



LXAR ARSENIC REDUCTION SYSTEM WATER FILTER INSTALLATION, OPERATING AND SERVICE MANUAL

ELECTRONIC WATER FILTER WITH THE X-FACTOR DIAMOND LINE CONTROL VALVE

- ☐ 7-LXAR-75B
- ☐ 7-LXAR-100B
- ☐ 7-LXAR-150B
- ☐ 7-LXAR-200B



Congratulations on purchasing your new **Lancaster Water Filter**. This unit is designed to give you many years of trouble free service. For servicing and future inspection purposes, please file this booklet with your important documents.

In the event that you need assistance for servicing your water filter, please first contact the professional contractor who installed the system.

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INSTALLATION RECORD

MODEL NO. _____

SERIAL NUMBER _____

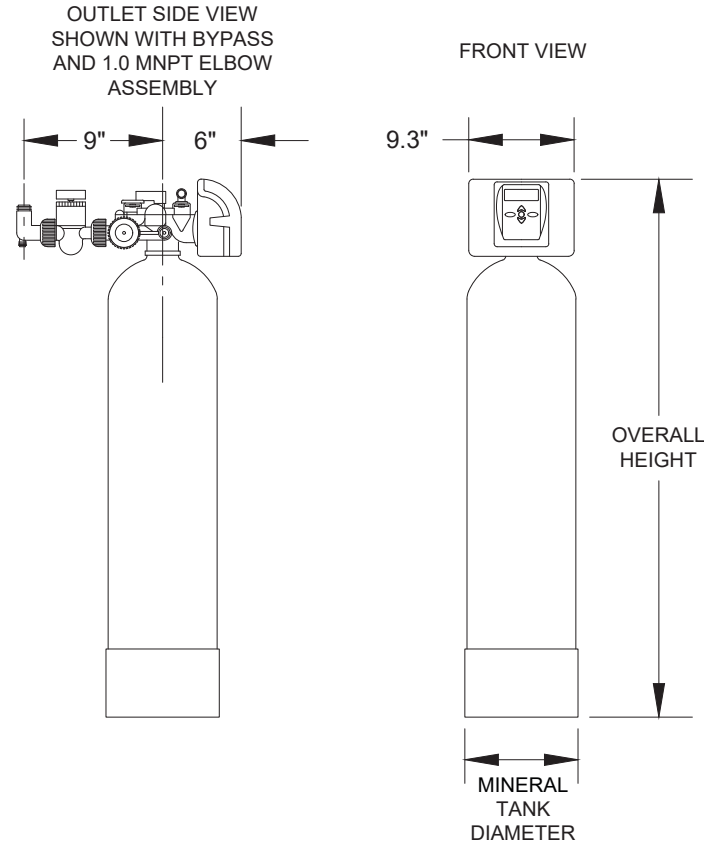
INSTALLATION DATE _____

INSTALLER NAME _____ PHONE _____

ADDRESS _____

FILTER SPECIFICATIONS

READ ALL INFORMATION IN THIS SECTION TO CONFIRM APPLICATION COMPATIBILITY



LXAR PROGRAM CYCLES ¹	WATER AVAILABLE TO SERVICE DURING REGENERATION	ARSENIC REDUCTION SYSTEM (SINGLE TANK MODEL)							
		7-LXAR-75B		7-LXAR-100B		7-LXAR-150B		7-LXAR-200B	
		Min.	Gals.	Min.	Gals.	Min.	Gals.	Min.	Gals.
Cycle 1: Backwash (program in minutes)	Untreated Water ²	10	13	10	22	10	22	10	32
Cycle 2: Rinse (program in minutes)	Untreated Water ²	5	6.5	5	11	5	11	5	16
DLFC - Drain Line Flow Control (GPM)	-	1.3		2.2		2.2		3.2	
Total Gallons of Water to Drain During Regeneration	-	19.5		33.0		33.0		48.0	
Total Regeneration Time (Minutes)	-	15.0		15.0		15.0		15.0	
Days Between Regeneration ³	-	7		7		7		7	
Service Alarm (Years) ⁴	-	0.5		0.5		0.5		0.5	

¹ Factory Program Settings

² To prevent untreated water availability to service during regeneration, an optional No Hard Water Bypass (NHWBP) Valve is available - consult factory.

³ Days between regeneration can be field adjusted, refer to manual. Periodic backwashing is recommended.

⁴ Service Alarm is used as a reminder to obtain a sample of the treated water every 6 months and have it tested for arsenic to determine if a filtration breakthrough has occurred. For a lead / lag style system (two identical filters plumbed in series; highly recommended) the treated water sample should be obtained between the two filters. When a treated water analysis has detected a breakthrough of arsenic, the media will need to be replaced immediately. Contact the installing contractor for service. To clear and reset the FLASHING YELLOW service alarm display and scrolling banner text "SCHEDULED SERVICE REQUIRED", simultaneously press and hold the UP and DOWN arrow buttons for > 3 seconds.

LXAR SPECIFICATIONS		ARSENIC REDUCTION SYSTEM USING ASM-10-HP MEDIA*			
Model Number		7-LXAR-75B	7-LXAR-100B	7-LXAR-150B	7-LXAR-200B
Inlet/Outlet Fitting Options (Inches) ¹		0.75 - 1.0 ¹ - 1.25 - 1.5	0.75 - 1.0 ¹ - 1.25 - 1.5	0.75 - 1.0 ¹ - 1.25 - 1.5	0.75 - 1.0 ¹ - 1.25 - 1.5
Built-In Meter		Included	Included	Included	Included
Bypass Valve (PN: BP2000)		Included	Included	Included	Included
No Hard Water Bypass (NHWBP) Valve - Optional		Not Included	Not Included	Not Included	Not Included
Drain Fitting Elbow NPT		3/4 NPT	3/4 NPT	3/4 NPT	3/4 NPT
Water Pressure Range (PSI)		20 - 100	20 - 100	20 - 100	20 - 100
Water Operating Temperature Range (°F)		35 - 100	35 - 100	35 - 100	35 - 100
Feed Water Requirements ²	Operating pH Range	5.0 to 8.0	5.0 to 8.0	5.0 to 8.0	5.0 to 8.0
	Water Hardness (GPG)	≤ 4	≤ 4	≤ 4	≤ 4
	Ferrous Iron (PPM)	< 0.3	< 0.3	< 0.3	< 0.3
	Manganese (PPM)	< 0.05	< 0.05	< 0.05	< 0.05
	Turbidity (NTU)	≤ 1	≤ 1	≤ 1	≤ 1
	Total Suspended Solids (PPM)	≤ 1	≤ 1	≤ 1	≤ 1
	Free Chlorine (PPM)	≤ 0.05	≤ 0.05	≤ 0.05	≤ 0.05
Plug-In Power Adapter Input (VAC - Hz - A)		120V AC - 60Hz - 0.35A	120V AC - 60Hz - 0.35A	120V AC - 60Hz - 0.35A	120V AC - 60Hz - 0.35A
Plug-In Power Adapter Output (VDC - A)		15V DC - 0.5A	15V DC - 0.5A	15V DC - 0.5A	15V DC - 0.5A
Plug-In Power Adapter Cord Length (FT)		15 FT	15 FT	15 FT	15 FT
PC Board Relay Terminal Block DC Output (VDC)		12V DC	12V DC	12V DC	12V DC
Pre-Installed 3 Volt Lithium Coin Cell Battery (Type)		CR2032	CR2032	CR2032	CR2032
Service Flow Rate Range (GPM) ³	Minimum	0.75 GPM	1.0 GPM	1.5 GPM	2.0 GPM
	Normal Range @ PSI Pressure Drop	1.5 GPM @ < 5 PSID 5.5 GPM @ 5 PSID	2.5 GPM @ < 5 PSID 7.5 GPM @ 5 PSID	3.5 GPM @ < 5 PSID 6 GPM @ 5 PSID 10.5 GPM @ 11 PSID	4.5 GPM @ < 5 PSID 9.5 GPM @ 5 PSID 14.5 GPM @ 11 PSID
	Peak @ PSI Pressure Drop	7.5 GPM @ 9 PSID	10.0 GPM @ 8 PSID	15.0 GPM @ 18 PSID	20.0 GPM @ 18 PSID
Approximate Throughput Capacity (Gallons) ⁴		525,000 Gal. at flow rates up to 5.25 GPM	700,000 Gal. at flow rates up to 7 GPM	1,050,000 Gal. at flow rates up to 10.5 GPM	1,400,000 Gal. at flow rates up to 14 GPM
Overall Height (Inches)		51.20	47.60	61.40	55.50
Mineral Tanks Size: Diameter x Height (Inches)		8 x 44	10 x 40	10 x 54	12 x 48
Bottom Distributor Type		Plate	Plate	Plate	Plate
Top Distributor Type		Basket (PN: D1203)	Basket (PN: D1203)	Basket (PN: D1203)	Basket (PN: D1203)
Underbed Layer (Support Bedding)		No	No	No	No
Cubic Feet of Resin (LBS)		0.75 (37.5 LBS)	1.0 (50 LBS)	1.5 (75 LBS)	2.0 (100 LBS)
DLFC - Drain Line Flow Control (GPM)		1.3	2.2	2.2	3.2
Water to Drain (Gallons)		19.5	33.0	33.0	48.0

*ResinTech ASM-10-HP is a strongly basic hybrid anion exchange resin specially formulated to selectively remove arsenic. This clean, dust-free, robust gel-type anion exchange resin is extremely selective for arsenic and will generally reduce arsenic concentrations to below the typical detection limit of 1 ppb. It has very fast kinetics, excellent flow characteristics, low-pressure loss, high capacity and superior physical strength.

ASM-10-HP has hydrated iron oxide monoatomically dispersed throughout the polymer giving the product hybrid properties that provide exceptional capacity and high affinity for arsenic over other anions.

The initial capture of arsenate (As+5) by ASM-10-HP is by ion exchange. Ion exchange reactions are very fast; once inside the gel phase, the arsenate is exposed to the immobilized iron and immediately precipitates onto the iron, leaving the resin free to react with more arsenic while the iron-bound arsenic remains trapped inside.

When sulfate is present (almost every potable water supply) and if the resin bed is overrun, the sulfate cannot displace the arsenic, i.e. no arsenic dumping will occur.

¹ 1.0 MNPT Elbow Standard - Options Available

² ResinTech ASM-10-HP is not greatly affected by ordinary ions commonly found in drinking water. Ions, such as sodium, bicarbonate, chloride and sulfate pose no interference unless concentrations are well above the maximum range for drinking water.

In general, the TDS (total dissolved solids) should be less than 2,000 ppm and no single ion concentration greater than 1,000 ppm.

TDS caused by salts, such as sodium bicarbonate, calcium chloride and magnesium sulfate, has practically no effect on ASM-10-HP throughput until the concentration is greater than 1,000 ppm.

Substances, such as silica, phosphate, and the oxyanions (e.g. nitrate, sulfate, carbonate, chlorate) either interfere with the adsorption or compete for adsorption sites, reducing the arsenic removal capacity.

ResinTech ASM-10-HP has limited capacity for arsenite (As+3) compared to arsenate (As+5). It is useful to know not only the total arsenic concentration, but also the relative fractions of arsenate and arsenite.

Whenever arsenite is more than 25% of the total arsenic or 5 ppb or greater, the feed water should be chlorinated to convert arsenite (As+3) to arsenate (As+5).

Prechlorination converts arsenite (As+3) to arsenate (As+5); follow by granular activated carbon (GAC) for dechlorination.

For potable waters, the optimum pH range is below 8.0. The operating capacity decreases more and more rapidly as pH rises. At pH levels above 8.0 and when silica is present, a significant decrease in operating capacity can be expected.

Calcium carbonate scale will blind off the media and could eventually cement the bed together. Pre-soften the water to reduce scaling potential by removing scale forming compounds.

Suspended solids will tend to accumulate in the media's void spaces and on the bed surface over the very long service cycle. Periodic backwashing is used to maintain void spaces and prevent channeling.

For suspended solids greater than 1 ppm, pre-filtration is recommended. Periodic backwashing at weekly or bi-weekly intervals is recommended (day override factory setting 7).

³ Service flow rates based on ResinTech ASM-10-HP suggested operating conditions - 1 to 10 GPM/CU. FT.

⁴ The Base Throughput Capacity for Arsenic in Gallons/Cu. Ft. at unit volume flow rates up to 7 GPM/Cu. Ft. is approximately 700,000 Gallons/Cu. Ft.

This is based on waters containing 50 ppb of As(+5) at neutral pH with no silica, vanadium, phosphate, sulfide or other oxyanions (e.g. nitrate, sulfate, carbonate, chlorate).

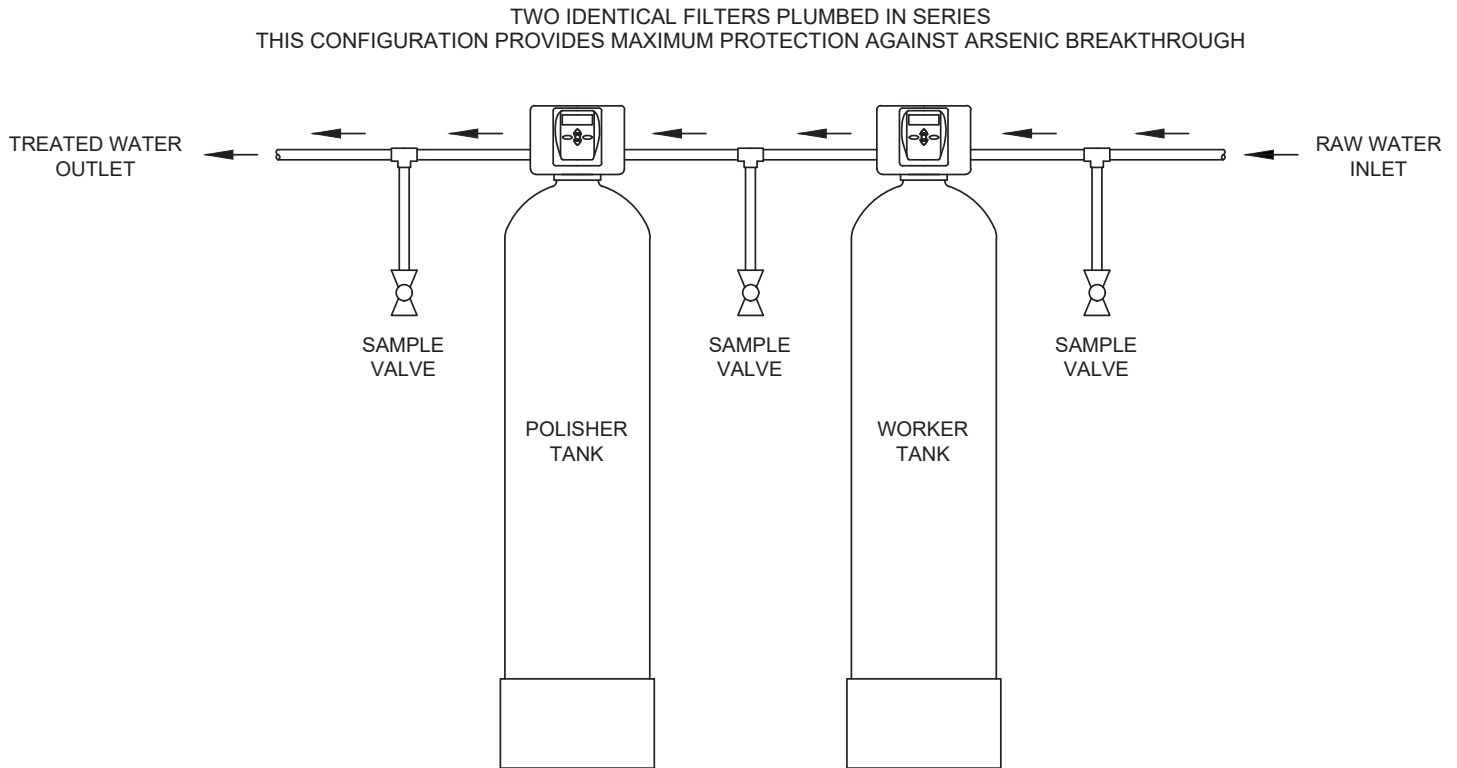
For other Arsenic concentrations, the following formula will give approximate gallonage at flow rates below 7 GPM/Cu. Ft. ...
Base operating capacity, gallons per cubic foot = 34,000,000/(As ppb).

For example, a water with 35 ppb of As would treat approximately 34,000,000/35 ppb = 971,000 gallons per cubic foot between change-outs.

The operating capacity of ASM-10-HP decreases with increasing pH. Below pH of 7.0, silica and pH have a relatively minor impact on performance. As the pH rises, their presence causes reduced operating capacities.

Due to the complexity of throughput calculations and their dependence on a complete water analysis, no throughput recommendation should be considered a guarantee of performance.

LEAD / LAG (WORKER / POLISHER) SYSTEM HIGHLY RECOMMENDED



A FLASHING YELLOW service alarm display with scrolling banner text “SCHEDULED SERVICE REQUIRED” is used as a reminder to obtain a sample of the treated water every 6 months and have it tested for arsenic to determine if a filtration breakthrough has occurred.

For a lead / lag style system (two identical filters plumbed in series; highly recommended) the treated water sample should be obtained between the two filters.

When a treated water analysis has detected a breakthrough of arsenic, the media will need to be replaced immediately. Contact the installing contractor for service.

To clear and reset the FLASHING YELLOW service alarm display and scrolling banner text “SCHEDULED SERVICE REQUIRED”, simultaneously press and hold the UP and DOWN arrow buttons for > 3 seconds.

DISPOSAL OF MEDIA: Although ASM-10-HP passes the current EPA TCLP leachables test, this test may not reasonably reflect actual landfill conditions, e.g. the presence of acid wastes that conceivably might cause arsenic to be released. ResinTech recommends compliance with all federal laws governing disposal. Always check with your local solid waste authority before disposal, as regulations regarding the disposal of spent water treatment media may vary.

PRE-INSTALLATION REVIEW

WATER PRESSURE: A minimum of 20 psi water pressure is required for backwash. Maximum 100 psi. **CAUTION:** the filter cannot be subject to a vacuum due to loss of pressure (such as a water main break or submersible well pump check valve failure) as this may cause the filter tank to implode and could cause leakage. Provide a vacuum breaker in the installation if the possibility of a vacuum could occur.

WATER TEMPERATURE: The range of water temperature is 40°F to 100°F. DO NOT install any water filter with less than 10 feet of piping between its outlet and the inlet of a water heater. **CAUTION:** the use of a thermal expansion tank might be required to protect the filter in the event of a hot water heater backup. Refer to installation diagrams.

AMBIENT TEMPERATURE: DO NOT locate filter where it or its connections (including the drain line) will ever be subject to room temperatures under 33°F.

ELECTRICITY: An uninterrupted 120 volt 60Hz source is required. *Make sure electrical source is not on a timer or switch.* All electrical connections must be connected according to local codes. The plug-in power adapter is for dry locations only. Surge protection is recommended with all electrical connections.

Control Valve plug-in power adapter rating...

Input: 100-120 VAC, 50/60 Hz, 0.35 A

Output: 15 VDC, 0.5 A

DRAIN: All plumbing should be done in accordance with local plumbing codes. The distance between the drain and the water filter should be as short as possible. Avoid overhead drain lines if possible to prevent backpressure on the system. Refer to installation diagrams for drain line pipe size recommendation.

FILTERING: It is recommended that the filter be installed to treat both the hot and cold water supply. A lead / lag (worker / polisher) system installation is highly recommended. It is not necessary to filter arsenic for outdoor water unless used for potable water applications. Outdoor hose bibs may have a high demand at high flow rates. Using hundreds of gallons of treated water to wash cars or water lawns can lower the life expectancy of the arsenic reduction media.

BYPASS: A bypass valve (included with all models) should be installed so that water will be available if it should be necessary to shut off the pressure in order to service the filter.

GENERAL INSTALLATION AND SERVICE WARNINGS

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

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

The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic wrench (V3193). If necessary, pliers can be used to unscrew the nut or cap. Do not use a pipe wrench to tighten or loosen nuts or caps. Do not place a screw driver in the slots on caps and/or tap with a hammer.

Do not use pipe dope or other sealants on threads. Use Teflon tape on the threaded inlet, outlet and drain fittings. Teflon tape is not necessary on the nut connection or caps because of o-rings seals.

After completing any valve maintenance involving the drive assembly or the drive cap assembly and pistons, unplug power source jack from the control valve printed circuit board and plug back in or press and hold **NEXT** and **REGEN** buttons for 3 seconds. This resets the electronics and establishes the service piston position. The display should flash the software version and then reset the valve to the service position.

Solder joints near the drain must be done prior to connecting the drain line flow control fitting. Leave at least 6" between the drain line control fitting and solder joints when soldering pipes that are connected on the drain line control fitting. Failure to do this could cause interior damage to the drain line flow control fitting.

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

If the building's plumbing is metal (e.g. copper) and the building's electrical system is grounded to the plumbing, install a copper grounding strap from the filter inlet pipe to the filter outlet pipe.

This water filter is not to be used for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after treatment.

BYPASS VALVE

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

The bypass body and rotors are glass filled Noryl® (or equivalent) and the nuts and caps are glass filled polypropylene. All seals are self-lubricating EPDM to help prevent valve seizing after long periods of non-use. Internal o-rings can easily be replaced if service is required.

The bypass consists of two interchangeable plug valves that are operated independently by red arrow-shaped handles. The handles identify the flow direction of the water. The plug valves enable the bypass valve to operate in four positions.

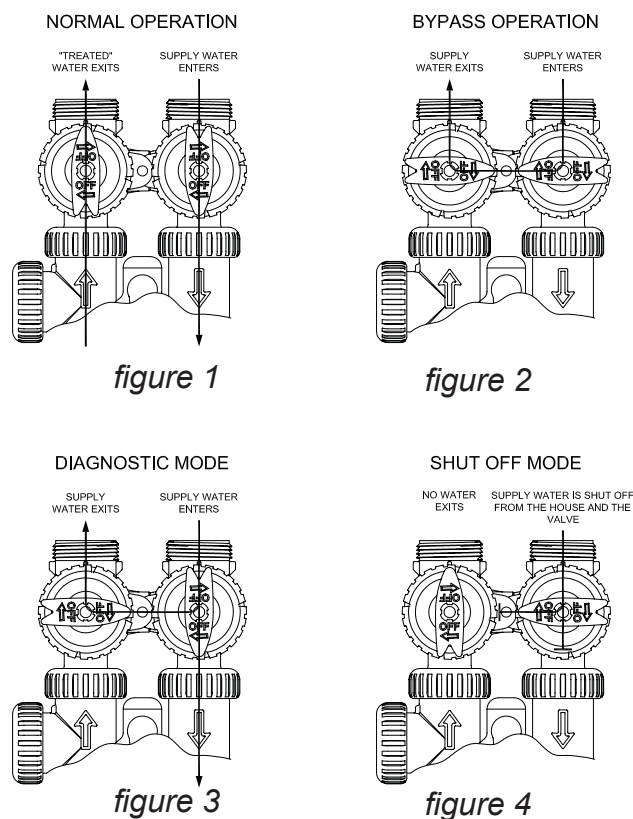
OPERATION:

1. Normal Operation Position: The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve. Water flows through the control valve during normal operation. During the regeneration cycle, this position also allows the control valve to provide regeneration water to the filter while also providing untreated water to the building plumbing system. (see figure 1)

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

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

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



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

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

Refer to page 21 for bypass valve parts diagram and page 22 for service spanner wrench information.

To access the rotor, unscrew the cap and lift the cap, rotor and handle out as one unit. Twisting the unit as you pull it out will help to remove it more easily. There are three o-rings: one under the rotor cap, one on the rotor stem and the rotor seal. Replace worn o-rings. Clean rotor. Reinstall rotor.

When reinstalling the red arrow handles be sure that:

1. The handle pointers are lined up with the control valve body arrows, and the rotor seal o-ring and retainer on both rotors face to the right when being viewed from the front of the control valve; or
2. Arrows point toward each other in the bypass position.

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

GENERAL INSTALLATION INSTRUCTIONS

(All electrical & plumbing should be done in accordance with all local codes)

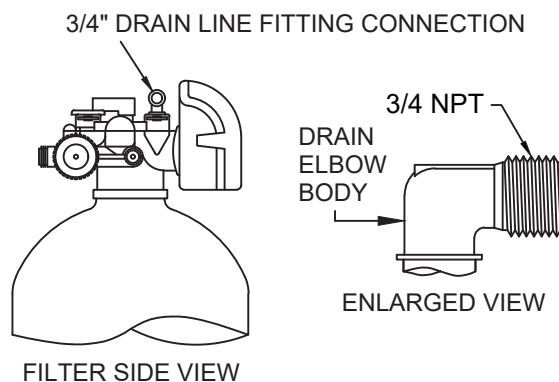
1. LXAR arsenic reduction systems are pre-loaded with media at the factory. Place the LXAR arsenic reduction system in the desired location close to the water supply inlet, after the pressure tank, and near a source for wastewater (utility sink, floor drain or sewer line). A 120V, 60 Hz uninterrupted electrical power outlet receptacle is required. Keep the filter system far enough away from walls and other obstructions to allow enough room for servicing the system. Pre-treatment equipment is likely necessary. Pre-treatment equipment installation sequence is application specific; if uncertain, please contact dealer or factory.

2. Do all necessary plumbing. The control valve, fitting assemblies and bypass valve are designed to accommodate minor plumbing misalignments but are not designed to support the weight of a system or the plumbing.

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

4. A jumper ground wire should be installed between the inlet and outlet pipe whenever the metallic continuity of a water distribution piping system is interrupted. Install grounding strap on metal pipes.

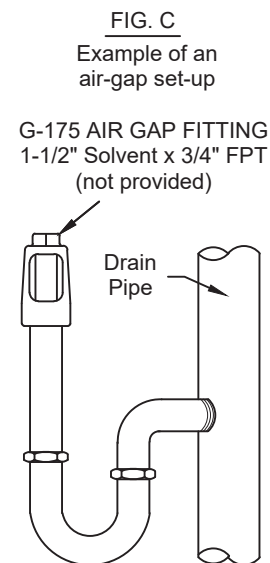
5. The drain connection may be made using a 3/4" female adapter (see below for recommended drain line size). If soldering, joints near the drain must be done prior to connecting the drain line flow control fitting. Leave at least 6" between the drain line control fitting and solder joints when soldering pipes that are connected on the drain line control fitting. Failure to do this could cause interior damage to the drain line flow control fitting. Never insert a drain line into a drain, sewer line, or trap. Always allow an air gap between the drain line and the wastewater to prevent the possibility of sewage being back-siphoned into the filter (Fig. C). Refer to installation diagram on the next page. **CAUTION** - Attach drain line **SECURELY** to an air gap device on the waste line.



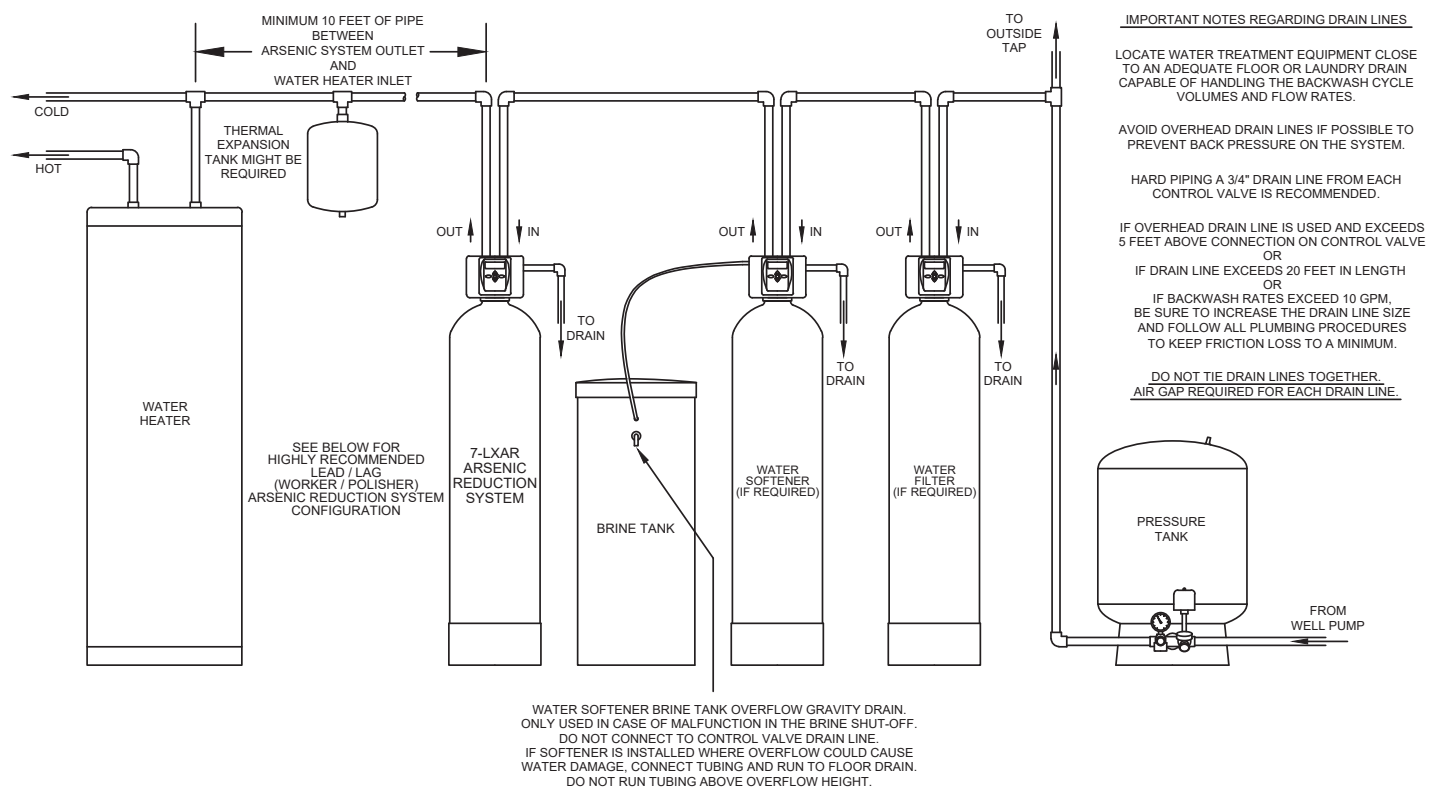
RECOMMENDED DRAIN LINE SIZE:

HARD PIPING A 3/4" DRAIN LINE IS RECOMMENDED FOR UP TO 10 GPM BACKWASH USING THE 3/4" NPT MALE THREADS ON THE DRAIN ELBOW BODY.

SEE NEXT PAGE FOR DRAIN LINE LIMITATIONS.

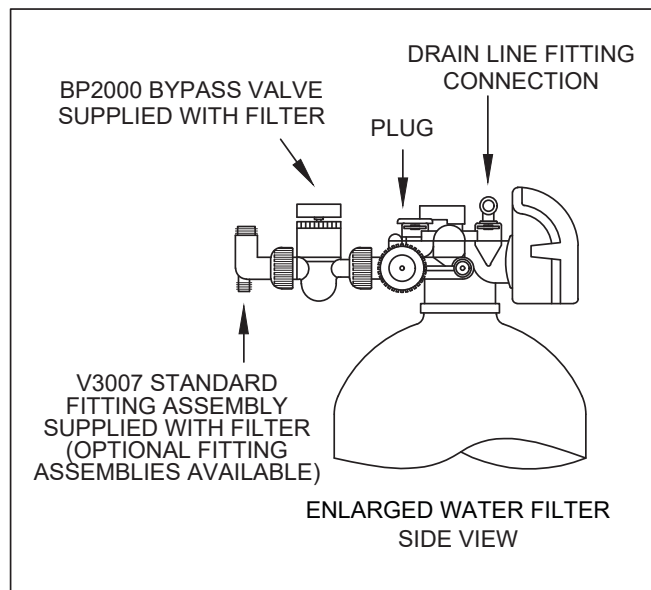
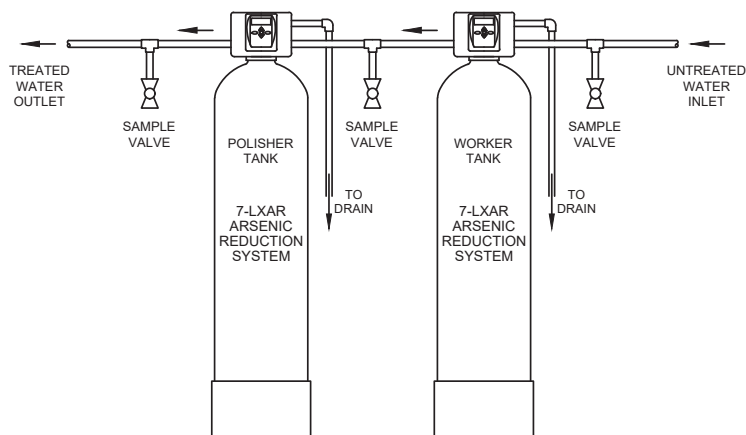


ARSENIC REDUCTION SYSTEM MODELS 7-LXAR-75B, -100B, -150B, -200B TYPICAL INSTALLATION DIAGRAM



LEAD / LAG (WORKER / POLISHER) SYSTEM HIGHLY RECOMMENDED

TWO IDENTICAL ARSENIC REDUCTION FILTERS PLUMBED IN SERIES
THIS CONFIGURATION PROVIDES MAXIMUM PROTECTION AGAINST ARSENIC BREAKTHROUGH



START-UP INSTRUCTIONS

Do not plug the transformer into the receptacle yet. Rotate the bypass handles to the **BYPASS** position (see figure 2 on page 8). Turn on main water supply. Open a cold water faucet. This will clear the line of any debris that may be in the line. Let water run at faucet for a couple minutes, or until clear. Turn off faucet. Now plug the transformer into a 120 volt receptacle (be certain the receptacle is uninterrupted). Within 5 seconds the control display and buttons will illuminate and the time of day screen will appear.

- Press and hold the  button for approximately 5 seconds until the motor starts. The display will change color, from SOLID BLUE to SOLID GREEN.
- Wait until display reads **BACKWASH**, the motor stops running, and numbers start counting down. Unplug the transformer so the filter control valve will not cycle to the next position.

SLOWLY turn bypass valve to **DIAGNOSTIC** position (see figure 3 on page 8) to allow water to slowly enter filter in order to expel air.

When water is flowing steadily to drain, clear and without the presence of air, plug the transformer into the receptacle to restore power. Momentarily press  again. Display will read **RINSE**. Place the bypass valve in the **NORMAL OPERATION MODE** (see figure 1 on page 8). Allow filter control valve to finish the **RINSE** cycle and automatically advance to the **FILTERING** position.

Continue to page 12 -15 for General Operation, User and Installer Display Settings.

GENERAL OPERATION

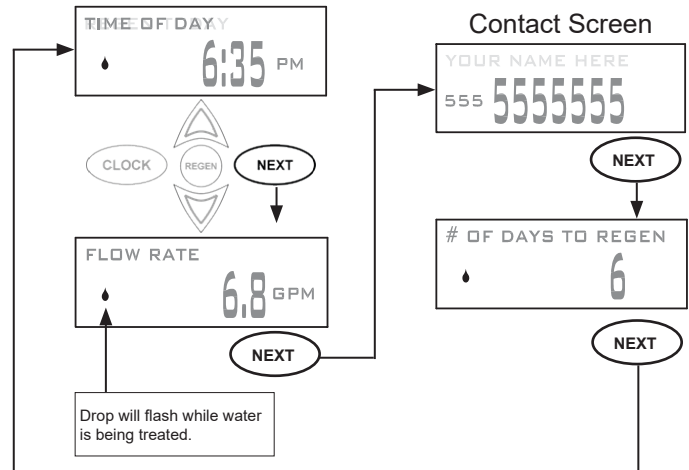
Note: As an energy saving feature, the control will automatically turn off all SOLID BLUE or SOLID GREEN display illumination and keypad illumination after about 5 minutes of the last keypad button push. Any further keypad touch will cause the re-illumination of the display and keypad, and re-activate keypad control.

User Displays

When the system is in normal service mode, display illumination is SOLID BLUE and one of up to four available User Displays will be shown. Pressing **NEXT** will alternate between the following displays:

- Current time of day
- Treated water flow rate
Utilizing the control valve's built-in water meter, a water drop flashes on the display when water is being treated (i.e. water is flowing through the system).
- Service contact name and phone number (if entered)
- Remaining days to regeneration (if Day Override is programmed)

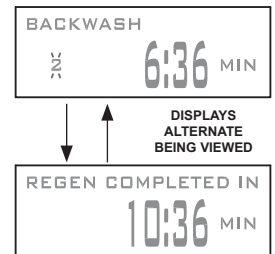
*If the system has called for a backwash that will occur at the preset time of backwash, the words **REGEN TODAY** will alternate with the header on the display.*



Regeneration Mode

Typically a system is set to regenerate at a time of low water usage. An example of a time with low water usage is when a household is asleep. If there is a demand for water when the system is regenerating, untreated water will be used. Factory preset delayed regeneration time: 12:00 AM (midnight).

When the system begins to regenerate, the display will change to SOLID GREEN when illuminated, and include information about the step of the regeneration process and the time remaining for that step to be completed. The current cycle display will alternate with the regen time remaining screen. The system runs through the steps automatically and will reset itself to provide treated water when the regeneration has been completed.



Manual Regeneration

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

To initiate a manual regeneration **at the preset delayed regeneration time**, press and release **REGEN**. The words "REGEN TODAY" will periodically be shown on the display to indicate that the system will regenerate at the preset delayed regeneration time. If you pressed the **REGEN** button in error, pressing the button again will cancel the request.

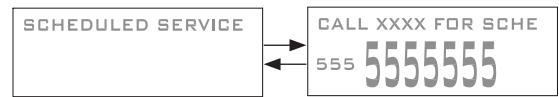
To initiate a manual regeneration **immediately**, press and hold the **REGEN** button for three seconds. The system will begin to regenerate immediately. The request cannot be cancelled.

Sometimes it is desirable to have the valve initiate and complete two regenerations within 24 hours and then return to the preset regeneration procedure. To do a double regeneration:

1. Press the **REGEN** button once. REGEN TODAY will flash on the display.
2. Press and hold the **REGEN** button for three seconds until the valve regeneration initiates.

Once the valve has completed the immediate regeneration, the valve will regenerate one more time at the preset regeneration time.

Service Call Reminder: An illuminated FLASHING YELLOW display and scrolling message to call contact name for scheduled service. To clear the Service Call Reminder, press  and  buttons simultaneously while the number banner text screen is displayed.



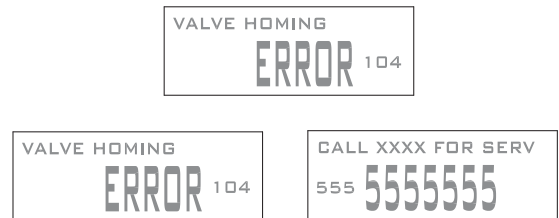
If the installing contractor did not program their contact name and phone number, the Service Call Reminder will still be displayed every 6 months per factory programming. **This serves as a reminder to obtain a sample of the treated water every 6 months and have it tested for arsenic to determine if a filtration breakthrough has occurred.**

For a lead / lag style system (two identical filters plumbed in series; highly recommended) the treated water sample should be obtained between the two filters.

When a treated water analysis has detected a breakthrough of arsenic, the media will need to be replaced immediately. Contact the installing contractor for service.

To clear and reset the FLASHING YELLOW display and scrolling banner text "SCHEDULED SERVICE REQUIRED", simultaneously press and hold the UP and DOWN arrow buttons for > 3 seconds.

Error Message: If the valve is not able to function properly, the display will illuminate FLASHING RED, the word "ERROR" and an error code number will display. If a contact name and phone number were input, this information will alternate with the ERROR display. Contact the name on the display, the professional contractor or our factory for help.

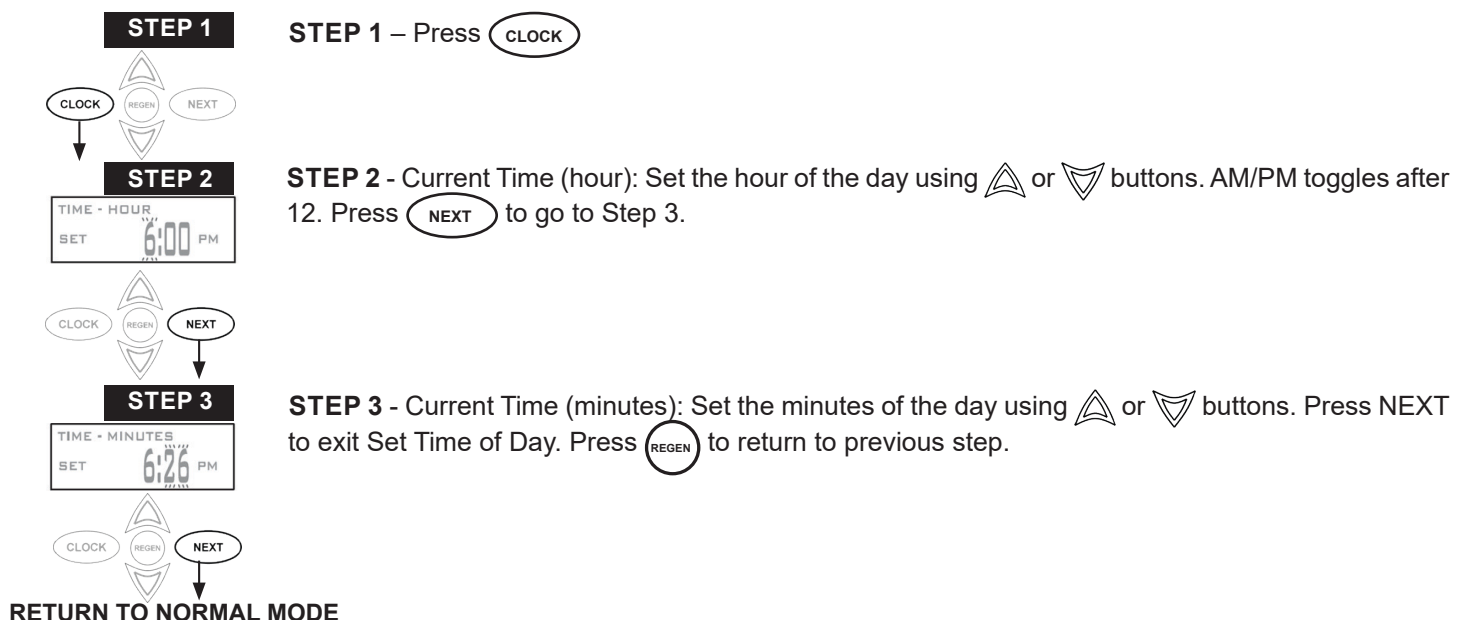


Low Battery: A non-rechargeable 3 volt lithium coin cell battery type 2032 is located on the circuit board (see diagram on page 17) used only to maintain the time of day during power outages (all other information will be stored in memory no matter how long the power outage). The screen displays LOW BATTERY when the battery needs to be replaced. The screen will remain illuminated SOLID BLUE when LOW BATTERY is displayed. Initially LOW BATTERY display will alternate with the User display, finally displaying only LOW BATTERY. User displays are still accessible by pressing .

To replace with new battery, unplug the control valve transformer from the 120 volt receptacle first. Install new battery and then plug transformer back into the receptacle to restore power. **It is important to replace the battery with the control valve unplugged to prevent the possibility of causing a short and damaging the PC Board.**

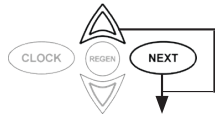
SET TIME OF DAY

Current time of day needs to be entered during initial installation, and adjusted when daylight saving time begins or ends. If an extended power outage occurs and depletes the on-board non-rechargeable coin cell battery, when power resumes the time of day should be reset and battery replaced.



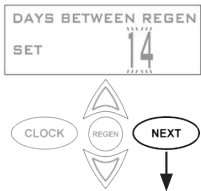
ADJUST DAYS BETWEEN BACKWASH, OR TIME OF BACKWASH

STEP 1



STEP 1 - Press **NEXT** and simultaneously for 3 seconds to access Installer Display Settings.

STEP 2

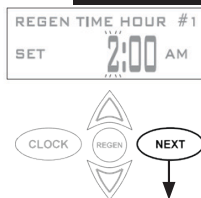


STEP 2 – Day Override: Set the maximum number of days between backwashes (REGEN). If value set to “OFF”, backwash initiation is based solely on volume used. If value is set as a number (allowable range from 1 to 28) a backwash initiation will be called for on that day even if sufficient volume of water were not used to call for a backwash. Set Day Override using or buttons:

- number of days between backwash (1 to 28); or
- “OFF”.

Press **NEXT** to go to step 3. Press **REGEN** to return to previous step.

STEP 3



STEP 3 – Next Regeneration Time (hour): Set the hour of day for backwash using or buttons. AM/PM toggles after 12. The default time is 12:00 AM (midnight). Press **NEXT** to go to Step 4. Press **REGEN** to return to previous step.

STEP 4

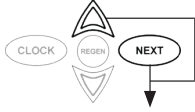


STEP 4 – Next Regeneration Time (minutes): Set the minutes of day for backwash using or buttons. Press **NEXT** to return to normal operation. Press **REGEN** to return to previous step.

RETURN TO NORMAL MODE

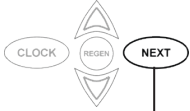
INSTALLER CONTACT SCREEN PROGRAMMING

STEP 1



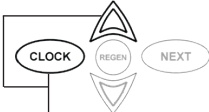
STEP 1 - Press **NEXT** and  simultaneously for 3 seconds to access Installer Display Settings.

STEP 2



STEP 2 - Press **NEXT** to go to step 3.

STEP 3



STEP 3 - While hour is flashing, press and hold both the **CLOCK** and  button to change phone number and banner text.

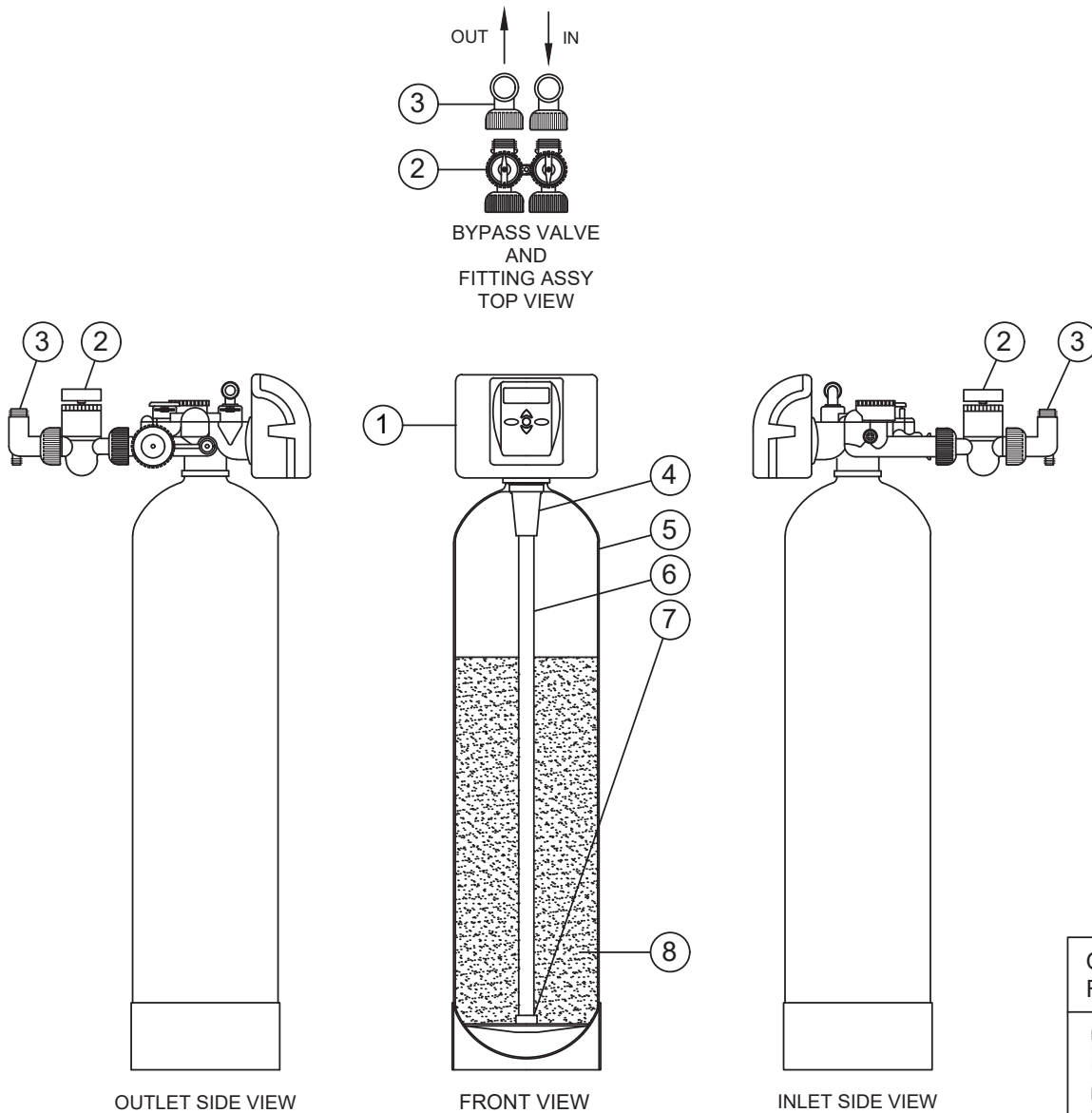


Phone Number - Set phone number using the  or  arrow. Press **NEXT** to forward to the next digit. Press **REGEN** to return to previous digit.



Banner Text - Set the banner text up to a maximum of 44 characters. Use the  or  to select letters of the alphabet, numbers, ampersand (&), or a space in the banner text. Press **NEXT** to forward to the next character or to exit the Installer Display Settings.

7-LXAR-75B, 7-LXAR-100B, 7-LXAR-150B, 7-LXAR-200B PARTS



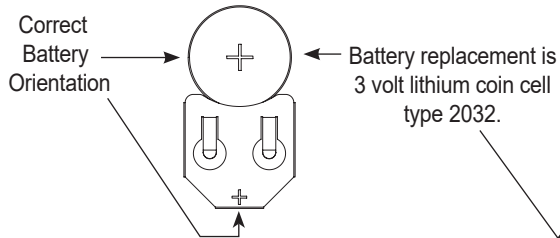
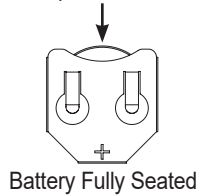
DWG. NO.	PART NUMBER AND DESCRIPTION	QUANTITY REQUIRED FOR MODEL NUMBER			
		7-LXAR-75B	7-LXAR-100B	7-LXAR-150B	7-LXAR-200B
1	LXCV1FM FILTER CONTROL VALVE - DETAILED COMPONENTS ARE SHOWN ON PAGES AHEAD	1	1	1	1
2	BP2000 BYPASS VALVE - DETAILED COMPONENTS ARE SHOWN ON PAGES AHEAD	1	1	1	1
3	V3007 FITTING 1" GFPP MNPT ELBOW (V3007 = 2 FITTING ASSEMBLIES) - DETAILED COMPONENTS ARE SHOWN ON PAGES AHEAD	1	1	1	1
4	D1203 TOP DISTRIBUTOR	1	1	1	1
5,6,7	TANK ASSY - FG844VT TANK, D1130-12FT DISTRIBUTOR TUBE (CUT FOR 44"), RDIP1050 CONNECTOR	1	-	-	-
5,6,7	TANK ASSY - FG1040VT TANK, D1130-12FT DISTRIBUTOR TUBE (CUT FOR 40"), RDIP1050 CONNECTOR	-	1	-	-
5,6,7	TANK ASSY - FG1054VT TANK, D1130-12FT DISTRIBUTOR TUBE (CUT FOR 54"), RDIP1050 CONNECTOR	-	-	1	-
5,6,7	TANK ASSY - FG1248VT TANK, D1130-12FT DISTRIBUTOR TUBE (CUT FOR 48"), RDIP1050 CONNECTOR	-	-	-	1
8	ASM10HP ARSENIC REDUCTION RESIN - QTY. SHOWN IN CU. FT. (LBS.)	0.75 (37.5)	1.0 (50)	1.5 (75)	2.0 (100)

X-FACTOR FRONT COVER AND DRIVE ASSEMBLY

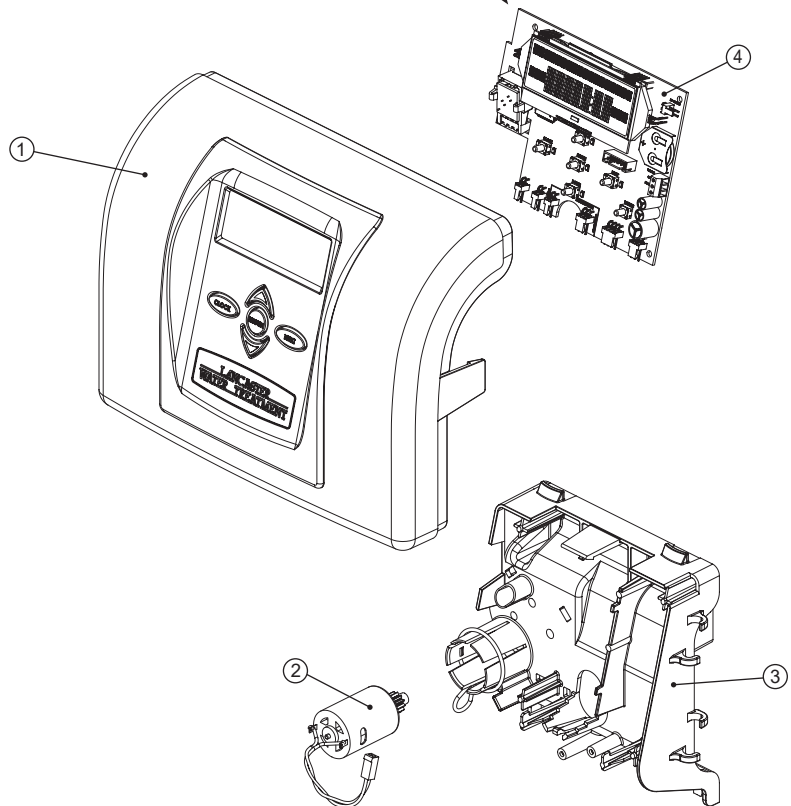
Drawing No.	Order No.	Description	Quantity
1	V3692-02LW	LP Front Cover Assembly	1
2	V3107-01	Motor	1
3	V3106-01	Drive Bracket, (new design—no spring clip needed), Drive Gear 12x36 and Drive Gear Cover	1
4	V3757LP	PC Board	1

When replacing the battery, first unplug the control valve power adapter from the 120 volt receptacle. Install new battery properly (see below) and then plug the power adapter back into the receptacle to restore power. **It is important to replace the battery with the control valve unplugged to prevent the possibility of causing a short and damaging the PC Board.**

When replacing the battery, align positives and push down to fully seat.



AC Adapter	(Not shown)
Order No.	V3186
Supply Voltage	120V AC
Supply Frequency	60 Hz
Input Current	0.35 A
Output Voltage	15V DC
Output Current	0.5 A
No user serviceable parts are on the PC board, the motor, or the power adapter. The means of disconnection from the main power supply is by unplugging the power adapter from the wall.	



After completing any valve maintenance involving the drive assembly or the drive cap assembly and pistons, unplug power source jack from the printed circuit board (black wire) and plug back in or press and hold **NEXT** and **REGEN** buttons for 3 seconds. This resets the electronics and establishes the service piston position. The display should flash the software version and then reset the valve to the service position.

DRIVE CAP ASSEMBLY, DOWNFLOW PISTON, REGENERANT PISTON AND SPACER STACK ASSEMBLY

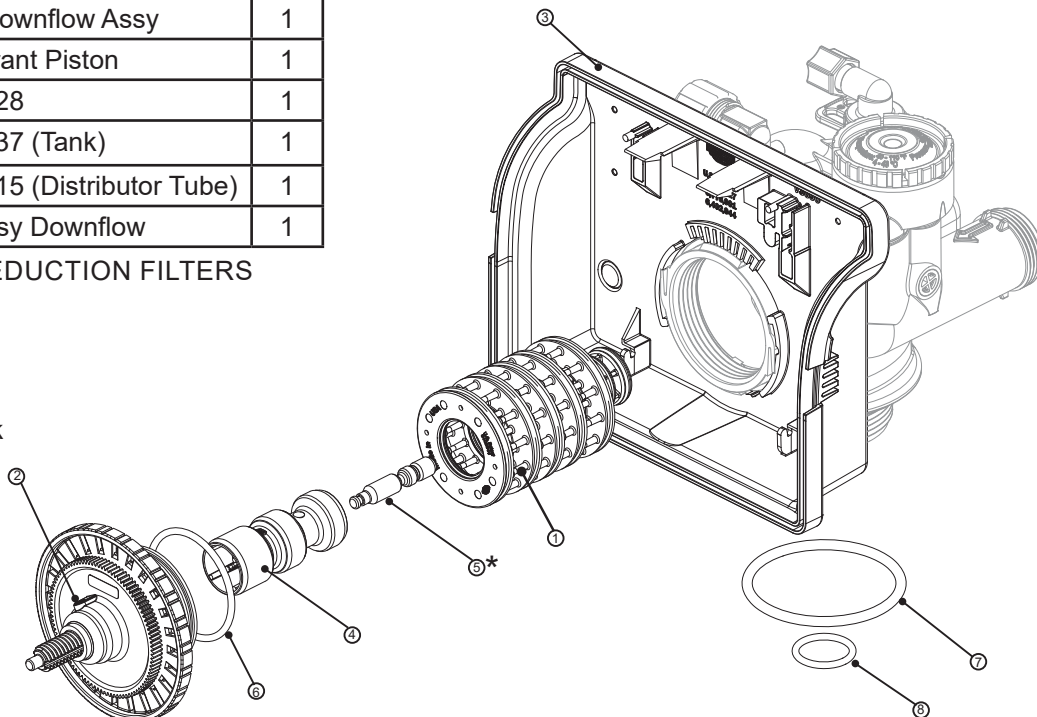
Drawing No.	Order No.	Description	Qty
1	V3005	Spacer Stack Assembly	1
2	V3004	Drive Cap Assy	1
3	V3178LP	Back Plate	1
4	V3011	Piston Downflow Assy	1
5*	V3174	Regenerant Piston	1
6	V3135	O-ring 228	1
7	V3180	O-ring 337 (Tank)	1
8	V3105	O-ring 215 (Distributor Tube)	1
Not Shown	V3001	Body Assy Downflow	1

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

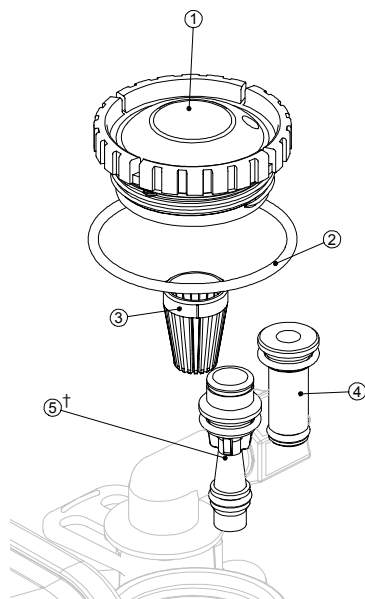
*Not used with 7-LXAR ARSENIC REDUCTION FILTERS

After completing any valve maintenance involving the drive assembly or the drive cap assembly and pistons, unplug power source jack from the printed circuit board (black wire) and plug back in or press and hold **NEXT** and **REGEN** buttons for 3 seconds. This resets the electronics and establishes the service piston position. The display should flash the software version and then reset the valve to the service position.

Refer to pages 26-27 for detailed service instructions.



— INJECTOR CAP, INJECTOR SCREEN, INJECTOR, PLUG AND O-RING —



Drawing No.	Order No.	Description	Qty
1	V3176	Injector Cap	1
2	V3152	O-ring 135	1
3	V3177-01	Injector Screen Cage	1
4	V3010-1Z	Injector Assy Z Plug	2
5†		Injector Assy	
Not Shown	V3170	O-ring 011	*
Not Shown	V3171	O-ring 013	*

* The injector plug and the injector each contain one 011 (lower) and 013 (upper) o-ring.

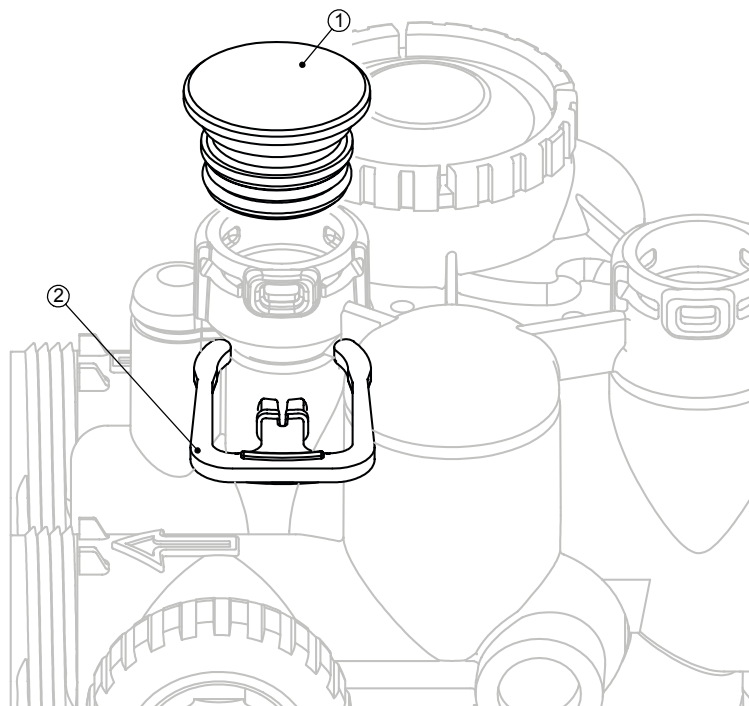
†Not used with 7-LXAR ARSENIC REDUCTION FILTERS, a second V3010-1Z injector assy Z plug is used.

The nut and caps are designed to be unscrewed or tightened by hand or with the service spanner wrench (see page 22). If necessary a pliers can be used to unscrew the nut or cap. Do not use a pipe wrench to tighten or loosen nuts or caps. Do not place a screwdriver in slots on caps and/or tap with a hammer.

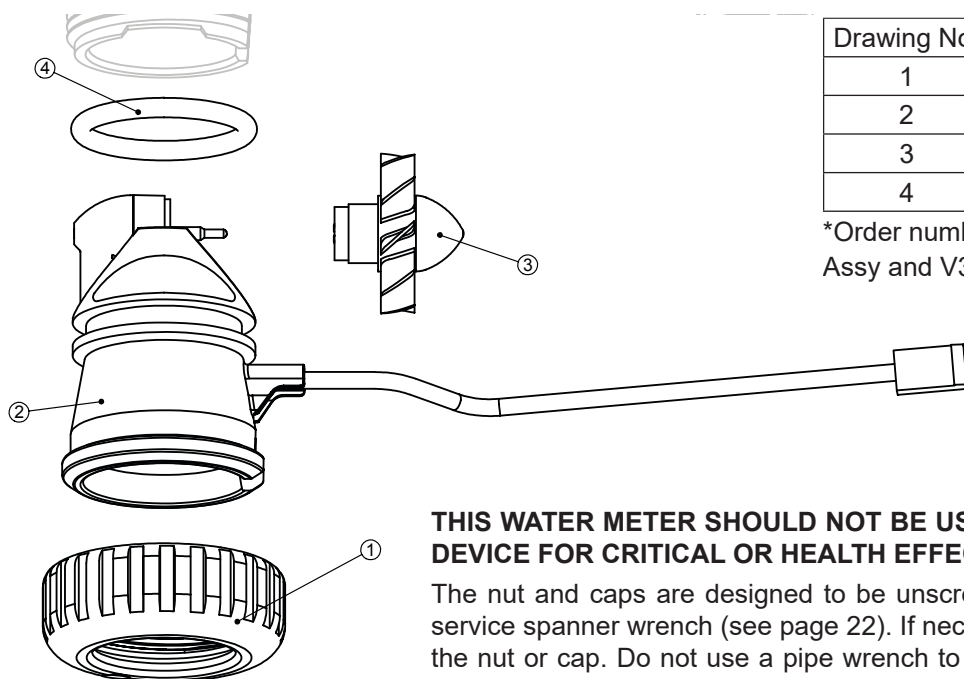
Refer to page 27 for detailed service instructions.

BRINE REFILL PLUG

Drawing No.	Order No.	Description	Qty
1	V3195	Refill Port Plug Assy	1
2	H4615	Elbow Locking Clip	1



WATER METER



Drawing No.	Order No.	Description	Qty
1	V3151	Nut 1" QC	1
2	V3003*	Meter Assy	1
3	V3118-01	Turbine Assy	1
4	V3105	O-ring 215	1

*Order number V3003 includes V3118-01 Turbine Assy and V3105 O-ring 215.

THIS WATER METER SHOULD NOT BE USED AS THE PRIMARY MONITORING DEVICE FOR CRITICAL OR HEALTH EFFECT APPLICATIONS.

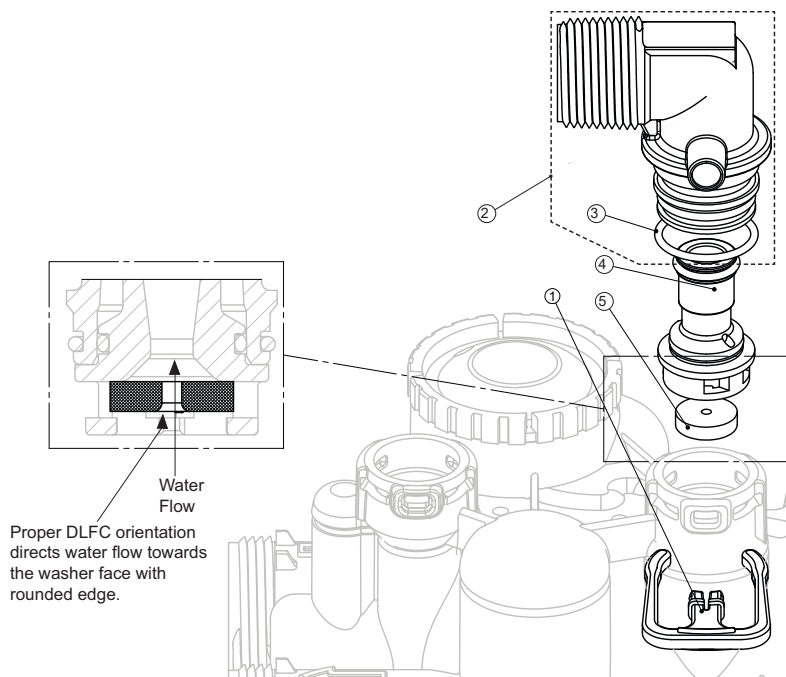
The nut and caps are designed to be unscrewed or tightened by hand or with the service spanner wrench (see page 22). If necessary a pliers can be used to unscrew the nut or cap. Do not use a pipe wrench to tighten or loosen nuts or caps. Do not place a screwdriver in slots on caps and/or tap with a hammer.

Refer to page 27 for detailed service instructions.

DRAIN LINE - 3/4"

Dwg No.	Order No.	Description	Qty
1	H4615	Elbow Locking Clip	1
2*	V3158	Drain Elbow 3/4 Male NPT, No Silencer	1
3	V3163	O-ring 019	1
4*	V3159	DLFC Retainer Assy	1
5	V3162-007	DLFC 0.7 gpm for 3/4	One DLFC must be used if 3/4 fitting is used
	V3162-010	DLFC 1.0 gpm for 3/4	
	V3162-013	DLFC 1.3 gpm for 3/4	
	V3162-017	DLFC 1.7 gpm for 3/4	
	V3162-022	DLFC 2.2 gpm for 3/4	
	V3162-027	DLFC 2.7 gpm for 3/4	
	V3162-032	DLFC 3.2 gpm for 3/4	
	V3162-042	DLFC 4.2 gpm for 3/4	
	V3162-053	DLFC 5.3 gpm for 3/4	
	V3162-065	DLFC 6.5 gpm for 3/4	
	V3162-075	DLFC 7.5 gpm for 3/4	
	V3162-090	DLFC 9.0 gpm for 3/4	
	V3162-100	DLFC 10.0 gpm for 3/4	

*2 and 4 can be ordered as a complete assembly - V3331 Drain Elbow and Retainer Assy



Refer to Specifications pages (4) to identify the correct DLFC gpm size for your particular 7-LXAR model.

Do not use pipe dope or other sealants on threads. Teflon tape must be used on threads of 3/4" NPT connection.

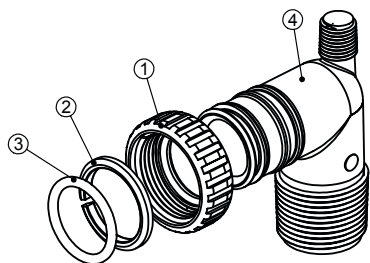
Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicone lubricant may be used on black o-rings but is not necessary.

INSTALLATION FITTING ASSEMBLIES

Order No: **V3007** (Standard for all models)

Description: **Fitting 1" GFPP Male NPT Elbow Assembly**

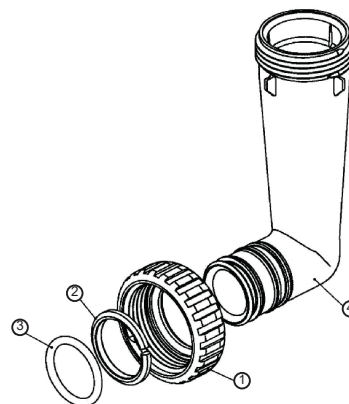
Drawing No.	Order No.	Description	Quantity
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3149	Fitting 1 PVC Male NPT Elbow	2



Order No. **V3191-01** (Optional)

Description: **Fitting Vertical Adapter Assembly**

Drawing No.	Order No.	Description	Quantity
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3191	Vertical Adapter	2



Do not use pipe dope or other sealants on threads. Teflon tape must be used on threads of 1" NPT connection. Teflon tape is not necessary on the nut connection nor caps because of o-ring seals.

The nut and caps are designed to be unscrewed or tightened by hand or with the service spanner wrench (see page 22). If necessary a pliers can be used to unscrew the nut or cap. Do not use a pipe wrench to tighten or loosen nuts or caps. Do not place a screwdriver in slots on caps and/or tap with a hammer.

Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicone lubricant may be used on black o-rings but is not necessary.

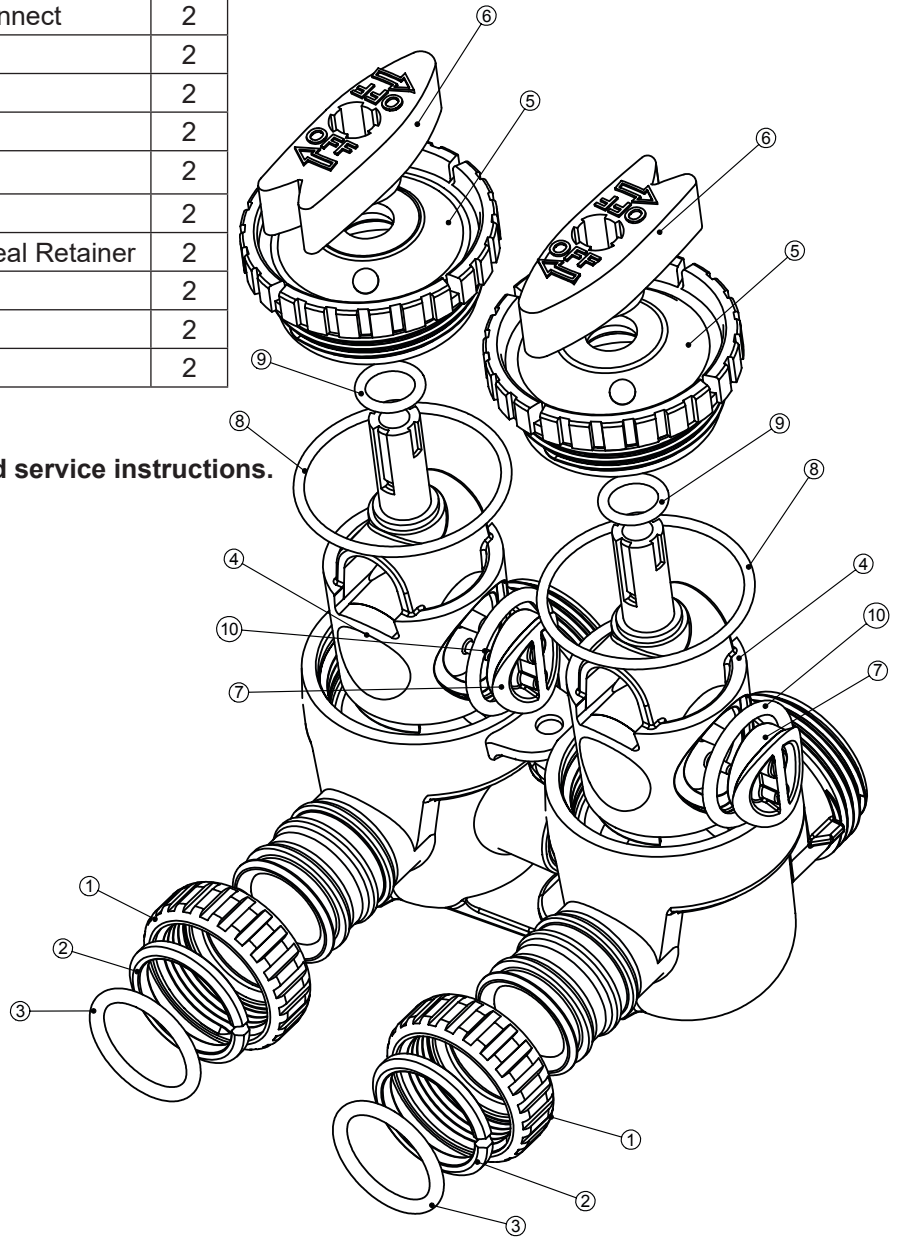
Refer to page 23 for optional installation fitting assemblies.

BYPASS VALVE

(Order No. BP2000)

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

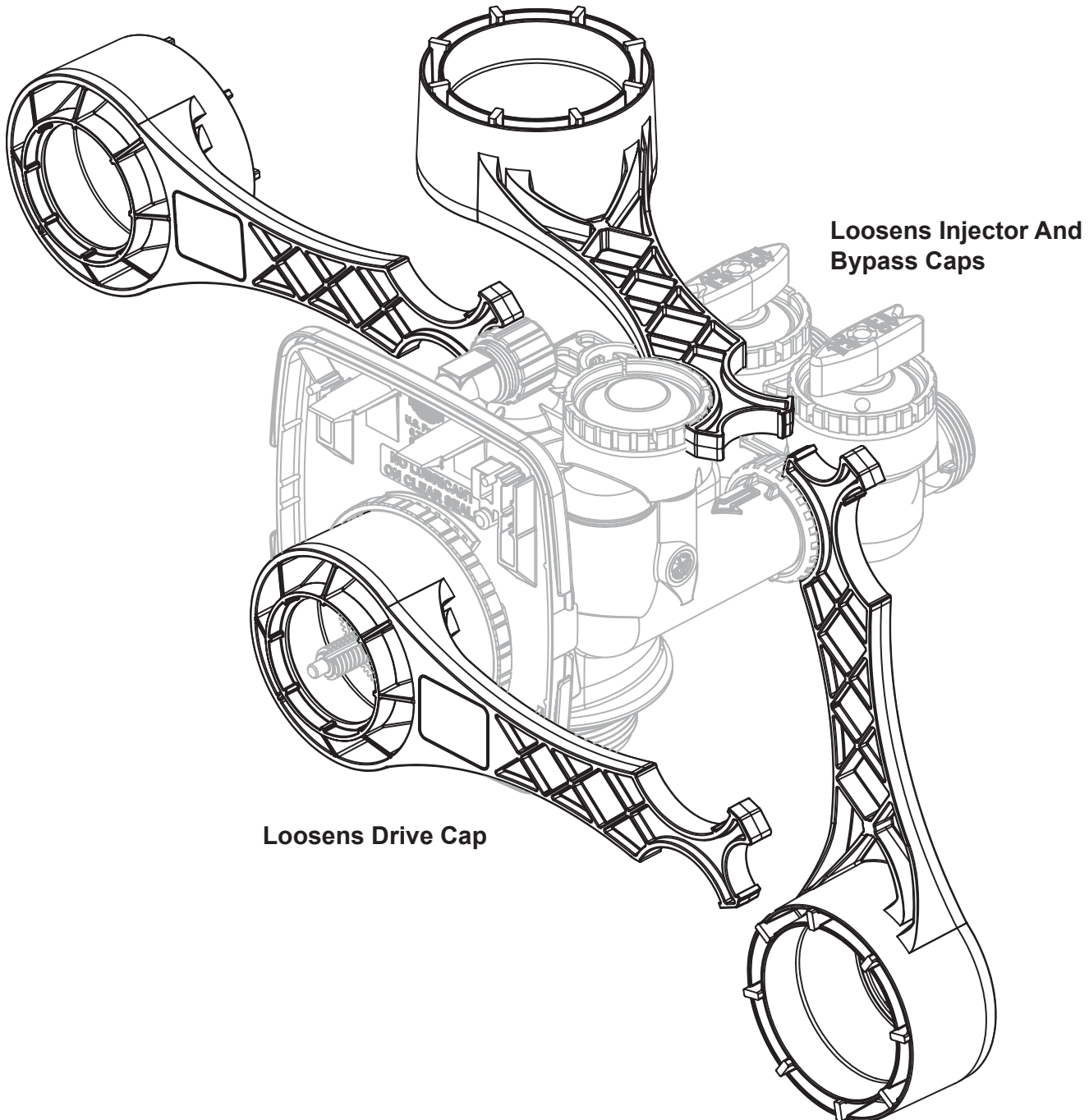
Refer to page 8 for detailed operation and service instructions.



SERVICE SPANNER WRENCH

(Order No. V3193)

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

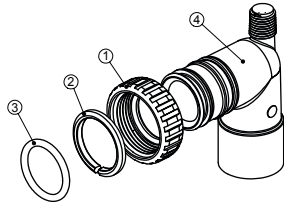


OPTIONAL INSTALLATION FITTING ASSEMBLIES

Order No: **V3007-01**

Description: **Fitting ¾" & 1" PVC Solvent 90° Assembly**

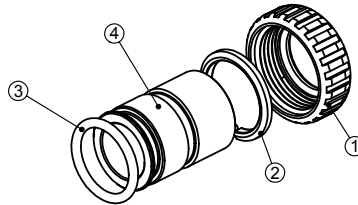
Drawing No.	Order No.	Description	Qty.
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3189	Fitting ¾&1 PVC Solvent 90	2



Order No: **V3007-02**

Description: **Fitting 1" Brass Sweat Assembly LF**

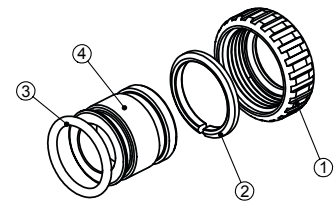
Drawing No.	Order No.	Description	Qty.
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3188	Fitting 1 Brass Sweat Assembly	2



Order No: **V3007-03**

Description: **Fitting ¾" Brass Sweat Assembly LF**

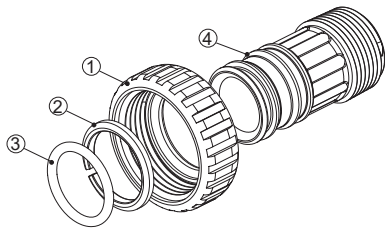
Drawing No.	Order No.	Description	Qty.
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3188-01	Fitting ¾ Brass Sweat	2



Order No: **V3007-04**

Description: **Fitting 1" Plastic Male NPT Assembly**

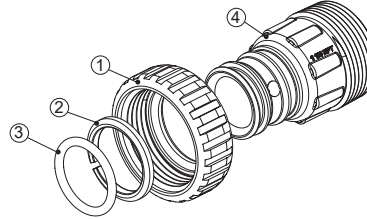
Drawing No.	Order No.	Description	Qty.
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3164	Fitting 1" Plastic Male NPT	2



Order No: **V3007-05**

Description: **Fitting 1-¼" Plastic Male NPT Assembly**

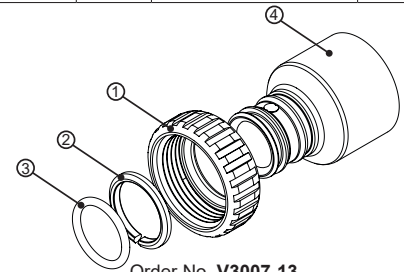
Drawing No.	Order No.	Description	Qty.
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3317	Fitting 1-¼" Plastic Male NPT	2



Order No: **V3007-07**

Description: **Fitting 1¼" & 1½" PVC Solvent Assembly**

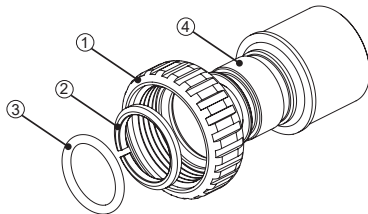
Drawing No.	Order No.	Description	Qty.
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3352	Fitting 1¼&1½" PVC Solvent	2



Order No: **V3007-09**

Description: **Fitting 1¼" & 1½" Brass Sweat Assembly LF**

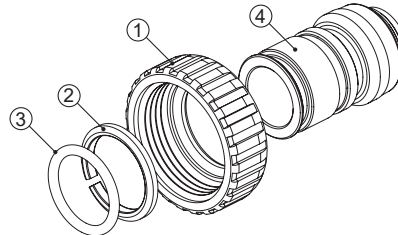
Drawing No.	Order No.	Description	Qty.
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3375	Fitting 1¼" & 1½" Brass Sweat	2



Order No: **V3007-12**

Description: **Fitting ¾" Brass SharkBite Assembly LF**

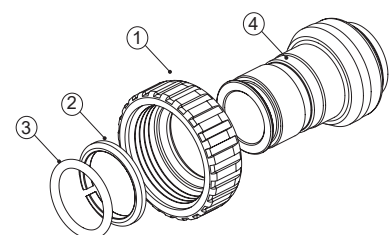
Drawing No.	Order No.	Description	Qty.
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3628	Ftg ¾ Brass Shark-Bite	2



Order No: **V3007-13**

Description: **Fitting 1" Brass SharkBite Assembly LF**

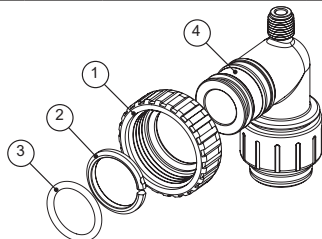
Drawing No.	Order No.	Description	Qty.
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3629	Ftg 1" Brass Shark-Bite	2



Order No: **V3007-15**

Description: **WS1 FTG ¾ JG QC 90 Assembly**

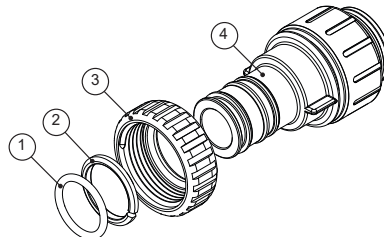
Drawing No.	Order No.	Description	Qty.
1	V3151	WS1 NUT 1 QC	2
2	V3150	WS1 SPLIT RING	2
3	V3105	O-RING 215	2
4	V3790	WS1 ELBOW ¾ QC W/STEM	2



Order No: **V3007-17**

Description: **WS1 FTG 1" JG QC Assembly**

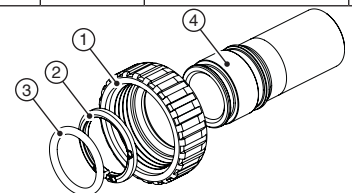
Drawing No.	Order No.	Description	Qty.
1	V3105	O-RING 215	2
2	V3150	WS1 SPLIT RING	2
3	V3151	WS1 NUT 1 QC	2
4	V4045	WS1 FTG 1 INCH QC	2



Order No: **V3007-22**

Description: **WS1 Fitting 1" Brass Press/Sweat Asy LF**

Drawing No.	Order No.	Description	Qty.
1	V3151	WS1 Nut 1" Quick Connect	2
2	V3150	WS1 Split Ring	2
3	V3105	O-Ring 215	2
4	V4318-LF	WS1 Fitting 1 Brass Press/Sweat LF	2



CONTROL VALVE SERVICE INSTRUCTIONS



CAUTION: Never perform service on an installed filter control valve unless pressure is fully relieved from the filter system. Injury and/or flooding can occur.



When servicing the valve, water may leak from the valve. Water from the valve may create a slip hazard. Clean up water spills.



Disconnect from electrical power prior to servicing the valve.

DRIVE ASSEMBLY (refer to pages 17&18 for diagrams):

Remove the valve cover to access the drive assembly.

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

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

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

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

To inspect the drive gears, the drive gear cover needs to be removed. Before trying to remove the gear cover, the drive bracket must be removed from the drive back plate. (Refer to the instructions above regarding removing the drive bracket from the drive back plate. The drive gear cover can be removed from the drive bracket without removing the motor or the PC board.) The drive gear cover is held in place on the drive bracket by three clips. The largest of the three clips is always orientated to the bottom of the drive bracket. With the PC board facing up, push in and down on the large clip on the drive gear cover. Handle the cover and the gears carefully so that the gears do not fall off the pegs in the cover.

Replace broken or damaged drive gears. Do not lubricate any of the gears. Avoid getting any foreign matter on the reflective coating because dirt or oils may interfere with pulse counting.

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

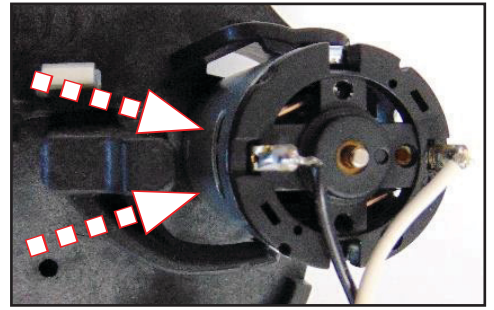
The drive bracket does not need to be removed from the drive plate if the motor needs to be removed. To remove the motor, disconnect the power and motor plugs from the jacks on the PC board. Replace the motor if necessary. Do not lubricate the motor or the gears. See the next page for instructions for removing and reinstalling the motor on the new drive bracket design (no spring clip needed). After the motor is reinstalled, reconnect the motor plug to the two-pronged jack on the lower left side of the PC board. Reconnect the power plug.

Replace the valve cover. After completing any valve maintenance involving the drive assembly or the drive cap assembly and pistons, unplug power source jack from the printed circuit board and plug back in or press and hold **NEXT** and **REGEN** buttons for 3 seconds.

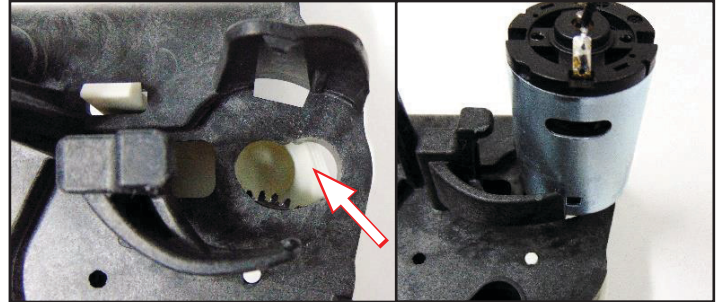
This resets the electronics and establishes the service piston position. The display should flash the software version and then reset the valve to the service position.

MOTOR REMOVAL & INSTALLATION INSTRUCTIONS

1. When removing the motor, push the motor from the bottom and top side of the retaining clip straight out and away from the locking tab and pull the motor up and out of the drive bracket.



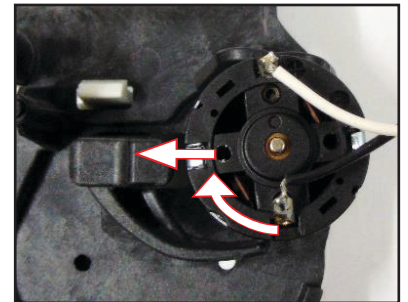
2. When installing the motor, place the motor gear side down into the end of the slot in the drive bracket furthest away from the locking tab. Ensure the holes in the motor housing are a quarter-turn away from the locking tab.



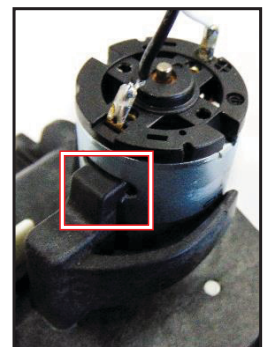
3. Ensure the motor is flush with the drive bracket before proceeding.



4. Gently rotate the motor clockwise (to the right) while pushing the motor towards the locking tab. The motor will engage the gears in the drive bracket while sliding into place.

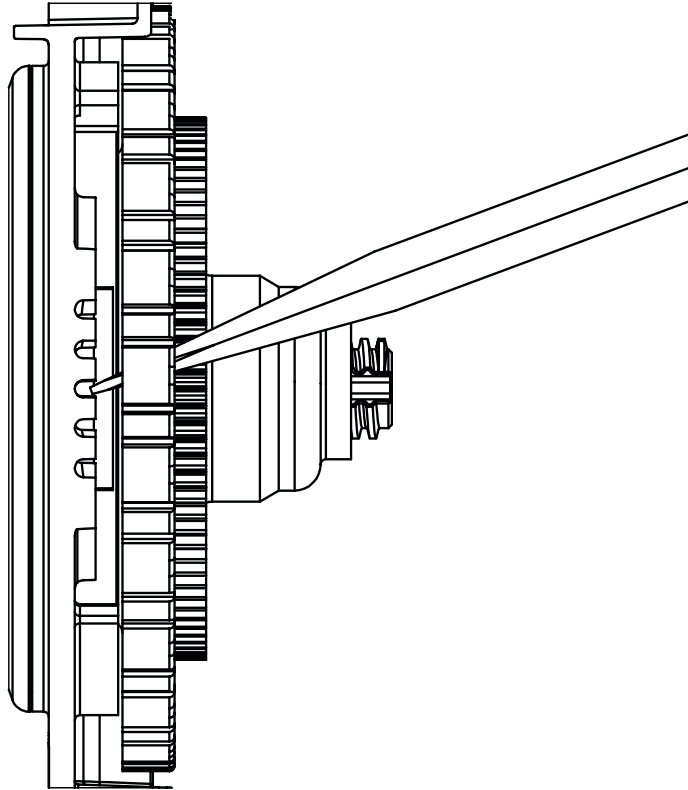


4. Ensure the locking tab on the drive bracket is fully inserted into one of the holes in the motor housing.



DRIVE CAP ASSEMBLY, MAIN PISTON AND REGENERANT PISTON (refer to page 18 for diagrams):

The drive assembly must be removed to access the drive cap assembly. The drive cap assembly must be removed to access the piston(s). The drive cap assembly is threaded into the control valve body and seals with an o-ring. To remove the drive cap assembly use the special plastic service spanner wrench (see page 22) or insert a ¼" to ½" flat blade screwdriver into one of the slots around the top 2" of the drive cap assembly so it engages the notches molded into the drive back plate around the top 2" of the piston cavity. See figure below. The notches are visible through the holes. Lever the screwdriver so the drive cap assembly turns counter clockwise. Once loosened unscrew the drive cap assembly by hand and pull straight out.



The drive cap assembly contains the drive cap, the main drive gear, drive cap spline, piston rod and various other parts that should not be disassembled in the field. The only replaceable part on the drive cap assembly is the o-ring. Attached to the drive cap assembly is the main piston.

To remove the main piston fully extend the piston rod and then unsnap the main piston from its latch by pressing on the side with the number. Chemically clean in dilute sodium bisulfite or vinegar, or replace the main piston.

Reattach the main piston to the drive cap assembly. Reinsert the drive cap assembly and piston into the spacer stack assembly and hand tighten the drive cap assembly. Continue to tighten the drive cap assembly using a screwdriver as a ratchet until the black o-ring on the spacer stack assembly is no longer visible through the drain port. Excessive force can break the notches molded into the drive back plate. Make certain that the main drive gear still turns freely. The exact position of the piston is not important as long as the main drive gear turns freely.

Reattach the drive assembly to the control valve and connect all plugs. After completing any valve maintenance involving the drive assembly or the drive cap assembly and pistons, unplug power source jack from the printed circuit board (black wire) and plug back in or press and hold **NEXT** and **REGEN** buttons for 3 seconds.

This resets the electronics and establishes the service piston position. The display should flash the software version and then reset the valve to the service position.

SPACER STACK ASSEMBLY (refer to page 18 for diagrams):

To access the spacer stack assembly remove the drive assembly, drive cap assembly and piston. The spacer stack assembly can be removed easily without tools by using thumb and forefinger. Inspect the black o-rings and clear lip seals for wear or damage. Replace the entire stack if necessary. Do not disassemble the stack.

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

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

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

After completing any valve maintenance involving the drive assembly or the drive cap assembly and pistons, unplug power source jack from the printed circuit board (black wire) and plug back in or press and hold  and  buttons for 3 seconds.

This resets the electronics and establishes the service piston position. The display should flash the software version and then reset the valve to the service position.

INJECTOR CAP, SCREEN, INJECTOR PLUG, AND INJECTOR (refer to page 18 for diagram):

Unscrew the injector cap and lift off. Loosen cap with special plastic service spanner wrench (see page 22) or pliers if necessary. Attached to the injector cap is a screen. Remove the screen and clean if fouled.

7-LXAR ARSENIC REDUCTION FILTERS do not use an injector.

The two plugs can be pried out with a small screwdriver. The plugs can be wiped clean. If the plugs leak replace the entire plugs.

Push the plugs in the holes marked "UP" and "DN".

Replace the screen and hand tighten the injector cap.

WATER METER (refer to page 19 for diagrams):

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

THIS WATER METER SHOULD NOT BE USED AS THE PRIMARY MONITORING DEVICE FOR CRITICAL OR HEALTH EFFECT APPLICATIONS.

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

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

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

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

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

TROUBLESHOOTING

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
3. Display does not indicate that water is flowing. Refer to user instructions for how the display indicates water is flowing	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Meter wire not installed securely into three pin connector	d. Verify meter cable wires are installed securely into three pin connector labeled METER
	e. Defective meter	e. Replace meter
	f. Defective PC Board	f. Replace PC Board
4. Control valve backwashes 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 backwash set incorrectly	c. Reset backwash time
	d. Control valve set at immediate regeneration	d. Check programming setting and reset to DELAYED (for a delayed regen time)
	e. Control valve set at (delayed + immediate)	e. Check programming setting and reset to DELAYED (for a delayed regen 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 backwash automatically when the REGEN button is depressed	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. Replace PC Board
7. Control valve does not backwash automatically but does when the REGEN button is depressed and held.	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Incorrect programming	d. Check for programming error
	e. Meter wire not installed securely into three pin connector	e. Verify meter cable wires are installed securely into three pin connector labeled METER
	f. Defective meter	f. Replace meter
	g. Defective PC Board	g. Replace PC Board

Problem	Possible Cause	Solution
8. 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
	c. Meter not registering	c. Remove meter and check for rotation or foreign material
	d. Water quality fluctuation	d. Test water and adjust program values accordingly
	e. Damaged seal/stack assembly	e. Replace seal/stack assembly
	f. Control valve body type and piston type mix matched	f. Verify proper control valve body type and piston type match
	g. Fouled media bed	g. Replace media bed
9. For aeration and ozone generator models only: Control valve fails to draw in air or ozone.	a. Injector is plugged	a. Remove injector and clean or replace
	b. Faulty regenerant piston	b. Replace regenerant piston
	c. Ozone generator line connection leak	c. Inspect ozone line for air leak
	d. Air (Brine) elbow check valve cartridge or ozone in-line check valve defective or installed backwards	d. Remove check valve(s) and replace correctly
	e. Drain line restriction or debris cause excess back pressure	e. Inspect drain line and clean to correct restriction
	f. Drain line too long or too high	f. Shorten length and or height
	g. Low water pressure	g. Check incoming water pressure - water pressure must remain at minimum of 25 psi
10. Water running to drain	a. Power outage during backwash	a. Upon power being restored control will finish the remaining backwash 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
11. Error – 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

Problem	Possible Cause	Solution
12. Error – 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.
13. Error – 103 = Control valve motor ran too long and was unable to find the next cycle position	a. Motor failure during a backwash	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.
14. Error – 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.

Problem	Possible Cause	Solution
15. Error -106 = 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 MAV MTR. 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.
16. Error – 107 = 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.



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