LANCASTER
WATER TREATMENT

X FACTOR SERIES™

INSTALLATION, OPERATING AND SERVICE MANUAL

GOLD LINE LER
ELECTRONIC ACID NEUTRALIZER WITH THE LERCV1 VALVE

☐ 7-LERDAN-1.5BNM

☐ 7-LERDAN-2BNM

Congratulations on purchasing your new **Lancaster Water Softener.** This unit is designed to give you many years of trouble free service. When installed in accordance with the following instructions and if given reasonable care, clear-soft water will be the result. For servicing and future inspection purposes, please file this booklet with your important documents.

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JOB SPECIFICATIONS

MODEL NO. _____

INSTALLATION DATE _____

SERIAL NUMBER _____

INSTALLER NAME _____ PHONE _____

ADDRESS _____

UNTREATED WATER TEST AT TIME OF INSTALLATION

_____ Hardness $CaCo_3$ (gpg) _____ pH Other: _____

_____ Iron (ppm or mg/l) _____ TDS (ppm or mg/l) _____

_____

COMPONENTS

MODEL	MINERAL TANKPART NO., dia."x ht."	PART ID, MINERAL (BAG qty.)
7-LXDAN-1.5B	FG1054DVT, 10x54	A8021, CALCITE (3)
7-LXDAN-2B	FG1348DVT, 13x48	A8021, CALCITE (4)

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 (all models) 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. Outside faucets should be left on untreated water.

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 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.

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 personal 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)*

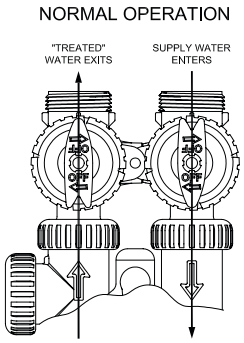


figure 1

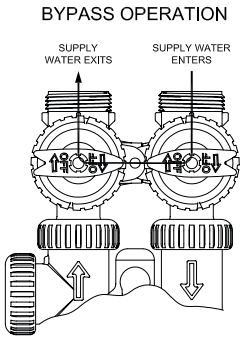


figure 2

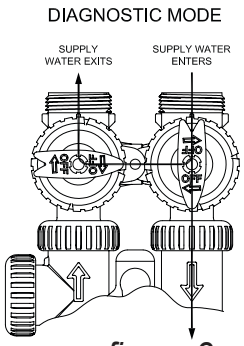


figure 3

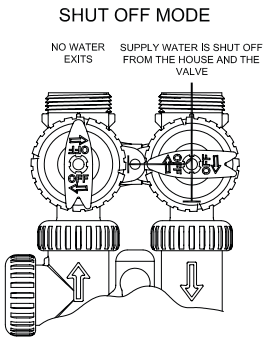


figure 4

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 11 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 to all local codes)

1. Place filter in desired location close to water supply inlet, after pressure tank, and near a source for waste water, (utility sink, floor drain or sewer line). A 120V, 60Hz uninterrupted outlet is required. Keep filter far enough away from walls and other obstructions to allow enough room for servicing the unit. If a water softener is also to be installed, generally it will be placed in line after the neutralizer or filter.
From water supply⟶neutralizer or filter⟶softener⟶to service
Installation sequence is application specific; if uncertain, please contact dealer or factory.
2. Add Minerals: Remove control valve from the mineral tank by turning counter-clockwise. Plug open end (top) of the distributor tube assembly to prevent the mineral from entering (fig. A). Add all the mineral supplied with filter (see page 2 for mineral bag qty.). **DO NOT OVERFILL.** Tanks should be approx. 2/3 full. Remove the plug from the distributor tube. Water can be manually added at this time to begin the mineral soaking process, particularly for lighter weight minerals such as Carbon or Filter Ag. **DO NOT SOAK KATALOX-LIGHT**. Replace the control valve making sure that the distributor tube is inserted into the center hole of the bottom of the control valve.
3. Do all necessary plumbing (inlet to inlet, outlet to outlet, and drain line to drain). The control valve, fittings 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.
4. 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 joint should be cool and solvent cements should be set before installing the nut, split ring and o-ring. Avoid getting primer and solvent cement on any part of the o-rings, split rings, bypass valve or control valve.
5. 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.
6. The drain connection may be made using either 5/8" polytube or a 3/4" or 1" female adapter (see below for recommended drain line size). The polytube insert is shipped attached to the drain line elbow's locking clip. Press the insert into the drain line tubing (tubing not provided). Loosen the nut of the drain line elbow. Press the 5/8" polytube with insert into the drain line elbow until it seats on the back of the fitting. Tighten the nut. 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 the installation diagram on the next page. **CAUTION** - Attach drain line **SECURELY** to an air gap device on the waste line, especially for AIR and AIR03 models.

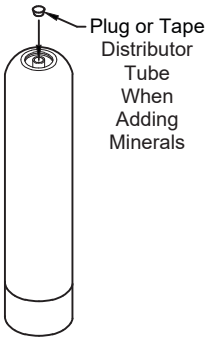


FIG. A

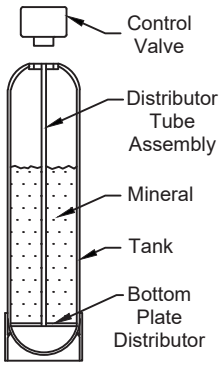


FIG. B

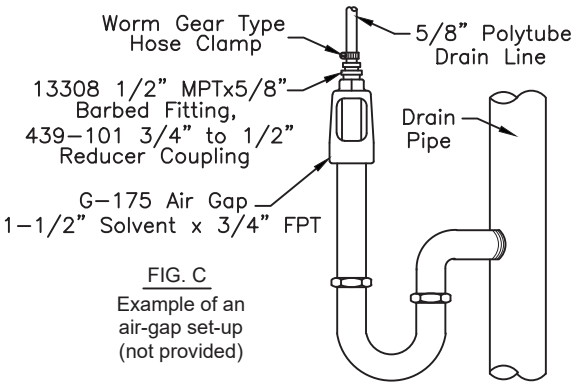
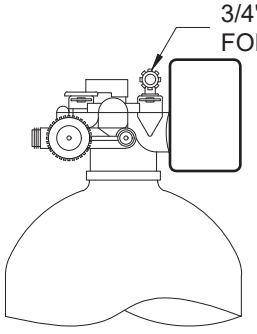
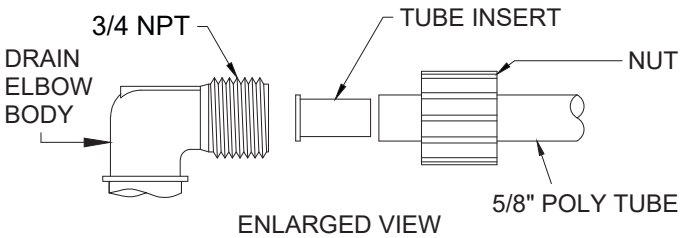


FIG. C
Example of an air-gap set-up (not provided)

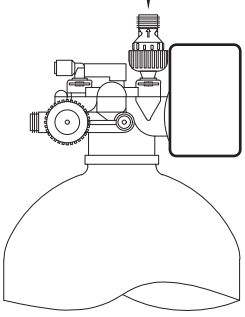
3/4" DRAIN LINE FITTING CONNECTION USING 5/8" POLYTUBE FOR 5.3 GPM MAX BACKWASH ...


FILTER SIDE VIEW



ENLARGED VIEW

1" DRAIN LINE FITTING CONNECTION

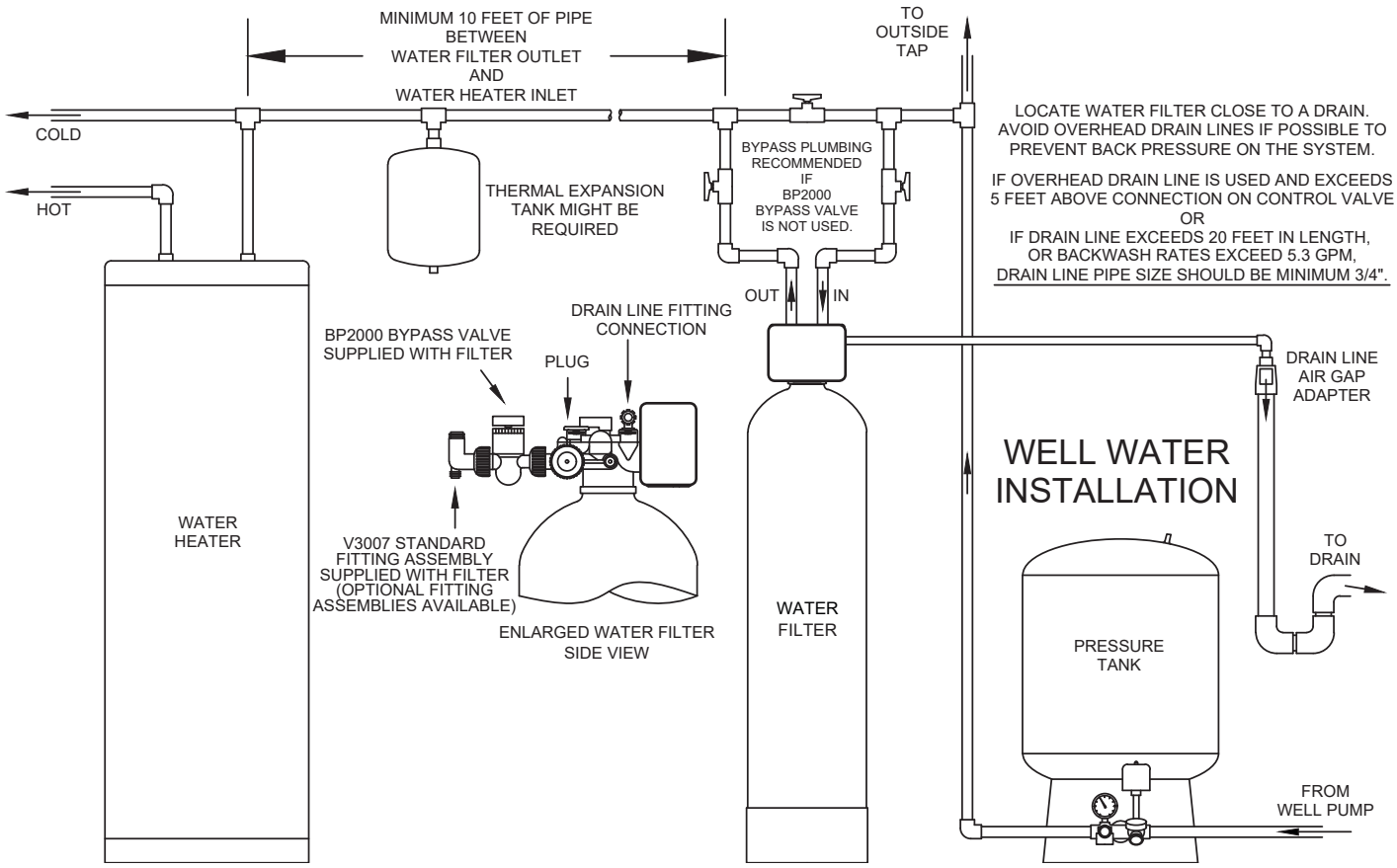

FILTER SIDE VIEW

RECOMMENDED DRAIN LINE SIZE:

FOR ALL 1 THROUGH 3 CU. FT. FILTER MODELS, SIMPLY REMOVE THE NUT SHOWN ABOVE AND DISCARD. HARD PIPING A 3/4" DRAIN LINE IS RECOMMENDED USING THE 3/4" NPT MALE THREADS ON THE DRAIN ELBOW BODY FOR UP TO 10 GPM BACKWASH.

EXCEPTION- 2 AND 3 CU. FT. "AIR" FILTERS ARE FACTORY FITTED WITH A 1" NPT STRAIGHT DRAIN FITTING BODY TO HARD PIPE A 1" DRAIN LINE FOR 10 GPM AND HIGHER BACKWASH ..... FILTER SIDE VIEW

INSTALLATION



START-UP INSTRUCTIONS

As noted on page 3 General Installation Instructions, allow lighter weight mineral such as Carbon and Filter Ag to soak in water prior to start-up; recommend minimum 12 hours up to 24 hours for best results. Do not plug the transformer into the receptacle yet. Rotate the bypass handles to the **BYPASS** position (see figure 2 on page 4). 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 (REGEN) 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 4*) to allow water to slowly enter filter in order to expel air.

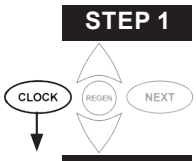
CAUTION:
If mineral is dry, filling to quickly with water will result in the mineral plugging the drain line and control valve assembly. Some minerals such as Carbon and Filter Ag should not be backwashed immediately for extended periods of time. For best results, these minerals need to soak in water for a 24-hour period before backwashing at full flow. Flow water to drain very slowly, increasing the flow until the water runs clear.

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 (REGEN) again. Display will read **RINSE**. Place the bypass valve in the **NORMAL OPERATION MODE** (*see figure 1 on page 4*). Allow filter control valve to finish the **RINSE** cycle and automatically advance to the **FILTERING** position.

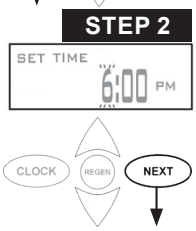
Continue to page 8.

SET TIME OF DAY

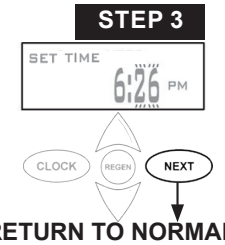
Current time of day needs to be entered during initial installation, and adjusted when daylight saving time begins or ends. If an extended power outage occurs and depletes the on-board non-rechargeable coin cell battery, when power resumes the time of day should be reset and battery replaced.



STEP 1 – Press (CLOCK)



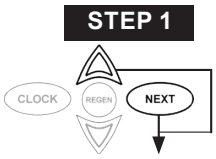
STEP 2 - Current Time (hour): Set the hour of the day using ▲ or ▼ buttons. AM/PM toggles after 12. Press (NEXT) to go to Step 3.



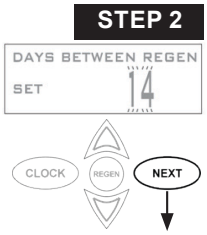
STEP 3 - Current Time (minutes): Set the minutes of the day using ▲ or ▼ buttons. Press NEXT to exit Set Time of Day. Press (REGEN) to return to previous step.

RETURN TO NORMAL MODE

ADJUST DAYS BETWEEN BACKWASH, OR TIME OF BACKWASH



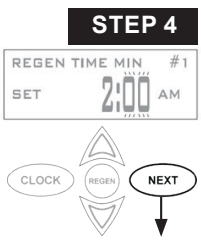
STEP 1 - Press (NEXT) and ▲ simultaneously for 3 seconds to access Installer Display Settings.



STEP 2 – Day Override: Set the <u>maximum</u> 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:

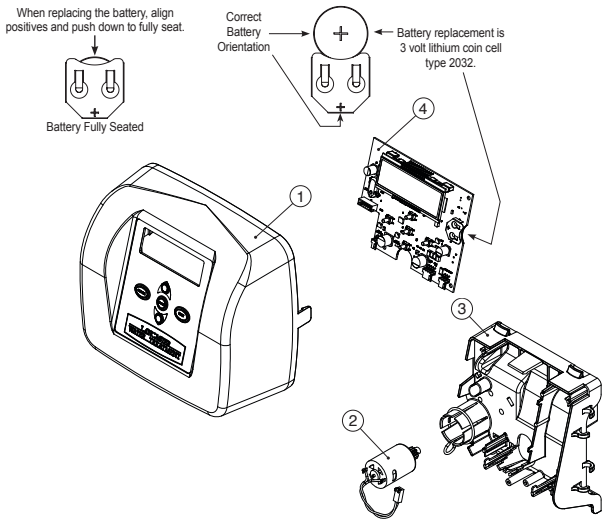
- number of days between backwash (1 to 28); or
- "OFF".

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 – 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

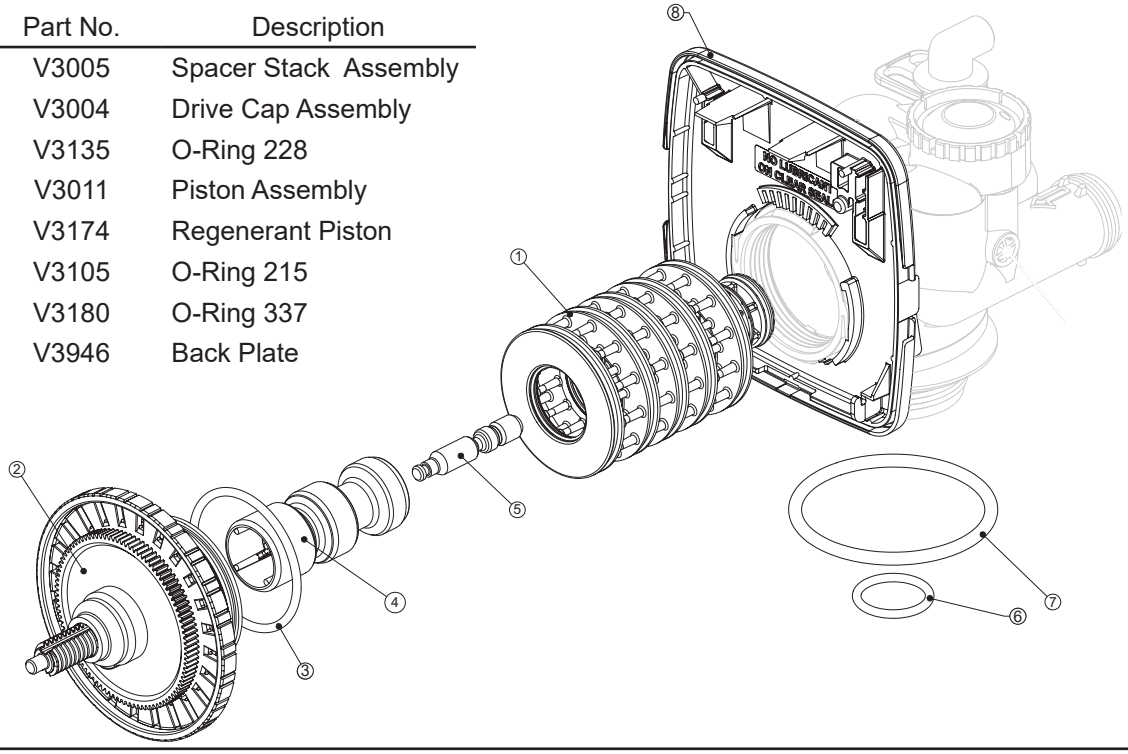


FRONT COVER AND DRIVE ASSEMBLY

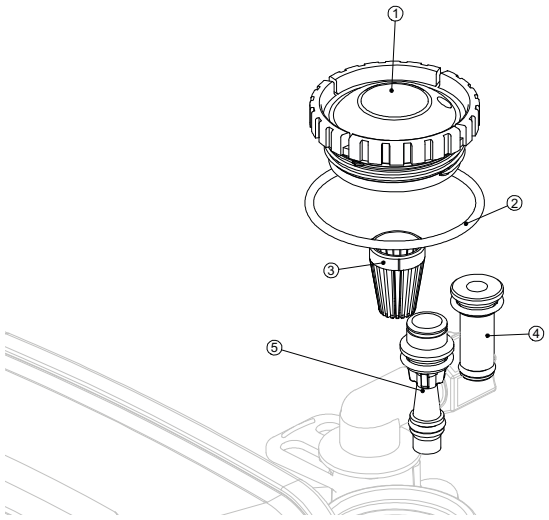
Item No.	Qy.	Part No.	Description
1	1	V4170	Front Cover Assembly
2	1	V3107	Motor
3	1	V3106	Drive Bracket, Spring Clip, Drive Gear 12 x 36 & Drive Gear Cover
4	1	V4179LC-BOARD	PC Board
Not Shown	1	V3186	Transformer 110V-12V

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

Item No.	Quantity	Part No.	Description
1	1	V3005	Spacer Stack Assembly
2	1	V3004	Drive Cap Assembly
3	1	V3135	O-Ring 228
4	1	V3011	Piston Assembly
5	1	V3174	Regenerant Piston
6	1	V3105	O-Ring 215
7	1	V3180	O-Ring 337
8	1	V3946	Back Plate

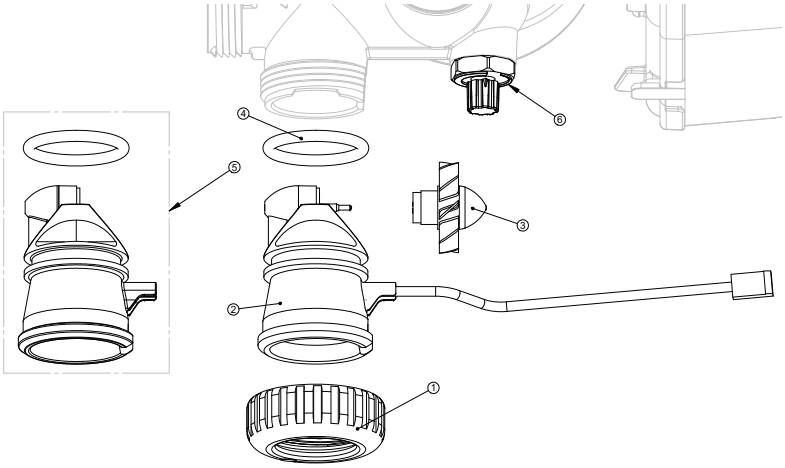


INJECTOR, INJECTOR CAP, SCREEN AND O-RING



Item No.	Quantity	Part No.	Description
1	1	V3176	Injector Cap
2	1	V3152	O-Ring 135
3	1	V3177	Injector Screen
4	1	V3010-1Z	Injector Assy Z Plug
5	1	V3010-1C	Injector Assy C Violet
5	1	V3010-1E	Injector Assy E White
5	1	V3010-1F	Injector Assy F Blue
5	1	V3010-1G	Injector Assy G Yellow
Not Shown	*	V3170	O-Ring 011
Not Shown	*	V3171	O-Ring 013

* Injector plug and injector each contain one 011 and one 013 O-Ring



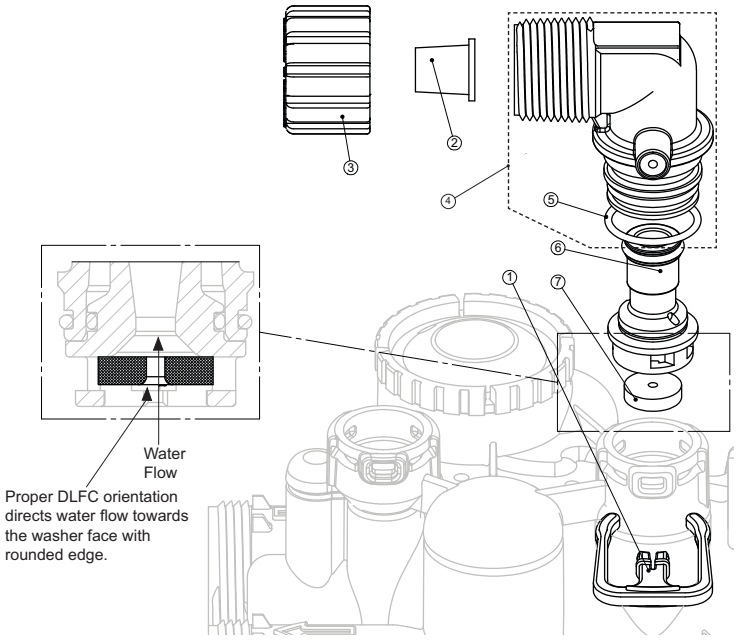
WATER METER AND METER PLUG

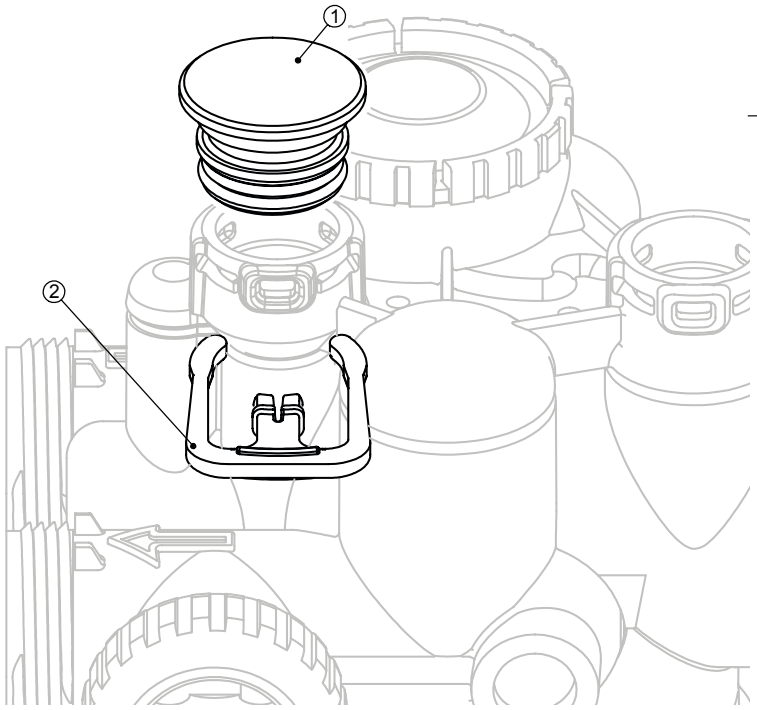
Item No.	Quantity	Part No.	Description
1	1	V3151	Nut 1” QC
2	1	V3003*	Meter Assy
3	1	V3118-01	Turbine Assy
4	1	V3105	O-Ring 215
5	1	V3003-01	Meter Plug Assy

*Part No. V3003 includes Items 2, 3 and 4

DRAIN LINE - 3/4”

Item No.	Quantity	Part No.	Description
1	1	H4615	Elbow Locking Clip
2	1	V3194	Polytube Insert 5/8
3	1	V3192	Nut for 3/4 Drain Elbow
4	1	V3158	3/4 Drain Elbow
5	1	V3163	O-Ring 019
6	1	V3159	DLFC Retainer
7	1	V3162-010	DLFC 1.0
7	1	V3162-017	DLFC 1.7
7	1	V3162-027	DLFC 2.7
7	1	V3162-032	DLFC 3.2
7	1	V3162-042	DLFC 4.2



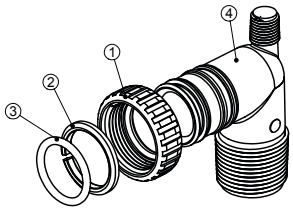


BRINE REFILL PLUG

Item No.	Quantity	Order No.	Description
1	1	V3195	Refill Port Plug Assy
2	1	H4615	Elbow Locking Clip

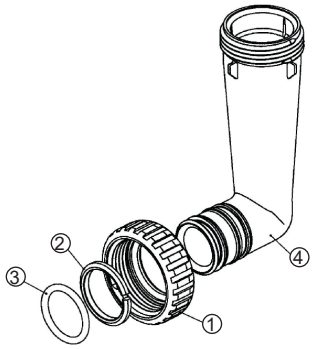
PARTS

V3007 1” PVC Male NPT Elbow Assembly Standard



Item No.	Qty	Part No.	Description
1	2	V3151	Nut 1” Quick Connect
2	2	V3150	Split Ring
3	2	V3105	O-Ring 215
4	2	V3149	1” PVC Male NPT Elbow

V3191-01 Vertical Adapter Assembly Optional

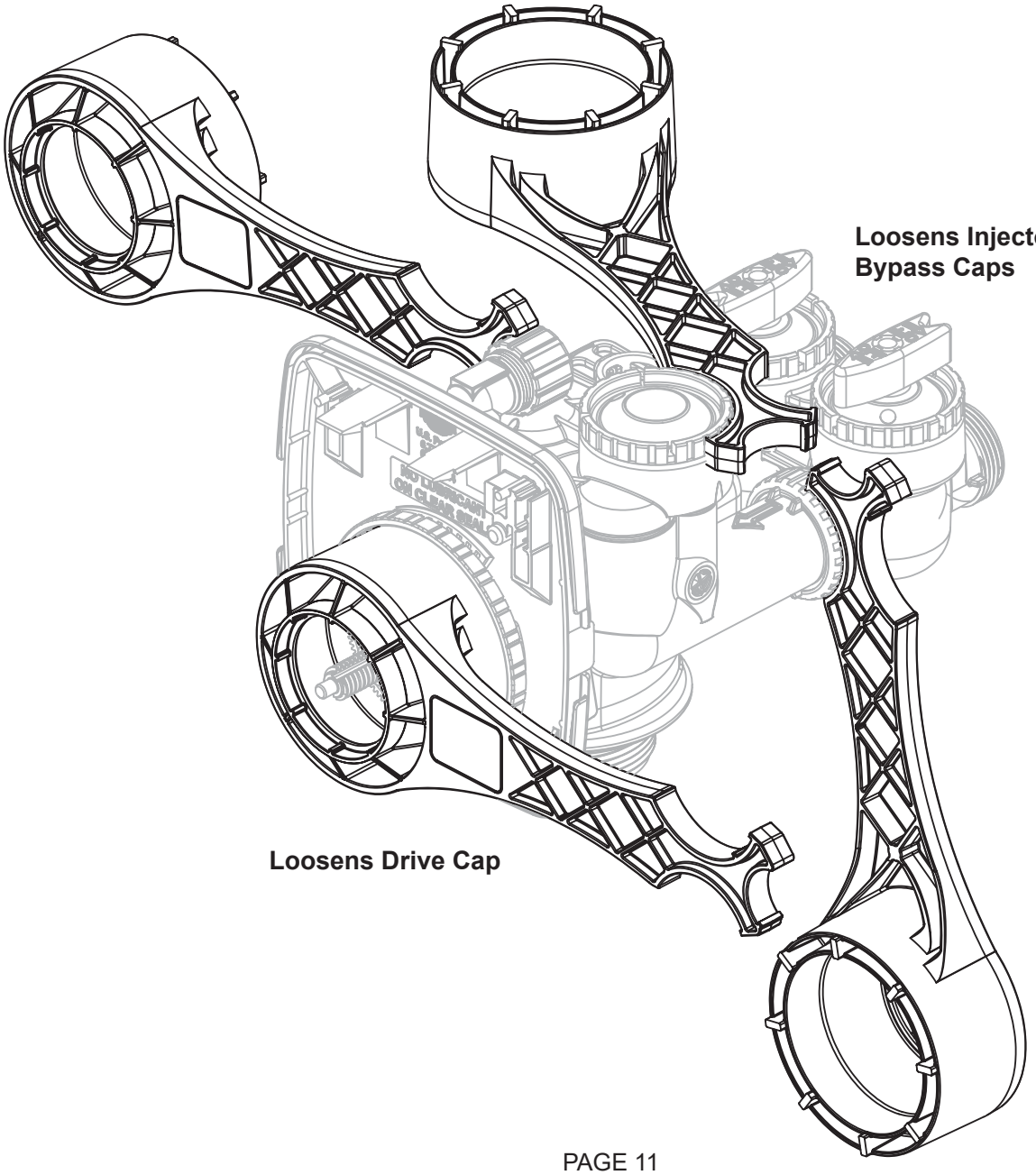


Item No.	Qty	Part No.	Description
1	2	V3151	Nut 1” Quick Connect
2	2	V3150	Split Ring
3	2	V3105	O-Ring 215
4	2	V3191	Vertical Adapter

SERVICE SPANNER WRENCH

(Order No. V3193)

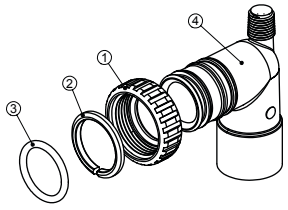
Although no tools are necessary to assemble or disassemble the valve, the wrench (shown in various positions on the valve) may be purchased to aid in assembly or disassembly.



OPTIONAL INSTALLATION FITTING ASSEMBLIES

Order No: **V3007-01**
Description: **Fitting ¾" & 1" PVC Solvent 90° Assembly**

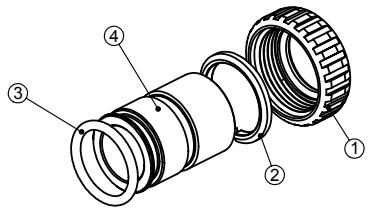
Drawing No.	Order No.	Description	Quantity
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3189	Fitting ¾&1 PVC Solvent 90	2



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

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	V3188	Fitting 1 Brass Sweat Assembly	2

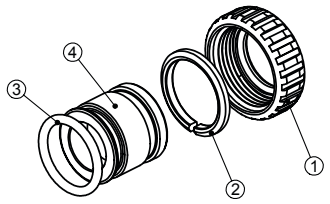
Do not install in California.



Order No: **V3007-03**
Description: **Fitting ¾" Brass Sweat Assembly**

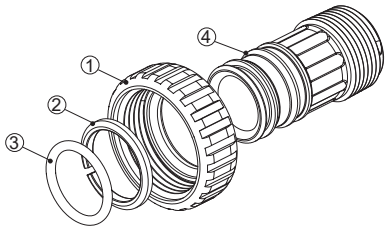
Drawing No.	Order No.	Description	Quantity
1	V3151	Nut 1" Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-Ring 215	2
4	V3188-01	Fitting ¾ Brass Sweat	2

Do not install in California.



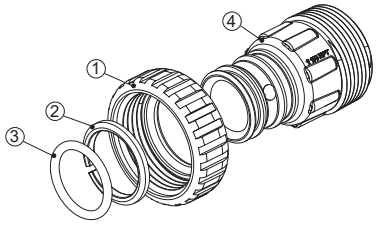
Order No: **V3007-04**
Description: **Fitting 1" Plastic Male NPT Assembly**

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	V3164	Fitting 1" Plastic Male NPT	2



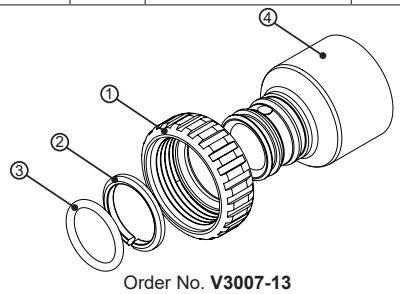
Order No: **V3007-05**
Description: **Fitting 1-¼" Plastic Male NPT Assembly**

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	V3317	Fitting 1-¼" Plastic Male NPT	2



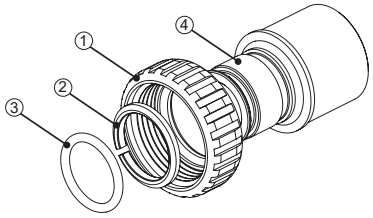
Order No. **V3007-07**
Description: **Fitting 1¼" & 1½" PVC Solvent Assembly**

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	V3352	Fitting 1¼"&1½" PVC Solvent	2



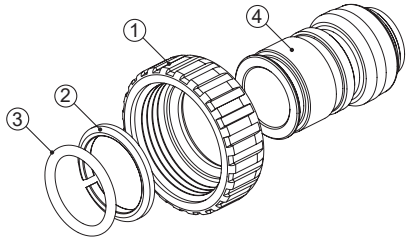
Order No: **V3007-09**
Description: **Fitting 1¼" & 1½" Brass Sweat Assembly**

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	V3375	Fitting 1¼" & 1½" Brass Sweat	2



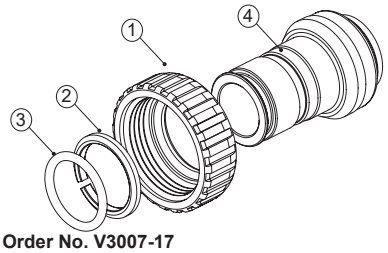
Order No. **V3007-12**
Description: **Fitting 3/4" Brass SharkBite Assembly**

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	V3628	Ftg 3/4 Brass Shark-Bite	2



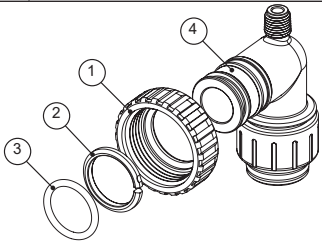
Order No. **V3007-13**
Description: **Fitting 1" Brass SharkBite Assembly**

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	V3629	Ftg 1" Brass Shark-Bite	2



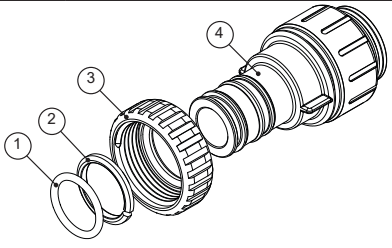
Order No. V3007-15
Description: WS1 FTG 3/4 JG QC 90 ASY

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



Order No. V3007-17
Description: WS1 FTG 1" JG QC ASY

Drawing No.	Order No.	Description	Quantity
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

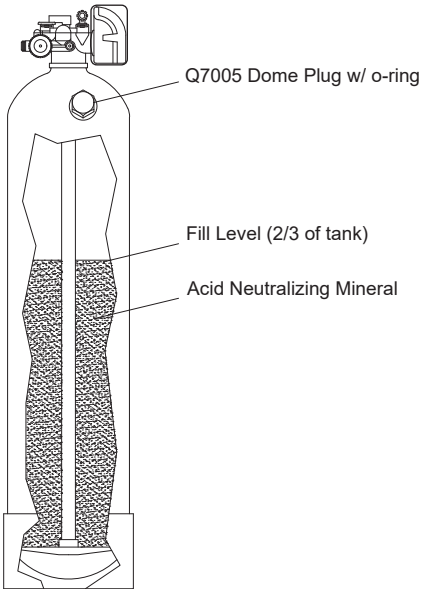


SERVICE INSTRUCTIONS

REPLACEMENT MINERAL INSTRUCTIONS: Mineral used: Calcite. Acid Neutralizers raise the pH of acidic water. Calcite is a sacrificial mineral, dissolving in proportion to the acidity of the raw water. Calcite is self-limiting, i.e. it corrects pH only enough to reach a non-corrosive equilibrium. It does not overcorrect under normal conditions.

The amount of Calcite in the tank should be checked periodically. Shine a flashlight through the tank to see the height of the mineral. The tank should be filled no more than two-thirds full (see diagram). Typically the mineral should not be below the halfway point in the tank.

The tank has a dome plug provided so that Calcite may be added without removing the control valve.



CAUTION: **Never unscrew the dome plug unless pressure is fully relieved from the system. Injury and/or flooding can occur.**

Before removing the dome plug, shut off the water supply and open a conditioned water tap to relieve the water pressure on the piping. Rotate the **BYPASS** handles to the bypass position (see figure 2 on page 4).

- Press and hold the REGEN button for approximately 5 seconds until the motor starts.
- Wait until the display reads **BACKWASH**, the motor stops running, and the numbers start counting down. Unplug the transformer so the control valve cannot cycle to the next position. This will relieve pressure in the tank.
- Unscrew the dome plug. A small amount of water will be lost from the tank.
- Adding Calcite will displace the water in the tank. Siphon out some water from the tank through the dome hole. This will allow room to add mineral and reduce water spillage.
- Add the appropriate amount of replacement mineral through the dome hole. Pay close attention to the mineral level when filling. **DO NOT OVERFILL** (see diagram).
- Replace the dome plug. Lubricate o-ring if necessary using only silicone grease. Hand tighten only.
- Leaving the unit in the bypass position, turn on the water supply.
- **SLOWLY** turn bypass valve to **DIAGNOSTIC** position (see figure 3 on page 4) to allow water to slowly enter tank in order to expel air. Flow water to drain very slowly, increasing the flow until the water runs clear. Allowing water to run to drain for a few minutes will backwash any mineral “fines” to drain.
- 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 REGEN again. Display will read **RINSE**.
- Place the bypass valve in the **NORMAL OPERATION MODE** (see figure 1 on page 4). Allow the control valve to finish the **RINSE** cycle and automatically advance to the **FILTERING** position.
- Visually check the dome plug for any leakage.

Checking the mineral level once a month for the first few months of operation should provide a good indication as to how frequently the Calcite will need to be replenished.

Calcite will add hardness to the original hardness of the raw water. This must be considered when programming the hardness level for a water softener located downstream of the acid neutralizer. As a rule of thumb, an increase of 3 to 5 grains of hardness can be expected to raise the pH by one point on the scale, e.g. from 6.0 pH to 7.0 pH.

Calcite is recommended for raw water pH range 6.0-7.0
Note: 1 cu. ft. of Calcite weighs approximately 90 lbs.
Super Mix (80% Calcite/20% Corosex) is recommended for high flow rates and raw water pH range 5.5-6.0

SPECIFICATIONS

ACID NEUTRALIZERS: Mineral used: Calcite. Acid Neutralizers raise the pH of acidic water. Calcite is a sacrificial mineral, dissolving in proportion to the acidity of the raw water. Calcite is self-limiting, i.e. it corrects pH only enough to reach a non-corrosive equilibrium. It does not overcorrect under normal conditions.

Calcite will add hardness to the original hardness of the raw water. This must be considered when programming the hardness level for a water softener located downstream of the acid neutralizer. As a rule of thumb, an increase of 3 to 5 grains of hardness can be expected to raise the pH by one point on the scale, e.g. from 6.0 pH to 7.0 pH.

Calcite is recommended for raw water pH range 6.0-7.0
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Super Mix (80% Calcite/20% Corosex) is recommended for high flow rates and raw water pH range 5.5-6.0

TROUBLESHOOTING PROCEDURES

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Timer does not display time of day.	a. Transformer unplugged	a. Connect power
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective transformer	c. Replace transformer
	d. Defective PC board	d. Replace PC board
2. Timer does not display correct time of day.	a. Switched outlet	a. Use uninterrupted outlet
	b. Power outage	b. Reset time of day
	c. Defective PC board	c. Replace PC board
3. No Softening/filtering display when water is flowing.	a. Bypass valve in bypass position.	a. Put bypass valve in service position
	b. Meter connection disconnected.	b. Connect meter to PC board
	c. Restricted/stalled meter turbine.	c. Remove meter and check for rotation or foreign material
	d. Defective meter.	d. Replace meter
	e. Defective PC board.	e. Replace PC board
4. Control valve regenerates at wrong time of day.	a. Power outages	a. Reset control valve to correct time of day
	b. Time of day not set correctly	b. Reset to correct time of day
	c. Time of regeneration incorrect	c. Reset regeneration time
	d. Control valve set at “on O” (immediate regeneration)	d. Check control valve set-up procedure regeneration time option
	e. Control valve set at NORMAL + O	e. Check control valve set-up procedure regeneration time option
5. ERROR followed by Code number: **Error Code 101**– Unable to recognize start of regeneration. **Error Code 102**– Unexpected stall. **Error Code 103** – Motor ran to long, timed out trying to reach next cycle position. **Error Code 104** – Motor ran to long, timed out trying to reach home position. If other Error Codes display contact the factory.	a. Control valve has just been serviced	a. Press NEXT and REGEN for 3 seconds or unplug power source jack (black wire) and plug back in to reset control valve.
	b. Foreign matter is lodged in control valve	b. Check piston and spacer stack assembly for foreign matter.
	c. High drive forces on piston	c. Replace piston (s) and spacer stack assembly.
	d. Control valve piston not in home position	d. Press NEXT and REGEN for 3 seconds or unplug power source jack (black wire) and plug back in to reset control valve.
	e. Motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure	e. Check motor and wiring. Replace motor if necessary.
	f. Drive gear label dirty or damaged, missing or broken gear	f. Replace or clean drive gear.
	g. Drive bracket incorrectly aligned to back plate	g. Reset drive bracket properly.
	h. PC board is damaged or defective	h. Replace PC board.
	i. PC board incorrectly aligned to drive bracket	i. Ensure PC board is correctly snapped onto drive bracket.
6. Control valve stalled in regeneration.	a. Motor not operating	a. Replace motor
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective transformer	c. Replace transformer
	d. Defective PC board	d. Replace PC board
	e. Broken drive gear or drive cap assembly	e. Replace drive gear or drive cap assembly
	f. Broken piston retainer	f. Replace drive cap assembly
	g. Broken main or regenerant piston	g. Replace main or regenerant piston
7. Control valve does not regenerate automatically when REGEN button is depressed and held.	a. Transformer unplugged	a. Connect transformer
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Broken drive gear or drive cap assembly	c. Replace drive gear or drive cap assembly
	d. Defective PC board	d. Replace PC board
8. Control valve does not regenerate automatically but does when REGEN button is depressed.	a. Bypass valve in bypass position	a. Put control valve in service piston
	b. Meter connection disconnected	b. Connect meter to PC board
	c. Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign matter
	d. Defective meter	d. Replace meter
	e. Defective PC board	e. Replace PC board
	f. Set-up error	f. Check control valve set-up procedure
9. Time of day flashes on and off.	a. Power has been out more than two hours, the transformer was unplugged and then plugged back into the wall outlet, the transformer plug was unplugged and then plugged back into the board or the NEXT and REGEN buttons were pressed to reset the valve.	a. Reset the time of day

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