



**INSTALLATION, OPERATION,
and SERVICE INSTRUCTIONS
with Parts Lists**

**Aquasential™
Select Plus™
Iron-OX5™ &
Sulfur-OX3™
Water Filters**

Models from 2021



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Introduction

Read this Manual First

Before you operate the Culligan® Aquasential™ Select Plus™ Iron-OX5 & Sulfur-OX3™ Water Filters systems, read this manual to become familiar with the device and its capabilities. This product is designed to meet the needs of applications for high quality water. This manual contains important information about the unit, including information needed for installation, operating, and maintenance procedures. A troubleshooting section provides a guide for quick and accurate problem solving.

The Culligan® Aquasential™ Select Plus Iron-OX5™ water filter systems have been tested and certified by WQA against NSF/ANSI Standard 372, CSA B483.1, and NSF/ANSI Standard 42 for the effective reduction of iron up to 500 gallons as verified and substantiated by test data.

The Culligan® Aquasential™ Select Plus Sulfur-OX3™ water filter systems have been tested and certified by WQA against NSF/ANSI Standard 372, CSA B483.1, and NSF/ANSI Standard 42 for the effective reduction of hydrogen sulfide up to 500 gallons as verified and substantiated by test data.

The Culligan® Aquasential™ Select Plus Iron-OX5™ Outdoor water filter systems have been tested and certified by WQA against NSF/ANSI Standard 372 and NSF/ANSI standard 42 for the effective reduction of iron up to 500 gallons as verified and substantiated by test data.

The Culligan® Aquasential™ Select Plus Sulfur-OX3™ Outdoor water filter systems have been tested and certified by WQA against NSF/ANSI Standard 372 and Standard NSF/ANSI 42 for the effective reduction of hydrogen sulfide up to 500 gallons as verified and substantiated by test data.

In order for the water treatment system to continue to provide high quality water, you must develop a thorough understanding of the system and its operation. Review this manual before making any attempt to install, operate, or service the system. Installation or maintenance done on this system by an untrained service person can cause major damage to equipment or property damage.

Licensed plumbers know that standard industry procedures include only to hand tighten or use strap wrenches on plastic parts. Plastic piping systems must be installed, operated and maintained in accordance with accepted standards and procedures. Not adhering to the recommended service/maintenance can cause damage to equipment or property damage.

This manual is based on information available at the time it was finalized, approved, and published. Continuing design refinement could cause changes that may not be included in this publication.

Your local independently operated Culligan dealer employs trained service and maintenance personnel who are experienced in the installation, function and repair of Culligan equipment. This publication is written specifically for these individuals and is intended for their use.

We encourage Culligan users to learn about Culligan products, but we believe that product knowledge is best obtained by consulting with your Culligan dealer. Untrained individuals who use this manual assume the risk of any resulting property damage or personal injury.

NOTE! This system and its installation must comply with state and local regulations. The use of saddle valves is not permitted.

An Owners Guide is available online; it contains answers to most questions, system operation information, suggested maintenance, and a trouble shooting section.
www.culligan.com/support/product-information/product-manuals

This system is to be supplied with cold water only.



Safety Instructions and Safety Definitions

Throughout this manual there are paragraphs set off by special headings.

Note

NOTE! “Note!” is used to emphasize installation, operation or maintenance information which is important, but does not present any hazard.

Caution



CAUTION!

“Caution” is used when failure to follow directions could result in damage to equipment or property.

Warning



WARNING!

“Warning” is used to indicate a hazard which could cause injury or death if ignored.

The **CAUTION** and **WARNING** paragraphs are not meant to cover all possible conditions and situations that may occur. It must be understood that common sense, caution, and careful attention are conditions which cannot be built into the equipment. These **MUST** be supplied by the personnel installing, operating, or maintaining the system.

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Attention Service Technician:

This publication is written specifically for, and is intended to be used by, trained service and maintenance personnel who are experienced in the installation, function and repair of Culligan equipment. Untrained individuals who use this manual assume the risk of any resulting property damage and/or personal injury.

NOTE! Please send any suggestions for improving this manual to productmanuals@culligan.com

Be sure to check and follow the applicable plumbing codes and ordinances when installing this equipment.



WARNING!

Electrical shock hazard! Prior to servicing equipment, disconnect power supply to prevent electrical shock.

WARNING!

If incorrectly installed, operated, or maintained, this product can cause severe injury. Those who install, operate, or maintain this product should be trained in its proper use, warned of its dangers, and should read the entire manual before attempting to install, operate, or maintain this product. Failure to comply with any warning or caution that results in any damage will void the warranty.

WARNING!

Use protective clothing and proper face or eye protection equipment when handling chemicals or power tools.



CAUTION!

This product is not to be used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, unless they have been given supervision or instruction. Children should be instructed not to play with this appliance.

CAUTION!

If the power cord from the power supply to the unit looks or becomes damaged, the cord and power supply should be replaced by a Culligan Service Agent or similarly qualified person in order to avoid a hazard.

CAUTION!

To reduce the risk of fire, use only No. 26 AWG or larger telecommunications line cord.

NOTE! This system is not intended for use with water that is microbiologically unsafe or of unknown quality without adequate disinfection either before or after the system.

Check your applicable local plumbing and sanitation codes. Follow local codes if they differ from the standards used in this manual. To ensure proper and efficient operation of this Culligan product to your full satisfaction, carefully follow the instructions in this manual.

This system is to be supplied with cold water only.

Specifications

Culligan Aquasential Select Plus Iron-OX5 & Sulfur-OX3 Filters

	10" Iron-OX5 Outdoor	10" Sulfur-OX3 Outdoor
Control Valve	1" reinforced thermoplastic with Accusoft electronics	1" reinforced thermoplastic with Accusoft electronics
Overall Conditioner Height	67"	67"
Media Tank Dimensions (D x H)	10" x 54"	10" x 54"
Filter Media Type	1.0 ft³ Birm	1.0 ft³ Cullar S
Underbedding		
G-50	35 lb	—
Cullsan U	25 lb	—
Cullsan	—	20 lbs.
Capacity ¹	500 gallons	500 gallons
Freeboard ²	21"	29"
Max. Clear Water (Soluble) Iron	5 ppm	not rated
Rated Hydrogen Sulfide	not rated	1 ppm
Max. Hydrogen Sulfide ⁵	not rated	3 ppm
Minimum Alkalinity	100 ppm	100 ppm
pH for Iron Removal ³	7.0 - 8.5	—
pH for Hydrogen Sulfide Removal ⁶	—	7.0 - 8.5
Service Flow @ Pressure Drop (Clean Bed)		
Normal	4 gpm @ 5 psi	4 gpm @ 2.9 psi
Maximum ⁴	6 gpm @ 9 psi	6 gpm @ 9 psi
Operating Pressure	20-60 psi	20-60 psi
Operating Temperature	33-120° F (1-48° C)	33-120° F (1-48° C)
Electrical Requirements	24 Volts/60 Hz	24 Volts/50-60 Hz
Power Consumption, Continuous/Maximum	3 Watts/10 Watts	3 Watts/10 Watts
Drain Flow	5.5 gpm	5.5 gpm
Reconditioning Time		
Backwash	15 minutes	15 minutes
Air Draw	40 minutes	40 minutes
Fast Rinse	5 minutes	5 minutes

¹ Capacity based on 4 gpm and 5 mg/L of dissolved iron for Iron-OX5 and 4 gpm and 3 mg/l of hydrogen sulfide for Sulfur-OX3.

² Measure from top of media bed to top of inlet fitting.

³ Not recommended for Hydrogen Sulfide removal.

⁴ Max flow rates and pressure drop characteristics have not been validated by the Water Quality Association. The maximum specified flow rate as validated by the Water Quality Association is defined as normal service flow.

⁵ Not validated by Water Quality Association - based on Culligan International lab testing

⁶ Not recommended for iron removal.

Preparation

Component Description

The water system is shipped from the factory in several cartons. With the exception of media containers, open the remaining containers, remove all the components, and inspect them before starting installation.

Control Valve Assembly

Includes the Aquasential Select Plus control valve, flow meter, inlet check valve, and the bypass valve. Small parts packages will contain additional installation hardware.

Media Tank

Includes one tank complete with manifold and inlet strainer.

Filter Media

The Sulfur-OX3 system includes one cubic foot of Cullar S Catalytic Carbon and 20 lbs. of Cullsan underbedding to be used in this system.

The Iron-OX5 system includes one cubic foot of Birm, 50 lbs of G-50 media and 25 lbs of Cullsan U underbedding. Note: Only 35 lbs of G-50 is used in this system.

Install Kit

Small parts pack including inlet check valve, air line check valve, air line strainer, the required no-refill eductor sleeve, backwash flow control and installation hardware.

Tools and Materials

The following are necessary components for installation.

NOTE! System should be installed only on cold water supply.

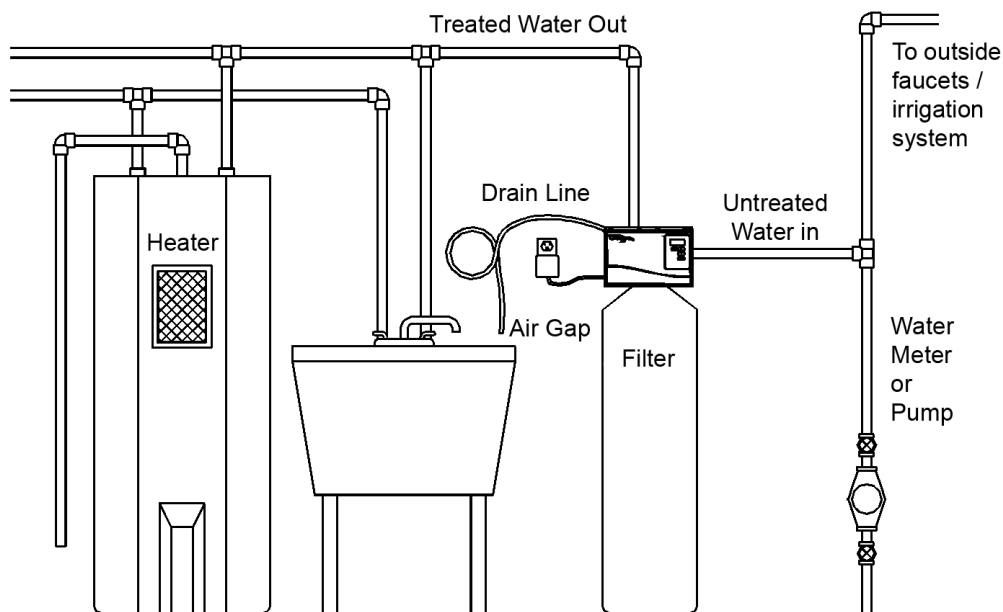
Materials

- Plastic tubing, 3/8" (P/N 01009819 or equivalent) for air line check valve and air line strainer
- Drain line, 1/2" (P/N 00303082, gray, semi-flexible; or P/N 00331946, black, semi-rigid; or equivalent)
- Thread sealing tape
- Pressure reducing valve (if pressure exceeds 60 psi [414 kPa])
- Pipe and fittings suited to the type of installation

Position the Media Tank

Determine the installation location and position the media tank prior to loading filter media. It may be difficult to move the tank after media is loaded.

Figure 1. Iron-OX5 and Sulfur-OX3 filter system placement.



Location

Set the media tank in the location where it will be installed.

Placement

Refer to [Figure 1](#) for system placement.

- Set the media tank on a solid, level surface near water, drain and electrical facilities.
- As you face the system, the inlet will be on the right and the outlet will be on the left.

Space Requirements

Allow 6-12 inches (15-30 cm) behind the unit for plumbing and drain lines and 4 feet (1.3 meters) above for service access.

Floor Surface

Choose an area with solid, level floor, free of bumps or irregularities.

Drain Facilities

Choose a nearby drain that can handle the rated drain flow (floor drain, sink or stand pipe).

NOTE! Most codes require an anti-siphon device or air gap for the drain line. Observe all local plumbing codes and drain restrictions. The system and installation must comply with all state and local laws and regulations.

Electrical Facilities

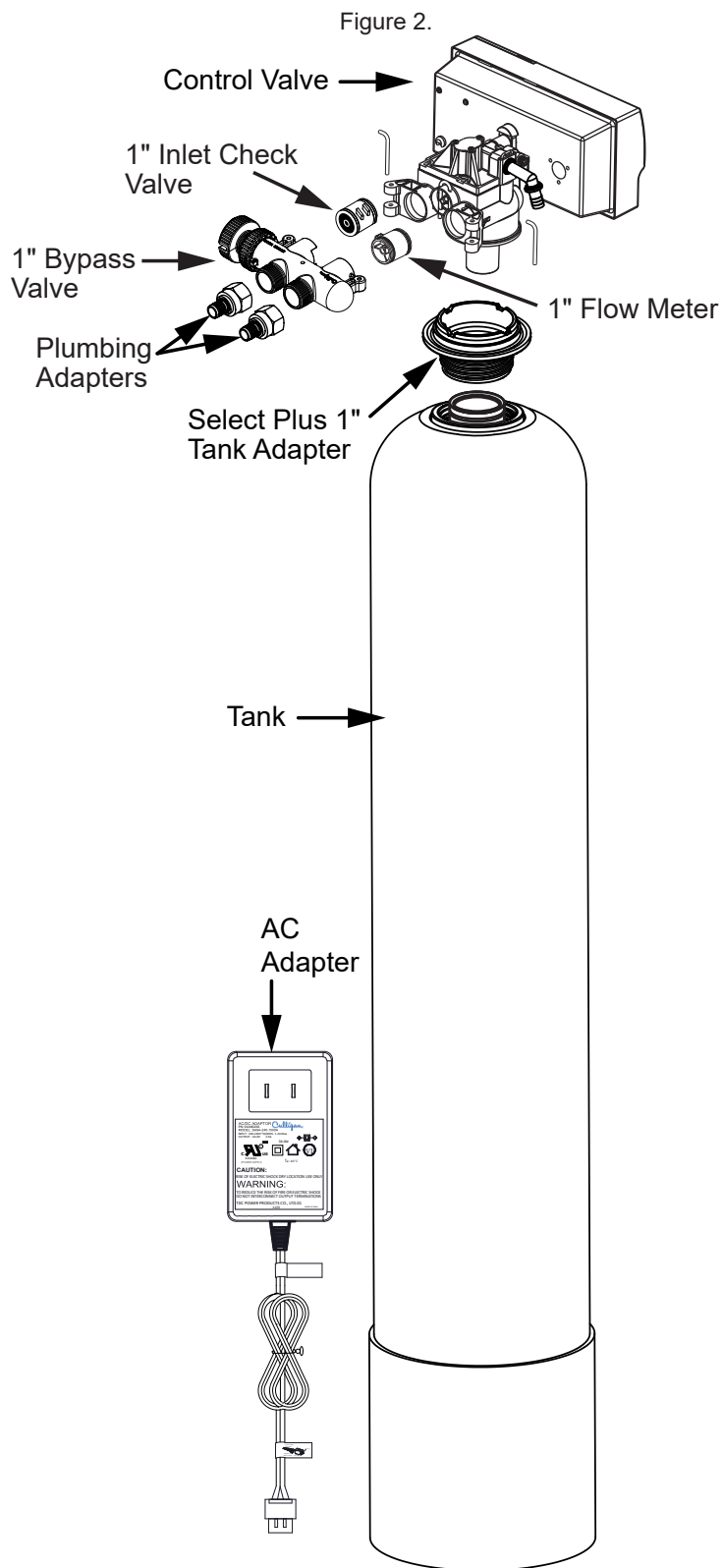
A wall mount plug-in power supply with a 20-foot cord is provided. The customer should provide an electrical outlet that is not controlled by a switch that can be turned off accidentally. Observe local electrical codes. For Outdoor use with a UL Listed Class 2 Direct Plug-in Power Unit only.

Installation

NOTE! Read this section entirely before starting the installation. Check and comply with your state and local codes. You must follow all applicable plumbing and electrical guidelines.

Select Plus OX System Components

The major system components are illustrated in [Figure 2](#).



Filter Media Loading – Iron-OX5

Table 1. Iron-OX5 Media Quantities.

Size	Cullsan U (lb)	G-50 (lbs)	Birm (ft ³)	Freeboard (inches)
10" Filter	25	35	1.0	21

1. Position the tank in the desired installation location.
2. Remove the inlet strainer by turning it counter-clockwise.
3. Position the outlet manifold in the tank.
4. Cover the top of the manifold with a clean rag to prevent filter media from entering the manifold during filling.
5. Using a large-mouth funnel, load the Culligan Cullsan U underbedding through the top of the tank. See [Table 1](#).
6. Load the G-50 media (only 35 lbs. of the 50 lb bag is used). Leveling is required. See [Table 1](#).
7. Load the Birm media. See [Table 1](#).
8. Remove the funnel.
9. Using a hose, top off the tank with water to bring the water level to within a few inches of the top opening and add 2 ounces of 6% liquid chlorine bleach to the tank for sanitization.
10. Install the inlet strainer making sure to thread the strainer until it bottoms out on the tank thread. Failure to install the strainer correctly can cause the control to leak.



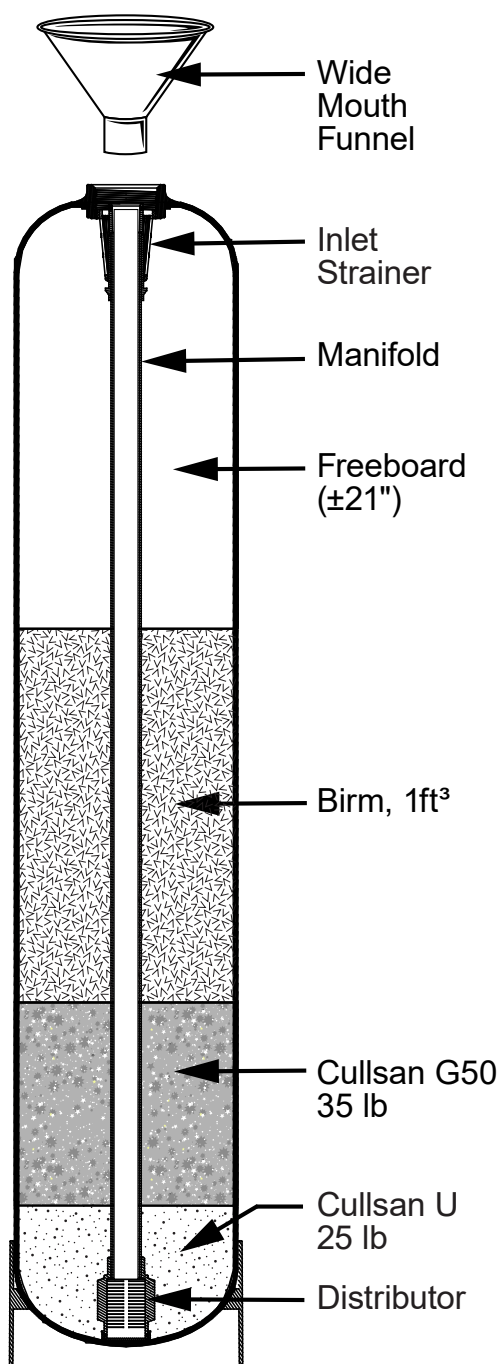
CAUTION!

Once the tank is full do not lay it down as this will disrupt the filter media and result in poor performance.

CAUTION!

DO NOT allow the outlet manifold to move when loading the media. The manifold must remain vertical to ensure a good seal at the o-ring. Rap the tank near the bottom with a rubber mallet to level the sand.

Figure 3. Iron-OX5 Media Tank Cross Section



Filter Media Loading – Sulfur-OX3

Table 2. Sulfur-OX3 Media Quantities.

Size	Cullsan (lb)	Cullar S (ft³)	Freeboard (inches)
10" Filter	20	1.0	29

NOTE! Cullar S Catalytic Activated Carbon media must be soaked for 24-48 hours before being put into service. In-plant prep is highly recommended.

Figure 4. Iron-OX5 Media Tank Cross Section

1. Position the tank in the desired installation location.
2. Remove the inlet strainer by turning it counter-clockwise.
3. Position the outlet manifold in the tank.
4. Cover the top of the manifold with a clean rag to prevent filter media from entering the manifold during filling.
5. Using a large-mouth funnel, load the Culligan Cullsan underbedding through the top of the tank. See [Table 2](#).
6. Load the tank with Cullar S media. Leveling is required. See [Table 2](#).
7. Remove the funnel.
8. Using a hose, top off the tank with water to bring the water level to within a few inches of the top opening and add 2 ounces of 6% liquid chlorine bleach to the tank for sanitization.
9. Install the inlet strainer making sure to thread the strainer until it bottoms out on the tank thread. Failure to install the strainer correctly can cause the control to leak.

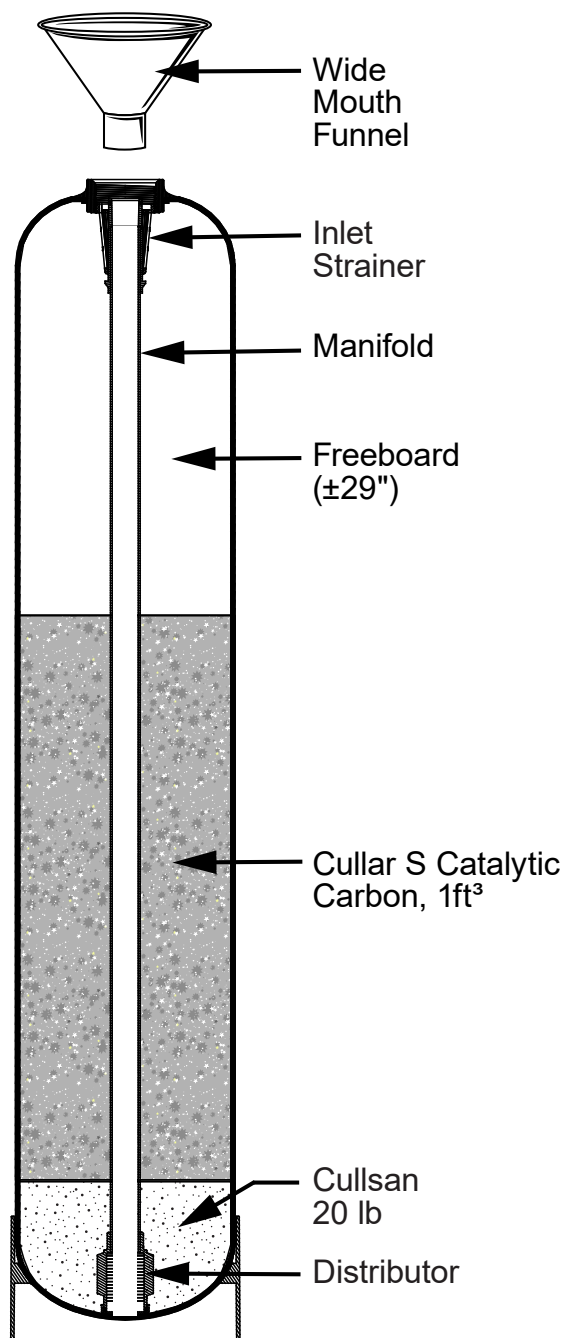


CAUTION!

Once the tank is full do not lay it down as this will disrupt the filter media and result in poor performance.

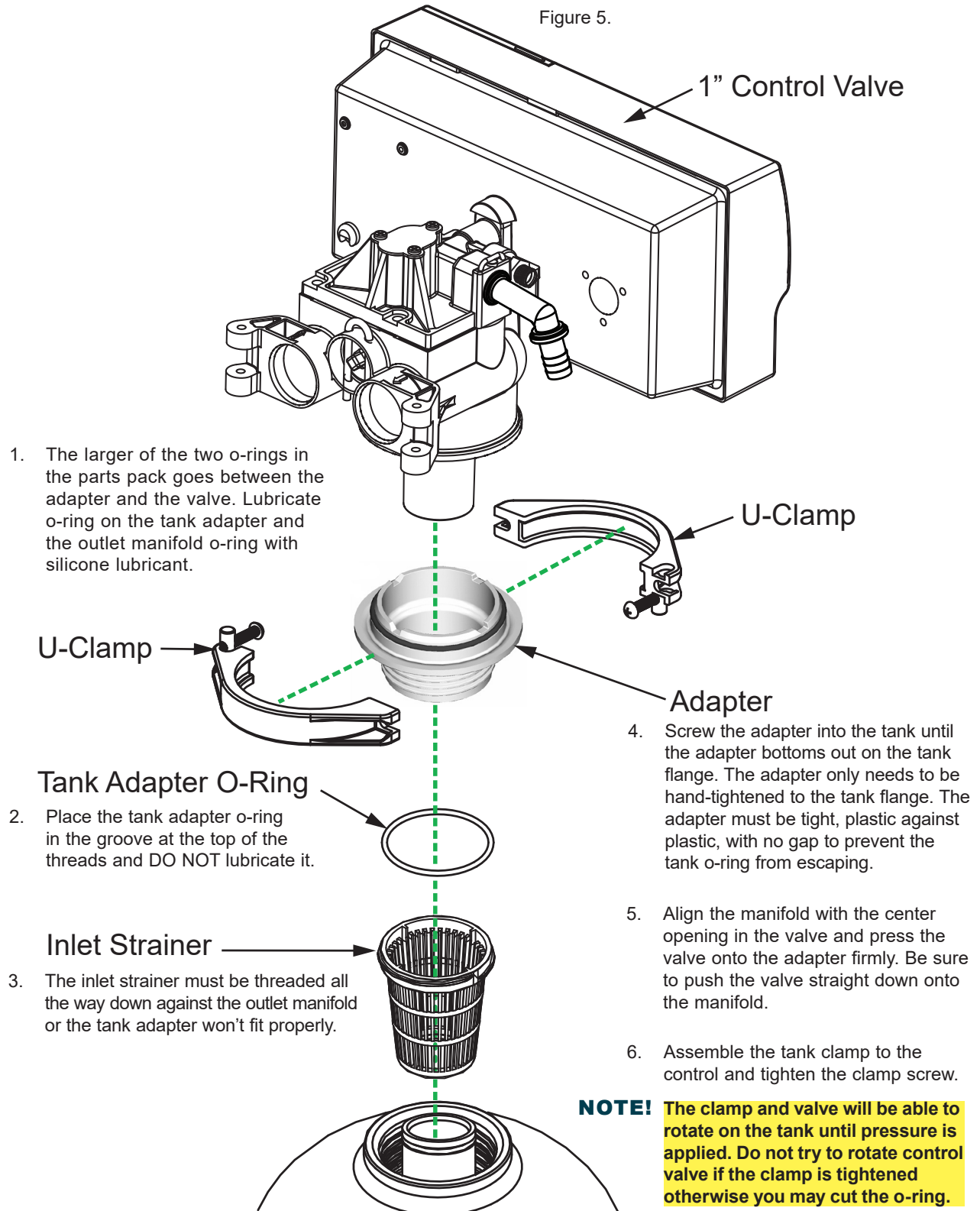
CAUTION!

DO NOT allow the outlet manifold to move when loading the media. The manifold must remain vertical to ensure a good seal at the o-ring.



Mount the Control Valve

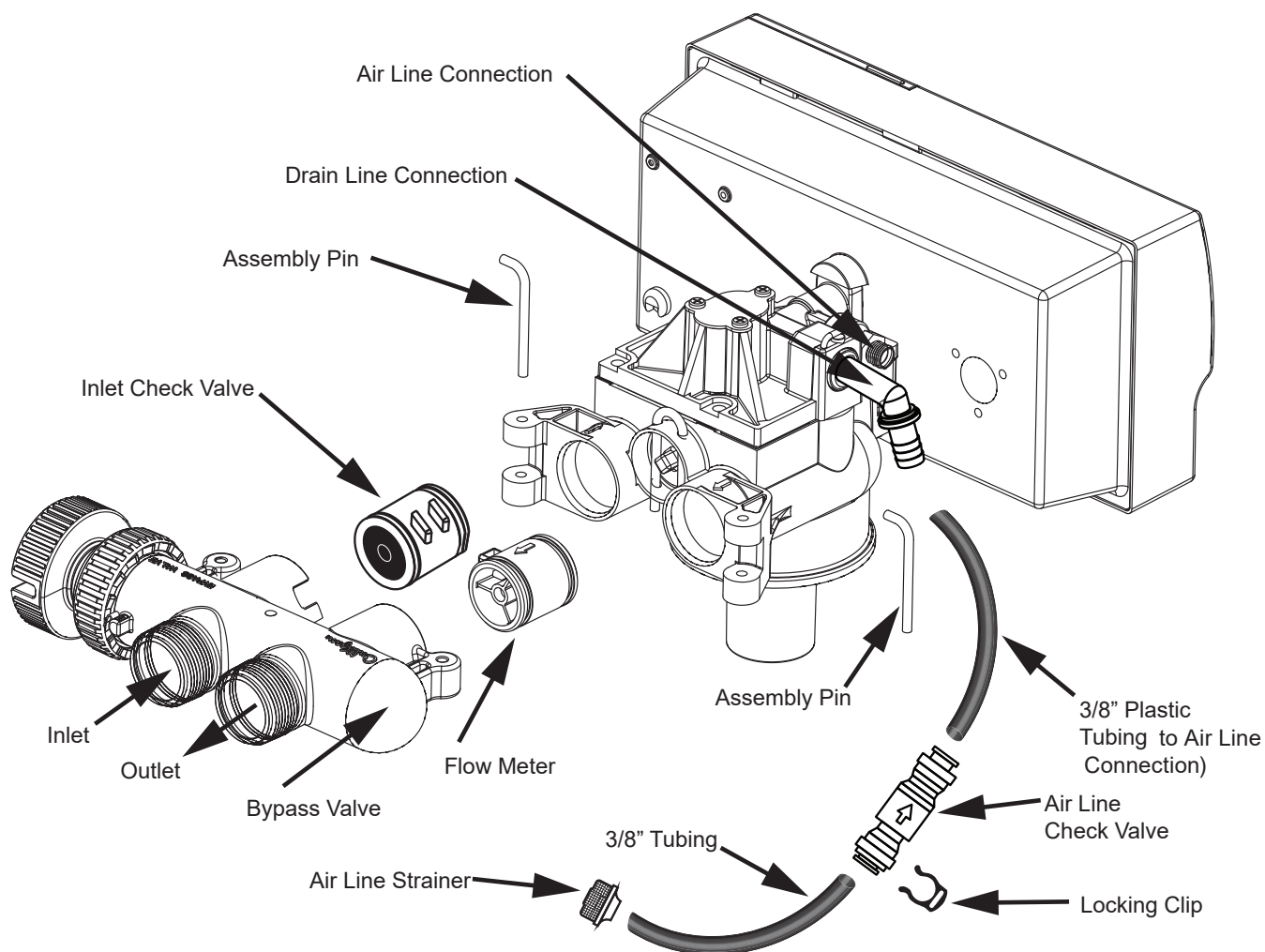
See [Figure 5](#) for a visual on mounting the control valve to the tank.



Bypass Valve and Air Line Check Valve Assembly Installation

The bypass valve connects directly to the control valve with the inlet check valve, the flow meter and two assembly pins (Figure 11). Lubricate all o-rings on the inlet check valve and flow meter with silicone lubricant. Make sure that the inlet check valve is installed on the inlet side of the control where the arrow points toward the control valve. The arrow on the check valve also needs to point toward the control valve. The flow meter is installed on the outlet side of the control valve where the arrow points away from the valve. (Figure 6).

Figure 6.



NOTE! If the ground from the electrical panel or breaker box to the water meter or underground copper pipe is tied to the copper water lines and these lines are cut during installation of the bypass valve, an approved grounding strap must be used between the two lines that have been cut in order to maintain continuity.

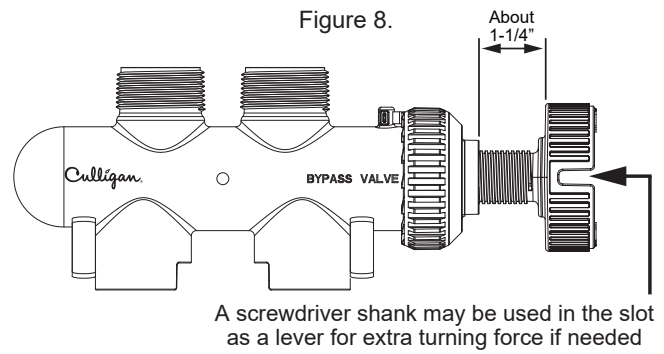
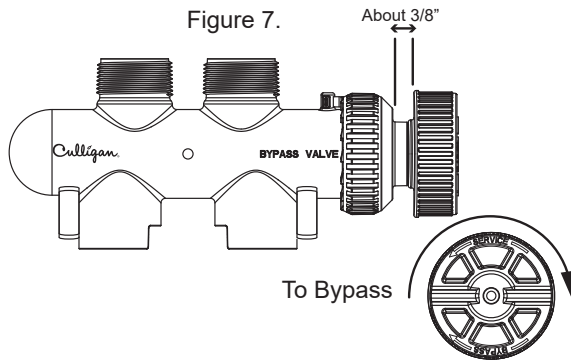
The length of the grounding strap will depend upon the number of units being installed. In all cases where metal pipe was originally used and is later interrupted by the bypass valve to maintain proper metallic pipe bonding, an approved ground clamp c/w not less than #6 copper conductor must be used for continuity.

Check your local electrical code for the correct clamp and cable size.

Bypass Valve

To bypass, turn the blue knob clockwise (see directional arrow on end of knob) until the knob stops as shown. ("Figure 7.") DO NOT OVERTIGHTEN!

To return to service, turn the blue knob counter-clockwise until the knob stops as shown. ("Figure 8.") (See directional arrow on the end of knob) DO NOT OVERTIGHTEN!



Plumbing Connections

- Take the time to perform a clean installation. Foreign objects, if allowed to enter the piping, can enter the control valve and cause operational problems.
- Once the plumbing is connected to the bypass, the main water supply line may then be reopened so that unfiltered water will be available to the household throughout the remainder of the installation process. Set the Cul-Flo-Valve Bypass in the bypass position by screwing the stem all the way in against the body.



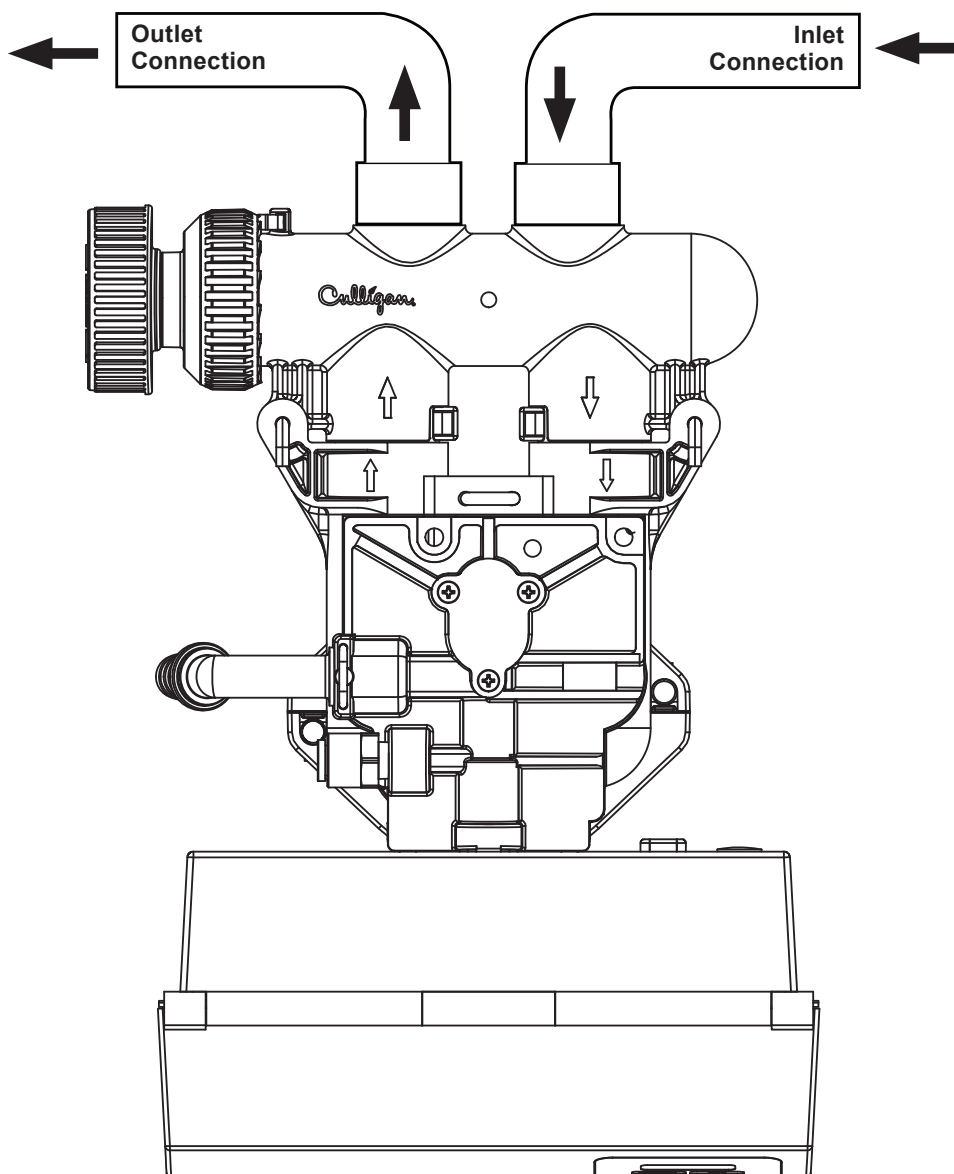
CAUTION!

Close the inlet supply line and relieve system pressure before cutting into the plumbing! Flooding could result if not done!

CAUTION!

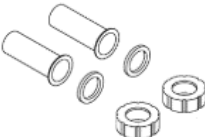

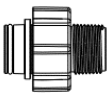



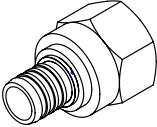
When making sweat connections, remove all plastic and rubber components which contact brass or copper. Damage to these components may result from heating solder joints.

Figure 9. Plumbing Connection - Top View



Bypass Connections

The bypass valve can be directly plumbed into the system, or can be connected with the following optional connection kits.

P/N	Description	Pipe Size	Fitting Type	Qty.	Control Valve	Adapter Image
01010783	Select Plus	1"	Copper Tube	Straight	1 Set	
P1009856	Select Plus/ Select	3/4" and 1"	Copper Plumbing Adapters	Gasket	25 ea	
P10vv18758	Select Plus	1"	Plastic - PVC Threaded MNPT	Straight	5 Sets	
P1018757	Select Plus	1"	Plastic - PVC Threaded MNPT	90° Elbow	5 Sets	
MS030226	Select Plus	1"	John Guest - CTS	Straight	1 Fitting	
MS030225	Select Plus	1"	John Guest - CTS	90° Elbow	1 Fitting	
MS030451	Select Plus	1"	Boshart - Brass to PEX	Straight	1 Fitting	
MS030449	Select Plus	1"	Boshart - Brass to PEX	Straight	1 Fitting	

NOTE! CTS = Copper Tube Size

Drain Line Connection

Refer to [Table 3](#) for drain line length and height limitations.

1. Fasten the drain line to the elbow with the hose.
2. Secure the drain line to prevent its movement during regeneration. When discharging into a sink or open floor drain, a loop in the end of the tube will keep it filled with water and will reduce splashing at the beginning of each regeneration.

NOTE! Waste connections or drain outlets shall be designed and constructed to provide for connection to the sanitary waste system through an air gap as required by the local plumbing code.

The system and installation must comply with state and local laws and regulations.

Figure 10.

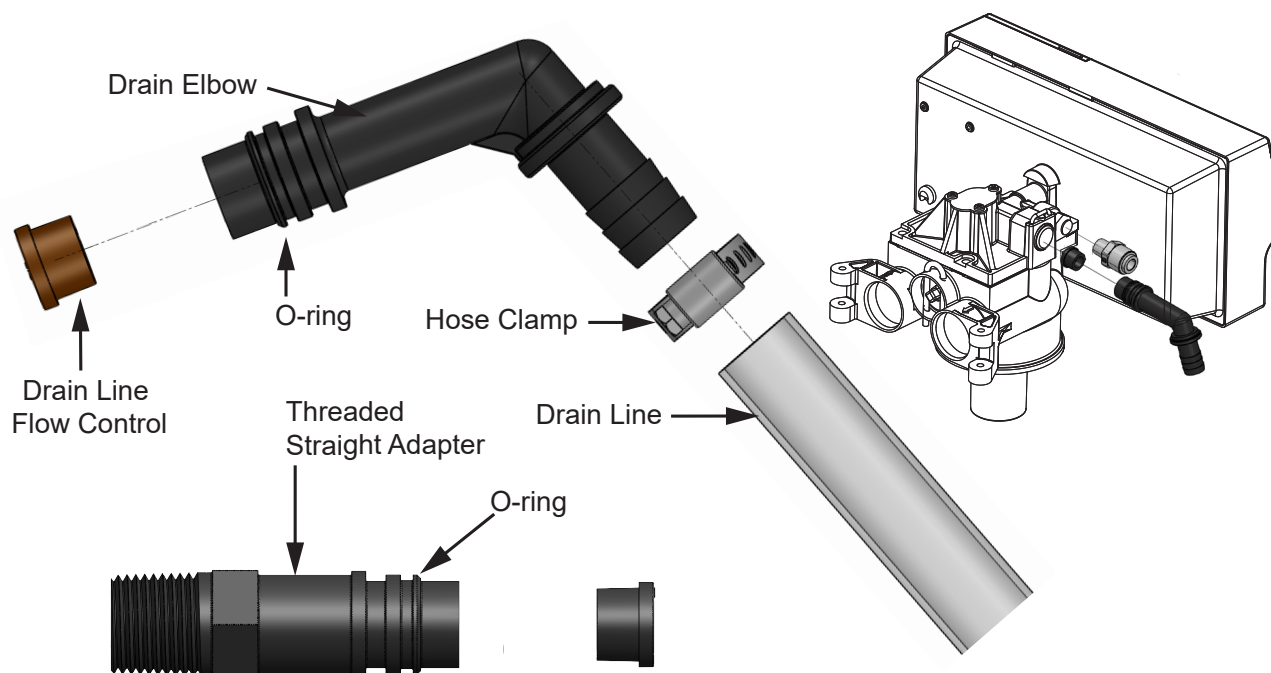


Table 3. Maximum Allowable Drain Line Length

Height of Discharge Above Floor Level Operating						
Operating Pressure	0 ft (0 m)	2 ft (0.6 m)	4 ft (1.2 m)	6 ft (1.8 m)	8 ft (2.4 m)	10 ft (3 m)
30 psi (210 kPa)	60 ft (18 m)	50 ft (15 m)	30 ft (9 m)	15 ft (5 m)	Not allowable	Not allowable
40 psi (279 kPa)	100 ft (30 m)	90 ft (27 m)	70 ft (21 m)	50 ft (15 m)	30 ft (9 m)	12 ft (4 m)
50 psi (349 kPa)	145 ft (41 m)	115 ft (35 m)	80 ft (24 m)	80 ft (24 m)	60 ft (18 m)	40 ft (12 m)
60 psi (419 kPa)	Normal installation		100 ft (30 m)	100 ft (30 m)	85 ft (26 m)	60 ft (18 m)
80 psi (559 kPa)	Should not require more than				140 ft (43 m)	120 ft (37 m)
100 psi (699 kPa)	100 ft (30 m) of drain line					150 ft (46 m)

Eductor Assembly Modifications for OX Systems

Refer to [Figure 11 on page 18](#) and the following instructions for the required replacement of the eductor nozzle and throat for OX systems.

1. Remove the three screws and the eductor plate.
2. Remove the eductor screen by lifting it from the eductor body.
3. Remove the eductor body by grasping one of the projections with the pliers and gently pulling upward.
4. Reverse the procedure to reassemble. Be certain that the replacement eductor body contains the correct eductor nozzle.

Table 4. Eductor Selection

Model	Nozzle Color	Throat	Nozzle with O-Ring P/N
10" Aquasential Select Plus Iron-OX5 or Sulfur-OX3	Green	Beige	P1024333 - 10 ea.

Backwash Flow Control

Refer to [Figure 10 on page 17](#) and the following instructions for replacement of the drain line flow control:

1. Remove the drain elbow retaining clip from the valve body.
2. Pull the drain elbow from the valve body.
3. Remove the flow control from the valve body and replace with a new flow restrictor.

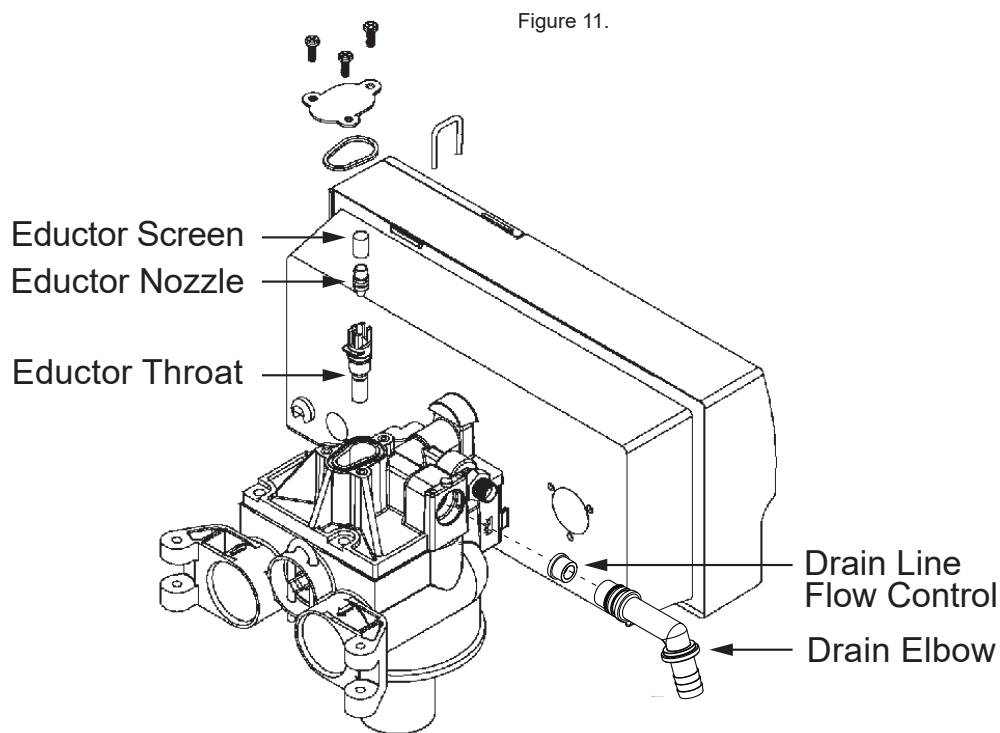
NOTE! The number on the backwash flow control should face into the valve body.

4. Reverse the procedure to reassemble. Be certain that the replacement is the correctly sized flow restrictor.

Table 5. Backwash Flow Restrictor Selection

Model	Color & Number	P/N
10" Aquasential Select Plus Iron-OX5 or Sulfur-OX3	Black, 5.5 GPM	P0401031 - 10 ea.

Refer to [Figure 11](#) for a visual on changing the eductor nozzle and the backwash flow control.



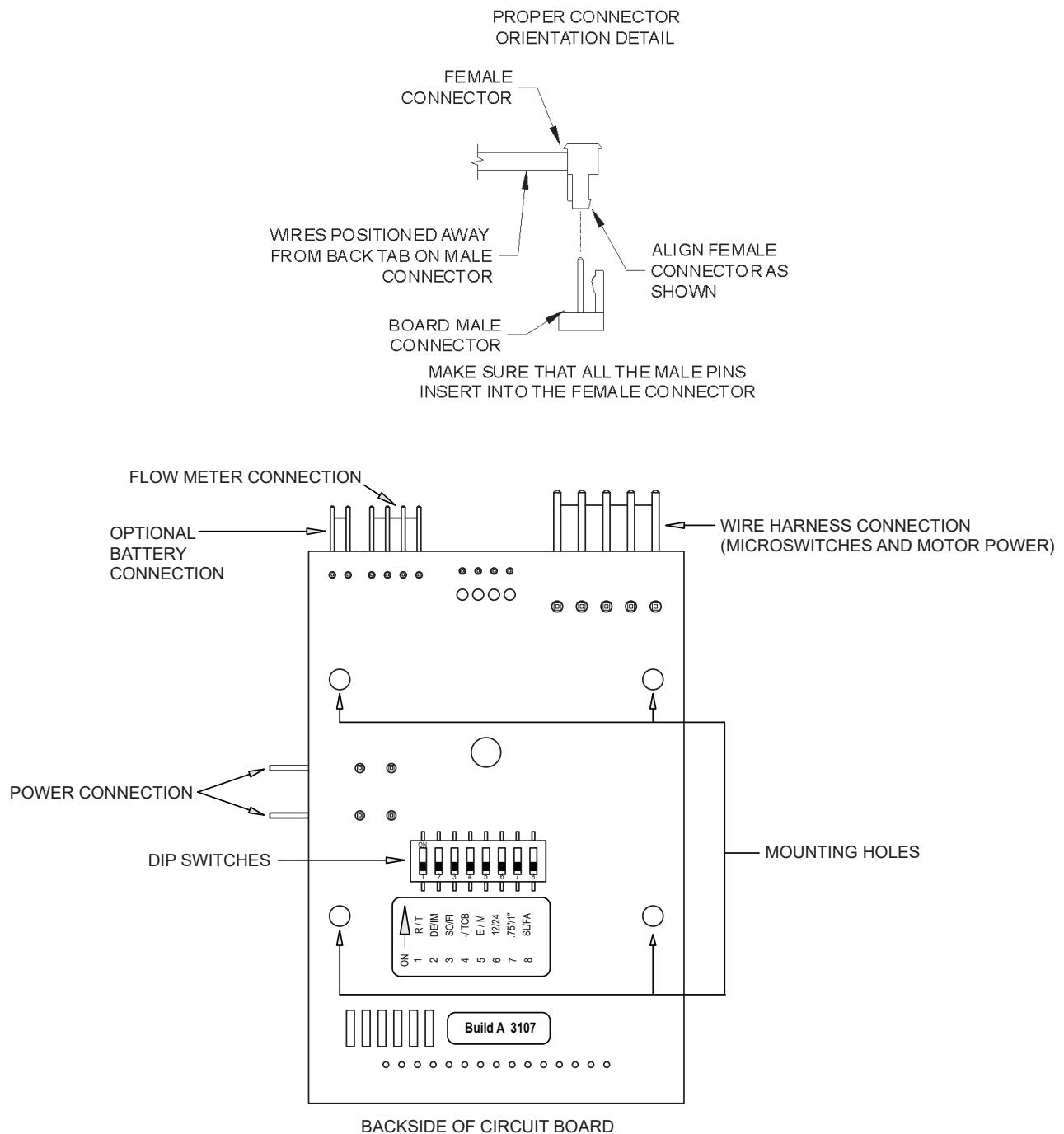
Controller

Control

The Culligan Aquasential Select Plus Iron-OX5 and Sulfur-OX3 should be set up for Timeclock operation.

Circuit Board

All terminals are clearly marked to ease installation.



Power Supply

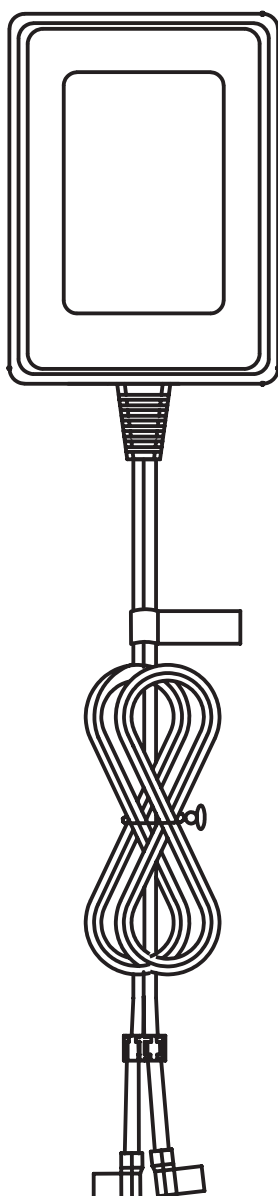
A wall mount plug-in power supply with a 20-foot cord is provided. The customer should provide an electrical outlet that is not controlled by a switch that can be turned off accidentally. Observe local electrical codes.

NOTE! The filter works on 24 volt - 60 Hz electrical power only.

P/N 01041743 20 ft plug-in power supply is rated for indoor installations only.

P/N 01031263 30 ft optional power cord for longer runs to an indoor outlet.

Figure 12. 20-foot AC Power Supply (01041743)



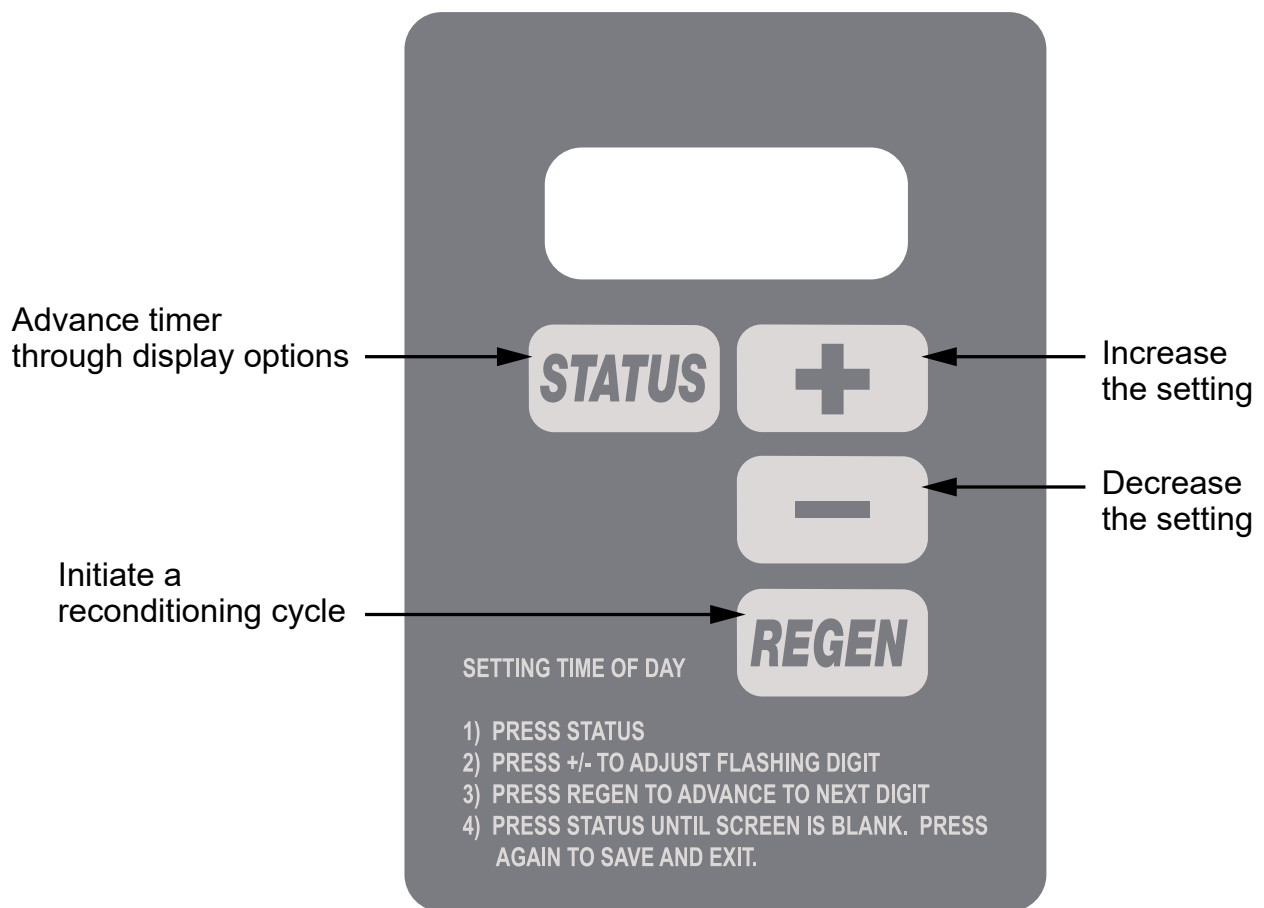
Programming

Powering Up Control

With the bypass to the unit closed, power up the control. The display will power up flashing “12:00 PM” and the motor will energize and cycle the control, without stopping. This is required to ensure that the control is in the home position.

The timer uses four buttons:

Figure 13. Keypad



Dip Switch Definitions

The circuit board is shipped with all DIP switches in the off position. Prior to programming the controller some DIP switches need to be moved to the ON position. Because each switch serves a specific purpose, please review the following information, moving the required switches to an ON position. The definitions and purpose are as follows:

NOTE! DIP switch #3, #4, and #7 MUST be set to the “ON” position for the Iron-OX5 and Sulfur-OX3 filters. All other switches are set to “OFF.”

Switch #	Abbreviation	Definition	Purpose
1	R / T	Run / Test	Off - Allows controller to function in a normal, operational mode.
			On - Places controller in test mode to verify operation of the board components & software.
2	D / I	Delayed / Immediate	Off - Reconditioning Cycle will occur at Delayed Time of Day upon a controller receiving a valid reconditioning cycle initiation signal.
			On - Reconditioning Cycle shall occur immediately upon a controller receiving a valid reconditioning initiation signal, regardless of the time of day.
3	SO / FI	Softener / Filter	Off - The unit shall be operated as a softener.
			On - The unit shall function as a filter but utilize program logic to time the air draw cycle to recharge the air head.
4	- / TCB	Time Clock Back-up Disabled / Enabled	Off - The time clock backup option is not enabled.
			On - Allows the user to program the time clock function of the control to initiate the reconditioning cycle on a fixed interval. This setting MUST be on for the Sulfur-OX3 filter.
5	E / M	English / Metric	Off - The unit will function in standard English dimensions.
			On - The unit will function in standard metric dimensions.
6	12 / 24	12 Hour Clock / 24 Hour Clock	Off - All time keeping functions shall be based on an AM/PM basis. The PM icon shall be lit in the display as appropriate.
			On - Time keeping functions shall work on a 24-hour clock (military time). The AM/PM display icons will be disabled.
7	.75" / 1"	3/4" / 1" Control	Off - 3/4" Medallist Control Valve
			On - 1" Medallist Plus Control Valve
8	S / F	Standard Refill / Fast Refill	Not applicable for filter applications.

The DEFAULT programming menu for a Select Plus Filter is outlined in the following table:

Setting	Display	Range Limits	Default	Comments
Time of Day		12:00 AM - 11:59 PM (12hr) 00:00 - 23:59 (24hr)	12:00 PM 12:00	12 / 24 hour function set with dip #6
*Time of Reconditioning Cycle		12:00 AM - 11:30 PM (12hr) 00:00 - 23:30 (24hr)	2:00 AM 02:00	- Adjust time in 30 minute increments only
*Backwash (Cycle 1)		01 - 99 minutes	10 minutes	-Always active in Time Clock Mode
*Air Draw (Cycle 2)		01 - 99 minutes	- Filter - 02 minutes	-Always active in Time Clock Mode
*Fast Rinse (Cycle 3)		01 - 99 minutes	10 minutes	-Always active in Time Clock Mode (Filter)
*Reconditioning Cycle Interval		Days - 01 to 99 days	03 days	
Gallons Capacity (if optional flow meter is used)		1 - 9,999	870	Active ONLY if flow meter is connected to circuit board

Hidden Programming Menu

(Accessed from service mode by holding the “+” key for 5 seconds)

*Delay / Immediate		Toggle Delay or Immediate	Delay	<ul style="list-style-type: none"> - Locks in a regen signal after a 3 hour or more power outage; regen can be set to go immediate or delay until the tor; - Only accessible from service mode, time of day display, by pressing and holding “+” for 5 seconds - (not in programming menu)
*Lock / Unlock		Toggle Lock & Unlock	Unlock	<ul style="list-style-type: none"> - Lock or unlock access to make program changes - Only accessible from service mode, time of day display, by pressing and holding “+” for 5 seconds - (not in programming menu)

- To be saved in EEPROM

Make sure inlet water supply is turned off to unit by placing it on bypass, then supply power to the timer. The display will power up flashing “12:00 PM” and the motor will energize and cycle the control, without stopping to the home position. This is required to ensure that the control is in the home position.

NOTE! IMPORTANT! Connect the flow meter to Accusoft circuit board prior to making any programming adjustments.

Settings

The Culligan Aquasential Iron-OX5 and Sulfur-OX3 Water Filters are designed to perform efficiently on a wide range of water supplies. Before the unit can be put into service and reconditioned, several settings must be changed from the factory default settings.

Backwash Cycle

Backwash expands and loosens the media bed, and flushes away accumulated particulate matter. The backwash interval is preset at the factory for 10 minutes. The Aquasential Iron-OX5 and Sulfur-OX3 Water Filter backwash setting is 15 minutes which is adequate for most water supplies. Refer to the Programming section to increase or decrease the backwash cycle time.

Air Draw Cycle

The Aquasential Iron-OX5 and Sulfur-OX3 Water Filter uses this cycle to educt air into the filter tank in sufficient volume for the required airhead. This cycle should be set for 40 minutes.

Rinse Cycle

During the "Rinse" cycle the air charge is compressed and stored within the filter tank and the filter media is rinsed prior to the system returning to the service cycle. The rinse setting for the Iron-OX5 is 5 minutes. Refer to the Programming section to increase or decrease the rinse cycle time.

Backwash Frequency

Iron Removal Applications

0.3 - 5 ppm Iron - Recommended every 3rd Day - Frequency of backwash may need to be increased for high water usage. If water usage is low, the frequency of backwash can possibly be decreased.

Hydrogen Sulfide Removal Applications

0.3 - 3.0 ppm Hydrogen Sulfide - Recommended every 3rd Day - Frequency of backwash may need to be increased for high water usage. If water usage is low frequency of backwash can possibly be decreased.

NOTE! Settings based on average pressure (50psi) and 500 gallon capacity between reconditioning cycles.

Gallons Capacity

The Aquasential Iron-OX5 and Sulfur-OX3 Water Filter system flow meter monitors the volume of treated water in gallons between reconditioning cycles and displays the remaining gallons capacity. The flow meter can work in conjunction with the programmed reconditioning interval by initiating a reconditioning cycle sooner than the interval setting if water usage is higher than expected.

Initiating the Reconditioning Cycle

Several conditions will result in the signaling and initiation of a reconditioning cycle. The control valve display will show "REG" when a reconditioning signal has been received. The "REG" will flash in the display during a reconditioning cycle.

The following conditions will signal or initiate a reconditioning cycle:

1. When the Soft-Minder flow meter has recorded the programmed number of gallons of treated water.
2. At the programmed "Time of Reconditioning" when the number of days without a reconditioning cycle equals the Timeclock Backup programmed value.
3. At the programmed "Time of Reconditioning" when the "REGEN" button is pressed once. REG will show in the display.
4. Immediately when the "REGEN" button is pressed and for 3 seconds. "REG" will display and flash.
5. Immediately if electrical power to the system has been off for more than 3 hours and power is restored.

Manual Cycling

Manual Control Cycling

The control can be manually cycled through a reconditioning cycle to troubleshoot the control or verify that the set-up is complete. When a control is manually cycled back to the service position, the statistical counters of capacity remaining, days since last reconditioning and the number of reconditionings in the last 14 days and the life of the unit will not be reset or updated. If the control is allowed to time out from the last position back to service (Home), the applicable statistical counters will not be reset or updated. A manual cycling of the control can be accomplished by following the steps as outlined below.

Figure 14.

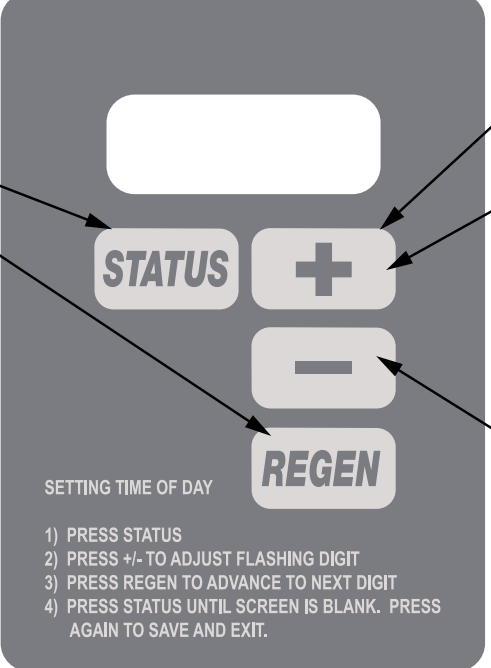


Figure 14 illustrates the manual control cycling process. The control panel features a display screen at the top, followed by four buttons: 'STATUS', '+', '-', and 'REGEN'. Below the buttons, the text 'SETTING TIME OF DAY' is displayed, followed by a list of instructions: 1) PRESS STATUS, 2) PRESS +/- TO ADJUST FLASHING DIGIT, 3) PRESS REGEN TO ADVANCE TO NEXT DIGIT, and 4) PRESS STATUS UNTIL SCREEN IS BLANK. PRESS AGAIN TO SAVE AND EXIT.

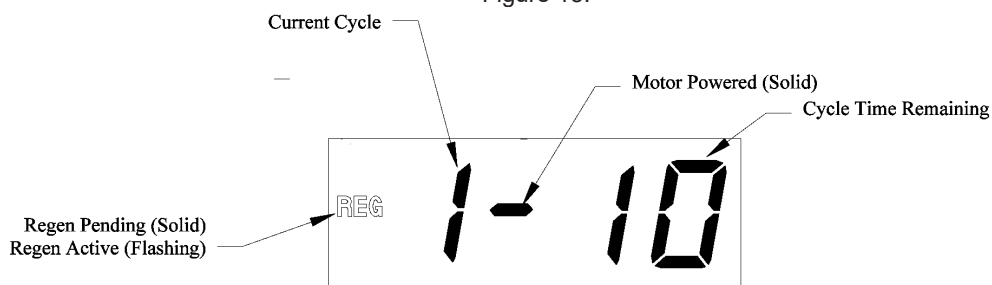
1. While in the service mode, press the "Status" key until the display goes blank.
2. Press the "+" key to display the current motor position.
3. Press and hold the "Regen" key for 5 seconds until the reconditioning is started. Once reconditioning is active, the "Regen" key will be ignored until the control returns to the service or "home" position.
4. The "REG" icon will flash and the motor will move the control to Backwash position.
5. Press the "+" key to cycle to the next position and remain there until the cycle times out or the control is manually indexed.
6. Continue to press the "+" key until the control returns to the service (Home) position. In order to step through the cycles again, repeat at step 3.

NOTE! If the "-" key is pressed at any time, the control will move back to the first item in the statistics menu. Pressing the "+" key from the statistics menu would move the display back to the current diagnostic cycle. The "+" key will be ignored once the control returns back to the home position.

While cycling the control, basic diagnostics can be accomplished.

- The display shows the "REG" icon solid (if a reconditioning is pending) or flashing (if in reconditioning).
- The display will show the current cycle ("H" for service, "1" for Backwash, "2" for Air Draw and "3" for Fast Rinse / Refill) in the left most segment.
- The status of the motor output is to be shown in the 3rd digit from the right. The center bar of the digit will light solid and the LEDs will turn off when the motor output is on.
- The cycle time remaining will be displayed in the two right most end digits.
- If a flow meter is attached, the phone icon will show solid and flash if the control is getting a flow signal from the flow meter.

Figure 15.



Service Check

The service mode allows one to view the number of reconditioning cycles in the past 14 days, the total number of reconditioning cycles the control has cycled through and the number of days since the last reconditioning cycle.

The statistical functions are reached by pressing the “Status” key until the screen blanks and then pressing the “-” key. Repetitive presses of the “-” key will cycle through the statistics mode. Pressing the “Status” key will exit statistics and move to the time display. The following table outlines the statistic function display, range limits and default setting:

Display	Range Limits	Comments
• Number of Reconditioning Cycles - Last 14 days	0 to 99	- Days counter is to be updated at 12:00 AM ONLY when dip #2 is on AND dip #4 is off; Otherwise update at whatever TOR is set for - Number of Reconditioning is to be updated after a valid reconditioning is complete (cycle 3 times out automatically)
• Number of days since last Reconditioning Cycles	0 to 99	- Days counter is to be updated at 12:00 AM ONLY when dip #2 is on AND dip #4 is off; Otherwise, update at whatever TOR is set for - After a valid reconditioning is complete (cycle 3 times out automatically), the counter is to be reset to 0
• Number of Reconditioning Cycles - Life of the Unit	0 to 9,999	Counter is to be updated after completion of valid reconditioning cycle. (cycle 3 times out automatically)

- To be saved in EEPROM before the control is powered down during a power outage.

Once the statistics menu is entered the information shown for each display is outlined below:

- “Regen” key is always ignored in statistics mode
- Can enter directly into diagnostics mode by pressing the “+” key
- When returning to statistics mode directly from diagnostics mode, always display the first statistic in the list as if statistics mode was entered for the first time (don’t have to remember where it left off in the list)
- Can exit back to service mode by pressing the “status” key
- Automatically times out back to service mode after 10 minutes of no key press activity
- Drop all leading zeros

Flow Rate

This display will only show if the flow meter is attached to the control. The display shall show the current flow rate of the water passing through the control. The display will show "FLO" for two seconds and then the current flow rate passing through the flow meter until a key is pressed.

This display shall never time out, as opposed to the rest of standard statistics (10 minutes).



Capacity Remaining (gal/ L)

This display will only show if the flow meter is attached to the control. The display shows the gallons or liters of capacity remaining in the batch before reconditioning cycle will be triggered. The display will show "GALr" ("Litr" for metric) for two seconds and then display the remaining capacity. When reaching "0" the display will remain at "0" and not show negative values.

This display shall never time out, as opposed to the rest of standard statistic (10 minutes).



Number of Reconditioning Cycles in Last 14 Days

This display will show the number of reconditioning cycles that have occurred in the last 14 days. The display will first show "14dY" for two seconds and then display the number of valid reconditioning cycles that have occurred.



Number of Days since Last Reconditioning Cycle

This display shows the number of days that have elapsed since the last reconditioning cycle. The display will show "dAYS" for two seconds and then the number of days that have elapsed since the unit completed its last valid reconditioning cycle.



Total Number of Reconditioning Cycles for Life of Unit

This display will show the total number of reconditioning cycles that have occurred since installation. The display will show "totL" for two seconds and then display the total number of valid reconditioning cycles for the life of the unit.



Statistical Function Timeout

If no key activity occurs for a period of 600 seconds (10 minutes) while in statistics functions mode, the mode will time out and return to the time of day display. An exception is that the flow rate and capacity remaining will not time out but will remain displayed until a key is pressed. Pressing the "Status" key at any time will return the unit back to the time display.



Start-Up

1. Close the main water supply valve.
2. Set the bypass valve to the bypass position.
3. Ensure that all faucets at the installation site are closed.
4. Direct the drain line discharge into a bucket where flow can be observed.
5. Before plugging in the power supply open the control valve cover to access the circuit board and move Dip Switch #3, #4, and #7 to the "ON" position then close the cover.
6. Plug the power supply into a 120 Volt, 60 Hz, single-phase receptacle and program the settings. Refer to the Programming section for an overview of circuit board programming. The program settings for this system can be found in the Programming section and in Settings on page 19 of this manual.
7. Once the circuit board is properly programmed open the main supply valve.
8. Manually cycle the control valve into Cycle 1 (Backwash) position.
9. While in the Cycle 1 position, slowly open the bypass valve, allowing the tank to fill until water flows to the drain.
10. With the bypass valve fully open, watch the drain line discharge for signs of media. If particles appear, reduce the flow. Increase the flow again when media no longer appears in the discharge.
11. After the backwash runs clear, cycle the control to Cycle 2 (Air Draw) position to verify air draw through the suction line.
12. Step the control to Cycle 3 (Fast Rinse) position and check for leaks on the suction line as it pressurizes.
13. When the drain runs clear, cycle the control back to H (Home) position, complete the installation and cleanup.
14. Initiate an immediate reconditioning cycle before leaving the installation site to establish a proper head of air in the filter tank.



CAUTION!

If a sudden rush of water enters the filter, some of the media could be forced into the control valve.



WARNING!

Although not normally necessary, should you need to disassemble any part of the control valve or remove the control from the tank assembly or associated plumbing, depressurize the unit first closing the main supply valve, then open a convenient faucet down stream from the water conditioner.

Before Leaving The Installation Site

1. The water heater will hold unfiltered water for several days. Advise the customer that the existing water volume in the tank will need to be used before the hot water is completely filtered. If filtered hot water is required immediately, refer to the water heater owner's manual for the proper method of draining the water heater.
2. Explain the operation of the filter to the customer. Make sure the customer knows that there will be new sounds associated with the reconditioning of the unit.
3. Fill in the number of people, and then sign and date the corresponding performance data sheet.
4. Leave the Welcome Card with the customer.
5. Attach the appropriate data plate label located in the Parts Pack onto the back of the control.
6. Clean up the unit and installation site, removing any soldering, or pipe threading, residues from the equipment and surrounding area with a damp towel.

Use of Bypass Valve

Depending on where the particular installation was made, the outside sill cocks may or may not be served by filtered water. Ideally, all lines not requiring filtered water should be taken off upstream of the filter. This is not always possible, however, due to the difficulty or expense of rearranging the piping.

Bypass the filter if:

1. The outside lines do not bypass the filter and the water is to be used for lawn irrigation or other outside uses.
2. Water is not used for several days.
3. You wish to inspect or work on the valve or air draw system.
4. A water leak from the valve is evident.

Three-Valve Bypass (If provided)

To bypass, close the inlet and outlet valves, and open the bypass valve. Reverse the process to get filtered water once again. Be sure to close the middle bypass valve completely to avoid mixing untreated water with filtered water.



CAUTION!

If the media tank is to remain attached to the control valve, close only the inlet valve, then open the bypass valve. This will prevent pressure from increasing in the media tank due to warming. If the filter is leaking or continuously running to the drain, turn the outlet valve off as well.

Care and Cleaning

Protect the operation and appearance of the water conditioner by following these precautions:

1. Do not place heavy objects on top of the filter cover.
2. Use only mild soap and warm water to clean the exterior of the unit. Never use harsh abrasive cleaners or compounds which contain acid or bleach. Culligan recommends Simple Green or an equivalent cleaner.
3. Protect the filter and drain line from freezing temperatures.
4. Reset the time, if required, after any interruption of electrical power to keep the unit on its normal schedule.

Serial Numbers

The serial number label is temporarily taped to the media tank and needs to be permanently attached to the tank during installation. The label now has a second serial number on a perforated strip that can be torn off and applied to the IQR form instead of handwriting the number. Wipe a location on the tank with an alcohol towelette then affix the label. That location could be near the tank collar, tank base, side shell near the tank base, or under the Culligan emblem of a Quadra-Hull tank. Alternately, the label may also be applied to the dealer copy of the customer sale order documentation.

The bottom portion of the label can be removed, placed on the IQR form, and recorded online.



The tank serial number label needs to be attached at the time of installation on a clean dry location on the outside of the tank.

NOTE! Do not remove or destroy the serial number; it is referenced on request for warranty repair or replacement.



WARNING!

Disconnect all electrical power to the unit before servicing.
Bypass the unit and relieve system pressure before attempting to repair.

Reconditioning Cycle

There are several conditions that will cause the control to initiate a reconditioning cycle. The “REG” enunciator will light when the control has signaled for a reconditioning cycle. The “REG” enunciator will flash while the control is in a reconditioning cycle. The following are conditions that will call for reconditioning, assuming “dip 2” has been set to “DEL”:

1. When the time clock has counted past the set number of days.
2. At the preset time, after the “REG” button is depressed once. “REG” will light.
3. Immediately, when the “REG” button is depressed for three seconds. “REG” will light and blink.
4. Immediately, if power to the unit has been off for more than 3 hours and time of day has been returned.
5. When the flow meter has recorded the passage of a predetermined number of gallons.

If “Dip Switch 2” is set to “Immediate”, the unit will begin a reconditioning cycle immediately for instances 2 and 4. With “Dip Switch 2” set to “Delayed”, the reconditioning cycle will not begin until the preset reconditioning time.

NOTE! If set to immediate mode as timeclock, the unit will initiate the reconditioning cycle at 12:00 AM. In the delay mode, “REG” indicator will light at 12:00 AM and reconditioning cycle will occur at programmed delayed time.

Display Lockout

The Culligan Aquasential Select Plus control is equipped with a feature which will allow you to protect the programmed settings from tampering by unauthorized individuals. When the lockout feature is activated, the only parameters which can be adjusted are the Time-of-Day and the Time of Reconditioning Cycle. Refer to the “Setting of the Microprocessor” for activating this feature.

Power Loss

The AccuSoft® circuit board is equipped with a Hi-Cap Capacitor and EEPROM memory chip. The capacitor is capable of maintaining the time, for at least two days, in the event of a power outage. The EEPROM ensures that the individual programming parameters of the filter are retained.

If the power outage lasts long enough to drain the Hi-Cap Capacitor, the control will flash “12:00 PM” when power is returned to the control. The unit will continue to keep time from the moment power is restored, and will initiate a full reconditioning cycle at the preset reconditioning time. The time of day will need to be reset in order to return the reconditioning cycle to its preset time.

Installing the optional battery back-up onto the circuit board will ensure the correct time of day is retained in the event of power outages lasting longer than two days.

Preventative Maintenance

Iron-OX5 Recommended Preventative Maintenance

The Culligan Aquasential Iron-OX5 water filter has been designed to provide a good, consistent service life. Because of the nature of problem water, we recommend that the local Culligan dealer provide regular maintenance/service contracts for the proper operation of your systems. The water filter service begins with a multi-point inspection of your water filter system in an effort to uncover any problems that may exist. Listed below is a recommended list of maintenance items to be inspected at a minimum of once a year (or more frequently depending on the untreated water quality).

Test Water	Feed	Product
Hardness		
Iron		
pH Level		
Alkalinity		
TDS		
Other		
Comments:		
Bypass Valve		
Bypass in Service or Bypass?		
Condition of bypass valve		
Operation OK?		
Control Valve		
Condition of Seal Pack		
Condition of Motor:		
Condition of Flow Control		
Condition of Switches:		
Condition of Inlet Check Valve		
Condition of Air Line Check Valve		
Condition of Suction Line Strainer		
Control settings	Before	After
Check / reset Circuit Board		
Check time of reconditioning cycle		
Check Reconditioning Cycle Frequency Interval - Days		
Backwash cycle (minutes)		
Air Draw cycle (minutes)		
Fast Rise cycle (minutes)		
Cycle control	Test Cycle	OK?
	Backwash	
	Air Draw	
	Fast rinse	
Media Tank		
Freeboard inches:		
Media Condition		
Iron-OX5: Condition of inlet strainer in Filter Tank		

Sulfur-OX3 Recommended Preventative Maintenance

The Culligan Aquasential Sulfur-OX3 water filter has been designed to provide a good, consistent service life. Because of the nature of problem water, we recommend that the local Culligan dealer provide regular maintenance/service contracts for the proper operation of your systems. The water filter service begins with a multi-point inspection of your water filter system in an effort to uncover any problems that may exist. Listed below is a recommended list of maintenance items to be inspected at a minimum of once a year (or more frequently depending on the untreated water quality).

Test Water	Feed	Product
Hardness		
Hydrogen Sulfide		
Iron		
pH Level		
Alkalinity		
TDS		
Comments:		
Bypass Valve		
Bypass in Service or Bypass?		
Condition of bypass valve		
Operation OK?		
Control Valve		
Condition of Seal Pack		
Condition of Motor:		
Condition of Flow Control		
Condition of Switches:		
Condition of Inlet Check Valve		
Condition of Air Line Check Valve		
Condition of Suction Line Strainer		
Control settings	Before	After
Check / reset Circuit Board		
Check time of reconditioning cycle		
Check Reconditioning Cycle Frequency Interval - Days		
Backwash cycle (minutes)		
Air Draw cycle (minutes)		
Fast Rise cycle (minutes)		
Cycle control	Test Cycle	OK?
	Backwash	
	Air Draw	
	Fast rinse	
Media Tank		
Freeboard inches:		
Media Condition		
Sulfur-OX3: Condition of inlet strainer in Filter Tank		

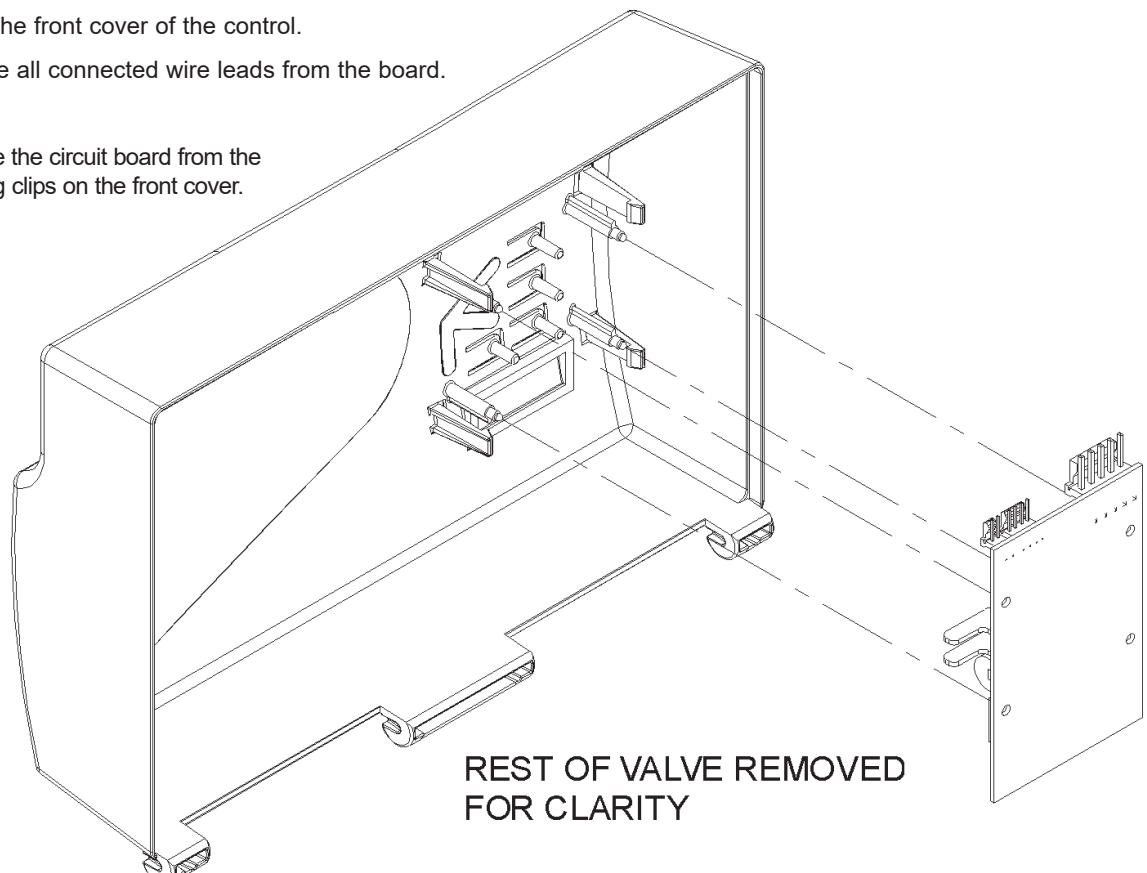
Service

Circuit Board

To replace the AccuSoft™ circuit board, refer to [“Figure 16.”](#) Then proceed as follows:

Figure 16.

1. Lift up the front cover of the control.
2. Remove all connected wire leads from the board.
3. Remove the circuit board from the retaining clips on the front cover.



4. The new circuit board can be installed by reversing the steps 1-3 above.
Refer to [Figure 16](#) for assembly and disassembly of the various valve components.



CAUTION!

Grip all connections to the circuit board by the terminals for assembly and disassembly. Failure to do so could result in damage.

CAUTION!

Electrical static discharges may cause damage. Do not touch any surfaces of the circuit board. Hold only by the edges. Mishandling will void the warranty.

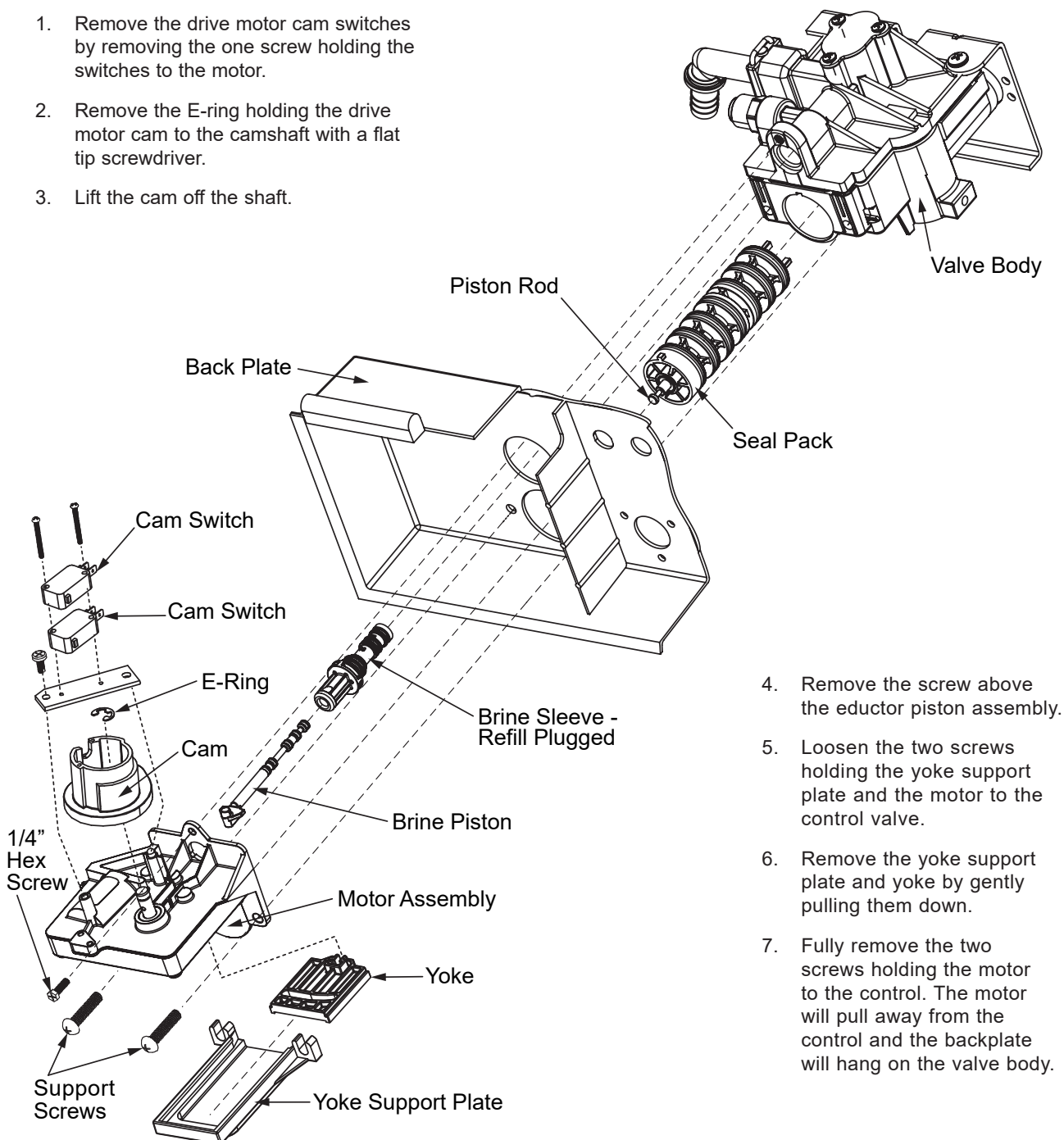
CAUTION!

The wire connectors must be connected to the circuit board properly.

Drive Motor Assembly

Figure 17. Control Valve Assembly

1. Remove the drive motor cam switches by removing the one screw holding the switches to the motor.
2. Remove the E-ring holding the drive motor cam to the camshaft with a flat tip screwdriver.
3. Lift the cam off the shaft.



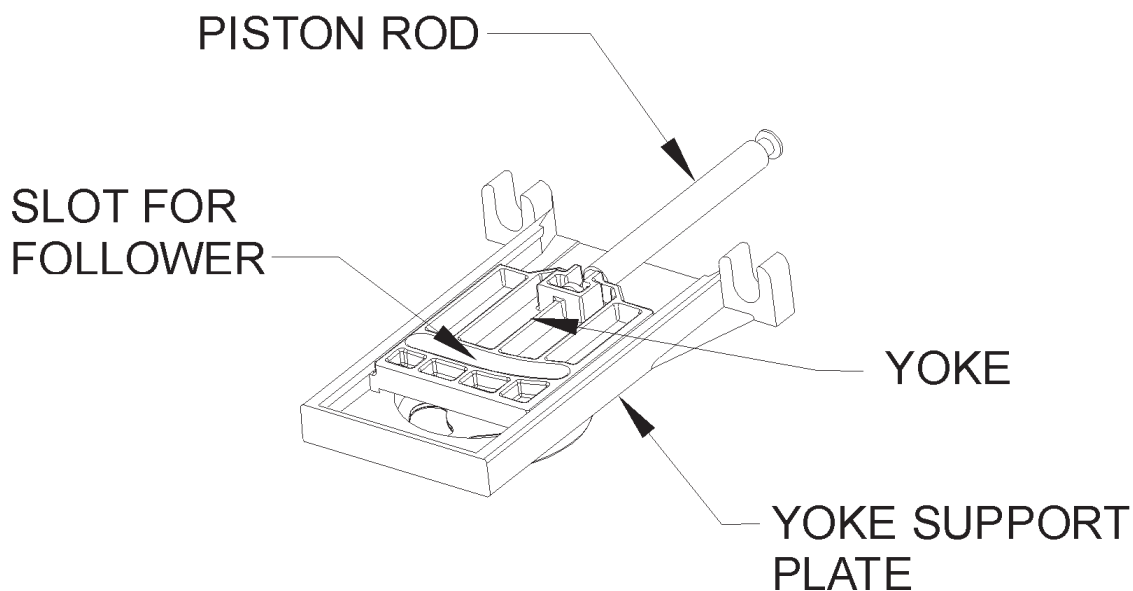
4. Remove the screw above the eductor piston assembly.
5. Loosen the two screws holding the yoke support plate and the motor to the control valve.
6. Remove the yoke support plate and yoke by gently pulling them down.
7. Fully remove the two screws holding the motor to the control. The motor will pull away from the control and the backplate will hang on the valve body.

This procedure can be followed in the reverse order to reassemble the motor to the control. When reassembling the scotch yoke, the yoke must slide into the yoke support plate prior to pushing the assembly up into the piston end and follower. [Figure 18 on page 35](#) shows proper assembly of the yoke into the support plate.

NOTE! Make sure that the follower is in the follower slot on the yoke, and that the end of the piston rod is held in the end of the yoke.

When attaching the yoke support plate be certain to push up on the plate until the two mounting screws bottom in the U-shaped channels of the support plate.

Figure 18.



Seal Pack Assembly

Follow the instructions for replacing the drive motor assembly through step 7, then continue as follows:

1. With the drive motor and backplate set aside, firmly pull the seal pack assembly from the valve body.
2. Lightly lubricate the o-rings of the replacement seal pack with silicone grease.
3. Reverse the procedure for reassembly.

NOTE! Use only silicone grease; petroleum-based lubricants will cause the degradation of the rubber components.



CAUTION!

Do not twist the seal pack upon insertion. This can cause the outer o-rings to pinch, cut, or crimp.

Eductor Piston / Eductor Sleeve Assembly

Follow the instructions for replacing the drive motor assembly through step 7, then proceed as follows:

1. With the drive motor set aside, firmly pull the eductor piston & sleeve assembly from the valve body.
2. Lightly lubricate the o-rings of the replacement piston & sleeve assembly with silicone grease.
3. Reverse the procedure for reassembly.

NOTE! Use only silicone grease; petroleum-based lubricants will cause the degradation of the rubber components.

The eductor piston and sleeve assembly is unique to the Iron-OX5 and Sulfur-OX3 system. Refer to the parts list to ensure the proper parts are used.

Eductor Assembly

Refer to the following instructions for replacement of the eductor.

1. Remove the three screws and the eductor plate.
2. Remove the eductor screen by lifting it from the eductor body.
3. Remove the eductor body by grasping one of the projections with the pliers and gently pulling upward.
4. Reverse the procedure to reassemble. Be certain that the replacement eductor body contains the correct eductor nozzle.

Table 6. Eductor Selection

Model	Nozzle Color	Nozzle with O-Ring P/N
10" Aquasential Select Plus Iron-OX5 and Sulfur-OX3	Green	01034602

Backwash Flow Control

Refer to the following instructions for replacement of the backwash flow control:

1. Remove the drain elbow retaining clip from the valve body.
2. Pull the drain elbow from the valve body.
3. Remove the flow control from the valve body and replace with a new flow restrictor.

NOTE! The number on the backwash flow control should face into the valve body.

4. Reverse the procedure to reassemble. Be certain that the replacement is the correctly sized flow restrictor.

Table 7. Backwash Flow Restrictor

Model	Color & Number	P/N
10" Aquasential Select Plus Iron-OX5 and Sulfur-OX3	Black - 5.5 GPM	P0401031 - 10 ea.

Troubleshooting Guide

Complaint	Problem	Cause	Solution
Hydrogen Sulfide and/or "rotten egg" odor Iron staining appearing on fixtures	A. Inadequate backwash of filter	1. Plugged drain line flow control	1. Clean or replace drain line flow control
		2. Insufficient water supply from well.	2. Check for minimum specified flow and pressure requirements of filter system.
		3. Plugged inlet strainer	3. (Generally will only plug with the presence of nuisance bacteria.) Clean inlet strainer assembly and shock treat the water supply with chlorine as needed to control iron bacteria.
		4. Media bed fouled.	4. Rebed filter and correct the cause of fouling.
	B. Fails to recondition	1. Interrupted electrical service.	1. Assure continuous electrical supply (check plug, breaker, fuses, etc.).
		2. Faulty circuit board.	2. Replace circuit board.
		3. Faulty drive motor.	3. Replace drive motor.
		4. Circuit board set incorrectly.	4. Reset circuit board.
	C. Water contaminant levels are greater than limits established by the manufacturer	1. It is not uncommon for local water conditions to change.	1. Consult manufacturer.
	D. Inadequate aeration	1. Loss of air through inlet check valve.	1a. Check installation position of check valve - Consult Installation and Operation Manual for proper position.
			1b. Check for foreign material in seat of check valve, clean or replace as required.
		2. Loss of air through air leak.	2. Check filter tank, control valve, air suction line, check valve and fittings for air leaks and repair (Note: soapy water solution works well for locating air leaks)
		a. Electrical failure	a. Assure permanent electrical service (check plug, breaker, fuses, terminal block on control valve, etc.).
		b. No Air Draw	b. Check air strainer and eductor assy. for presence of restriction.
		4. Air loss through high demand	4. Increase reconditioning cycle frequency of filter.
	E. Exceeding recommended filter system flow rate.	1. Service flow rate demand is higher than filter system design flow rate.	1a. Install a flow control at filter system outlet equal to or less than the design flow rate of filter system.
			1b. Install additional filter(s) or a larger single filter system which meets both the service flow demand and backwash flow requirements available.

Complaint	Problem	Cause	Solution
Water is effervescent	A. This can be expected when water is aerated under pressure.	1. Water has been aerated by the Iron-OX5 and Sulfur-OX3 system. As water is released to the atmosphere, air molecules separate from the water molecules.	1. This natural phenomenon will typically dissipate to the atmosphere in a matter of seconds. If preferred, water can be drawn and stored in an open container prior to use (i.e. fill a pitcher and store in the refrigerator for cool, fresh drinking water).
Loss of pressure	A. See complaint #1, problem A & B		
Air spurting at outside or non-filtered water fixtures.	A. Inlet check valve not sealing.	1. Improper installation location.	1. See installation and operation manual for proper location of inlet check valve
		2. Foreign material preventing check valve from seating properly.	2. Clean or replace check valve.
		3. Worn or faulty check valve.	3. Replace check valve
Air spurting from filtered water fixtures.	A. Reduced pressure in distribution system.	1. Service flow demand is greater than water supply available from well pump system.	1. Repair or replace well pump system.
		2. Water flow is restricted by supply piping and/or water treatment equipment.	2a. Eliminate restrictions in supply piping to water treatment equipment such as iron bacteria plugging the upper diffuser assembly, etc.
			2b. Install larger water treatment system to provide less pressure drop.
Loss of media through drain line.	A. New filter media was loaded dry in filter tank.	1. New filter media is shipped in a dry condition and must be fully wetted inside tank before backwashing at full flow.	1. Clean drain line flow control, control valve body, seals, spacers and piston assemblies
	B. Air passing through filter during backwash.	1. Excess air accumulated in filter tank.	1a. Check programmed settings to ensure proper air draw cycle. 1b. Check that drain flow is not restricted.
		2. Excess air accumulated in filter system from water supply or well pump.	2a. Repair well pump system. 2b. If the cause was due to temporary loss of water main pressure; the problem will most likely correct itself with the return of continuous pressure.
Excessive noise during reconditioning cycle .	A. Howling or whistling noise during reconditioning cycle.	1. Inadequate drain line size.	1. Increase drain line size
		2. Drain line is vibrating against other pipes, conduits, pipe hangers, heat ducts, floor joists, etc.	2. Insulate drain line, specifically at points of contact with other materials.

Complaint	Problem	Cause	Solution
Water is running to drain continuously.	A. Control valve is stuck in reconditioning cycle.	1. Electrical service to control(s) has been interrupted.	1. Assure continuous electrical service is available. (check plug, breaker, fuse, etc.)
		2. Faulty circuit board.	2. Replace circuit board..
		3. Faulty drive motor.	3. Replace drive motor.
		4. Foreign material lodged in piston.	4. Disassemble and clean control valve, replace seals, spacers and piston assemblies.
Blue green staining.	A. Corrosive water condition in copper distribution piping system.	1. Low pH condition of the raw water supply.	1. A Cullneu® filter may be required to elevate the pH - consult factory.
		2. In rare occasions, highly aerated water in combination with a specific water supply can create a slightly corrosive condition.	2. Install a polyphosphate cartridge filter after the Iron-OX5 and Sulfur-OX3 Filter System to protect the distribution piping.

Periodic Sanitization Procedure

If the system develops off tastes and odors and requires sanitization follow the procedure below to educt 3 ounces of a 6% household bleach solution into the system.

Bypass the system and relieve water pressure by manually cycling the system into the backwash cycle.

When flow to drain has stopped and it is certain the system is no longer under pressure remove the air line, air line check valve and line strainer.

Temporarily replace the air line assembly with an 18" length of 3/8" tubing.

Manually cycle the unit to the air draw cycle and slowly open the bypass valve to allow water into the filter system.

When line suction is present through the 3/8" tubing immerse the tubing in the chlorine solution to allow the system to educt the chlorine into the filter tank.

Once the chlorine solution has been drawn into the system remove the temporary length of 3/8" tubing.

Replace the air line assembly components and allow the system to complete the air draw and rinse cycles.

Check the air line components for leaks after reassembly by inspecting the components during the rinse cycle when the system repressurizes.




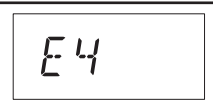
Circuit Board Troubleshooting

Error Mode

When a failure is detected, the control will generate and display an error or alarm code, depending on the type of failure, as shown in the table below.

In order to clear an error code (after correcting the problem), push and hold the "Status" key for 10 seconds. After the 10 seconds, the control will clear the error code and cycle the valve to service (Home). Other methods of clearing the error code are: powering down the control for 60 seconds, toggling a DIP switch or changing an input connection (adding or removing a Flow Meter). If the problem is still present after clearing the error code, the error code will again be displayed. While in error mode, the control will not function. When returning from Error mode, the control shall use the values stored in EEPROM unless a DIP switch was toggled or an input connection (Flow Meter) was changed. In those cases, the programmed values shall revert back to the defaults.

For E2 and E3 errors, the control is to attempt to return to home and stop. If the control is successful in finding and stopping in the home position it is to display the error code but return to functioning as normal. If the next reconditioning cycle is successful without errors the error code is to be removed and the control will function as normal.

Display	Error Description	Mode of Detection	Clearing Error/Alarm
	Motor Failure to Start (No switch changes)	If the valve fails to reach the desired state within 70 seconds of driving the motor. The control will attempt to start the motor 3 times for 70 seconds each time with a 60 second off period between each attempt.	Press and hold 'STATUS' key for 10 seconds
	Motor Failure to Stop (unexpected switch changes)	If the control detects changes in the Cam inputs when the motor is not supposed to be turning	Press and hold 'STATUS' key for 10 seconds
	Incorrect Cycle Position (switch changes out of sequences)	The control expects to be in a different position than that indicated by the Cam switch closures	Press and hold 'STATUS' key for 10 seconds
	Cannot detect 4-cycle valve operation	Control fails to recognize the proper cam switch sequence upon initializing the valve. Similar to E1 detection, the control will make 3 attempts to establish the proper 4-cycle sequence. After the third failed attempt, the E4 code will be displayed. Each attempt will turn the motor output on for 30 seconds, with a 30 second pause n between attempts (30sec on, 30 sec off, 30 sec on, 30 sec off, 30 sec on E4).	Press and hold 'STATUS' key for 10 seconds

When **E1** or **E4** are detected, the control should stop the motor and remain in error mode until manually cleared. (All program settings, statistics and EEPROM values should be stored, and filter operations should cease with the exception of time keeping)

When E2 or E3 are detected, the control should display the error code and attempt to "home" the valve, just like it does upon a reset or initial power up.

- If the control can successfully detect the complete and correct valve position sequence, then it should automatically “self-clear” the error code display and resume operation back at the point where the error occurred:
 - If **E2** or **E3** occurred while it was in a known position of the regen cycle (with motor off), then it should resume operation at the same point where the error occurred, with the same amount of time remaining in the cycle.
 - If **E2** or **E3** occurred while seeking a specific position of the regen cycle (while the motor was on), then the control should resume operation at the beginning of the cycle it was looking for when the error occurred.
- If the control cannot successfully detect the complete and correct 4-cycle valve position sequence while trying to “self clear” the error code, then the control should stop the motor and remain in error mode until manually cleared. (All program settings, statistics and EEPROM values should be stored, and filter operations should cease with the exception of time keeping)

In order to manually clear an error code (after correcting the problem), push and hold the “Status” key for 10 seconds. After the 10 seconds, the control will clear the error code and initialize the valve to home position.

Other methods of manually clearing the error code are powering down the control for 60 seconds, toggling dip switch #1, or by adding or removing a Flow Meter or Chlorinator.

When returning to Service mode from Error mode, the control shall use the values stored in EEPROM unless a DIP switch setting or device connection (Flow meter, Chlorinator) is different from what was saved. In those cases, the program settings shall revert back to the factory defaults.

Circuit Board Troubleshooting

Most circuit board problems are caused by outside influences and it is not the board itself. Replacing the board may seem to work only because the cause hasn’t reappeared – yet.

Let’s start with what to check when you come upon a circuit board problem:

1. **Are the switches aligned too closely to the cam?**
There should be a small but obvious gap between the switches and the cam so that a “wobbling cam” doesn’t accidentally bump the switch.
2. **Has the seal pack been checked for free movement?**
Feedback and experience has demonstrated that seal packs that are over-tightened create drag on the motor and delays that would result in an error code: If the motor never stops (still runs after the desired position is sensed, causing unexpected switch closures) OR if the motor gets stuck “timing out” and the control never sees any switch action.
3. **Are all the wiring terminals tightly connected?**
Sometimes a loose or poorly connected wire can give feedback to the board that would result in an error code or default.
4. **After checking all of these possibilities you should run the diagnostics (test mode) on the board**
Instructions are listed on [page 42](#).

Listed below are some other circuit board problems and their explanations:

- **Board skips the service position or only stops momentarily in service before advancing to the backwash position**
Board has been armed for reconditioning. Let the board time out of all three cycles or reset and reprogram the board. Resetting the board can be done by connecting or disconnecting the meter cable.
- **Motor cycles continuously**
Only one of two things can happen when this is the case; it can find its desired position or it gives you an error code. So, LET IT RUN until you find out which will occur.
 - If the motor still runs or there is power to motor after the error code is displayed, then the triac is likely bad – change the board.
 - If the error code is displayed and the motor is stopped (no power to the motor), check switches, cam and wire harness – the board got a signal it wasn’t supposed to or a connection failed.

A Word About Triacs

A triac is an electronic switch and can “latch on” when it becomes overheated from a laboring motor (tight seal pack). It may operate properly when it cools down. A continuously running motor could be caused by an overheated triac. Checking the seal pack and voltage draw and allowing the triac to cool down could give you favorable result and prevent the need to change the board. Otherwise, when it is sent to Returned Goods it could test good and be returned.

You Clear an Error Code and it Starts Into Reconditioning Cycle

It was either in reconditioning cycle or has kept track of time since the error code occurred and it's trying to finish the reconditioning cycle. Reset and reprogram the board.

The Board Repeatedly Defaults, Resets or Gains Time

Look at the power supply or source. Most of these issues are caused by the power source, so-called “dirty power” having noise interference or incorrect voltage. This could be erratic fluctuations caused by other heavy power draws, poor wiring, low voltage wiring running along high voltage, having active electrical storms that causes “corruption” of the EEPROM. Consider the use of a surge protector or an uninterruptible power supply after you see this repeatedly.

If you suspect the power source is causing problems, take a voltage reading at the outlet, at the power connection on the board, and on the motor leads while the motor is running. We are looking for a consistent range of 108-132 volts at the receptacle and 22-28 volts on the board. Also, the wall transformer is only used to step down the voltage; it is not used for protection or filtering the power source.

Test Mode

In this mode the control can be put through a performance test to verify the operation of the board components. Moving dip #1 from service to test mode enters the test mode; the motor output should turn off (if it was on) upon entering test mode.

When entering test mode all program settings and statistical data should be stored in EEPROM. The test sequence is to follow the description as found in the table below. Upon exiting test mode, if a device connection is different (flow meter connected or disconnected) or a DIP switch setting is changed from the condition that was present when entering test mode, the control should behave as if the change was made while out of test mode. For example, if a flow meter was added and not removed while in test mode, the control shall load the flow meter defaults when exiting test mode.

Test Description	Display Information	Action Trigger
Start Test Mode	All LCD segments lit	DIP switch #1 set to on, all others off
Software version	Software version #	Press a key after entering test mode as above
Enter test mode	Blank Display	Press a key after displaying the software version #.
DIP switch #2	Display to show “2”	Turn on DIP switch #2
	Display to Blank	Turn off DIP switch #2
DIP switch #3	Display to show “3”	Turn on DIP switch #3
	Display to Blank	Turn off DIP switch #3
DIP switch #4	Display to show “4”	Turn on DIP switch #4
	Display to Blank	Turn off DIP switch #4
DIP switch #5	Display to show “5”	Turn on DIP switch #5
	Display to Blank	Turn off DIP switch #5
DIP switch #6	Display to show “6”	Turn on DIP switch #6
	Display to Blank	Turn off DIP switch #6
DIP switch #7	Display to show “7”	Turn on DIP switch #7
	Display to Blank	Turn off DIP switch #7
DIP switch #8	Display to show “8”	Turn on DIP switch #8
	Display to Blank	Turn off DIP switch #8

Test Description	Display Information	Action Trigger
Status Key	Display to show "11"	Press Status Key
+ Key	Display to show "12" and motor to run for 15 seconds	Press + Key
- Key	Display to show "13" (and turns on Chlorinator output for 15 seconds IF chlorinator is connected)	Press - Key
Regen Key	Display to show "14"	Press Regen Key
Home Switch	Display to show "H" when Home switch closed	Close Home Switch
	Display to Blank when open	Open Home Switch
Position Switch	Display to show "P" when Position switch closed	Close Position Switch
	Display to Blank when open	Open Position Switch
Flow Meter	Display to show "Phone" icon when flow meter is connected	Connect Flow Meter
	Display to blink "Phone" icon when flow meter is sending pulses	Spin Flow Meter
Chlorinator	Display to show "Colon" icon when chlorinator is connected	Connect Chlorinator
	Display to blink "Colon" icon when chlorinator is turned on	Turn on Chlorinator when the plus key is pressed.

When exiting test mode, if the dip switches or sensors have not changed, the control is to restore all values from EEPROM, and resume where it left off after homing. If the dip switch or sensors have change, the values should reset to factory defaults. In either case the valve should home itself upon exit of test mode.

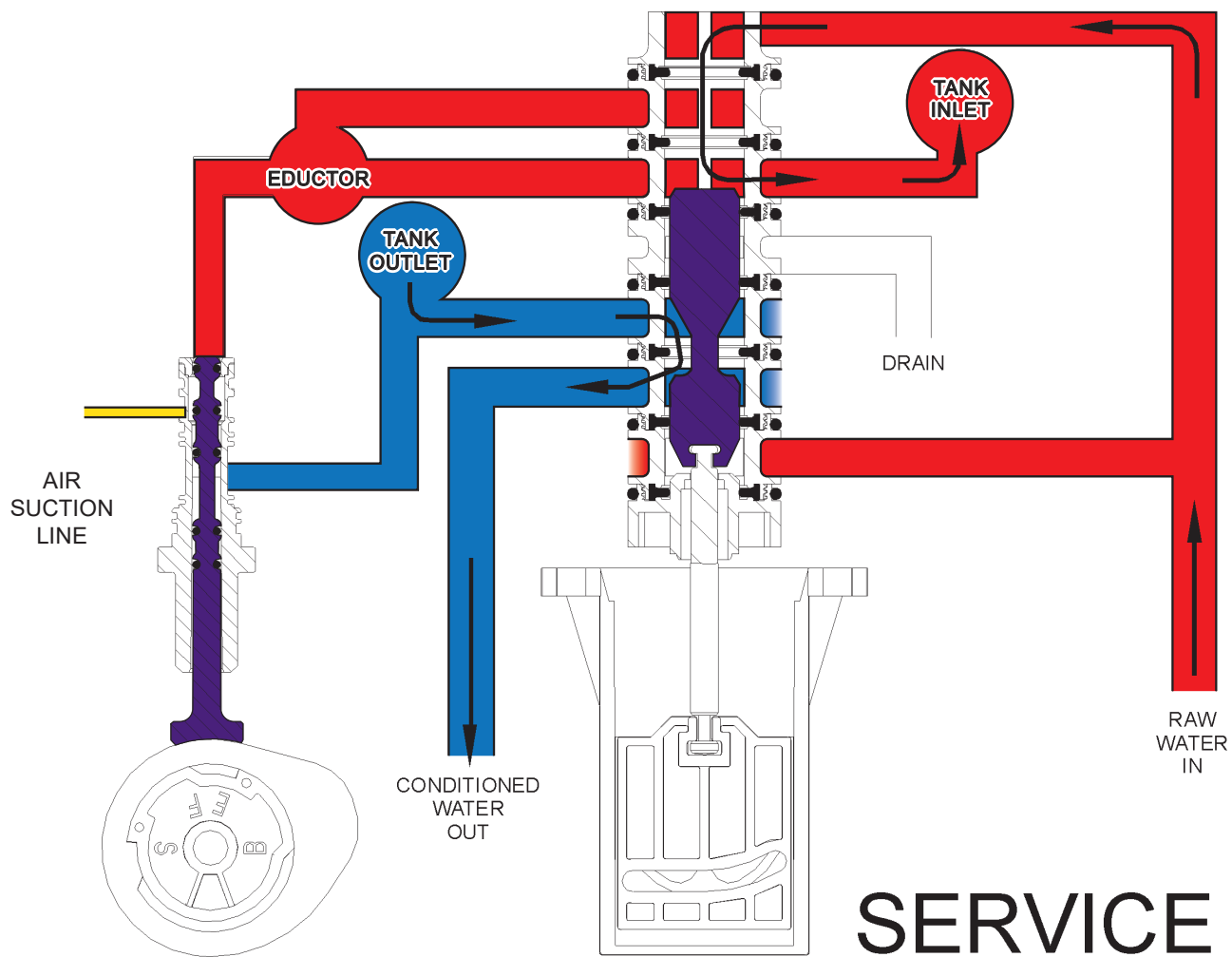
Flow Diagram

Service

Refer to [Figure 19](#)

Untreated water is allowed in the inlet to the top of the tank. The water is run through the filter media then up the manifold to the outlet to service. The water to the service should be free of iron if the system is operating properly.

Figure 19.



COLOR KEY

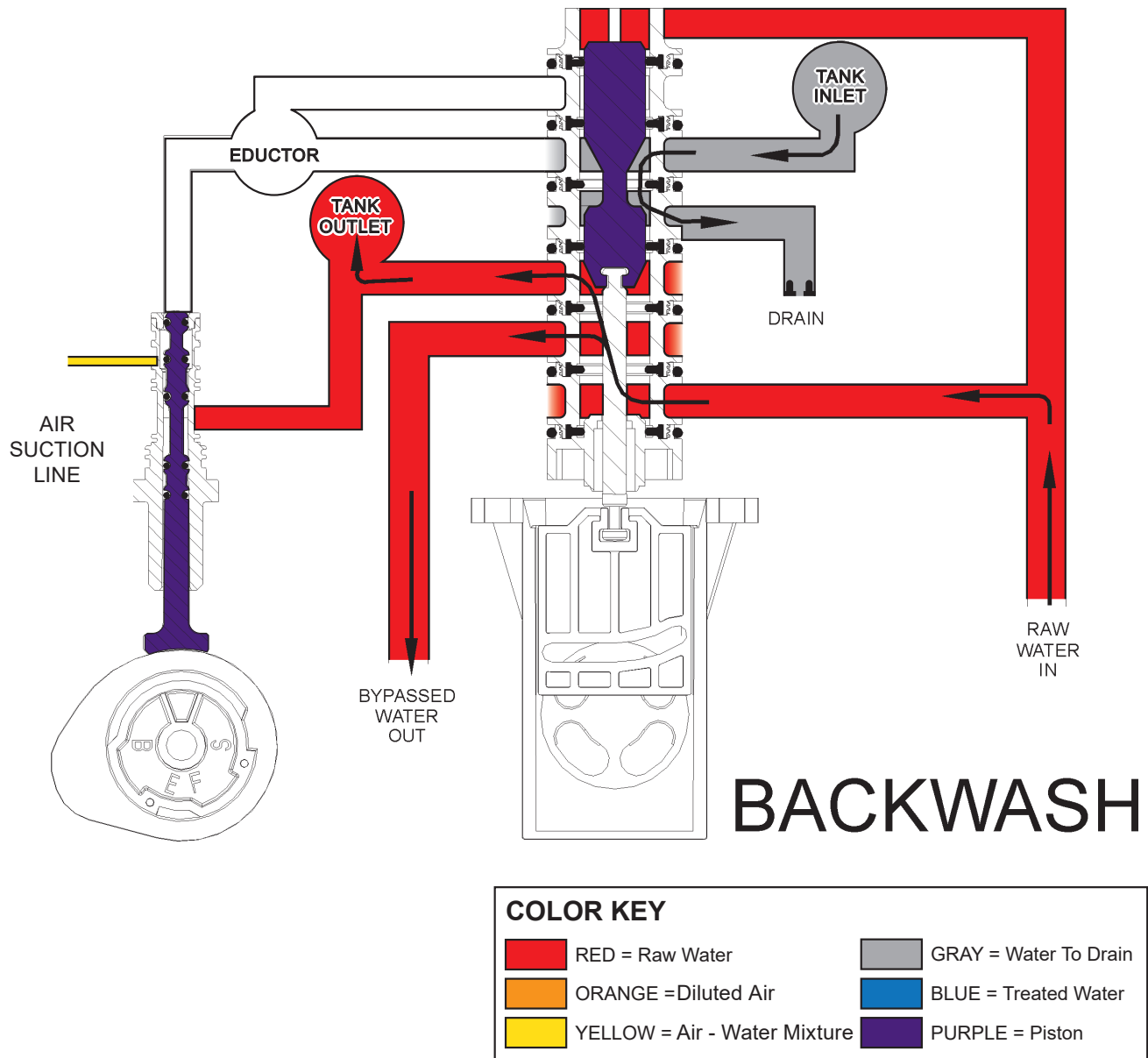
RED	RED = Raw Water	GRAY	GRAY = Water To Drain
ORANGE	ORANGE = Diluted Air	BLUE	BLUE = Treated Water
YELLOW	YELLOW = Air - Water Mixture	PURPLE	PURPLE = Piston

Backwash

Refer to [Figure 20](#)

Untreated water is directed down the outlet manifold, up through the filter media and out the top of the tank through the control valve to drain. The water to drain may be discolored for several minutes due to the volume of precipitated iron being removed from the filter tank and media. Unfiltered water is available to service during backwash.

Figure 20.

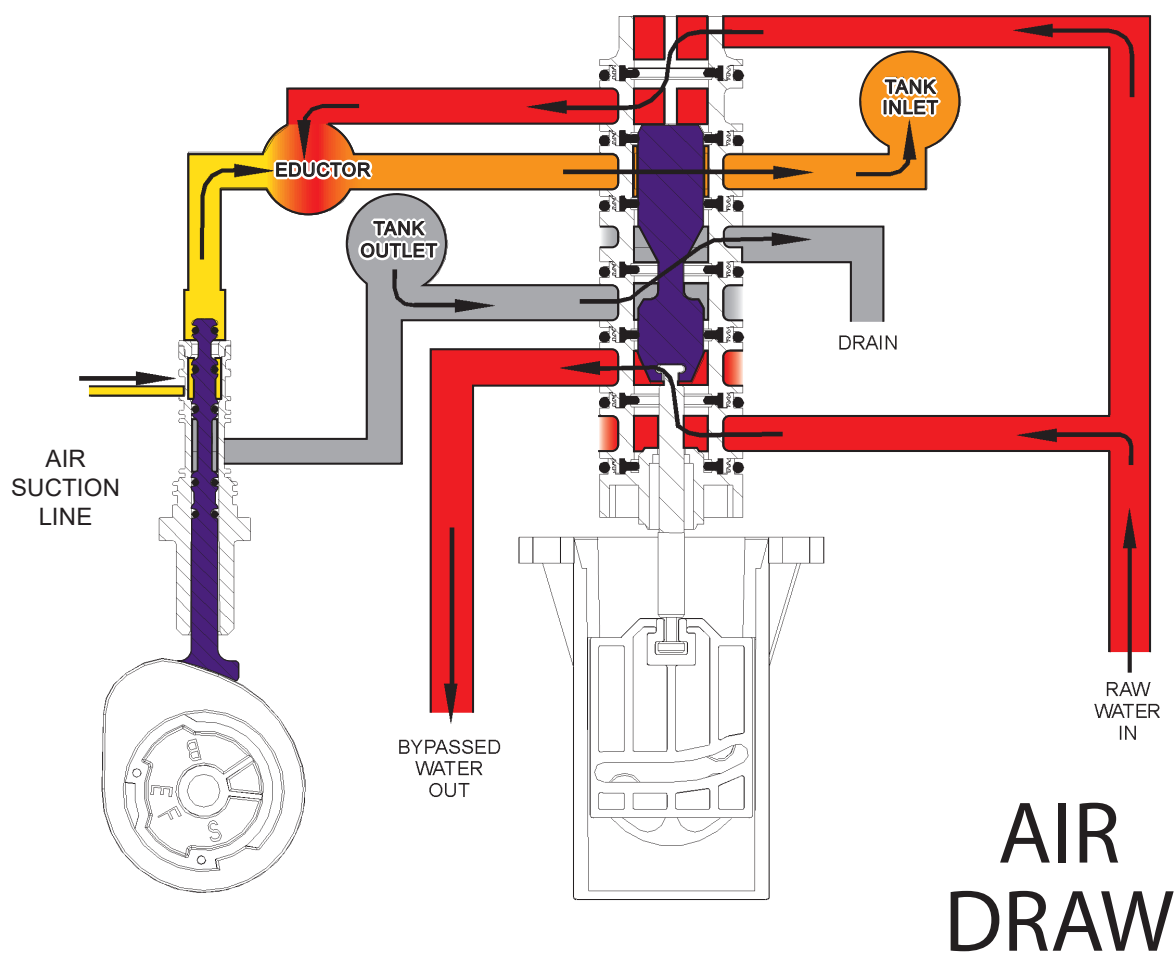


Air Draw

Refer to [Figure 21](#)

Untreated water is directed from the inlet through the nozzle and into the throat. A vacuum is created and air is educted (drawn). The air enters the mineral tank and displaces the water in the tank to recharge the air head. Water moves up the manifold and to the drain. Once the air draw cycle is complete the unit cycles to fast rinse. Unfiltered water is allowed to service during Air Draw.

Figure 21.



COLOR KEY

■ RED = Raw Water	■ GRAY = Water To Drain
■ ORANGE = Diluted Air	■ BLUE = Treated Water
■ YELLOW = Air - Water Mixture	■ PURPLE = Piston

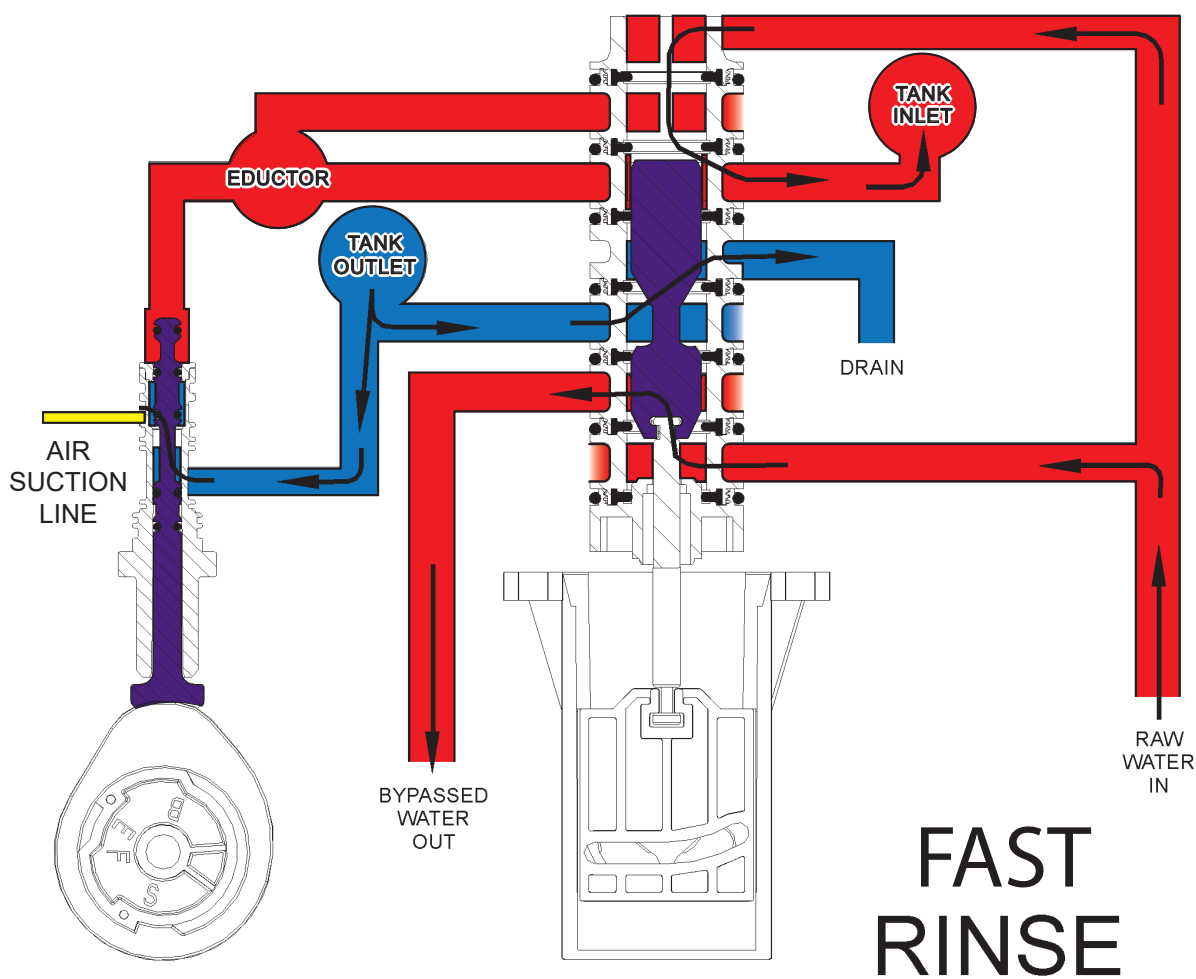
Fast Rinse

Refer to [Figure 22](#)

Untreated water is directed from the inlet, through the eductor and inlet to the top of tank, down the through the filter media, up the manifold, and out to drain. The air charge is compressed and stored within the filter tank and the filter media is rinsed prior to the system returning to the service cycle. Unfiltered water is available to service during Fast Rinse.

NOTE! No water should flow continuously from the air line during fast rinse if the no-refill eductor sleeve was installed.

Figure 22.

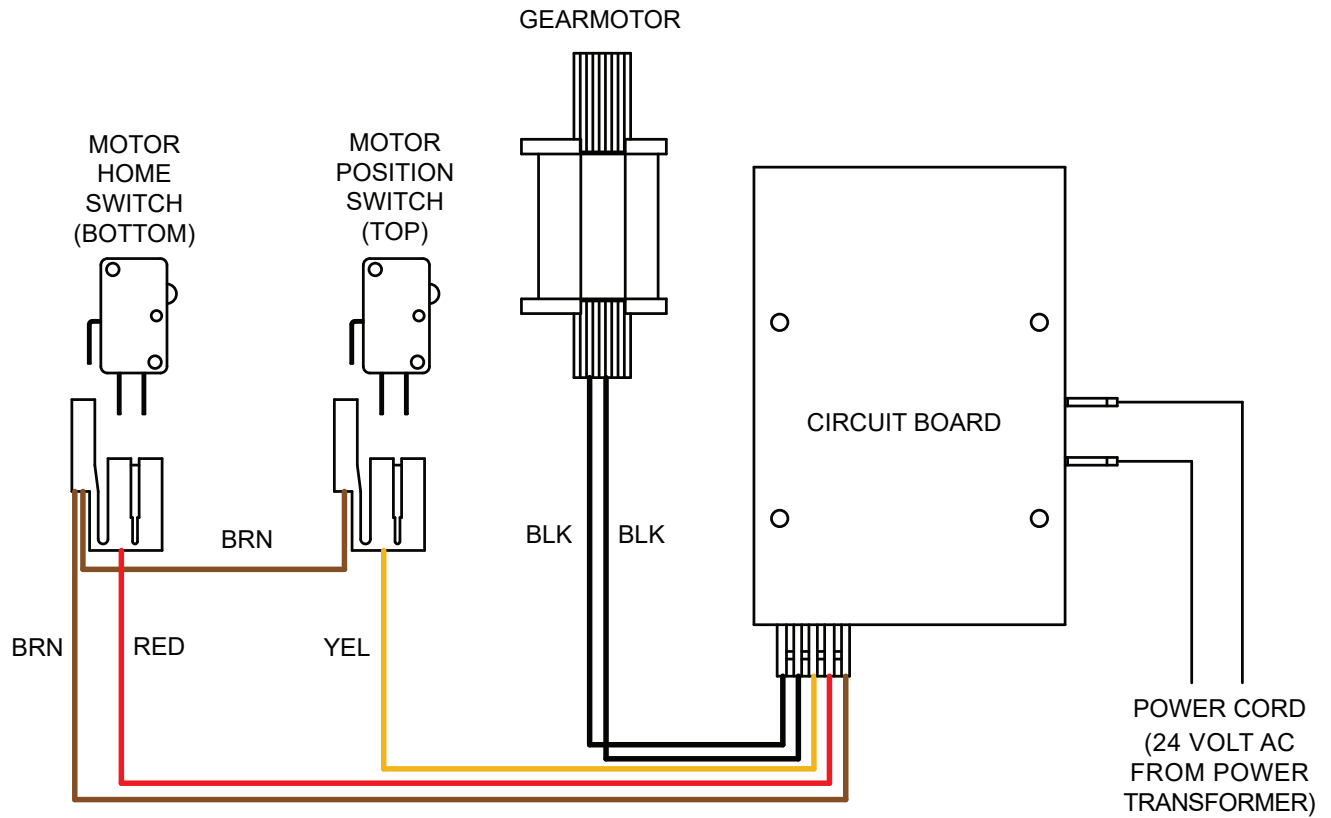


COLOR KEY

RED	RED = Raw Water	GRAY	GRAY = Water To Drain
ORANGE	ORANGE = Diluted Air	BLUE	BLUE = Treated Water
YELLOW	YELLOW = Air - Water Mixture	PURPLE	PURPLE = Piston

Wiring Diagram

Figure 23.



Parts List

Aquasential Select Plus OX 1" Control

Figure 24. 1" Control Valve

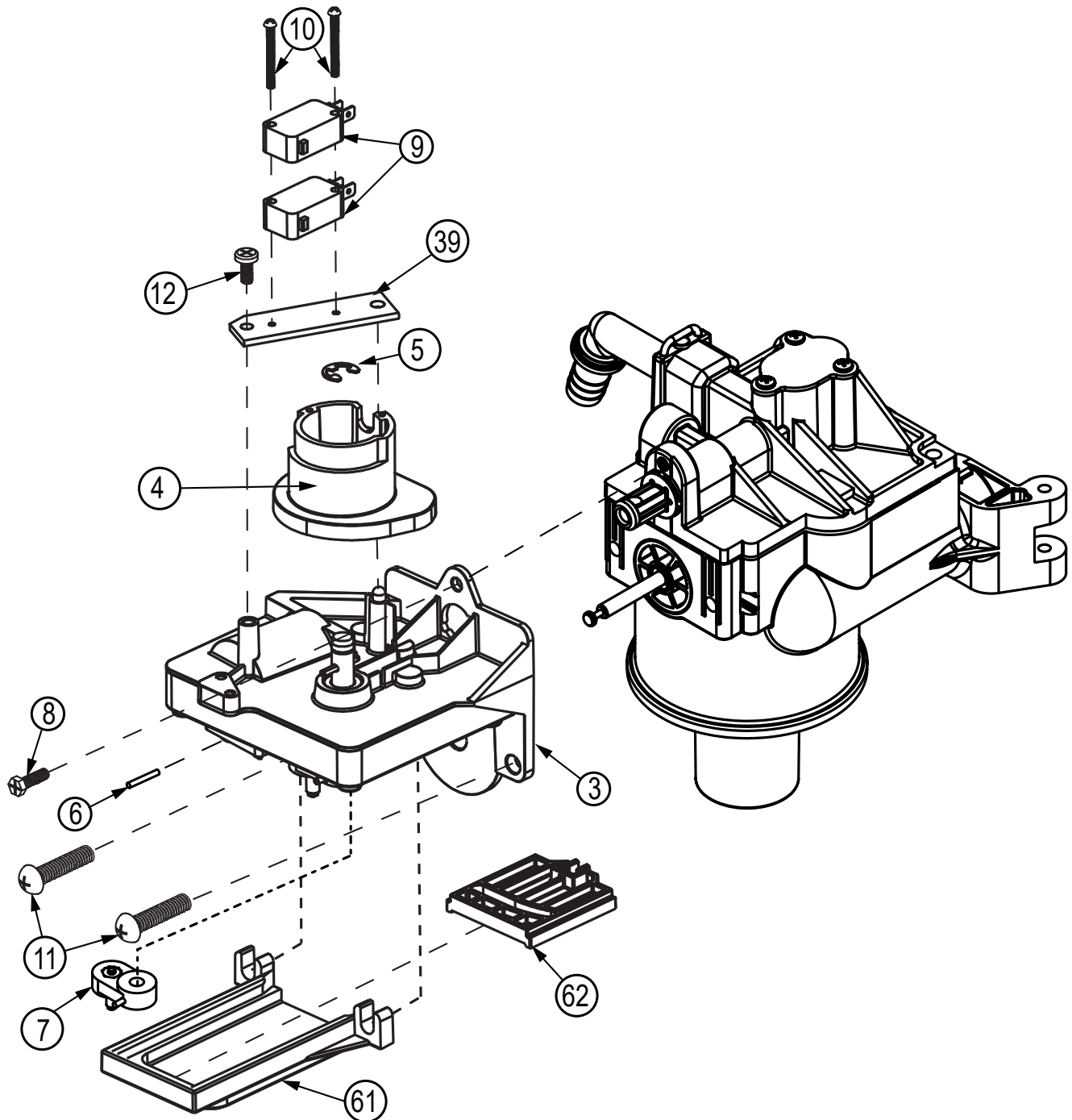


Figure 25. 1/2" Control Valve

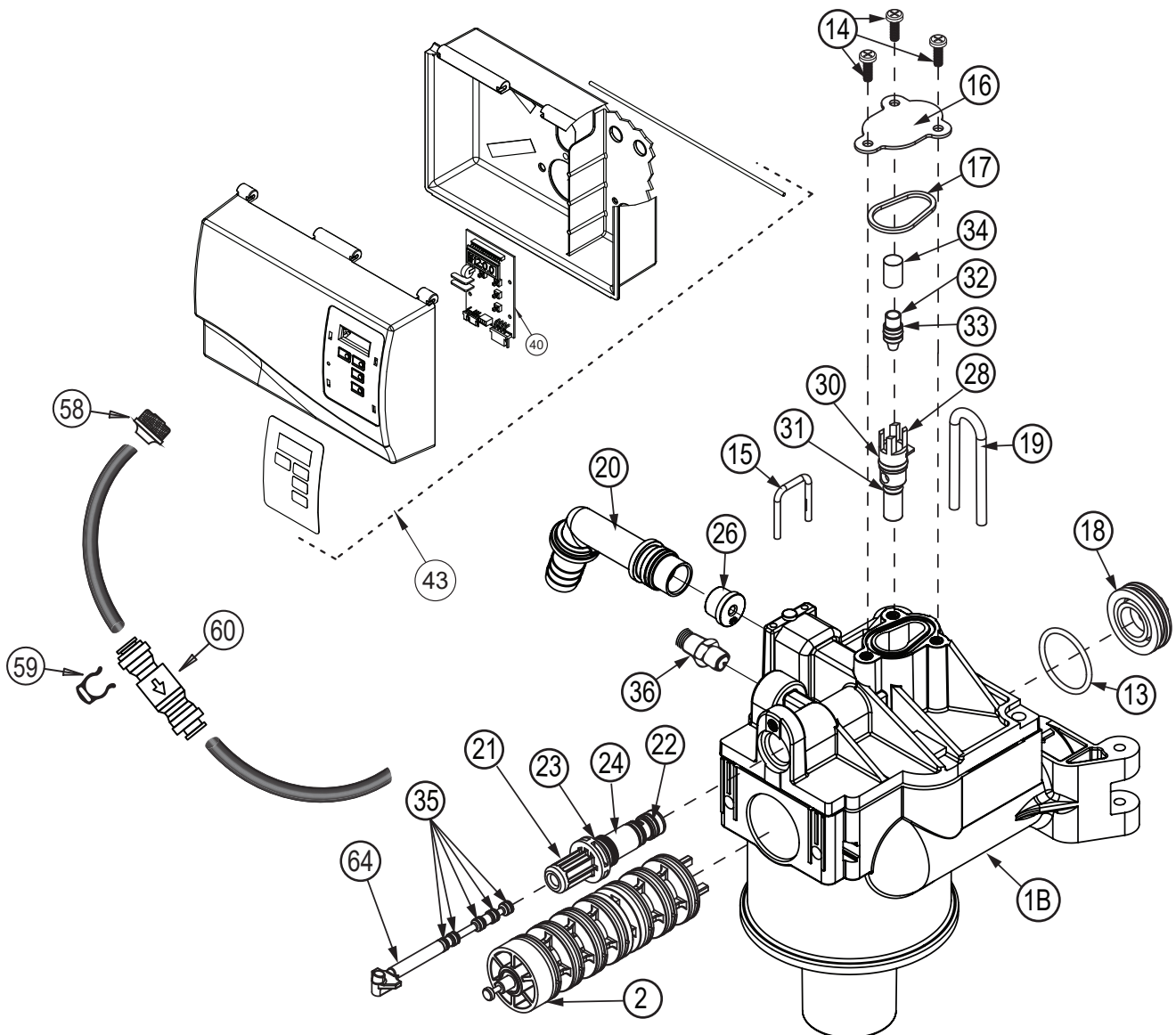
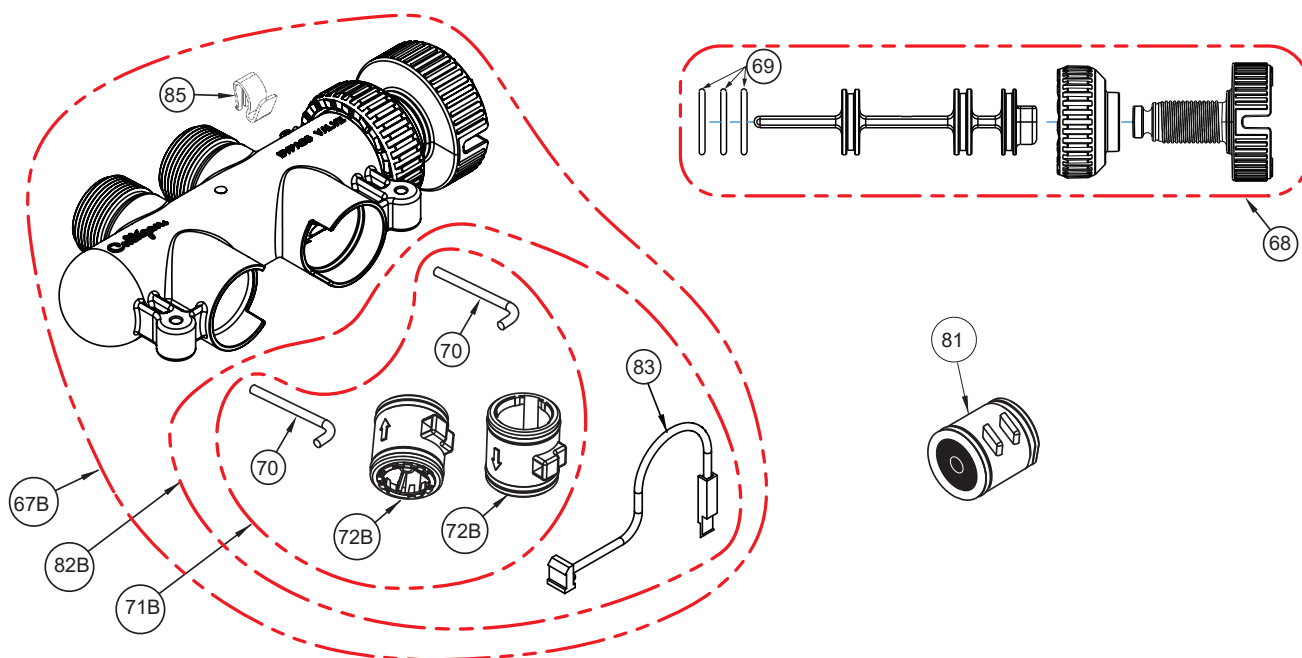
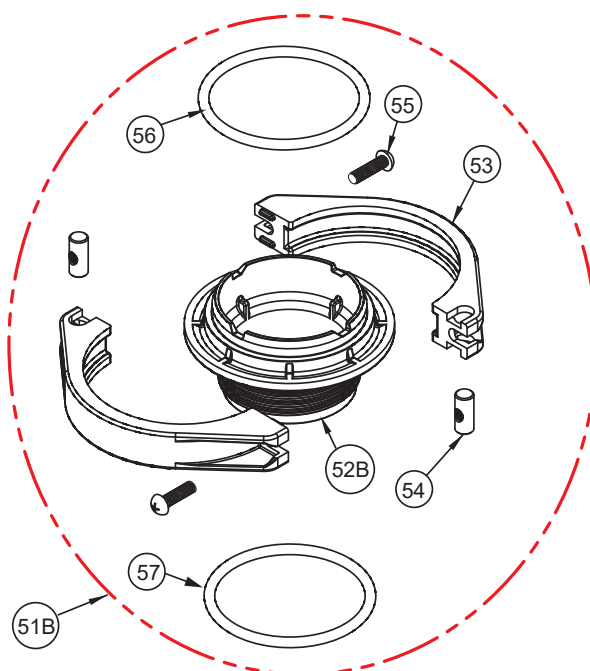


Figure 26. 1" Control Valve

Select Plus 1" Bypass Valve



Select Plus 1" Tank Adapter



Aquasential Select Plus 1" OX Power Valve Service Parts List

No.	P/N	Description	Qty
—	01040331	Control, Select Plus Series Softener, 1" - Indoor	1 EA
—	01040332	Control, Select Plus Series Softener, 1" - Outdoor	1 EA
1B	01013976	Control Valve Body 1"	1 EA
2	01013083‡	Seal Pack Assembly	1 EA
3	01030206	Drive Motor Kit 24V (Includes Items 6, 7, 12 and 39)	1 EA
4	P1013031	Drive Cam	10 EA/PK
5	P1013043	Retaining E-ring	10 EA/PK
6	P0445246‡	Pin	25 EA/PK
7	P1013677‡	Bell Crank/Follower Kit	10 EA/PK
8	P1001784	Screw, motor retaining, top	25 EA/PK
9	P1003244‡	Microswitch 24v	10 EA/PK
10	P0448686	Screw, Microswitch retaining	25 EA/PK
11	P0318452	Screw, Motor retaining, bottom	25 EA/PK
12	P0318455	Screw, Microswitch Plate	25 EA/PK
13	P0444914	O-ring, Rear Seal	10 EA/PK
14	P0448687	Screw, Eductor Cover	25 EA/PK
15	P0447387	Clip, Drain Elbow	25 EA/PK
16	P0401022	Eductor Cover	10 EA/PK
17	P0445797‡	Seal, Eductor Port	10 EA/PK
18	00448126	Plug, Body, Rear	1 EA
19	P0448128	Clip, Body, Rear	10 EA/PK
20	P1040222	Drain Elbow Assembly, Barbed with O-ring	10 EA/PK
21	P1001257‡	Repl Eductor Sleeve (Sulfur-Cleer/OX) (Includes Items 22, 23 and 24)	10 EA/PK
22	P0447986	O-ring, Eductor Sleeve, Small	25 EA/PK
23	P0308407	O-ring, Eductor Sleeve, Large	25 EA/PK
24	P0448750	Screen, Eductor Sleeve	10 EA/PK
26	P1040214	Drain Line Flow Control, 5.5 GPM - Black	10 EA/PK
28	P0401248	Eductor Throat, Beige w/O-rings (Includes Items 30 and 31)	10 EA/PK
30	P0308437	O-Ring, Eductor Throat/Plug, Large	25 EA/PK
31	P0308438	O-Ring, Eductor Throat, Small	10 EA/PK
32	P1013895	Eductor Nozzle, Beige w/ O-ring (Includes Item 33)	10 EA/PK
33	P1024333	Eductor Nozzle, Green, w/o-ring (Includes Items 32 and 33)	10 EA/PK
34	P0445269‡	Eductor Screen	10 EA/PK
35	P0447987	O-ring, brine piston	10 EA/PK
36	P1034571	Connector, Air Line, 3/8" PTF x 1/4" NPT Male	25 EA/PK
39	00401040	Plate, Microswitch	1 EA
40	01020368‡	Circuit Board Kit - Select Series	1 EA
43	01041521	Enclosure Kit - Select Series - Indoor	1 Kit
	01041522	Enclosure Kit - Select Series - Outdoor	1 Kit
51B	01014153	Adapter Assy, 1" valve to tank w/o O-ring (Includes Items 52B, 53, 54, 55, 56, 57)	1 EA
52B	01013958	Tank Adapter, 1" Valve	1 EA

53	P1013959	Tank Clamp, 1" Valve	10 EA/PK
54	P1013669	Tank Clamp Pin, 1" Valve	10 EA/PK
55	P0318383	Tank Clamp Screw, 1" Valve and 3/4" Bracket	10 EA/PK
56	P1014848	O-ring, 3/4"/1" Valve Adapter to ACME Tank	25 EA/PK
57	P0440052	O-ring, Large, 1" Valve to Tank Adapter	25 EA/PK
58	01034601	Air Line Suction Strainer	1 EA
59	P1022192	Locking Clip, 3/8", Red	10 EA/PK
60	P1009649	Air Line Check Valve, 3/8", Push-In	10 EA/PK
61	01012926	Bracket, Scotch Yoke	1 EA
62	01012933‡	Scotch Yoke	1 EA
63	01016269‡	Seal Pack/Bell Crank Kit (Includes Items 2, 4, 5, 7, 11, and 62)	1 EA
64	01013034	Brine Piston w/EPDM O-Rings	1 EA
65	01013606‡	Kit, Brine Piston/Eductor Sleeve -OX/Sulfur-Cleer (Includes Items 21, 35, & 64)	1 EA
67B	01018760	Bypass Valve - 1"/1-1/4" Rotary (Includes Items 68 and 71B)	1 EA
68	01018755	Rebuild Kit - 1"/1-1/4" Rotary Bypass (Includes Item 69)	1 EA
69	P1016467‡	O-Ring, Bypass Valve	50 EA/PK
70	P1009075	Retaining Pin, 1" Bypass valve	10 EA/PK
71B	01014033	Coupling Kit for 1" Bypass - Includes couplings (2), O-rings (4), Pins (2)	1 Kit
72B	P1009099	O-ring, 1" Couplings/Meters	50 EA/PK
81	01034517	Inlet Check Valve	1 EA
82B	01011188‡	Meter Kit - 1" w/wire harness (Includes Items 72B and 83)	1 EA
83	01008070	Wire Harness, 3/4"/1" Flow Meters	1 EA
85	P1018422	Spring Clip, 1" and 1/4" Bypass Valve	10 EA
*	01041743	Power Supply, Single Output, 24VAC, Indoor, 20 ft	1 EA
*	01013839‡	Backup Battery w/Plug-In Connector	1 EA
*	01031263	Power Supply, Single Output, 24VAC, Indoor, 30 ft	1 EA
*	P1017798	Stud, 1/4 Turn Fastener, Enclosure / 10 ea	10 EA
*	P1041578	Hose Clamp, Drain	10 EA/PK
*	P1014734	Wire Harness - CB Gold/Select Series	5 EA/PK
*	P1000372	Strain Relief (Power Cord) - Indoor	25 EA/PK
*	01018403	Cord Grip (Power Cord) - Outdoor	1 EA
*	01016142	Locknut, Cord Grip, 1/2" - Outdoor	1 EA

* Not Shown

‡ Recommended Spare Part

Filter Media – Iron-OX5

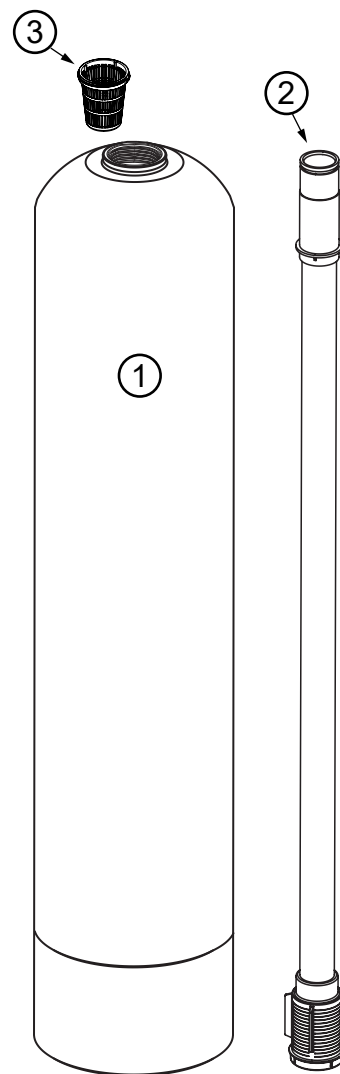
P/N	Description	Qty	UM
00163813	Mineral, Cullsan U, 25 lb bag	1	BAG
01001345	Mineral, Cullsan G-50, 50 lb bag	1	BAG
A1025002	Mineral, Birm, 1.0 ft³ bag	1	BAG

Filter Media – Sulfur-OX3

P/N	Description	Qty	UM
00160702	Mineral, Cullsan, 20 lb bag	1	BAG
01034911	Mineral, Cullar S Catalytic Carbon	1	BAG

Filter Tank

Item	P/N	Description
1	01040431	Tank Assembly QH, 10" x 54", Complete, Gray (Outdoor)
	01040418	Replacement Tank Fiberglass, 10" x 54", Complete, Gray
2	01014539	Outlet manifold, 10" x 54"
	P1009099	O-ring (outlet manifold for 1" control), 50 PK
3	P1011195	Top Strainer, Wide Slot, Select Plus, 10 PK



Appendix A - Application: Iron-OX5

Water Quality

Verify that untreated water iron, pH, and alkalinity levels are within recommended limits.

Iron—A Common Water Problem

The chemical/physical nature of iron found in natural water supplies is exhibited in four general types:

1. **Ferrous Iron** - also referred to as “dissolved iron” or “clear water” iron. The Iron-OX5 is rated to remove up to 5 ppm of this type of iron. If a glass is filled with water containing ferrous iron the water will initially be clear. Upon standing and being exposed to air the water will gradually turn cloudy and colored as the ferrous iron oxidizes to ferric iron.
2. **Particulate Iron**—Also called ferric iron. This type of iron is an undissolved particle of iron. The Iron-OX5 filter will effectively remove these particles but it is not the intended design of the system. If there is a significant amount of ferric iron additional filtration treatment may be required prior to the Iron-OX5.
3. **Organic Bound Iron**—This type of iron is strongly attached to an organic compound in the water. The oxidation / filtration process used in the Iron-OX5 will not remove this type of iron.
4. **Bacterial Iron and Colloidal Iron**—These types of iron, like organic bound iron will not be removed by the Iron-OX5 filter.

Principles of Operation - Iron-OX5 Aeration System

The Culligan Iron-OX5 system utilizes the principle of oxidation to convert ferrous iron to ferric iron, resulting in removal of the iron as a filterable particle. The process is accomplished by water entering the filter tank being immediately exposed to an “airhead” at the top of the filter tank to begin the oxidation process. The filter media acts as a catalyst to help complete the oxidation reaction and retain the precipitated iron. Periodic reconditioning purges the accumulated iron particles from the filter tank and re-classifies the media bed.

After the backwash cycle the Iron-OX5 control valve replenishes the airhead in the filter tank during the “Air Draw” cycle. During this cycle air is educted into the filter tank in sufficient volume for the required airhead. During the “Rinse” cycle the air charge is compressed and stored within the filter tank and the filter media is rinsed prior to the system returning to the service cycle.



CAUTION!

Do not use where the water is microbiologically unsafe or with water of unknown quality without adequate disinfection before or after the unit.

Pressure - Although the system is designed and tested to operate at a maximum pressure of 60 psi, it is not expected that the system should be exposed to such pressure for extended operation. Culligan recommends following the IAPMO Uniform Plumbing code section 806.2 by installing a Pressure Regulating Valve if the water pressure is greater than 60 psi. Operating on pressures above the UPC for extended periods of time can increase the service frequency and failure of replacement parts. On a private water system, make sure the minimum pressure (when the pump starts) is greater than 20 psi (140 kPa).



CAUTION!

The use of a pressure reducing valve may limit the flow of water in the household.

Temperature - Do not install the unit where it might freeze, or next to a water heater or furnace or in direct sunlight. Outdoor installation is not recommended, and voids the warranty and UL certification.

Appendix B - Application: Sulfur-OX3

Water Quality

Verify that untreated water hydrogen sulfide, pH, and alkalinity levels are within recommended limits.

Hydrogen Sulfide

Hydrogen Sulfide usually occurs naturally in well water as a dissolved gas. It is typically the result of organic decomposition. It has a characteristic “rotten egg” odor and can usually be noticed at a concentration above .50 ppm. In some cases hydrogen sulfide can be caused by Sulfate Reducing Bacteria (SRB). This system is not designed to treat hydrogen sulfide caused by SRB. The Culligan Analytical Laboratory can test for both of these contaminants.

Principles of Operation - Sulfur-OX3 Aeration System

The Culligan Sulfur-OX3 system utilizes the principle of oxidation to convert hydrogen sulfide to sulfate or a filterable particle, resulting in the reduction of hydrogen sulfide odor. The process is accomplished by water entering the filter tank being immediately exposed to an “airhead” at the top of the filter tank to begin the oxidation process. The filter media acts a catalyst to help complete the oxidation reaction and retain precipitated particles.

Periodic backwashing purges the accumulated particles from the filter tank and reclassifies the media bed. After the backwash cycle the Sulfur-OX3 control valve replenishes the airhead in the filter tank during the “Air Draw” cycle. During this cycle Air is educted into the filter tank in sufficient volume for the required airhead. During the “Rinse” cycle the air charge is compressed and stored within the filter tank and the filter media is rinsed prior to the system returning to the service cycle.



CAUTION!

Do not use where the water is microbiologically unsafe or with water of unknown quality without adequate disinfection before or after the unit.

Pressure - Although the system is designed and tested to operate at a maximum pressure of 60 psi, it is not expected that the system should be exposed to such pressure for extended operation. Culligan recommends following the IAPMO Uniform Plumbing code section 806.2 by installing a Pressure Regulating Valve if the water pressure is greater than 60 psi. Operating on pressures above the UPC for extended periods of time can increase the service frequency and failure of replacement parts. On a private water system, make sure the minimum pressure (when the pump starts) is greater than 20 psi (140 kPa).



CAUTION!

The use of a pressure reducing valve may limit the flow of water in the household.

Temperature - Do not install the unit where it might freeze, or next to a water heater or furnace or in direct sunlight. Outdoor installation is not recommended, and voids the warranty and UL certification.

Operating Conditions

The hydrogen sulfide limit listed below reflects the maximum limit that was tested without any interference from other contaminants in the influent water.

In reality, however, we know that other contaminants may be present that could limit the filter's ability to remove hydrogen sulfide. In some cases, individual sellers of this equipment have had success removing other concentrations of contaminants such as ferrous iron. If you are considering the installation of this system for the removal hydrogen sulfide and iron is present we recommend that you consult Culligan for proper application.

This system should not be used for the treatment of odors caused by sulfate reducing bacteria (SRB).

Appendix C - Outdoor Installation

Outdoor Select Series Enclosure

Outdoor rated Select Series have a water tight enclosure to protect the electrical and mechanical components from the weather.

Sealing Unit with Provided Screws

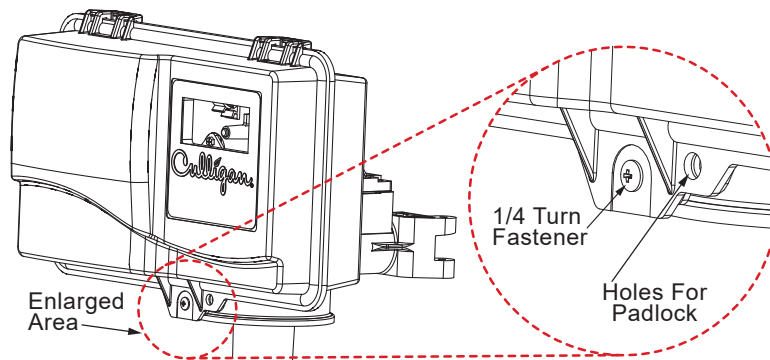
The control comes with 1/4 turn fastener for sealing the enclosure. Rotate the 1/4 turn fastener to open or close the enclosure (See [Figure 27](#)). A hole is available at the bottom of the enclosure for an optional padlock if so desired.



WARNING!

Do not use an extension cord. Connect only to a suitably marked, covered GFCI receptacle location.

Figure 27. Figure of Outdoor Enclosure



Placement

Refer to [Figure 28](#) for system placement outdoors.

- Set the media tank on a solid, level surface near plumbing, drain, and electrical connections. Media tank and plumbing should be secured so the system can't be knocked over.
- The customer should provide a GFCI electrical outlet suitable for outdoor use that is NOT controlled by a switch that can be turned off accidentally.
- For outdoor installation, only use an outdoor rated power supply.
- Power supply **MUST** be mounted on the wall at least 1 foot above ground level. (See [Figure 28](#))
- Properly ground to conform with all governing codes and ordinances.
- Observe all state and local electrical codes.
- P/N 01041744 plug-in 20-foot power supply is included, is rated for outdoor installations, and is to be mounted within 2-ft of the outdoor receptacle. It **MUST** be mounted at least 1-ft above ground level.
- P/N 01041744 is an Outdoor rated 20-foot power supply included with Outdoor systems. It is to be mounted within 2-ft of the outdoor power receptacle.
- For Outdoor use with a UL Listed Class 2 Direct Plug-in Power Unit only.
- **WARNING!** Use only Outdoor Power supplies for Outdoor installations. DO NOT use Indoor Power Supplies for Outdoor system installations.

Figure 28. Outdoor System Placement

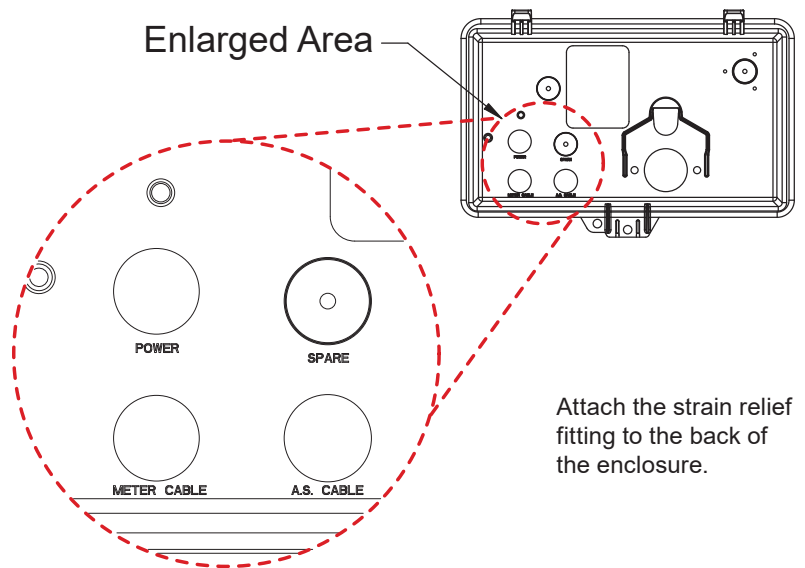


Electrical Connection

Outdoor rated systems are supplied with a 24 volt – 60Hz outdoor rated power supply.

The customer should provide a GFCI electrical outlet suitable for outdoor use that is not controlled by a switch for powering the unit. The location of that receptacle will determine the proper power supply to select to complete the installation.

Figure 29. Rear Port Markings - Close-up View



Power Supply and Cable

1. Connect the power cable from the control valve to the power transformer where shown.
2. Insert the two-prong cable connection into the transformer and tighten the water-proof nut.
3. The power supply plug can now safely be connected to the power receptacle.

Figure 30. Wall Mounted Outdoor Transformer for 01041744

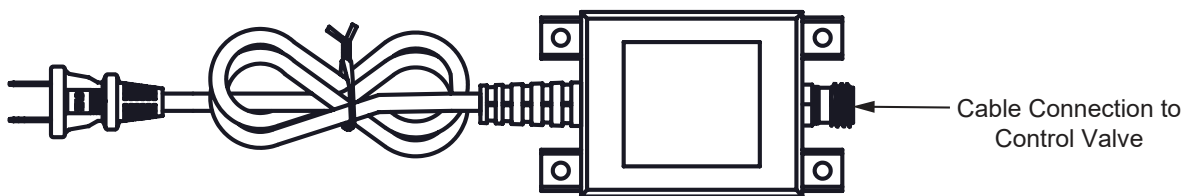
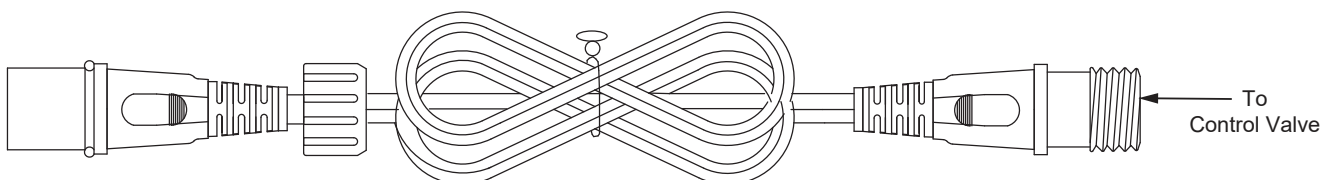


Figure 31. Power Cable - Transformer (01040230) to Control Valve



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