



SWEETWATER®

BEAD FILTER

MODELS: 165, 330, 495 AND 990



INSTALLATION AND USER'S GUIDE

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

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IMPORTANT WARNING AND SAFETY INSTRUCTIONS



Important Notice:

This guide provides installation and operation instructions for this product. Consult Pentair with any questions regarding this equipment.

Attention Installer: This guide contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/or operator of this equipment after installation or left on or near the filter.

Attention User: This manual contains important information that will help you in operating and maintaining this filter. Please retain it for future reference.

READ AND FOLLOW ALL INSTRUCTIONS SAVE THESE INSTRUCTIONS



This is the safety alert symbol. When you see this symbol on your system or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

DANGER

Warns about hazards that can cause death, serious personal injury, or major property damage if ignored.

WARNING

Warns about hazards that may cause death, serious personal injury, or major property damage if ignored.

CAUTION

Warns about hazards that may or can cause minor personal injury or property damage if ignored.

NOTE

Indicates special instructions not related to hazards.

Carefully read and follow all safety instructions in this manual and on equipment. Keep safety labels in good condition; replace if missing or damaged.

WARNING

Before installing this product, read and follow all warning notices and instructions which are included.

Failure to follow safety warnings and instructions can result in severe injury, death, or property damage. Call US: (877) 347-4788 - INT: (407) 886-3939 for additional free copies of these instructions.

Consumer Information and Safety

This filter is designed and manufactured to provide many years of safe and reliable service when installed, operated and maintained according to the information in this manual and the installation codes referred to in later sections. Throughout the manual, safety warnings and cautions are identified by the “” symbol. Be sure to read and comply with all of the warnings and cautions.

WARNING

Do not operate the filter until you have read and understand clearly all the operating instructions and warning messages for all equipment that is a part of the circulating system.

The following instructions are intended as a guide for initially operating the filter in a general installation, however each installation may have unique conditions where the starting procedure could be different. Failure to follow all operating instructions and warning messages can result in severe injury, death, or property damage.

WARNING

Do not permit children to use or operate this filter.

WARNING

FILTER OPERATES UNDER HIGH PRESSURE.

When any part of the circulating system, (e.g., clamp, pump, filter, valve(s), etc.), is serviced, air can enter the system and become pressurized. Pressurized air can cause the lid to separate which can result in severe injury, death, or property damage.



To avoid this potential hazard, follow these instructions:

1. Before repositioning valve(s) and before beginning the assembly, disassembly, or adjustment of the clamp or any other service of the circulating system: (A) Turn the pump **OFF** and **shut OFF** any automatic controls to ensure the system is NOT inadvertently started during the servicing; (B) open the manual air relief valve; (C) stand clear of the filter; (D) wait until all pressure is relieved.
2. Whenever installing the filter clamp **FOLLOW THE FILTER CLAMP INSTALLATION INSTRUCTIONS EXACTLY.**
3. Once service on the circulating system is complete **FOLLOW SYSTEM RESTART INSTRUCTIONS EXACTLY.**
4. Maintain circulation system properly. Replace worn or damaged parts immediately, (e.g., clamp, pressure gauge, valve(s), o-rings, etc).
5. Be sure that the filter is properly mounted and positioned according to instructions provided.

WARNING

Due to the potential risk that can be involved it is recommended that the pressure test be kept to the minimum time required by the local code. Do not allow people to work around the system when the circulation system is under pressure test. Post appropriate warning signs and establish a barrier around the pressurized equipment. If the equipment is located in an equipment room, lock the door and post a warning sign.



Never attempt to adjust any closures or lids or attempt to remove or tighten bolts when the system is pressurized. These actions can result in a separation or failure of system components. This instantaneous release of energy can cause components to be accelerated to high velocities and to travel far distances. These components could cause severe personal injury or death if they were to strike a person.

Never exceed the maximum operating pressure of the system components. Exceeding these limits could result in a component failing under pressure. This instantaneous release of energy can cause the closure to separate and could cause severe personal injury or death if they were to strike a person.

WARNING

Never exceed the maximum operating pressure of the system components. Exceeding these limits could result in a component failing under pressure. This instantaneous release of energy can cause the closure to separate and could cause severe personal injury or death if they were to strike a person.



WARNING

RISK OF ELECTRICAL SHOCK OR ELECTROCUTION. This filter must be installed by a qualified service professional in accordance with the current National Electrical Code and all applicable local codes and ordinances.



Always disconnect power to the equipment at the circuit breaker before servicing any of the equipment. Ensure that the disconnected circuit is locked out or properly tagged so that it cannot be switched on while you are working on the equipment. Failure to do so could result in serious injury or death to serviceman, equipment users or others due to electric shock. Position the filter and the air relief valve to safely direct water drainage and purged air or water. Water discharged from an improperly positioned filter or valve can create an electrical hazard that can cause severe personal injury as well as damage property.

IMPORTANT WARNING AND SAFETY INSTRUCTIONS

WARNING This filter is intended for use in aquaculture installations ONLY. Do not use with any type of swimming pool, hot tub, or spa.

DANGER **SERIOUS BODILY INJURY OR DEATH CAN RESULT IF THIS FILTER IS NOT INSTALLED AND USED CORRECTLY.**

DANGER **INSTALLERS, OPERATORS AND OWNERS MUST READ THESE WARNINGS AND ALL INSTRUCTIONS BEFORE USING THIS FILTER.**

DANGER **HAZARDOUS PRESSURE: STAND CLEAR OF PUMP AND FILTER DURING START UP**



Circulation systems operate under high pressure. When any part of the circulating system (i.e. locking ring, pump, filter, valves, etc.) is serviced, air can enter the system and become pressurized.

Pressurized air can cause the pump housing cover filter lid and valves to violently separate which can result in severe personal injury or death. Filter tank lid and strainer cover must be properly secured to prevent violent separation. Stand clear of all circulation system equipment when turning on or starting up pump.

Before servicing equipment, make note of the filter pressure. Be sure that all controls are set to ensure the system cannot inadvertently start during service. Turn off all power to the pump. **IMPORTANT: Place filter manual air relief valve in the open position and wait for all pressure in the system to be relieved.**

Before starting the system, fully open the manual air relief valve and place all system valves in the "open" position to allow water to flow freely from the tank and back to the tank. Stand clear of all equipment and start the pump.

IMPORTANT: Do not close filter manual air relief valve until all pressure has been discharged from the valve and a steady stream of water appears. Observe filter pressure gauge and be sure it is not higher than the pre-service condition.

For Installation of Electrical Controls at Equipment Pad (ON/OFF Switches, Timers and Automation Load Center)

CAUTION Install all electrical controls at equipment pad, such as on/off switches, timers, and control systems, etc. to allow the operation (startup, shut-down, or servicing) of any pump or filter so the user does not place any portion of his/her body over or near the pump strainer lid, filter lid or valve closures.



This installation should allow the user enough space to stand clear of the filter and pump during system start-up, shut down or servicing of the system filter.

General Installation Information

The following information should be read carefully since it outlines the proper manner of care and operation for your filter system.

You can expect maximum efficiency and life from your filtration system by following these instructions and taking the necessary preventative care.

- Have a trained professional perform all pressure tests.
- Do not connect the system to a high pressure or city water system.
- Trapped air in the system can create a hazardous condition. **BE SURE** to purge all air from the system before operating or testing equipment.
- **DO NOT** pressure test with compressed air!
- Piping must conform to local/state plumbing and sanitary codes.
- Support piping independently to prevent strains on filter or valve.
- Fittings restrict flow; for best efficiency, use the fewest possible fittings.
- A check valve installed ahead of the filter inlet will prevent contaminants from draining back into the system.
- A check valve installed between the filter and heater will prevent hot water from backing up into the filter and deforming the internal components.
- All wiring, grounding and bonding of associated equipment must meet current local and/or National Electrical Code standards.

Only a qualified plumbing professional should install this filter. Refer to the "Important Warning and Safety Instructions on pages ii-iii for installation and safety information.

SAVE THESE INSTRUCTIONS

INSTALLATION

Note: Before installing this product, read and follow all warning notices and instructions on pages ii-iii.



WARNING Only a qualified service person should install the filter. This filter is designed and intended for use in aquaculture installations ONLY. Do not use with any type of swimming pool, hot tub, or spa.

Introduction

The following general information describes how to install the Sweetwater® Bead Filter. This filter operates under pressure and if assembled improperly or operated with air in the water circulation system, the valve can separate from the filter and result in an accident causing property damage or serious bodily injury. Warning labels have been affixed to the control valve and vessel body and should not be removed. Keep safety labels in good condition and replace if missing or illegible.

How the Filter Works

Sweetwater up-flow bead filters are used for mechanical and biological filtration in recirculating aquaculture systems. A bed of floating plastic bead media catches solid debris in the water column as water flows up through the media.

Beneficial bacteria grow on the plastic beads, feeding on the ammonia produced by the fish being raised in the system tanks. These bacteria then turn the ammonia into nitrate, a much less toxic molecule for the fish. The bacteria colonies also provide a sticky layer on the bead media to help trap superfine solids suspended in the water column, adding an additional component to the mechanical filtration of the bead filter.

During backwash, the bead media is heavily agitated by blowing air into the filter vessel, allowing solids to be sloughed off the beads and then be rinsed away to waste. This action also serves to remove dead and excess bacteria from the bead media, preventing detrimental bacteria colonies from over-running the beneficial bacteria.

Table 1: General Filter Data

PART #	MODEL	Inlet/Outlet Size	Max. System Size (Gal/m ³)	Fish Supported (lbs/kg)	Media Capacity (ft ³)	Dimensions (diameter x height)	Recommended Flow Rate (GPM)
930080	Sweetwater 165	2" (1-1/2")	4,000/15.1	75/34	1.65	19" x 38"	40-60
930081	Sweetwater 330	2"	8,000/30.3	165/75	3.30	24" x 43"	75-100
930082	Sweetwater 495	2"	12,000/45.4	240/110	4.95	30" x 48"	90-110
930083	Sweetwater 990	2"	24,000/90.9	480/220	9.90	36" x 52"	100-125

Installing the Filter



WARNING Filters should never be tested or subjected to air or gas under pressure. All gases are compressible and under pressure create a danger. Severe bodily injury or property damage could occur if the filter is subjected to air or gas pressure.

Removing the Control Valve:

1. Depending on your model of Sweetwater® Bead Filter, there are two different valve clamps that can be included with the filter (see Figure 1 or Figure 2). The Sweetwater 165 and 330 include the clamp shown in Figure 1, while the Sweetwater 495 and 990 include the band clamp shown in Figure 2.
2. Follow the clamp installation and removal procedures covered in provided valve manual to install and remove the control valve.

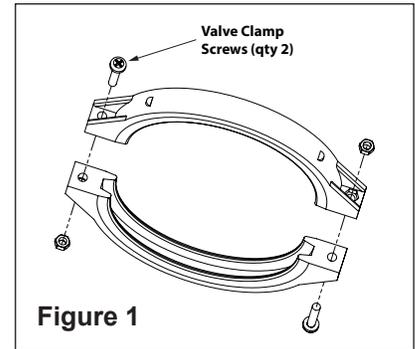


Figure 1

Plumbing the Filter (see Figure 3):

3. Plumb the line coming from the outlet of the pump into the port marked "PUMP" on the valve head.
4. Plumb the port marked "RETURN" to the downstream flow returning to the body of water.
5. Plumb the port marked "WASTE" to your waste management or treatment system.
6. The sludge drain valve can be found in the foot of the tank. Plumb the sludge drain valve to your waste management or treatment system.

Note: It is recommended that clear tubing/piping be used for the sludge drain connection.

Filling the Tank with Media:

Note: The filter should be installed and plumbed in its final position before adding any media.

7. Fill the filter 30-50% full of water and introduce the appropriate amount of floating bead media, according to Table 2.
8. Place the valve head assembly on the tank vessel and tighten the valve clamps.

Note: Be sure to reinstall the stainless steel blower assembly support bar.



This filter operates under pressure. Air can enter the filter if the valve is not clamped correctly. This can cause the valve to separate from the filter, which could cause serious personal injury and/or property damage.

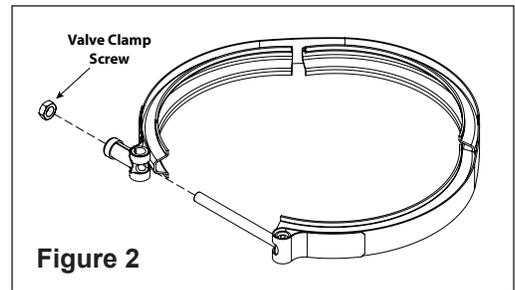


Figure 2

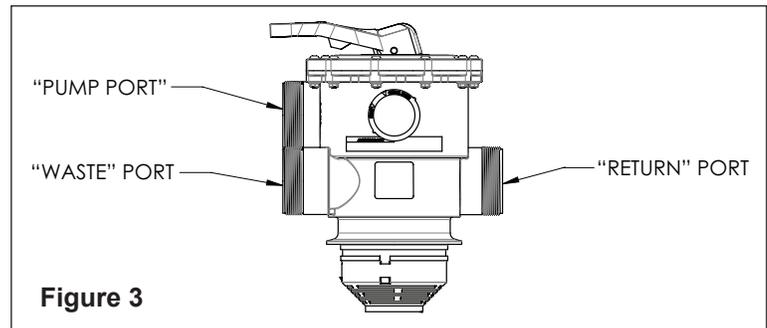


Figure 3

Table 2: Bead Media Capacity

Filter Part #	Model	Media Capacity (ft ³)
930080	Sweetwater 165	1.65
930081	Sweetwater 330	3.30
930082	Sweetwater 495	4.95
930083	Sweetwater 990	9.90

Electrical Connection:

9. Connect 115VAC, 60Hz power to the air blower.
10. The filter is now ready for operation. Continue to *Initial Start-up*, on next page.

Initial Start-up

1. Ensure the return line is open so that water is free to come from the body of water and flow out the return line.
2. Check pump strainer pot to be sure it is full of water.



WARNING Air entering an improperly installed filter can cause the valve to separate from the tank and could cause severe bodily injury and/or property damage.

3. Check the valve clamp on filter for tightness.
4. Set the control valve to the OPEN position. Stand clear of the filter and start the pump.

Note: Bead media is typically pre-washed and should not require extensive backwashing. However, the shipping process may cause excessive abrasion which could require an extended backwash cycle at initial start-up; continue to backwash until the backwash water is as clear as the body of water. See *Filter Backwash Procedure* on page 5 for backwash instructions.



CAUTION To prevent equipment damage and possible injury, always turn the pump off before changing the valve position.

5. Stop the pump once all air has been removed from the system and a steady stream of water appears. Set the valve to the FILTER position.
6. Ensure all suction and return lines are open so that water is free to come from the body of water and return to the body of water.
7. Stand clear of the filter and start the pump.
8. The filter has now started its filtering cycle. You should ensure that water is returning to the body of water and take note of the operating pressure when the filter is clean.

MAINTENANCE

This section describes how to maintain your Sweetwater® Bead Filter.

Filter Care

The filter is a very important part of the system equipment and installation. Proper care and maintenance will add many years of service. Follow these suggestions for long, trouble-free operation:

1. To clean the exterior of the filter of dust and dirt, wash with a mild detergent and water then hose off. Do not use solvents.
2. If internal maintenance is required, media may be removed by removing the drain from the bottom of the filter and flushing with a garden hose.
3. If after a number of years, the filter tank appears foggy in color or rough in texture, the tank surface can be painted. We recommend the use of a Quick Dry Spray Enamel. **DO NOT paint the valve.**



WARNING Always visually inspect filter components during normal servicing to ensure structural safety. Replace any item which is cracked, deformed or otherwise visually defective. Defective filter components can allow the filter top or attachments to separate and could cause severe bodily injury or property damage.

4. The control valve on your filter was manufactured with high quality corrosion resistant materials. This part should be carefully inspected whenever servicing your filter. If excessive leakage is noted coming from the valve/tank interface, the valve and o-ring should be carefully inspected and replaced if any signs of deterioration exist.
5. Your filter is a pressure vessel and should never be serviced while under pressure. Always relieve tank pressure and set the control valve to the OPEN position before attempting to service your filter.

Cleaning Frequency

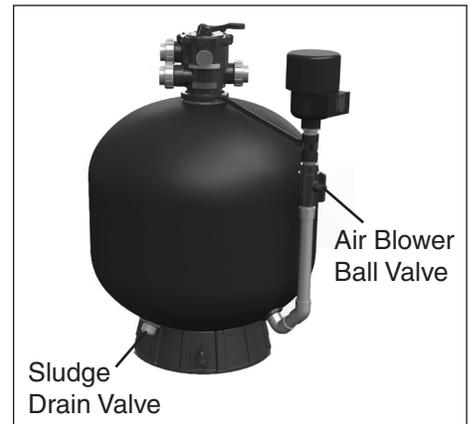
1. A newly installed filter should be backwashed and thoroughly cleaned before being placed into service. This will clean out packaging and/or construction debris.
2. The bead filter should be backwashed regularly to prevent build-up of solid debris, which promotes heterotrophic bacteria (non-beneficial) to grow and stifle the efficacy of the beneficial bacteria in the filter. It is recommended to backwash the filter approximately once per week, with exact frequency based upon pressure drop across the filter. The maximum pressure build-up is 10 PSI. This pressure build-up is when the filter gauge reading increases 10 PSI over the initial (clean filter) reading. This pressure build-up is largely based upon the amount of solids filtration the bead filter is performing.
3. It is important not to backwash the filter too frequently as each backwash disrupts the growth of beneficial bacterial colonies in the filter. Backwash the filter at regular intervals, depending on the pressure build-up in the filter, to maintain steady system performance.
4. The bead filter should be backwashed no less frequently than once every other week during system operation. This minimum backwash schedule is to break up the beneficial (and non-beneficial) bacterial growth on the bead media to eliminate any water flow channeling and to wash away dead bacteria that impede maximum filter efficiency.

Filter Backwash Procedure

⚠ WARNING To prevent equipment damage and possible injury, always turn the pump off before changing the valve position.

1. Stop the pump.
2. Ensure that the suction and return lines are open so that water is free to come from the body of water and flow out the return line. Set control valve to RECIRCULATE position.
3. Open the ball valve on the external air blower piping.
4. Turn on the air blower and allow the blower to agitate the bead media for one minute.
5. Turn off the blower and close the blower ball valve.
6. Set the control valve to the BACKWASH position and turn on the pump.
7. Allow the pump to run until the water exiting the waste port runs clear, or a minimum of one minute. Turn the pump off.
8. **For light-duty aquaculture:** You may return the filter to FILTER mode, and turn on the pump. With the pump running, slowly open the sludge drain valve and allow heavy solids that have collected in the bottom of the filter to drain to waste. Close the sludge drain when water runs clean, or after one minute.

Note: It is possible to drain bead media through the sludge drain. Be careful to not accidentally drain a significant quantity of media during this operation.
9. **For heavier-duty aquaculture:** Your system may benefit from an additional round of bead agitation and backwashing. Repeat steps 2-7 as needed.
10. The filter has now started its filtering cycle. You should ensure that water is returning to the body of water and take note of the filter pressure.



TROUBLESHOOTING

Use the following troubleshooting information to resolve possible problems with your Sweetwater® Bead Filter.

⚠ WARNING

THIS FILTER OPERATES UNDER HIGH PRESSURE



When any part of the circulating system, (e.g., closure, pump, filter, valve(s), etc.), is serviced, air can enter the system and become pressurized. Pressurized air can cause the valve to separate from the filter which can result in severe injury, death, or property damage. To avoid this potential hazard, follow these instructions:

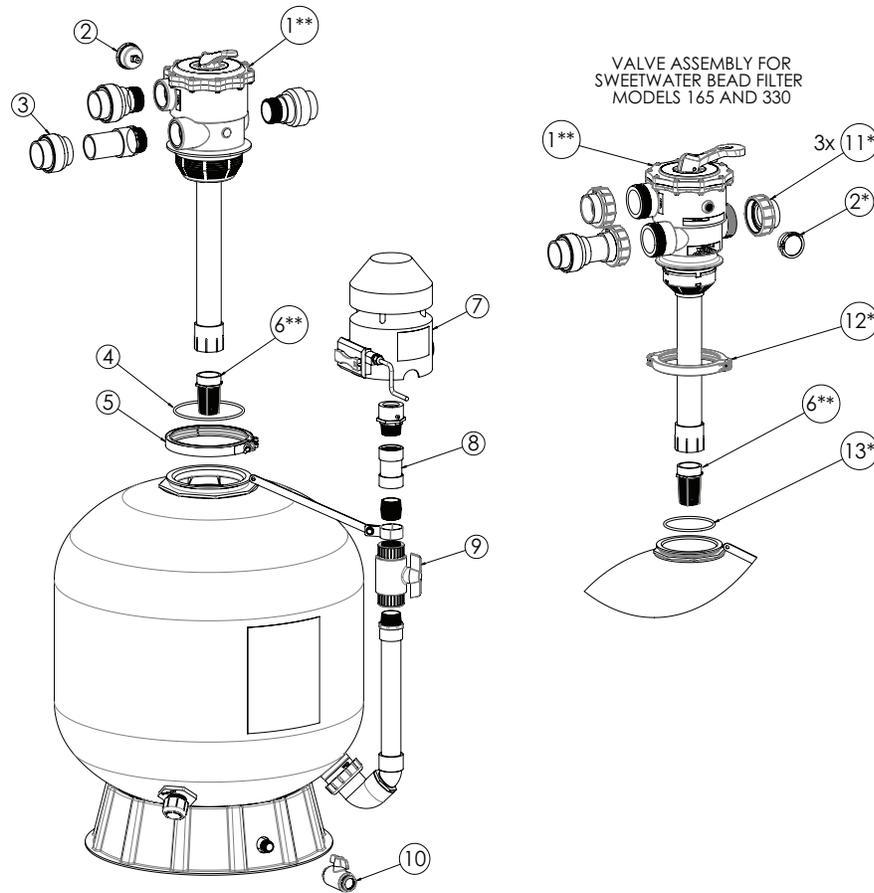
1. If you are not familiar with your filtration system and/or heater:
 - a. **Do NOT** attempt to adjust or service without consulting your dealer, or a qualified technician.
 - b. Read the entire Installation & User’s Guide before attempting to use, service or adjust the filtration system or heater.
2. Before repositioning valve(s) and before beginning the assembly, disassembly, or any other service of the circulating system: (A) Turn the pump **OFF** and **shut OFF** any automatic controls to ensure the system is NOT inadvertently started during the servicing; (B) set the control valve to the OPEN position; (C) wait until all pressure is relieved.
3. Whenever installing the filter valve **FOLLOW THE FILTER VALVE WARNINGS EXACTLY**.
4. Once service on the circulating system is complete **FOLLOW INITIAL START-UP INSTRUCTIONS EXACTLY**.
5. Maintain circulation system properly. Replace worn or damaged parts immediately, (e.g., closure, pressure gauge, valve(s), o-rings, etc).
6. Be sure that the filter is properly mounted and positioned according to instructions provided.

PROBLEM	CAUSE	REMEDY
Body of water not sufficiently clean	<ol style="list-style-type: none"> 1. Poor super-fines filtration 2. Inadequate turnover rate 3. Wrong media size 	<p>Reduce backwash frequency to allow bacterial colonies to develop fully.</p> <p>Increase flow rate (reduce restrictions, increase pumping capacity).</p> <p>Use only media matching that supplied with the filter. Replacement media available through Pentair.</p>
High filter pressure	<ol style="list-style-type: none"> 1. Insufficient backwashing 2. Media bed plugged 3. Partially closed valve 	<p>Backwash until effluent runs clear, may require additional backwash cycles.</p> <p>Remove valve head and physically agitate bead media to break up large clumps of media; backwash thoroughly.</p> <p>Open valve or remove obstruction in return line.</p>
Short cycles	<ol style="list-style-type: none"> 1. Improper backwash 2. Mechanical filtration load too high 3. Media bed plugged 4. Foreign growth inside filter 	<p>Backwash until effluent runs clear.</p> <p>Recommended addition of primary mechanical filter upstream of the bead filter.</p> <p>Remove valve head and physically agitate bead media to break up large clumps of media; backwash thoroughly.</p> <p>Remove bead media and chemically clean filter to eradicate growth. Clean bead media or replace with new media.</p>
Return flow to body of water diminished, low filter pressure	<ol style="list-style-type: none"> 1. Obstruction in pump strainer 2. Obstruction in pump 3. Obstruction in suction line of pump 	<p>Clean basket in pump strainer.</p> <p>Disassemble and clean pump.</p> <p>Remove obstruction in lines, open valves in suction line.</p>

Troubleshooting, (Cont.)

PROBLEM	CAUSE	REMEDY
Media returning to body of water	<ol style="list-style-type: none"> 1. Broken media strainer 2. Broken or damaged valve head screen 	<p>Replace broken or damaged strainer.</p> <p>Replace control valve head assembly.</p>
Media loss to waste	<ol style="list-style-type: none"> 1. Broken media strainer 2. Wrong Media Size 	<p>Replace broken or damaged strainer.</p> <p>Change to proper media.</p>
Leak at valve	<ol style="list-style-type: none"> 1. Improperly tightened valve clamp 2. Dirt or contamination on sealing surface 3. Damaged part 	<p>Shut off pump, relieve tank pressure, tighten valve clamp properly.</p> <p>Shut off pump, relieve tank pressure, remove valve and clean all sealing surfaces. Reassembly valve properly.</p> <p>Same as above except replace damaged o-ring, valve, tank, or any combination of parts as required.</p>
Poor water quality (high ammonia and/or nitrite)	<ol style="list-style-type: none"> 1. Insufficient beneficial bacteria 2. Insufficient bead media 3. High biological load 4. Excessive heterotrophic bacteria (detrimental) 	<p>Modify water chemistry to promote bacterial growth; Add bacterial booster (ProLine Baquaculture Bacteria Concentrate, or similar) to filter; reduce excessive backwash frequency (or increase frequency if backwash cycles are fewer than once every two weeks).</p> <p>Add bead media to replenish media to proper volume.</p> <p>Decrease fish load and/or feed rate, or supplement system with additional biological filtration.</p> <p>Noted by excessively slimy surfaces/bead media, increase backwash frequency and mechanical filtration load to inhibit growth of heterotrophic bacteria.</p>

REPLACEMENT PARTS



Item #	P/N	Description	Used On:			
			930080	930081	930082	930083
1	930138	Valve Head, Replacement for 930080	1	-	-	-
1	930139	Valve Head, Replacement for 930081	-	1	-	-
1	930140	Valve Head, Replacement for 930082	-	-	1	-
1	930141	Valve Head, Replacement for 930083	-	-	-	1
2*	190059-AQ	Pressure Gauge w/Indicator Bezel	1	1	1	1
3	457020S	Union, 2" Sch40 PVC, Soc X Soc	1	1	3	3
4	275333-AQ	O-Ring, Valve Body, 3/16"	-	-	1	1
5	152130-AQ	Clamp, Valve Head	-	-	1	1
6**	270561	Strainer, 2" Mipt	1	1	1	1
7	930135	Blower, 1HP 110V/60Hz	1	1	-	-
7	930137	Blower, 1.5HP 115V/60Hz	-	-	1	1
8	CV485	Check Valve, 1-1/2" w/ Spring	1	1	1	1
9	1071015	Ball Valve, 1-1/2" Threaded	1	1	1	1
10	1071007	Ball Valve, 3/4" Threaded	1	1	1	1
11*		2" Hybrid Valve Union Adapter Set	3	3	-	-
12*		2" Hybrid Valve Clamp Set	1	1	-	-
13*		2" Hybrid Valve Body O-Ring	1	1	-	-
*	272569-AQ	Hybrid Valve, Replacement Kit	1	1	-	-

Note (*): These items are included with Item #14 (P/N 272569-AQ). Item #2 (P/N 190059-AQ) is also available separately.

Note ()**: Item #6 is included with your filter's valve head, but can also be purchased separately.



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