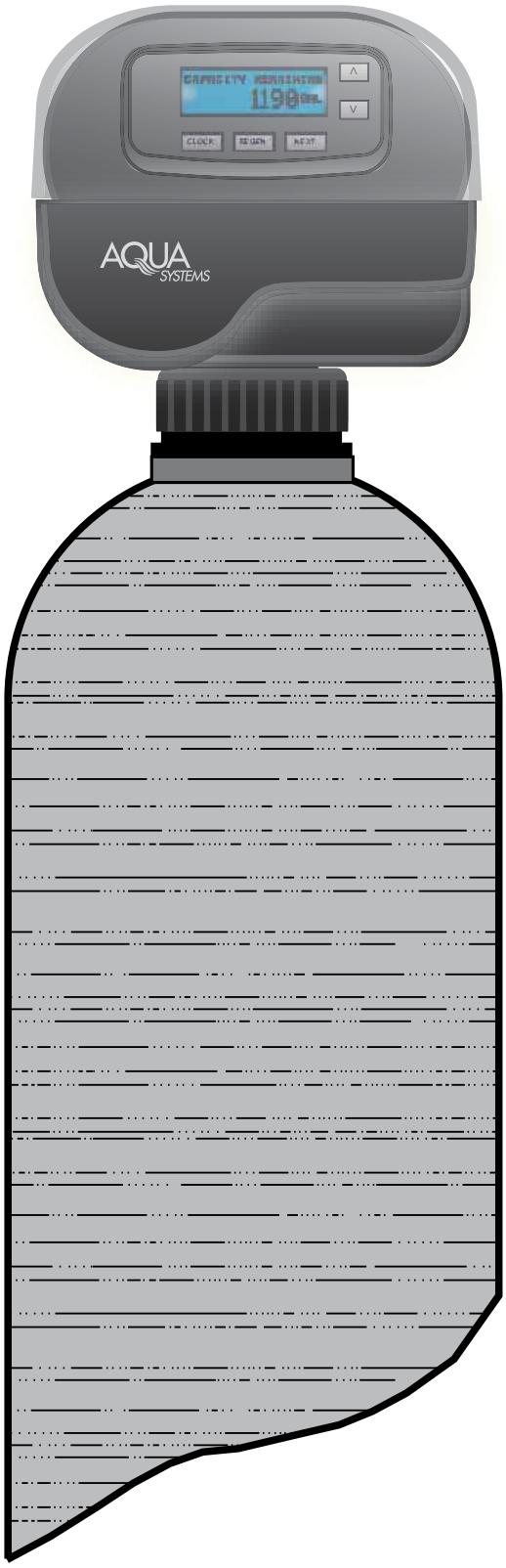
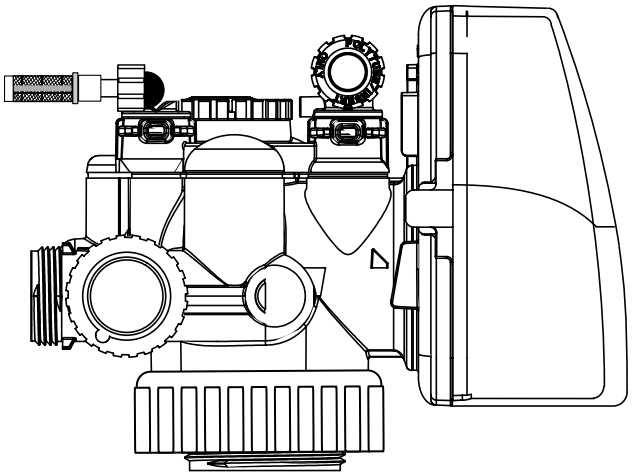
Eradicator II AIF

Air Induction Filter Systems



Installation, Operation,
and Maintenance Manual



AQUA SYSTEMS®

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Avon, IN 46123
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Patent # 7,300,569

Eradicator II AIF Systems

Installation, Operation,and Maintenance Manual

Introduction

Welcome to the Aqua Systems family of customers. Thank you for placing your confidence in us to help improve your water. Our goal is to provide water quality solutions with lasting performance. We are here to ensure the ongoing successful operation of your water treatment system, and we want to hear from you anytime you need assistance.

The Eradicator Air Induction Filter (AIF) is a product line with multiple solutions for managing problem well water. The AIF technology is effective in controlling both mild and excessive levels of iron and sulfur. The AIF uses air as an oxidizer, introducing it through the control valve. So, the AIF system does not require an external device, such as an air compressor, to induce the air into the process.

Due to variables found from well to well, treating problem water is not refined to a small set of solutions. Although there are standard systems in the AIF family, the AIF can be configured to specifically address the problems of a particular well. This manual will address the fundamentals of the product line and the standard models. However, it is possible that your AIF system was designed to be site specific. Refer to the model number if you have questions for your system provider.

The AIF water filters are designed with Aqua Systems' exclusive SmartChoice™ Gen II line of controls. The SmartChoice™ line wis designed with the owner in mind. Most water treatment systems on the market today are designed to be disposable. The SmartChoice™ is designed to be a lasting appliance that can provide a lifetime of operation. The Exchangeable Component Maintenance System allows for easy and efficient maintenance solutions. Each major part of the SmartChoice™ is a replaceable component that is easily removed. Although it may be years before the first service is required, this system offers you the ultimate in long-term care. This system makes maintenance expedient and cost effective. Due to the knowledge required in treating well water, we encourage maintenance on AIF systems to be done by a trained technician.

Aqua Systems recommends that AIF systems be installed by a trained technician. There are many issues involved in successfully treating problem water that go beyond putting the pipes together. This manual is written for the owner. It covers the basic installation requirements and the simple settings that an owner will need to know. It is not intended to be a comprehensive service and installation manual. If you have questions, please feel free to contact the factory or your local dealer. Aqua Systems and our professional dealers are always prepared to assist you.

Visit us on the web at www.aquasystems.com

Owner Information

Owner Name _____ Serial Number _____

Date of Installation _____ Dealer Name _____

Model Number _____ Installer Name _____

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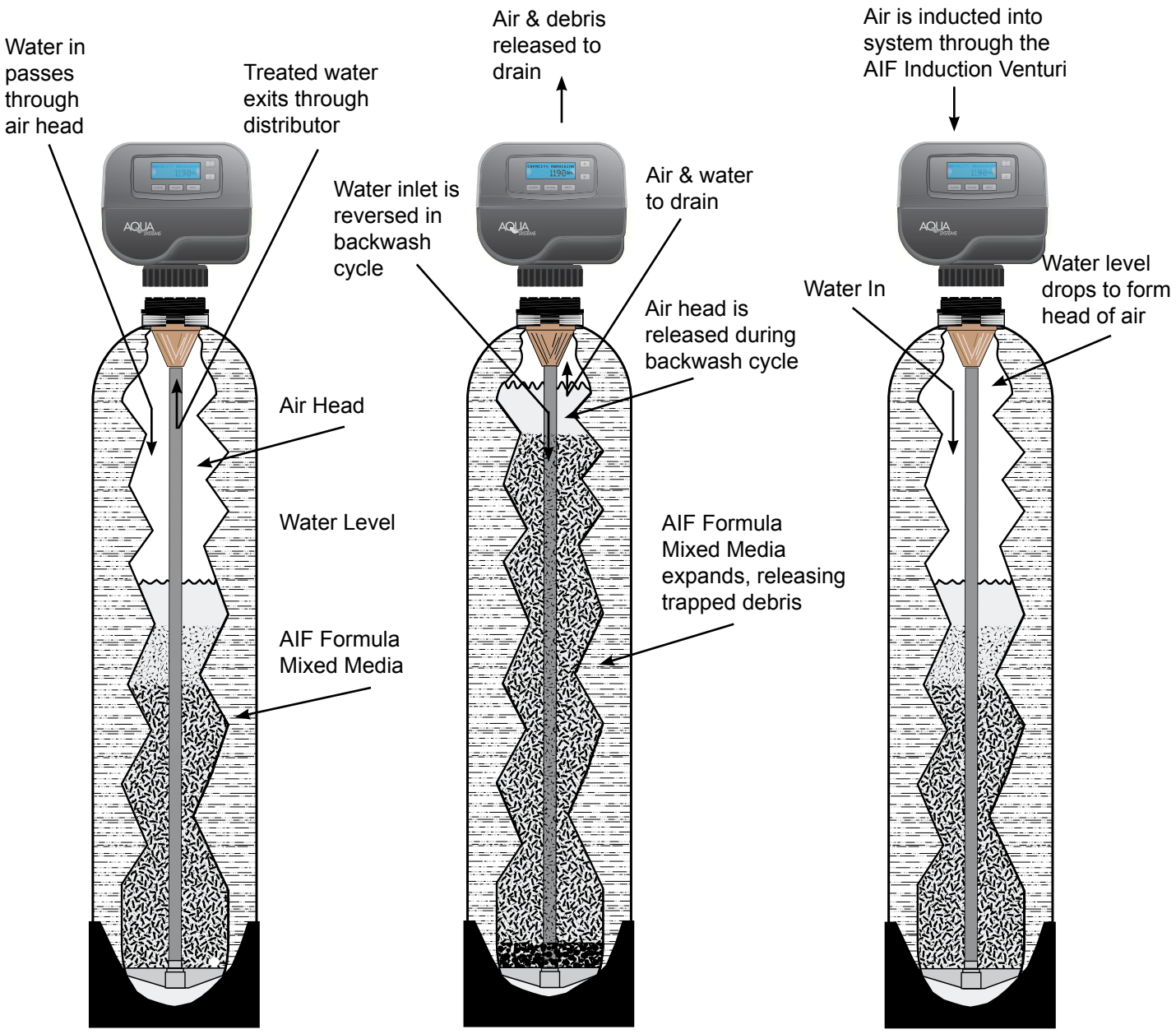
How the Eradicator Air Induction Filter Works



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How the Eradicator Air Induction Filtration (AIF) Systems Work

Air is a powerful oxidizer for both iron and sulfur. Historically, air has been utilized in water treatment through aeration towers, injection of compressed air, or by using an inline venturi. Aqua Systems AIF technology is a breakthrough because air is introduced through an induction venturi that is built into the control valve. This allows a single tank to be used as an aerator and a filtration system.

The AIF systems retain a head of air in the top of the tank during each treatment cycle. Each regeneration process purges that air from the tank before backwashing the media bed. Fresh air is introduced after the media has been cleared of the debris it has filtered from the water. The fresh air is introduced through the venturi. As the air is introduced, it displaces the water in the tank, exposing the media to fresh air. This exposure of air to the media sets up oxygen sites on the surface of the media, which provides the action it needs to perform. The head of air begins the oxidation process, while the oxygen sites on the media complete the process by holding the iron and sulfur in the media bed.

Limitations of the AIF Systems:

- In order for the AIF Iron Filters to function, the pH of the source water must be at or above 7. If the pH is below 7, you must include the pH adjustment option when treating iron.
- The water supply must have adequate flow and pressure to backwash the applied system. Be sure to reference the required backwash rate of a specific model when considering an application. The minimum requirement for the smallest system is 5 gallons per minute while maintaining a minimum of 20 psi.
- Water supplies may change over time. It is possible for the source water conditions to deteriorate beyond the capability of an applied system months, or even years, after the initial installation.
- There will always be some effervescence to the water with this system. This effervescence is caused by residual air in the water. This milky appearance is most noticeable immediately after a new installation. It could take 30 to 90 days to settle out as the media fully absorbs the water, and expels the excess air.
- If you have a reverse osmosis (RO) system, the air will be noticeable in the drinking water as well. In fact, the membrane in the RO system will actually concentrate the air and make it more noticeable. This too will soon settle to a minimum.
- This residual air in the effluent water may loosen iron, or sulfur, build up from plumbing systems. If you are installing an AIF system where the water pipes have a build-up inside, it may take a few weeks, or more, to clear out the water lines. You may notice debris expelled from the tap on occasion as this build up is released and cleaned from the plumbing system. This may require you to clean the faucet aerators, until the debris is clear.
- **You should never introduce chlorine into an AIF Iron Filter**. Chlorine, and other strong oxidizers, will damage the special media.

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Pre Install Review

Requirements for Proper Operation:

Water Pressure: The system requires a minimum of 20 psi to be sustained with flowing water of 5 gallons per minute or greater. Maximum is 125 psi.

Flow Rate: A minimum of 5 gallons per minute is required for proper operation. If less than 5 gallons per minute is available, consult with your dealer for possible custom configurations.

Water Temperature: The range of water temperature for these systems is 40˚ F to 110˚ F.

Drain: A drain within 20' of the system can be run with 1/2" tubing. Drains running over 20' should use 3/4" tubing. Maximum overhead rise should be ≤ 8'. Consult your dealer for any drain > 30' in length.

Special Drain Note: The drain must be a legal connection with a code compliant air gap. It is critical that the drain be secured tightly at each end, and anchored throughout the run. The AIF systems will jolt the drain line during the release of air. Be sure to protect the immediate area from any spray that may occur at the air gap. The drain connections should be thoroughly tested before completing the installation.

Electricity: An uninterrupted 110volt A.C. source is required to operate AIF systems.
Special Electrical *Note:* You must make sure that the power
outlet is not connected to a timer, or a switch.

Tips:

Source water pH: If the pH of the source water is < 7, you must consult with your dealer. The pH adjustment option must be added if pH is below this specification.

Freezing: The AIF system, drain, plumbing and all other water fixtures, must be protected from freezing temperatures. Be sure that the installation site is not exposed to temperatures below 32˚ F.

Positioning: Be sure to position the AIF system so it can be removed or accessed for future servicing.

Outside Faucets: Outside faucets must be bypassed from any AIF system. These systems are not designed for watering lawns, filling pools, or any other outdoor use.

Sand: If sand or sediment is present you must install a sand separator, or sediment filter ahead of the AIF system.

Chlorine: AIF systems will not work on chlorinated water supplies. Chlorine, and other strong oxidizers will damage the media bed in AIF iron filters.

Location Data

Bypassed Hard Water Lines:

Outside Spigots _____

Swimming Pool Fill Line _____

Kitchen Cold _____

Irrigation Systems_____

Sizing Information:

Hardness _____ grains per gallon

Iron _____ parts per million

pH _____

Chlorine _____ parts per million

Inlet Water Line Size _____

No. in Family _____

No. Baths _____

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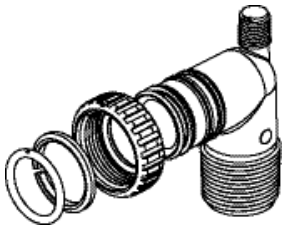
Pre Assembly

1. Carefully remove system from carton and inspect. The system box should contain:

   a. AIF Filter System
   b. Bypass Valve
   c. Owner's Manual

2. Attach the bypass to the unit. (*see figure 1*)
   The bypass valve easily connects to the control valve body using nuts that only require hand tightening. Hand tighten nut connections between control valve and fittings, control valve and bypass valve, and bypass valve and installation fittings. The split ring retainer design holds the nut on and allows load to be spread over the entire nut surface area reducing the chance for leakage. The split ring design, incorporated into the bypass, allows approximately 2 degrees off axis alignment to the plumbing system. The bypass is designed to accommodate minor plumbing misalignments but is not designed to support the weight of a system or the plumbing.

3. Attach one of the available connection fitting kits to the bypass as shown in *figure 1*.
   The nuts, split rings, and o-rings install the same as the bypass. (*see figure 2*)



1" PVC Male shown

figure 2

Tip:

Take a moment to fill out the information sections in the Owner's Manual. It can be a valuable tool in the future to have all the installation data available to answer any questions.

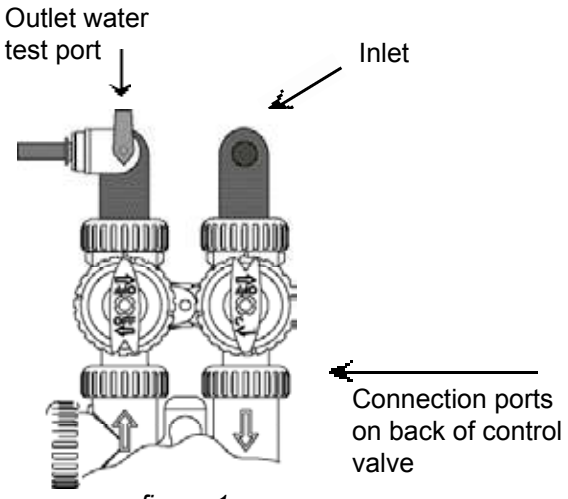


figure 1

Tip:

Do not use Vaseline, oils, or any petroleum lubricants on o-rings. A silicon lubricant may be used on black o-rings only.

Caution:

When assembling the inlet/outlet fitting kit, Solder or Glue pipe to plumbing and fittings and let cool (or dry) before attaching them to the connection fittings on the bypass. Heat from soldering or PVC glue solvents may damage the nut, split ring, or o-ring and fittings.

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Bypass Operation

The bypass valve is typically used to isolate the control valve from the plumbing system's water pressure in order to perform control valve repairs or maintenance. The Eradicator bypass valve is particularly unique in the water treatment industry due to its versatility and state of the art design features. The 1" full flow bypass valve incorporates four positions including a diagnostic position that allows service work on a pressurized system while still providing untreated bypassed water to the facility or residence. Its completely non-metallic, all plastic design allows for easy access and serviceability without the need for tools.

1. Normal Operation Position: The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve. Water flows through the control valve during normal operation and this position also allows the control valve to isolate the media bed during the regeneration cycle. *(see figure 1)*

2. Bypass Position: The inlet and outlet handles point to the center of the bypass, the control valve is isolated from the water pressure contained in the plumbing system. Untreated water is supplied to the plumbing system. *(see figure 2)*

3. Diagnostic Position: The inlet handle points in the direction of flow and the outlet handle points to the center of bypass valve, system water pressure is allowed to the control valve and the plumbing system while not allowing water to exit from the control valve to the plumbing. *(see figure 3)*

4. Shut Off Position: The inlet handle points to the center of the bypass valve and the outlet handle points in the direction of flow, the water is shut off to the plumbing system . If water is available on the outlet side of the filter it is an indication of water bypass around the system (i.e. a plumbing connection somewhere in the building bypasses the system). *(see figure 4)*

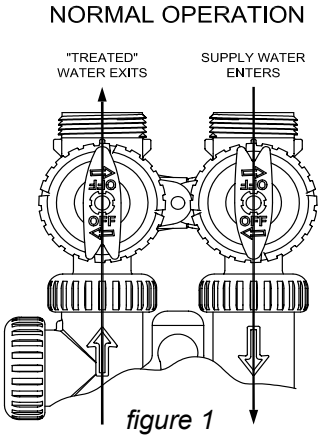

figure 1

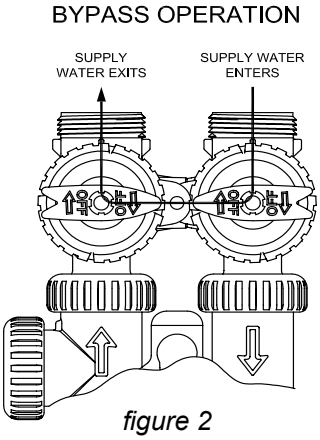

figure 2

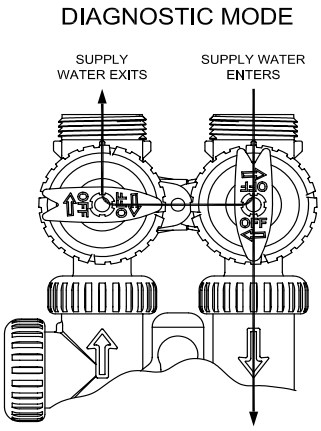

figure 3

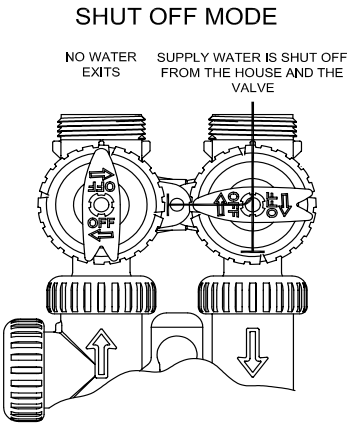

figure 4

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Installation

AIF System Placement

Special Note:

The Eradicator AIF systems are to be installed before a water conditioner. This allows the iron and sulfur to be treated before the softening process. This also protects the water softeners' performance from being hampered from the iron, or sulfur. A water softener can normally be installed next to the outlet of the AIF system. Never route the outside faucets, or an irrigation system, through an AIF Iron or Sulfur system. These systems are not designed for the volume load of lawn watering, or other outside uses.

1. Find a location with:

   A. Enough room to pull the system away from the plumbing if necessary.

   B. The main inlet water supply or pre-plumbed connection point.

   C. Adequate drain fixture, capable of 5 gallons per minute flow.

   D. An electrical outlet that is **not** operated by a switch or timer.

2. Place unit in the desired location. If floor is not level the unit may be leveled with the built in adjustable base by lightly tapping the unit on the floor.

3. There should be a minimum of 12' of water line between the AIF system connection and the water heater.

All plumbing must be done in accordance with local plumbing codes.

Caution:

The control valve, fittings and/or bypass are designed to accommodate minor plumbing misalignments but are not designed to support the weight of a system or the plumbing.

Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicon lubricant may be used on black o-rings but is not necessary. **Avoid any type of lubricants, including silicone, on red or clear lip seals.**

The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic wrench. If necessary, pliers can be used to unscrew the nut or cap. Do not use a pipe wrench to tighten or loosen nuts or caps. Do not place screwdriver in slots on caps and/or tap with a hammer.

Do not use pipe dope or other sealants on threads. Teflon tape must be used on the threads of the 1" NPT elbow or the 1/4" NPT connection (for the Test Port). Teflon tape is not necessary on the nut connection or caps because of o-ring seals.

When assembling the installation fitting package (inlet and outlet), connect the fitting to the plumbing system first and then attach the nut, split ring and o-ring. Heat from soldering or solvent cements may damage the nut, split ring or o-ring. Solder joints should be cool and solvent cements should be set before installing the nut, split ring and o-ring. Avoid getting primer and solvent cement on any part of the o-rings, split rings, bypass valve or control valve.

Tip:

If there is a three way bypass in the existing plumbing, inspect it to make sure the bypass valve shuts off 100% when closed.

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Installation

4. Before connecting the water lines:

    A. Turn off the electric or gas to the water heater.
    B. Turn off the main water supply to the building, an drain off the pressure to all cold water outlets.
    C. Determine which outlets are to be bypassed and make provisions to connect them before the AIF system.
    D. It is highly recommended to provide an inlet shut off valve near the unit.
    E. The inlet water line should be a minimum of 3/4" in size. If yours is smaller, consult your dealer for required adjustments.

5. With the above considerations, connect the water line to the inlet of the unit, which is designated by an arrow on the bypass pointing toward the control valve.

6. Connect the outlet which is designated by an arrow pointing away from the control valve to the water line that feeds the softener, or back to the main if a softener is not being used.

7. If the plumbing system is metal pipe (ex. – copper), install a jumper ground wire and grounding clamps between the inlet and outlet pipes to retain continuity of the plumbing.

8. Connect the drain on the AIF system to an approved air gap drain. When using the 5/8" poly tubing for the drain line, connect the nut to the line as illustrated in figure 1. If copper line is used, be sure to pre-sweat and cool pipe & fittings before attaching to the drain fitting on the valve.

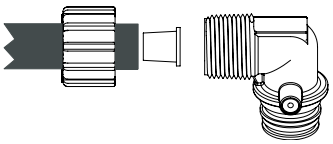
Turning on the water:

1. With all plumbing connections made, make sure the bypass is in the "bypass" position. (See figure 3). Slowly turn on the water supply valve until lines are pressurized. At nearby faucet, turn on cold water and let it run for 2 – 3 minutes to flush debris from the plumbing. Check for water leaks, repair any leaks immediately before proceeding.

2. After confirming no leaks, and flushing the lines, proceed to the Start Up instructions on page 11.

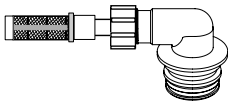
Caution:

Make sure all plumbing connections are completed before turning on water. Check for and repair any leaks before proceeding with start up of system.



Drain Fitting

figure 1



Air Injection Fitting (pre-assembled)

figure 2

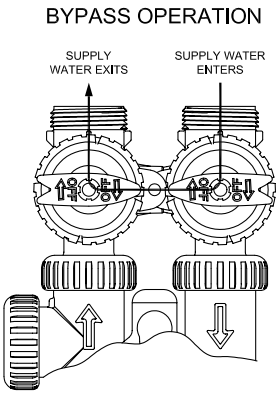


figure 3

Caution:

The drain line on the AIF system must be secure at all points along the length of the drain run. The drain line will jolt when the air is released during the cycle. You must test the drain line security before leaving any installation site.

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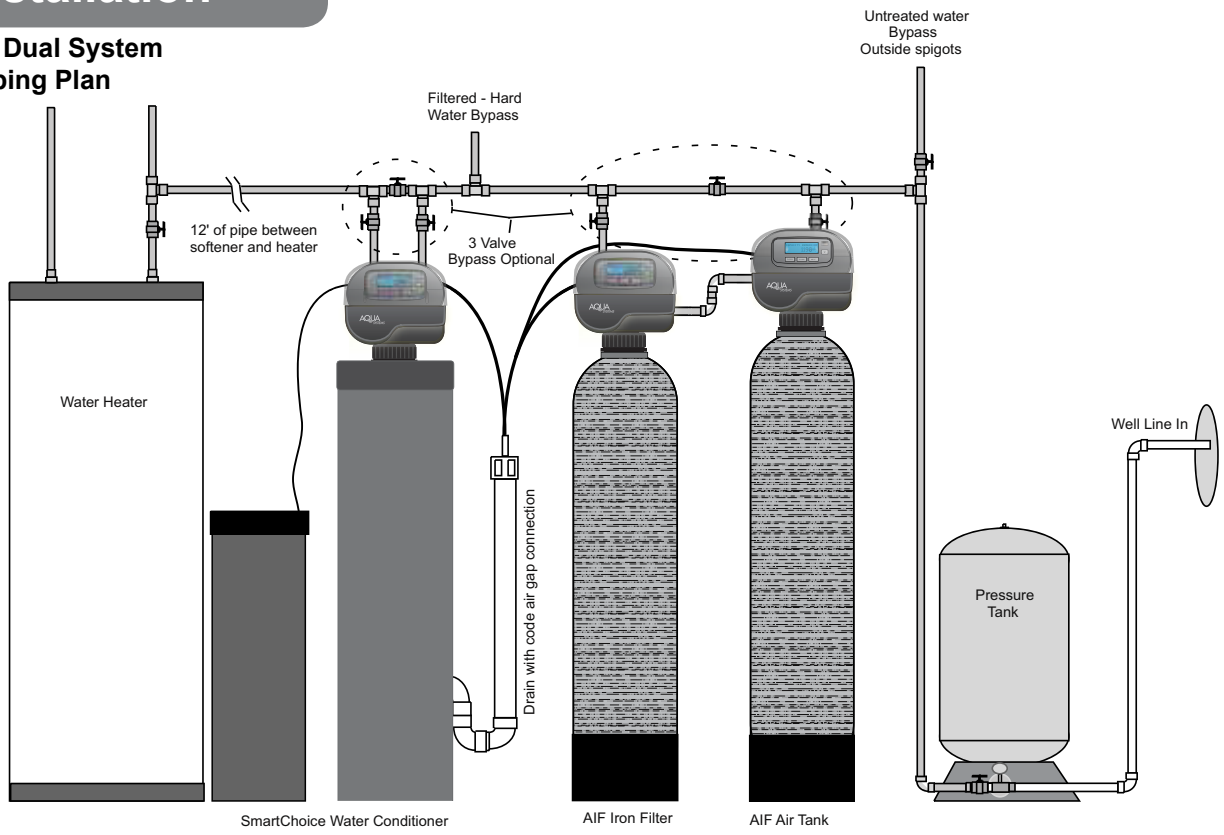
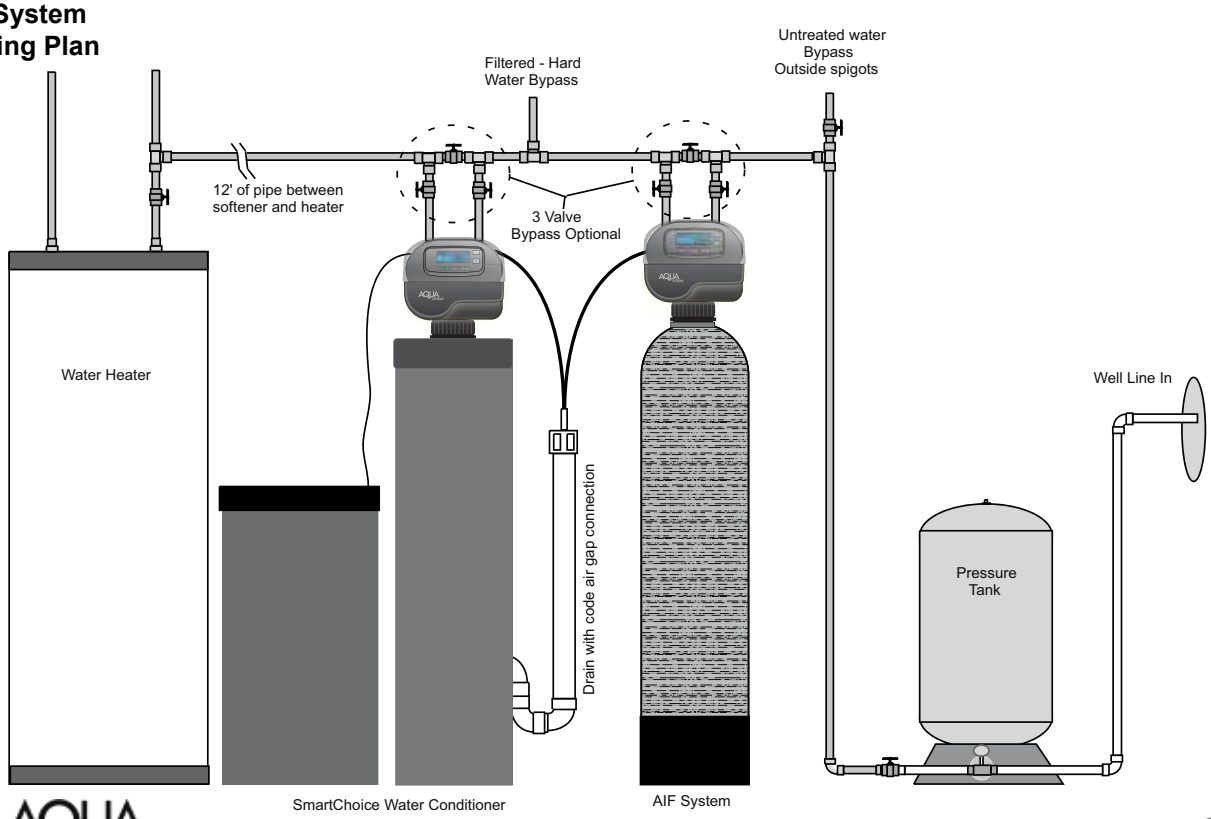
Installation

Eradicator II Dual System Install Plumbing Plan



Eradicator II System Install Plumbing Plan



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Start Up

Put Unit into Service:

1. Plug transformer into 110v receptacle. The control will place itself into the Filtering mode, and will flash a time on the display.

2. Set the current time of day. (See page 13)

Note:

Make sure that the electrical outlet used is an uninterrupted outlet (such as outlet that is operated by a switch).

All electrical connections must be connected according to local codes.

Turning Water On to AIF System:

1. Water should be turned on to the AIF system while in the filtering mode. Do not initiate a “Regen” cycle before turning water on to the system. To turn the water on, open the inlet side of the bypass to the system. Water will fill the unit, and trap a head of air in the top of the tank. This initial head of air will be used to check the drain connection.

2. Once water has filled the tank, and is no longer flowing into the tank, you can test the drain connection. Review both connection points of the drain line, and all fasteners over the length of the drain line. Make sure that every part of the drain line is secure.

Note:

When pushing the “REGEN” button to advance cycles, let the control reach the next cycle before pushing the “REGEN” button again.

3. Once drain line security has been verified, you can initiate the first cycle. This will allow you to check the drain line to make sure that it is sending water to the drain, and that it is stable. Push the “Regen” button and hold for 3 seconds. This will move the control to the back wash cycle. Immediately check the drain line for secure positioning, and leaks. If the drain line is functioning properly, let the system complete the backwash cycle.

4. The Eradicator AIF system control valve will automatically advance to the air induction cycle after backwashing for the appropriate amount of time. You must let the system complete the air induction cycle, which will be 30 – 40 minutes depending on the system size.

5. Once the air induction cycle has been completed, the Eradicator control valve will automatically turn off, returning the system to the “Filtering” mode. Once the system has returned to the Filtering mode it is time to turn the system on to the facility. To turn the AIF system on, turn the outlet handle on the bypass to point toward the line of the piping. At this point the bypass should be in the service position, with one handle pointing toward the control valve, the other pointing away from the control valve.

6. With the AIF system placed in service you need to rinse the system down. Turn on a cold water line in the facility. The Eradicator display should show the spinning flow indicator. This verifies that the water is flowing through the AIF system. Let the water run until it is clear.

Special Note:

The AIF system will retain a lot of air in the first 30 - 90 days of operation. This air will make the water in the facility have a milky look to it. This is to be expected as normal until the dry media has had the opportunity to fully absorb the water. Water from the AIF system will always have effervescence to it because of the air in the treatment process. However, it is much more significant in the first 90 days.

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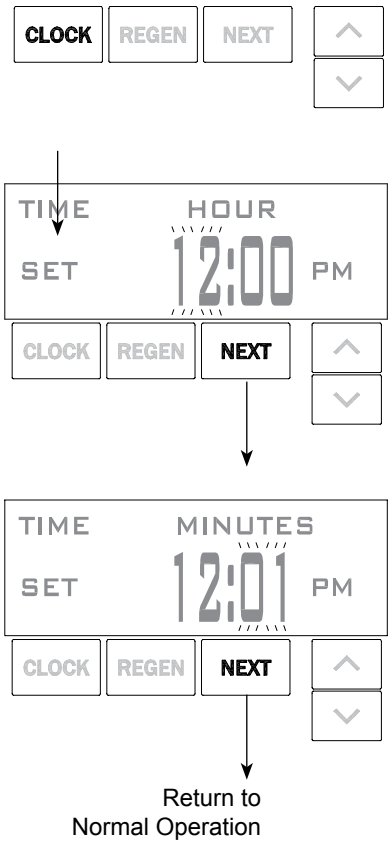
Programming

Set Time of Day:



1. Press “SET CLOCK”

2. Current Time (hour): Set the hour of the day using “Up” or “Down” buttons. AM/PM toggles after 12. Press “NEXT” to go to step 3.

3. Current Time (minutes): Set the minutes of the day using “Up” or “Down” buttons. Press “NEXT” to exit Set Clock. Press “REGEN” to return to previous step.

Displayed when battery voltage is low.
Display alternates with previously selected display.

Note:

If the power goes out, the current time will remain correct as long as the battery has sufficient charge (up to 2 years). If the battery expires, the screen will state “Low Battery”. The battery should be replaced and the time reset. All other programming will be retained.

Note:

If a softener is installed or existing after the AIF, it is recommended that the regeneration time for the softener be set at a time after the AIF regen.

If there is any question or concern about this setting, contact our authorized dealer for assistance.

New Energy Saver Feature for 2013 with Gen II Enhanced Electronics:

The Energy Saver function manages the display backlight in the Gen II control. A new option is available on the newly enhanced circuit boards. The new option is Energy Saver / AUTO. This new feature combines the benefit of the Energy Saver, that turns the backlight off when buttons are not in use, but it will activate the backlight when a User Alert Screen is triggered. Red Screen User Alerts, which include Salt Monitoring, Service Alarm and Error Screens will activate the Display light, and keep it on until the Alert condition is cleared.

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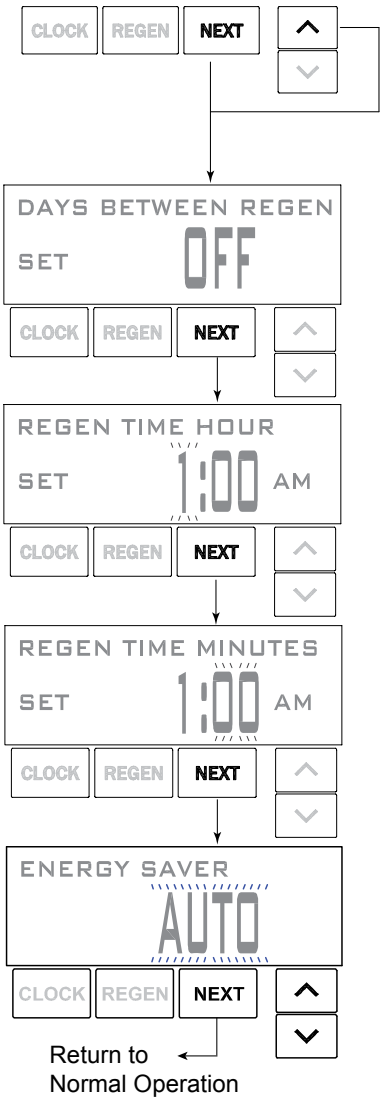
Programming

Installer Displays/Settings:



1. Press “NEXT” and “Up” simultaneously for 3 seconds.

2. Day Override: Maximum allowable days between regenerations. Leave this setting on “OFF”. Press “NEXT” to go to the next step.

3. Regeneration Time (hour): Set the hour of day for regeneration using the “Up” or “Down” buttons. Press “NEXT” to set minutes.

4. Regeneration Time (minutes): Set the minutes of day for regeneration using the “Up” or “Down” buttons. Press “NEXT” to set energy saver.

5. Energy Saver: Use the “Up” or “Down” buttons to activate or cancel the energy saver.
“OFF” = Backlight always on.
“ON” = Back light off after 5 minutes of inactivity.
“AUTO” = Like “ON” except will automatically turn on backlight for alert screens.

Press “NEXT” to exit program and return to normal operation.

AUTO

Energy Saver / AUTO will turn the display backlight off after 5 minutes of no button activity.

Display backlight will turn on with the first push of any button. Other functions of that button will be ignored on the first push.

Display backlight will turn on with the activation of any User Alter Screen.

This is the default setting

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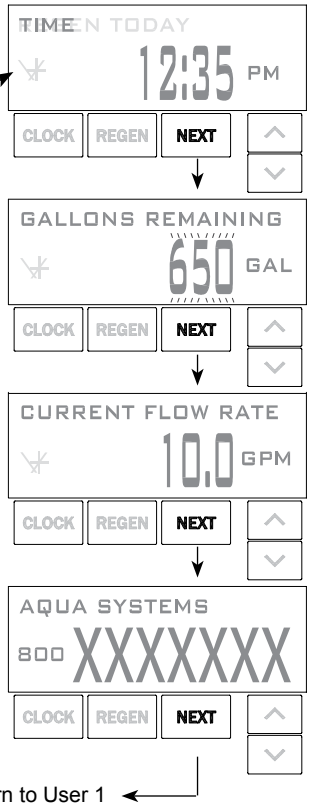
Programming

User Displays/Settings:

Blue Screen = Softener
Green Screen = Filter
Red Screen = Error or Alert

"/" Will appear to rotate whenever flow is detected.



User 1
Time of Day Screen

User 2
Capacity Remaining Screen

User 3
Current Flow Rate Screen - Displays Water Flow through System

User 4
Contact Screen - Displays Dealer Name and Phone Number (If programmed)

User screens will continuously scroll, switching views every 10 seconds. If the screens are manually scrolled by pushing the "NEXT" button, the screen will remain constant for 5 minutes then continue to scroll.
* Error and Alert screens will take precedence over the normal scrolling.

Regeneration Mode:

1. Typically a system is set to regenerate at a time of low water usage. An example of a time with low water usage is when a household is asleep. If there is a demand for water when the system is regenerating, untreated water will be used.

2. When the system begins to regenerate, the display will change to include information about the step of the regeneration process and the time remaining for that step to be completed. The system runs through the steps automatically and will reset itself to provide treated water when the regeneration has been completed.

3. Sometimes there is a need to regenerate the system, sooner than the system calls for it, usually referred to as manual regeneration. There may be a period of heavy water usage because of guests or a heavy laundry day.

4. To initiate a manual regeneration immediately, press and hold the "REGEN" button for three seconds until the system starts the regen. To initiate a regeneration at the normal scheculed time, push and release the "REGEN" button. The display will alternate from the current screen to "REGEN TODAY".

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Service

Removing & Reinstalling Eradicator Control Valve:

Removing the Control Valve from the Media Tank:

1. Turn Bypass to the “Bypass” Position. *(see diagram on page 8, figure 2)*
2. Push regen button for 3 seconds to engage cycle - this will relieve the pressure in the system. *see note at right*
3. Once water has stopped running through the drain line, the pressure has been relieved off of the system.
4. Once the pressure is relieved, remove the Drain line from the control by pulling the locking clip. *see figure 1*
5. Next, remove the Air Injection fitting by pulling the locking clip.*see figure 1*
6. Loosen the connection nuts between the valve and the bypass. *see figure 1*
7. Once the nuts are loose you may pull the system away from the plumbing. *see note at right*
8. With the system off of the plumbing, you can loosen the base nut to remove the valve from the media tank. *see figure 2*

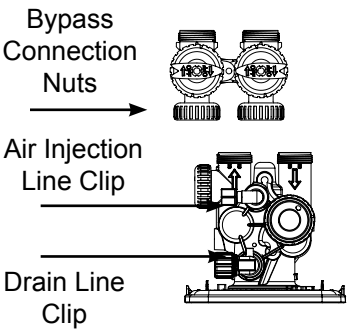

figure 1

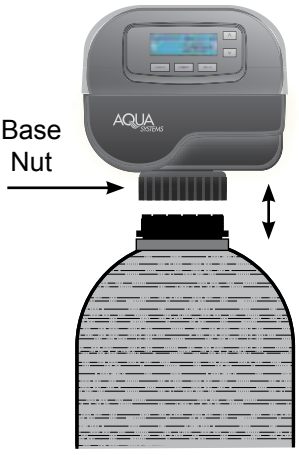

figure 2

Note:

Make sure the valve moves to the “Backwash” cycle - Look at the message on the digital display. If “Backwash” is not the first cycle on your system, wait until the control stops at the first cycle. Then press the regen button again and wait for the valve to complete changing to the next cycle.

Repeat this until you see “Backwash” designated on the display.

Once you have engaged the backwash cycle, unplug the system from the electrical outlet.

Note:

Make sure that the water pipes are supported when the system has been pulled off of the connection fittings.

Note:

Have a towel handy to absorb any water that spills during this service.

Note:

Normal Threads - Facing the unit from the front, loosen the base nut by turning from left to right.

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Service

Re-installing a replacement Control Valve:

1. Place the new control valve over the base connection, insert the connnection fitting into the base. *see page 16 figure 2*
2. Thread the base nut on to the base adapter - do not tighten more than hand tight.
3. Once the control valve is mounted on the media tank, move the system to align with the pipe connections.
4. Slide the system onto the pipe connections at the bypass valve.
5. Thread the connnection nuts onto the valve threads -Clockwise thread direction.
6. Do not over tighten, these connections have an O-Ring seal, Hand Tight Only.
7. Insert Air Injection fitting into it's position and install the locking clip. *(see page 16 figure 1)*
8. Insert the Drain line into it's position and install the lock clip. *(see page 16 figure 1)*
9. Plug unit into the electrical outlet.
10. Press "Next" and "Regen" buttons to reset control.
11. Set clock to current time of day.
12. Carefully turn water on to the system, open just the inlet valve handle on the bypass. *see figure 3*
13. Examine all connections to ensure that there is a 100% seal with No Water Leaks.
14. Press "Regen" for 3 seconds to start a regeneration.
15. Let the system finish a complete regeneration.
16. Open the second valve handle (outlet) on the bypass. *see figure 3*

Caution:

Tighten base and connection nut fittings **Hand Tight** only.

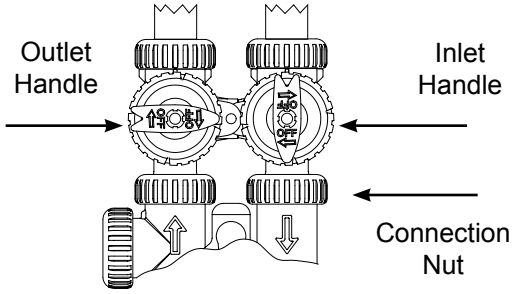

figure 3

Note:

When turning water back on, if there are any leaks detected, immediately turn off the water, loosen the leaky fitting or fittings, check o-rings - clean and reseat, and re-connect fittings. Turn on water and make sure there are no leaks before continuing return to service.

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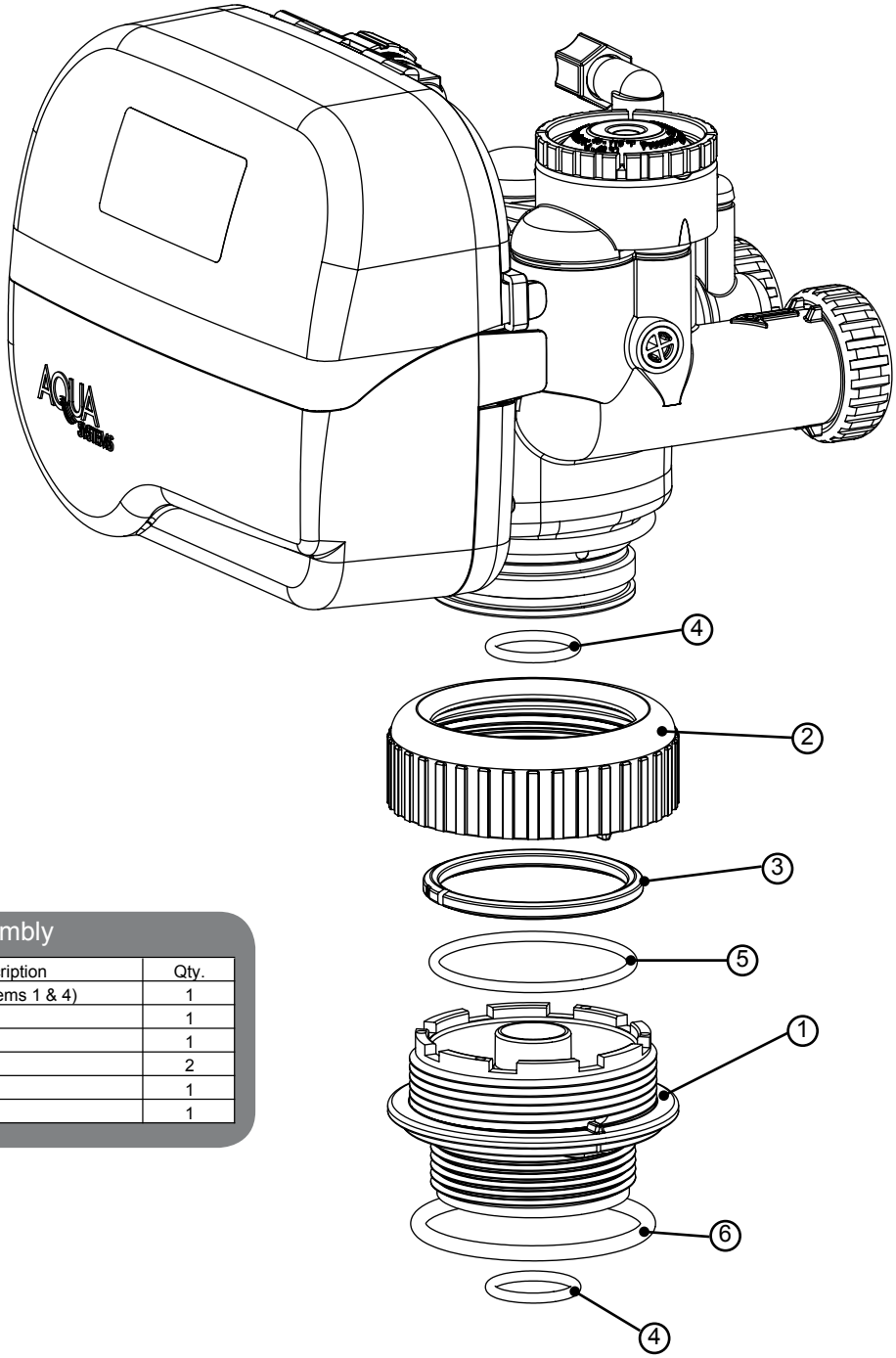
Parts Diagrams



Quick Connect Assembly

No.	Part No.	Description	Qty.
1	02910182	Tank Adapter (items 1 & 4)	1
2	02910183	Tank Nut	1
3	02910184	Split Ring	1
4	02910126	O-Ring 215	2
5	02910188	O-Ring 231	1
6	02910166	O-Ring 337	1

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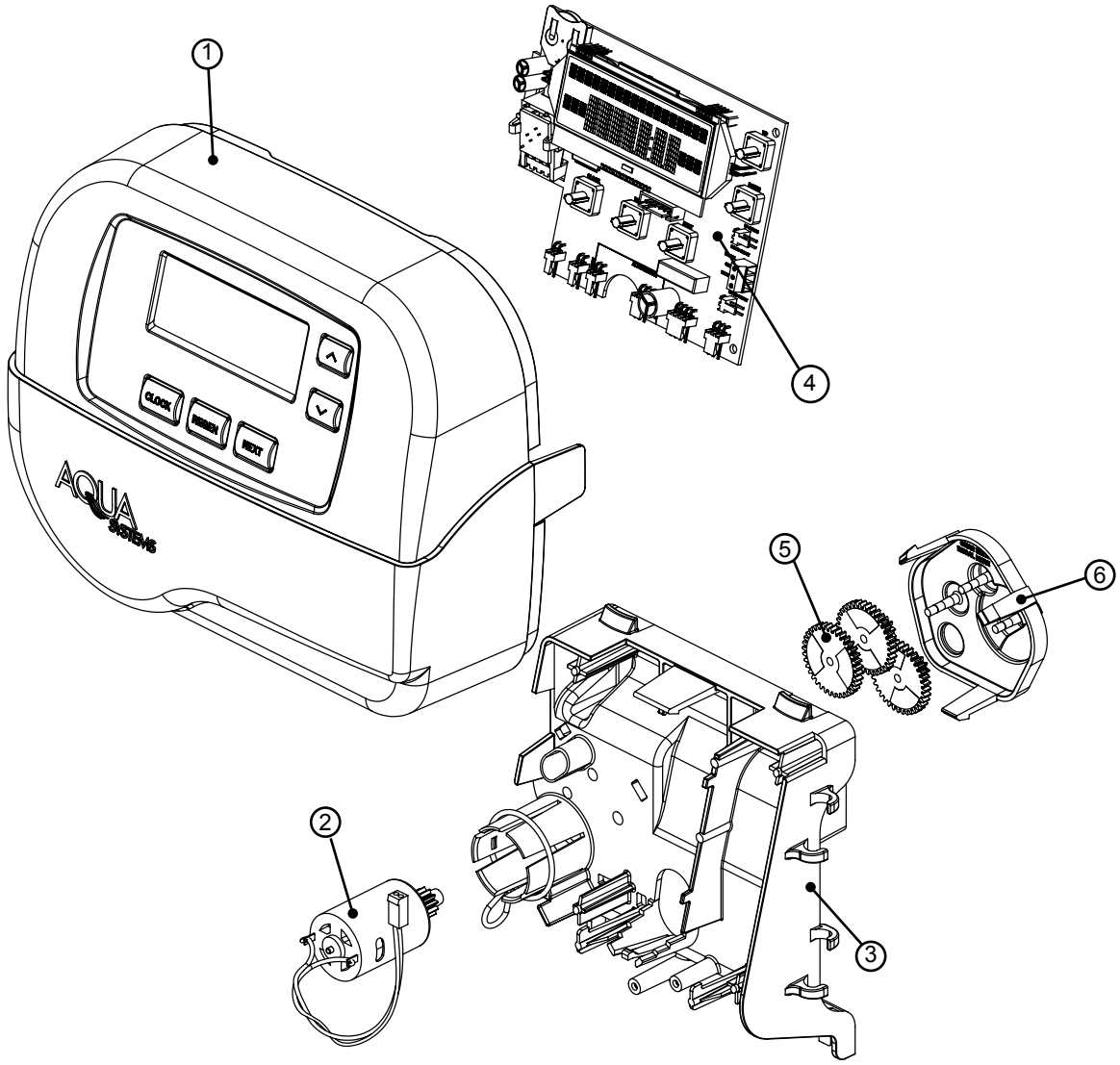
Parts Diagrams



Quick Connect Assembly

No.	Part No.	Description	Qty.
1	02910301	SCII Front Cover Assy	1
2	02910128	Motor	1
3	02910127	Drive Bracket and Spring Clip	1
4	02910300	SCII "ALX" PC Board	1
or	02910299	SCII "AQX" PC Board	1
5	02910132	Drive Gear 12 x 36	3
6	02910131	Drive Gear Cover	1
(2 - 6)	02910106	Drive Assy (includes parts 2 - 6)	(1)
Not Shown	02910302	Clear Display Cover	1
Not Shown	02910166	Transformer 110v - 12v	1

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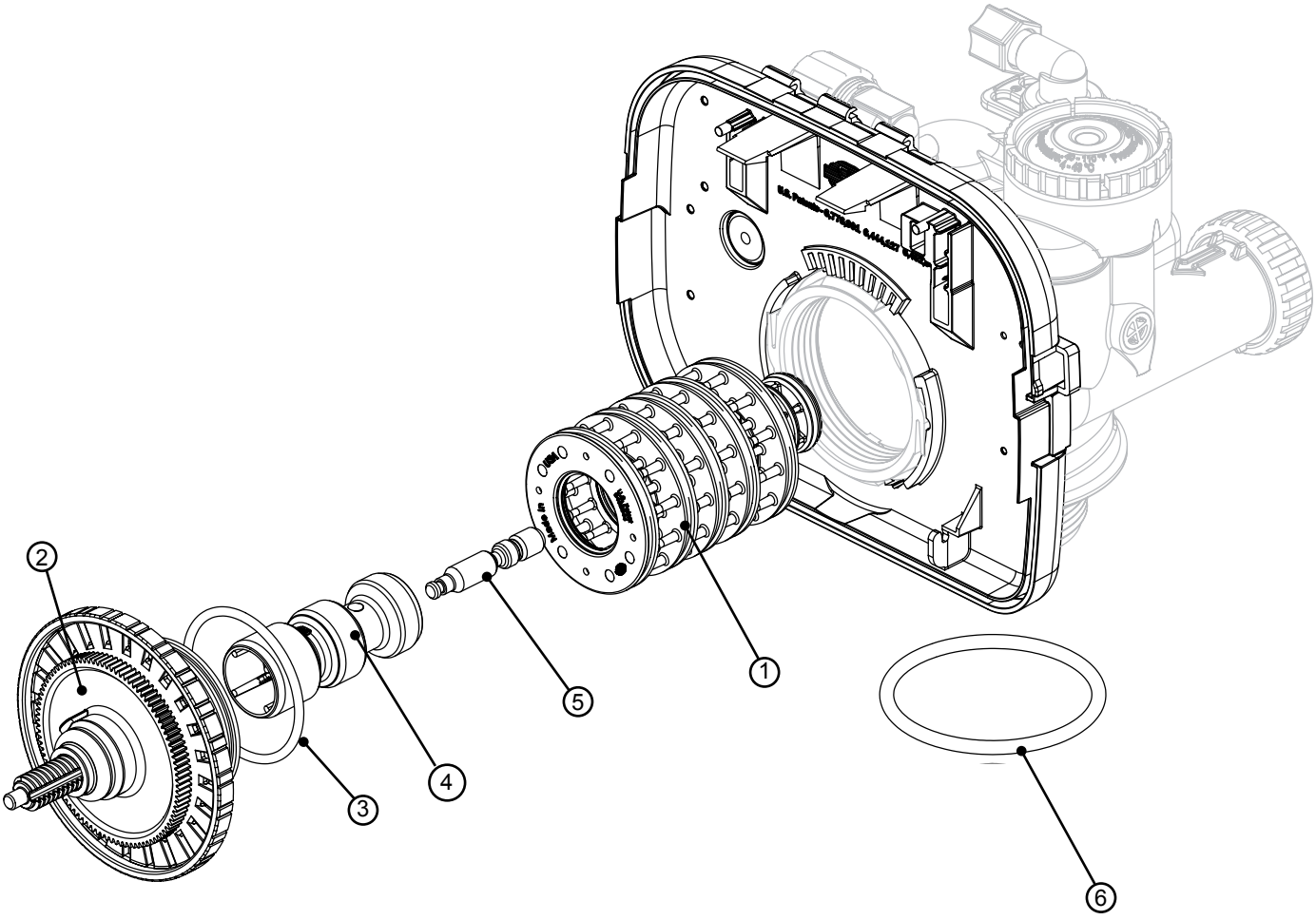
Parts Diagrams

Quick Connect Assembly

No.	Part No.	Description	Qty.
1	02910111	Spacer Stack Assy	1
2	02910110	Drive Cap Assy	1
3	02910141	O-Ring 228	1
4	02910124	Piston Downflow Assy	1
5	02910160	Regenerate Piston	1
6	02910166	O-Ring 337	1



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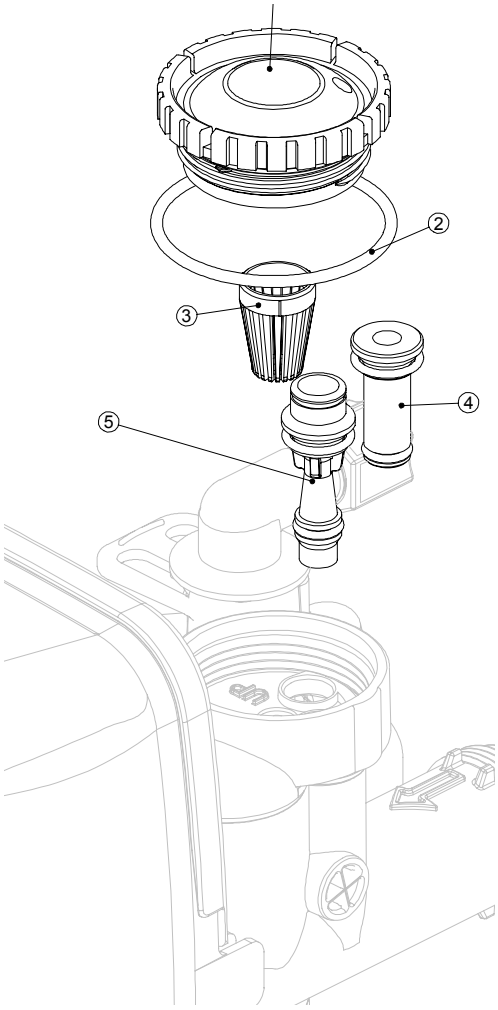
Parts Diagrams

Injector Assy

No.	Part No.	Description	Qty.
1	02910163	Injector Cap	1
2	02910149	O-Ring 135	1
3	02910164	Injector Screen	1
4	02910123	Injector Assy Z Plug	1
5	02910112	Injector Assy A Black	1
	02910113	Injector Assy B Brown	
	02910114	Injector Assy C Violet	
	02910115	Injector Assy D Red	
	02910116	Injector Assy E White	
	02910117	Injector Assy F Blue	
	02910118	Injector Assy G Yellow	
	02910119	Injector Assy H Green	
	02910120	Injector Assy I Orange	
	02910121	Injector Assy J Light Blue	
	02910122	Injector Assy K Light Green	
Not Shown	02910158	O-Ring 11 (Injector)	1
Not Shown	02910159	O-Ring 13 (Injector)	1



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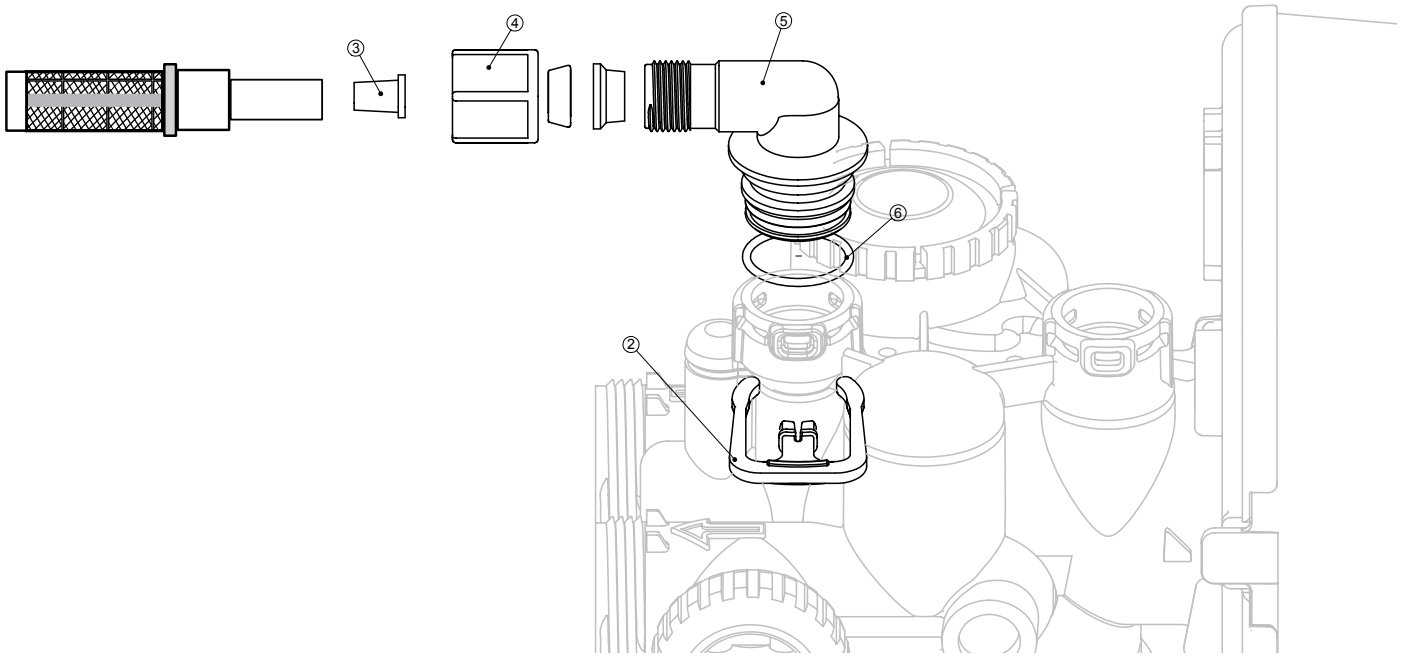
Parts Diagrams

Air Injection Port

No.	Part No.	Description	Qty.
2	03310730	Elbow Locking Clip	1
3	03310738	Polytube Insert 3/8"	1
4	03310732	Nut 3/8"	1
5	03310740	Elbow Cap	1
6	02910154	O-Ring 019	1
Not Shown	09470053	OF15 DN15 Check Valve	1



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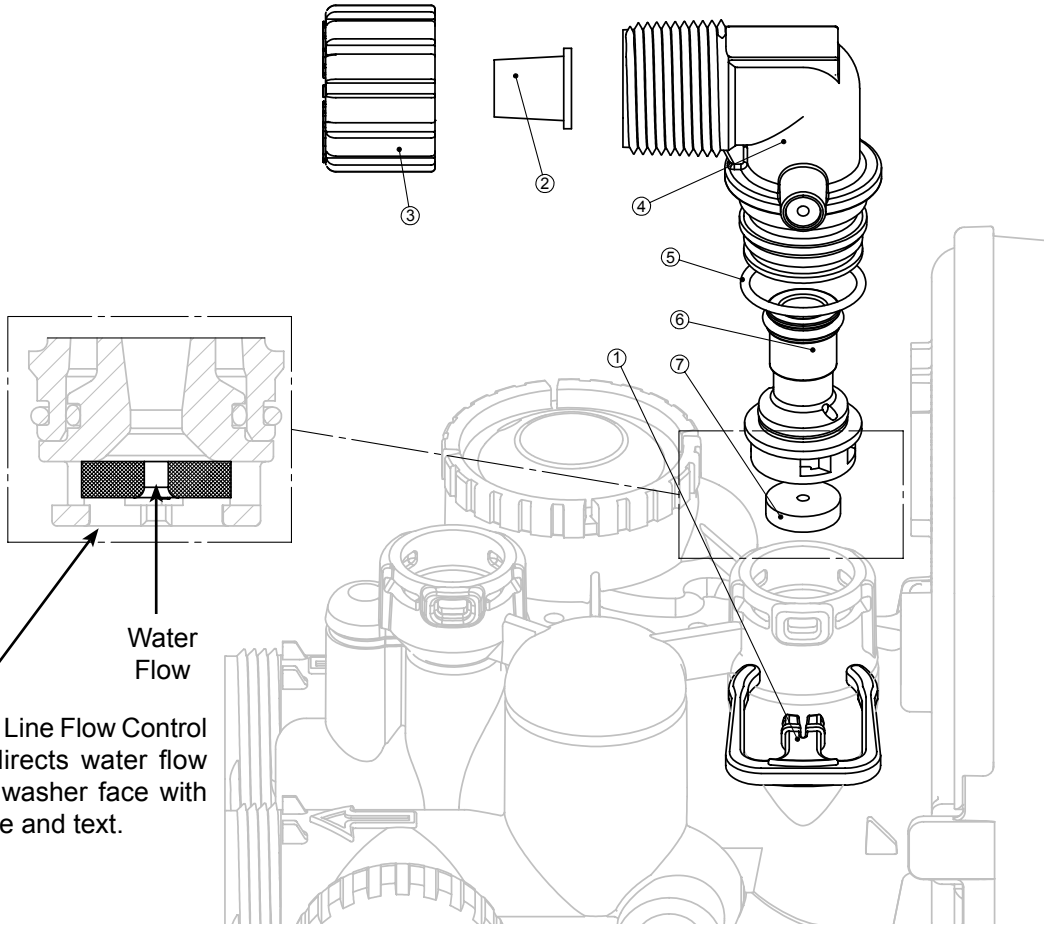
Parts Diagrams

3/4” Drain Assy

No.	Part No.	Description	Qty.
1	03310730	Elbow Locking Clip	1
2	02950122	Polytube Insert 5/8"	1
3	02950121	Nut 3/4" Drain Elbow	1
4	02910152	Drain Elbow 3/4" Male Assy	1
5	02910154	O-Ring 019	1
6	02910153	DLFC Retainer Assy	1
7	02950124	DLFC 0.7 gpm for 3/4"	One DLFC must be used if 3/4" fitting is used
	02950125	DLFC 1.0 gpm for 3/4"	
	02950126	DLFC 1.3 gpm for 3/4"	
	02950127	DLFC 1.7 gpm for 3/4"	
	02950128	DLFC 2.2 gpm for 3/4"	
	02950129	DLFC 2.7 gpm for 3/4"	
	02950130	DLFC 3.2 gpm for 3/4"	
	02950131	DLFC 4.2 gpm for 3/4"	
	02950132	DLFC 5.3 gpm for 3/4"	
	02950133	DLFC 6.5 gpm for 3/4"	
	02950134	DLFC 7.5 gpm for 3/4"	
	02950135	DLFC 9.0 gpm for 3/4"	
	02950136	DLFC 10.0 gpm for 3/4"	



Proper Drain Line Flow Control orientation directs water flow towards the washer face with rounded edge and text.

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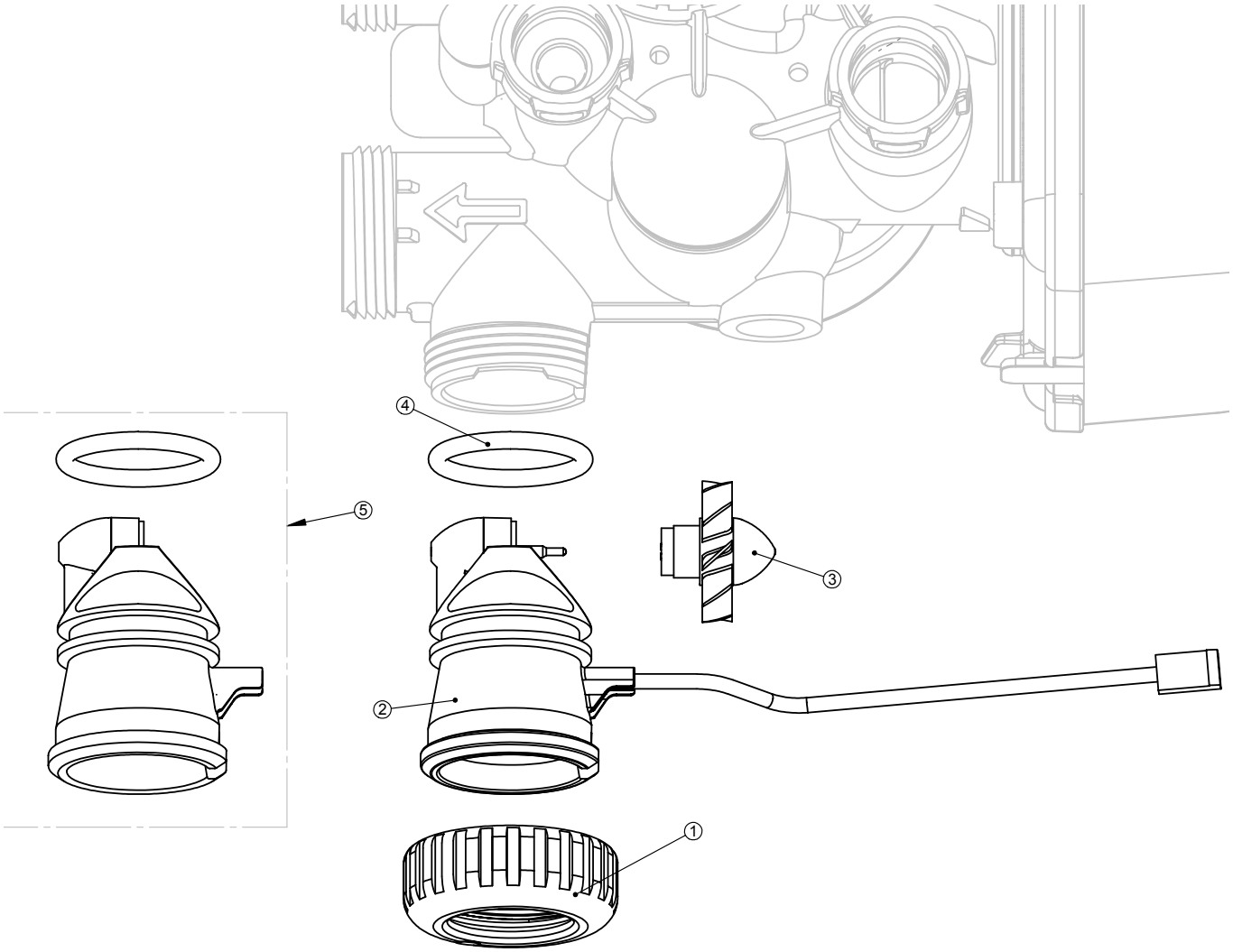
Parts Diagrams

Meter Assy

No.	Part No.	Description	Qty.
1	02910148	Nut 1" QC	1
2	02910108	Meter Assy	1
3	02910140	Turbine Assy	1
4	02910126	O-Ring 215	1
5	02910109	Meter Plug Assy	1



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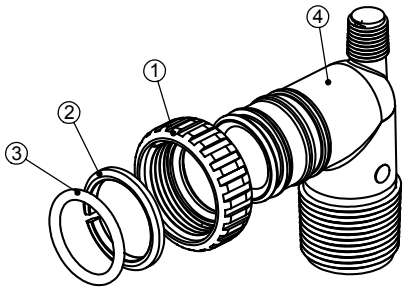
Parts Diagrams

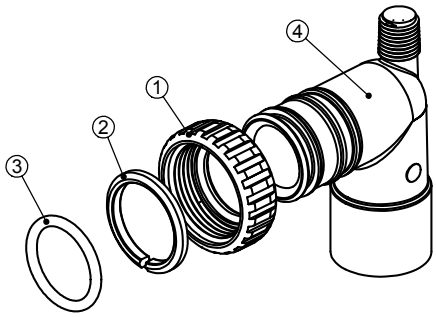
1” AIF Male NPT Elbow Assy

No.	Part No.	Description	Qty.
1	02910148	Nut 1" Quick Connect	2
2	02910147	Split Ring	2
3	02910126	O-Ring 215	2
4	02910146	Fitting 1" PVC Male NPT Elbow	2
Not Shown	22302027	Test Port Valve	1
	02950002	Complete PVC Male Kit	

1” AIF Solvent Elbow Assy

No.	Part No.	Description	Qty.
1	02910148	Nut 1" Quick Connect	2
2	02910147	Split Ring	2
3	02910126	O-Ring 215	2
4	02910172	Fitting 3/4" & 1" PVC Solvent 90	2
Not Shown	22302027	Test Port Valve	1
	02950003	Complete PVC Solvent Kit	





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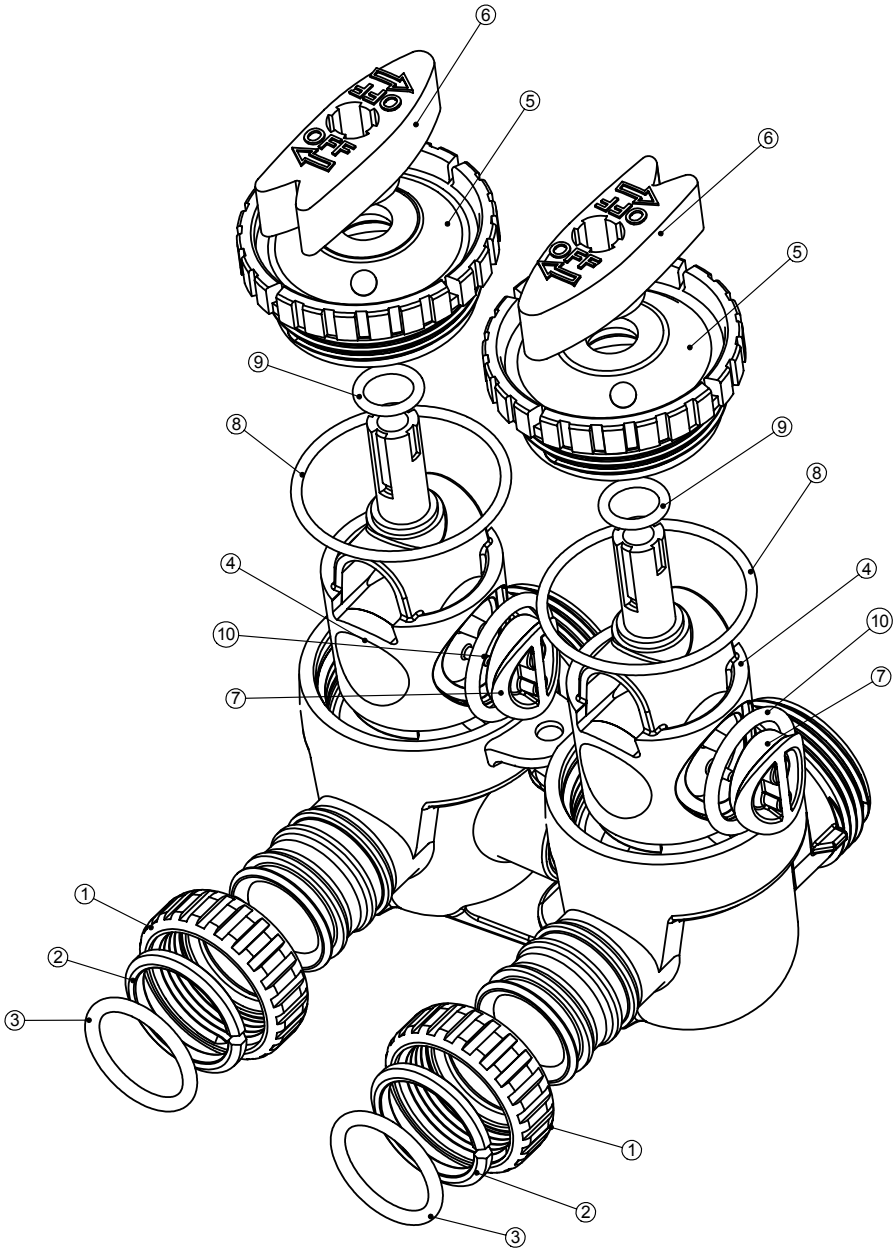
Parts Diagrams

Vertical Adapter Assy (Not Shown)

No.	Part No.	Description	Qty.
Not Shown	02910148	Nut 1" Quick Connect	2
Not Shown	02910147	Split Ring	2
Not Shown	02910126	O-Ring 215	2
Not Shown	02950120	Bypass Vertical Adapter Assy	2

Bypass Valve

No.	Part No.	Description	Qty.
1	02910148	Nut 1" Quick Connect	2
2	02910147	Split Ring	2
3	02910126	O-Ring 215	2
4	02910142	Bypass 1" Rotor	2
5	02910143	Bypass Cap	2
6	02910187	Bypass Handle Gray	2
7	02910144	Bypass Rotor Seal Retainer	2
8	02910149	O-Ring 135	2
9	02910150	O-Ring 112	2
10	02910151	O-Ring 214	2



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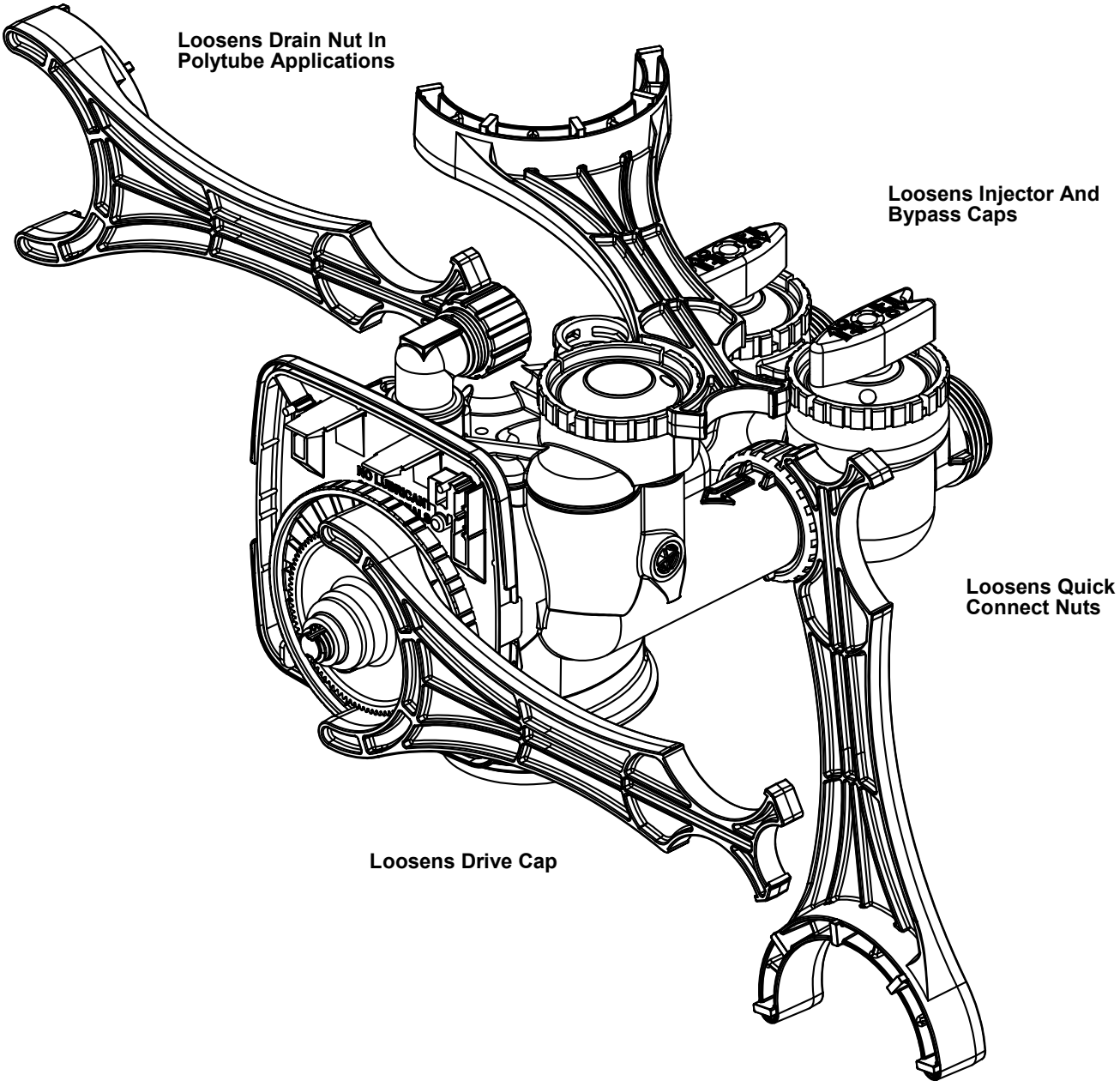
Parts Diagrams

Valve Wrench

No.	Part No.	Description	Qty.
Shown	02950123	Valve Wrench	1



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Service Guide

Drive Assembly

Always unplug the system from the electrical outlet before performing service on the unit.
Remove the valve cover to access the drive assembly.

Disconnect the power source plug (black wire) from the PC board prior to disconnecting the motor or water meter plugs from the PC board. The motor plug connects to the two-pin jack on the left-hand side of the PC board. The power source plug connects to the four-pin jack. The four-pin jack is between the two-pin and three-pin jacks. The water meter plug (gray wire) connects to the three-pin jack on the far right-hand side of the PC board.

The PC board can be removed separately from the drive bracket but it is not recommended. Do not attempt to remove the display panel from the PC board. Handle the board by the edges. To remove the PC board from the drive bracket, unplug the power, water meter and motor plugs from the PC board. Lift the middle latch along the top of the drive bracket while pulling outward on the top of the PC board. The drive bracket has two plastic pins that fit into the holes on the lower edge of the PC board. Once the PC board is tilted about 45° from the drive bracket it can be lifted off of these pins. To reinstall the PC board, position the lower edge of the PC board so that the holes in the PC board line up with the plastic pins. Push the top of the PC board towards the valve until it snaps under the middle latch, weave the power and water meter wires into the holders and reconnect the motor, water meter and power plugs.

The drive bracket must be removed to access the drive cap assembly and pistons or the drive gear cover. It is not necessary to remove the PC board from the drive bracket to remove the drive bracket. To remove the drive bracket start by removing the plugs for the power source and the water meter. Unweave the wires from the side holders. Two tabs on the top of the drive back plate hold the drive bracket in place. Simultaneously lift the two tabs and gently ease the top of the drive bracket towards your body. The lower edge of the drive bracket has two notches that rest on the drive back plate. Lift up and outward on the drive bracket to disengage the notches.

To reassemble seat the bottom of the drive bracket so the notches are engaged at the bottom of the drive back plate. Push the top of the drive bracket towards the two latches. The drive bracket may have to be lifted slightly to let the threaded piston rod pass through the hole in the drive bracket. Maintain a slight engaging force on top of the drive bracket while deflecting the bracket slightly to the left by pressing on the side of the upper right corner. This helps the drive gears mesh with the drive cap assembly. The drive bracket is properly seated when it snaps under the latches on the drive back plate. If resistance is felt before latching, then notches are not fully engaged, the piston rod is not in hole, the wires are jammed between the drive bracket and drive back plate, or the gear is not engaging the drive cap assembly.

To inspect drive gears, the drive gear cover needs to be removed. The drive gear cover is held in place on the drive bracket by three clips. The largest of the three clips is always orientated to the bottom of the drive bracket. Before trying to remove the drive gear cover, the drive bracket must be removed from the drive back plate. The drive gear cover can be removed from the drive bracket without removing the motor or the PC board. Simultaneously, push in and down on the large clip at the bottom and the clip on the left-hand side of the drive bracket behind the PC board. Keep your other fingers behind the drive gear cover so the drive gears do not drop on the ground.

Replace broken or damaged drive gears. Do not lubricate any of the gears. Avoid getting any foreign matter on the

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Service Guide

reflective coating because dirt or oils may interfere with pulse counting.

The drive gear cover only fits on one way, with the large clip orientated towards the bottom. If all three clips are outside of the gear shroud on the drive bracket the drive gear cover slips easily into place.

The drive gear cover only fits on one way, with the large clip orientated towards the bottom. If all three clips are outside of the gear shroud on the drive bracket the drive gear cover slips easily into place.

The drive bracket does not need to be removed from the drive plate if the motor needs to be removed. To remove the motor, disconnect the power and motor plugs from the jacks on the PC board. Move the spring clip loop to the right and hold. Rotate the motor at least a 1/4 turn in either direction before gently pulling on the wire connectors to remove the motor.

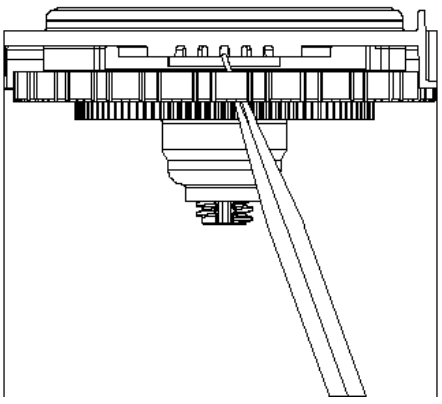
Pulling directly on the wires without rotating the motor may break the wires off the motor.

Replace the motor if necessary. Do not lubricate the motor or the gears. When reinstalling the motor gently turn the motor while inserting so that the gear on the motor meshes with the gears under the drive gear cover and the small plastic bulge engages one of the slots on the motor housing. Reconnect the motor plug to the two pronged jack on the lower left hand side of the PC board. If motor will not easily engage with drive gear when reinstalling, lift and slightly rotate motor before reinserting.

Replace the valve cover. After completing any valve maintenance, press and hold “NEXT” and “REGEN” buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the soft ware version (e.g. 154) and then reset the valve to the service position.

Drive Cap Assembly, Main Piston and Regenerant Piston

The drive assembly must be removed to access the drive cap assembly. The drive cap assembly must be removed to access the piston(s). The drive cap assembly is threaded into the control valve body and seals with an o-ring. To remove the drive cap assembly use the special plastic wrench or insert a 1/4” to 1/2” flat bladed screwdriver into one of the slots around the top 2” of the drive cap assembly so it engages the notches molded into the drive back plate around the top 2” of the piston cavity. (See Figure 5). The notches are visible through the holes. Lever the screwdriver so the drive cap assembly turns counter clockwise. Once loosened unscrew the drive cap assembly by hand and pull straight out.



The drive cap assembly contains the drive cap, the main drive gear, drive cap spline, piston rod and various other parts that should not be dissembled in the field. The only replaceable part on the drive cap assembly is the o-ring. Attached to the drive cap assembly is the main piston (down flow or up flow) and if a regenerant is used, a regenerant piston.

The regenerant piston (the small diameter one behind the main piston) is removed from the main piston by unsnapping it from its latch. Chemically clean in dilute sodium bisulfite or vinegar or replace the regenerant piston if needed. To remove the main down flow or up flow piston fully extend the piston rod and then unsnap the main piston from its latch by pressing on the side with the number. Chemically clean in dilute sodium bisulfite or vinegar or replace the main piston.

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Service Guide

Reattach the main piston to the drive cap assembly. Reattach the regenerant piston (if needed) to the main piston. Do not lubricate the piston rod, main piston or regenerant piston. Lubricant will adversely affect the red or clear lip seals. Reinsert the drive cap assembly and piston into the spacer stack assembly and hand tighten the drive cap assembly. Continue to tighten the drive cap assembly using a screwdriver as a ratchet until the black o-ring on the spacer stack assembly is no longer visible through the drain port.

Excessive force can break the notches molded into the drive back plate. Make certain that the main drive gear still turns freely. The exact position of the piston is not important as long as the main drive gear turns freely.

Tip:
Excessive force can break the notches molded into the drive back plate. Make certain that the main drive gear still turns freely. The exact position of the piston is not important as long as the main drive gear turns freely.

Reattach the drive assembly to the control valve and connect all plugs.
After completing any valve maintenance, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the soft ware version (e.g. 154) and then reset the valve to the service position.

Spacer Stack Assembly

To access the spacer stack assembly remove the drive assembly, drive cap assembly and piston. The spacer stack assembly can be removed easily without tools by using thumb and forefinger. Inspect the black o-rings and red or clear lip seals for wear or damage. Replace the entire stack if necessary. The spacer stack assembly has been 100% tested at the factory to insure proper orientation of one way seals. Do not disassemble the stack.

The spacer stack assembly may be chemically cleaned (dilute sodium bisulfite or vinegar) or wiped with a soft cloth.

The spacer stack assembly can be pushed in to the control valve body bore by hand. Since the spacer stack assembly can be compressed it is easier to use a blunt object (5/8” to 1-1/8” in diameter) to push the center of the assembly into the control valve body. The assembly is properly seated when at least four threads are exposed (approximately 5/8”). Do not force the spacer stack assembly in. The control valve body bore interior can be lubricated with silicone to allow for easy insertion of the entire stack. Do not use silicone or any other type of lubricant on the red or clear lip seals or the piston.

Reattach the drive cap assembly and piston(s) and the drive assembly.

After completing any valve maintenance, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the soft ware version (e.g. 154) and then reset the valve to the service position.

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Service Guide

Injector Cap, Screen, Injector Plug and Injector

Unscrew the injector cap and lift off. Loosen cap with special plastic wrench or pliers if necessary. Attached to the injector cap is a screen. Remove the screen and clean if fouled.

The plug and/or injector can be pried out with a small screwdriver. The plug can be wiped clean. If the plug leaks replace the entire plug. The injector consists of a throat and a nozzle. Chemically clean the injector with vinegar or sodium bisulfite. The holes can be blown out with air. Both pieces have small diameter holes that control the flow rates of water to insure that the proper concentration of regenerant is used. Sharp objects, which can score the plastic, should not be used to clean the injector. Scoring the injector or increasing the diameter of the hole could change the operating parameters of the injector.

Two holes are labeled DN and UP. Check for compliance with one of the following:

a. for down flow systems, the appropriate size injector is located in the “DN” hole, a plug is in the “UP” hole and that the piston is a combination of the down flow main piston and the regenerant piston;
b. for up flow systems, the appropriate size injector is located in the “UP” hole, a plug is in the “DN” hole and that the piston is a combination of the up flow main piston and the regenerant piston; or
c. for backwash only systems, a plug is in the “DN” hole and in the “UP” hole, and that the piston only has a down flow main piston (the regenerant piston must be removed) and a plug is in the refill flow control position.

Push the plug(s) and/or injectors firmly in place, replace the screen and hand tighten the injector cap.

Refill Flow Control Assembly or Refill Port Plug

To clean or replace the refill flow control, pull out the elbow-locking clip and then pull straight up on the elbow. Replace the elbow locking clip in the slot so that it is not misplaced. Twist to remove the white flow control retainer. The flow control can be removed by prying upward through the side slots of the retainer with a small blade flat screwdriver.

Chemically clean the flow control or the white flow control retainer using dilute sodium bisulfite or vinegar. Do not use a wire brush. If necessary, replace the flow control, o-ring on the flow control retainer, or the o-ring on the elbow.

Reseat the flow control so the rounded end is visible in the flow control. Reseat the white flow control retainer by pushing the retainer into the elbow until the o-ring seats. Remove locking clip, push down on elbow to reseat and insert locking clip.

Do not use Vaseline, oils, or other unacceptable lubricants on o-rings. A silicon lubricant may be used on the o-ring on the elbow or the white retainer.

Tip:

Do not use Vaseline, oils, or other unacceptable lubricants on o-rings. A silicon lubricant may be used on the o-ring on the elbow or the white retainer.

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Water Meter or Meter Plug

The water meter assembly is connected to the PC board by a wire. If the entire water meter assembly is to be replaced, remove the control valve cover and remove the power source and water meter plugs from the PC board. Unlatch the drive assembly and lean it forward. Unthread the water meter wire from the side of the drive assembly and through the drive back plate. To reinstall, rethread the water meter wire through the drive back plate and the side of the drive assembly. Reattach the drive assembly and the water meter and power plugs.

If no water meter wire is visible, then a plug is installed not a water meter.

The water meter wire does not need to be removed from the PC board if the water meter is only being inspected and cleaned. To remove the water meter assembly, unscrew the meter cap on the left side of the control valve. Pliers may be used to unscrew the nut if necessary.

With the nut removed, a slot at the top of the water meter is visible. Twist a flat blade screwdriver in the slot between the control valve body and the meter. When the meter is part way out it is easy to remove the water meter from the housing. Once the water meter is removed from the control valve body, use your fingers to gently pull forward on the turbine to remove it from the shaft.

Do not use a wire brush to clean. Wipe with a clean cloth or chemically clean in dilute sodium bisulfite or vinegar. The turbine can be immersed in the chemical. Do not immerse electronics. If the turbine is scored or damaged or the bearings on the turbine are worn replace the turbine.

Do not lubricate the turbine shaft. The turbine shaft bearings are prelubricated. Do not use Vaseline, oils, or other unacceptable lubricants on the o-ring. A silicon lubricant may be used on the black o-ring.

Snap the turbine on the shaft and reinsert the water meter into the side slot. Hand tighten the nut. Do not use a pipe wrench to tighten nut.

Bypass Valve

The working parts of the bypass valve are the rotor assemblies that are contained under the bypass valve caps. Before working on the rotors, make sure the system is depressurized. Turn the gray arrow shaped handles towards the center of the bypass valve and back to the arrow direction several times to ensure rotor is turning freely.

The nuts and caps are designed to be unscrewed or tightened by hand. If necessary a pliers can be used to unscrew the nut or cap. Do not use a pipe wrench to tighten or loosen nuts or caps. Do not place screwdriver in slots on caps and/or tap with a hammer.
To access the rotor, unscrew the cap and lift the cap, rotor and handle out as one unit. Twisting the unit as you pull it out will help to remove it more easily. There are three o-rings: one under the rotor cap, one on the rotor stem and the rotor seal. Replace worn o-rings. Clean rotor. Reinstall rotor.

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When reinstalling the gray arrow handles be sure that:

1. O-rings on both rotors face to the right when being viewed from the front of the control valve when the handle pointers are lined up with the control valve body arrows; or
2. Arrows point toward each other in the bypass position.

Since the handles can be pulled off, they could be accidentally re-installed 180˚ from their correct orientation. To install the gray arrow handles correctly, keep the handles pointed in the same direction as the arrows engraved on the control valve body while tightening the bypass valve caps.

Tip:

After completing any valve maintenance, press and hold “NEXT” and “REGEN” buttons for 3 seconds or unplug power source jack (black wire) and plug back in.

After completing any valve maintenance, press and hold “NEXT” and “REGEN” buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the software version (e.g. 154) and then reset the valve to the service position.

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Troubleshooting

Problem	Possible Cause	Solution
1. Timer does not display time of day	a. Transformer unplugged	a. Connect power
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective transformer	c. Replace transformer
	d. Defective PC board	d. Replace PC board
2. Timer does not display correct time of day	a. Switched outlet	a. Use uninterrupted outlet
	b. Power outage	b. Reset time of day
	c. Defective PC board	c. Replace PC board
3. No softening/filtering display when water is flowing	a. Bypass valve in bypass position	a. Put bypass valve in service position
	b. Meter connection disconnected	b. Connect meter to PC board
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
4. Control valve regenerates at wrong time of day	a. Power outages	a. Reset control valve to correct time of day
	b. Time of day not set correctly	b. Reset to correct time of day
	c. Time of regeneration incorrect	c. Reset regeneration time
	d. Control valve set at “on 0” (immediate regeneration)	d. Check control valve set-up procedure regeneration time option
	e. Control valve set at NORMAL + on 0	e. Check control valve set-up procedure regeneration time option
5. SYSTEM ERROR – Red Screen showing “ERROR”; screen also lists cause of error (see example below), some possible solutions are listed to the right. If not easily resolved, call an authorized dealer for service. If programmed in, the dealer phone number will show on one of the rotating screen displays.	a. Control valve has just been serviced	a. Press NEXT and REGEN for 3 seconds or unplug power source jack (black wire) and plug back in to reset control valve
	b. Foreign matter is lodged in control valve	b. Check piston and spacer stack assembly for foreign matter
	c. High drive forces on piston	c. Replace piston(s) and spacer stack assembly
	d. Control valve piston not in home position	d. Press NEXT and REGEN for 3 seconds or unplug power source jack (black wire) and plug back in to reset control valve
	e. Motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure	e. Check motor and wiring. Replace motor if necessary
	f. Drive gear label dirty or damaged, missing or broken gear	f. Replace or clean drive gear
	g. Drive bracket incorrectly aligned to back plate	g. Reseat drive bracket properly
	h. PC board is damaged or defective	h. Replace PC board
	i. PC board incorrectly aligned to drive bracket	i. Ensure PC board is correctly snapped on to drive bracket

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Troubleshooting

Problem	Possible Cause	Solution
6. Control valve stalled in regeneration	a. Motor not operating	a. Replace motor
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective transformer	c. Replace transformer
	d. Defective PC board	d. Replace PC board
	e. Broken drive gear or drive cap assembly	e. Replace drive gear or drive cap assembly
	f. Broken piston retainer	f. Replace drive cap assembly
	g. Broken main or regenerate piston	g. Replace main or regenerate piston
7. Control valve does not regenerate automatically when REGEN button is depressed and held	a. Transformer unplugged	a. Connect transformer
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Broken drive gear or drive cap assembly	c. Replace drive gear or drive cap assembly
	d. Defective PC board	d. Replace PC board
8. Control valve does not regenerate automatically but does when REGEN button is depressed	a. By-pass valve in bypass position	a. Put bypass valve in normal operation position
	b. Meter connection disconnected	b. Connect meter to PC board
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign matter
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
	f. Set-up error	f. Check control valve set-up procedure
9. Time of day flashes on and off	a. Power has been out and the battery has expired, or the NEXT and REGEN buttons were pressed to reset the control.	a. Replace battery (type CR2032) if it has expired b. Reset the time of day

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Troubleshooting

Additional Notes on Trouble Shooting Problems:

Regeneration: The amount of regeneration time varies between specific models, but is generally less than one hour. Water should not be used during this time period. If water is used, un-treated water will pass to the facility water lines. If hot water is used, the un-treated water will get into the water heater. Once un-treated water is in the heater it will taint all of the water in the heater. If un-treated water reaches the water heater, it may take several days to flush out. Water usage during regeneration can result in consistent or intermittent break through of iron and/or sulfur.

Be sure that water-using appliances, such as a humidifier, are not pulling water during regeneration. If you require 24-hour service from your AIF, with no interruptions, it can be achieved with additional and/or optional equipment.

Excessive Water Usage: The Eradicator AIF systems are not designed to handle excessive water consumption. In no circumstances should an AIF system be used for outside watering, irrigation systems, filling of pools or hot tubs, or any other similar circumstance. Water for these purposes should be treated separately. Using an AIF for any of these, or similar, uses will result in poor performance, and damage to the system.

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Notes

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