AIO OZONE SYSTEM SET-UP OPERATION & MAINTENANCE MANUAL

EOG 200
ENHANCED
OXYGEN GENERATOR

CLACK AIO OZONE CONTROL SET-UP

CLACK AIO OZONE SET-UP USING THE WS1EE CONTROL 10" Tank AIO Set Up			CLACK AIO OZONE SET-UP USING THE WS1EE CONTROL 12" Tank AIO Set Up		
Injector DLFC Button	1 Cubic Foot System	White-E 4.2gpm	Injector DLFC Button	1.5 Cubic Foot System	Blue-F 5.3gpm
TIMER SETTINGS			TIMER SETTINGS		
1 Set Backwash To:		14 Mins	1 Set Backwash To:		14 Mins
2-Set Brine Draw To:		40 Mins	2-Set Brine Draw To:		60 Mins
3-Set Second Backwash To:		OFF	3-Set Second Backwash To:		OFF
4-Rinse To:		OFF	4-Rinse To:		OFF
5-Set Fill To:		OFF	5-Set Fill To:		OFF
d-SetSystem Capatict To		5	d-SetSystem Capatict To		5
e-Set Volume To:		OFF	e-Set Volume To:		OFF
f-Set Regeneration To:		OFF	f-Set Regeneration To:		OFF
g-Set Regeneration To:		7 Days	g-Set Regeneration To:		7 Days
(Go To "Installer Display Settings" To Select Every 4th Day Regeneration) NOTE: Turn Relay On For OZONE			(Go To "Installer Display Settings" To Select Every 4th Day Regeneration) NOTE: Turn Relay On For OZONE		
Activate Relay To:		15 Mins	Activate Relay To:		15 Mins
De-activate Relay To:		38 Mins	De-activate Relay To:		58 Mins

CLACK AIO OZONE SET-UP USING THE WS1EE CONTROL 13" Tank AIO Set Up			CLACK AIO OZONE SET-UP USING THE WS1EE CONTROL 14" Tank AIO Set Up		
Injector DLFC Button	2 Cubic Foot System	Yellow-G 7.5	Injector DLFC Button	2.5 Cubic Foot System	Green-H 9.0gpm
TIMER SETTINGS			TIMER SETTINGS		
1 Set Backwash To:		14 Mins	1 Set Backwash To:		14 Mins
2-Set Brine Draw To:		60 Mins	2-Set Brine Draw To:		80 Mins
3-Set Second Backwash To:		OFF	3-Set Second Backwash To:		OFF
4-Rinse To:		OFF	4-Rinse To:		OFF
5-Set Fill To:		OFF	5-Set Fill To:		OFF
d-SetSystem Capatict To		5	d-SetSystem Capatict To		5
e-Set Volume To:		OFF	e-Set Volume To:		OFF
f-Set Regeneration To:		OFF	f-Set Regeneration To:		OFF
g-Set Regeneration To:		7 Days	g-Set Regeneration To:		7 Days
(Go To "Installer Display Settings" To Select Every 4th Day Regeneration) NOTE: Turn Relay On For OZONE			(Go To "Installer Display Settings" To Select Every 4th Day Regeneration) NOTE: Turn Relay On For OZONE		
Activate Relay To:		15 Mins	Activate Relay To:		15 Mins
De-activate Relay To:		58 Mins	De-activate Relay To:		78 Mins

MediasThat Can Be Used With A OZONE AIO System.
Coconut Shell Carbon, Centaur Catalytic Carbon , CAT-HAC Catalytic Carbon, Filter AG, Aldex CR26 & Katalox-Light NOTE: BIRM Cannot Be Used With OZONE

Above Settings Are Defult Settings Please Refer To The WS1-EE Manual For Full Programming.

Dear Valued Customer:

Welcome to the Enhanced Oxygen Generator (EOG) User Manual

Congratulations on your purchase of an EOG! This comprehensive user manual is designed to be your ultimate guide to unlocking the full potential of your new EOG. Whether you're a first-time user or an experienced water treatment professional, this manual will provide you with the knowledge and insights you need to make the most out of your EOG.

What's Inside

In this manual, you'll find clear and concise instructions on how to set up, operate, and maintain your EOG. We've organized the content in a logical sequence, from initial unboxing to advanced usage techniques, making it easy for you to navigate and find exactly what you need. Each section is accompanied by illustrative diagrams, helpful tips, and troubleshooting suggestions, all aimed at enhancing your experience.

Your Feedback Matters

We're dedicated to continuous improvement, and your feedback is invaluable to us. If you have suggestions for improving this manual please **Contact iwaterwerks@aol.com** If you encounter any challenges, please reach out to your local dealer.

Thank you for choosing Ozotech.

Enhanced Oxidation Generator

FREQUENTLY ASKED QUESTIONS

What would be the ideal situation to try the Ozotech EOG?

Slight rotten egg odors or metallic tastes that stem from iron, manganese, IRB's or mild H2S.

Is it a unique solution for a unique issue, or is it enhancing an existing solution?

The EOG generator is an enhancement of the AIO type systems controlling bacteria build up in the dome area of the tank and reducing odors related to that build up.

Who is the target market for the Ozotech EOG?

The EOG II when added to a Clack AIO system will increase the oxidation process and re-oxidize medias such as Katalox Lite, Greensand Plus or Titanium oxide. It also controls the buildup of iron-related bacteria, nuisance bacteria and aerobic bacteria thus controlling associated tastes and smells.

The typical water analysis would be:

Iron	<5 ppm
Manganese	<1 ppm
pH	>6.5
IRB'S	
Pink Algae	
Biofilm	

With this type of water Katalox lite, Greensand Plus or Titanium oxide All would work well in a 10 x 54 vessel.

What filtration media works well with ozone?

Usually media choice is determined by our OEMs. Some use Katalox Lite, Greensand Plus or titanium oxide. All of these work well with ozone but would be dependent on factors such as pH, organics or turbidity.

Does the Ozotech EOG work with the Clack 'filter' valve?

The EOG requires a Clack valve set up in the AIO configuration and needs an EE board to turn it on.

Does the Ozotech EOG help with bacterial iron issues?

Yes, many of our OEM's report success with not only iron bacteria but all IRB's and nuisance bacteria.

Does the Ozotech EOG work well with Birm?

No. Clack does not recommend the use of Birm with ozone.

1.0 Caution

Read the following safety guidelines thoroughly before attempting to operate or install your equipment.

As with all electrical devices, this equipment should never be allowed to come in contact with water.

Only qualified personnel should be allowed to set up, maintain and operate this equipment

The equipment must be operated using a properly grounded electrical circuit that is protected by either a fuse or circuit breaker.

Do not use an extension cord to supply power to this equipment.

WARNING: This product contains a chemical known to the State of California to cause cancer. For more information, go to www.p65Warnings.ca.gov.

Ozotech, Inc. & International Water Werks, Inc
Assumes no liability for damages or injuries incurred by misuse of this product.

2.0 Installation and Operation

Your generator requires special operating conditions in order to maintain performance and reliability. Your ozone generator is designed to be operated under a negative pressure situation.

Warranty coverage of your equipment is contingent upon strict compliance with the operating conditions specified in this manual.

2.1 Operating Environment

External
It is most important to choose a cool, clean external operating environment. Consideration of these factors should be a priority. Mount your ozone generator in the best possible operating environment that is available at the chosen site. If possible, mount in an area that is free of airborne moisture particles.

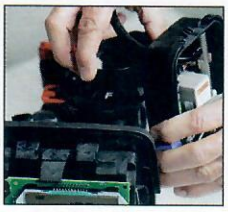
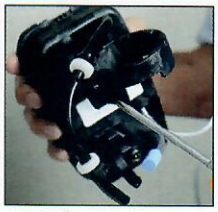
Internal
Keep the inside of the generator chassis clean and dry. Dust particles and condensation pose a challenge to the consistent operation of all ozone generators. Make a note to inspect the internal cleanliness of the equipment when scheduled maintenance is performed. For additional information, refer to Section 3.0.

2.2 Installation

Tools required: #2 Philips screwdriver

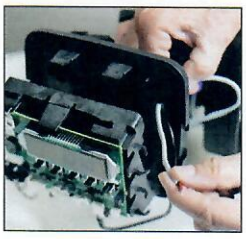
1. Mount the EOG to the Clack® control valve.
    a. Place inlet filter into the clear tube.
    b. Install clamp ring into EOG backplate receiver.
    c. Install port clip into EOG backplate receiver.
    d. Connect the EOG power supply plug to the
    to the DC jack on the EOG.
    e. Loosen clamp screw, slide clamp over valve injector cap. Rotate EOG counterclockwise to secure port clip.
    f. Tighten clamp screw using a #2 Philips screwdriver.

a. 
b. 
c. 

d. 
e. 
f. 

2. Unplug the power supply to the control valve from the wall outlet. Remove the front cover from the valve backplate. Release the control board bracket from the backplate.

3. Route the gray control wire from the EOG into Clack® valve housing through the hole in the backplate, and through the strain relief channel above the Clack® power supply cable to keep wiring in place.

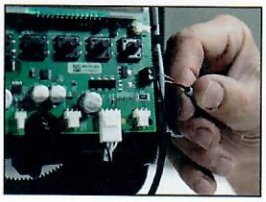
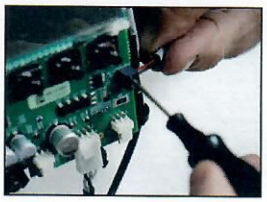
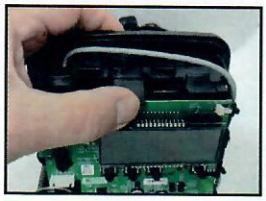


    a. Leave enough wire length to connect to the signal relay terminal block of the control circuit board. Make sure the wire is flush in the channel for proper bracket installation.

    b. Replace the control board bracket into backplate until it "snaps" into place.

2.2 Installation Continued

4. Secure red wire into RLY 1 terminal, and black wire into +COM terminal on Clack® control board.

5. Replace control valve front cover.

6. Plug the EOG and control valve power supplies into a wall outlet.

7. Program ozone start and end schedule using the control valve PCB:
   Refer to the specific service manual for your Clack® control valve model. Programming steps are based on an WS-1 EE control valve and parameters or settings may vary depending on the particular valve and tank combination used.

Enter "Cycle Programming" mode using the selection buttons.
a. Set control valve to (softening) mode

See AIO Ozone Set-Up Chart & WS1EE Manual

Important Notes:

- Relay turns ozone on 1 minute after draw starts and turns ozone off 1 minute before draw ends. Clack Corp. recommends venturi relative to tank size should be used.

3.0 Maintenance

The EOG ozone generator is delivered factory tested, calibrated, and adjusted for maximum efficiency and long life. Simple maintenance and appropriate operating conditions are the only requirements to keep the unit functioning within manufacturer's specifications.

Performing any other modifications or adjustments to internal components will cause the unit to function outside of manufacturer's specifications and will cause damage to the unit not covered under warranty terms.

3.1 Ozone Generator Maintenance

Frequency of Maintenance:
Every 12 months, more frequently in high humidity areas.

Perform the following general maintenance procedure:

1. Disconnect the EOG from the power source.
2. Remove cover.
3. Inspect the inside of the generator for dust and moisture.
4. Thoroughly clean and dry the inside of the generator.
5. Replace top cover.
6. Replace any in-line and brine elbow check valves.

Normally the EOG controller board will signal cell maintenance after one year of service by changing the LED indicator light to orange. Once service has been performed, the timer can be reset by following the timer reset instructions below. However, if the cell is serviced or replaced prior to the one-year service signal, a "forced reset" on the timer should be performed.

3.2 Maintenance Timer Service Reset Instructions:

Follow these instructions to perform a reset on the EOG board:

1. Disconnect power from the EOG.
2. Press and hold reset button while re-powering the EOG.
3. Pulsing orange LED will indicate timer rest function is active.
   * Press reset button again to complete reset. LED will pulse green when finished.
4. The EOG is now ready to operate as normal.

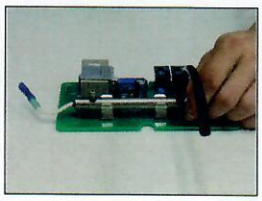
Notes: This feature only applies to EOGs manufactured after May 2020 (See program rev code on side of transformer and/or date code in serial number).

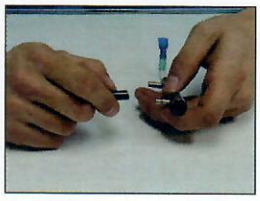
To abort the timer reset once timer reset function is active (pulsing orange), disconnect then reconnect power without pressing any buttons.

3.3 Cleaning the Corona Discharge Cell

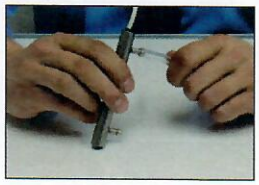
__CAUTION:__ UNPLUG POWER SUPPLY TO EOG BEFORE PERFORMING SERVICE

1. Disconnect the cell from the unit by removing cell-to-board electrical connections and the CD cell from it's mounting clips. Remove the tubing from the cell barbs.

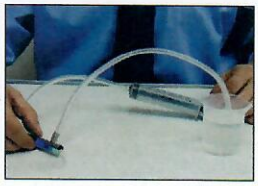




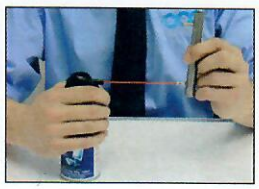
2. Connect the longer piece of clear tubing from your cleaning kit to one of the cell barbs. Attach the shorter piece of clear tubing from the kit to the open CD cell barb. Insert the tubing adapter, attached to the syringe, into the open end of the short piece of tubing. Fill the beaker included in your kit with warm water. Place the open end of the long clear tube into the beaker. Now you're ready to flush the cell. **Note:** Hot water can be used if nitric acid buildup is severe.



3. Flush water through the cell by pulling back and pushing the syringe plunger. Water may become cloudy or discolored as the nitric byproducts are released from the CD cell during flushing. Discard and replace warm water in the beaker as cloudiness continues. Flush the CD cell until the water is clear.



4. Remove both pieces of tubing from the CD cell barbs. Dry the cell using the can of compressed air supplied in your kit. Place the nozzle of the compressed air into one of the barbs of the CD cell. Depress the trigger on the can to dry the cell until all moisture is evacuated from the cell.



3.4 Replacing a Corona Discharge Cell

__CAUTION:__ UNPLUG POWER SUPPLY TO EOG BEFORE PERFORMING SERVICE

1. With the cover of your specific unit removed, remove the CD cell from the ozone generator:

    a. Disconnect any electrical connections between the CD cell and the electronics board.

    b. Remove and discard any shipping ties that may be securing the CD cell(s).

    c. Disconnect the air inlet and ozone outlet hoses from the CD cell barb fittings.

    d. Pull the CD cell straight up from the retaining clips.

2. Replace with a new CD cell in reverse order, making sure all air and electrical connections are secure.

New CD cell as installed on the EOG 200

4.0 Spare/Replacement Parts

Part #	Description
33218-R	Replacement CD cell and adapter kit
47049	Ozone resistant in-line check valve* (1)
40080-01	Wall transformer, 100-240Vac to 12Vdc/2A, regulated (domestic customers only)
47044-1	CD cell maintenance kit

* Denotes recommended spare maintenance parts with initial purchase. Followed by additional quantity recommended for one year's scheduled maintenance.

5.0 Specifications

Specification	EOG 200
Operating Voltage	12 Vdc via 120/240Vac 50/60Hz switching power supply
Power Consumption	600mA @ 12Vdc (7.2 Watts) nominal
Ozone Output	220 mg/hr
Size	6.8" x 4.4" x 5.4"
Shipping Weight	2 lbs.
Enclosure	ABS

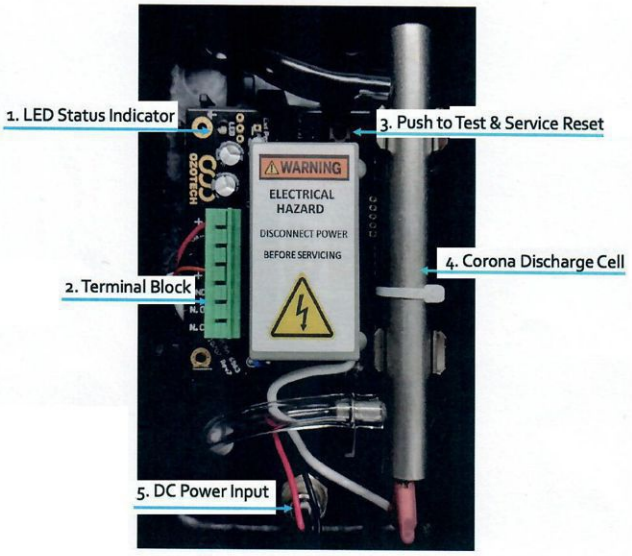


Figure 1: EOG internal layout

47049 Ozone Resistant Brine Valve Back Check Assembly

V3957 In-Let Back Check Assembly

33218-R Replacement Corona Cell

40080-01 Wall Transformer

47044-1 CD Cell Maintenance Kit

34054 Standard Air Filter

47047-10R Optional Intake Air Dryer Kit For High Humidity Areas

6.0 Troubleshooting Guide

System	Possible Cause	Solution
Unit doesn't turn on	Unit is not connected to power source, or is connected to improper power source	Refer to input power requirements on pg. 10, and Figure 1 on pg. 14 for proper electrical connections.
	Electrical short circuit	Visually inspect unit and check for loose connections. Inspect printed circuit board (PCB) for burn marks. Inspect HV wire from PCB to CD cell for disconnection or burn marks. Repair any and all problems prior to placing unit back into service, or contact factory for service.
	Unit is connected to improper power source	Refer to pg. 10 to ensure that unit is plugged into proper voltage outlet.
Unit turns on, but no ozone output	Frequency driver high voltage lead not connected to ozone cell	Connect red flag terminal to CD cell spade connection.
	Water has been allowed to back up into the CD cell(s) and has caused a direct short	Dry CD cell using drying procedure on page 8. Replace CD cell(s).
	Cell is plugged with build-up of nitrous byproducts and particulate matter. Usually caused by the lack of proper air preparation	Refer to section 3.3 on page 8 to clean CD cell. Replace CD cell(s).
	Frequency driver is defective	Contact dealer for service.

7.0 Limited Warranty

OZOTECH, Inc., warrants the EOG ozone generator to be free from defects in parts and workmanship for (12) months from date of invoice, under conditions of normal use. The corona discharge cell is warrantied against catastrophic electrical failure for 3 years from date of invoice. All other parts, repaired or replaced, will be warranted only for the remainder of the original warranty period.

OZOTECH, Incorporated will refund the purchase price, perform repairs or replace equipment, at the option of OZOTECH, Incorporated.

The warranty shall be null, void, and non-binding upon OZOTECH, Incorporated if OZOTECH, Incorporated (or authorized service center) determines the cause of malfunction or defect to be a result of:

1. Failure to perform proper maintenance as defined and recommended in this manual.

2. Failure to adhere to and provide proper operating conditions, as defined in this manual, including operation outside of temperature range, operating in wet or dirty environment, operation outside of manufacturer's specifications.

3. Adjustments made by user other than product output flow rate within ranges specified by manufacturer.

OZOTECH, Incorporated assumes no liability for damages incurred by deliberate or incidental misuse of this product, or damages incurred in transit.

8.0 Service Returns

If the need arises to return your equipment for service, the following procedure must be followed to ensure accurate and timely processing of repairs.

- ✓ Obtain model number/name of unit to be returned.
- ✓ Contact Ozotech, Inc and request a Return Material Authorization (RMA) form. Make sure to give the factory representative an accurate and current shipping address.
- ✓ Provide a description detailing the problem with the unit. Be as specific as possible.
- ✓ After receipt of RMA form, package unit for shipment. Enclose the RMA form with the unit. Use the original packaging materials if possible. If not, please package the product to ensure against shipping damage.
- ✓ Clearly write the RMA number on the outside of the shipping package.
- ✓ Verify that the address is correct and current.
- ✓Shipments that are not factory authorized will be refused.

It is recommended that you ship with a reputable and reliable shipping company, and that the contents of the package are insured. Ozotech, Inc. accepts no responsibility for damage or loss of equipment in transit.

ALL FREIGHT CHARGES INTO THE FACTORY MUST BE PREPAID.
If the repair is covered under warranty, the factory will pay return shipping charges (surface rates only) to the address listed on the RMA, within the Continental United States.

If the repair is not covered under warranty, the returning party is responsible for payment of return shipping and handling charges, as well as labor and equipment costs associated with the repair.

Maintenance Notes

Front Cover and Drive Assembly

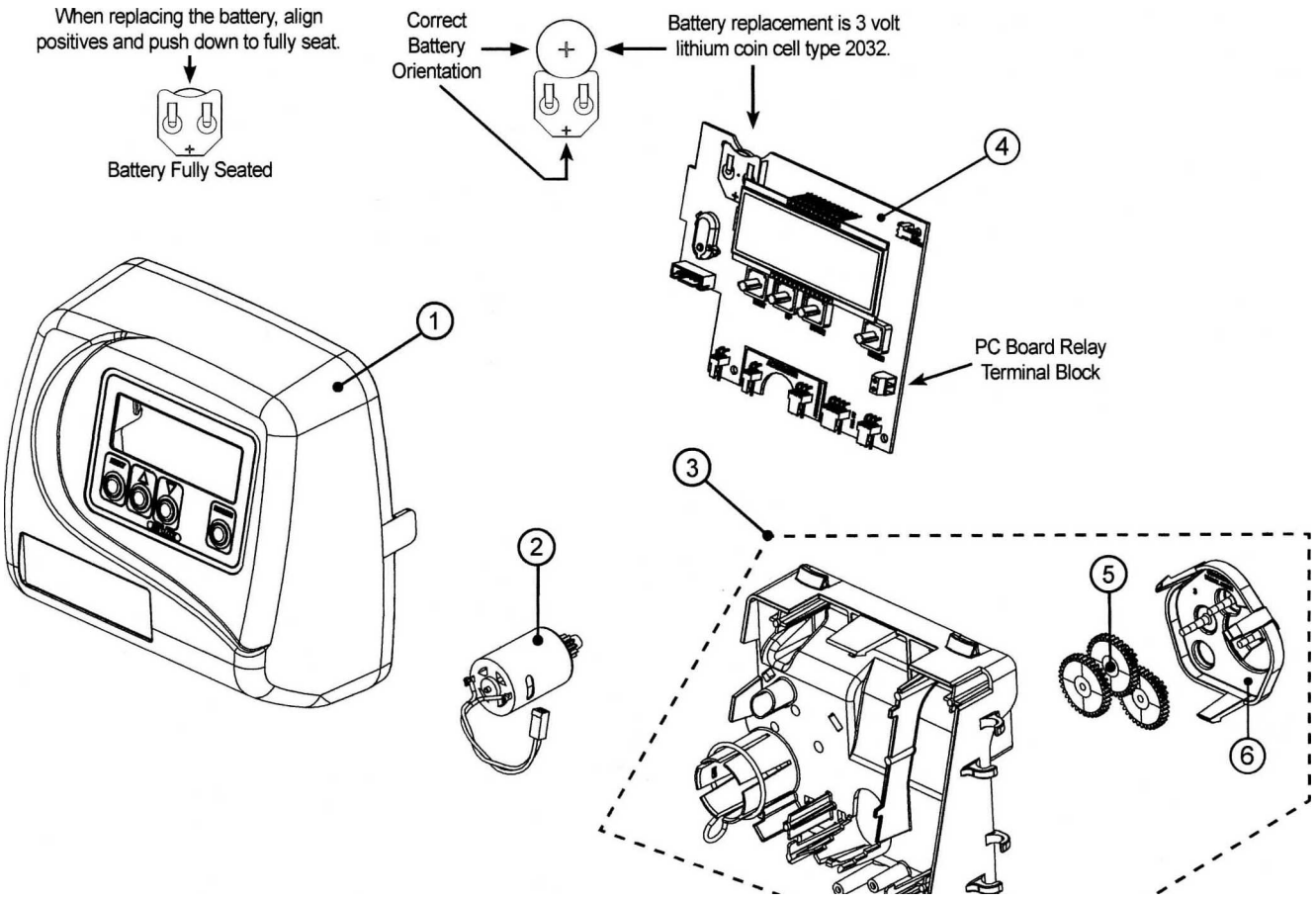
Drawing No.	Order No.	Description	Quantity
1	V3175EE-01	WS1EE FRONT COVER ASSEMBLY	1
2	V3107-01	WS1 MOTOR	1
3	V3002-A	WS1 DRIVE BRACKET ASY	1
4	V3408EE-13BOARD	WS1THRU/2 EE PCB 5 DIGIT REPL	1
5	V3110	WS1 DRIVE GEAR 12X36	3
6	V3109	WS 1 DRIVE GEAR COVER	1
Not Shown	V3186-06	WS1 POWER SUPPLY US 15VDC HOCP	1
	V3186-01	WS1 POWER CORD ONLY	
Not Shown	V3178	WS1 DRIVE BACK PLATE	1

Refer to Control Valve Service Manual for other drawings and part numbers.

Power Supply	U.S.	International
Supply Voltage	100-120 VAC	100-240 VAC
Supply Frequency	50/60 Hz	50/60 Hz
Output Voltage	15 VDC	15 VDC
Output Current	500 mA	500 mA

Relay Driver Output Type - Single Solid-State 12VDC “wet” contact - N.O.
Relay Driver Output Capacity - 12VDC @ 100mA.
NOTE: Check for proper mounting dimensions on valve backplate prior to mounting an external relay under control cover.

Wiring For Correct On/Off Operation	
PC Board Relay Terminal Block	Relay
RLY 1	Coil -
COM	Coil +

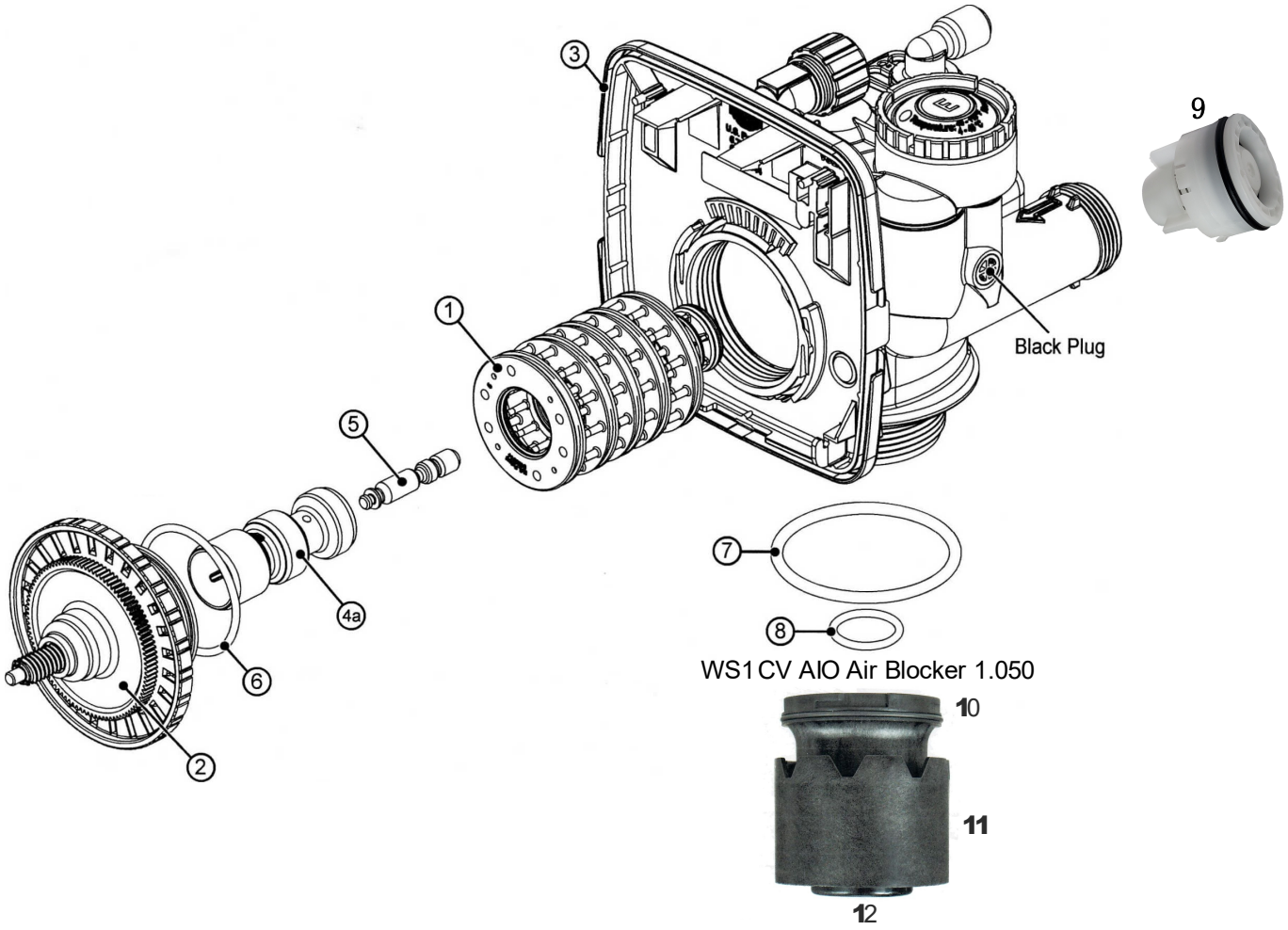


WSl Drive Cap Assembly, Downflow Piston, Regenerant Piston and Spacer Stack Assembly

Drawing No.	Order No.	Description	Quantity
1	V3005-02	WSl Spacer Stack Assembly	1
2	V3004	Drive Cap ASY	1
3	Back Plate	Refer to Programming and Cover Drawing Manual	1
4a	V3011*	WSl Piston Downflow ASY	1
5	V3174	WSl Regenerant Piston	1
6	V3135	O-ring 228	1
7	V3180	O-ring 337	1
8	V3105	O-ring 215 (Distributor Tube)	1
9	V3957	In-Let Back Check Assy	1
Not Shown			
	V3005-10	WSl Downflow Piston, Seal/Spacer Stack, Regenerant Piston & Siiicone Kit	
	V3001	WSl Body ASY Downflow	

WS1 CV AIO Air Blocker 1.050

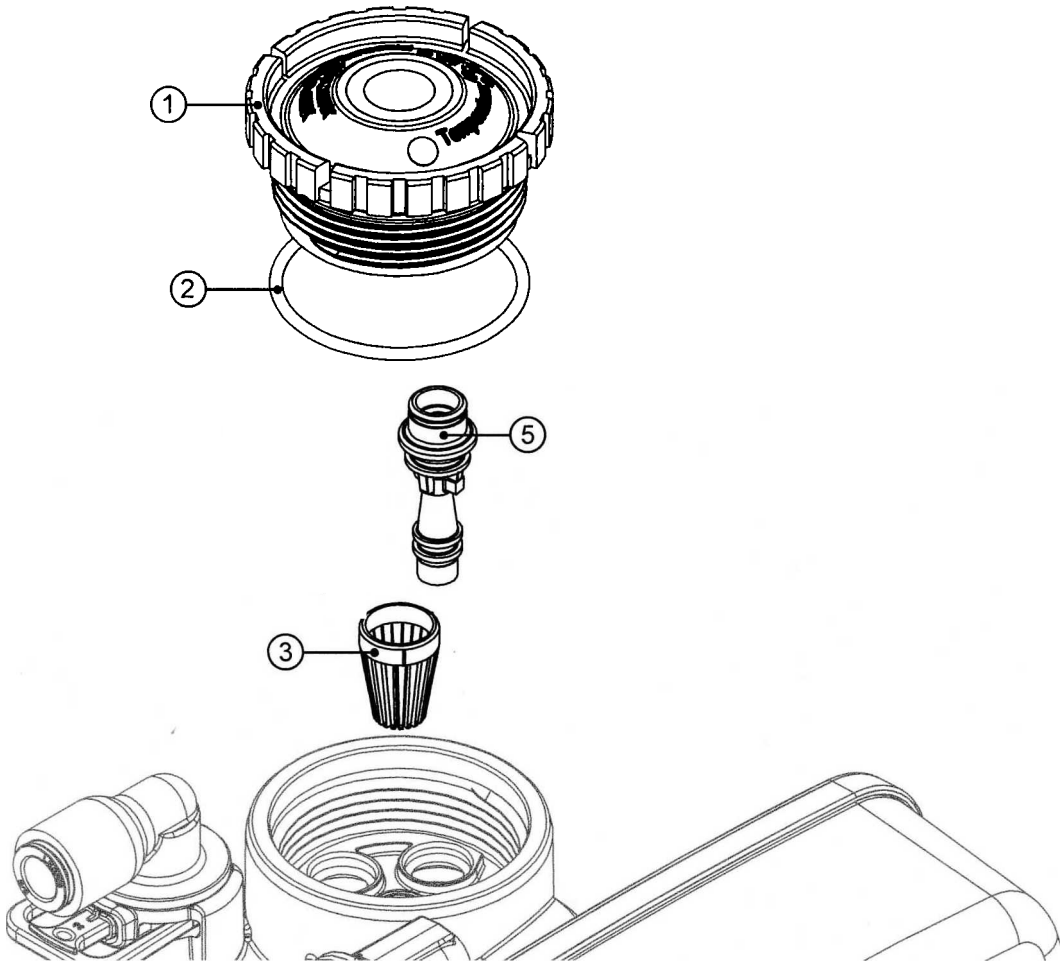
10	D1048	O-ring 035
11	D1047	WS1 CV AIO Air Blocker 1.050
12	V3105	O-ring 215



Injector Cap, Injector Screen, Injector, Plug and O-Ring

Drawing No.	Order No.	Description	Quantity
1	V3176	INJECTOR CAP	1
2	V3152	O-RING 135	1
3	V3177-01	INJECTOR SCREEN CAGE	1
5			Injector Used In System
	V3010-1E	WS1 INJECTOR ASY E White 10" Tank	
	V3010-1F	WS1 INJECTOR ASY F Blue 12" Tank	
	V3010-1G	WS1 INJECTOR ASY G Yellow 13" Tank	
	V3010-1H	WS1 INJECTOR ASY H Grenn 14" Tank	

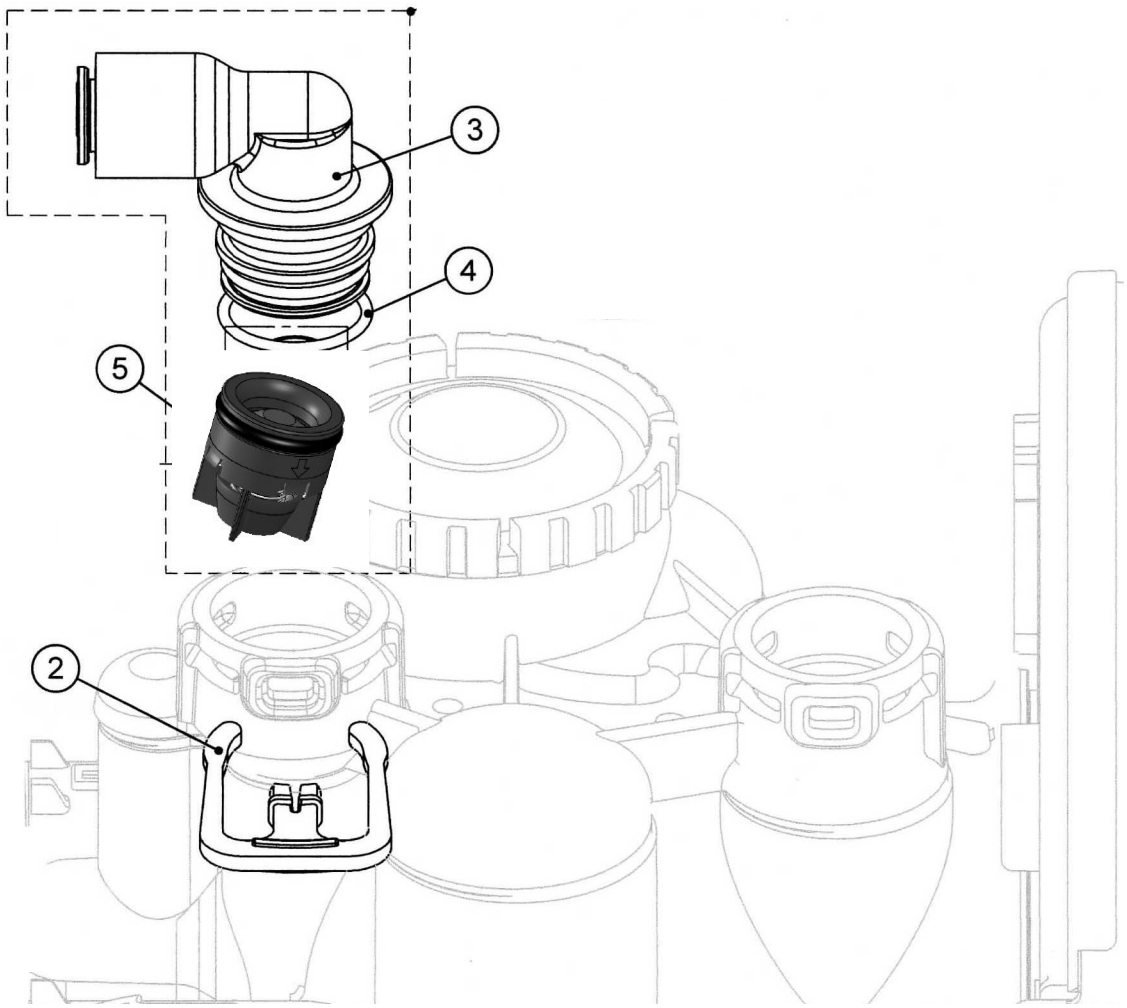
WS1 INJECTOR ASY E WHITE 10" Tank, Blue-F Is Used on Request



Air intake Flow Control Assembly

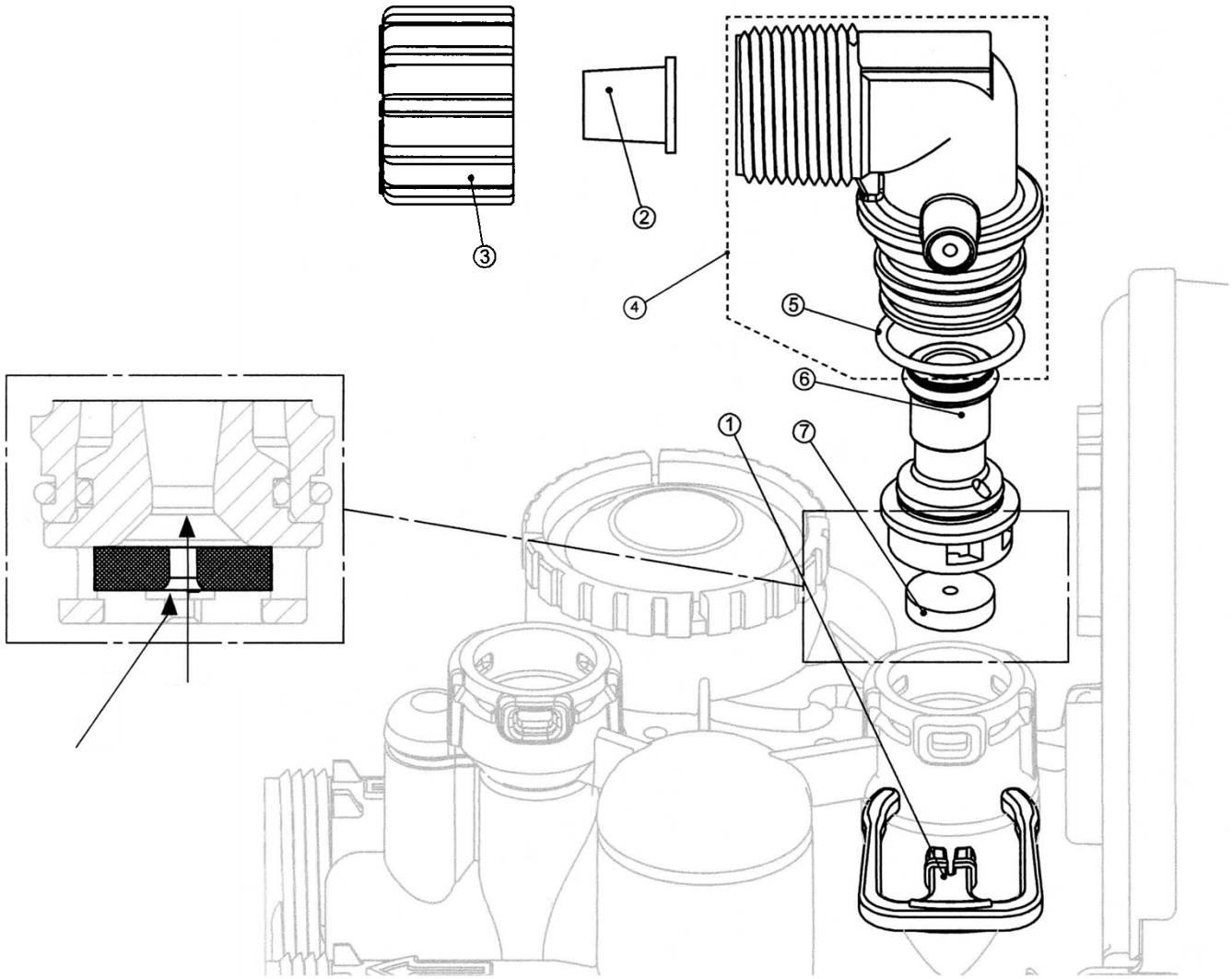
Drawing No.	Order No.	Description	Quantity
1	EOG 200	Enhanced Oxygen Generatior	1
2	H4615	Elbow Locking Clip	1
3	H4628	Elbow 3/8 Brine QC	1
4	V3163	0-ring019	1
5	47049	Brine Valve Back Check Assy	1

1

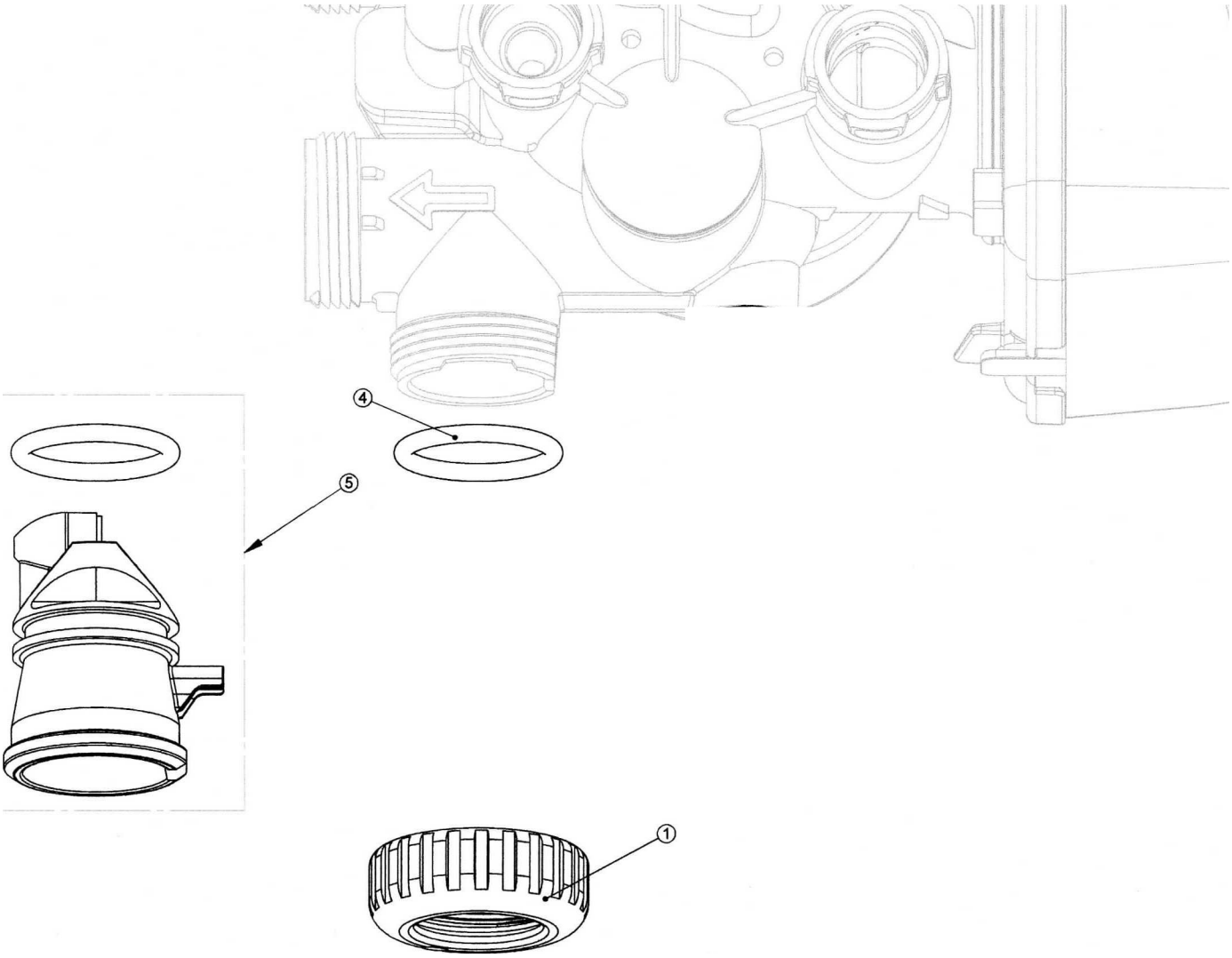


Drain Line - 3/4”

Drawing No.	Order No.	Description	Quantity
1	H4615	Elbow Locking Clip	1
2	PKP10TS8-BULK	Polytube insert 5/8	Option
3	V3192	WS1 Nut % Drain Elbow	Option
4	V3158-01	WS1 Drain Elbow % Male w/Silencer	1
5	V3163	O-ring 019	1
6	V3159-01	WS1 DLFC Retainer ASY	1
7			DLFC used In Systems
	V3162-042	WS1 DLFC 4.2 gpm for 10" Tank	
	V3162-053	WS1 DLFC 5.3 gpm for 12" Tank	
	V3162-075	WS1 DLFC 7.5 gpm for 13" Tank	
	V3162-090	WS1 DLFC 9.0 gpm for 14" Tank	



Meter Plug Assembly



Drawing No.	Order No.	Description	Quantity
1	V3151	WS1 Nut 1” QC	1
			1
			1
4	V3105	O-ring 215	1
5	V3003-01	WS1 Meter Plug ASY	1
			Optional

Drawing No.	Order No.	Description	Quantity
1	V3151	WS1 Nut 1” Quick Connect	2
2	V3150	WS1 Split Ring	2
3	V3105	O-Ring 215	2
4	V3145	WS1 Bypass 1” Rotor	2
5	V3146	WS1 Bypass Cap	2
6	V3147	WS1 Bypass Handle	2
7	V3148	WS1 Bypass Rotor Seal Retainer	2
8	V3152	O-ring 135	2
9	V3155	O-ring 112	2
10	V3156	O-ring 214	2

(Not Shown) Order No. V3191-01, Description: WS1 Bypass Vertical Adapter Assembly

Order No.	Description	Quantity
V3151	WS1 Nut 1” Quick Connect	2
V3150	WS1 Split Ring	2
V3105	O-Ring 215	2
V3191	WS1 Bypass Vertical Adapter	2

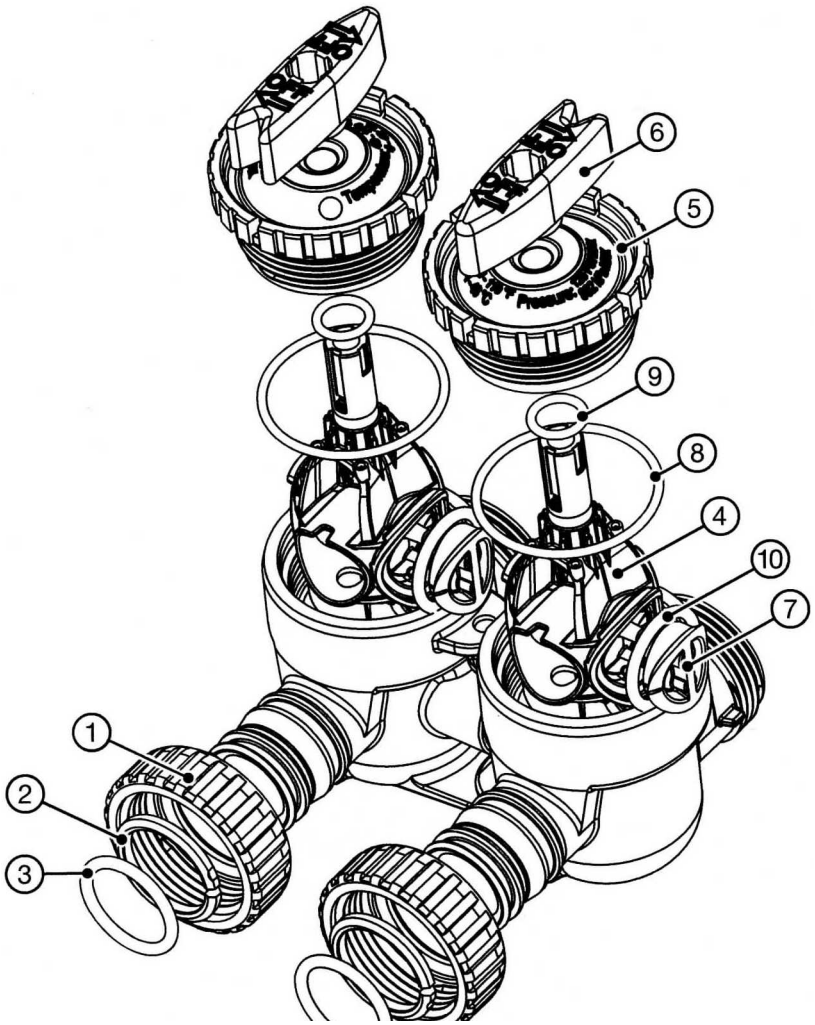


Figure 1

NORMAL OPERATION

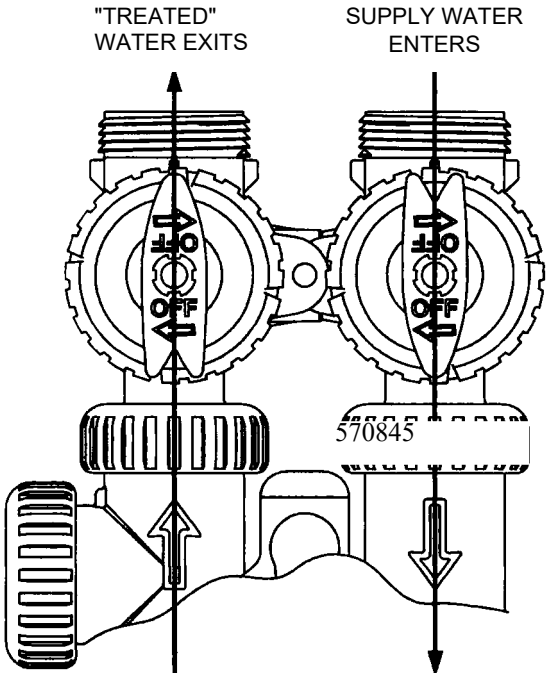


Figure 2

BYPASS OPERATION

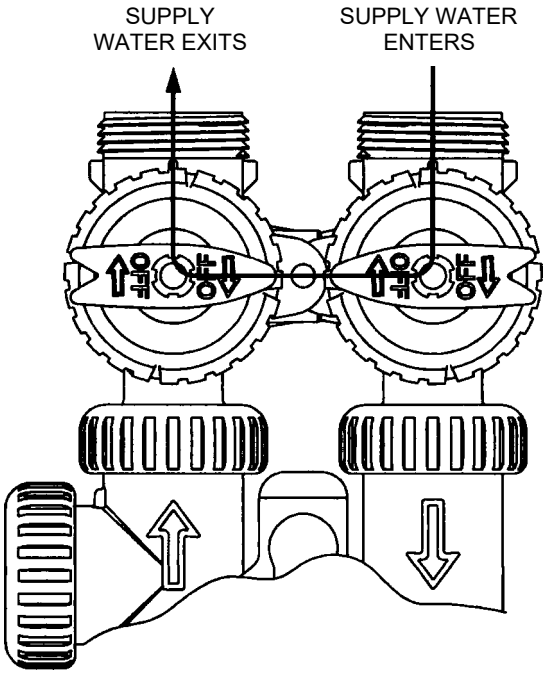


Figure 3

DIAGNOSTIC MODE

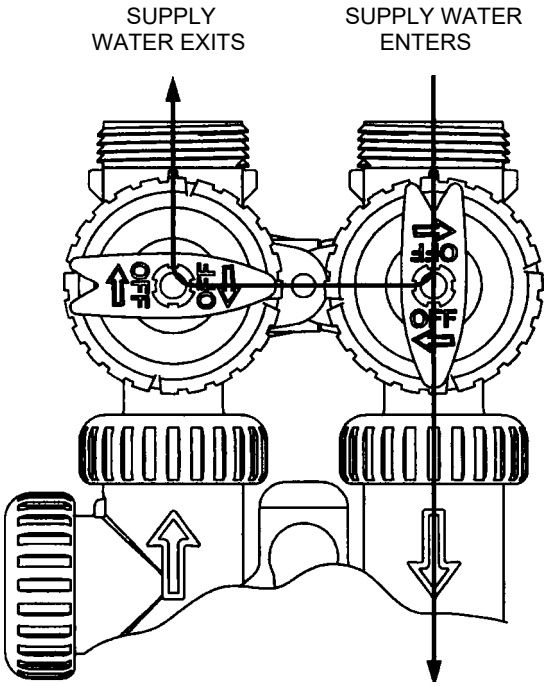
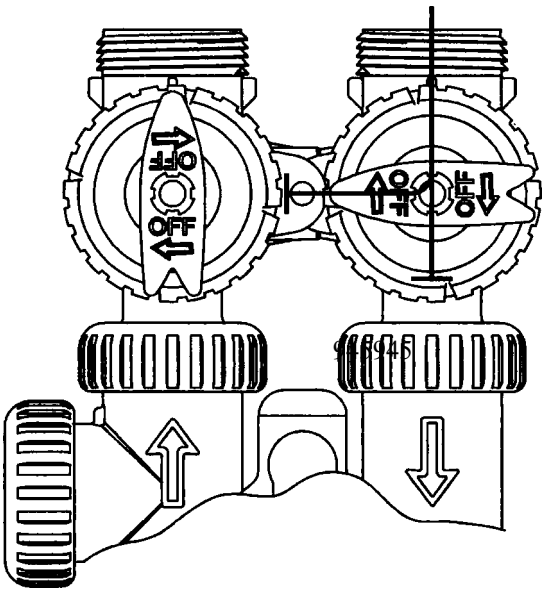


Figure 4

SHUTOFF MODE

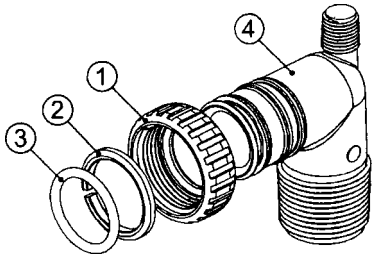
NO WATER SUPPLY WATER IS SHUT OFF
EXITS FROM THE HOUSE AND THE VALVE



WS1 INSTALLATION FITTING ASSEMBLIES

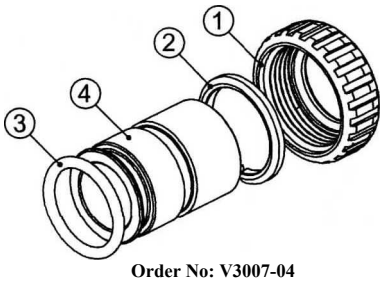
Order No: V3007
Description: WS1 Fitting 1" Male NPT Elbow Assembly

Drawing No.	Order No.	Description	Quantity
1	V3151	WSl NUT I" QUICK CONNECT	2
2	V3150	WS1 SPLIT RING	2
3	V3105	O-RING 215	2
4	V3149	WSl FITTING 1 MALE NPT ELBOW	2



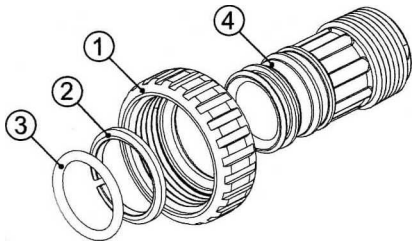
Order No: V3007-02LF
Description: WS1 Fitting 1" Brass Sweat Assembly LF

Drawing No.	Order No.	Description	Quantity
1	V3151	WSl NUT 1" QUICK CONNECT	2
2	V3150	WSl SPLIT RING	2
3	V3105	O-RING 215	2
4	V3188-LF	WSl FITTING 1 BRASS SWEATASSEMBLYLF	2
Do not install in California.			



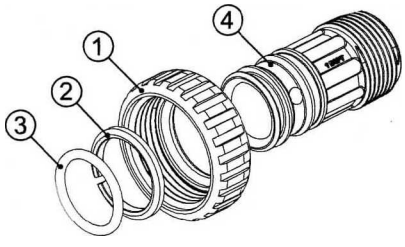
Order No: V3007-04
Description: WS1 Fitting 1" Plastic Male NPT Assembly

Drawing No.	Order No.	Description	Quantity
1	V3151	WSl NUT 1" QUICK CONNECT	2
2	V3150	WSl SPLIT RING	2
3	V3105	O-RING 215	2
4	V3164	WSl FITTING 1" PLASTIC MALE NPT	2



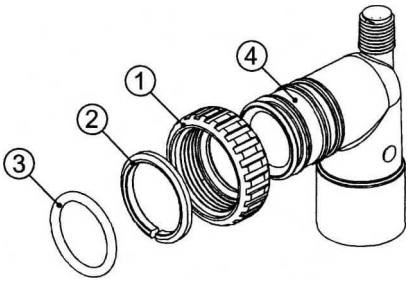
Order No: V3007-06
Description: WS1 Fitting 1" Plastic Male BSPT Assembly

Drawing No.	Order No.	Description	Quantity
1	V3151	WSl NUT 1" QUICK CONNECT	2
2	V3150	WSl SPLIT RING	2
3	V3105	O-RING 215	2
4	V3316	WSl FITTING 1" PLASTIC MALE BSPT	2



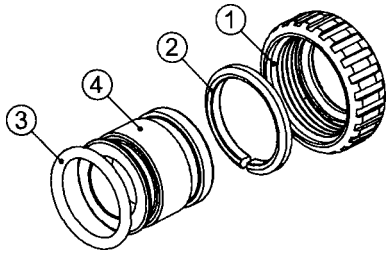
Order No: V3007-01
Description: WS1 Fitting 3/4" & 1" PVC Solvent 90° ASY

Drawing No.	Order No.	Description	Quantity
1	V3151	WSl NUT 1" QUICK CONNECT	2
2	V3150	WSl SPLIT RING	2
3	V3105	O-RING 215	2
4	V3189	WSl FITTING 'A&l PVC SOLVENT 90	2



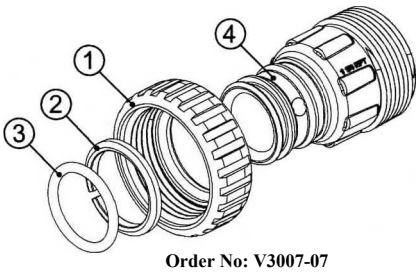
Order No: V3007-03LF
Description: WS1 Fitting 3/4" Brass Sweat Assembly LF

Drawing No.	Order No.	Description	Quantity
1	V3151	WSl NUT 1" QUICK CONNECT	2
2	V3150	WSl SPLIT RING	2
3	V3105	O-RING 215	2
4	V3188-0 ILF	WS1 FITTING % BRASS SWEAT LF	2
Do not install in California.			



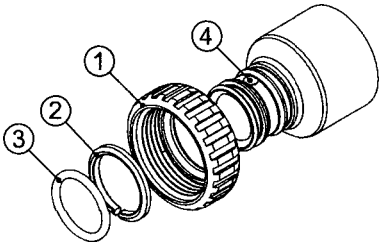
Order No: V3007-05
Description: WS1 Fitting 1-1/4" Plastic Male NPT Assembly

Drawing No.	Order No.	Description	Quantity
1	V3151	WSl NUT 1" QUICK CONNECT	2
2	V3150	WSl SPLIT RING	2
3	V3105	O-RING 215	2
4	V3317	WSl FITTING l-'/d" PLASTIC MALE NPT	2



Order No: V3007-07
Description: WS1 Fitting 1-1/4" & 1-1/2" PVC Solvent Assembly

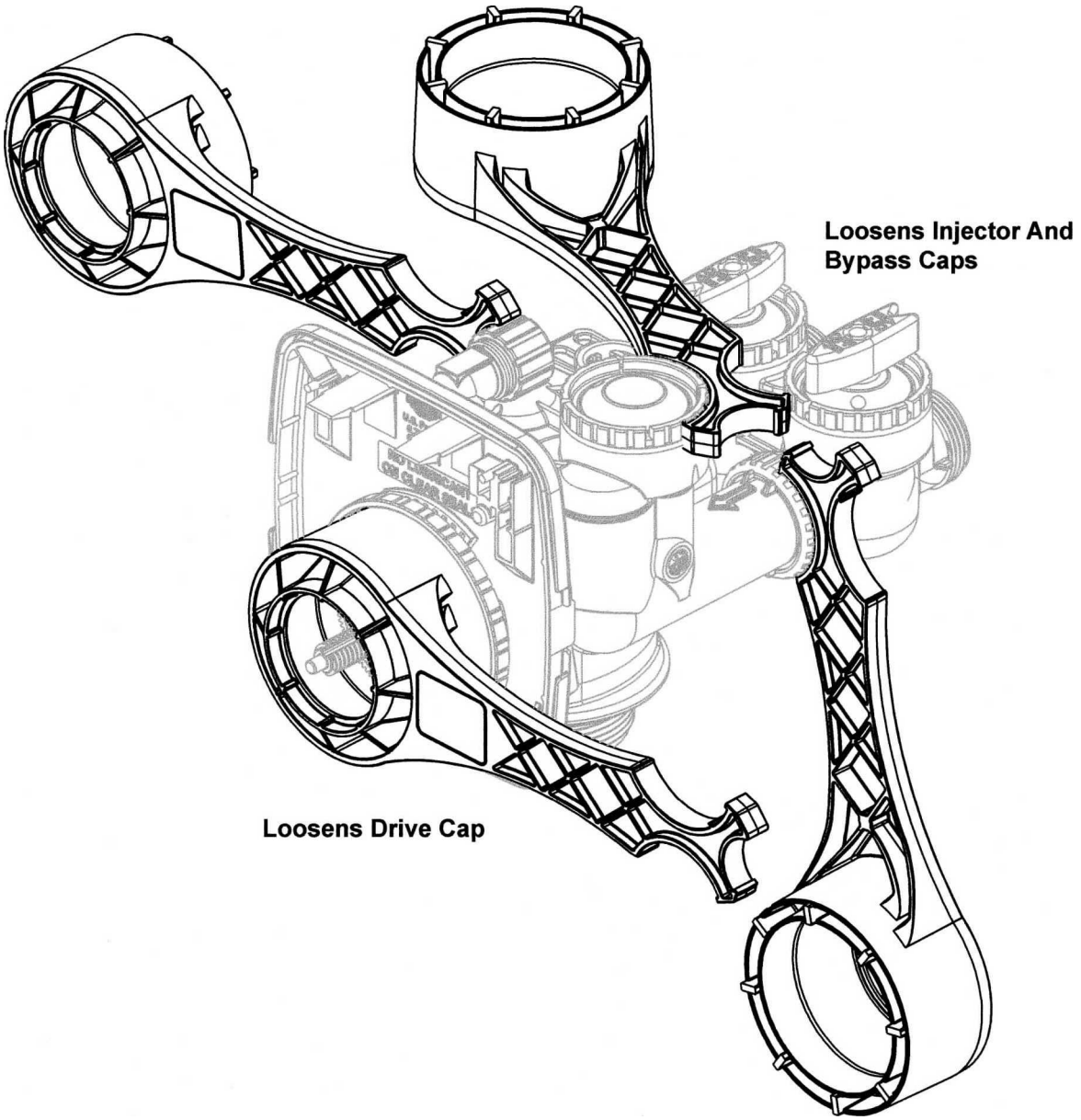
Drawing No.	Order No.	Description	Quantity
1	V3151	WSl NUT 1" QUICK CONNECT	2
2	V3150	WSl SPLIT RING	2
3	V3105	O-RING 215	2
4	V3352	WSl FITTING 1-1/4"&1-1/2"PVC SOLVENT	2



WS1 Service Spanner Wrench

(Order No. V3193-02)

Although no tools are necessary to assemble or disassemble the valve, the WS1 wrench (shown in various positions on the valve) may be purchased to aid in assembly or disassembly.



Problem	Possible Cause	Solution
1. No Display on PC Board	a. No power at electric outlet	a. Repair outlet or use working outlet
	b. Control valve Power Adapter not plugged into outlet or power cord end not connected to PC board connection	b. Plug Power Adapter into outlet or connect power cord end to PC Board connection
	c. Improper power supply	c. Verify proper voltage is being delivered to PC Board
	d. Defective Power Adapter	d. Replace Power Adapter
	e. Defective PC Board	e. Replace PC Board
2. PC Board does not display correct time of day	a. Power Adapter plugged into electric outlet controlled by light switch	a. Use uninterrupted outlet
	b. Tripped breaker switch and/or tripped GFI	b. Reset breaker switch and/ or GFI switch
	c. Power outage	c. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	d. Defective PC Board	d. Replace PC Board
4. Control valve regenerates at wrong time of day	a. Power outage	a. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	b. Time of day not set correctly	b. Reset to correct time of day
	c. Time of regeneration set incorrectly	c. Reset regeneration time
5. Time of day flashes on and off	a. Power outage	a. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
6. Control valve does not regenerate automatically when the correct button(s) is depressed and held. For TC valves the buttons are A&V. For all other valves the button is REGEN	a. Broken drive gear or drive cap assembly	a. Replace drive gear or drive cap assembly
	b. Broken Piston Rod	b. Replace piston rod
	c. Defective PC Board	c. Defective PC Board
7. Control valve does not regenerate automatically but does when the correct button(s) is depressed and held. For TC valves the buttons are A&V. For all other valves the button is REGEN	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	g. Defective PC Board	g. Replace PC Board

WS1 TROUBLESHOOTING GUIDE

Problem	Possible Cause	Solution
8. Hard or untreated water is being delivered	a. Bypass valve is open or faulty	a. Fully close bypass valve or replace
	b. Media is exhausted due to high water usage	b. Check program settings or diagnostics for abnormal water usage
	d. Water quality fluctuation	d. Test water and adjust program values accordingly
	e. No regenerant or low level of regenerant in regenerant tank	e. Add proper regenerant to tank
	f. Control fails to draw in regenerant	f. Refer to Trouble Shooting Guide number 12
	g. Insufficient regenerant level in regenerant tank	g. Check refill setting in programming. Check refill flow control for restrictions or debris and clean or replace
	h. Damaged seal/stack assembly	h. Replace seal/stack assembly
	i. Control valve body type and piston type mix matched	i. Verify proper control valve body type and piston type match
	j. Fouled media bed	j. Replace media bed
9. Control valve uses too much regenerant	a. Improper refill setting	a. Check refill setting
	b. Improper program settings	b. Check program setting to make sure they are specific to the water quality and application needs
	c. Control valve regenerates frequently	c. Check for leaking fixtures that may be exhausting capacity or system is undersized
10. Residual regenerant being delivered to service	a. Low water pressure	a. Check incoming water pressure - water pressure must remain at minimum of 25 psi
	b. Incorrect injector size	b. Replace injector with correct size for the application
	c. Restricted drain line	c. Check drain line for restrictions or debris and clean
11. Excessive water in regenerant tank	a. Improper program settings	a. Check refill setting
	b. Plugged injector	b. Remove injector and clean or replace
	c. Drive cap assembly not tightened in properly	c. Re-tighten the drive cap assembly
	d. Damaged seal/ stack assembly	d. Replace seal/ stack
	e. Restricted or kinked drain line	e. Check drain line for restrictions or debris and or un-kink drain line
	f. Plugged backwash flow controller	f. Remove backwash flow controller and clean or replace
	g. Missing refill flow controller	g. Replace refill flow controller
12. Control valve fails to draw in regenerant	a. Injector is plugged	a. Remove injector and clean or replace
	b. Faulty regenerant piston	b. Replace regenerant piston
	c. Regenerant line connection leak	c. Inspect regenerant line for air leak
	d. Drain line restriction or debris cause excess back pressure	d. Inspect drain line and clean to correct restriction
	e. Drain line too long or too high	e. Shorten length and or height
	f. Low water pressure	f. Check incoming water pressure - water pressure must remain at minimum of 25 psi

Problem	Possible Cause	Solution
13. Water running to drain	a. Power outage during regeneration	a. Upon power being restored control will finish the remaining regeneration time. Reset time of day.
	b. Damaged seal/ stack assembly	b. Replace seal/ stack assembly
	c. Piston assembly failure	c. Replace piston assembly
	d. Drive cap assembly not tightened in properly	d. Re-tighten the drive cap assembly
14. El, Err - 1001, Err- 101 = Control unable to sense motor movement	a. Motor not inserted full to engage pinion, motor wires broken or disconnected	a. Disconnect power, make sure motor is fully engaged, check for broken wires, make sure two pin connector on motor is connected to the two pin connection on the PC Board labeled MOTOR. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. PC Board not properly snapped into drive bracket	b. Properly snap PC Board into drive bracket and then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Missing reduction gears	c. Replace missing gears
15. E2, Err - 1002, Err - 102 = Control valve motor ran too short and was unable to find the next cycle position and stalled	a. Foreign material is lodged in control valve	a. Open up control valve and pull out piston assembly and seal/ stack assembly for inspection. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Mechanical binding	b. Check piston and seal/ stack assembly, check reduction gears, check drive bracket and main drive gear interface. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Main drive gear too tight	c. Loosen main drive gear. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	d. Improper voltage being delivered to PC Board	d. Verify that proper voltage is being supplied. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.

Problem	Possible Cause	Solution
16. E3, Err- 1003, Err- 103 = Control valve motor ran too long and was unable to find the next cycle position	a. Motor failure during a regeneration	a. Check motor connections then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	b. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	c. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
17. Err - 1004, Err — 104 = Control valve motor ran too long and timed out trying to reach home position	a. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	a. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
18. Err-1006, Err-106, Err - 116 = MAV/ SEPS/ NHBP/ AUX MAV valve motor ran too long and unable to find the proper park position Motorized Alternating Valve = MAV Separate Source = SEPS No Hard Water Bypass = NHBP Auxiliary MAV = AUX MAV	a. Control valve programmed for ALT A or b, nHbP, SEPS, or AUX MAV with out having a MAV or NHBP valve attached to operate that function	a. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect. Then re-program valve to proper setting
	b. MAV/ NHBP motor wire not connected to PC Board	b. Connect MAV/ NHBP motor to PC Board two pin connection labeled DRIVE. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. MAV/ NHBP motor not fully engaged with reduction gears	c. Properly insert motor into casing, do not force into casing Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	d. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	d. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
19. Err - 1007, Err-107, Err - 117 = MAV/ SEPS/ NHBP/ AUX MAV valve motor ran too short (stalled) while looking for proper park position Motorized Alternating Valve = MAV Separate Source = SEPS No Hard Water Bypass = NHBP Auxiliary MAV = AUX MAV	a. Foreign material is lodged in MAV/ NHBP valve	a. Open up MAV/ NHBP valve and check piston and seal/ stack assembly for foreign material. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Mechanical binding	b. Check piston and seal/ stack assembly, check reduction gears, drive gear interface, and check MAV/ NHBP black drive pinion on motor for being jammed into motor body. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.

CLACK CORPORATION
SOFTENER AND FILTER CONTROLS
LIMITED WARRANTY

Clack Corporation ("Clack") warrants to OEM that its Softener and Filter Control Valves will be free from defects in material and workmanship under normal use and service for a period of five years from the date of shipment of such Valves from Clack's plant in Windsor, Wisconsin when installed and operated within recommended parameters. No warranty is made with respect to defects not reported to Clack within the warranty period and/or defects or damages due to neglect, misuse, alterations, accident, misapplication, physical damage, or damage caused by fire, acts of God, freezing or hot water or similar causes. For outdoor installations where the Softener and Filter Control Valves are not under cover, the weather cover must be utilized for the warranty to be valid.

Clack's obligation to OEM under this Limited Warranty shall be limited, at its option, to replacement or repair of any Softener and Filter Control valve covered by this Limited Warranty. Prior to returning a Control Valve, OEM must obtain a return goods authorization number from Clack and return the Control Valve freight prepaid. If any Control Valve is covered under this Limited Warranty, Clack shall return the Control Valve repaired, or its replacement, prepaid to the original point of shipment.

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