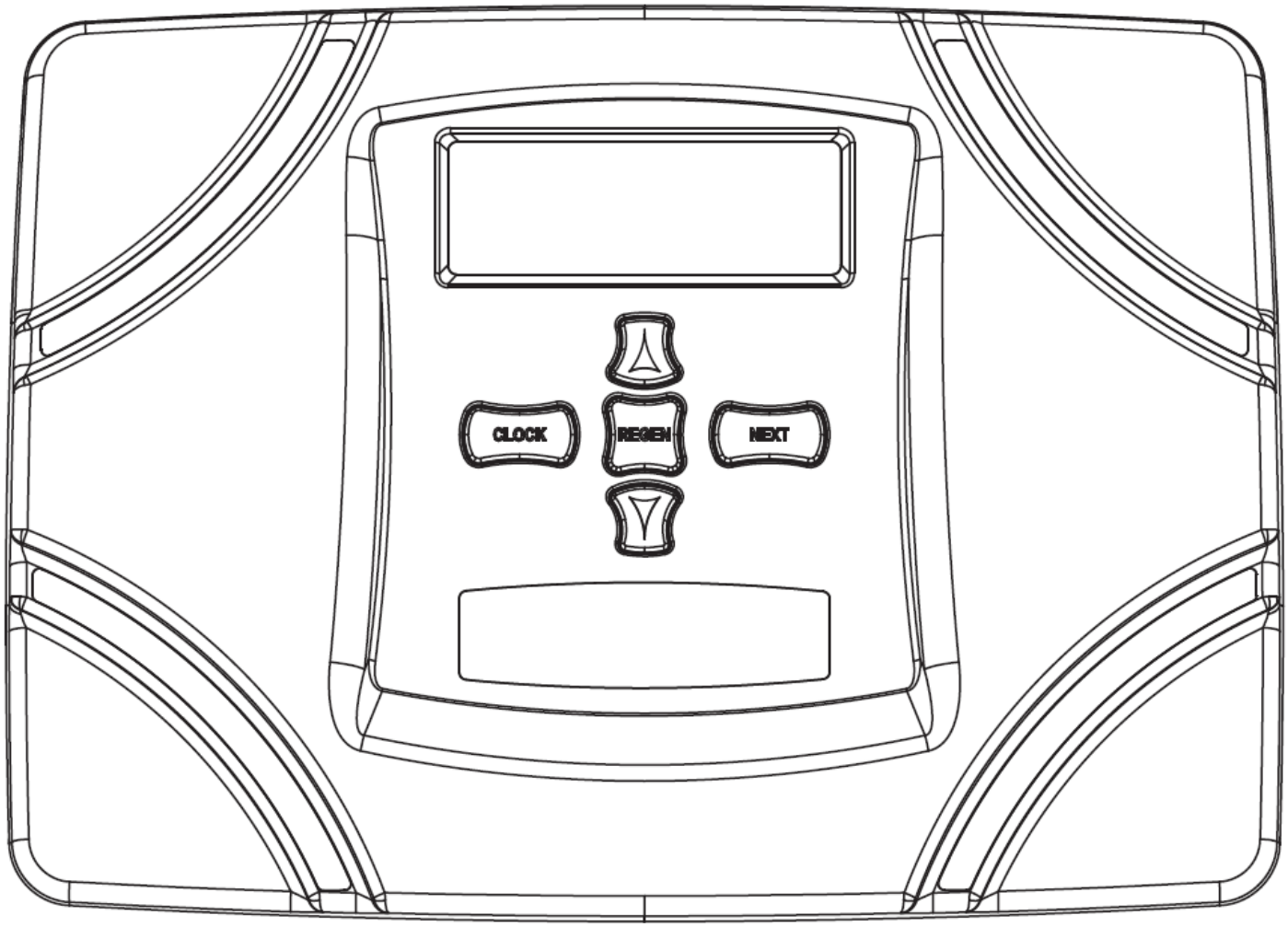
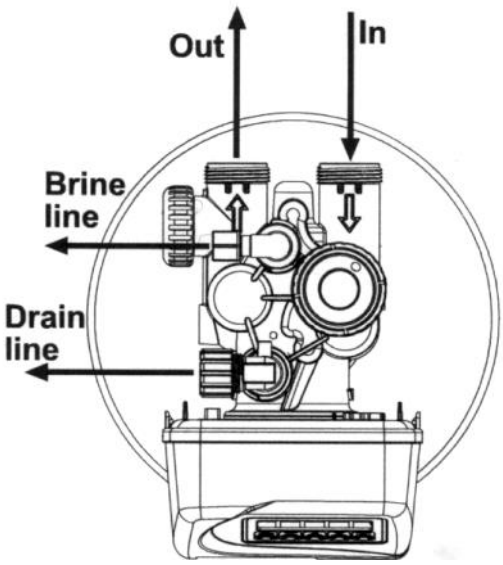
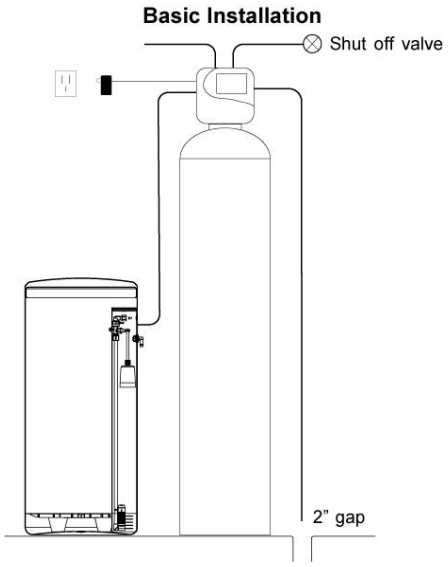
VISION PR SERIES



WATER SOFTENER INSTALLATION & USER MANUAL (UP-FLOW)
PROPORTIONAL BRINING

BASIC INSTALLATION





General installation & Guide

The control valve, fittings and/or bypass 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 red or clear lip seals.

Do not use pipe dope or other sealants on threads. Teflon tape must be used on the plumbing threads of the 1" connection and on the threads for the drain line connection only- that are having plumbing fittings threaded on to them. Teflon tape is not necessary on the nut connections or cap because o-rings seals are used. The nuts and caps are designed to be tightened by hand or with the special plastic service wrench, #V3193-XXX. If necessary a pliers can be used to unscrew the nut or cap. **Do not** use a pipe wrench. **Do not** place screwdriver in slots on caps and/or tap with a hammer.

1. The distance between the drain and the water softener should be as short as possible. Drain tube/pipe should be a minimum of 5/8" size.
2. All plumbing should be done in accordance with local plumbing codes.
3. Do not install any Water Softener with less than 15 feet of piping between its outlet and the inlet of a water heater- because of hot water back feed. Hot water back feed will ruin water softener & void warranty.
4. Do not locate unit where it or its connections (including the drain and overflow lines) will ever be subjected to room temperatures under 34F.
5. Inlet/outlet plumbing: connect to a supply line and install an inlet shutoff valve.
6. Drain line: Be sure that the drain can handle the backwash rate of the system and install a flexible plastic tube to the Drain Line Assembly.
7. ****Check your water pressure! Water pressure over 90 psi WILL VOID THE WARRANTY OF THE SYSTEM.**

Pre-Installation Instructions

The manufacturer has preset the water treatment unit's cycle times, salt dose, exchange capacity and the salt dose refill time.

The dealer should read this page and guide the installer through setting the Hardness, Days Override, and Time of Regeneration prior to installation.

For the installer the following settings should be used:

1. Program Installer Settings
   Hardness (set to local conditions)
   Day Override (factory set to 14)
   Time of Regeneration (preset to 2:00AM)

2. Set Time of Day

For the homeowner, please read user display settings.

Water Softeners:
During operation, the normal user display is time of day or volume remaining. Other displays are available and can be viewed by pressing the NEXT button to scroll through them. When stepping through any programming, if no buttons are pressed within 5 minutes, the display returns to a normal user display. Any changes made prior to the 5 minute time out are incorporated.

To quickly exit any Programming, Installer Settings, etc., press the CLOCK button. Any changes made prior to the exit are incorporated. If desired, two regenerations within 24 hours are possible with a return to the preset program. To do a double regeneration:
1. Press the REGEN button once. "REGEN TODAY" will flash on the display.
2. Press and hold the REGEN button for three seconds until the regeneration begins.

Once the control valve has completed the immediate regeneration it will do another one at the next scheduled regeneration time.

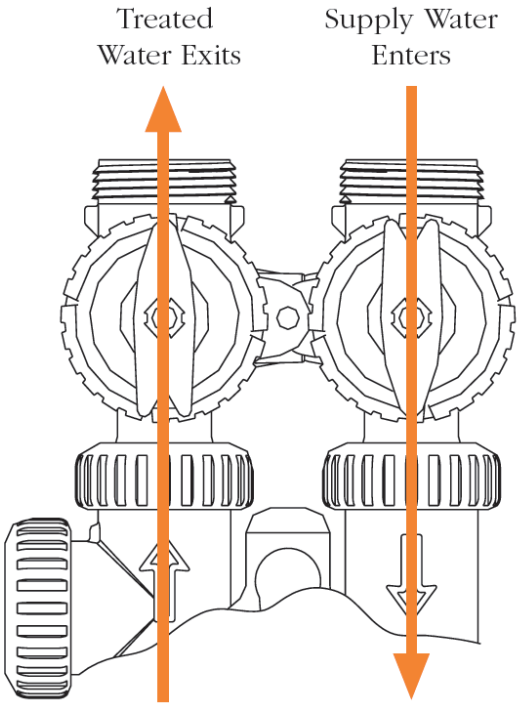
Bypass Valve

The bypass valve is used to isolate the control valve from the plumbing system in order to perform valve repairs or maintenance.

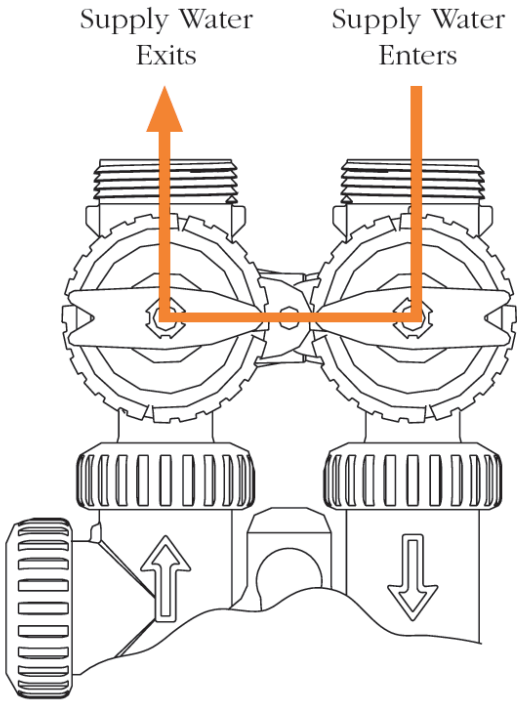
1. **Normal Operation Position:** The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve.
2. **Bypass Position:** The inlet and outlet handles point to the center of the bypass. Untreated water is supplied to the plumbing system.

To **shut-off water** to the system, please 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.

NORMAL OPERATION



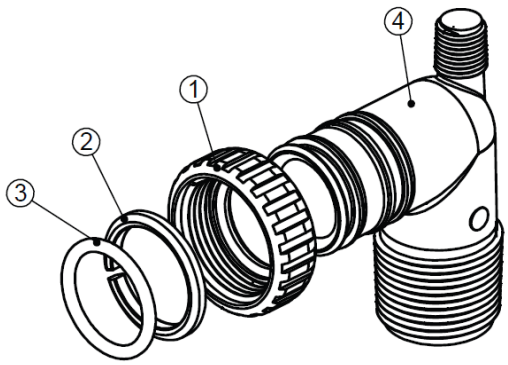
BYPASS OPERATION



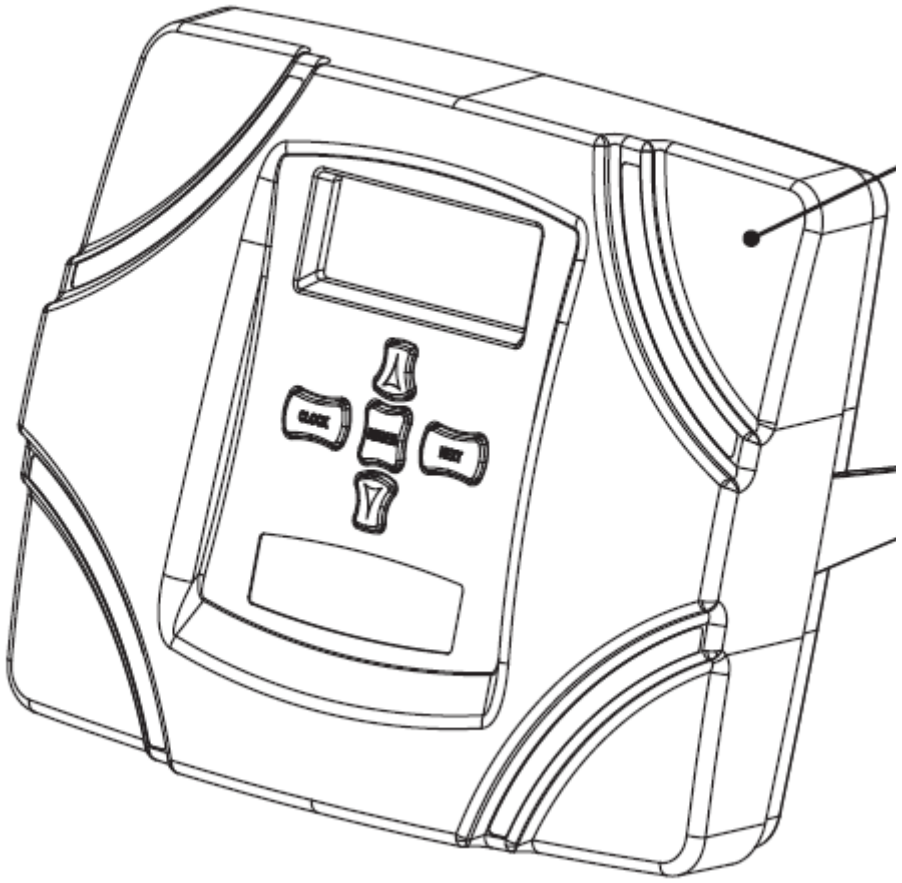
Installation Fitting Assemblies

Order No: **BP-C-V3007**
Description: **Fitting 1" PVC Male NPT Elbow Assembly**

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



Start-up Instructions:

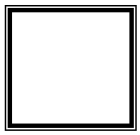


- After installation is completed rotate the bypass handles on the water softener to the bypass position.
- Fully open a cold water faucet in the home & turn water supply back on in the home.
- Allow water to run until clear to rid pipes of debris, which may have occurred during installation.

- **The system is now ready for start-up:**

1. Press and hold the **"REGEN"** button for five seconds until the drive motor starts. Wait until the motor stops running and the display reads **"FILL"**
2. Press the **"REGEN"** button again to advance the control to the next position. Once the motor stops running the display will read "**BRINE DRAW"**. Press the **REGEN** button again & release.
3. When the motor stops running, the display will read **"BACKWASH".**
4. Open the inlet handle of the bypass valve very slowly, ½ way open, allowing water to fill the tank slowly in order to expel air.
5. When the water is flowing steadily to the drain without the presence of air, fully open the inlet bypass valve handle & let the water flow to drain for 3 to 5 minutes.
6. Press the **"REGEN"** button again to advance the control to the next position. The Display will now read **RINSE.** Allow water to run to drain for 3 minutes, then press the **REGEN** button again & release.
7. The system will now return to the service position on its own.
8. Once your system is displaying time of day, slowly open the outlet bypass handle to the fully open position.
9. Your system is now operational and servicing the home.
10. ****Note**** Manually, put 2" of water into the empty salt/brine tank during start-up. This will prime the salt tank for the first regeneration. Everything will be automatic after initial start-up.
11. ****Note**** Now add salt to the salt/brine tank. **Note: Always keep the salt/brine tank at least halfway full of salt.

Setting the Time of day:



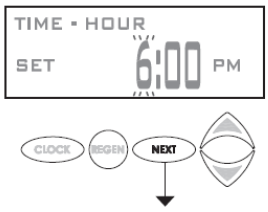
Set Time of Day

The user can also set the time of day. Time of day should only need to be set if the battery has been depleted because of 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 which indicates the time of day should be reset. The non rechargeable battery should also be replaced.

STEP 1U

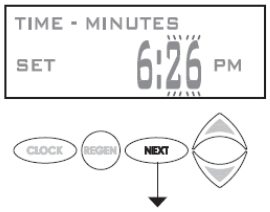
STEP 1U – Press CLOCK.

STEP 2U



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

STEP 3U



STEP 3U - 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

Power Loss

If the power goes out the system will keep time until the battery is depleted. If an extended power outage occurs, the time of day will flash on and off which indicates the time of day should be reset and the non rechargeable battery replaced. The system will remember the rest.

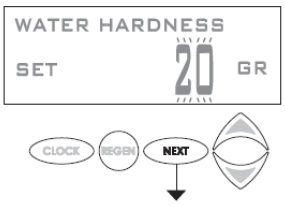
Setting the Hardness Setting, Calendar Override Day & Regeneration time:

Installer Display Settings

STEP 1I

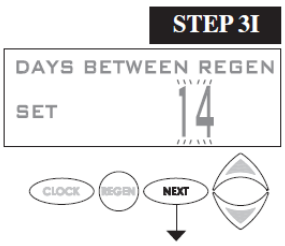
STEP 1I - Press NEXT and ▲ simultaneously for 3 seconds.

STEP 2I



STEP 2I – Hardness: Set the amount of hardness in grains of hardness as calcium carbonate per gallon using the ▲ or ▼ buttons. The default is 20 with value ranges from 1 to 150 in 1 grain increments. Note: The grains per gallon can be increased if soluble iron needs to be reduced. This display will not show if "FILTER" is selected in Step 2F or if 'AUTO' is not selected in Set Volume Capacity in OEM Softener System Setup. Press NEXT to go to step 3I. Press REGEN to exit Installer Display Settings.

STEP 3I



STEP 3I – Day Override: When volume capacity is set to "OFF", sets the number of days between regenerations. When volume capacity is set to AUTO or to a number, sets the maximum number of days between regenerations. If value set to "OFF", regeneration initiation is based solely on volume used. If value is set as a number (allowable range from 1 to 28) a regeneration initiation will be called for on that day even if sufficient volume of water were not used to call for a regeneration. Set Day Override using ▲ or ▼ buttons:

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

See Setting Options Table for more detail on setup. Press NEXT to go to step 4I. Press REGEN to return to previous step.

STEP 4I

STEP 4I – Next Regeneration Time (hour): Set the hour of day for regeneration using ▲ or ▼ buttons. AM/PM toggles after 12. The default time is 2:00 AM. This display will show "REGEN IMMEDIATE ON ZERO GAL" if "IMMEDIATE" is selected in Set Regeneration Time Option in OEM Softener System Setup Step 9S. Press NEXT to go to Step 5I. Press REGEN to return to previous step.

When Step 6CS is set to a value of two to four, additional regeneration time settings will be viewed. These displays are used to set additional times of day where a regeneration cycle may be initiated by the control as needed. When this feature is active a number (#1 - #4) will be added to the upper right corner of this display to indicate which of the additional regeneration time settings is currently being viewed.

STEP 5I

STEP 5I – Next Regeneration Time (minutes): Set the minutes of day for regeneration using ▲ or ▼ buttons. This display will not be shown if "IMMEDIATE" is selected in Set Regeneration Time Option in OEM Softener System Setup Step 9S. Press NEXT to go to Step 6I. Press REGEN to return to previous step. When this feature is active a number (#1 - #4) will be added to the upper right corner of this display to indicate which of the additional regeneration time settings is currently being viewed.

RETURN TO NORMAL MODE

Regeneration Mode

Typically a system is set to regenerate at a time of low water usage. An example of a time with low water usage is when a household is asleep. If there is a demand for water when the system is regenerating, untreated water will be used.

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 current cycle display will alternate with the regen time remaining screen. The system runs through the steps automatically and will reset itself to provide treated water when the regeneration has been completed.

Manual Regeneration

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

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

User Display Settings

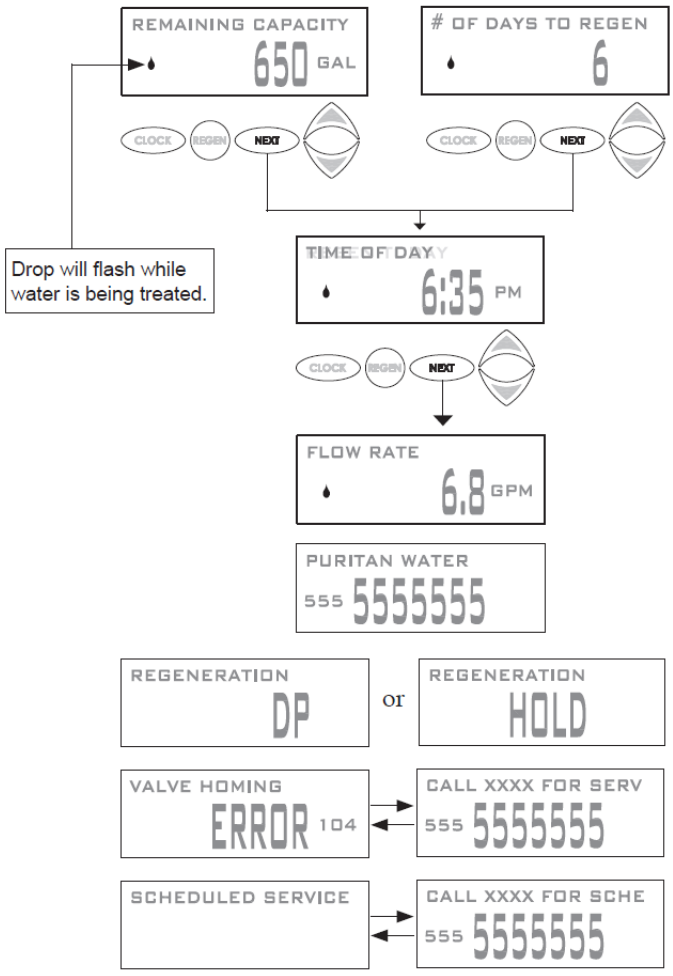
General Operation

When the system is operating, one of six 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 is one of the following: days remaining or volume remaining. Days remaining is the number of days left before the system goes through a regeneration cycle. Capacity remaining is the gallons that will be treated before the system goes through a regeneration cycle. Pressing the ▼ button while in the Capacity Remaining or Days Remaining displays will decrease the capacity remaining in 10 gallon increments or the Days Remaining in 1 day increments, and will also increase the volume used impacting the recorded values in Diagnostics Steps 3D, 4D and 5D and Valve History, Step 4VH.

The third display shows the current treated water flow rate through the system. The fourth display will display contact screen information, if it was edited. The fifth display will show either dP or hold if the dP switch is closed. The sixth display indicates the user should call for service. The service display will not appear if OFF is selected in Step 12S of OEM Softener System Setup. To clear the Service Call reminder, press the ▲ and ▼ buttons simultaneously while the number and banner text screen is displayed.

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

If a water meter is installed, the water drop flashes on the display when water is being treated (i.e. water is flowing through the system).



PR Front Cover and Drive Assembly

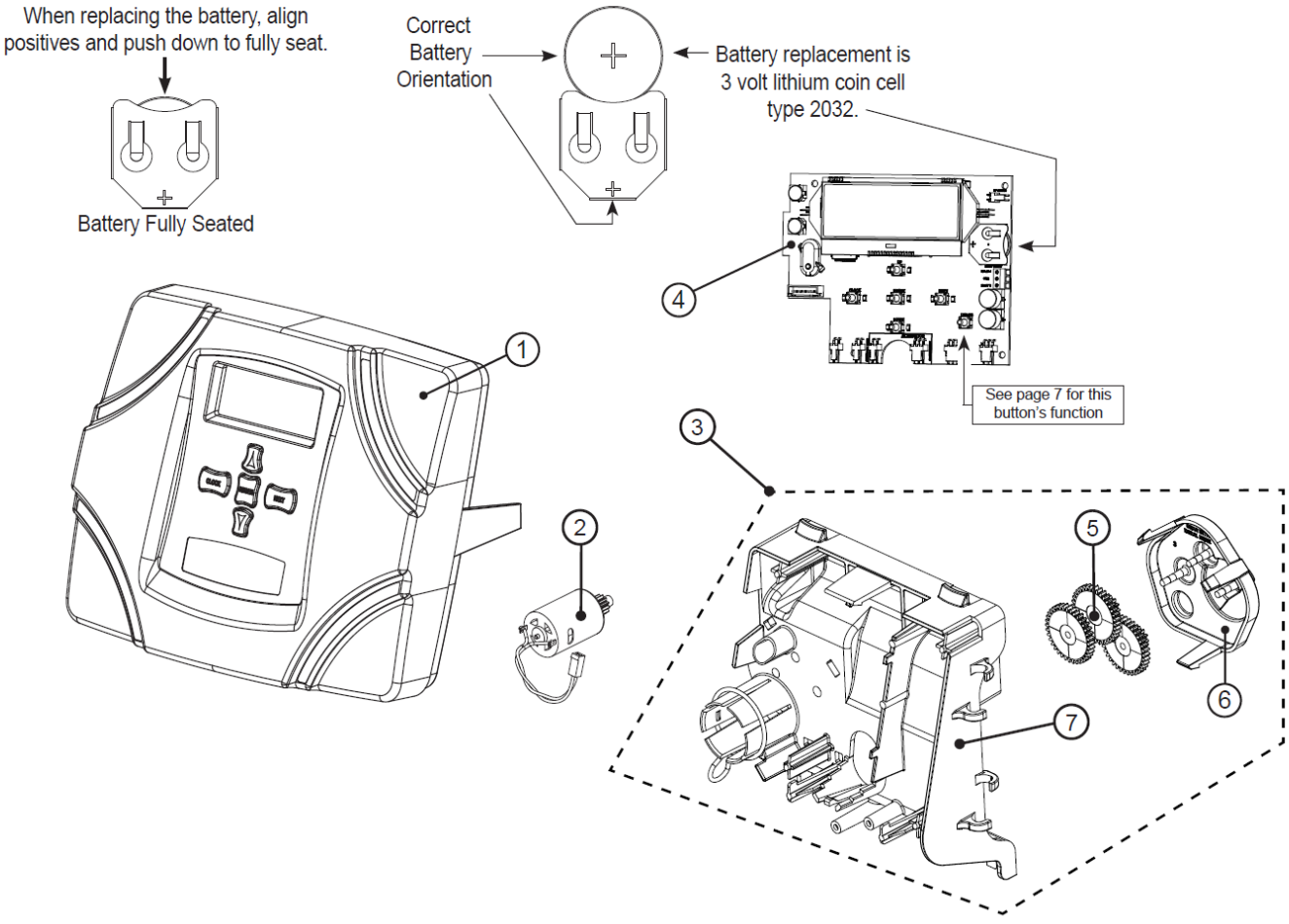
Drawing No.	Order No.	Description	Quantity
1	V4392-01	WS1NA FRONT COVER ASY	1
2	V3107-01	WS1 MOTOR	1
3	V3002-A	WS1 DRIVE BRACKET ASY	1
4	V3757PR-03BOARD	WS1THRU2L/2 PR PC BOARD 20POS REPLACE	1
5	V3110	WS1 DRIVE GEAR 12X36	3
6	V3109	WS1 DRIVE GEAR COVER	1
7	V3106-01	WS1 DRIVE BRACKET & SPRING CLIP	1
Not Shown	V3186-05	WS1 POWER SUPPLY US 15VDC VI	1
	V3186EU-05	WS1 POWER SUPPLY EU 15VDC VI	
	V3186UK-05	WS1 POWER SUPPLY EK 15VDC VI	
	V3186-01	WS1 POWER CORD ONLY	
Not Shown	V3343	WS1 DRIVE BACK PLATE	1

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

Relay Driver Output Type – Dual Solid-State 12VDC "wet" contacts - N.O.
Relay Driver Output Capacity - 12VDC @100mA per relay output (total current through both outputs not to exceed 200mA).
NOTE: Check for proper mounting dimensions on valve backplate prior to mounting an external relay under control cover.

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

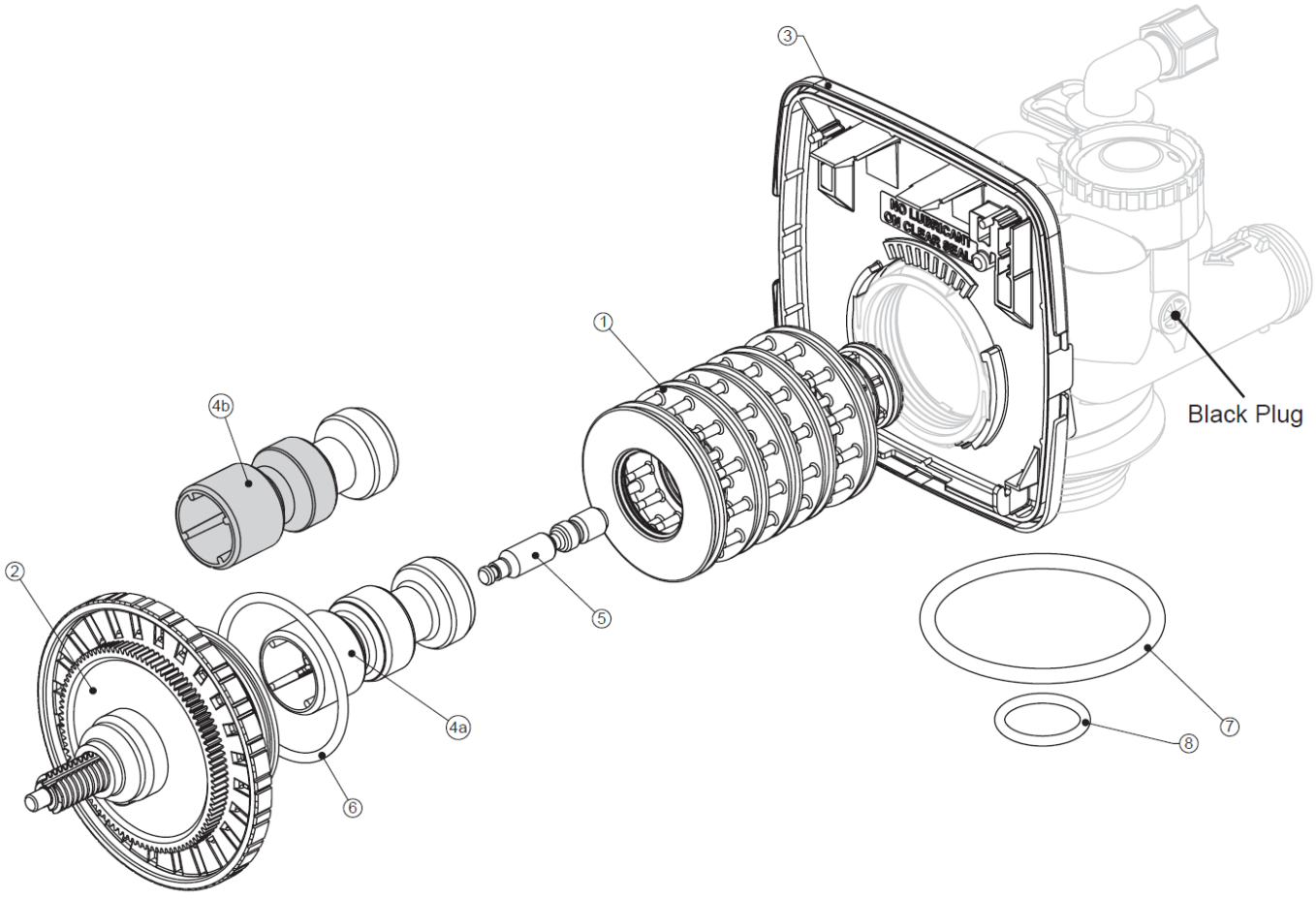
Wiring For Correct On/Off Operation	
PC Board Relay Terminal Block	Relay
RELAY1	Coil -
COM	Coil +
RELAY2	Coil -



WS1 Drive Cap Assembly, Downflow Piston, Upflow Piston, Regenerant Piston and Spacer Stack Assembly

Drawing No.	Order No.	Description	Quantity
1	V3005	WS1 Spacer Stack Assembly	1
2	V3004	Drive Cap ASY	1
3	V3178	WS1 Drive Back Plate	1
4a	V3011*	WS1 Piston Downflow ASY	1
4b	V3011-01*	WS1 Piston Upflow ASY	
5	V3174	WS1 Regenerant Piston	1
6	V3135	O-ring 228	1
7	V3180	O-ring 337	1
8	V3105	O-ring 215 (Distributor Tube)	1
Not Shown	V3001	WS1 Body ASY Downflow	1
	V3001-02	WS1 Mixing Valve Body ASY	
	V3001UP	WS1 Body ASY Upflow	
	V3001-02UP	WS1 Mixing Valve Body Upflow ASY	

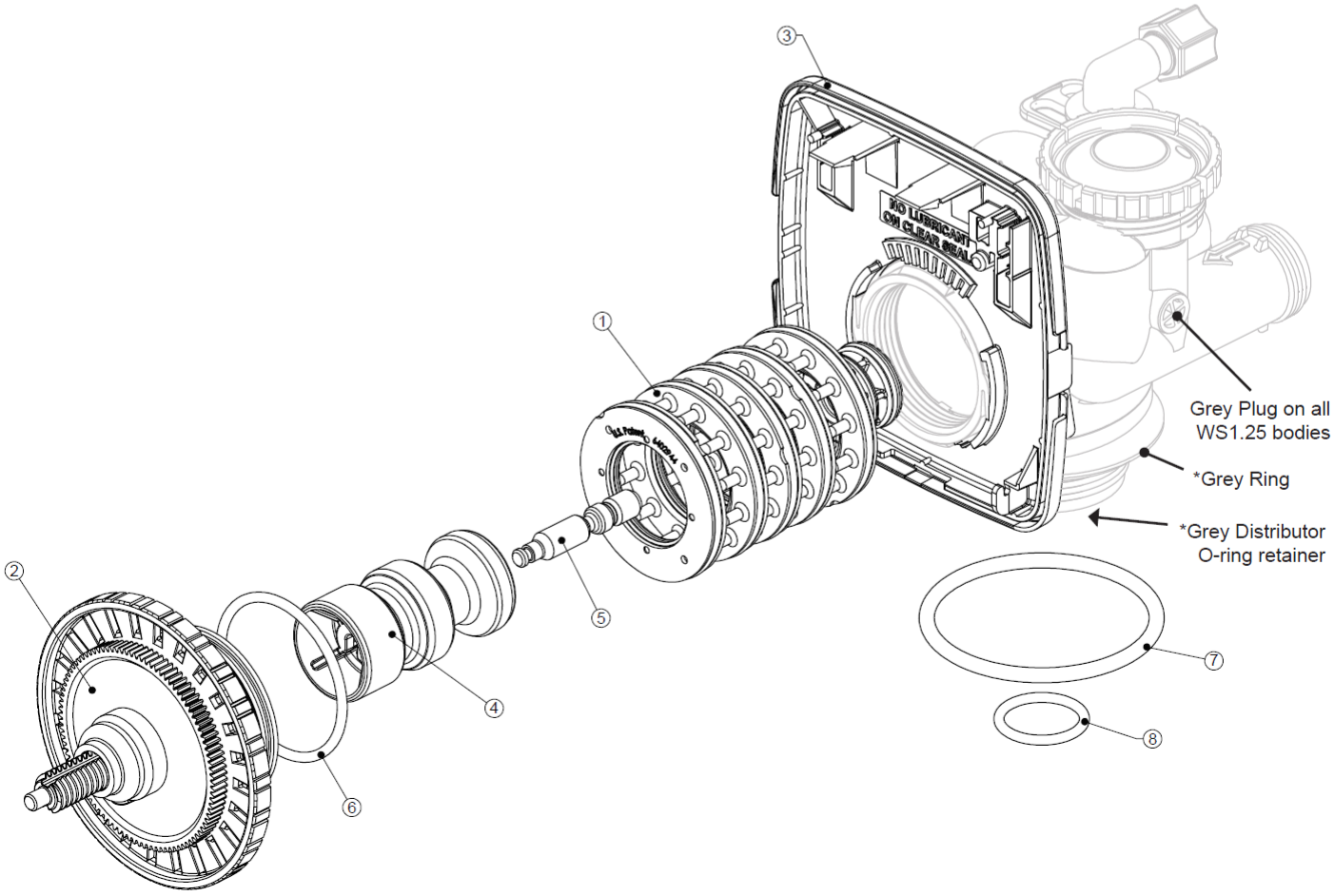
*V3011 is labeled with DN and V3011-01 is labeled with UP.
Note: The regenerant piston is not used in backwash only applications.



WS1.25 Drive Cap Assembly, Downflow Piston, Regenerant Piston and Spacer Stack Assembly

Drawing No.	Order No.	Description	Quantity
1	V3430	WS1.5 Spacer Stack Assembly	1
2	V3004	Drive Cap ASY	1
3	V3178	WS1 Drive Back Plate	1
4	V3407	WS1.5 Piston Downflow ASY	1
5	V3174	WS1 Regenerant Piston	1
6	V3135	O-ring 228	1
7	V3180	O-ring 337	1
8	V3358	O-ring 219 (Distributor Tube Opening 1.32")	1
	V3357	O-ring 218 (Distributor Tube Opening 32mm)	
Not Shown	V3020	WS1.25 Body ASY Downflow (Distributor Tube Opening 1.32")	1
	V3020-01	WS1.25 Mixing Valve Body Downflow ASY (Distributor Tube Opening 1.32")	
	V3020-02	WS1.25 Body ASY Downflow (Distributor Tube Opening 32mm)	
	V3020-03	WS1.25 Mixing Valve Body Downflow ASY (Distributor Tube Opening 32mm)	

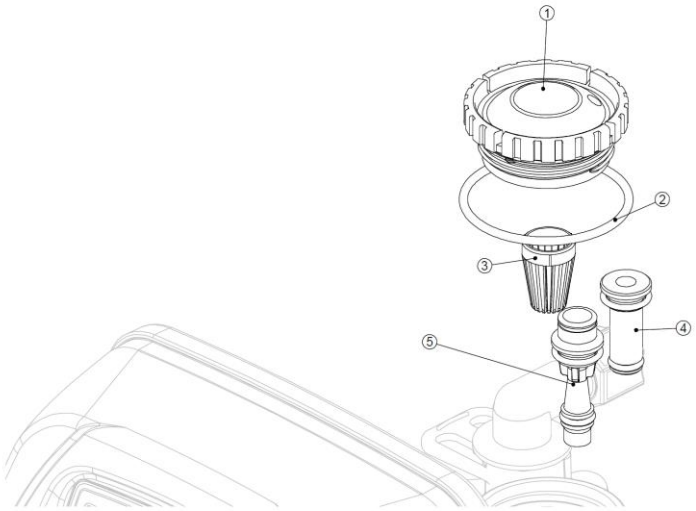
Note: The regenerant piston is not used in backwash only applications.



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

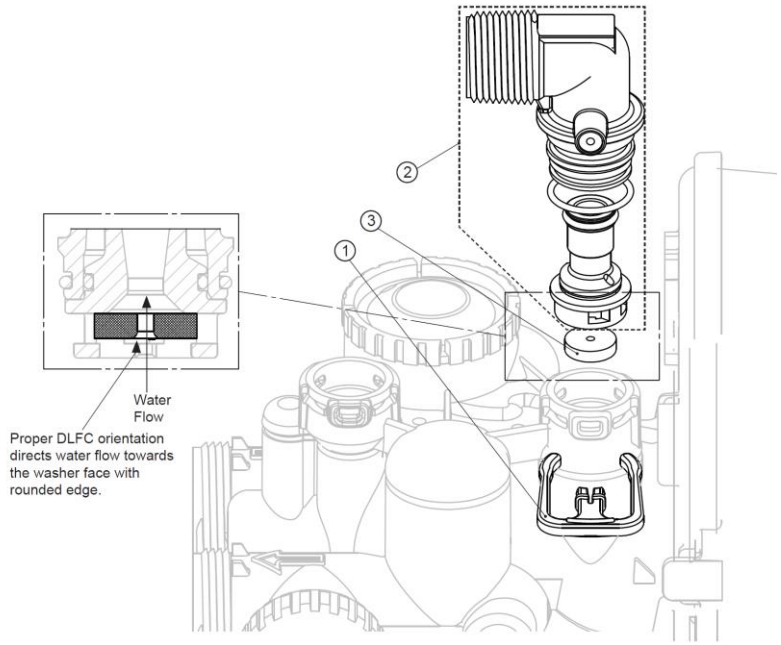
Drawing No.	Order No.	Description	Quantity
1	CV-P-V3176	INJECTOR CAP	1
2	CV-P-V3152	O-RING 135	1
3	CV-P-V3177-01	INJECTOR SCREEN CAGE	1
4	CV-P-V3010-1Z	INJECTOR ASY Z PLUG	1
5	CV-P-V3010-1E	INJECTOR ASY E WHITE	1
	CV-P-V3010-1F	INJECTOR ASY F BLUE	
	CV-P-V3010-1G	INJECTOR ASY G YELLOW	
Not Shown	CV-P-V3170	O-RING 011	*
Not Shown	CV-P-V3171	O-RING 013	*

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



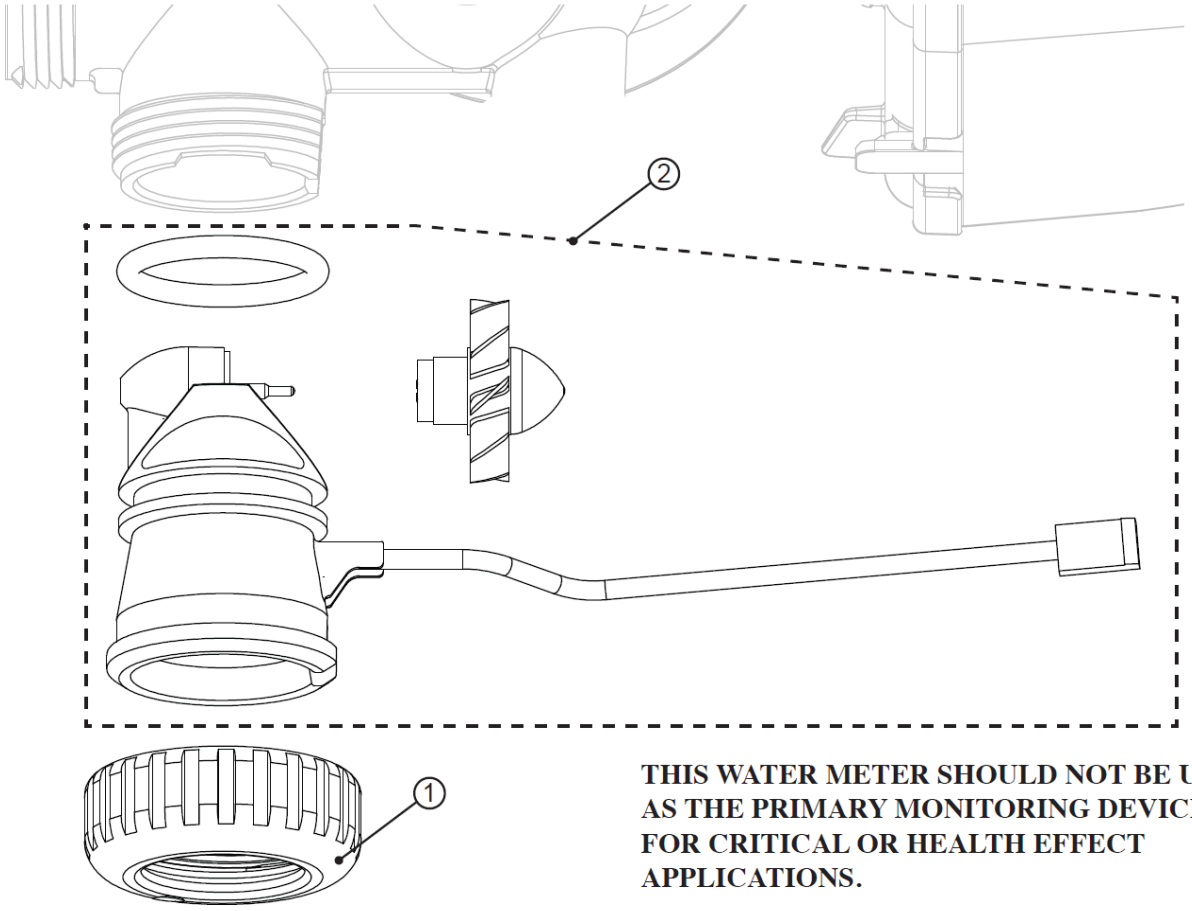
Drain Line – 3/4"

Drawing No.	Order No.	Description	Quantity
1	CV-P-H4615	ELBOW LOCKING CLIP	1
2	CV-P-V3331	DRAIN ELBOW & RETAINER ASSY	1
3	CV-P-V3162-027	DLFC 2.7 GPM FOR ¾	1
	CV-P-V3162-032	DLFC 3.2 GPM FOR ¾	
	CV-P-V3162-042	DLFC 4.2 GPM FOR ¾	



Water Meter

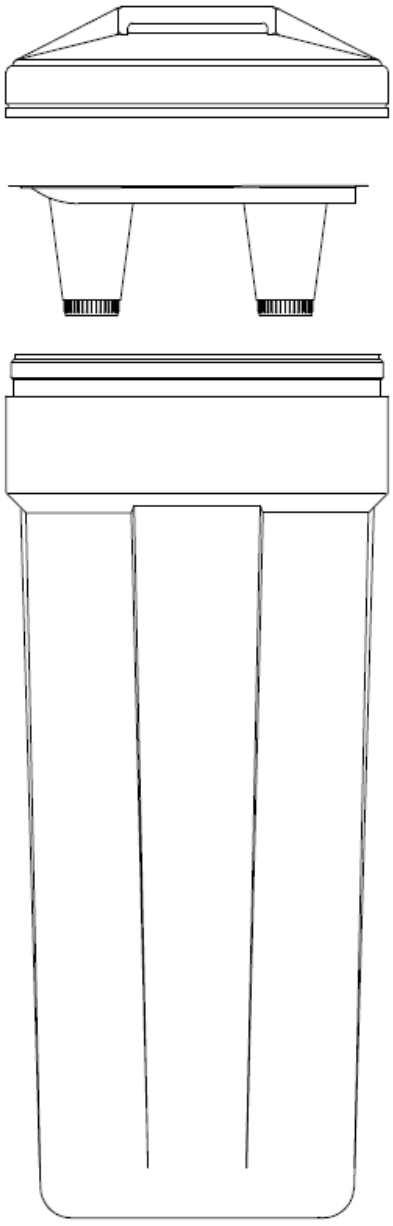
Drawing No.	Order No.	Description	Quantity
1	CV-P-V3151	Nut 1" QC	1
2	CV-P-V3003	Meter ASY	1

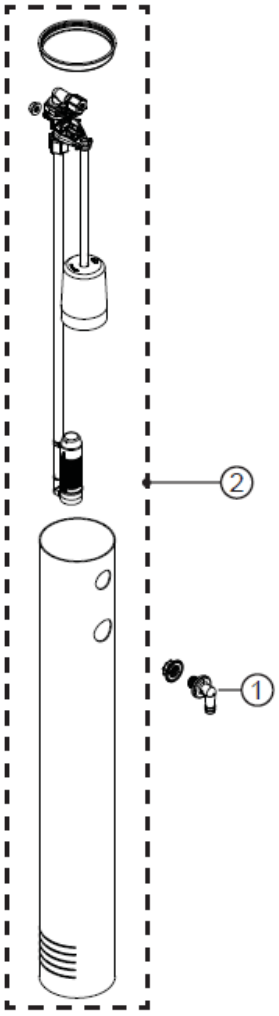


THIS WATER METER SHOULD NOT BE USED AS THE PRIMARY MONITORING DEVICE FOR CRITICAL OR HEALTH EFFECT APPLICATIONS.

Brine Tank Assembly 14 x 14

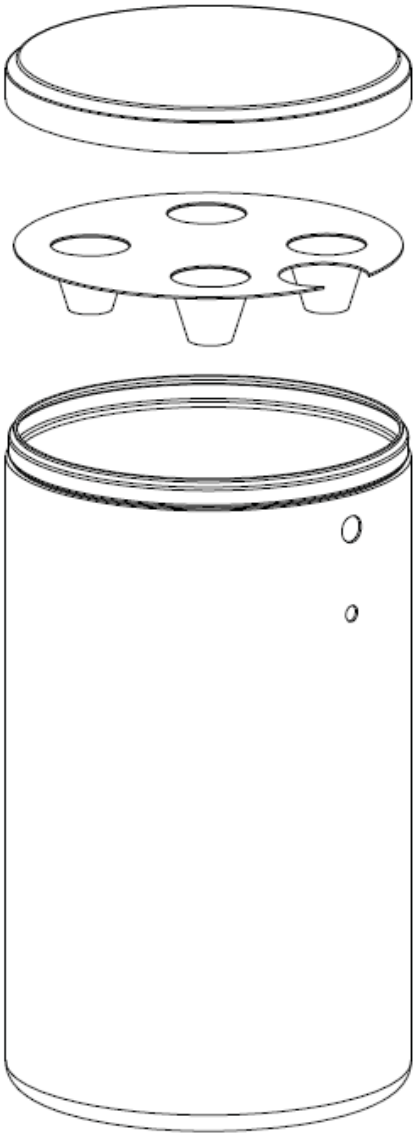
Item No.	Part No.	Description	Qty.
1	BTP-OVERFLOW	2 PIECE OVERFLOW SET	1
2	BTP-474 ASSY 4-30"	BRINE FLOAT ASSY 474-30	1

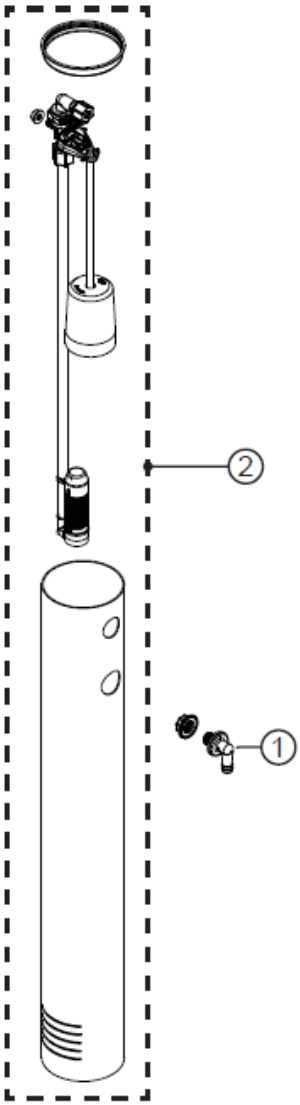




Brine Tank Assembly 18 x 40

Item No.	Part No.	Description	Qty.
1	BTP-OVERFLOW	2 PIECE OVERFLOW SET	1
2	BTP-474 ASSY 4-36"	BRINE FLOAT ASSY 474-36	1

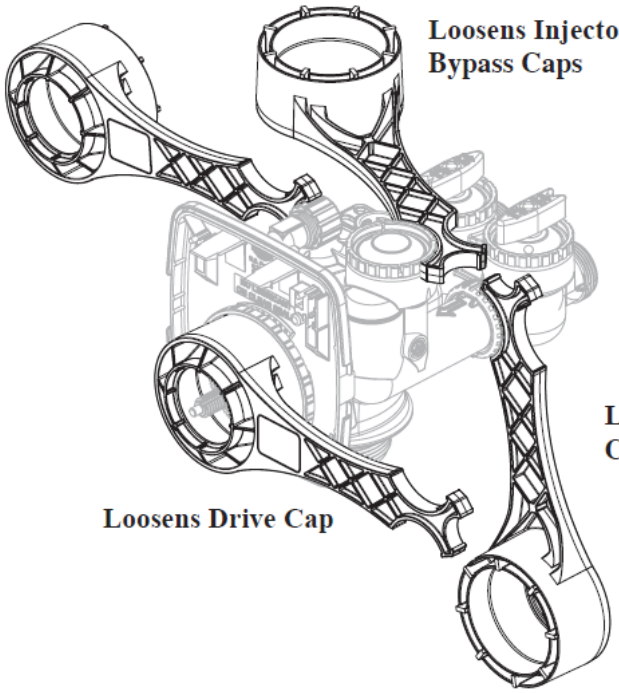




Service Wrench - CV-P-V3193-02

Not provided with system. Separate purchase required. Bypass and depressurize system before using wrench.

Loosens Drain Nut in Polytube Applications



Loosens Injector And Bypass Caps

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.

Loosens Quick Connect Nuts

Loosens Drive Cap

BYPASS VALVE OPERATION

Figure 1

NORMAL OPERATION

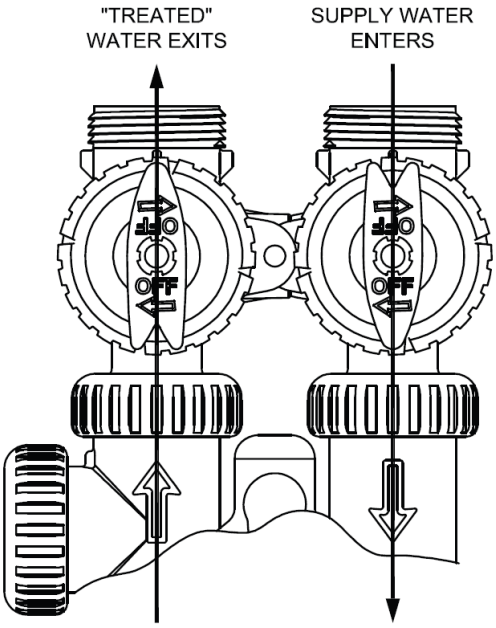


Figure 2

BYPASS OPERATION

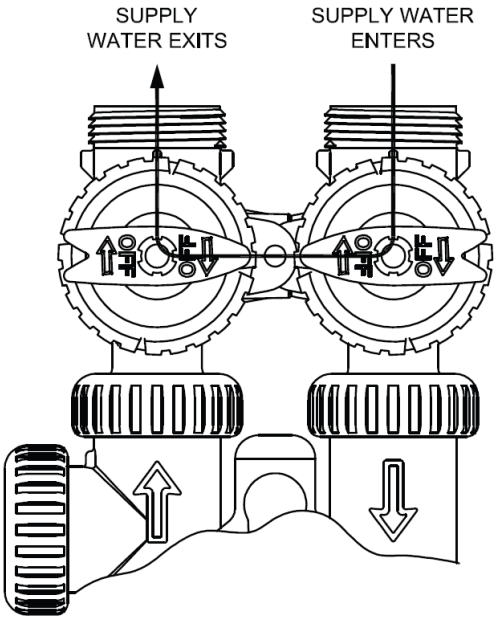


Figure 3

DIAGNOSTIC MODE

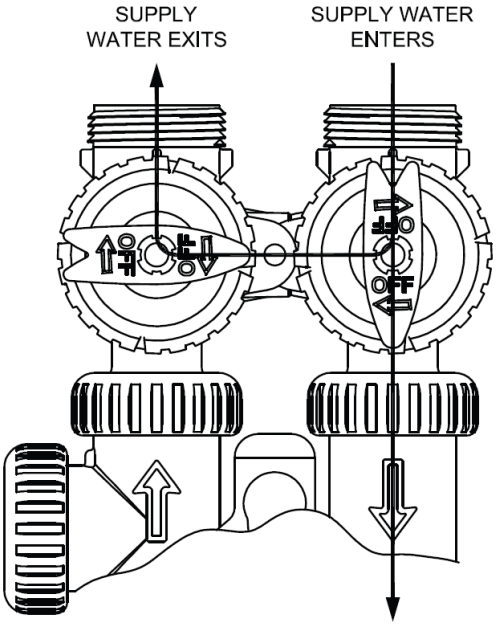
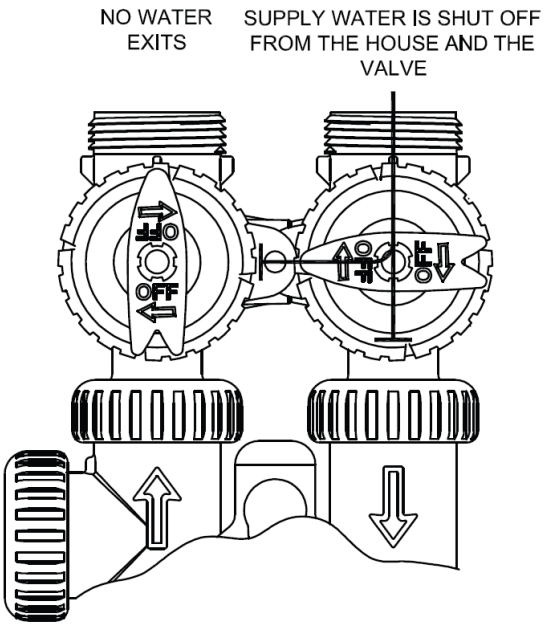


Figure 4

SHUT OFF MODE



Troubleshooting

Problem	Possible Cause	Solution
1. No Display on PC Board	a. No power at electric outlet	a. Repair outlet or use working outlet
	b. Control valve Power Adapter not plugged into outlet or power cord end not connected to PC board connection	b. Plug Power Adapter into outlet or connect power cord end to PC Board connection
	c. Improper power supply	c. Verify proper voltage is being delivered to PC Board
	d. Defective Power Adapter	d. Replace Power Adapter
	e. Defective PC Board	e. Replace PC Board
2. PC Board does not display correct time of day	a. Power Adapter plugged into electric outlet controlled by light switch	a. Use uninterrupted outlet
	b. Tripped breaker switch and/or tripped GFI	b. Reset breaker switch and/ or GFI switch
	c. Power outage	c. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	d. Defective PC Board	d. Replace PC Board
3. Display does not indicate that water is flowing. Refer to user instructions for how the display indicates water is flowing	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Meter wire not installed securely into three pin connector	d. Verify meter cable wires are installed securely into three pin connector labeled METER
	e. Defective meter	e. Replace meter
	f. Defective PC Board	f. Replace PC Board
4. Control valve 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 REGEN button is depressed and held.	a. Broken drive gear or drive cap assembly	a. Replace drive gear or drive cap assembly
	b. Broken Piston Rod	b. Replace piston rod
	c. Defective PC Board	c. Defective PC Board
7. Control valve does not regenerate automatically but **does** when the REGEN button is depressed and held.	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Incorrect programming	d. Check for programming error
	e. Meter wire not installed securely into three pin connector	e. Verify meter cable wires are installed securely into three pin connector labeled METER
	f. Defective meter	f. Replace meter
	g. Defective PC Board	g. Replace PC Board

Problem	Possible Cause	Solution
8. 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 Trouble Shooting Guide number 12
	g. Insufficient regenerant level in regenerant tank	g. Check refill setting in programming. Check refill flow control for restrictions or debris and clean or replace
	h. Damaged seal/stack assembly	h. Replace seal/stack assembly
	i. Control valve body type and piston type mix matched	i. Verify proper control valve body type and piston type match
	j. Fouled media bed	j. Replace media bed
9. Control valve uses too much regenerant	a. Improper refill setting	a. Check refill setting
	b. Improper program settings	b. Check program setting to make sure they are specific to the water quality and application needs
	c. Control valve regenerates frequently	c. Check for leaking fixtures that may be exhausting capacity or system is undersized
10. Residual regenerant being delivered to service	a. Low water pressure	a. Check incoming water pressure – water pressure must remain at minimum of 25 psi
	b. Incorrect injector size	b. Replace injector with correct size for the application
	c. Restricted drain line	c. Check drain line for restrictions or debris and clean
11. Excessive water in regenerant tank	a. Improper program settings	a. Check refill setting
	b. Plugged injector	b. Remove injector and clean or replace
	c. Drive cap assembly not tightened in properly	c. Re-tighten the drive cap assembly
	d. Damaged seal/ stack assembly	d. Replace seal/ stack
	e. Restricted or kinked drain line	e. Check drain line for restrictions or debris and or un-kink drain line
	f. Plugged backwash flow controller	f. Remove backwash flow controller and clean or replace
	g. Missing refill flow controller	g. Replace refill flow controller
12. Control valve fails to draw in regenerant	a. Injector is plugged	a. Remove injector and clean or replace
	b. Faulty regenerant piston	b. Replace regenerant piston
	c. Regenerant line connection leak	c. Inspect regenerant line for air leak
	d. Drain line restriction or debris cause excess back pressure	d. Inspect drain line and clean to correct restriction
	e. Drain line too long or too high	e. Shorten length and or height
	f. Low water pressure	f. Check incoming water pressure – water pressure must remain at minimum of 25 psi

Problem	Possible Cause	Solution
13. Water running to drain	a. Power outage during regeneration	a. Upon power being restored control will finish the remaining regeneration time. Reset time of day.
	b. Damaged seal/ stack assembly	b. Replace seal/ stack assembly
	c. Piston assembly failure	c. Replace piston assembly
	d. Drive cap assembly not tightened in properly	d. Re-tighten the drive cap assembly
14. 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	Possible Cause	Solution
16. E3, Err – 1003, Err – 103 = Control valve motor ran too long and was unable to find the next cycle position	a. Motor failure during a regeneration	a. Check motor connections then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	b. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	c. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
17. Err – 1004, Err – 104 = Control valve motor ran too long and timed out trying to reach home position	a. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	a. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.