FLOW-TECH HOME
INLINE WATER SYSTEMS

Installation Instructions & Owner's Manual

Water Filter Series

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PREINSTALLATION INSTRUCTIONS FOR DEALERS:

The manufacturer has preset the water treatment unit's sequence of cycles, including all cycle times.

The dealer *should read this page and guide the installer regarding day override and time of regeneration, before installation.*

For the installer, the following must be used:

- Program Installer Settings: Day Override (preset to 14 days), and Time of Regeneration (preset to 12 a.m.)
- Read Normal Operating Displays
- Set Time of Day
- Read Power Loss & Error Display

For the homeowner, please read operating displays and instructions.

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 1" full flow bypass valve incorporates four positions, including a diagnostic position that allows a service technician to have pressure to test a system while providing untreated bypass water to the building. Be sure to install bypass valve onto main control valve, before beginning plumbing. Or, make provisions in the plumbing system for a bypass. The bypass body and rotors are glass-filled Noryl® 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 direction of flow. The plug valves enable the bypass valve to operate in four positions.

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 for normal operation of a water filter. During the regeneration cycle this position provides regeneration water to the unit, while also providing untreated water to the distribution system ***(Fig. 1)***.

2. ***BYPASS POSITION:*** The inlet and outlet handles point to the center of the bypass. The system is isolated from the water pressure in the plumbing system. Untreated water is supplied to the building ***(Fig. 2)***.

3. ***DIAGNOSTIC POSITION:*** The inlet handle points toward the control valve and the outlet handle points to the center of bypass valve. Untreated supply water is allowed to flow to the system and to the building, while not allowing water to exit from the system to the building (***Fig. 3)***. This allows the service technician to draw brine and perform other tests without the test water going to the building.

   NOTE: The system must be rinsed before returning the bypass valve to the normal position.

4. ***SHUT OFF POSITION:*** The inlet handle points to the center of the bypass valve and the outlet handle points away from the control valve. The water is shut off to the building. The water treatment system will depressurize upon opening a tap in the building. A negative pressure in the building combined with the filter being in regeneration could cause a siphoning of brine into the building. If water is available on the outlet side of the filter, it is an indication of water bypassing the system ***(Fig. 4)*** (i.e. a plumbing cross-connection somewhere in the building).

NORMAL OPERATION POSITION

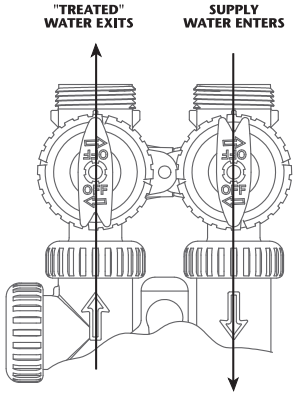


Figure 1

BYPASS POSITION

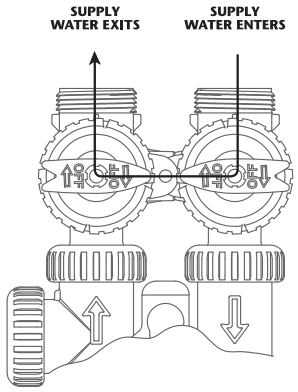


Figure 2

DIAGNOSTIC POSITION

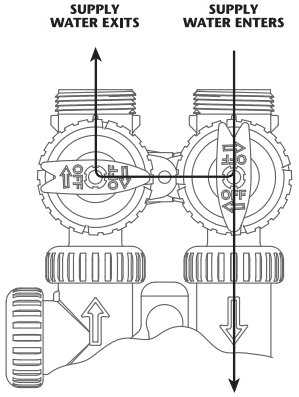


Figure 3

SHUT OFF POSITION

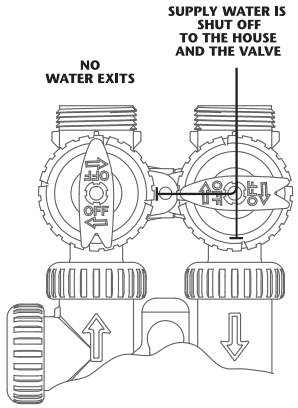


Figure 4

INSTALLATION:

GENERAL INSTALLATION & SERVICE WARNINGS

The control valve, fittings and/or bypass are designed to accommodate minor plumbing misalignments. There is a small amount of "give" to properly connect the piping, but the water filter is not designed to support the weight of the plumbing.

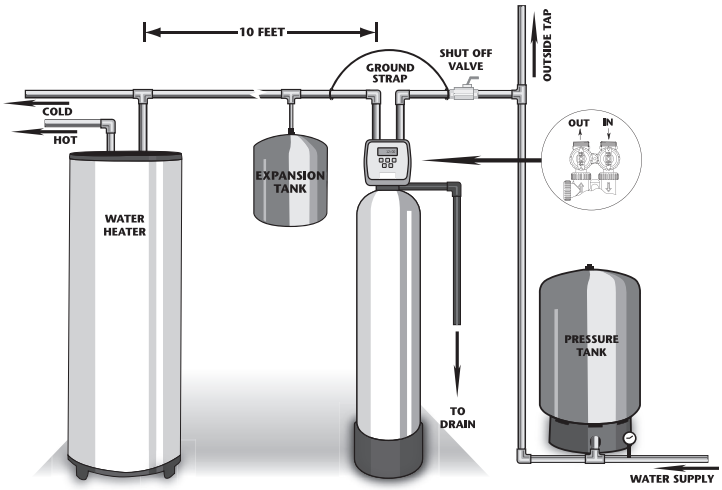
Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicone lubricant may be used on black "O" Rings, but is not necessary. *Avoid any type of lubricants, including silicone, on red or clear lip seals.*

Do not use pipe dope or other sealants on threads. Teflon® tape must be used on the threads of the 1" NPT inlet and outlet, the brine line connection at the control valve, and on the threads for the drain line connection. Teflon® tape is not used on the nut connections or caps because "O" Ring seals are used. The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic Service Wrench, #CV3193-02. If necessary, pliers can be used to unscrew the nut or cap. Do not use a pipe wrench to tighten nuts or caps. *Do not place screwdriver in slots on caps and/or tap with a hammer.*

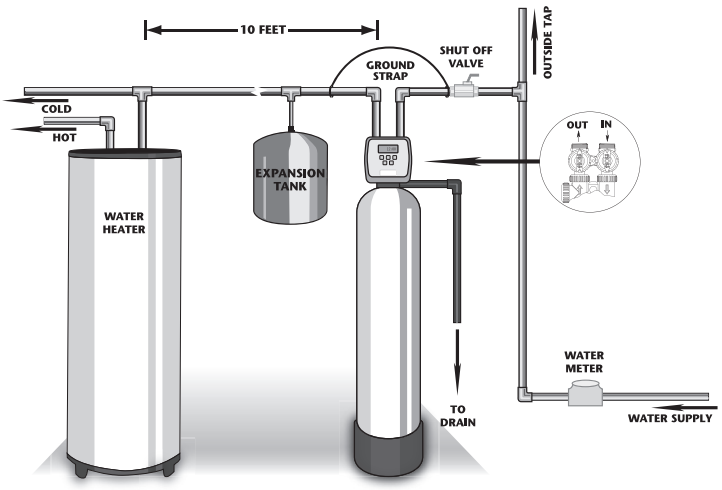
SITE REQUIREMENTS

- water pressure – 25-100 psi
- water temperature – 33-100°F (0.5-37.7°C)
- electrical – 115/120V, 60Hz uninterrupted outlet
- current draw is 0.5 amperes
- the plug-in transformer is for dry locations only
- the tank should be on a firm level surface

WELL WATER INSTALLATION



MUNICIPAL INSTALLATION



1. The distance between the drain and the water filter should be as short as possible.

2. Do not install any water filter with less than 10 feet of piping between its outlet and the inlet of a water heater. For an Air Sulfur or Air Iron filter, an expansion tank on the outlet side of the system is recommended.

CAUTION: **To protect the unit in the event of a hot water heater backup, the manufacturer recommends the use of an expansion tank on the outlet side of the unit.**

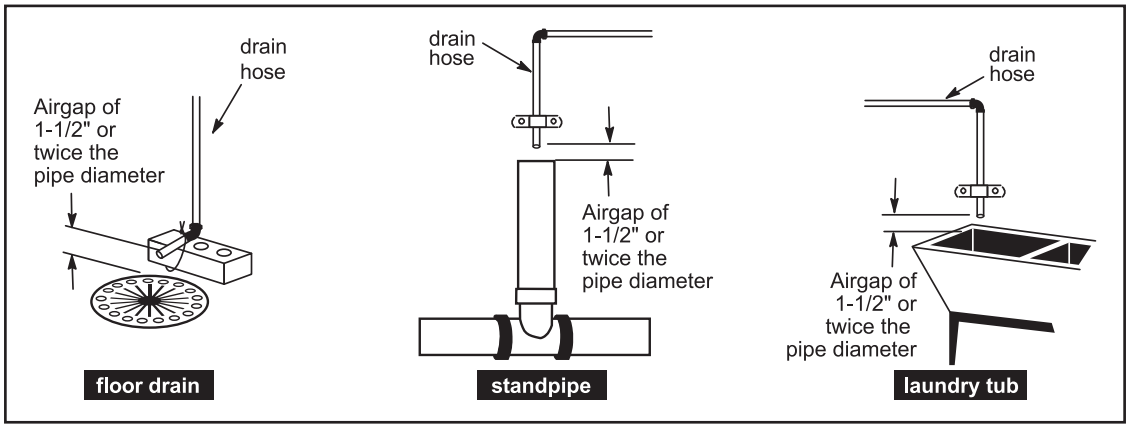
3. Do not locate unit where it or its connections (including the drain and overflow lines) will ever be subjected to room temperatures under 33° F.

4. Do not subject the tank to any vacuum, as this may cause an "implosion" and could result in leaking. If there is a possibility a vacuum could occur, please make provision for a vacuum breaker in the installation.

5. ***INLET/OUTLET PLUMBING:*** Be sure to install Bypass Valve onto main control valve before beginning plumbing. Make provisions to bypass outside hydrant and cold hard water lines at this time. Install an inlet shutoff valve and plumb to the unit's bypass valve inlet located at the right rear as you face the unit. There are a variety of installation fittings available. They are listed under Installation Fitting Assemblies, page 20-21. 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 solder flux, primer, and solvent cement on any part of the "O" Rings, split rings, bypass valve or control valve. If the building's electrical system is grounded to the plumbing, install a copper grounding strap from the inlet to the outlet pipe. Plumbing must be done in accordance with all applicable local codes.

6. ***DRAIN LINE:*** First, be sure that the drain can handle the backwash rate of the system. 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 flow control fitting and solder joints. Failure to do this could cause interior damage to the flow control. Install 3/4" rigid plastic pipe or copper tubing to the Drain Line Assembly, discarding the tubing nut and use the 3/4" NPT fitting for rigid pipe (recommended). If the backwash rate is greater than 7 gpm, use a 3/4" drain line. Where the drain line is elevated but empties into a drain below the level of the control valve, form a 7" trap at the discharge end of the line so that the bottom of the trap is level with the drain connection on the control valve. This will provide an adequate anti-siphon trap. Piping the drain line overhead <10 ft is normally not a problem. Be sure adequate pressure is available (40-60 psi is recommended). Where the drain empties into an overhead sewer line, a sink-type trap must be used. Run drain tube to its discharge point in accordance with plumbing codes. Pay special attention to codes for air gaps and anti-siphon devices.

CAUTION: **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.**



Typical Drain Line Installations

PROGRAMMING PROCEDURES:

1. Set time of day:

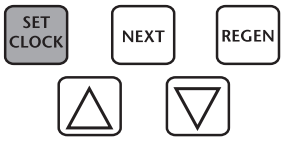
Time of day should only need to be set after extended power outages or when daylight saving time begins or ends. If an extended power outage occurs, the time of day will flash on and off indicating that the time should be reset.

STEP 1 – Press ***SET 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 using ▼ or ▲ buttons. If it is desired to back up to the previous step press ***REGEN*** button once. Pressing ***NEXT*** will exit ***SET CLOCK*** and return to the general operating display (page 10).

1



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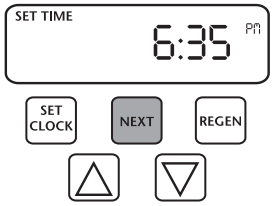

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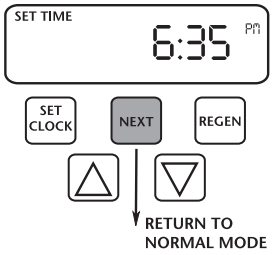


2. Programming:

NOTE: The manufacturer has preset the unit for regeneration to occur every 3,000 gallons or every 21 days, whichever occurs first.

STEP 1 – Press ***NEXT*** and ▲ simultaneously for 3 seconds.

STEP 2 – ***HARDNESS:*** This display will show "–nA– (not available)" if "FILTER" is selected. Press ***NEXT*** to go to step 3. Press ***REGEN*** to exit.

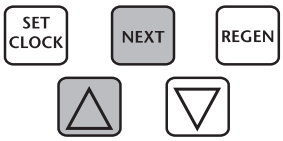
STEP 3 – ***DAY OVERRIDE:*** The manufacturer has factory set 21 DAYS as the default. This is the maximum number of days between regenerations. If this is set to "OFF", regeneration initiation is based solely on gallons used. If any number is set (allowable range from 1 to 28), a regeneration initiation will be called for on that day even if a sufficient number of gallons were not used to call for a regeneration.

Set Day Override using ▼ or ▲ buttons (14 is recommended):

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

Press ***NEXT*** to go to step 4. Press ***REGEN*** if you need to return to the previous step.

1



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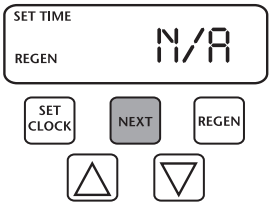

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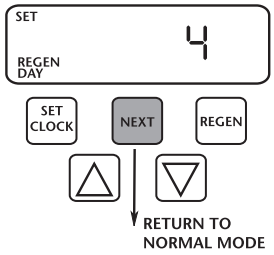
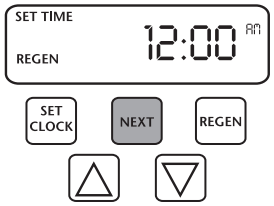


2. Programming cont'd:

STEP 4 – ***REGENERATION HOUR:*** The manufacturer has factory set 12:00 A.M. as the default. This is the hour of day for regeneration and can be reset by using ▼ or ▲ buttons. "AM/PM" toggles after 12. The default time is 12:00 a.m. (recommended for a normal household).
Press ***NEXT*** to go to step 5. Press ***REGEN*** if you need to return to the previous step.

STEP 5 – ***REGENERATION MINUTES:*** Set the minutes using ▼ or ▲ buttons. Press ***NEXT*** to exit installer programming. Press ***REGEN*** if you need to return to the previous step. To initiate an immediate manual regeneration, press and hold the ***REGEN*** button for three seconds. The system will begin to regenerate immediately. The control may be manually stepped through the regeneration cycles by pressing ***REGEN***.

4



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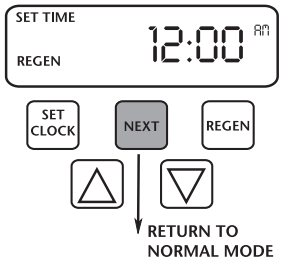


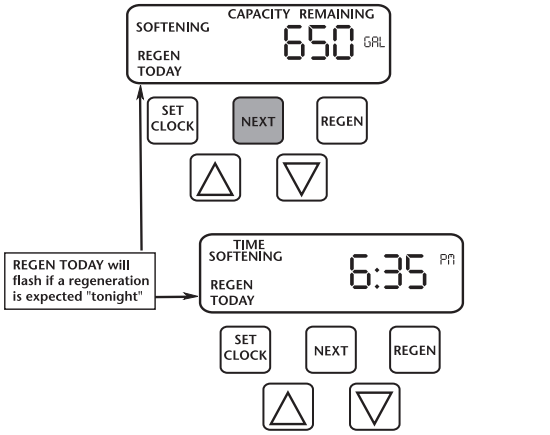
OPERATING DISPLAYS AND INSTRUCTIONS:

1. ***GENERAL OPERATION:*** When the system is operating, one of three displays may be shown. Pressing ***NEXT*** will alternate between the displays. One of the displays is always the current time of day. The second display shows the current treated water flow rate through the system in Gallons Per Minute. The third display is capacity remaining. Capacity remaining is the gallons that will be treated before the system goes through a regeneration cycle. The user can scroll between the displays as desired.

   If the system has called for a regeneration that will occur at the preset time of regeneration, the words "REGEN TODAY" will appear on the display.

   If a water meter is installed, the word "Softening" or "Filtering" flashes on the display when water is being treated (i.e. water is flowing through the system).

GENERAL OPERATION DISPLAYS

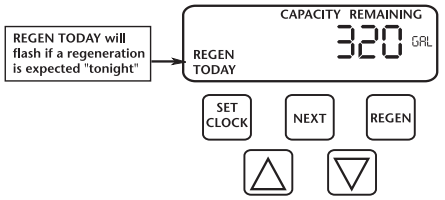


2. ***REGENERATION MODE:*** Typically a system is set to regenerate at a time of no water use. If there is a demand for water when the system is regenerating, untreated water will be delivered. When the system begins to regenerate, the display will change to include information about the step of the regeneration process and the time remaining for that step to be completed. The system runs through the steps automatically and will reset itself to provide treated water when the regeneration has been completed.

REGENERATION MODE

3. ***MANUAL REGENERATION:*** Sometimes there is a need to regenerate before the control valve calls for it. This may be needed if a period of heavy water use is anticipated.

MANUAL REGENERATION



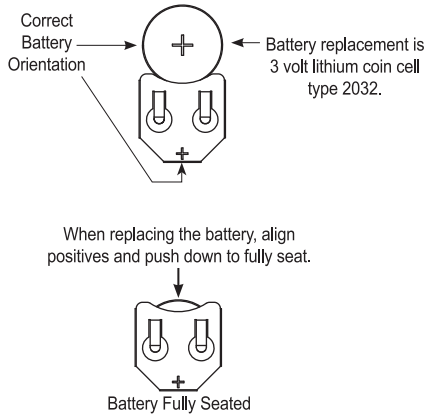
- To initiate a manual regeneration *at the next preset regeneration time,* press and release ***REGEN***. The words "REGEN TODAY" will flash on the display to indicate that the system will regenerate at the next regeneration time (set in Programming, steps 4 and 5). *If you pressed the* ***REGEN*** *button in error, pressing the button again will cancel the command.*

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

Once a manual regeneration is initiated, the unit will go into its first regeneration position and subsequent positions thereafter (see Start Up Instructions for regeneration sequence). The water filter will deliver water, but it will be untreated.

4. ***POWER LOSS AND BATTERY REPLACEMENT:*** The AC transformer comes with a 15 foot power cord and is designed for use with the control valve; the transformer should only be used in a dry location.

BATTERY REPLACEMENT

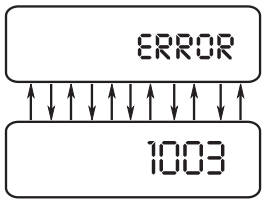


In the event of a power outage that is less than 24 hours, the control valve will remember all settings and time of day. After 24 hours, the only item that needs to be reset is the time of day and will be indicated by the time of day flashing. All other settings are permanently stored in the nonvolatile memory.

If a power loss occurs that *is less than 24 hours and the time of day flashes,* this indicates that the battery is depleted. The time of day should be reset and the non-rechargeable battery should be replaced. The battery is a 3 Volt Lithium Coin Cell type 2032 and is readily available at most stores. To access battery location, remove front cover (*see diagram on page 18 for battery location).*

5. ***ERROR MESSAGE:*** If the word "ERROR" and a number are alternately flashing on the display record the number and contact the dealer for help. This indicates that the control valve was not able to function properly.

ERROR



START-UP INSTRUCTIONS:

- After installation is complete, rotate bypass handles to bypass mode ***(see Fig. 2 on page 4)***.
- Turn on water and check for leaks.
- Fully open a cold water faucet — preferably a laundry sink or bathtub without an aerator.
- Allow water to run until clear to rid pipes of debris which may have occurred during installation.

System regeneration sequence is in the following order. Some sequence differences may be noticed depending upon local conditions. (If it is desired to change this sequence, please refer to the Dealer Master Programming Guide or contact the manufacturer.)

Sequencing for Carbon Filters:

1. Backwash
2. Pause
3. Backwash
4. Pause
5. Rinse

The system is now ready for filling with water and for testing.

1. Place the bypass valve into the bypass mode ***(Fig. 2 on page 4)***.

2. Press and hold the ***REGEN*** button until the motor starts. Release button. Put the valve into "BACKWASH" position. Unplug the transformer so that the valve will not cycle to the next position. Open the inlet handle of the bypass valve very slightly allowing water to fill the tank slowly in order to expel air.

CAUTION: **If water flows too rapidly, there will be a loss of media to the drain. Some medias such as carbon should not be backwashed immediately for extended periods of time. These medias need to "soak" in the water for a 24-hour period prior to full backwash conditions.**

Media is dry and filling with water too quickly in backwash will result in media plugging the drain and valve assembly.

3. When the water is flowing steadily to the drain without the presence of air, slowly open the inlet valve. Restore power and momentarily press the ***REGEN*** button to advance the control to the "RINSE" position.

4. With the bypass still in the diagnostic mode ***(Fig. 3 on page 4)***, there should be a rapid flow to the drain. Unplug the transformer to keep the valve in the "RINSE" position. Allow water to run until steady, clear and without air.

   Note: Carbon filters may require a longer rinse period to rinse the media of excess particles. Some "color throw" can be expected. Run water until clear.

5. Restore power, press ***REGEN*** button in sequence until display returns to "TIME." Place bypass valve in the normal operating mode ***(Fig. 1 on page 4)*** by opening the outlet bypass handle.

6. Go to laundry tub or bathtub faucet, preferable a faucet without an aerator, and turn on cold water. Let the water run. Note the color of water coming from faucet. If discolored, let water run until clear. If severely discolored, place unit into rinse position (step 4) and run water to the system's drain until clear.

   Note: At no time should there by large particles of media noticed at faucet or laundry tub. If this is seen, immediately shut off water and bypass system, as this could be an indication of a distributor failure. Contact manufacturer or distributor for assistance.

TROUBLESHOOTING GUIDE:

PROBLEM	CAUSE	CORRECTION
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 regenerates at wrong time of day	A. Power outage	A. Reset time of day. If PC board has battery back up present the battery may be depleted. See front cover and drive assembly drawing for instructions.
	B. Time of day not set correctly	B. Reset to correct time of day
	C. Time of regeneration set incorrectly	C. Reset regeneration time
	D. Control valve set at "on 0" (immediate regeneration)	D. Check programming setting and reset to NORMAL (for a delayed regen time)
	E. Control valve set at "NORMAL + on 0" (delayed and/or immediate)	E. Check programming setting and reset to NORMAL (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 regenerate automatically when the correct button(s) is depressed and held. For timeclock valves the buttons are ▲ & ▼. For all other valves the button is REGEN.	A. Broken drive gear or drive cap assembly	A. Replace drive gear or drive cap assembly
	B. Broken piston rod	B. Replace piston rod
	C. Defective PC board	C. Defective PC board

TROUBLESHOOTING GUIDE *cont'd:*

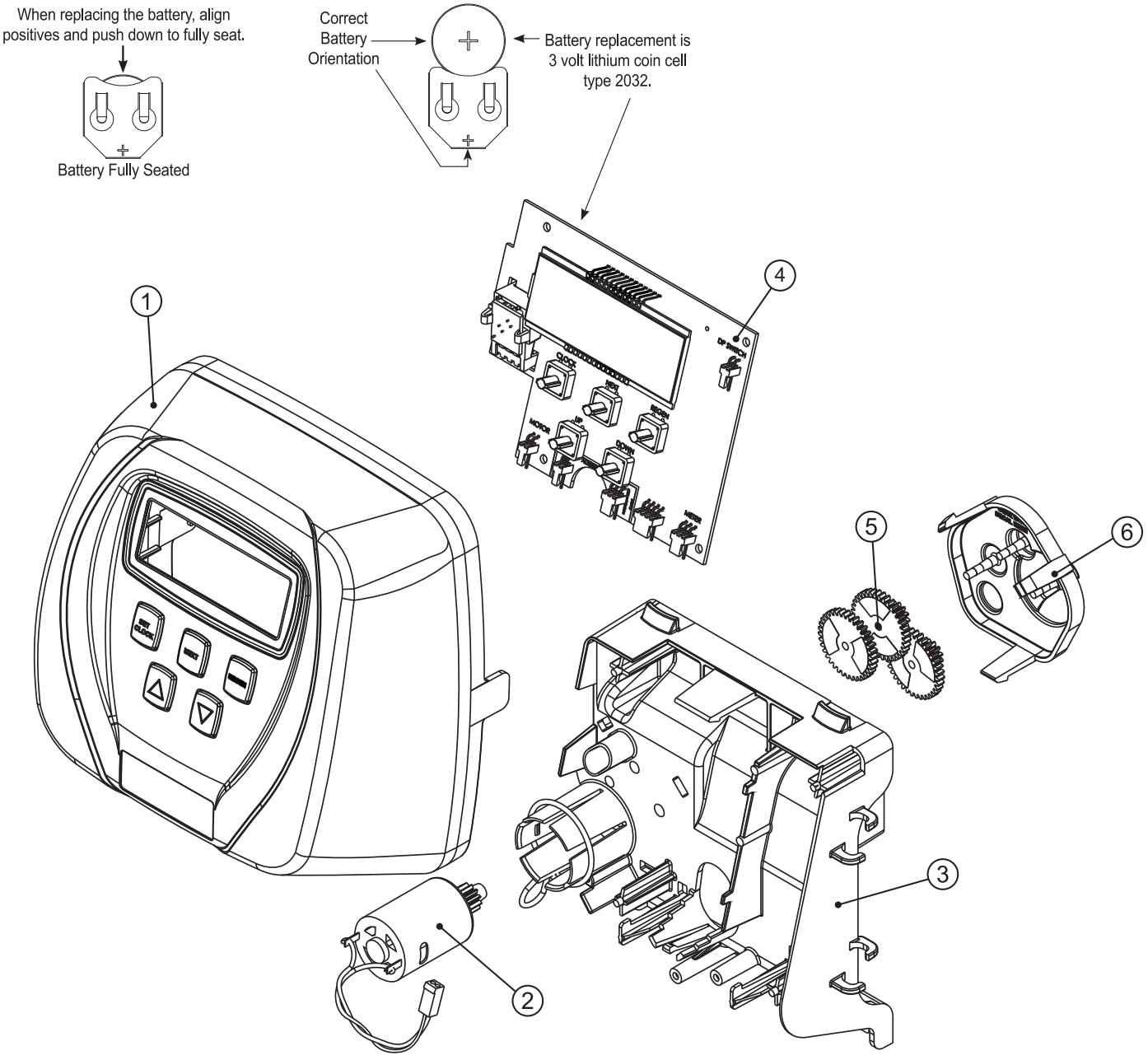
PROBLEM	CAUSE	CORRECTION
7. Control valve does not regenerate automatically but does when the correct button(s) is depressed and held. For timeclock valves the buttons are ▲ & ▼. For all other valves the button is REGEN.	A. Bypass valve in bypass position	A. Turn bypass handles to place bypass in service 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
8. Hard or untreated water is being delivered	A. Bypass valve is open or faulty	A. Fully close bypass valve or replace
	B. Media is exhausted due to high water usage	B. Check program settings or diagnostics for abnormal water usage
	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. No regenerant or low level of regenerant in regenerant tank	E. Add proper regenerant to tank
	F. Control fails to draw in regenerant	F. Refer to Troubleshooting Guide number 12
	G. Insufficient regenerant level in regenerant tank	G. Check refill setting in programming. Check refill flow control for restrictions or debris and clean or replace
	H. Damaged seal/stack assembly	H. Replace seal/stack assembly
	I. Control valve body type and piston type mix matched	I. Verify proper control valve body type and piston type match
	J. Fouled media bed	J. Replace media bed
9. Control valve uses too much regenerant	A. Improper refill setting	A. Check refill setting
	B. Improper program settings	B. Check program setting to make sure they are specific to the water quality and application needs
	C. Control valve regenerates frequently	C. Check for leaking fixtures that may be exhausting capacity or system is undersized
10. Residual regenerant being delivered to service	A. Low water pressure	A. Check incoming water pressure – water pressure must remain at minimum of 25 psi
	B. Incorrect injector size	B. Replace injector with correct size for the application
	C. Restricted drain line	C. Check drain line for restrictions or debris and clean
11. Excessive water in regenerant tank	A. Improper program settings	A. Check refill setting
	B. Plugged injector	B. Remove injector and clean or replace
	C. Drive cap assembly not tightened in properly	C. Retighten the drive cap assembly
	D. Damaged seal/stack assembly	D. Replace seal/stack
	E. Restricted or kinked drain line	E. Check drain line for restrictions or debris and or unkink drain line
	F. Plugged backwash flow controller	F. Remove backwash flow controller and clean or replace
	G. Missing refill flow controller	G. Replace refill flow controller

PROBLEM	CAUSE	CORRECTION
12. Control valve fails to draw in regenerant	A. Injector is plugged	A. Remove injector and clean or replace
	B. Faulty regenerant piston	B. Replace regenerant piston
	C. Regenerant line connection leak	C. Inspect regenerant line for air leak
	D. Drain line restriction or debris cause excess back pressure	D. Inspect drain line and clean to correct restriction
	E. Drain line too long or too high	E. Shorten length and or height
	F. Low water pressure	F. Check incoming water pressure – water pressure must remain at minimum of 25 psi
13. Water running to drain	A. Power outage during regeneration	A. Upon power being restored control will finish the remaining regeneration time. Reset time of day. If PC board has battery back up present the battery may be depleted. See front cover and drive assembly drawing for instructions.
	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. Retighten the drive cap assembly
14. E1, Err – 1001, Err – 101 = Control unable to sense motor movement	A. Motor not inserted full to engage pinion, motor wires broken or disconnected	A. Disconnect power, make sure motor is fully engaged, check for broken wires, make sure two pin connector on motor is connected to the two pin connection on the PC board labeled MOTOR. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
	B. PC board not properly snapped into drive bracket	B. Properly snap PC board into drive bracket and then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
	C. Missing reduction gears	C. Replace missing gears
15. E2, Err – 1002, Err – 102 = Control valve motor ran too short and was unable to find the next cycle position and stalled	A. Foreign material is lodged in control valve	A. Open up control valve and pull out piston assembly and seal/stack assembly for inspection. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
	B. Mechanical binding	B. Check piston and seal/stack assembly, check reduction gears, check drive bracket and main drive gear interface. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
	C. Main drive gear too tight	C. Loosen main drive gear. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
	D. Improper voltage being delivered to PC board	D. Verify that proper voltage is being supplied. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.

PROBLEM	CAUSE	CORRECTION
16. E3, Err – 1003, Err – 103 = Control valve motor ran too long and was unable to find the next cycle position	A. Motor failure during a regeneration	A. Check motor connections then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
	B. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	B. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
	C. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	C. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
17. E4, Err – 1004, Err – 104 = Control valve motor ran too long and timed out trying to reach home position	A. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	A. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
18. Err -1006, Err – 106, Err - 116 = MAV/ SEPS/ NHBP/ AUX MAV valve motor ran too long and unable to find the proper park position ***Motorized Alternating Valve = MAV*** ***Separate Source = SEPS*** ***No Hard Water Bypass = NHBP*** ***Auxiliary MAV = AUX MAV***	A. Control valve programmed for ALT A or B, nHbP, SEPS, or AUX MAV with out having a MAV or NHBP valve attached to operate that function	A. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect. Then reprogram valve to proper setting
	B. MAV/NHBP motor wire not connected to PC board	B. Connect MAV/NHBP motor to PC board two pin connection labeled DRIVE. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
	C. MAV/NHBP motor not fully engaged with reduction gears	C. Properly insert motor into casing, do not force into casing Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
	D. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	D. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
19. Err – 1007, Err – 107, Err - 117 = MAV/ SEPS/NHBP/AUX MAV valve motor ran too short (stalled) while looking for proper park position ***Motorized Alternating Valve = MAV*** ***Separate Source = SEPS*** ***No Hard Water Bypass = NHBP*** ***Auxiliary MAV = AUX MAV***	A. Foreign material is lodged in MAV/NHBP valve	A. Open up MAV/NHBP valve and check piston and seal/ stack assembly for foreign material. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.
	B. Mechanical binding	B. Check piston and seal/stack assembly, check reduction gears, drive gear interface, and check MAV/NHBP black drive pinion on motor for being jammed into motor body. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect.

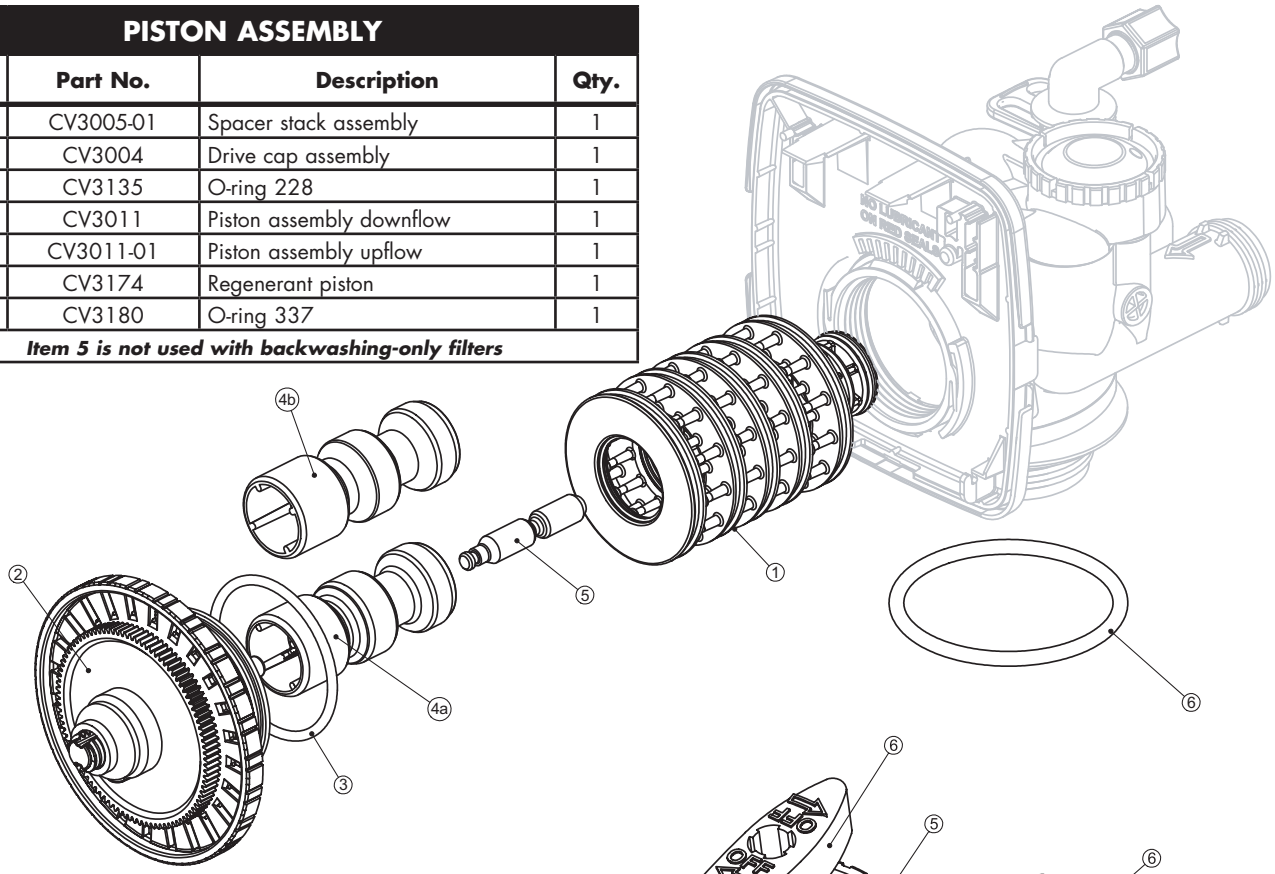
REPLACEMENT PARTS:

FRONT COVER AND DRIVE ASSEMBLY			
Item No.	**Part No.**	**Description**	**Qty.**
1	CV3175CC-01	Front cover assembly CC	1
2	CV3107-1	Motor	1
3	CV3106-1	Drive bracket & spring clip	1
4	CV3108CC	PC board, CC	1
5	CV3110	Drive gear, 12 x 36	3
6	CV3109	Drive gear cover	1
2-6	CV3002CC	Drive assembly, CC	-
	CV3186	Transformer, 110V-12V	1
	CV3543	***Optional*** weather cover	1

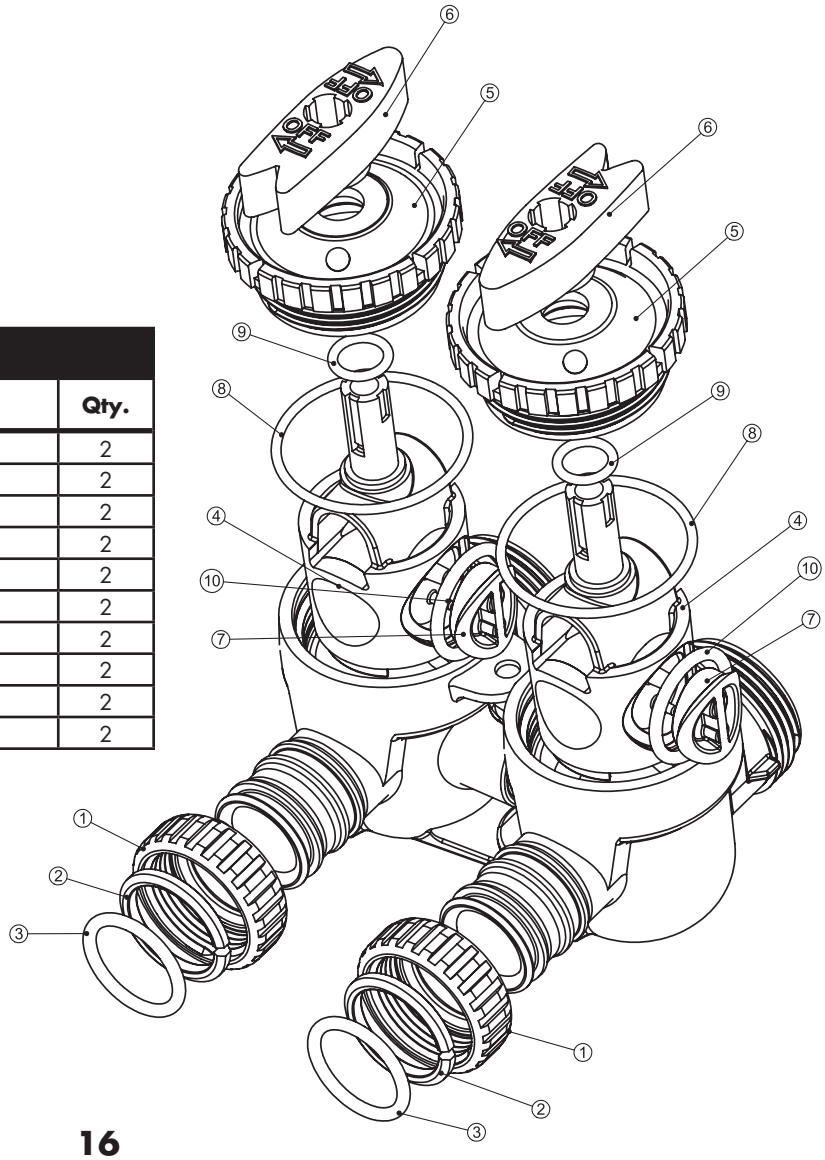


REPLACEMENT PARTS:

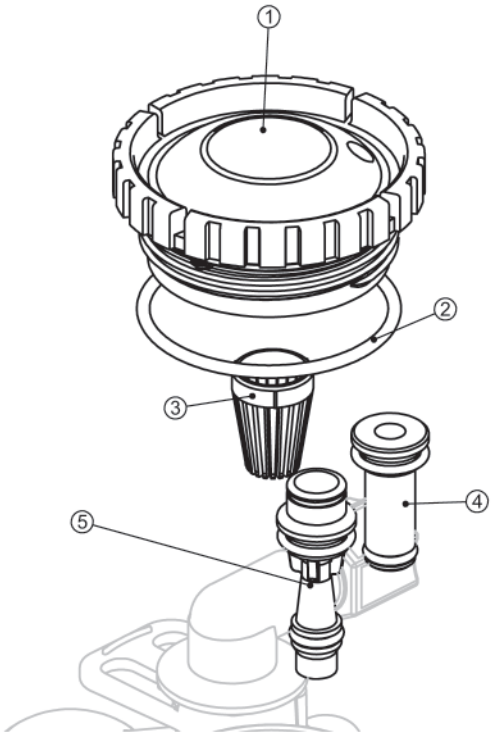
PISTON ASSEMBLY			
Item No.	**Part No.**	**Description**	**Qty.**
1	CV3005-01	Spacer stack assembly	1
2	CV3004	Drive cap assembly	1
3	CV3135	O-ring 228	1
4a	CV3011	Piston assembly downflow	1
4b	CV3011-01	Piston assembly upflow	1
5*	CV3174	Regenerant piston	1
6	CV3180	O-ring 337	1
*	***Item 5 is not used with backwashing-only filters***		



BYPASS VALVE			
Item No.	**Part No.**	**Description**	**Qty.**
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3145	Bypass rotor, 1"	2
5	CV3146	Bypass cap	2
6	CV3147	Bypass handle	2
7	CV3148	Bypass rotor seal retainer	2
8	CV3152	O-ring 135	2
9	CV3155	O-ring 112	2
10	CV3156	O-ring 214	2

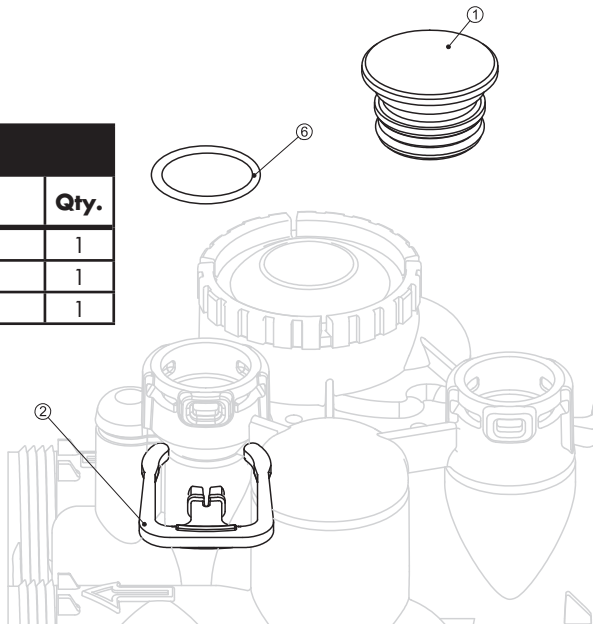


REPLACEMENT PARTS:



INJECTOR ASSEMBLIES			
Item No.	**Part No.**	**Description**	**Qty.**
1	CV3176	Injector cap	1
2	CV3152	O-ring 135	1
3	CV3177-01	Injector screen	1
4	CV3010-1Z	Injector assembly plug	1
5	CV3010-1A	**A** injector assembly, **BLACK**	1
	CV3010-1B	**B** injector assembly, **BROWN**	
	CV3010-1C	**C** injector assembly, **VIOLET**	
	CV3010-1D	**D** injector assembly, **RED**	
	CV3010-1E	**E** injector assembly, **WHITE**	
	CV3010-1F	**F** injector assembly, **BLUE**	
	CV3010-1G	**G** injector assembly, **YELLOW**	
	CV3010-1H	**H** injector assembly, **GREEN**	
	CV3010-1I	**I** injector assembly, **ORANGE**	
	CV3010-1J	**J** injector assembly, **LIGHT BLUE**	
	CV3010-1K	**K** injector assembly, **LIGHT GREEN**	
not shown	CV3170	O-ring 011, lower	*
not shown	CV3171	O-ring 013, upper	*
* The injector plug and the injector each use one lower and one upper o-ring			

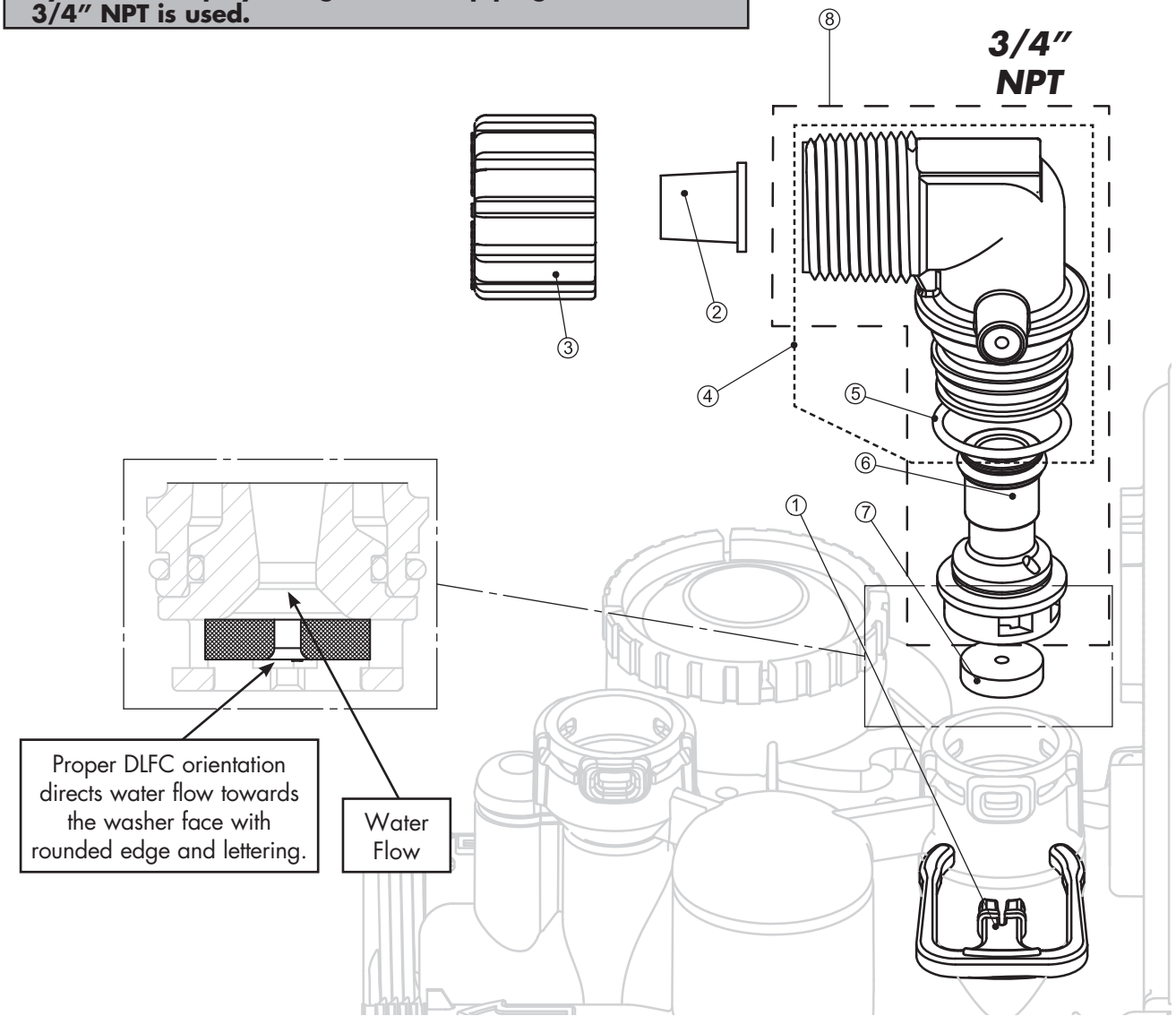
BRINE ELBOW ASSEMBLY			
Item No.	**Part No.**	**Description**	**Qty.**
1	CV3195-01	Refill port plug assembly	1
2	CH4615	Elbow locking clip	1
6	CV3163	O-ring 019	1



REPLACEMENT PARTS:

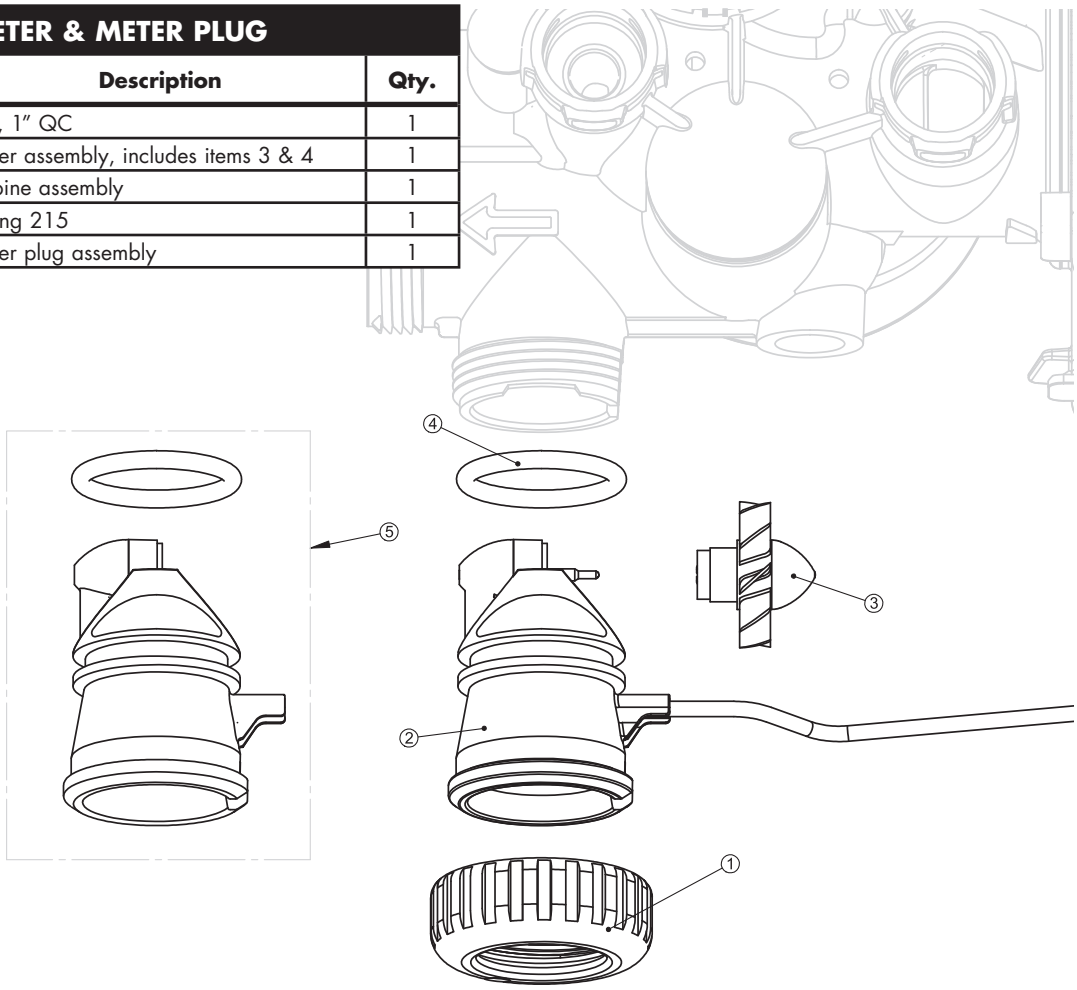
DRAIN LINE ASSEMBLY 3/4"			
Item No.	**Part No.**	**Description**	**Qty.**
1	CH4615	Elbow locking clip	1
2	CPKP10TS8-BULK	***Optional*** insert, 5/8" tube	1
3	CV3192	***Optional*** nut, 3/4" drain elbow	1
4	CV3158-01	Drain elbow, 3/4" NPT with O-ring	1
5	CV3163	O-ring 019	1
6	CV3159-01	DLFC retainer assembly	1
7	CV3162-007	0.7 DLFC for 3/4" elbow	1
	CV3162-010	1.0 DLFC for 3/4" elbow	
	CV3162-013	1.3 DLFC for 3/4" elbow	
	CV3162-017	1.7 DLFC for 3/4" elbow	
	CV3162-022	2.2 DLFC for 3/4" elbow	
	CV3162-027	2.7 DLFC for 3/4" elbow	
	CV3162-032	3.2 DLFC for 3/4" elbow	
	CV3162-042	4.2 DLFC for 3/4" elbow	
	CV3162-053	5.3 DLFC for 3/4" elbow	
8	CV3331	Drain elbow and retainer assembly	

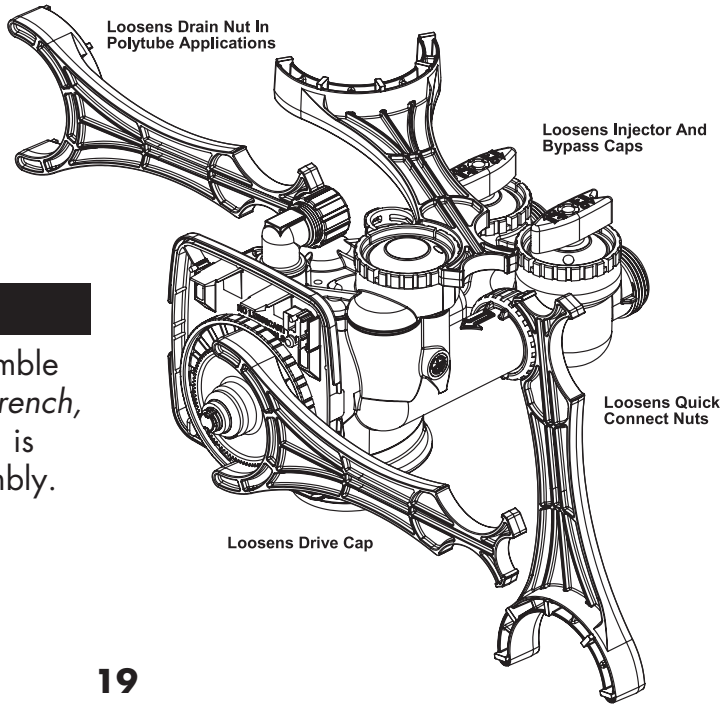
Items 2 and 3, nut and insert are only used with 1/2" I.D. by 5/8" O.D. polytubing. For other piping material, the 3/4" NPT is used.



REPLACEMENT PARTS:

WATER METER & METER PLUG			
Item No.	**Part No.**	**Description**	**Qty.**
1	CV3151	Nut, 1" QC	1
2	CV3003	Meter assembly, includes items 3 & 4	1
3	CV3118-01	Turbine assembly	1
4	CV3105	O-ring 215	1
5	CV3003-01	Meter plug assembly	1

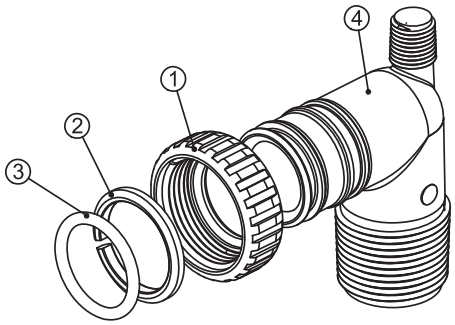




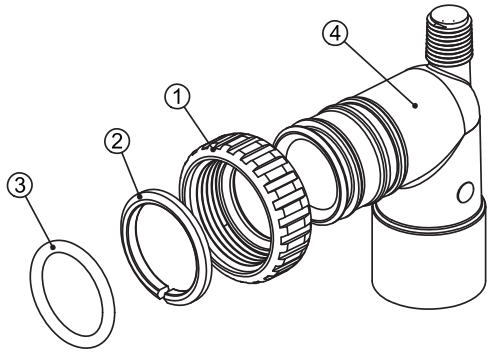
SERVICE WRENCH - CV3193-02

Although no tools are necessary to assemble or disassemble the valve, the *Service Wrench,* (shown in various positions on the valve) is available to aid in assembly or disassembly.

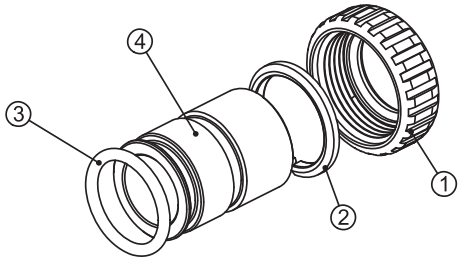
INSTALLATION FITTING ASSEMBLIES:



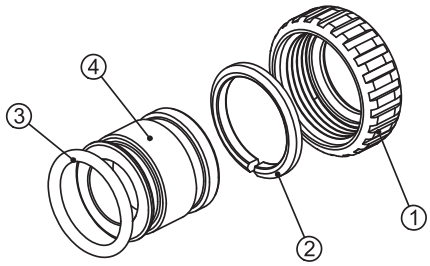
1" PVC MALE NPT ELBOW			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007	1" PVC male NPT elbow assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3149	Fitting	2



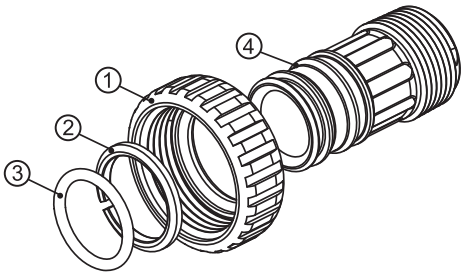
3/4" & 1" PVC SOLVENT ELBOW			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007-01	3/4" & 1" PVC solvent elbow assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3189	Fitting	2



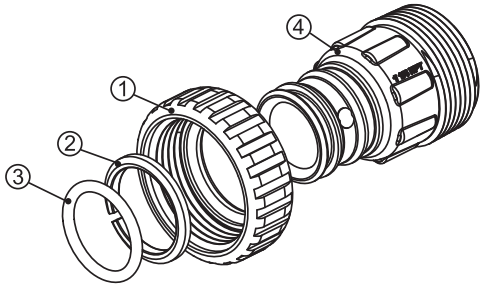
1" BRASS SWEAT			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007-02	1" brass sweat assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3188	Fitting	2



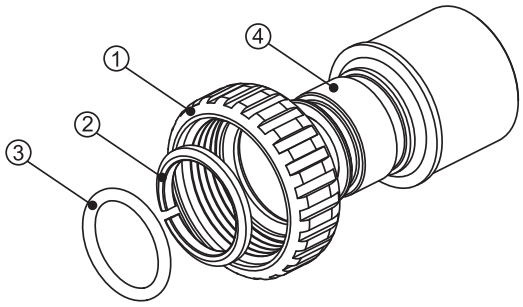
3/4" BRASS SWEAT			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007-03	3/4" brass sweat assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3188-01	Fitting	2



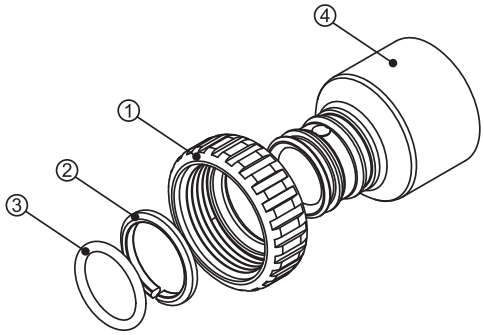
1" PLASTIC MALE NPT			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007-04	1" plastic male NPT assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3164	Fitting	2



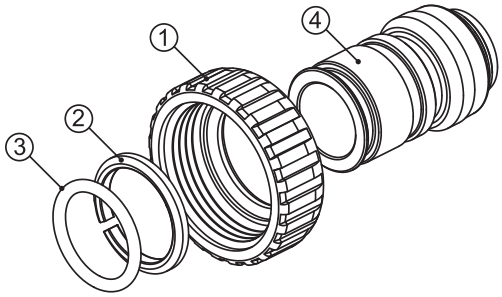
1-1/4" PLASTIC MALE			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007-05	1-1/4" plastic male assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3317	Fitting	2



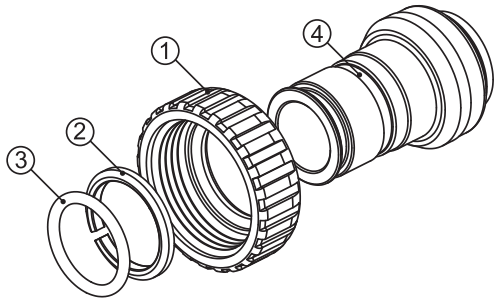
1-1/4" & 1-1/2" BRASS SWEAT			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007-09	1-1/4 & 1-1/2" brass sweat assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3375	Fitting	2



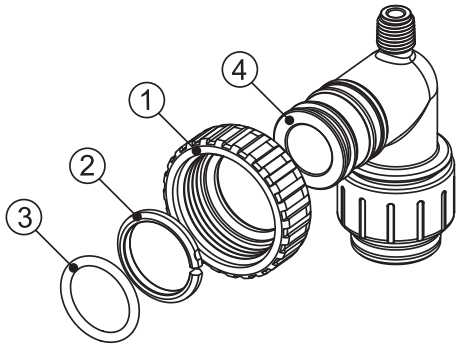
1-1/4" & 1-1/2" PVC SOLVENT			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007-07	1-1/4" & 1-1/2" PVC solvent assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3352	Fitting	2



3/4" BRASS SHARK BITE			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007-12	3/4" brass Shark Bite assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3628	Fitting	2



1" BRASS SHARK BITE			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007-13	1" brass Shark Bite assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3629	Fitting	2



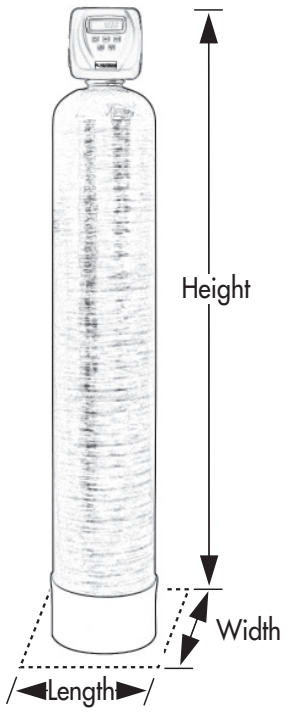
3/4" JOHN GUEST ELBOW			
Item No.	**Part No.**	**Description**	**Qty.**
	CV3007-15	3/4" John Guest elbow assembly	2
1	CV3151	Nut, 1" quick connect	2
2	CV3150	Split ring	2
3	CV3105	O-ring 215	2
4	CV3790	Fitting	2

SPECIFICATIONS:

CARBON FILTER SPECIFICATIONS

MODEL NUMBER	109455	109456	109477	109463
Mineral cu. ft.	CATALYTIC CARBON 1.5	CATALYTIC CARBON 2.0	CARBON 1.5	CARBON 2.0
Cont. Flow Peak Flow	5.0 20.0	7.0 22.0	5.0 20.0	6.0 22.0
Backwash Flow GPM	5.3	9.0	5.3	9.0
Total Dimensions	10″W x 62″H	13″W x 62″H	10″W x 62″H	13″W x 62″H
Shipping Weight	90 lbs	145 lbs	90 lbs	145 lbs

Notes:
- Quality of water may vary depending on flow rate and water conditions
- The pH of the influent water must be above 7.0
- Backwash rates may change depending on water temperature



CYCLE TIMES AND WATER USAGE

MODEL	109455 109477		109456 109463	
	MIN.	GAL.	MIN.	GAL.
Backwash	3	16	3	27
Pause	2	—	2	—
Backwash	2	11	2	18
Pause	2	—	2	—
Rinse	1	6	1	9
Total	**6**	**34**	**6**	**54**

DUAL CX FILTER/SOFTENER SPECIFICATIONS

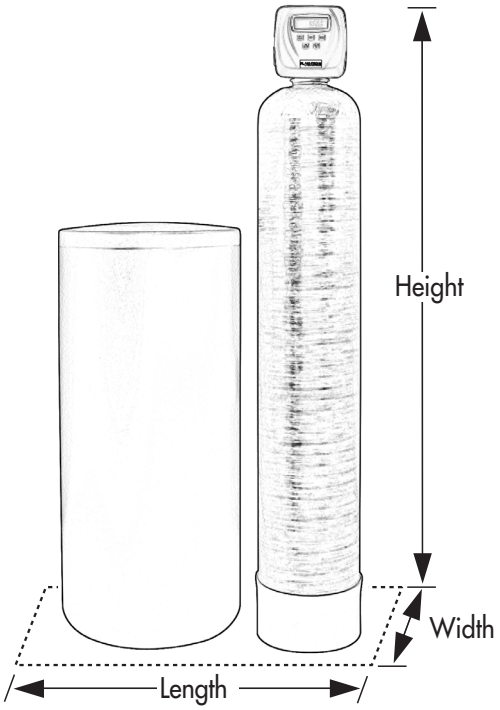
MODEL		109457	109458
[1]Capacity: (Grains/Lbs. NaCl)	Maximum	32,000 @ 15.0	48,800 @ 21.0
	Medium	28,400 @ 9.0	44,400 @ 15.0
	Minimum	23,600 @ 6.0	35,400 @ 9.0
Amount of Resin Media (Cu. Ft.)		1.0	1.5
Amount of Carbon Media (Cu. Ft.)		.5	1.0
Maximum Water Hardness (GPG)		75	100
[2]Maximum Iron (PPM)		1.0	1.0
[3]Minimum pH Required		7.0	7.0
[4]Peak Flow Rate (GPM @ P-PSI)		15.6 @ 15.0	20.4 @ 15.0
Continuous Flow Rate (GPM @ P-PSI)		9.7 @ 7.5	13.2 @ 7.5
Water Pressure Range (PSI)		25-100	25-100
Water Temp. (°F)		33-100	33-100
Electrical Requirements (volts-hertz)		110-50/60	110-50/60
Pipe Size		1″	1″
Total Dimensions:	Media Tank & Valve	10″W x 62″H	13″W x 62″H
	Brine Tank	18″W x 33″H	18″W x 40″H

[1] All water conditioners are pre-factory set at medium salting.

[2] Iron removal may vary depending on form of iron, pH and other local conditions. On waters that are pre-chlorinated or where other pre-oxidation occurs, an iron precipitate can form that is too small to be filtered.

[3] The pH listed is the minimum for the influent water.

[4] Unit not tested for capacity at these flow rates. Water quality may vary.



CYCLE TIMES AND WATER USAGE

MODEL	109457		109458	
	MIN.	GAL.	MIN.	GAL.
Brine Refill	6	3	10	5
Softening (Pause)	240	0	240	0

The above sequences take place prior to regeneration; therefore, minutes are not included in totals.

Backwash	8	42	8	60
Brine & Rinse	60	24	90	36
Rapid Rinse	4	21	4	30
Total	**72**	**90**	**102**	**131**

PLUMBER'S CHOICE
PROFESSIONAL WATER SOLUTIONS

Congratulations. You have purchased one of the finest water treatment systems available. In the unlikely event of a problem due to defects in material and workmanship, we proudly warrant our water treatment systems to the original owner, when installed in accordance with Plumber's Choice, LLCspecifications. This warranty is effective for all registered products from the date of original installation for:

A period of TEN YEARS: Fiberglass mineral tank except for damages due to freezing, high pressure (120 PSI and above), extreme temperature (100°F and above) or a vacuum on the system.

A period of FIVE YEARS: The control valve and all internal components.

A period of ONE YEAR: All other conditioner components.

Any part found defective within the terms of this warranty will be repaired or replaced by the dealer. You pay only freight from our factory and local dealer charges. To obtain local warranty service, contact original installer.

The above provisions of the warranty are valid as long as the unit is connected in compliance with local plumbing codes and in an equivalent manner and condition of the original installation and is owned by the original owner.

This warranty does not cover damages due to accident, fire, flood, freezing, or any other Act of God. We are not responsible for damages due to change in water conditions, misapplication, misuse, neglect, vacuum, oxidizing agents, alteration, or lack of maintenance. No responsibility is assumed for loss of use of the unit, inconvenience, loss or damage to real or personal property or any incidental or consequential damages. Furthermore, we assume no liability and extend no warranties, express or implied, for the use of this product with a non-potable water source. **To the extent permitted by law, Plumber's Choice, LLC disclaims all implied warranties, including without limitation warranties of merchantability and fitness for particular purpose; to the extent required by law, any such implied warranties are limited in duration to the aforementioned period specified above.**

Some states do not allow the exclusion of implied warranties or limitations on how long an implied warranty lasts. Consequently, the above limitation may not apply to you.

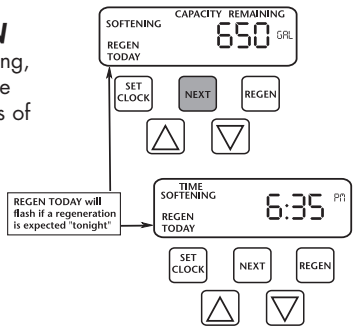
This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Register product online at www.plumberschoicewater.com/registration or by phone at 615-866-6100.

QUICK REFERENCE GUIDE:

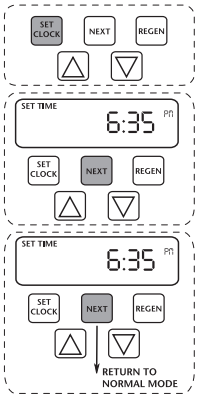
GENERAL OPERATION

When the system is operating, one of three displays will be shown: time of day, gallons of treated water available, or gallons per minute. Pressing ***NEXT*** will toggle between the three choices.



TO SET TIME OF DAY

In the event of a prolonged power outage, time of day flashes, indicating that this needs to be reset. All other information will be stored in memory no matter how long the power outage. Please complete the steps as shown to the right. To access this mode, press ***SET CLOCK.***

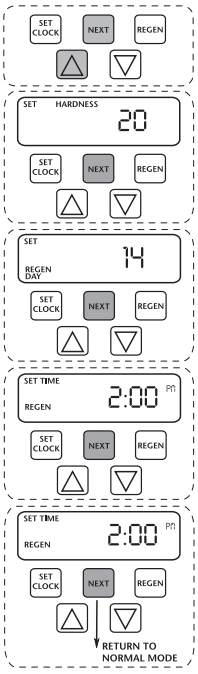


1. Accessed by pressing ***SET CLOCK***
2. Adjust hours with ▼ and ▲ buttons, AM/PM toggles at 12
3. Press ***NEXT***
4. Adjust minutes with ▼ and ▲ buttons
5. Press ***NEXT*** to complete and return to normal operation

ADJUST DAYS BETWEEN REGENERATION OR TIME OF REGENERATION

For initial set-up or to make adjustments, please complete the steps as shown to the right. Access this mode by pressing ***NEXT*** and ▲ button simultaneously.

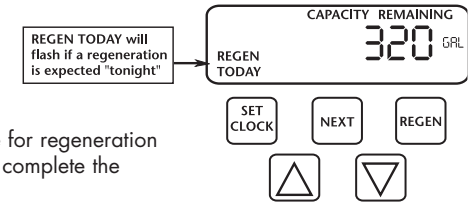
NOTE: Hardness display shows "-nA-" if used as a filter. If other displays do not appear, refer to manual.



1. Accessed by pressing ***NEXT*** and ▲ button simultaneously
2. Adjust hardness using ▼ and ▲ buttons
3. Press ***NEXT***
4. Adjust days between regenerations using ▼ and ▲ buttons
5. Press ***NEXT***
6. Adjust time of regeneration hour with ▼ and ▲ buttons, AM/PM toggles at 12.
7. Press ***NEXT***
8. Adjust time of regeneration minutes with ▼ and ▲ buttons
9. Press ***NEXT*** to complete and return to normal operation.

MANUAL REGENERATION

NOTE: If you need to initiate a manual regeneration, either immediately, or the same night at the preprogrammed time for regeneration (typically 2:00 AM), complete the following steps.

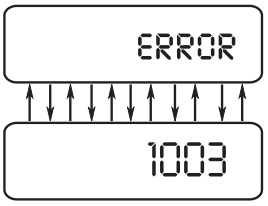


For Immediate Regeneration:
Press and hold ***REGEN*** until valve motor starts (typically 3 seconds).

For Regeneration the same night:
Press and release ***REGEN*** (notice that flashing "REGEN TODAY" appears).

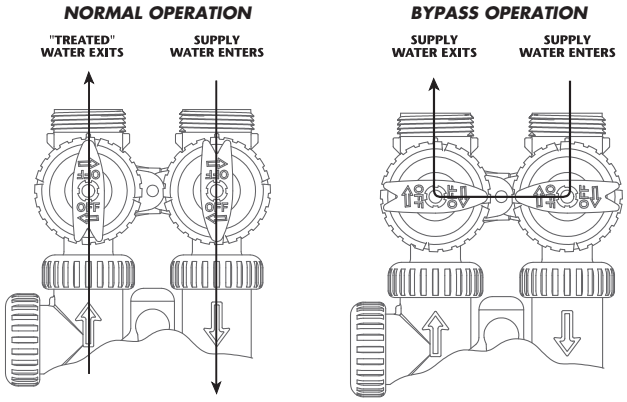
ERROR

If the display toggles between "Error" and an error code (i.e. a number), call a service technician and report the error code.



BYPASS VALVE OPERATION

To shut off water to the system, position arrow handles as shown in the bypass operation diagram below. If your valve doesn't look like the diagram below, contact your service technician for instructions on how to shut off water.



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