AmeriWater
The Water Purification Specialists

Softener / Filter
Fleck Model 2850 SXT
Medical Series

Operation and Service Manual

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Table of Contents **Page**

1.0 INTRODUCTION & WARNINGS

Congratulations on your decision to use AmeriWater Dialysis Water Purification Equipment! Federal law restricts this device to sale by or on the order of a physician for use as a water purification device for hemodialysis.

Your Water Purification Equipment was thoroughly tested and in excellent condition when it was shipped to you. However, because damage during shipment is possible, please unpack and carefully inspect as soon as you receive it. Please notify AmeriWater immediately if any problems or shipping damage are identified.

Please read the Operations Manual before using the system. Contact AmeriWater Customer Service with any questions at 1-800-535-5585 Monday through Friday 8:00 a.m. to 5:00 p.m. eastern standard time. For after hours emergencies call 1-800-535-5585 and follow the instructions on the recorded message. Our on-call technician will return your call as soon as possible.

NOTE: This entire Operations Manual should be read before operating or servicing the device. This Operations Manual should then be kept near the device and used as a reference and troubleshooting guide**.**

WARNING: The selection of water treatment equipment for dialysis and the maintenance of the equipment following its installation is the responsibility of the dialysis physician. The product water should be tested periodically to verify that all equipment is operating within specifications.

WARNING: *DO NOT* operate the water purification system without properly functioning carbon filtration! Suspend dialysis treatments immediately if chlorine or chloramines level after the polisher tank exceeds 0.1 mg/L!

WARNING: Water softeners, carbon filtration, and multimedia filters are intended to be used as pretreatment for reverse osmosis or deionization; and are not meant to be used as the primary means of water purification for Dialysis.

2.0 Fleck 2850 SXT System Specifications

2.1 Series 2850 SXT Water Softener

Series 2850 SXT Fleck Water Softener

Features:

- A full flow 1-1/2" valve.
- The control valve utilizes the time proven piston-seal-spacer technology for durable, maintenance free service.
- All plastic construction will not corrode.
- Programmable electronic controller is flexible for all conditions. All times can be set to the minute.
- Single tank design regenerates at off hours to prevent pressure loss caused by dual metered systems regenerating during dialysis treatment.
- Included with the water softener is a reverse osmosis lock-out switch.
- Choose from a 1", 1¼", or 1½" header that includes (3) true union ball valve by-pass, stainless steel liquid filled outlet pressure gauge and sample port. Header can be oriented from left to right flow or right to left flow.

MEDICAL SERIES 2850 SXT FLECK WATER SOFTENER						
Medical Model Number	**Grain Capacity**	**Flow* Rate GPM**	**Resin Tank Size in Inches**	**Brine Tank Size in Inches**	**Brine Tank Capacity in Lbs.**	**Shipping Weight in Lbs.**
0095012	104,000	21	14 x 65	18 x 40	400	310
0095013	144,000	27	16 x 65	24 x 50	900	415
0095014	176,000	33	18 x 65	24 x 50	900	485
0095015	240,000	45	21 x 62	24 x 50	900	610
0095016	285,000	57	24 x 65	30 x 50	1400	810
0095017	320,000	63	24 x 72	30 x 50	1400	810
0095018	480,000	66	30 x 72	30 x 50	1400	1125
* Based on 10 psi pressure drop.						

HEADERS	
Part Number	**Description**
009591	1" Header By-Pass Assy.
009592	1¼" Header By-Pass Assy.
009595	1½" Header By-Pass Assy.

2.2 Series 2850 SXT Carbon Filter

Series 2850 SXT Fleck Backwashable Carbon Filter

Features:

- A full flow 1-1/2" valve for less pressure drop.
- The control valve utilizes the time proven piston-seal-spacer technology for durable, maintenance free service.
- All plastic construction will not corrode.
- Carbon is acid washed granular activated carbon, 12 x 40 mesh with an iodine number greater than 1000 is used only for Dialysis.
- Programmable electronic controller is flexible for all conditions. All times can be set to the minute.
- Included with the carbon filter is a reverse osmosis lock-out switch.

- Choose either a 1" 1¼" or 1½" header that includes three true union ball valve by-pass header, stainless steel liquid filled outlet pressure gauge and sample port. The header comes pre-assembled and can be installed using PVC schedule 80 piping. The header can be oriented from left to right flow or right to left flow.

MEDICAL SERIES 2850 SXT FLECK BACKWASHABLE CARBON FILTER					
Medical Model Number	**Flow Rate* GPM**	**Cubic Feet of Carbon**	**Backwash Flow Rate GPM**	**Media Tank Size in Inches**	**Shipping Weight in Lbs.**
0095027	5.1	3	9	14 x 65	235
0095028	6.5	4	12	16 x 65	340
0095029	8.5	5	15	18 x 65	400
0095030	11.2	7	20	21 x 62	430
0095031	14.3	9	25	24 x 65	590
0095032	17.3	10	25	24 x 72	670
* Based on 5-minute EBCT. Worker / Polisher arrangement is required.					

HEADERS	
Part Number	**Description**
009591	1" Header By-Pass Assy.
009592	1¼" Header By-Pass Assy.
009595	1½" Header By-Pass Assy.

2.3 Series 2850 SXT Multimedia Filter

Series 2850 SXT Fleck Multi-Media Filter

Features:

- A full flow 1-1/2" valve with flow rates up to 51 GPM.
- The control valve utilizes the time proven piston-seal-spacer technology for durable, maintenance free service.
- All plastic construction will not corrode.
- Media bed has three layers selected for particle size and specific gravity providing highly efficient removal of particulate matter from water. The top layer traps coarse debris, the middle layer traps medium size particles, and the bottom layer traps particles as small as 10 microns.
- The multi-media design offers the advantage of efficient filtering and long service runs between filter backwashes.
- Programmable electronic controller is flexible for all conditions. All times can set to minutes.
- Included with the multi-media filter is the reverse osmosis lock-out switch.
- Choose either a 1" 1¼" or 1½" header that includes three true union ball valve by-pass header, stainless steel liquid filled outlet pressure gauge and sample port. The header comes pre-assembled and can be installed using PVC schedule 80 piping. The header can be oriented from left to right flow or right to left flow.

MEDICAL SERIES 2850 SXT FLECK MULTI-MEDIA FILTER

Medical Model Number	Service Flow* Rate GPM	Backwash Flow Rate GPM	Cubic Feet of Media	Media Tank Size in Inches	Shipping Weight in Lbs.
0095042	13	12	3.0	14 x 65	350
0095043	17	15	4.0	16 x 65	495
0095044	22	20	5.0	18 x 65	570
0095045	28	25	7.0	21 x 62	635
0095046	35	30	9.0	24 x 65	880

* At an initial pressure loss of 10 psi.

HEADERS

Part Number	Description
009591	1" Header By-Pass Assy.
009592	1¼" Header By-Pass Assy.
009595	1½" Header By-Pass Assy.

3.0 Series 2850 SXT Water Softener Operation Summary

3.1 DESCRIPTION

The Water Softener removes calcium and magnesium (hardness) from the water to prevent these contaminants from being deposited onto the surface of the RO membranes, which may irreversibly damage the membranes.

3.2 HOW IT WORKS:

Water Softeners remove calcium and magnesium ions from the water through an ion exchange process. The water passes over resin beads charged with sodium ions. The resin beads attract the calcium and magnesium ions in the water and exchange them with sodium ions. The supply of sodium ions is progressively depleted until reaching a state of exhaustion. Regeneration of the softener replenishes the supply of sodium ions and eliminates the previously removed calcium and magnesium ions.

NOTE: Install Water Softeners before any Dealkalizer or an Organic Scavenger.

3.3 MONITORING:

1. Verify at the beginning of each day that the control head timer is set to the correct time of day and record that this verification was done. This prevents inadvertent regeneration during clinical operation, which would cause the RO to shut down via the interlock mechanism.

2. Test and record the hardness level of the water at the softener outlet to ensure that the hardness level is less than or equal to one grain per gallon (GPG). This testing must be done at least once per day at the end of the treatment day. Recording of the hardness level must be done after 15 minutes of operation.

3. Monitor the brine tank daily to ensure that the salt level fills at least half of the tank. Salt added to the brine tank must be clean pellet type, cube, or solar salt only. Do not use rock salt.

4. Monitor and record the pressure drop across the softener daily. Notify the medical director if the delta pressure is $\geq$ 10 PSI above established. High delta pressure may cause improper operation of some of the downstream water purification components.

NOTE: Hard water results at the softener outlet may indicate a lack of salt in the brine tank resulting in insufficient regeneration, softener not going into or exiting regeneration, a degeneration in the chemical properties of the resin, or an open bypass valve. Notify the Supervisor in charge, if hard water results are obtained at the softener outlet.

4.0 Series 2850 SXT Carbon Filter Operation Summary

4.1 DESCRIPTION:

Carbon filtration removes chlorine, and chloramines from the feed water supply to protect both the patients and the downstream water purification equipment (RO membranes). Removal of free chlorine and chloramines to a maximum level of 0.1 mg/L is necessary to protect dialysis patients from red cell hemolysis, and to prevent degradation of the RO membranes.

4.2 HOW IT WORKS:

Carbon adsorption filtration is composed of two or more carbon tanks in a series or parallel-series configuration with a total empty bed contact time (EBCT) of at least 10 minutes. The granular activated carbon (GAC) removes chlorine and chloramines through an adsorption process. Backwashing restores the carbon's adsorptive properties.

4.3 MONITORING:

1. Verify at the beginning of each day that the control head timer is set to the correct time of day and record that this verification was done. This prevents inadvertent backwash during clinical operation, which would cause the RO to shut down via the interlock mechanism.

2. Verify and record that the product water free chlorine and chloramines levels are less than 0.1 mg/L prior to beginning each patient shift or at least every 4 hours. This sample is taken at the sample port between the worker (first tank) and polisher (second tank) in each series after at least 15 minutes of operation.

3. Monitor and record the pressure drop across the carbon filter daily. Notify the Supervisor in charge, if the delta pressure is $\geq$ 10 PSI above established. High delta pressure may cause improper operation of some of the downstream water purification components.

WARNING: ***Suspend dialysis treatments immediately if chlorine or chloramines level after the polisher tank exceeds 0.1 mg/L!***

4. Notify the Supervisor in charge, immediately when samples from the first sampling port are positive for chlorine or chloramines. Operation may be continued for up to 72 hours until a replacement bed is installed provided that samples from the second sampling port remain negative. Log the actual times testing is done when operating on a single carbon bed. When using a dual carbon bed, log the actual times testing is done on the secondary (Polisher) every hour.

5. Replacement beds are recommended to be moved into the polisher position and the existing polisher moved to the worker position. If this is not possible, both beds are recommended to be replaced.

WARNING: ***DO NOT* operate the water purification system without properly functioning carbon filtration!**

5.0 Series 2850 SXT Multimedia Filter Operation Summary

5.1 DESCRIPTION:

Multimedia Filter removes coarse particulate matter (sediment) from incoming water supply.

5.2 HOW IT WORKS:

The media bed has three layers (anthracite, sand, and garnet) selected for particle size and specific gravity providing highly efficient removal of particulate matter from water. The top layer traps coarse debris, the middle layer traps medium size particles, and the bottom layer traps particles as small as 10 microns. The density of each layer is such that garnet will settle to the bottom of the tank, the sand settles in the next layer, and the anthracite settles at the top during backwash.

Water enters at the top of the tank contacting the larger particles first which retains the larges particulate matter. The water flows through each successive layer, and each layer traps progressively smaller particles. During backwash, the sediment particles are swept away from the media and flushed to drain restoring the capacity of the filter to trap sediment.

5.3 MONITORING:

1. Verify at the beginning of each day that the control head timer is set to the correct time of day and record that this verification was done. This prevents inadvertent backwash during clinical operation, which would cause the RO to shut down via the interlock mechanism.

2. Monitor and record the pressure drop across the multimedia filter daily. Notify the Supervisor in charge, if the delta pressure is $\geq$ 10 PSI above established. High delta pressure may cause improper operation of some of the downstream water purification components.

6.0 Fleck 2850 SXT System Installation

6.1 Installation Requirements

Water Pressure

20 psi minimum inlet water pressure required for regeneration valve to operate correctly.

Electrical Facilities

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

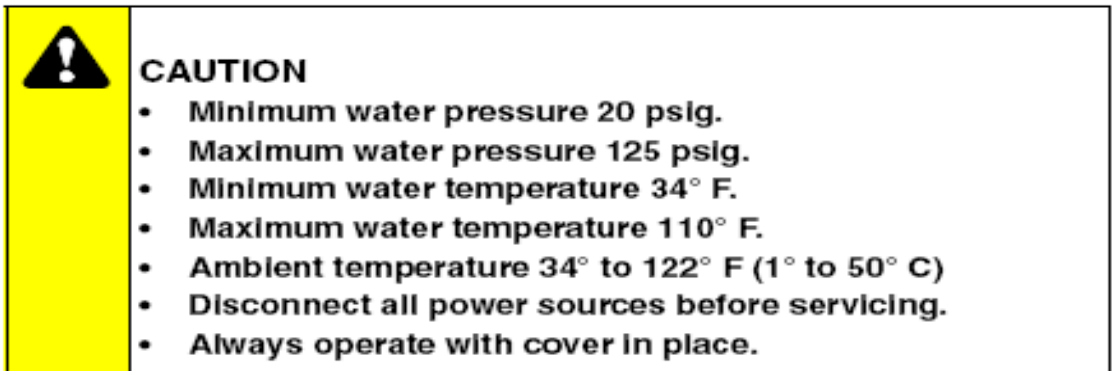
- Voltage supply is compatible with unit before installation.
- Current supply is always hot and cannot be turned off with another switch.

Location of Softener and Drain

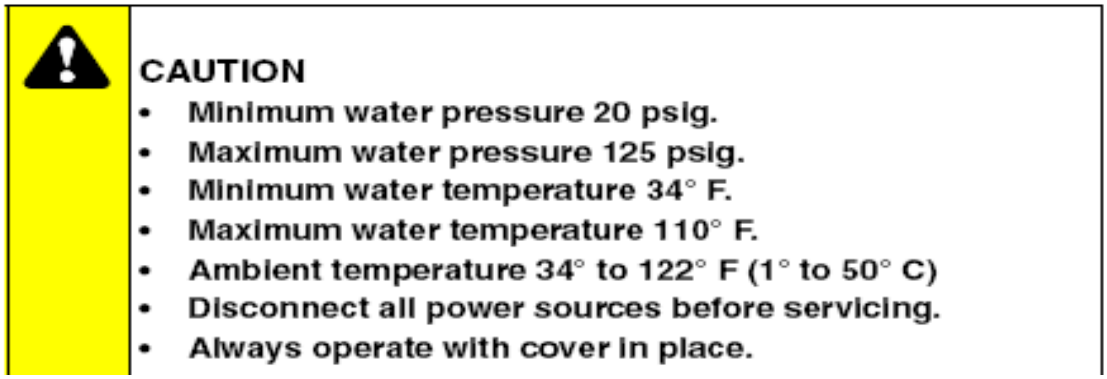
Locate tanks close to clean working drain and connect according to local plumbing codes.

Bypass Valves

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



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



6.2 Installation Instructions

1. Always install devices as shown on the AmeriWater Piping and Instrumentation Drawing (P&ID) provided with the water purification system. Failure to do so may adulterate the marketing clearance on the device and void all AmeriWater warranties.

2. Place the tank where you want to install the unit. Verify that the tank is level and on a firm base, and that the tank label and control face are visible. Here are some additional things to consider when choosing an installation location.

   a) Is there sufficient space available to mount the Bypass Header?

   b) Will the hoses reach from the Bypass Header to the control valve connections?

   c) Will the control valve power cord reach the 120-Volt GFI receptacle?

   d) Will the control valve drain hose reach the drain?

   e) Is there sufficient space available to set the brine tank?

   f) Will the brine line tubing reach from the control head to the brine tank?

   g) Are there any obstructions that interfere with reading the labels, reading the controller screen, programming the controller, or performing maintenance?

3. After the tank is loaded with media it may be too difficult to reposition. Perform the Following steps to establish the final location of the control valve in relation to the tank body.

   a) Install the control valve and sealing o-ring into the tank.

   b) Tighten to the same torque you expect to use after the media is loaded.

   c) Mark the junction of the control valve to the tank body with a small ink pen mark or mark from a marker pen or a piece of tape.

   d) Remove the control valve and sealing o-ring from the tank, being careful not to disturb the alignment marks just made.

   e) Reposition the tank now if needed to keep the control valve in the desired position.

4. Place the distibutor basket and riser pipe into the empty tank. Measure down from the tank opening to the top of the distributor basket. Pull the tape measure back up 1" to 2". record this measurement.

5. Fill the tank approximately 1/4 of the way up the tank side with water to protect the distributor from falling media during media loading.

6. Cover, plug, or otherwise protect the open end of the riser pipe from the media being loaded.

7. Load the gravel media. While loading periodically take measurements from the tank opening to the top of the gravel media layer. Stop loading when the measurement taken previously is reached. Refer to the loading charts provided for the approximate amount of gravel to be used for your particular model number.

8. Load the softener resin media. Refer to the loading charts provided for the amount required to be used for your particular model number.

9. Remove the plug or cover from the riser pipe and clean the tank opening threads and surrounding surface of media loading debris.

10. Clean & lubricate the control valve o-ring seals and any surfaces they will seal against.

11. Install the control valve into the tank opening threads. Tighten to the mark established previously in this procedure.

12. Connect all plumbing in accordance to your local plumbing codes. The softener should be installed using the appropriate AmeriWater Bypass Header. This allows the device to be bypassed for service.

13. Make plumbing connections to the Fleck 2850 SXT valve head.

14. Pre-Treatment lock-out must be set-up as shown in drawing on page 50.

15. Place information label, record regen time and days of week that regen occurs. Also log media lot numbers.

16. Wire tie or lock bypass valve to prevent accidental bypass, see figure 6.1.

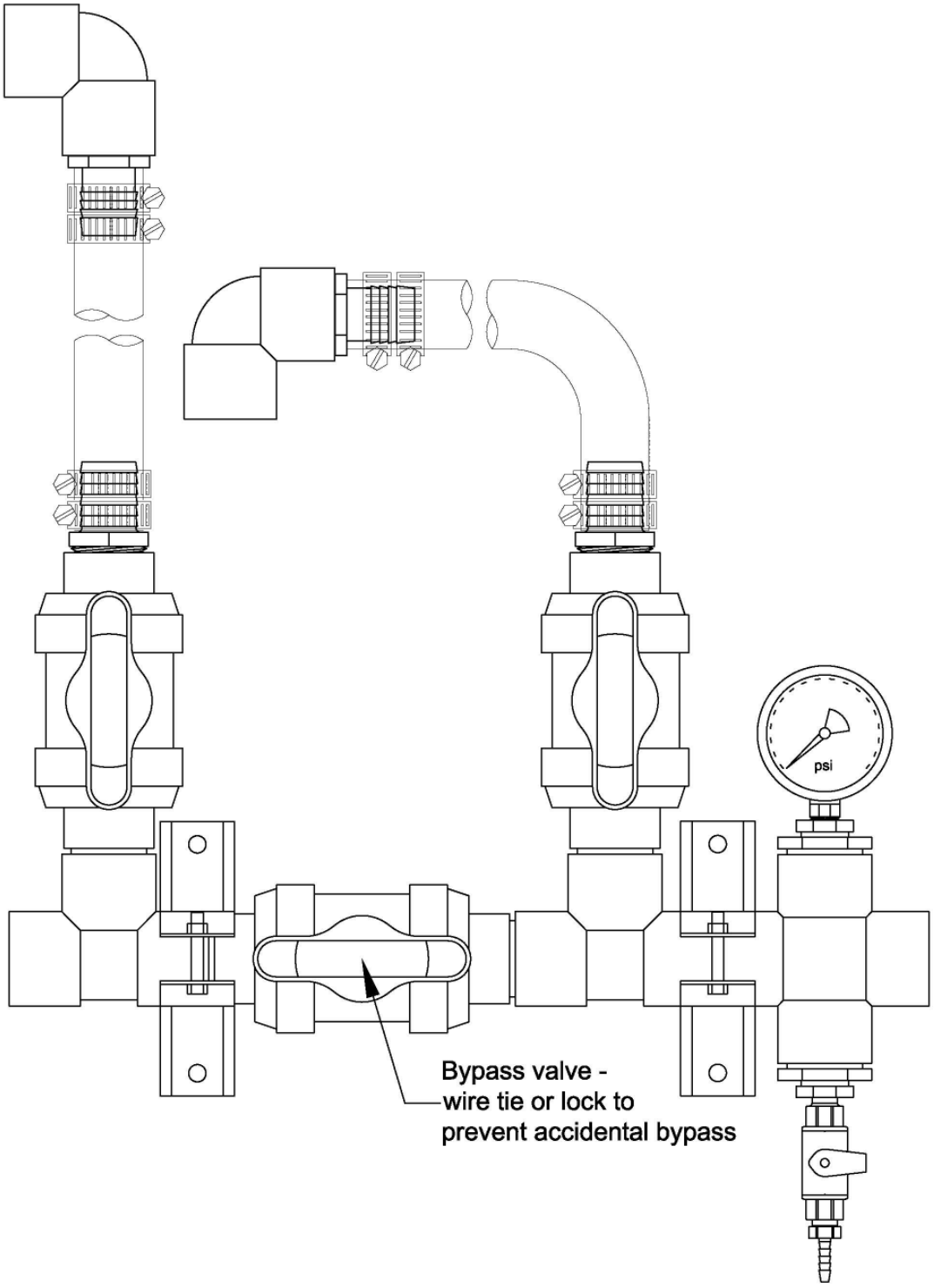
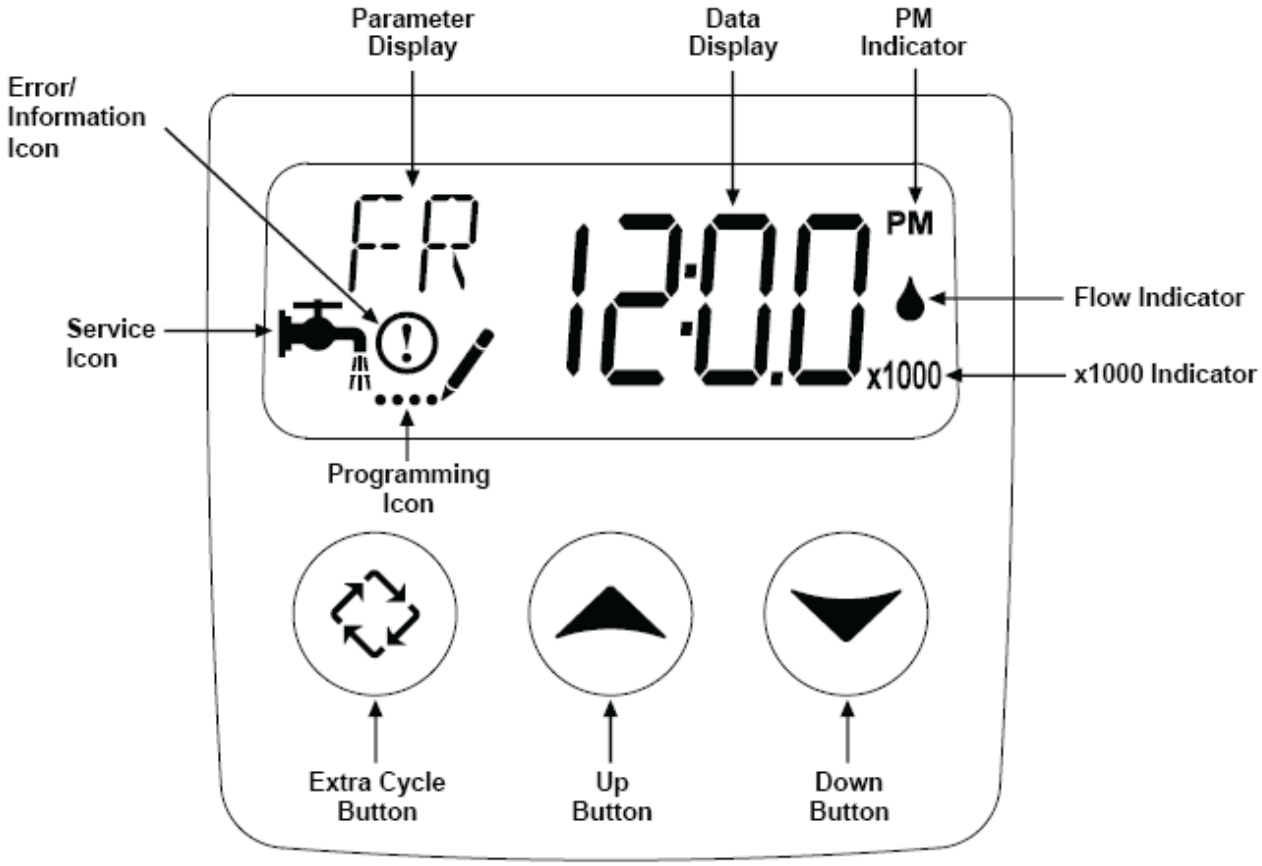

psi
Bypass valve -
wire tie or lock to
prevent accidental bypass

Figure 6.1

7.0 Fleck 2850 SXT Operation and Programming

7.1 Fleck 2850 SXT Operation Buttons



7.2 Fleck 2850 SXT Master Programming

Table 7.2.1 Water Softeners Fleck 2850 SXT

Programming		
Step	**Description**	
DO	Adjusting the time of day – Entering the master programming mode	Adjust the displayed time with the UP or DOWN buttons. For programming, set time to 12:01P.M.
DO	Setting the desired time of day - Entering the master programming mode	When the desired time is set, press the Extra Cycle button to exit setting time of day.
1.	Display Format (DF)	Choose GAL holding down the UP and DOWN buttons together. Once the display flashes, choose the GAL setting using the UP or DOWN buttons. Press the Extra Cycle button to go to Step 2.
2.	Valve Type (VT)	Choose dF1b (softener) using the UP or DOWN buttons. Press the Extra Cycle button to go to Step 3.
3.	Control Type (CT)	Choose dAY (Day of Week) using the UP or DOWN buttons. Press the Extra Cycle button to go to Step 4.
4.	Number of Tanks (NT)	Choose 1 using the UP or DOWN buttons. Press the Extra Cycle button to go to Step 5.
5.	Regen Time (RT)	Choose time for regen using the UP or DOWN buttons. Press Extra Cycle button to go to Step 6.
6.	Select Time for Backwash (BW) - Reference manual table	Choose time for Backwash using the UP or DOWN buttons. Press Extra Cycle button to go to Step 7.
7.	Select Time for Brine Draw (BD) - Reference manual table	Choose time for Brine Draw using the UP or DOWN buttons. Press Extra Cycle button to go to Step 8.
8.	Select Time for Rapid Rinse (RR) - Reference manual table	Choose time for Rapid Rinse using the UP or DOWN buttons. Press Extra Cycle button to go to Step 9.
9.	Select Time for Brine Refill (BF) - Reference manual table	Choose time for Brine Refill using the UP or DOWN buttons. Press Extra Cycle button to go to Step 10.
10.	Set Current Day of the Week Set to Desired Day:D1 = Sun, D2 = Mon, D3 = Tue, D4 = Wed, D5 = Thurs, D6 = Fri, D7 = Sat	Set the current day of the week using the UP or DOWN buttons. Select D1, D2, D3, etc. for that particular day. Press Extra Cycle button to go to Step 11.
11.	Set day to Regen Regen Days of Week,	Set the day for regeneration using the UP or DOWN buttons. Select On or Off for that particular day. Press Extra Cycle button to return to service.

Table 7.2.2 Filters Fleck 2850 SXT

Programming		
Step	**Description**	
DO	Adjusting the time of day – Entering the master programming mode	Adjust the displayed time with the UP or DOWN buttons. For programming, set time to 12:01P.M.
DO	Setting the desired time of day - Entering the master programming mode	When the desired time is set, press the Extra Cycle button to exit setting time of day.
1.	Display Format (DF)	Choose GAL holding down the UP and DOWN buttons together. Once the display flashes, choose the GAL setting using the UP or DOWN buttons. Press the Extra Cycle button to go to Step 2.
2.	Valve Type (VT)	Choose Fltr (filter) using the UP or DOWN buttons. Press the Extra Cycle button to go to Step 3.
3.	Control Type (CT)	Choose dAY (Day of Week) using the UP or DOWN buttons. Press the Extra Cycle button to go to Step 4.
4.	Number of Tanks (NT)	Choose 1 using the UP or DOWN buttons. Press the Extra Cycle button to go to Step 5.
5.	Regen Time (RT)	Choose time for regen using the UP or DOWN buttons. Press Extra Cycle button to go to Step 6.
6.	Select Time for Backwash (BW) - Reference manual table	Choose time for Backwash using the UP or DOWN buttons. Press Extra Cycle button to go to Step 7.
7.	Select Time for Rinse (RR) - Reference manual table	Choose time for Rinse using the UP or DOWN buttons. Press Extra Cycle button to go to Step 8.
8.	Set Current Day of the Week Set to Desired Day:D1 = Sun, D2 = Mon, D3 = Tue, D4 = Wed, D5 = Thurs, D6 = Fri, D7 = Sat	Set the current day of the week using the UP or DOWN buttons. Select D1, D2, D3, etc. for that particular day. Press Extra Cycle button to go to Step 9.
9.	Set day to Regen Regen Days of Week,	Set the day for regeneration using the UP or DOWN buttons. Select On or Off for that particular day. Press Extra Cycle button to return to service.

7.3 AmeriWater Programming Tables For Dialysis Fleck 2850SXT

Table 7.4.1 Water Softener Fleck 2850 SXT

Medical Model Number		**0095012**	**0095013**	**0095014**	**0095015**	**0095016**	**0095017**	**0095018**
Tank Size (Dia x Height)		14 x 65	16 x 65	18 x 65	21 x 62	24 x 65	24 x 72	30 x 72
Cubic Feet Resin		3	4	5	7	9	10	14
Injector Size		#3	#4	#4	#4	#4	#4	#6
Refill Flow Control		2.0	2.0	2.0	2.0	2.0	2.0	2.0
Backwash Flow Control		7.0	8.0	10.0	12.0	20.0	20.0	25.0
Programming								
Step	**Description**							
DF	DISPLAY FORMAT US/Metric	GAL	GAL	GAL	GAL	GAL	GAL	GAL
VT	VALVE TYPE STANDARD DOWNFLOW DOUBLE BACKWASH	dF1b	dF1b	dF1b	dF1b	dF1b	dF1b	dF1b
CT	CONTROL TYPE Day of Week	dAY	dAY	dAY	dAY	dAY	dAY	dAY
RT	REGENERATION TIME Set Desired Time	_ _:_ _	_ _:_ _	_ _:_ _	_ _:_ _	_ _:_ _	_ _:_ _	_ _:_ _
Regeneration Cycles								
B1	1st Backwash	10MIN	10MIN	10MIN	10MIN	10MIN	10MIN	10MIN
BD	Brine Draw	60MIN	60MIN	60MIN	60MIN	60MIN	60MIN	60MIN
RR	Rapid Rinse	10MIN	10MIN	10MIN	10MIN	10MIN	10MIN	10MIN
BF	Brine Refill	9MIN	11MIN	14MIN	19MIN	24MIN	26MIN	37MIN
Regeneration Days of the Week Set Desired Days to Regenerate SET EACH DAY ON or OFF D1 = Sun, D2 = Mon, D3 = Tue, D4 = Wed, D5 = Thurs, D6 = Fri, D7 = Sat								
CD	Current Day of Week	SET	SET	SET	SET	SET	SET	SET
* 15 Lbs. per Cubic Foot.								

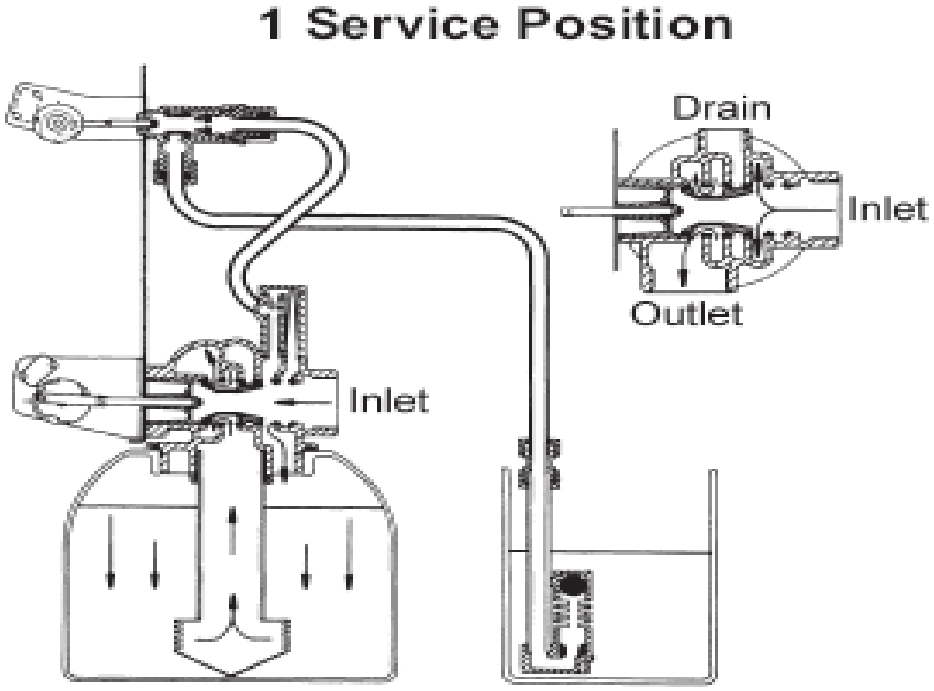
Table 7.4.2 Carbon Filter Fleck 2850 SXT

Medical Model Number		0095027	0095028	0095029	0095030	0095031	0095032
Tank Size (Dia x Height)		14 x 65	16 x 65	18 x 65	21 x 62	24 x 65	24 x 72
Cubic Feet Carbon		3	4	5	7	9	10
Backwash Flow Control		7	7	10	15	15	15
Programming							
Step	**Description**						
DF	DISPLAY FORMAT US/Metric	GAL	GAL	GAL	GAL	GAL	GAL
VT	VALVE TYPE STANDARD DOWNFLOW SINGLE BACKWASH	Fltr	Fltr	Fltr	Fltr	Fltr	Fltr
CT	CONTROL TYPE Time Clock	dAY	dAY	dAY	dAY	dAY	dAY
RT	REGENERATION TIME Set Desired Time	_ _:_ _	_ _:_ _	_ _:_ _	_ _:_ _	_ _:_ _	_ _:_ _
BW	1 Backwash	10MIN	10MIN	10MIN	10MIN	10MIN	10MIN
RR	2 Rinse	10MIN	10MIN	10MIN	10MIN	10MIN	10MIN
All Others = 0							
Regeneration Days of the Week Set Desired Days to Regenerate SET EACH DAY ON or OFF D1 = Sun, D2 = Mon, D3 = Tue, D4 = Wed, D5 = Thurs, D6 = Fri, D7 = Sat							
CD	Current Day of Week	SET	SET	SET	SET	SET	SET

Table 7.4.3 Multi-Media Fleck 2850 SXT

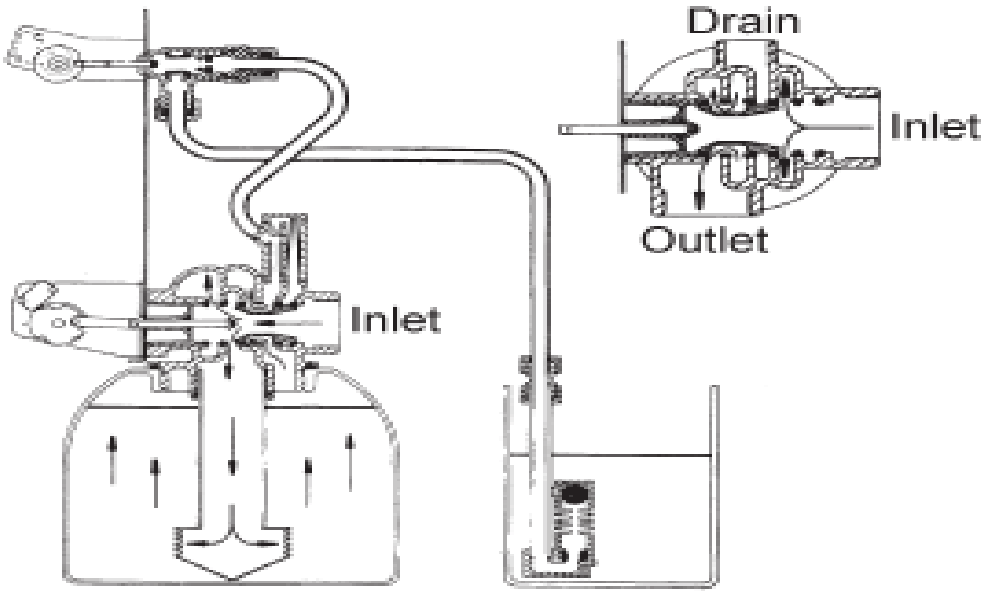
Medical Model Number		0095042	0095043	0095044	0095045	0095046
Tank Size (Dia x Height)		14 x 65	16 x 65	18 x 65	21 x 62	24 x 65
Cubic Feet Anthracite		1	2	2	3	4
Cubic Feet Garnet		0.40	0.40	1.2	1.2	2
Cubic Feet Sand #00		1	1.5	1.75	2.75	3
Backwash Flow Control		10	15	15	25	30
Programming						
Step	**Description**					
DF	DISPLAY FORMAT US/Metric	GAL	GAL	GAL	GAL	GAL
VT	VALVE TYPE STANDARD DOWNFLOW SINGLE BACKWASH	Fltr	Fltr	Fltr	Fltr	Fltr
CT	CONTROL TYPE Time Clock	dAY	dAY	dAY	dAY	dAY
RT	REGENERATION TIME Set Desired Time	_ _:_ _	_ _:_ _	_ _:_ _	_ _:_ _	_ _:_ _
BW	1 Backwash	10MIN	10MIN	10MIN	10MIN	10MIN
RR	2 Rinse	10MIN	10MIN	10MIN	10MIN	10MIN
All Others = 0						
Regeneration Days of the Week Set Desired Days to Regenerate SET EACH DAY ON or OFF D1 = Sun, D2 = Mon, D3 = Tue, D4 = Wed, D5 = Thurs, D6 = Fri, D7 = Sat						
CD	Current Day of Week	SET	SET	SET	SET	SET

8.0 Fleck 2850 Flow Diagrams



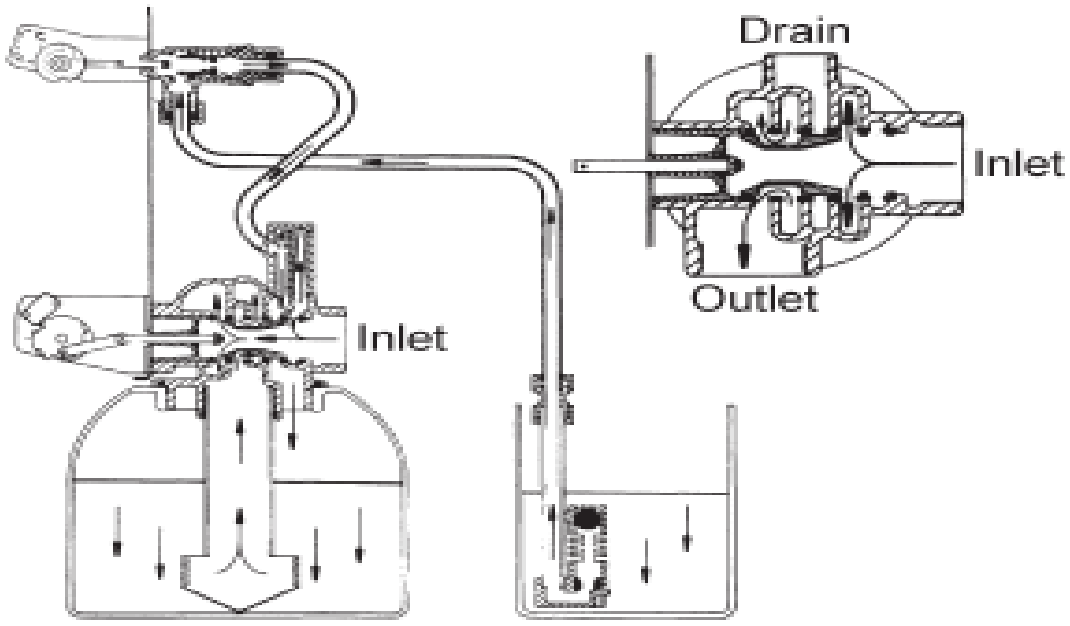
Hard water enters unit at valve inlet and flows down through the mineral in the mineral tank. Conditioned water enters center tube through the bottom distributor, then flows up through the center tube, around the piston, and out the outlet of the valve.

Figure 4.1 In Service Position



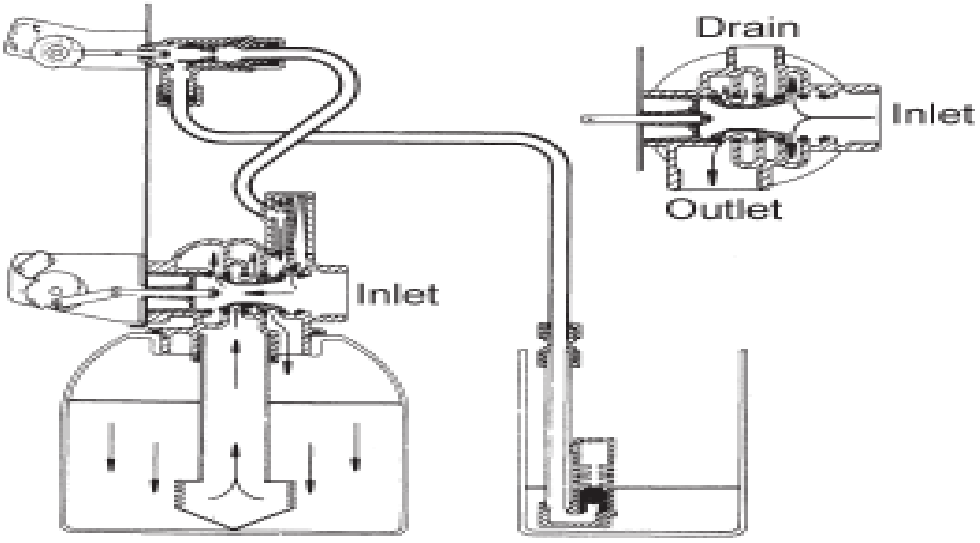
Hard water enters unit at valve inlet, flows through piston, down center tube, through bottom distributor, and up through the mineral, around the piston and out the drain line.

Figure 4.2 Backwash Position



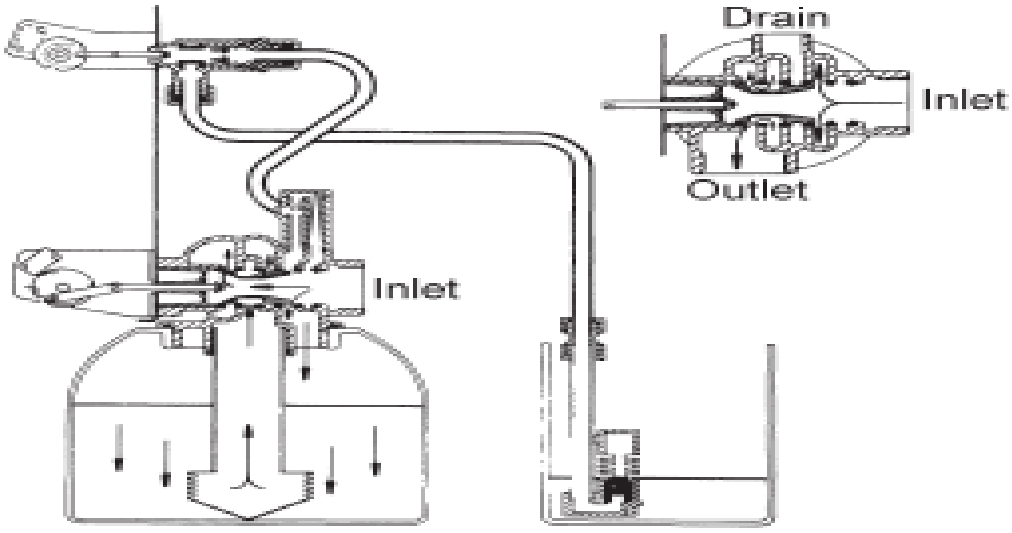
Hard water enters unit at valve inlet, flows up into injector housing and down through nozzle and throat to draw brine from the brine tank, brine flows down through mineral and enters the center tube through bottom distributor and out through the drain line.

Figure 4.3 Brine Position



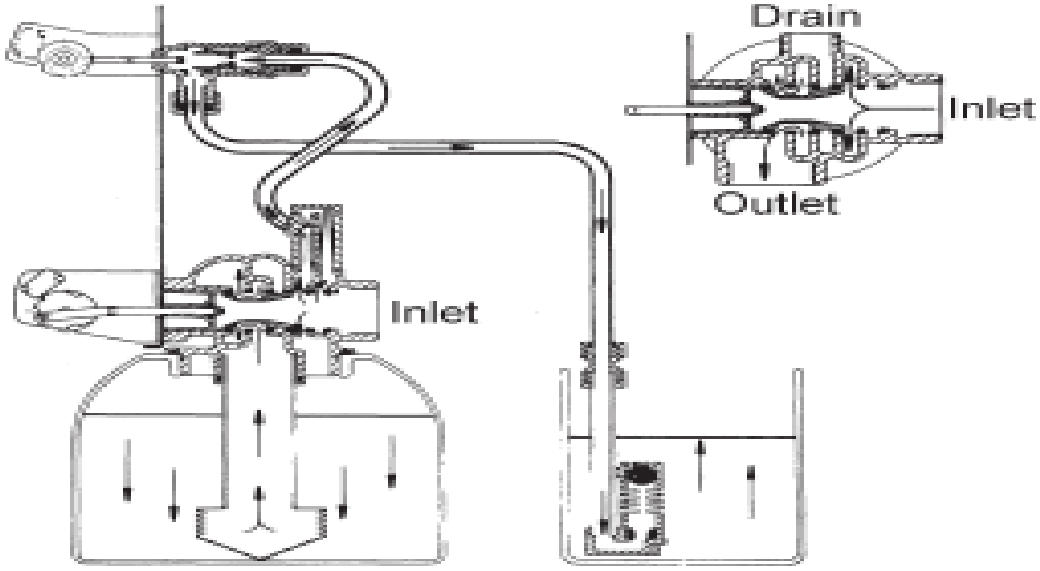
Hard water enters unit at valve inlet, flows up into injector housing and down through nozzle and throat, around the piston, down through mineral, enters center tube through bottom distributor, flows up through center tube, around piston and out through drain line.

Figure 4.4 Slow Rinse Position



Hard water enters unit at valve inlet, flows directly from inlet down through mineral into center tube bottom distributor and up through center tube, around piston and out through the drain line.

Figure 4.5 Rapid Rinse Position



Hard water enters unit at valve inlet, flows up through the injector housing, through the brine valve to refill the brine tank.

Figure 4.6 Brine Tank Refill Position

9.0 Troubleshooting

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

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

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.
UD	Upper Drive Sync	Power failure install programming change	Valve will automatically recover.

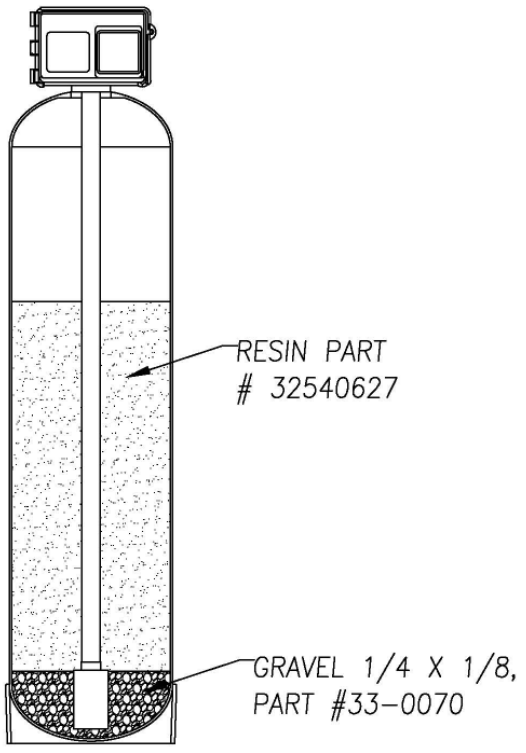
10.0 Maintenance

10.1 Loading Diagrams

MEDIA LOADING WATER SOFTENERS

NOTE: ALL TANKS ARE FIELD LOADED

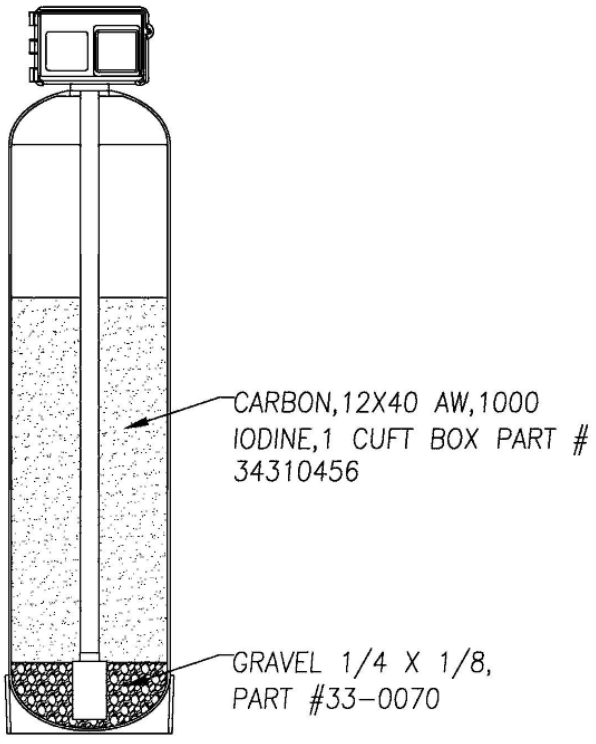
PART #	DESCRIPTION	GRAVEL 1/4 X 1/8 (33-0070)	SOFTENER RESIN(32540627)
0095012	SOFTENER ASSY,14X65 TANK,FLECK 2850,MEDICAL	1 BAGS	3 BAGS
0095013	SOFTENER ASSY,16X65 TANK,FLECK 2850,MEDICAL	1 BAGS	4 BAGS
0095014	SOFTENER ASSY,18X65 TANK,FLECK 2850,MEDICAL	1 BAGS	5 BAGS
0095015	SOFTENER ASSY,21x62 TANK,FLECK 2850,MEDICAL	2 BAGS	7 BAGS
0095016	SOFTENER ASSY,24X65 TANK,FLECK 2850,MEDICAL	2 BAGS	9 BAGS
0095017	SOFTENER ASSY,24X72 TANK,FLECK 2850,MEDICAL	2 BAGS	10 BAGS
0095018	SOFTENER ASSY,30X72 TANK,FLECK 2850,MEDICAL	6 BAGS	15 BAGS



MEDIA LOADING CARBON FILTERS

NOTE: ALL TANKS ARE FIELD LOADED

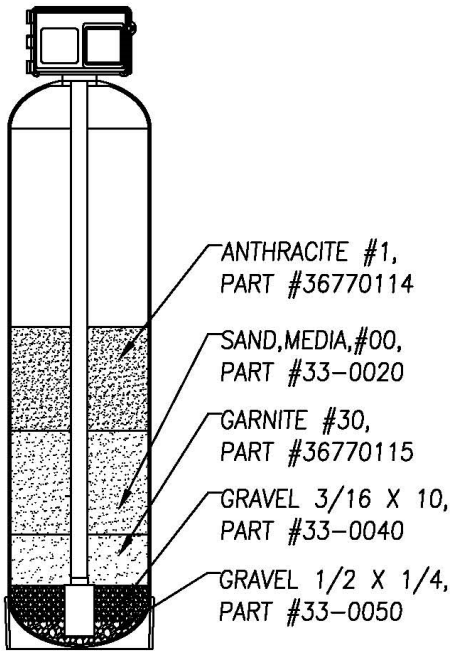
PART #	DESCRIPTION	GRAVEL 1/4 X 1/8 (33-0070)	CARBON,12X40 AW,1000 IODINE, 1 CUFT BOX (34310456)
0095027	FILTER ASSY,CARBON,14X65,FLECK 2850	1 BAGS	3 BAGS
0095028	FILTER ASSY,CARBON,16X65,FLECK 2850	1 BAGS	4 BAGS
0095029	FILTER ASSY,CARBON,18X65,FLECK 2850	1 BAGS	5 BAGS
0095030	FILTER ASSY,CARBON,21X62,FLECK 2850	2 BAGS	7 BAGS
0095031	FILTER ASSY,CARBON,24X65,FLECK 2850	2 BAGS	9 BAGS
0095032	FILTER ASSY,CARBON,24X72,FLECK 2850	2 BAGS	10 BAGS



MEDIA LOADING MULTIMEDIA FILTERS

NOTE: ALL TANKS ARE FIELD LOADED

MODEL	DESCRIPTION	ANTHRACITE (36770114)	SAND (33-0020)	GARNITE (36770115)	GRAVEL (33-0040)	GRAVEL (33-0050)
0095042	FILTER ASSY,MULTIMEDIA,14X65,FLECK 2850	1.00 CU FT	1.00 CU FT	0.2 CU FT	0.25 CU FT	0.5 CU FT
0095043	FILTER ASSY,MULTIMEDIA,16X65,FLECK 2850	1.50 CU FT	1.50 CU FT	0.3 CU FT	0.5 CU FT	0.5 CU FT
0095044	FILTER ASSY,MULTIMEDIA,18X65,FLECK 2850	1.75 CU FT	1.75 CU FT	0.30 CU FT	0.5 CU FT	0.75 CU FT
0095045	FILTER ASSY,MULTIMEDIA,21X62,FLECK 2850	2.50 CU FT	2.50 CU FT	0.5 CU FT	0.75 CU FT	1.00 CU FT
0095046	FILTER ASSY,MULTIMEDIA,24X65,FLECK 2850	3.00 CU FT	3.00 CU FT	0.6 CU FT	0.75 CU FT	1.25 CU FT



10.2 Media Specifications

Multimedia Filters

AmeriWater Part #	Media Type	Specification
33-0050	Gravel	1/2 x 1/4 Gravel
33-0040	Gravel	3/16 x 10 Gravel
36770115	Garnite	#30 Garnite
33-0020	Sand	#00 Sand
36770114	Anthracite	#1, 0.60 - 0.80MM Anthracite

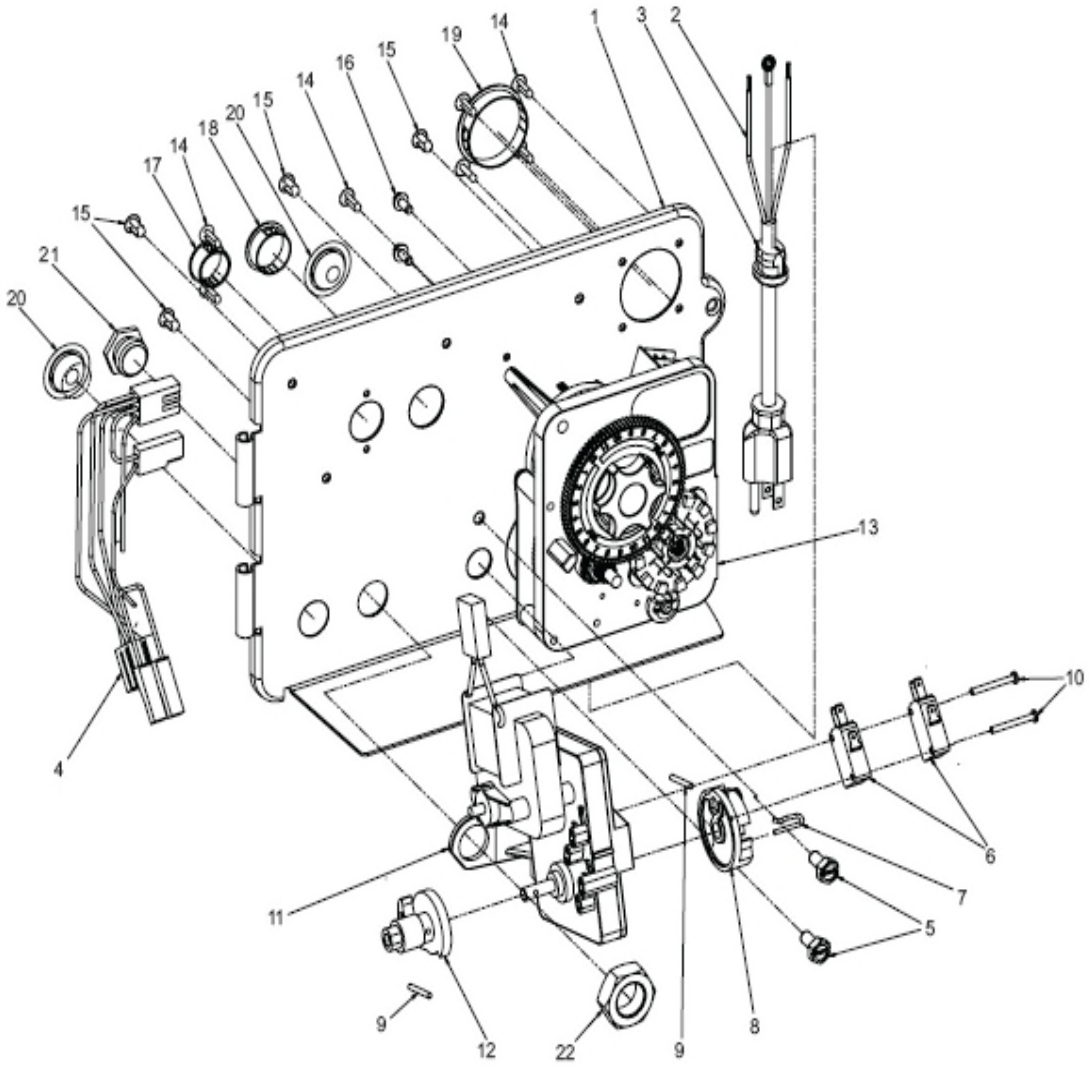
Carbon Filters

AmeriWater Part #	Media Type	Specification
33-0070	Gravel	1/4 x 1/8 Gravel
34310456	Carbon	12 x 40 Mesh, Acid Washed, Granular Activated, Coal Based, Iodine Number $\geq$ 1000

Softeners

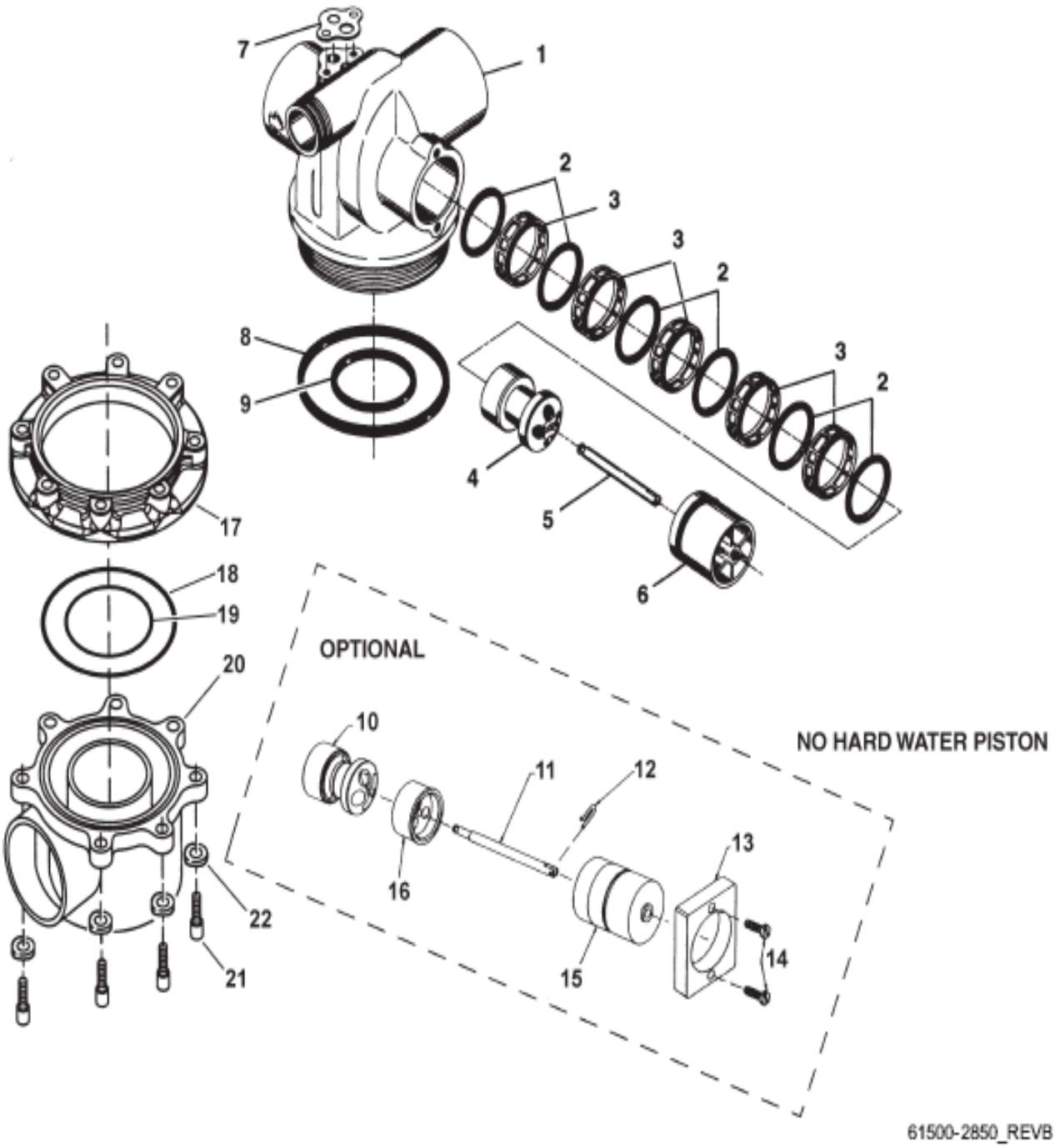
33-0070	Gravel	1/4 x 1/8 Gravel
32540627	Softener Resin	Sodium form standard crosslinked gel strong acid cation resin, 16 – 50 mesh, capacity > 1.7 meq/mL (Na Form), water retention 40 - 52% (Na Form), 90% Minimum Sphericity.

10.3 Environmental Power Head Assembly



Item No.	Quantity	Part No.	Description
1	1	18697-13	Backplate, Hinged
2	1	11838	Power Cord, 6’ Fleck
3	1	13547	Strain Relief, Cord
4	1	40400	Harness, Drive, Designer/Enviromental
5	2	10231	Scrw, Slot Hex, 1/4-20 x 1/2
6	2	10218	Switch, Micro
7	1	10909	Pin, Connecting Rod Spring
8	1	60160-15	Drive Cam Assy, STF, Blue, 2900
9	2	10338	Pin, Roll, 3/32 x 7/8
10	2	14923	Screw, Pan HD Mach, 4-40 x 1
11	1	41543	Motor, Drive, 115V/60HZ
12	1	12777	Cam, Shut-off Valve
13	1	61502-3200	Timer Assy, 3200 Clock(NOT WITH SXT CONTROLLER!) See Section 10.4 for SXT parts list.
14	7	19800	Plug (Hole Size: Dia .140)
15	4	19801	Plug, Dia .190
16	2	10300	Screw, Hx Wash Head, 8 x 3/8
17	1	15806	Hole Plug, Heyco
18	1	16493	Plug, Hole, Heyco, .88 Dia
19	1	40306	Plug, 1.50 Hole, Dome, Heyco
20	2	19691	Plug, .750 Dia. Hole, Flush
21	1	10712	Fitting, Brine Valve
22	1	10269	Nut, Jam, 3/4-16

10.4 Valve Assembly

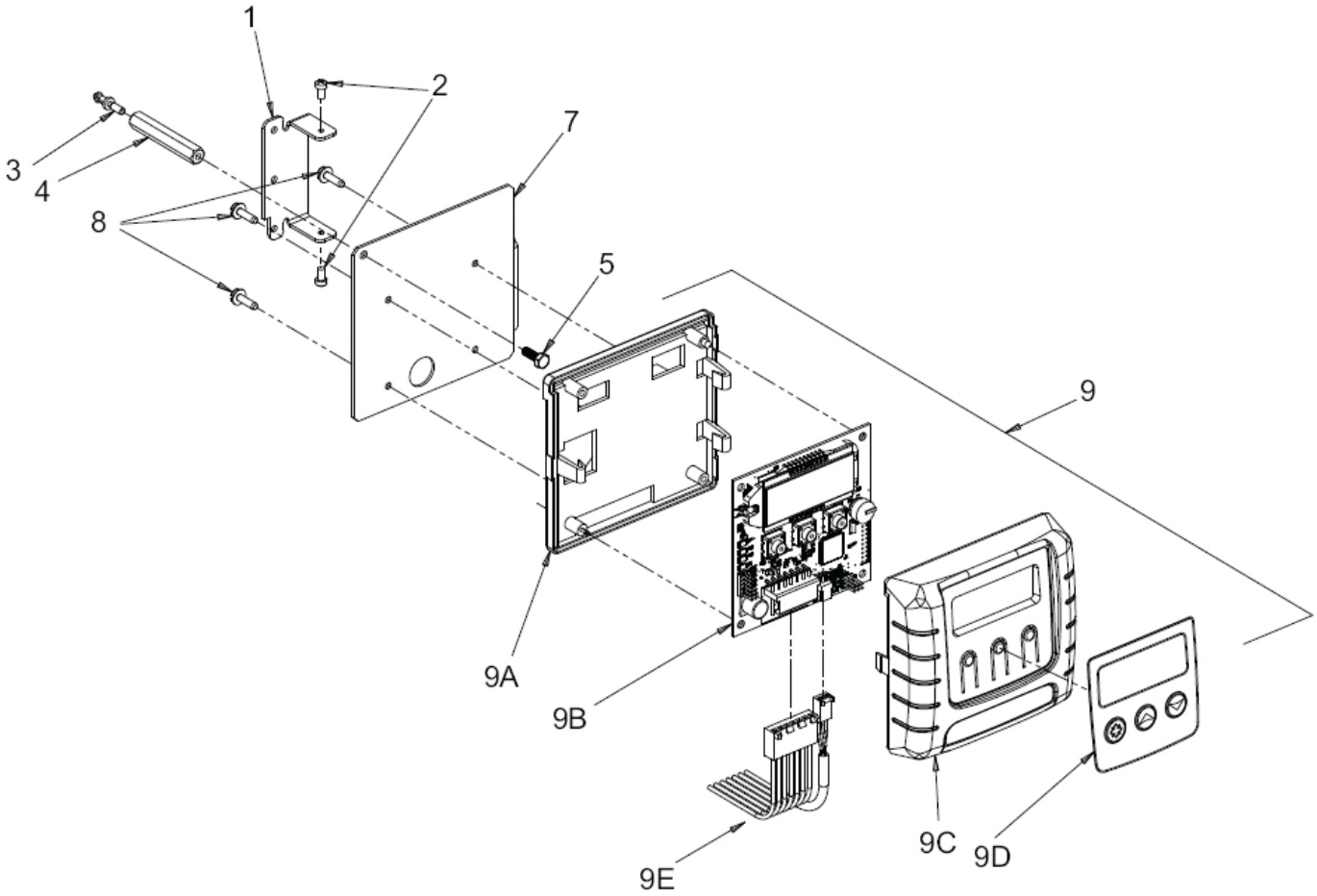


Valve Assembly Parts List

Item No.	Quantity	Part No.	Description
1	1	16250-01	Valve Body, 2850, Machd
2	6	16101	Seal, 2850
3	5	16638	Spacer, 9500/2850
4	1	16092	Piston, 2850
5	1	16436	Piston, 2850
6	1	16395	End Plug Assy, 2850
16395-01			End Plug Assy, 2850, Hot Water
7	1	14805	Gasket, Injector Body, 1600/1700
8	1	16455	O-ring, -347
*9	1	13577	O-ring, -226
10	1	19606	Piston, 2850, NHWBP
11	1	19300	Rod, Piston, 2850
12	1	10909	Pin, Link
13	1	19339	Spacer, 2850, NHWBP
14	2	13386	Screw, Hex Hd Mach, 1/4 - 20x1
15	1	16395-02	End Plug Assy/2850, NHWBP
16	1	19298-01	Piston Assy, 2850, NHWBP, O-ring
Not Shown	1	60366-xx	DLFC 1” NPT (not shown) - specify size
Not Shown	1	17996	Disperser, Air, Injector
Not Shown	1	19608-15	Disperser, Commercial 1 1/2” 2850/2900/9500
Optional Side Mount:			
17	1	40316	Adapter, Sidemount
18	1	40368	O-ring, -160, Sidemount, Flange
19	1	40372	O-ring, -142
20	1	40310	Base, 2850/2900/3930, Rotating
21	7	19768	Screw, Hex Hd, 3/8-16x1, Cap 18-8
22	7	40375	Washer, Flat, 3/8, Type A, N-SERS

*** Do not use O-ring if control is side mounted.**

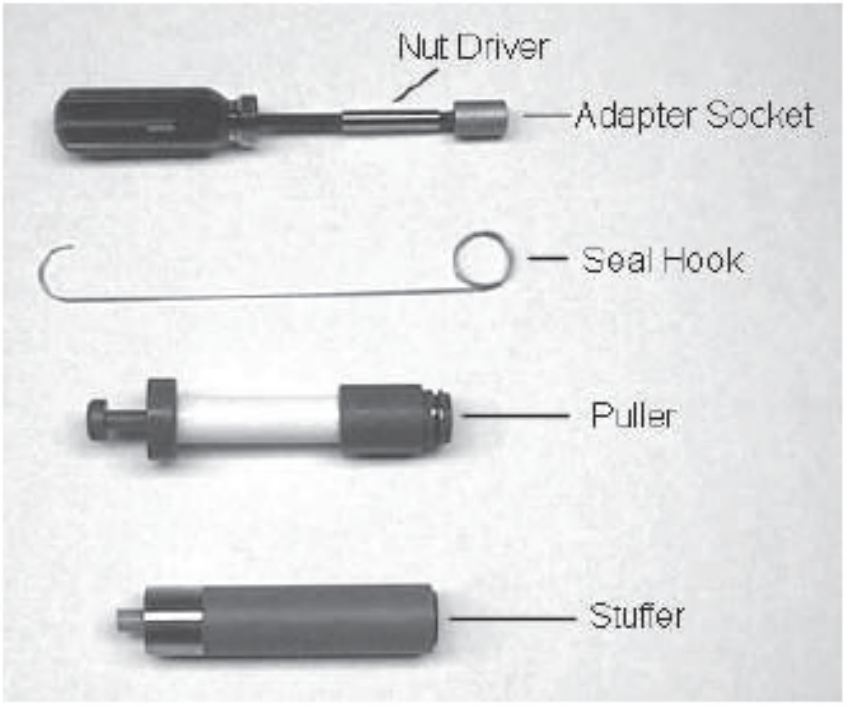
10.5 2850SXT Timer Assembly



2850SXT Timer Assembly Parts List

Item No.	Quantity	Part No.	Description
1	1	13881	Bracket, Hinge Timer
3	1	14265	Clip, Spring
4	1	27172	Stand-off, Timer, 2510SXT, 2750SXT
5	1	21363	Screw, Hex HD, M4 X 12 MM
7	1	27168	Bracket, Timer, 2510SE/2750SXT
8	3	13296	Screw, Hex Washer, 6-20 X 1/2
9	1	42778	Timer, SXT, 2510/2750, DF
9A	1	19889	Housing, Circuit Board
9B	1	42196	Circuit Board, SXT
9C	1	42635-01	Cover, Front, SXT, Square
9D	1	42637	Label, Display, SXT
9E	1	42864	Wire Harness, SXT

10.6 Seal & Spacer Tools & Replacement Parts



Tools Used in the Seal and Spacer Replacement

Seal & Spacer Tools & Replacement Parts List

Description Part No.

Nut Driver 12664
Socket Adapter 16906
Socket 7/16” 12665
Seal Hook 12874
Puller 13061, 1500/2510/5600/4650
.....17623, 2850/9500
.....12682, 2900/3180
Stuffer 11098, 1500/2510/2750
.....12763, 5600/9000/9100/4650
.....12683, 2100/3150
.....16516, 2850/9500

10.7 Seal & Spacer Replacement

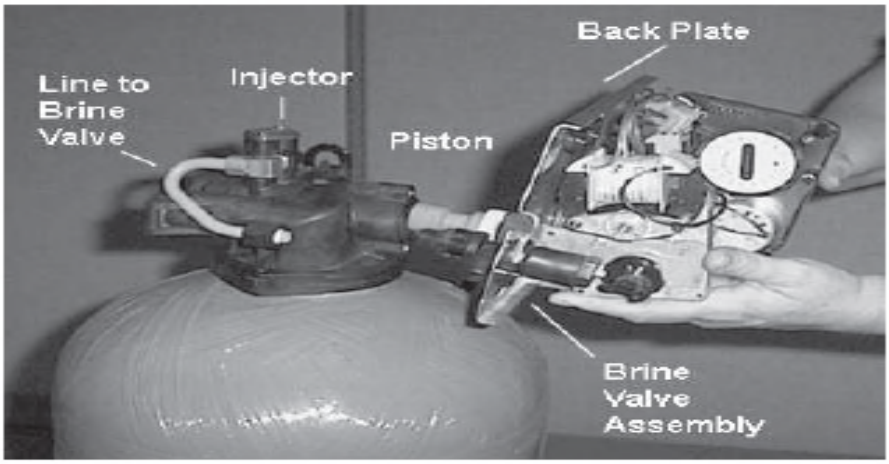


Figure 5

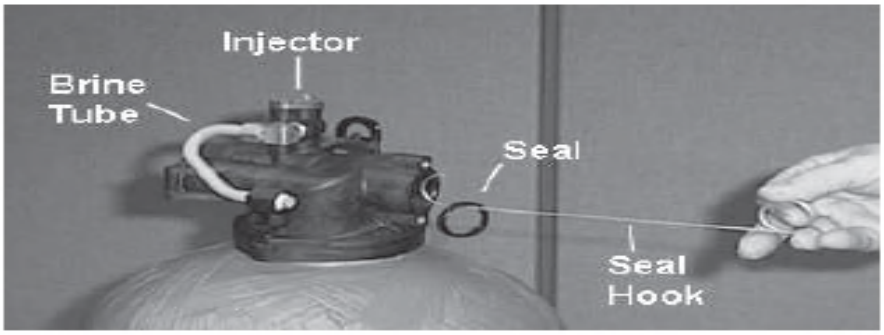


Figure 6

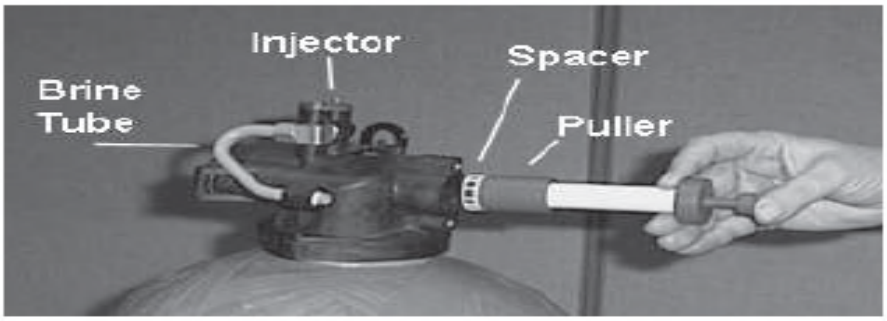


Figure 7

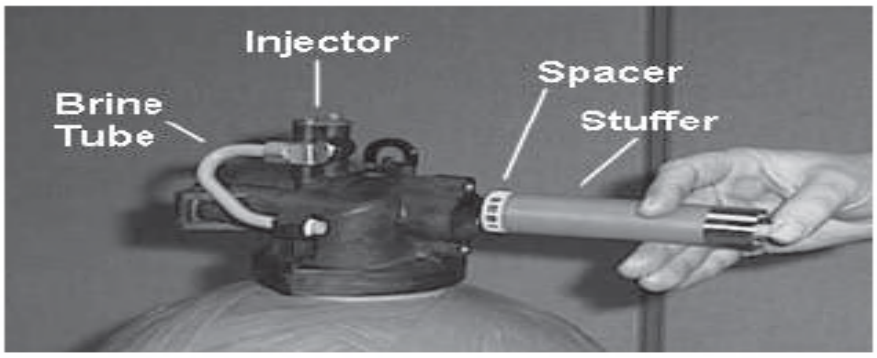


Figure 8

NOTE: Photos shown are for reference only for replacing the seal and spacer. Actual valve may be different.

1. Turn off water supply to valve. Next, cycle valve to backwash position, then to service. Now remove electrical plug from outlet, and cover from the control box.

2. Disconnect brine line from injector housing to brine valve (if unit has timed brine tank fill).

3. Remove the two capscrews that hold the back plate to the valve.

4. Grasp the back plate on both sides and slowly pull end plug and piston assembly out of the valve body (see Figure 5) and lay aside.

5. Remove the seal first using the wire hook with the finger loop (see Figure 6).

6. The spacer tool (use only for removing the spacers) has three retractable pins, retained by a rubber ring, at one end. They are retracted or pushed out by pulling or pushing the center button the opposite end.

7. Insert the pin end of the spacer tool into the valve body with the pins retracted (button pulled back). Push the tool tight against the spacer and push the button in, (seeFigure 7). When the button is pushed in, the pins are pushed out to engage the 1/4 dia. holes in the spacer. Remove the tool from the valve body. The spacer will be on the end. Pull the center button back, the pins will be retracted and the spacer can be removed from the spacer tool.

8. Alternately remove remaining seals and spacers in accordance with steps 5 and 7.

9. The last or end spacer does not have any holes for the pins of the spacer tool to engage, therefore if the end spacer does not come out on the first try, try again using the wire hook with the finger loop.

10. To replace seals, spacers and end ring, use special tool with the brass sleeve on one end. This is a double-purpose tool (see Figure 8). The male end acts as a pilot to hold the spacers as they are pushed into the valve body and the brass female end is used to insert the seals into the valve body.

11. To restuff a valve body, first take the end ring (the plastic or brass ring without holes), then with your thumb press the button on the brass sleeve end. The large dia. inner portion is now exposed (see Figure 8). Place the end ring on this pilot with the lip on the end ring facing the tool. Push the tool into the valve body bore until it bottoms. While the tool is in the valve body, take a seal and press it into the inside diameter of the exposed brass female end.

12. Remove the tool, turn it end for end and insert it into the valve body bore. While holding the large dia. of the tool, slide it all the way into the valve body bore until it bottoms. Then push the center button to push the seal of the tool and leave it in place in the valve body.

13. Remove tool from valve body and push center on brass female end to expose the pilot on opposite end. Place a spacer on this end and insert the spacer and tool into the valve.

10.8 Service Bypass and Pre-Treatment Lockout

1. The multimedia filter may be bypassed for service by opening the bypass valve and closing the inlet and outlet valves on the bypass header, see figure 10.1.

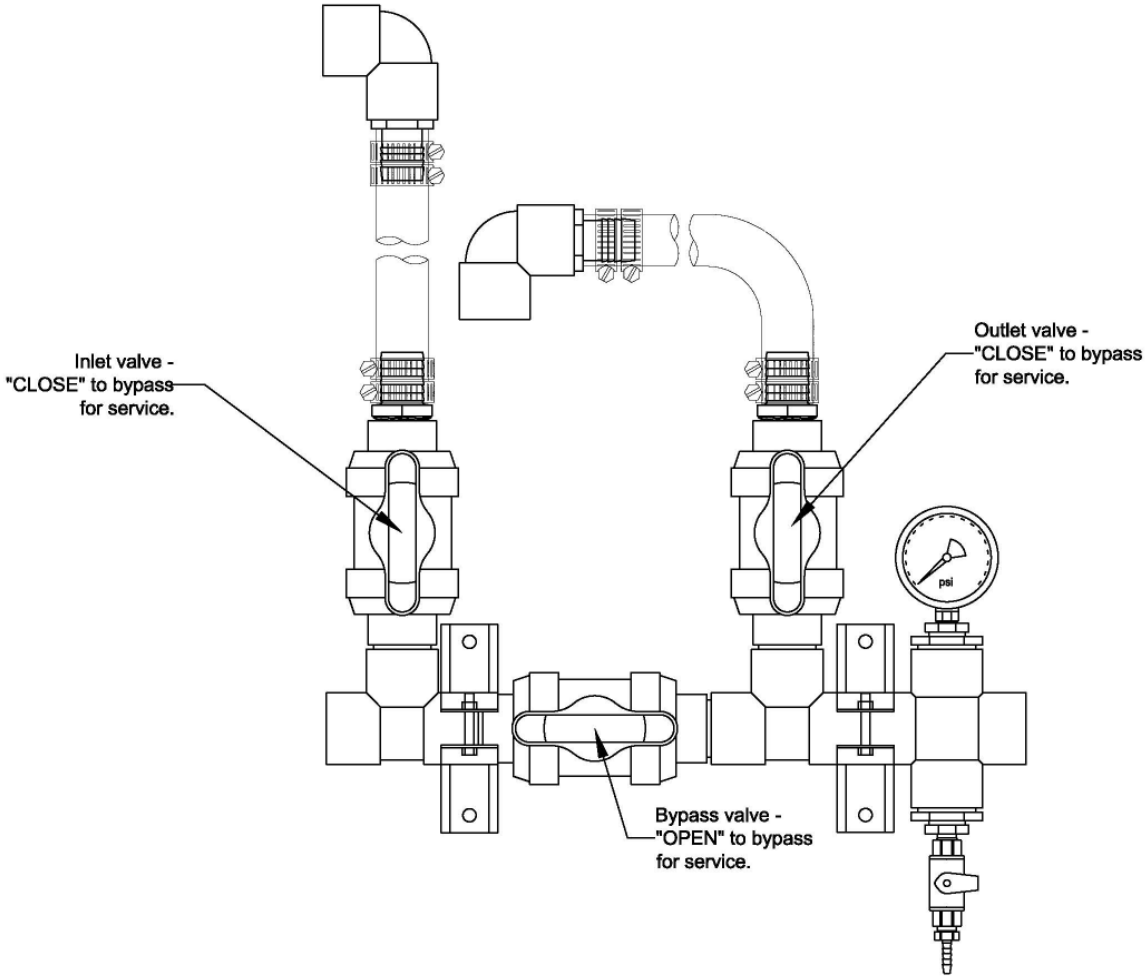


Figure 10.1

Pretreatment Lockout Diagrams

⚠ WARNING

This product can expose you to chemicals such as vinyl chloride (used in the production of PVC) or Nickel (used in the production of stainless steel), that are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Dear Valued Customer,

California Proposition 65 (Prop 65) is the Safe Water and Toxic Enforcement Act of 1986. The State of California began enforcing amendments to California Prop 65 at the end of August 2018. Prop 65 requires manufacturers to provide a clear and reasonable warning to residents of California about chemicals used in products that they purchase that are included on the Prop 65 Chemical List. The chemicals included on the list are chemicals that are known to the State of California to cause cancer, birth defects, or other reproductive harm. One such chemical is Vinyl Chloride, a compound used to produce Polyvinyl Chloride (PVC). The AmeriWater system you have purchased may contain PVC or stainless steel parts.
While warnings are only required in the State of California, AmeriWater has initiated the use of Prop 65 labeling for all products to ensure compliance with California regulations. Please note that the above warning does not necessarily mean that the product that you have purchased is unsafe. Products that have been cleared for market by FDA have been determined to be safe and effective by the United States Food and Drug Administration. The warning is simply a requirement by the State of California. If you wish to obtain additional information, please visit: p65warnings.ca.gov. You may also contact your AmeriWater representative if you have any questions.

Thank you for your understanding and we look forward to continuing to serve you.