valve is **In Service**, push either the **Set Up** or **Set Down** button once to adjust the **Time Of Day** by one digit. Push and hold to adjust by several digits.

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Control Start-Up Procedures (Cont'd.)

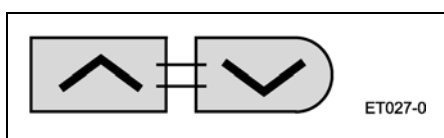
Start an Extra Regeneration Cycle



Push the **Extra Regeneration** button to start an extra regeneration tonight. Push and hold the **Extra Regeneration** button for 5 seconds to start an **Extra Regeneration** immediately.

Set Control Programming

1. Push and hold both the **Set Up** and **Set Down** buttons for 5 seconds.



2. Set the Treated Water Capacity. Using the **Set Up** or **Set Down** buttons, set the amount of treated water to flow through the unit before a regeneration is required.

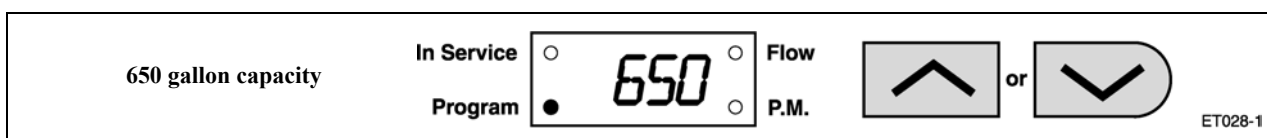
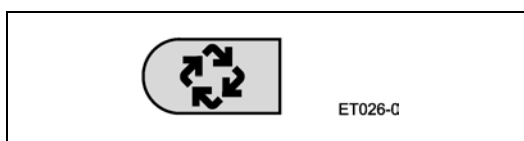


Figure 4: Set Treated Water Capacity

3. Push the **Extra Regeneration** button.



4. Set the **Regeneration Time**. Use the **Set Up** or **Set Down** buttons to set the desired time of day for regeneration to occur.

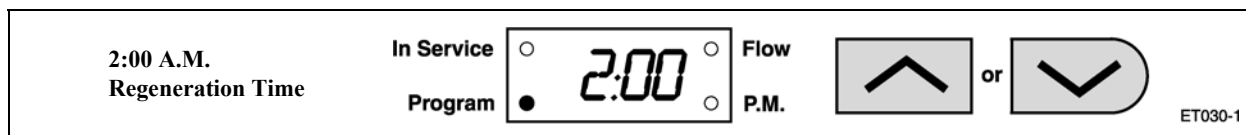
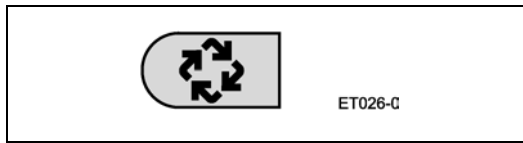


Figure 5: Set Regeneration Time

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Control Start-Up Procedures (Cont'd.)

5. Push the **Extra Regeneration** button.



6. Set **Regeneration Day Override**. Use the **Set Up** or **Set Down** buttons to set the maximum number of days before a regeneration cycle must occur.

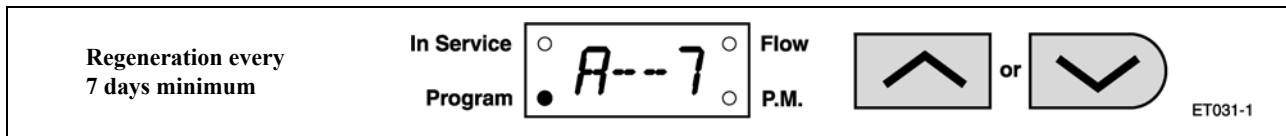
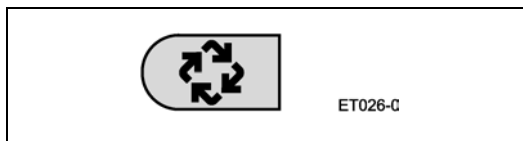


Figure 6: Regeneration Day Override

7. Push the **Extra Regeneration** button to exit the program.*



*Fast Cycle Regeneration

Perform the following Fast Cycle Regeneration if setting up the system for the first time:

1. Push the **Extra Regeneration** button for 5 seconds to force an extra regeneration immediately.
2. Once the valve reaches **Regeneration**, step 1, let water run to drain for approximately 5 minutes.
3. Push the **Extra Regeneration** button once to advance valve to **Regeneration**, step 2.
4. Push the **Extra Regeneration** button once to advance valve to **Regeneration**, step 3 (if active).
5. Push the **Extra Regeneration** button once to advance valve to **Regeneration**, step 4 (if active).
6. Push the **Extra Regeneration** button once to advance valve to **Regeneration**, step 5 (if active).
7. Push the **Extra Regeneration** button once more to advance the valve back to **In Service**.

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Control Start-Up Procedures (Cont'd.)

Final Setup

With proper valve operation verified:

1. Add water to the top of the air check. Manually step the valve to the **Brine Draw** position and allow the valve to draw water from the brine tank until it stops.
NOTE: The air check will check at approximately the midpoint of the screened intake area.
2. Manually step the valve to the **Brine Refill** position and allow the valve to return to the **In Service** position automatically.
3. With the valve in the Service position, check that there is approximately 1" (25 mm) of water above the grid in the brine tank, if used.
4. Fill the brine tank with salt.
5. Setup is complete, the control can now run automatically.

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Control Operation

Immediate Regeneration Valves with Days Between Regeneration Override Set

When the valve reaches its set **Days Since Regeneration Override** value, a regeneration cycle initiates immediately. This event occurs regardless of the **Volume Remaining** display having reached zero gallons.

Delayed Regeneration Valves With Days Between Regeneration Override Set

When the valve reaches its set **Days Since Regeneration Override** value a regeneration cycle initiates at the preset **Regeneration Time**. This event occurs regardless of the **Volume Remaining** display having reached zero gallons.

Control Operation During Regeneration

In **Regeneration** the control displays a special **Regeneration** display. In this display the control shows the current regeneration step number the valve is advancing to, or has reached, and the time remaining in that step. The step number that displays flashes until the valve completes driving to this regeneration step position. Once all regeneration steps are complete the valve returns to **In Service** and resumes normal operation.

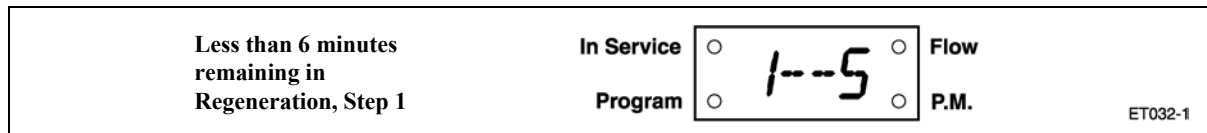


Figure 7: Regeneration Display

Pushing the **Extra Cycle** button during a **Regeneration** cycle immediately advances the valve to the next cycle step position and resumes normal step timing.

Control Operation During Programming

The control only enters the **Program Mode** with the valve **In Service**. While in the **Program Mode** the control continues to operate normally monitoring water usage and keeps all displays up to date. Control programming is stored in memory permanently. There is no need for battery backup power.

Control Operation During A Power Failure

During a power failure all control displays and programming are stored for use upon power re-application. The control retains these values for years, if necessary, without loss. The control is fully inoperative and any calls for regeneration are delayed. The control, upon power re-application, resume normal operation from the point that it was interrupted. An indication that a power outage has occurred is an inaccurate **Time Of Day** display.

Model 5600SE Downflow

Water Conditioner Flow Diagrams (Downflow Brining)

Single Backwash Positions Black Cycle Cam (Part Number 17438)	Double Backwash Positions Blue Cycle Cam (Part Number 40609)
Service Position	Service Position
1. Backwash Position	1. First Backwash Position
2. Brine/Slow Rinse Position	2. Brine/Slow Rinse Position
3. Rapid Rinse Position	3. Second Backwash Position
4. Brine Tank Fill Position	4. Rapid Rinse Position
Service Position	5. Brine Tank Fill Position
	Service Position

Service Position

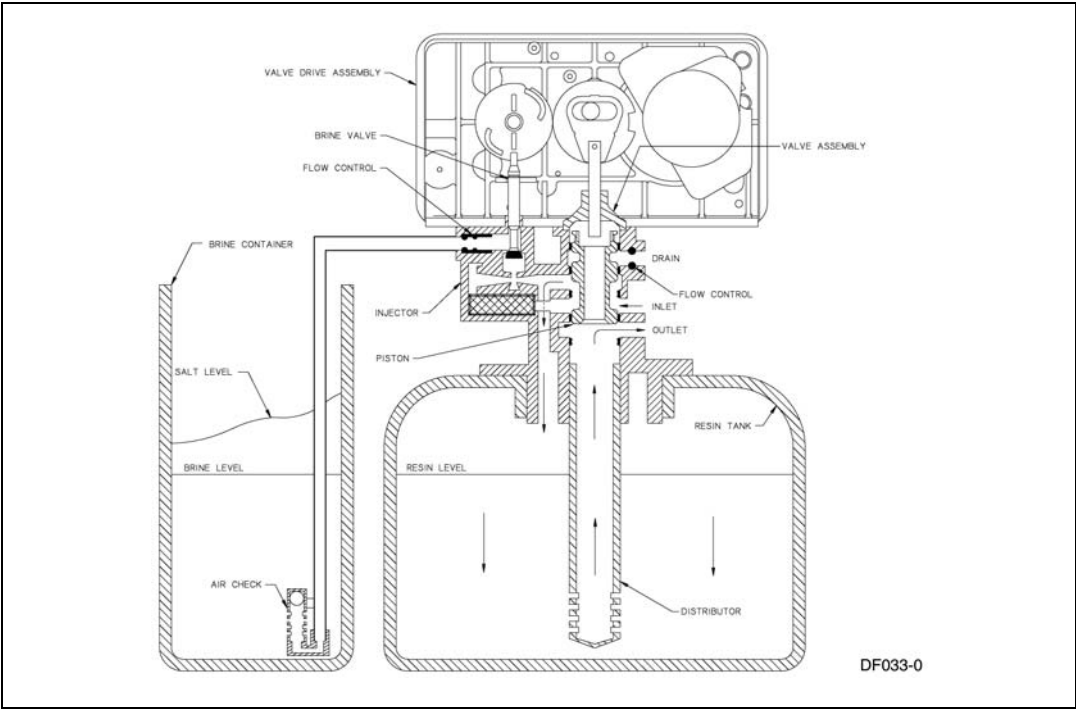


Figure 8: Service Position

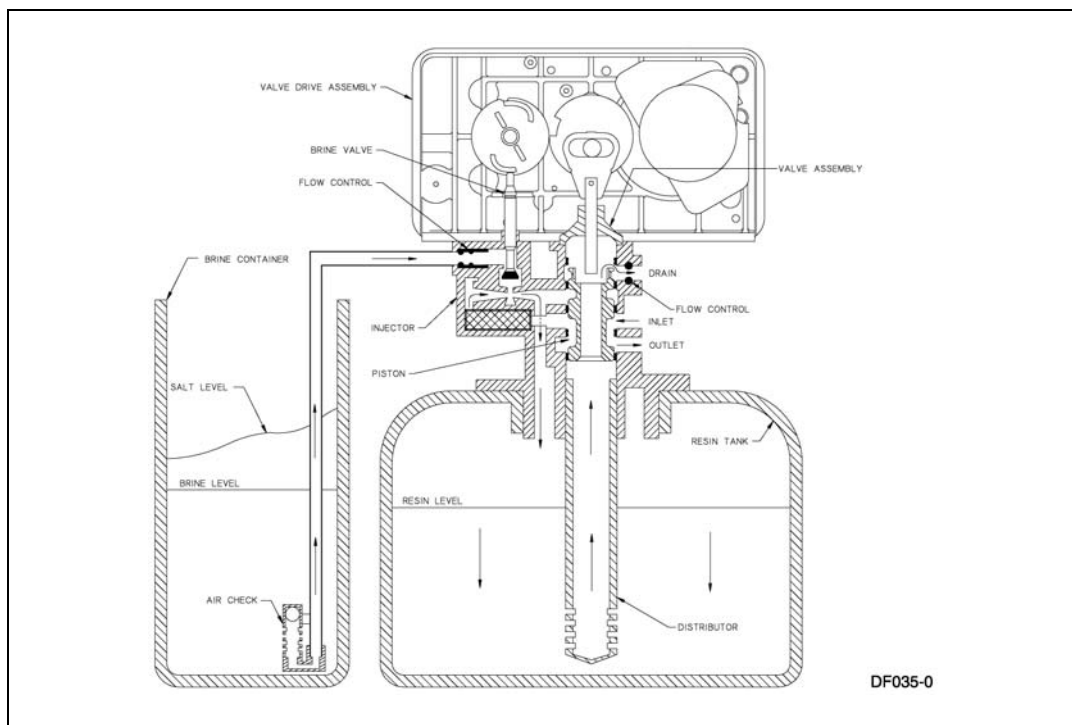
Water Conditioner Flow Diagrams (Downflow Brining)

The diagram illustrates the internal components and flow paths of a water softening system. Key parts labeled include:

- VALVE DRIVE ASSEMBLY**: The top mechanism that controls the valve.
- BRINE VALVE**: A valve that allows brine to enter the system.
- FLOW CONTROL**: A component that regulates the flow of water and brine.
- VALVE ASSEMBLY**: The main valve that directs the flow of water and brine.
- BRINE CONTAINER**: A container for brine solution.
- SALT LEVEL**: The level of salt in the brine container.
- BRINE LEVEL**: The level of brine in the container.
- AIR CHECK**: A check valve that prevents air from entering the system.
- INJECTOR**: A device that injects brine into the water flow.
- PISTON**: A component that moves up and down to control the flow.
- DRAIN**: A point where excess brine or water is removed.
- INLET**: The point where water enters the system.
- OUTLET**: The point where softened water exits the system.
- RESIN TANK**: The tank containing the resin used for softening the water.
- RESIN LEVEL**: The level of resin in the tank.
- DISTRIBUTOR**: A device that distributes water evenly across the resin bed.

The diagram shows the flow of water from the inlet, through the resin tank, and out the outlet. It also shows the flow of brine from the brine container, through the injector, and into the resin tank. The piston and distributor are shown in their respective positions, and the air check valve is shown preventing air from entering the system.

Brine/Slow Rinse Position



12

Model 5600SE Downflow

Water Conditioner Flow Diagrams (Downflow Brining)

Second Backwash Position (Double Backwash Units Only)

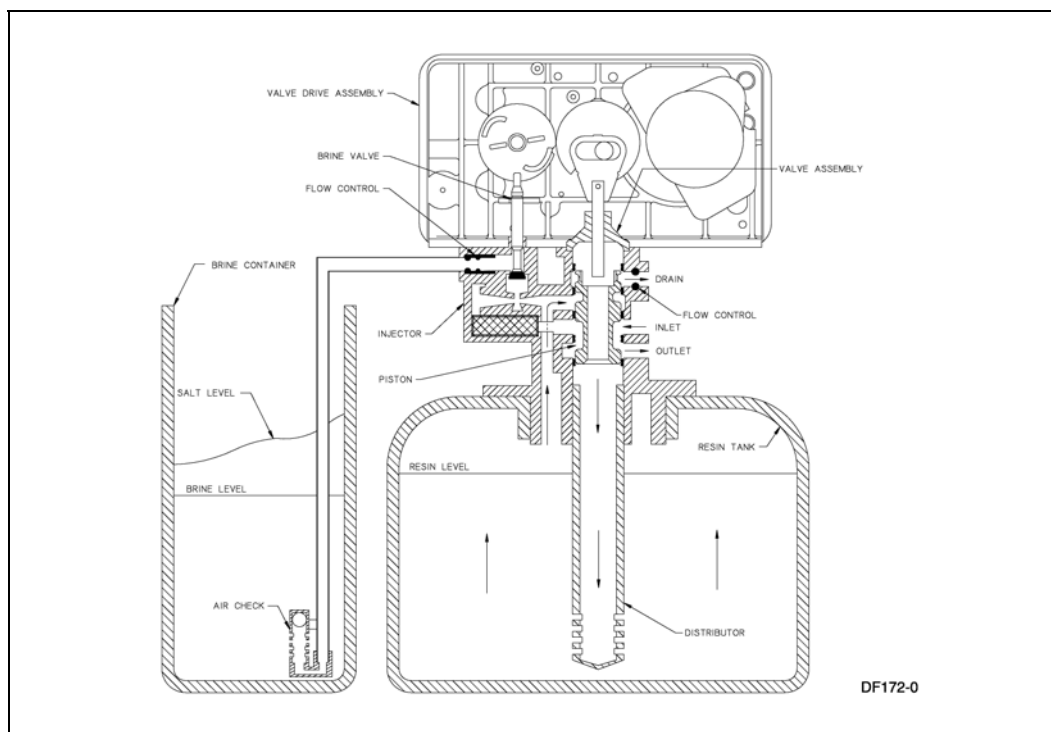


Figure 11: Second Backwash Position (Double Backwash Units Only)

Rapid Rinse Position

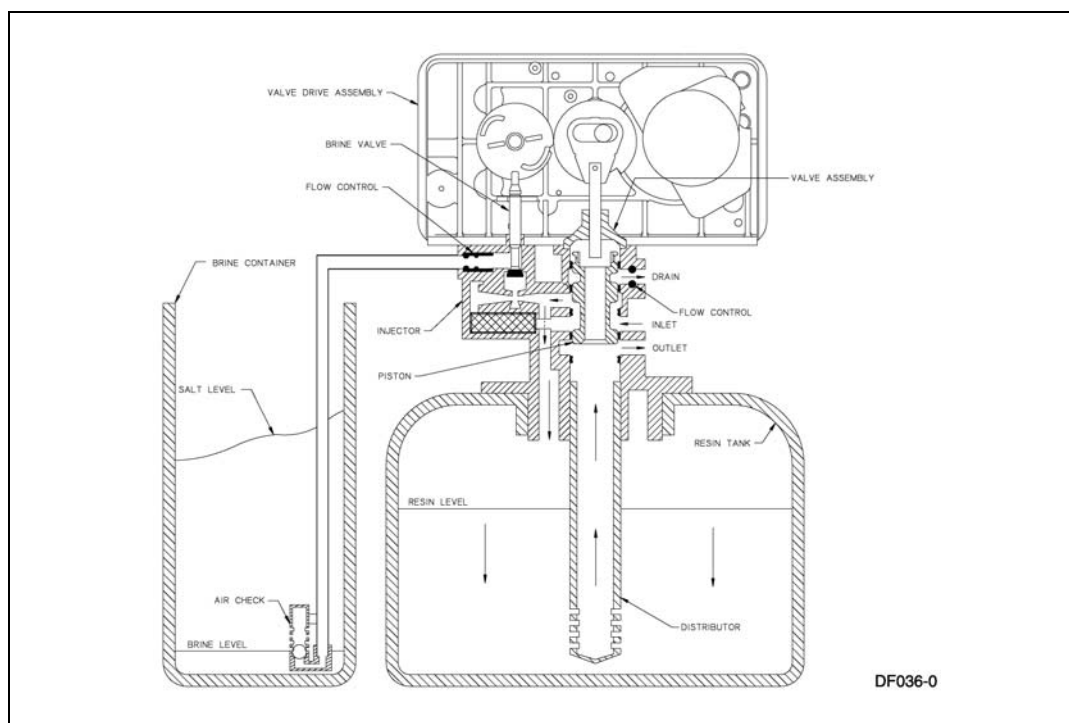


Figure 12: Rapid Rinse Position

Model 5600SE Downflow

Water Conditioner Flow Diagrams (Downflow Brining)

Brine Tank Fill Position

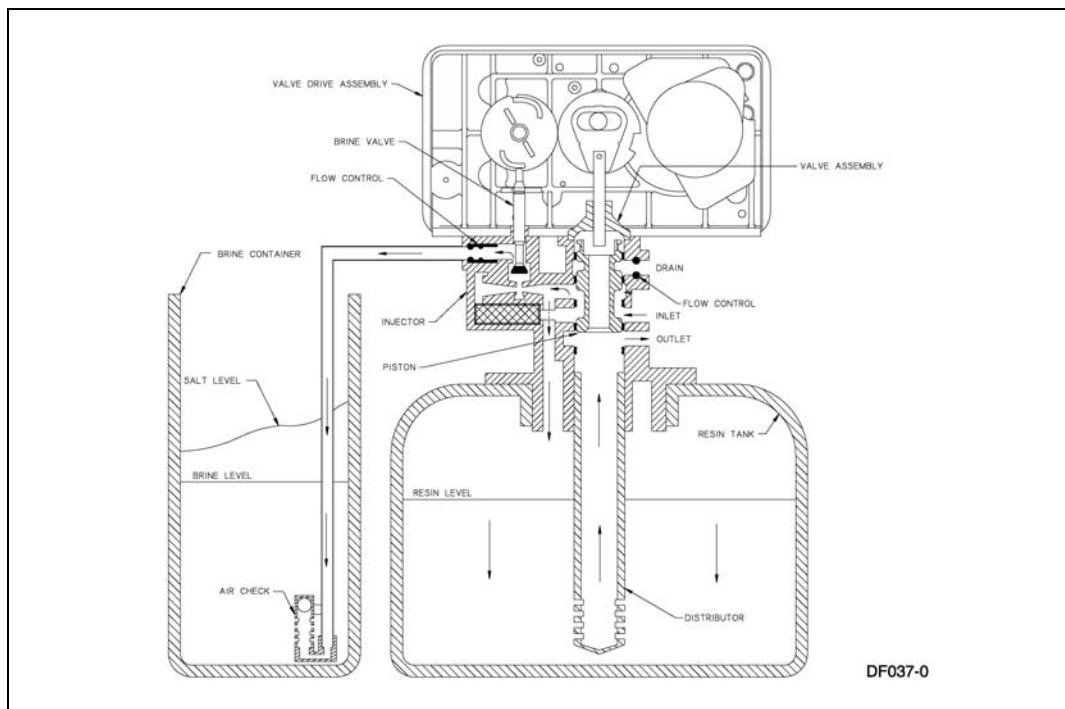


Figure 13: Brine Tank Fill Position

Service Position

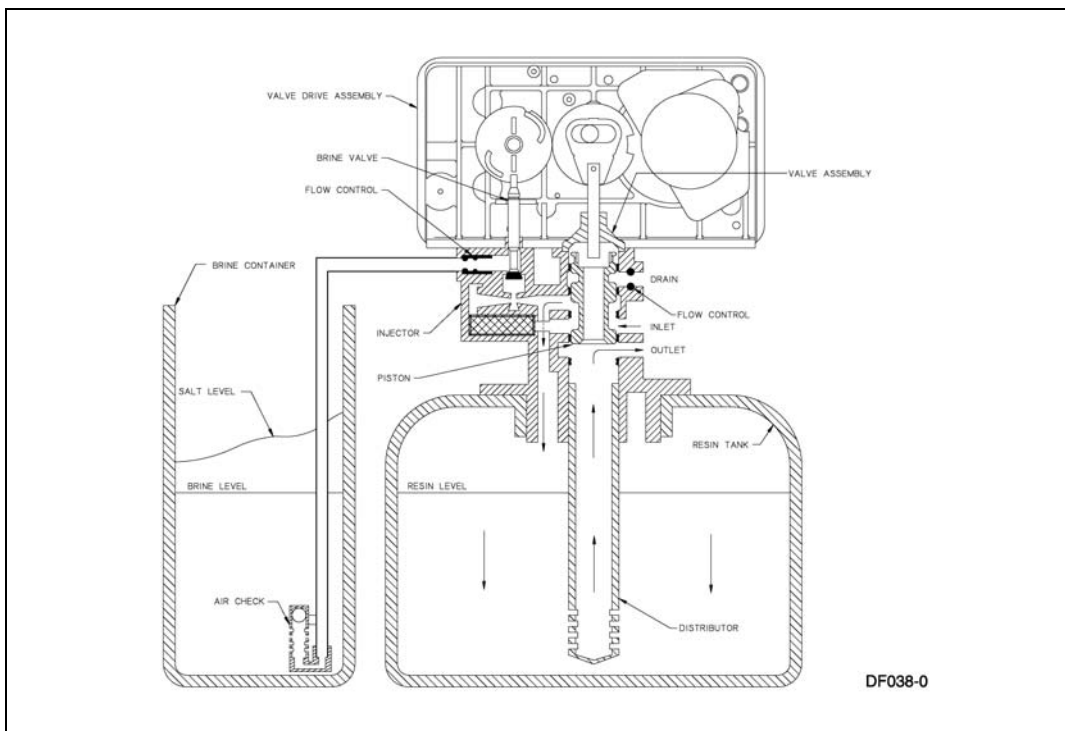


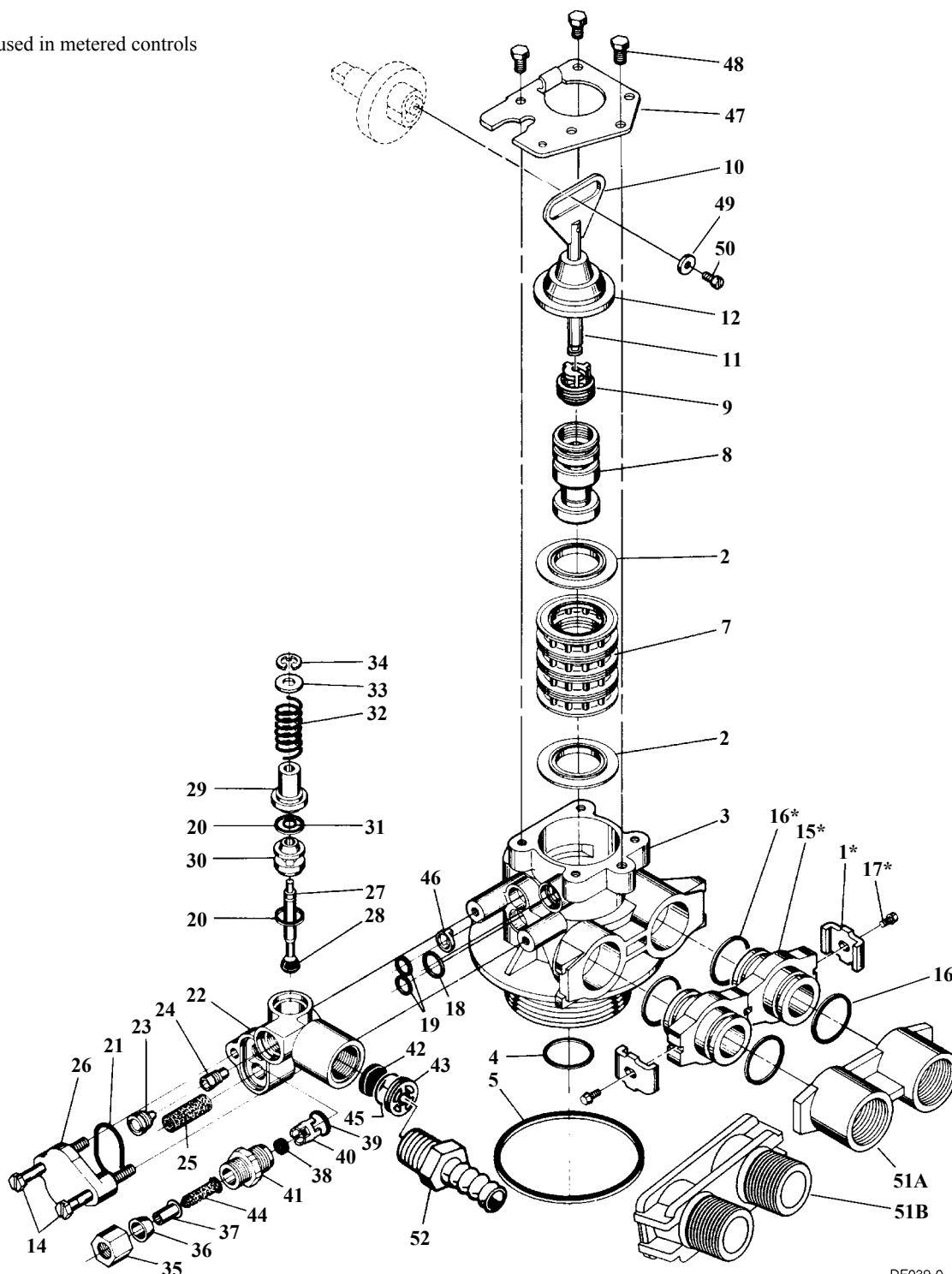
Figure 14: Service Position

Model 5600SE Downflow

Notes

Control Valve Assembly

* Not used in metered controls



DF039-0

Figure 15: Control Valve Assembly

Model 5600SE Downflow

Control Valve Assembly (Cont'd.)

<i>Item Number</i>	<i>No. Req'd</i>	<i>Part Number</i>	<i>Description</i>
1	2	13255	adapter clip (not used in metered controls)
2	5	13242	seal
3	1	14449	valve body assembly, 1" dist.
	1	14450	valve body assembly, 13/16" dist.
4	1	13304	o-ring, distributor tube, 1"
	1	10244	o-ring, distributor tube, 13/16"
5	1	12281	o-ring, top of tank
7	4	14241	spacer
8	1	17218	piston (used with black cycle cam)
9	2	14309	piston rod retainer
	2	16590	piston rod retainer, HW (hot water)
10	1	13001-04	piston rod assembly
11	1	14919	piston rod
12	1	13446-40	end plug assembly, green
14	2	13315	screw, injector mounting
15	2	19228	adapter coupling
16	4	13305	o-ring, adapter coupling
17	2	13314	screw, adapter coupling
18	1	12638	o-ring, drain
19	2	13301	o-ring, injector
20	2	13302	o-ring, brine spacer
21	1	13303	o-ring, injector cover
22	1	13163	injector body
23	1	10913	injector nozzle, specify size
24	1	10914	injector throat, specify size
25	1	10227	injector screen
26	1	13166	injector cover
27	1	13172	brine valve stem
28	1	12626	brine valve seat
29	1	13165	brine valve cap
30	1	13167	brine valve spacer
31	1	12550	quad ring
32	1	11973	spring, brine valve
33	1	16098	washer, brine valve
34	1	11981-01	retaining ring
35	1	10329	BLFC fitting nut, 3/8"
36	1	10330	BLFC ferrule, 3/8"
37	1	10332	BLFC tube insert, 3/8"
38	1		BLFC button, specify size
39	1	12977	o-ring, BLFC
40	1	13245	BLFC button retainer
41	1	13244	BLFC fitting
42	1		DLFC button, specify size
43	1	13173	DLFC button retainer
44	1	12767	screen, brine line
45	1	15348	o-ring, DLFC
46	1	13497	air disperser
47	1	13546	end plug retainer
48	3	12112	screw
49	1	13363	washer
50	1	13296	screw
51A	1	13398	yoke, brass, 1" NPT
	1	13708	yoke, brass, 3/4" NPT
51B	1	18706	yoke, plastic, 1" NPT
	1	18706-02	yoke, plastic, 3/4" NPT
52	1	13308	drain hose barb

Model 5600SE Downflow

Valve Powerhead Assembly

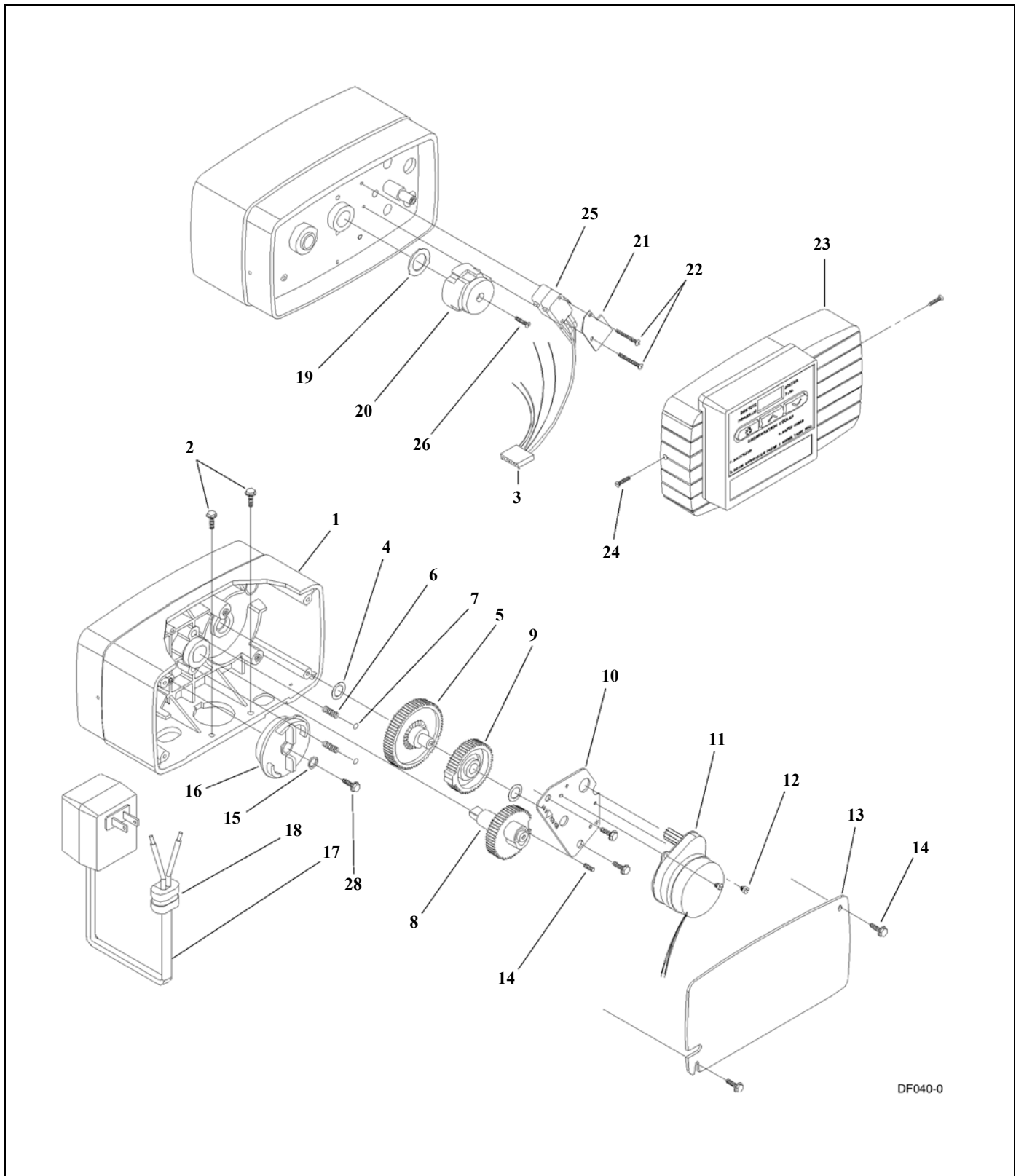


Figure 16: Valve Powerhead Assembly

Model 5600SE Downflow

Valve Powerhead Assembly (Cont'd.)

<i>Item Number</i>	<i>No. Req'd</i>	<i>Part Number</i>	<i>Description</i>
1	1	26001-02	drive housing, black
2	2	12473	screw, drive mount
3	1	19474	wire harness, power
4	1	13299	spring washer
5	1	13299	idler gear
6	2	19080	spring, detent
7	2	13300	ball, detent
8	1	25005	main drive gear and shaft (downflow brining, black)
9	1	23045	drive gear
10	1	13175	motor mounting plate
11	1	16944	drive motor, 2RPM 24V 50/60 Hz
12	3	11384	screw, motor
13	1	13229	back plate
14	4	13296	screw, component
15	1	12037	washer
16	1	18722	cam, brine valve
17	1	19674	transformer, 24V 9.6VA (US 120V)
	1	25651	transformer, 24V 9.6VA (European 230V)
18	1	13547	strain relief
19	1	19079	washer, friction
20	1	17438	cycle cam (downflow brining, black, single backwash)
	1	40609	cycle cam (downflow brining, blue, double backwash)
21	1	10302	insulator
22	2	17876	screw, microswitch
23	1	60755-021	front panel assembly (backwash first label, black cycle cam, single backwash)
	1	60755-221	front panel assembly (backwash first label, blue cycle cam, double backwash)
24	2	13898	screw, front panel
25	2	10218	microswitch
26	1	15151	screw, cycle cam
27	4	12681	wire nut, beige (not shown)
28	1	40214	screw

Model 5600SE Downflow

3-3/4" Turbine Meter Assembly

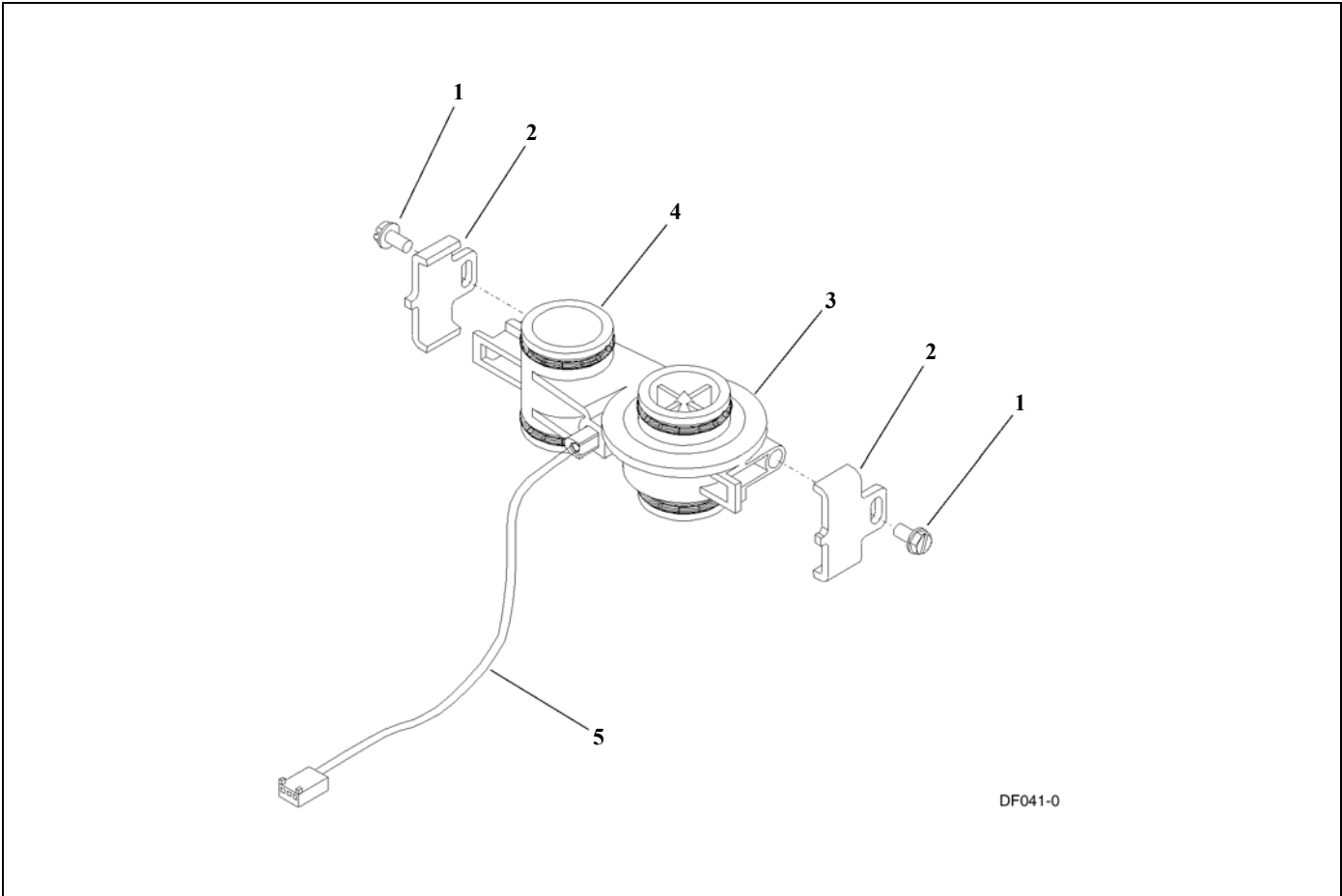


Figure 17: 3-3/4" Turbine Meter Assembly

Item Number	No. Req'd	Part Number	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)

Model 5600SE Downflow

Bypass Valve Assembly, Plastic

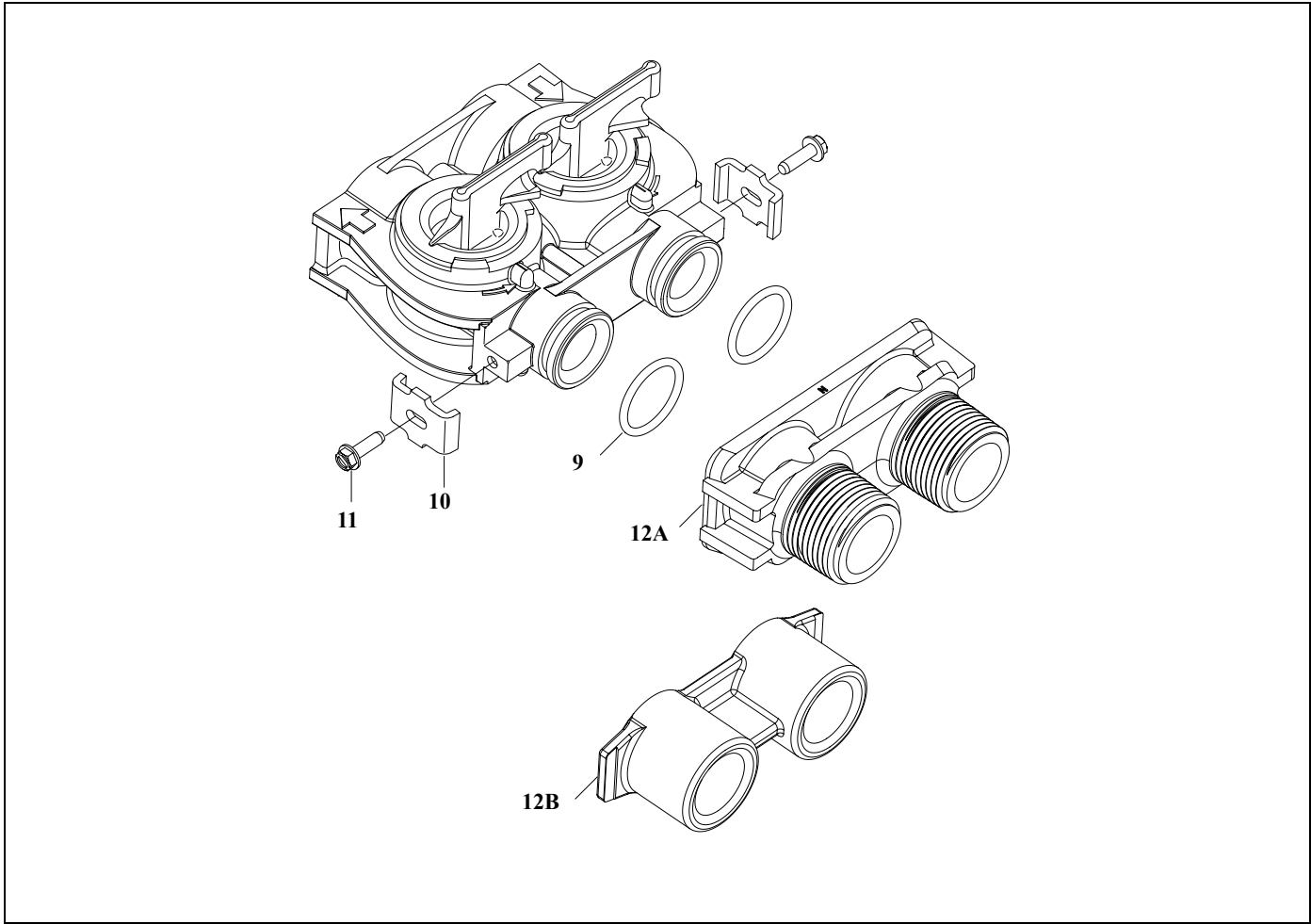


Figure 18: Bypass Valve Assembly, Plastic

Item Number	No. Req'd	Part Number	Description
9	2	13305	o-ring, 119
10	2	13255	clip, mounting
11	2	13314	screw, hex washer head, 8-18 x 5/8
12A	1	18706	yoke, plastic, 1" NPT
		18706-02	yoke, plastic, 3/4" NPT
12B	1	13708	yoke, brass, 3/4" NPT
	1	13708NP	yoke, 3/4" NPT nickel plated
	1	13398	yoke, brass, 1" NPT
	1	13398NP	yoke, 1" NPT nickel plated

Model 5600SE Downflow

Bypass Valve Assembly, Brass

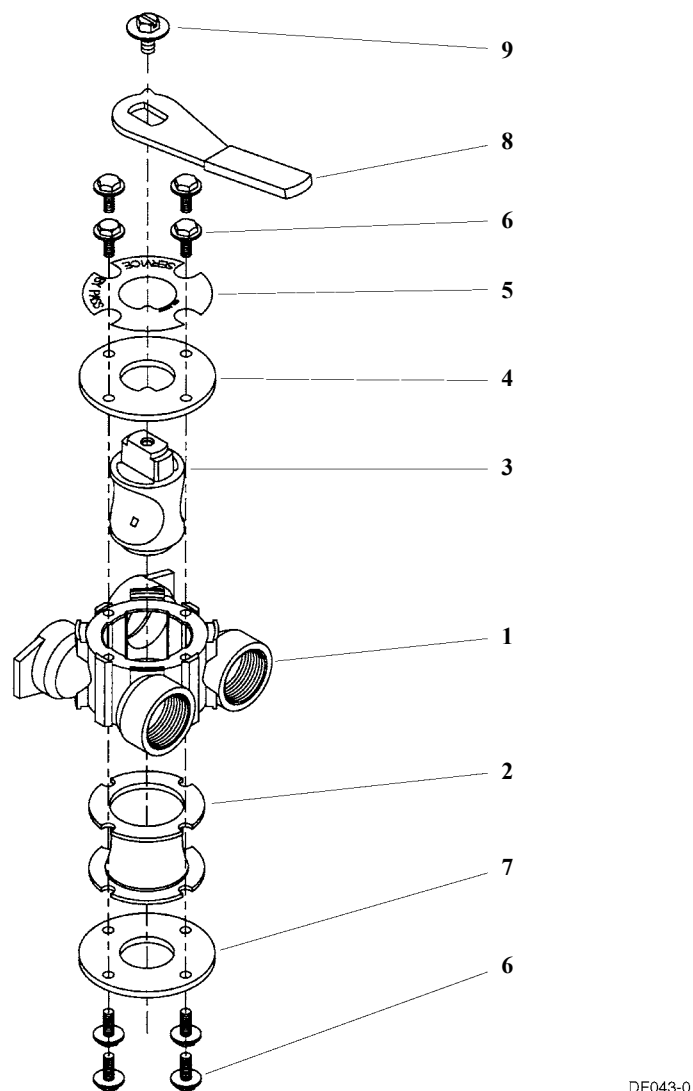


Figure 19: Bypass Valve Assembly, Brass

Item Number	No. Req'd	Part Number	Description
1	1	17290	bypass valve body, 3/4"
	1	17290NP	bypass valve body, 3/4" nickel plated
	1	13399	bypass valve body, 1"
	1	13399NP	bypass valve body, 1", nickel plated
2	1	11726	seal, bypass
3	1	11972	plug, bypass
4	1	11978	side cover
5	1	13604-01	label
6	8	15727	screw
7	1	11986	side cover
8	1	11979	lever, bypass
9	1	11989	screw, hex head, 1/4-14

Model 5600SE Downflow

2300 Safety Brine Valve

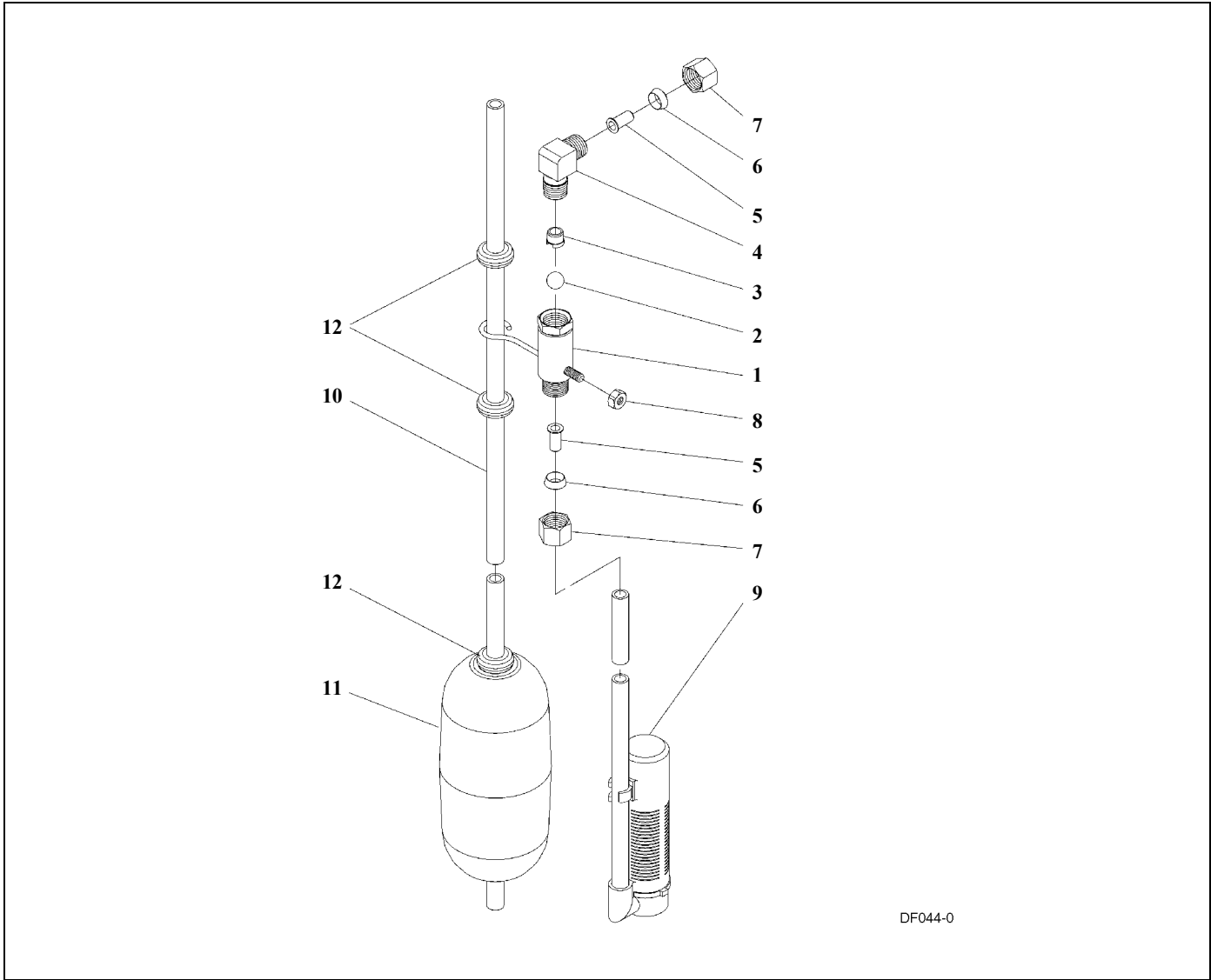


Figure 20: 2300 Safety Brine Valve

Item Number	No. Req'd	Part Number	Description
1	1	60027-00	2300 safety brine valve body
2	1	10138	ball, 3/8"
3	1	11566	bull stop
4	1	10328	elbow, 1/4" x 1/4" T
5	2	10332	insert, 3/8"
6	2	10330	sleeve, 3/8"
7	2	10329	tube nut, 3/8"
8	1	10186	nut, hex, 10-32, nylon
9	1	60002	#500 air check
10	1	10149	float rod, 30"
11	1	10700	float assembly, blue/white
12	4	10150	grommet

Model 5600SE Downflow

2310 Safety Brine Valve

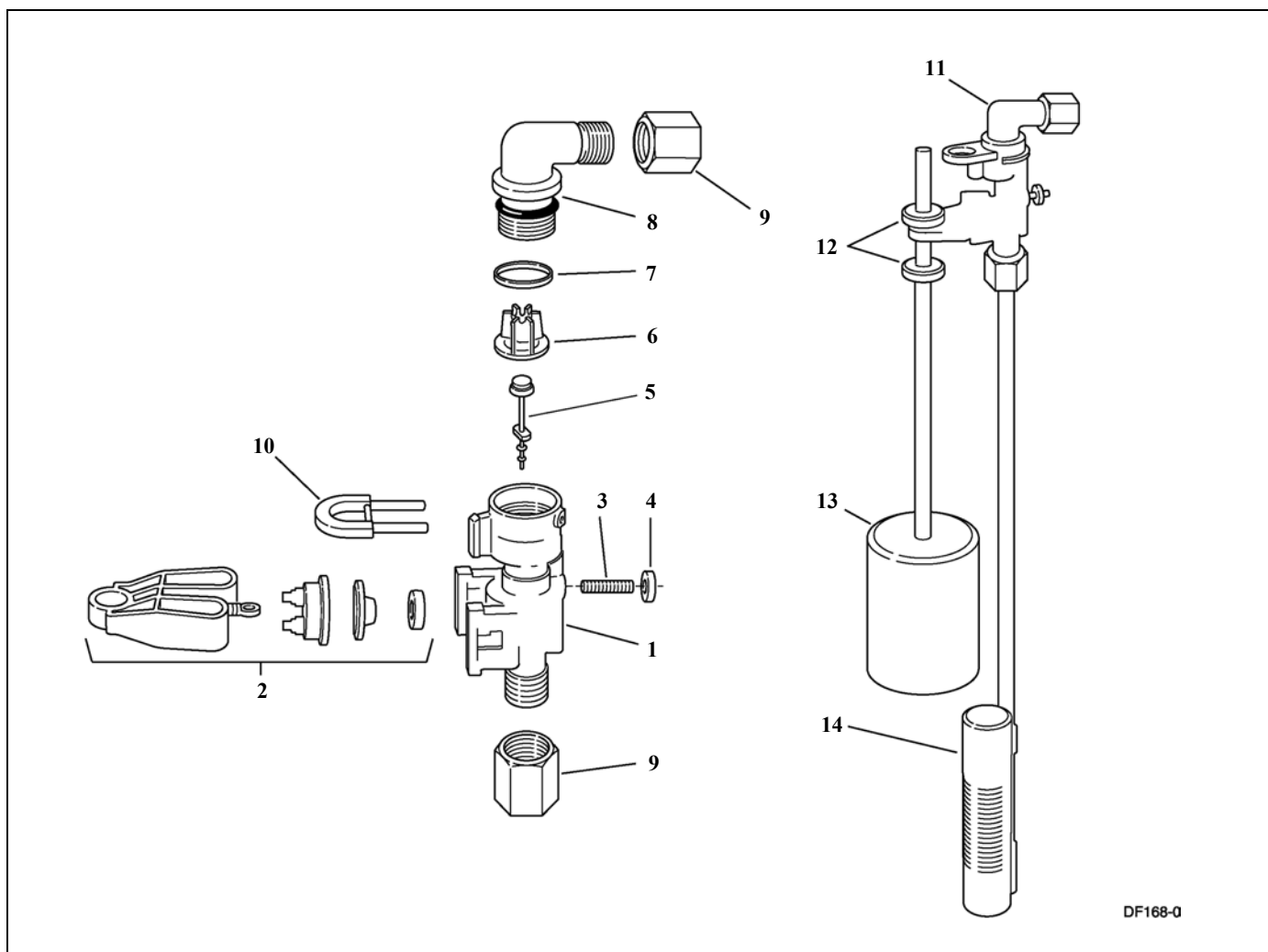
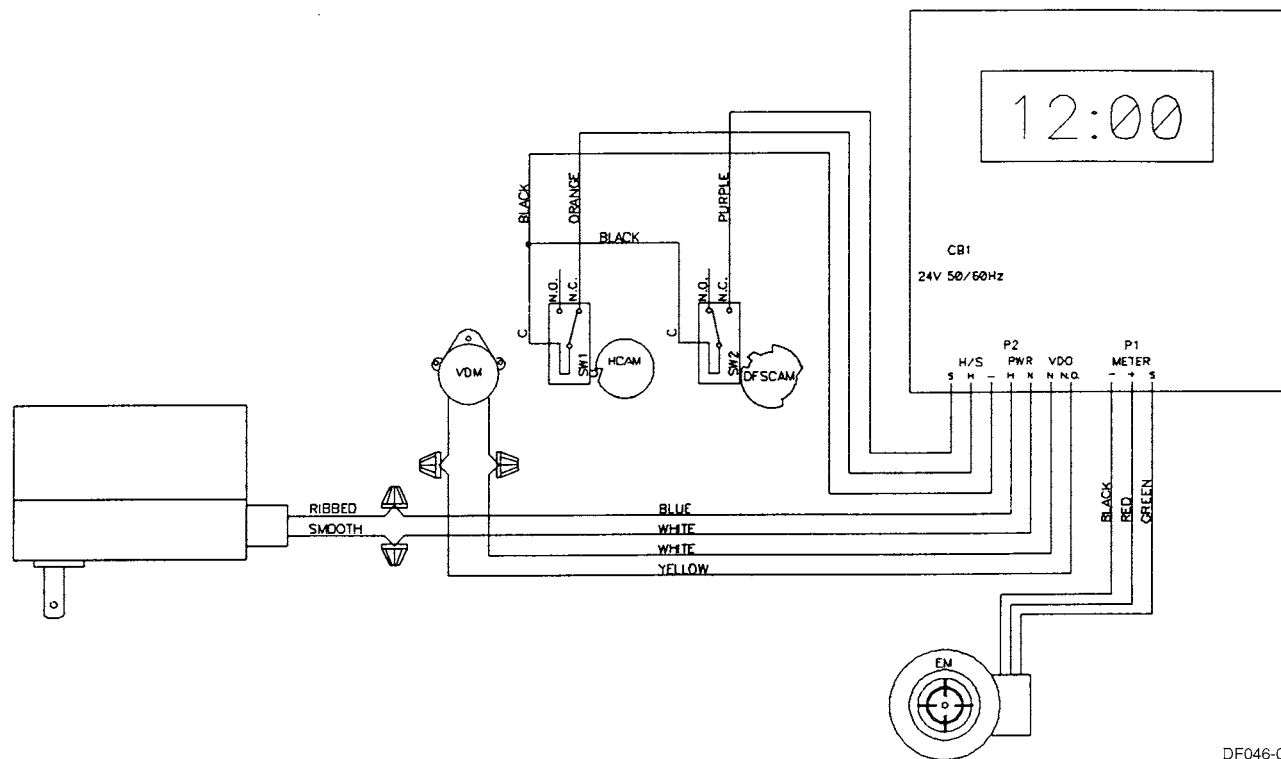


Figure 21: 2310 Safety Brine Valve

Item Number	No. Req'd	Part Number	Description
1	1	19645	safety brine valve body
2	1	19803	safety brine valve arm assembly
3	1	19804	stud, 10-24
4	1	19805	nut, 10-24
5	1	19652-01	poppet and seal
6	1	19649	flow dispenser
7	1	11183	o-ring, 017
8	1	19647	elbow, safety brine valve
9	2	19625	nut assembly, 3/8
10	1	18312	retaining clip
11	1	60014	safety brine valve, 2310 (includes items 1-10)
12	2	10150	grommet (included with item 13)
13	1	60068	float assembly, 2310
14	1	60002	500 air check assembly

Model 5600SE Downflow



DF046-0

CB1 - **5600SE** Circuit Board
VDM - Valve Drive Motor
EM - Electronic Flow Meter (Optional)
SW1 - Homing Switch
SW2 - Step Switch
HCAM - Homing Cam
DFSCAM - Downflow Step Cam

Figure 22: Valve Wiring Diagram

Model 5600SE Downflow

Service Instructions

Replacing Brine Valve, Injectors and Screen

1. Turn off water supply to conditioner:
 - a. If the conditioner installation has a “three valve” bypass system, first open the valve in the bypass line, then close the valves at the conditioner inlet and outlet.
 - b. If the conditioner has an integral bypass valve, put it in the **Bypass** position.
 - c. If there is only a shut-off valve near the conditioner inlet, close it.
2. Relieve water pressure in the conditioner by stepping the control into the **Backwash** position momentarily. Return the control to the **In Service** position.
3. Unplug electrical cord from outlet.
4. Disconnect brine tube and drain line connections at the injector body.
5. Remove the two injector body mounting screws. The injector and brine module can now be removed from the control valve. Remove and discard brine body o-rings.

Brine Valve Replacement

1. Pull brine valve from injector body. Also remove and discard o-ring at bottom of brine valve hole.
2. Apply silicone lubricant to new o-ring and reinstall at bottom of brine valve hole.
3. Apply silicone lubricant to o-ring on new valve assembly and press into brine valve hole. Be sure shoulder on bushing is flush with injector body.

Injectors/Screen Replacement

1. Remove injector cap and screen, discard o-ring. Unscrew injector nozzle and throat from injector body.
2. Screw in new injector throat and nozzle, be sure they are sealed tightly. Install a new screen.
3. Apply silicone lubricant to new o-ring and install around oval extension on injector cap.
4. Apply silicone lubricant to three new o-rings and install over three bosses on injector body.
5. Insert screws through injector cap and injector. Place this assembly through hole in timer housing and into mating holes in the valve body. Tighten screws.
6. Reconnect brine tube and drain line.
7. Return bypass or inlet valving to normal **In Service** position. Water pressure automatically builds in the conditioner.
NOTE: Be sure to shut off any bypass line.
8. Check for leaks at all seal areas. Check drain seal with the control in the **Backwash** position.
9. Plug electrical cord into outlet.
10. Set **Time Of Day** and cycle the control valve manually to assure proper function. Make sure control valve is returned to the **In Service** position.
11. Be sure there is enough salt in the brine tank.
12. Start regeneration cycle manually if water is hard.

Model 5600SE Downflow

Service Instructions (Cont'd.)

Timer Replacement

To replace timer refer to [Replacing Brine Valve, Injectors and Screen](#), steps 1–3.

1. Remove the control valve back cover. Remove the control valve front cover. Disconnect the meter dome signal wire from the front cover and feed it back through the control.
2. Remove screw and washer at drive yoke. Remove timer mounting screws. The entire timer assembly then lifts off easily.
3. Put new timer on top of valve. Be sure drive pin on main gear engages slot in drive yoke.
4. Replace timer mounting screws. Replace screw and washer at drive yoke. Replace meter signal wire.
5. Return bypass or inlet valving to normal **In Service** position. Water pressure automatically builds in the conditioner.

NOTE: Be sure to shut off any bypass line.

6. Replace the control valve back cover.
7. Follow [Injectors/Screen Replacement](#), steps 9–12.

Piston Assembly Replacement

To replace piston assembly refer to [Replacing Brine Valve, Injectors and Screen](#), steps 1–3.

1. Remove the control valve back cover. Remove the control valve front cover. Disconnect the meter dome signal wire from the front cover and feed it back through the control.
2. Remove screw and washer at drive yoke. Remove timer mounting screws. The entire timer assembly will now lift off easily. Remove end plug retainer plate.
3. Pull upward on end of piston yoke until assembly is out of valve.
4. Inspect the inside of the valve to make sure that all spacers and seals are in place, and that there is no foreign matter that would interfere with the valve operation.
5. Take new piston assembly as furnished and push piston into valve by means of the end plug. Twist yoke carefully in a clockwise direction to properly align it with drive gear. Replace end plug retainer plate.
6. Place timer on top of valve. Be sure drive pin on main gear engages slot in drive yoke.
7. Replace timer mounting screws. Replace screw and washer at drive yoke.
8. Return bypass or inlet valving to normal **In Service** position. Water pressure automatically builds in the conditioner.

NOTE: Be sure to shut off any bypass line.

9. Replace the control valve back cover.
10. Follow [Injectors/Screen Replacement](#), steps 9–12.

Model 5600SE Downflow

Service Instructions (Cont'd.)

Seal and Spacer Replacement

To replace seals and spacers, refer to [Replacing Brine Valve, Injectors and Screen](#), steps 1–3.

1. Remove the control valve back cover. Remove the control valve front cover. Disconnect the meter dome signal wire from the front cover and feed it back through the control.
2. Remove screw and washer at drive yoke. Remove timer mounting screws. The entire timer assembly will now lift off easily. Remove end plug retainer plate.
3. Pull upward on end of piston rod yoke until assembly is out of valve. Remove and replace seals and spacers.
4. Take piston assembly and push piston into valve by means of the end plug. Twist yoke carefully in a clockwise direction to properly align it with drive gear. Replace end plug retainer plate.
5. Place timer on top of valve. Be sure drive pin on main gear engages slot in drive yoke.
6. Replace timer mounting screws. Replace screw and washer at drive yoke.
7. Return bypass or inlet valving to normal **In Service** position. Water pressure automatically builds in the conditioner.

NOTE: Be sure to shut off any bypass line.

8. Replace the control valve back cover.
9. Follow [Injectors/Screen Replacement](#), steps 9–12.

Meter Replacement

To replace meter refer to [Replacing Brine Valve, Injectors and Screen](#), steps 1–3.

1. Remove two screws and clips at bypass valve or yoke. Pull resin tank away from plumbing connections.
2. Pull meter module out of control valve.
3. Remove signal wire from meter module, (snap tab on end opposite wire cable).
4. Apply silicone lubricant to four new o-rings and assemble to four ports on new meter module.
5. Install signal wire into new meter module.
6. Assemble meter to control valve. Note, meter portion of module must be assembled at valve outlet.
7. Push resin tank back to the plumbing connections and engage meter ports with bypass valve or yoke.
8. Attach two clips and screws at bypass valve or yoke. Be sure clip legs are firmly engaged with lugs.
9. Return bypass or inlet valving to normal **In Service** position. Water pressure automatically builds in the conditioner.

NOTE: Be sure to shut off any bypass line.

10. Check for leaks at all seal areas.
11. Follow [Injectors/Screen Replacement](#), steps 9–12.

Model 5600SE Downflow

Troubleshooting

PROBLEM	CAUSE	CORRECTION
1. Softener fails to regenerate.	A. Electrical service to unit has been interrupted. B. Timer is not operating properly. C. Defective valve drive motor. D. Timer programming bad (improper programming).	A. Assure permanent electrical service (check fuse, plug, pull chain or switch). B. Replace timer. C. Replace drive motor. D. Check programming and reset as needed.
2. Softener delivers hard water.	A. Bypass valve is open. B. No salt in brine tank. C. Injectors or screen plugged. D. Insufficient water flowing into brine tank. E. Hot water tank hardness F. Leak at distributor tube G. Internal valve leak. H. Flow meter jammed. I. Flow meter cable disconnected or not plugged into meter. J. Improper programming.	A. Close bypass valve. B. Add salt to brine tank and maintain salt level above water level. C. Replace injectors and screen. D. Check Brine tank fill time and clean brine line flow control if plugged. E. Repeated flushings of the hot water tank is required. F. Make sure distributor tube is not cracked. Check o-ring and tube pilot. G. Replace seals and spacers and/or piston. H. Remove obstruction from flow meter. I. Check meter cable connection to timer and meter. J. Reprogram the control to the proper regeneration type, inlet water hardness, capacity or flow meter size.
3. Unit uses too much salt.	A. Improper salt setting. B. Excessive water in brine tank. C. Improper programming.	A. Check salt usage and salt setting. B. See problem 7, page 30 . C. Check programming and reset as needed.
4. Loss of water pressure.	A. Iron buildup in line to water conditioner. B. Iron buildup in water conditioner. C. Inlet of control plugged due to foreign material broken loose from pipes by recent work done on plumbing system.	A. Clean line to water conditioner. B. Clean control and add resin cleaner to resin bed. Increase frequency of regeneration. C. Remove piston and clean control.
5. Loss of resin through drain line.	A. Air in water system. B. Drain line flow control is too large.	A. Assure that well system has proper air eliminator control check for dry well condition. B. Ensure drain line flow control is sized correctly.
6. Iron in conditioned water.	A. Fouled resin bed. B. Iron content exceeds recommended parameters.	A. Check backwash, brine draw and brine tank fill. Increase frequency of regeneration. Increase backwash time. B. Add iron removal from filter or system.

Model 5600SE Downflow

Troubleshooting (Cont'd.)

PROBLEM	CAUSE	CORRECTION
7. Excessive water in brine tank.	A. Plugged drain line flow control. B. Brine valve failure. C. Improper programming.	A. Clean flow control. B. Replace brine valve. C. Check programming and reset as needed.
8. Salt water in service line.	A. Plugged injector system. B. Timer not operating properly. C. Foreign material in brine valve. D. Foreign material in brine line flow control. E. Low water pressure. F. Improper programming.	A. Clean injector and replace screen. B. Replace timer. C. Clean or replace brine valve. D. Clean brine line flow control. E. Raise water pressure. F. Check programming and reset as needed.
9. Softener fails to draw brine.	A. Drain line flow control is plugged. B. Injector is plugged. C. Injector screen plugged. D. Line pressure is too low. E. Internal control leak. F. Improper programming. G. Timer not operating properly.	A. Clean drain line flow control. B. Clean or replace injectors. C. Replace screen. D. Increase line pressure (line pressure must be at least 25 psi at all times.) E. Change seals and spacers and/or piston assembly. F. Check programming and reset as needed. G. Replace timer.
10. Control cycles continuously.	A. Timer not operating properly. B. Faulty microswitches and or harness. C. Faulty cycle cam operation.	A. Replace timer. B. Replace faulty microswitch or harness. C. Replace cycle cam or reinstall.
11. Drain flows continuously.	A. Foreign material in control. B. Internal control leak. C. Control valve jammed in brine or backwash position. D. Timer motor stopped or jammed. E. Timer not operating properly.	A. Remove piston assembly and inspect bore, remove foreign material and check control in various regeneration positions. B. Replace seals and/or piston assembly. C. Replace piston and seals and spacers. D. Replace timer motor and check all gears for missing teeth. E. Replace timer.

Model 5600SE Downflow

Service Assemblies

	60022-12	BLFC .125 gpm
	60022-25	BLFC .25 gpm
	60022-50	BLFC .50 gpm
	60022-100	BLFC 1.0 gpm
		<i>For illustration see Figure 15, page 16.</i>
	17307	flow washer .125 gpm
	12094	flow washer .25 gpm
	12095	flow washer .50 gpm
	12097	flow washer 1.0 gpm
1	12977	o-ring, 015
1	13244	adapter, BLFC
1	13245	retainer, BLFC
	60032	brine valve
		<i>For illustration see Figure 15, page 16.</i>
1	11973	spring, brine valve
1	11981-01	retaining ring
1	12550	quad ring, 009
1	13165	cap, brine valve
1	13167	spacer, brine valve
2	13302	o-ring, 014
1	16098	washer, plain, nylon
1	13172	brine valve stem
1	12626	seat, brine valve
	60040	bypass, 3/4", brass
	60040NP	bypass, 3/4", nickel
	60041	bypass, 1", brass
	60041NP	bypass, 1", nickel
		<i>For illustration see Figure 19, page 22.</i>
	60049	bypass, plastic, 3/4"
		<i>For illustration see Figure 18, page 21.</i>
	60102-71	5600SE piston assembly, downflow
		<i>For illustration see Figure 15, page 16.</i>
1	14309	piston rod retainer
1	13001-04	piston rod assembly
1	13446-40	end plug assembly, green
1	17218	piston, downflow rapid rinse
	60125	5600SE seal and spacer kit
		<i>For illustration see Figure 15, page 16.</i>
5	13242	seal
4	14241	spacer
	60084	injector, module assembly
		(Specify injector number, DLFC size, BLFC size)
		<i>For illustration see Figure 15, page 16.</i>
	60626	5600SE meter assembly
		<i>For illustration see Figure 17, page 20.</i>
	60755-021	5600SE front panel assembly
		black backwash first label, downflow/upflow
		<i>For illustration see Figure 16, page 18.</i>
	60755-221	5600SE front panel assembly
		blue, second backwash label
		<i>For illustration see Figure 16, page 18.</i>

