

Up-Flow Filtration System
Installation and Operation Manual



Manufacturer's Warranty

To the original purchaser, the valve body, and Stainless Steel Tank carry an unconditional non-prorated 10-year guarantee, replaced F.O.B. Orem, Utah

The UF System manufactured by **Holts Water Conditioning** is unconditionally guaranteed against defects in workmanship and materials for a period of **1 year** from the date of original purchase at the original installation site.

Filter element carries a **1 year** warranty against defects. If filter degeneration is due to water quality the **1 year** warranty will be pro-rated from date of install.

Warranty coverage on all moving parts and electronics carry a limited 10 year warranty. Should any part or parts except those listed above prove defective after the initial two-year period from the original date of purchase and installation site, said part or parts will be repaired, rebuilt, or replaced at the manufacturer's option for a maximum charge of \$75.00 F.O.B Orem, Utah, provided the part is returned to the manufactures place of business, with transportation and other charges incurred in replacement or repair of defective parts paid by customer.

Holts Water Conditioning will not be held responsible/liable for Freight/shipping charges, labor/service charges, loss(property or other), or damages caused by a defective part.

The following items will Void this manufacturer's warranty:

- All systems must have main feed water pressure greater than 30 P.S.I. but lower than 90 P.S.I.
- All systems must have water temperature over 34 degrees Fahrenheit and under 90 degrees Fahrenheit. Any vacuum causing reverse flow allowing Hot water to enter any system will Void the Manufacturer's warranty.



**369 South Mountainway Drive Orem, UT 84058
(801) 426-9243**

General Warnings

1. The control valve, fittings and/or bypass are designed to accommodate minor plumbing mis-alignments but are not designed to support the weight of a system or the plumbing.

HYDROCARBONS SUCH AS KEROSENE, BENZENE, GASOLINE, ETC., MAY DAMAGE PRODUCTS THAT CONTAIN O-RINGS OR PLASTIC COMPONENTS. EXPOSURE TO SUCH HYDROCARBONS MAY CAUSE THE PRODUCTS TO LEAK. DO NOT USE THE PRODUCT(S) CONTAINED IN THIS DOCUMENT ON WATER SUPPLIES THAT CONTAIN HYDROCARBONS SUCH AS KEROSENE, BENZENE, GASOLINE, ETC.

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

2. Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicon lubricant may be used on black o-rings but is not necessary.
3. The nuts and caps are designed to be unscrewed or tightened by hand or with the special plastic wrench. 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 screwdriver in slots on caps and/or tap with a hammer.
4. Do not use pipe dope or other sealants on threads. Teflon tape must be used on the threads of the 1" NPT elbow or the 1/4" NPT connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connection or caps because of O-ring seals.
5. After completing any valve maintenance involving the drive assembly or the drive cap assembly and pistons, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack from the printed circuit board (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the software version (e.g. 154) and then reset the valve to the service position.
6. All plumbing should be done in accordance with local plumbing codes. The pipe size for the drain line should be a minimum of 1/2". Backwash flow rates in excess of 7 gpm or length in excess of 20' require 3/4" drain line.
7. 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.
8. 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-rings, split rings, bypass valve or control valve.
9. Plug into an electrical outlet. Note: All electrical connections must be connected according to local codes. (Be certain the outlet is uninterrupted.)
10. Install grounding strap on metal pipes.

Control Valve Function and Cycles of Operation

This glass filled Noryl¹ (or equivalent) fully automatic control valve is designed as the primary control center to direct and regulate all cycles of a water softener or filter. When the WS1 or the WS1.25 control valve is manufactured as a softener, the control valve can be ordered to perform downflow or upflow regeneration. When the WS1 or WS1.25 control valve is set up as a filter, the control valve can be set to perform downflow regeneration or simply backwash. The control valve can be set to regenerate on demand (consumption of a predetermined amount of water) and/or as a time clock (passage of a particular number of days). The control valve can be set so that a softener can meet the Water Quality Association (WQA) Standard S100 or NSF/ANSI Standard 44 efficiency rating.

It is not recommended to change control valves from downflow to upflow brining or vice versa in the field. The valve bodies for downflow and upflow are unique to the regeneration type and should not be interchanged. A mismatch of valve body and regeneration piston will result in hard water bypass during service.

The control valve is compatible with a variety of regenerants and resin cleaners. The control valve is capable of routing the flow of water in the necessary paths to regenerate or backwash water treatment systems. The injector regulates the flow of brine or other regenerants. The control valve regulates the flow rates for backwashing, rinsing, and replenishing treated water into a regenerant tank, when applicable.

The control valve uses no traditional fasteners (i.e., screws); instead, clips, threaded caps, nuts, and snap type latches are used. Caps and nuts only need to be firmly hand tightened because radial seals are used. Tools required to service the valve include one small blade screwdriver, one large blade screwdriver, pliers, and a pair of hands. A plastic wrench is available which eliminates the need for screwdrivers and pliers. Disassembly for servicing takes much less time than comparable products currently on the market. Control valve installation is made easy because the distributor tube can be cut 1/2" above to 1/2" below the top of tank thread. The distributor tube is held in place by an O-ring seal, and the control valve also has a bayonet lock feature for upper distributor baskets.

The DC wall adapter comes with a 15-foot power cord and is designed for use with the control valve. The DC wall adapter is for dry location use only. The control valve remembers all settings for up to 8 hours if the power goes out and the battery is not depleted. After 8 hours, the only item that needs to be reset is the time of day; other values are permanently stored in the nonvolatile memory. If a power loss lasts less than 8 hours and the time flashes on and off, the time of day should be reset and the non-rechargeable battery should be replaced.

Table 1 shows the order of the cycles when the valve is set up as a softener. When the WS1 or WS1.25 control valve is used as a downflow softener, 2 backwashes always occur. When the WS1 or WS1.25 control valve is used as an upflow softener, only one backwash occurs after brining. The OEM has the option of having the regenerant refill after the rinse cycle or have the regenerant pre-fill before regeneration. If the OEM chooses to have the regenerant pre-fill before regeneration, the pre-fill starts 2 hours before the regeneration time set. During the 2-hour period in which the brine is being made, treated (softened) water is still available. For example, if regeneration time is set to 2 a.m. with the pre-fill option selected on a downflow softener, fill will occur at 12 a.m. and the backwash cycle will occur at 2 a.m.

Introduction

Pre-Installation Checklist

1. A standard electrical outlet (120V/60Hz) must be located within 12' of the installation site.
2. A working floor drain, washer standpipe or suitable location for wastewater discharge should be within 20' of the installation site. (See General Warning #6.)
3. If a working pressure reducing valve is not already installed in the home, then one must be installed on the inlet water line that supplies the water softener.
Note: **The warranty is void if the system is exposed to water pressure in excess of 90 psi.**
4. If installed outside, then the temperature at the location of the water softener system must be kept above 40°F.

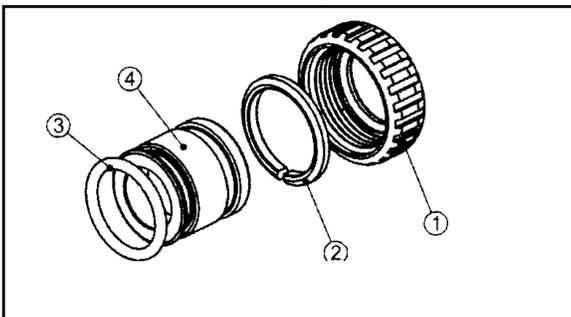
Installation

1. **Floor space:** Make sure the floor space that has been selected to install the water softener is clean and on a level surface. If it is not level, then a platform that supports the entire bottom surface of the brine tank must be used, do not use shims.
2. **Connection kit:** The standard connection kit supplied with the water softener will be a brass sweat connection kit (see Figure 1). Other kits and vertical adaptors are available.

This kit will consist of the following:

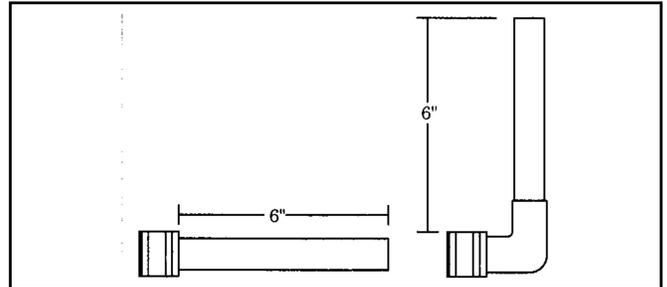
- 2 - Plastic nut 1" quick connect, black (#1)
- 2 - Plastic split ring, white (#2)
- 2 - O-Ring (#3)
- 2 - Brass connector 3/4" or 1" sweat (#4)

Figure 1



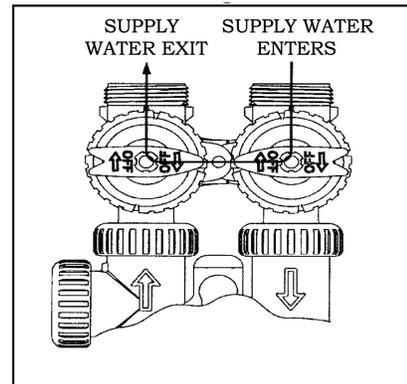
4. Solder at least 6" of pipe to the brass connectors before reassembly. (See Figure 2)

Figure 2



5. After soldering is complete, cool the pipe and connectors. Slide the plastic nuts (#1) over the brass connectors (#4). Place the white plastic split rings (#2) into the grooves closest to the copper pipe. Next place the O-Rings (#3) into the grooves closest to the end of the brass connectors (#4). Reassemble the completed connection kit onto the bypass assembly. (see General Warning #8)
6. **Plumbing:** As you are facing the front of the softener, the water enters on the right side and exits on the left. Arrows on the valve body indicate direction of flow. Connect the plumbing accordingly. Make sure the bypass valves are in the position shown in figure 3.

Figure 3

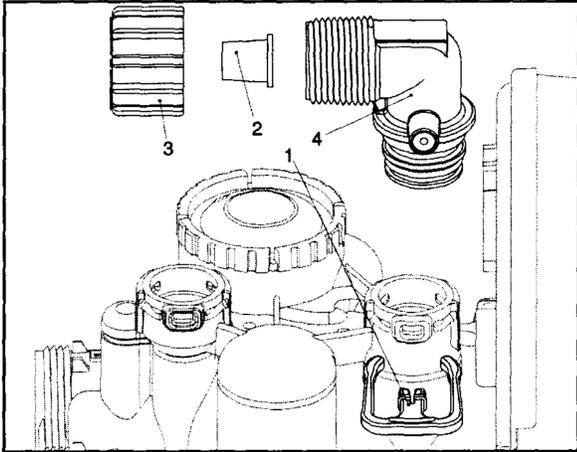


7. All plumbing should be done in accordance with local plumbing codes. (See General Warning #1.)

Installation

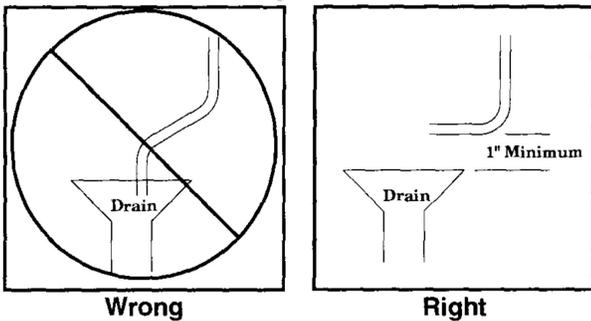
8. **Connecting the drain line:** Slide plastic nut (#3) over the permanent drain tubing and place the polytube insert (#2) into the end of the drain tubing. Insert the drain tubing into the drain elbow fitting (#4) and tighten plastic nut (#3) hand tight plus 1/2 turn with pliers.
Caution: Do Not Over tighten. (See Figure 4)

Figure 4



9. **Drain Line Specs:** If the distance from the water softener to the drain is greater than 20' the drain line size must be increased to 3/4". The threads on the drain elbow fitting are 3/4" male NPT and can be used in lieu of the 1/2" plastic nut and insert. If the drain line must run overhead, the maximum height of the drain line should not exceed 8' above the top of the water softener.
10. **Air Gap:** The drain line must have an approved air gap to prevent the possibility of a cross connection to the sewer. (See Figure 5)

Figure 5



13. The water softener is equipped with a 15-foot power cord with built-in transformer. Plug the power cord into a standard (120V 60Hz) electrical outlet. The motor will start running and in approximately 10 seconds you will see the display (this is normal). The water softener is now ready to be programmed.

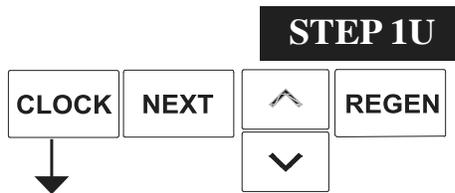
Programming

Programming the Controller

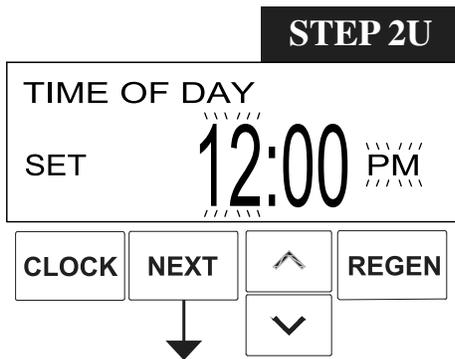
Set Time of Day:

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 flashes, which indicates the time of day should be reset and the non-rechargeable battery replaced.

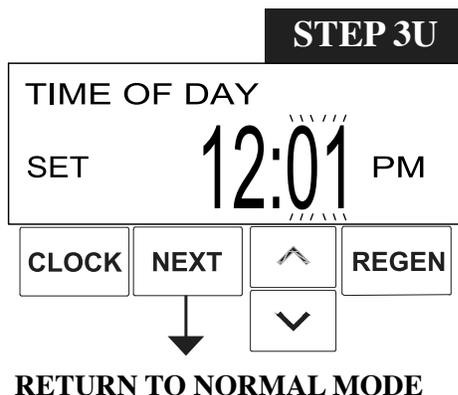
Step 1U – Press CLOCK.



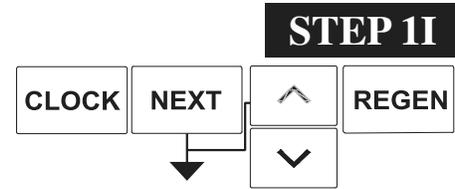
Step 2U – Current Time (Hour): Use ▼ or ▲ to set the hour of the day. a.m./p.m. toggles after 12. Press



Step 3U – Current Time (Minutes): Use ▼ or ▲ to set the minutes of the day. Press NEXT to exit Set Time of Day. Press REGEN to return to previous step.



Step 1I – Press NEXT and ▲ simultaneously for 3 seconds.



Step 2I–Day Override: If Volume Capacity is set to *OFF*, sets the number of days between regenerations. If Volume Capacity is set to *AUTO* or to a number, sets the maximum number of days between regenerations. Use or to select one of the following options:

- A number (1-28): Regeneration initiation is called for every set number of days even if sufficient volume of water was not used to call for a regeneration.
- *OFF*: Regeneration initiation is based solely on volume used.

Press NEXT to go to Step 4I. Press REGEN to return to previous step.

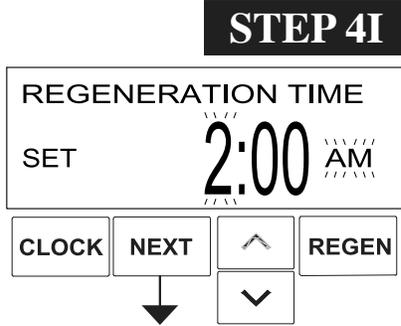


Notes:

1. When in operation, the display can show either time of day or capacity remaining by pressing the **NEXT** button.
2. If the system has called for a regeneration at the preset time, the words **REGEN TODAY** will appear on the display.
3. When water is flowing through the system the word "Softening" flashes on the display.

Programming

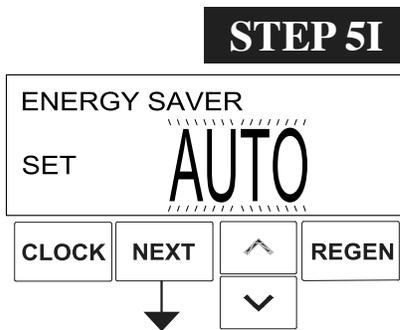
Step 4I – Regeneration Time: Use ▼ or ▲ to set the hour of day for regeneration. a.m/p.m. toggles after 12. The default time is 2:00a.m. Press NEXT to set the minutes. This display does not appear if Regeneration Time Option is set to *IMMEDIATE REGENERATION*. Once the minutes are set, press NEXT to go to Step 5I. Press REGEN to return to previous step.



Step 5I – Energy Saver: Use ▼ or ▲ to select one of the following options:

- ON: The control automatically turns off the display backlight after 5 mins of keypad inactivity. The display will re-illuminate for 5 minutes after any keypad activity or water use.
- AUTO: The display backlight automatically turns off after 5 minutes of keypad inactivity. The display backlight will re-illuminate after any keypad activity, flow detection, valve error, salt alarm, or service alarm.
- OFF: The display backlight is always on.

Press NEXT to exit Installer Display Settings. Press REGEN to return to previous step.



Start-Up Instructions

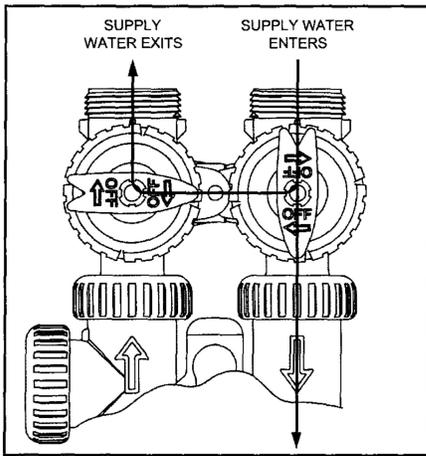
1. Manually Cycling the Controller:

Step 1: Initiate a manual regeneration by pressing and holding the REGEN button until you hear the drive motor turn on (approx. 6 sec.). When the motor stops running press the "REGEN" button four times until "BACKWASH" each time waiting for motors to stop cycling

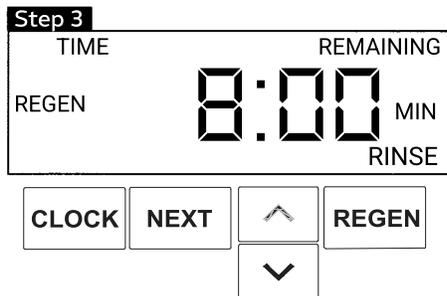


Step 2: Slowly open the red inlet bypass handle by turning it counter clockwise. The handles should now be in the same position as in Figure 1 (Bypass handles may be slightly difficult to turn.)

Figure 1

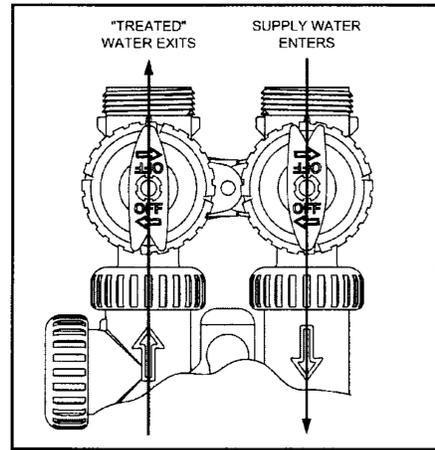


Step 3: Press the REGEN button. The drive motor will run and the "RINSE" display will flash until the drive motor stops.



Step 4: Slowly open the red outlet bypass handle by turning it counter clockwise. The handles should now be in the same position as in Figure 2 (Bypass handles may be slightly difficult to turn.)

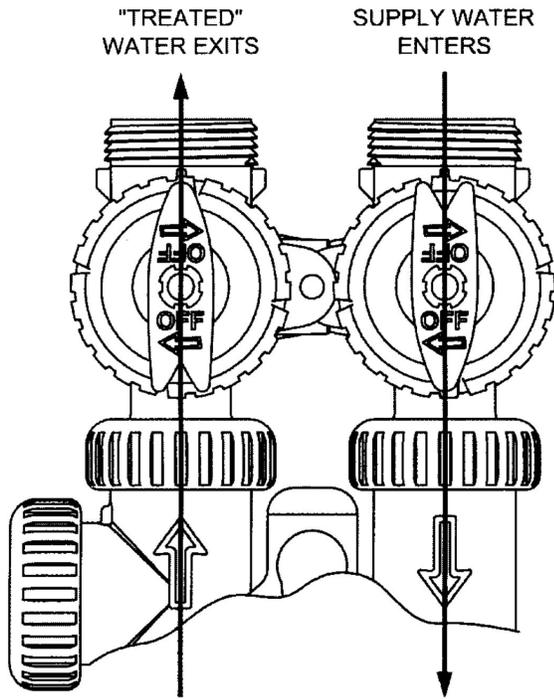
Figure 2



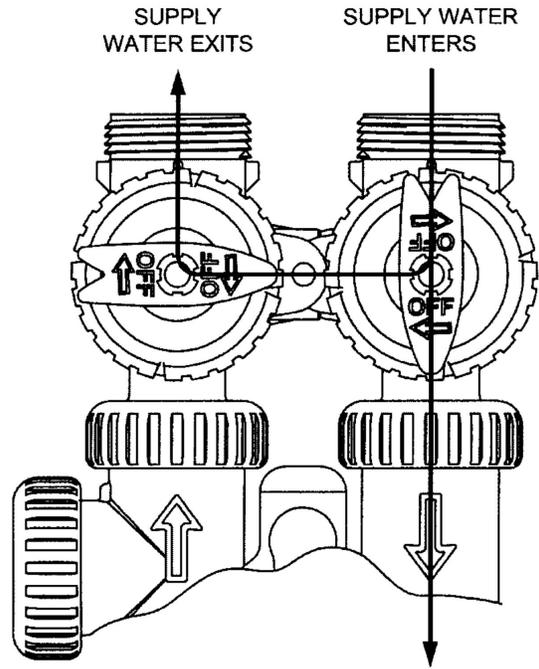
Step 5: With start-up complete, tap the "REGEN" button. "REGEN TODAY" should be flashing on the display. This will allow the system to cycle tonight. The UF System is now ready for use.

Bypass Valve Operation

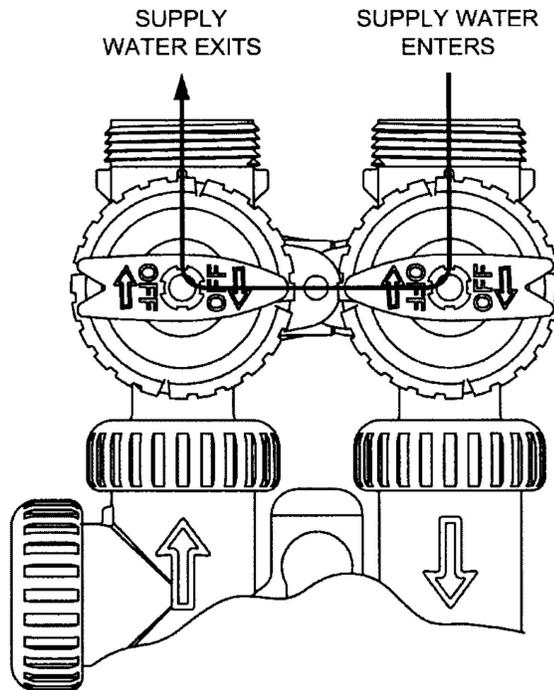
NORMAL OPERATION



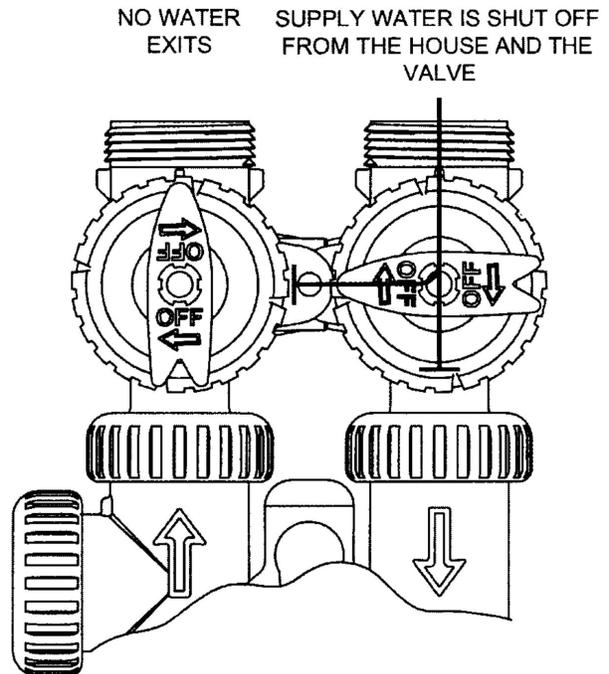
DIAGNOSTIC MODE



BYPASS OPERATION



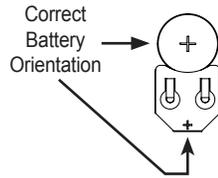
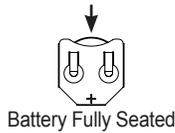
SHUT OFF MODE



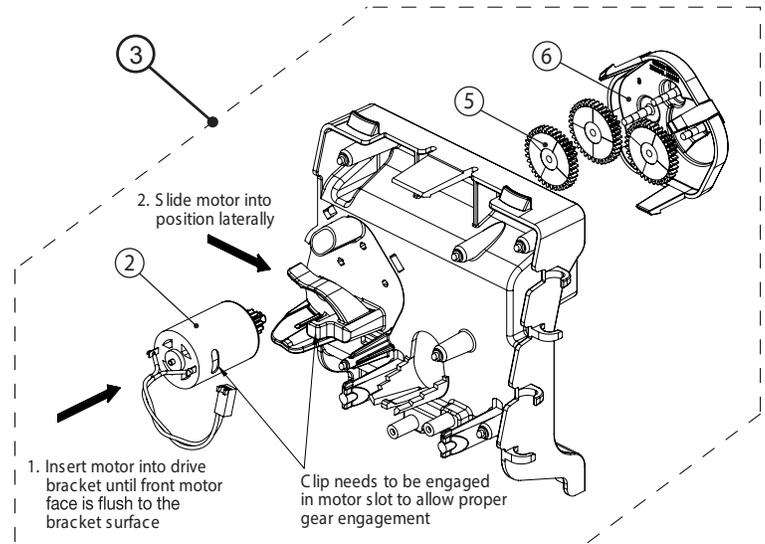
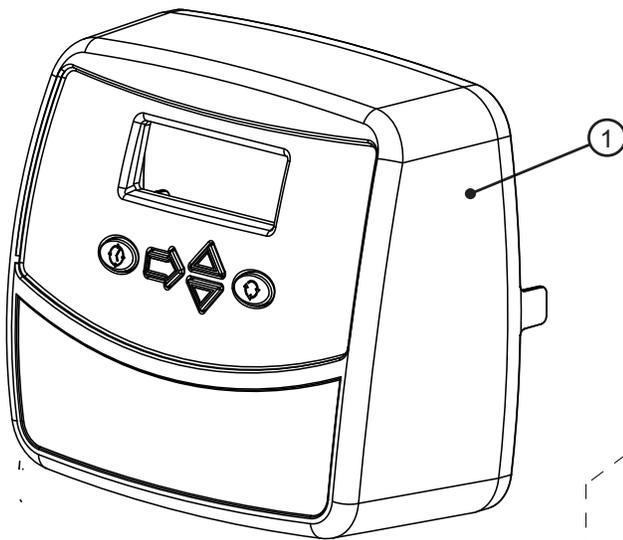
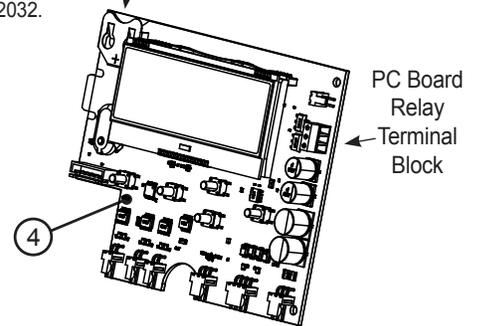
Front Cover and Drive Assembly

| Drawing No. | Order No. | Description | Quantity |
|-------------|---------------|---------------------------------------|----------|
| 1 | V4594-01 | HW FRONT COVER ASY BLACK | 1 |
| 2 | V3107-01 | WS1 MOTOR ASY | 1 |
| 3 | V3002 | DRIVE BRACKET ASY W/ MOTOR | 1 |
| 4 | V3758HW-BOARD | WS1 THRU 2 HW PCB REPL | 1 |
| 5 | V3110 | WS1 DRIVE REDUCING GEAR 12X36 | 3 |
| 6 | V3109 | WS1 DRIVE GEAR COVER | 1 |
| Not Shown | V3186-06 | WS1 POWER SUPPLY US 15VDC HOCP | 1 |
| | V3186AUS-05OD | WS1 POWER SUPPLY AUS 15VDC VI OUTDOOR | |
| | V3186EU-06 | WS1 POWER SUPPLY EU 15VDC HOCP | |
| | V3186UK-06 | WS1 POWER SUPPLY UK 15VDC HOCP | |
| Not Shown | V3186-01 | WS1 POWER CORD ONLY | |
| Not Shown | V3946 | BACKPLATE MIDSIZE | 1 |

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



Battery replacement is 3 volt lithium coin cell type 2032.

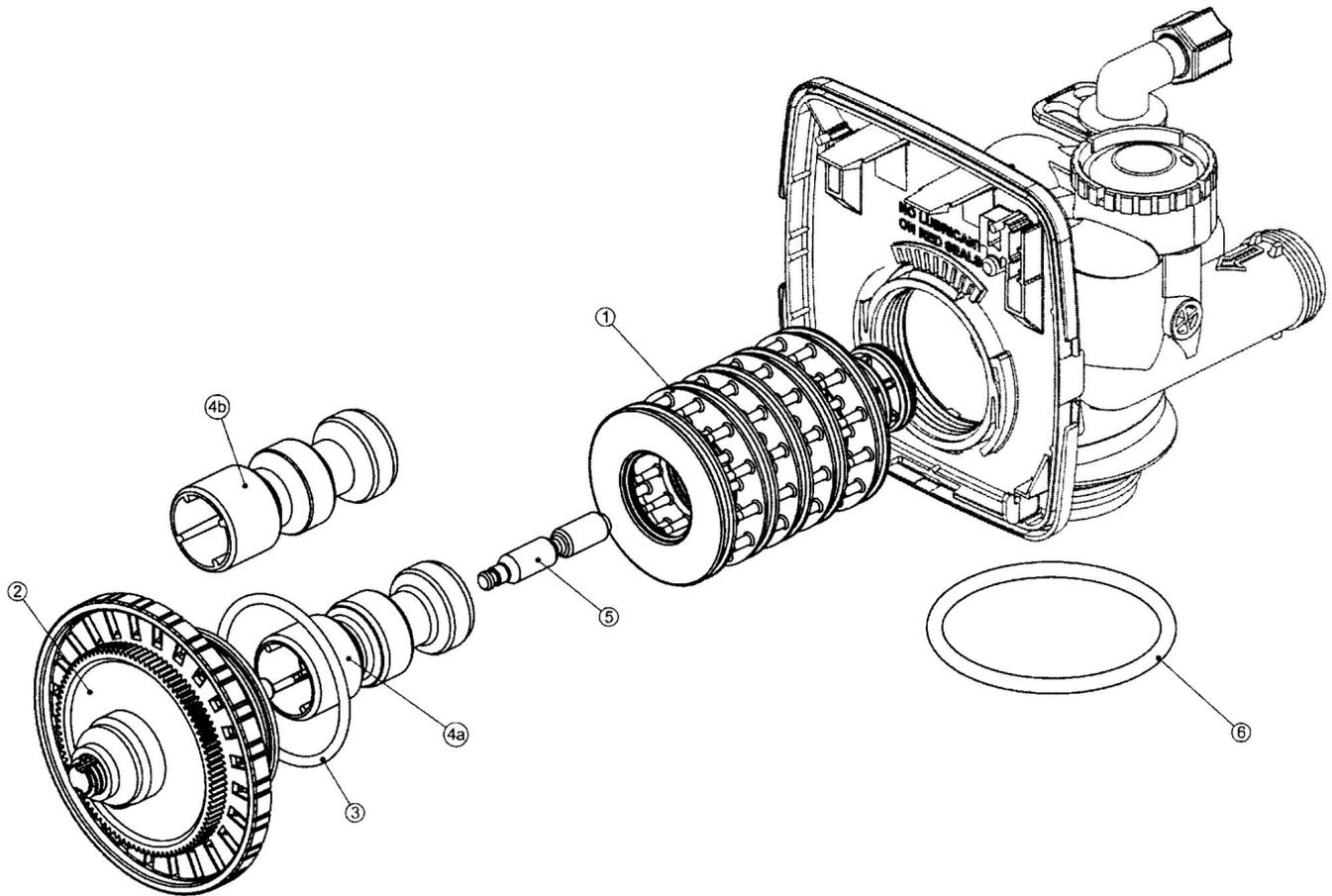


Internal Parts Breakdown

| Drawing No. | Order No. | Description | Quantity |
|-------------|-----------|---------------------------|----------|
| 1 | V3005 | WS1 Spacer Stack Assembly | 1 |
| 2 | V3004 | Drive Cap ASY | 1 |
| 3 | V3135 | O-ring 228 | 1 |
| 4a | V3011* | WS1 Piston Downflow ASY | 1 |
| 4b | V3011-01* | WS1 Piston Upflow ASY | 1 |
| 5 | V3174 | WS 1 Regnerant Piston | 1 |
| 6 | V3180 | O-ring 3371 | 1 |

***V3011 is labeled with DN and V3011-01 is labeled with UP.**

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

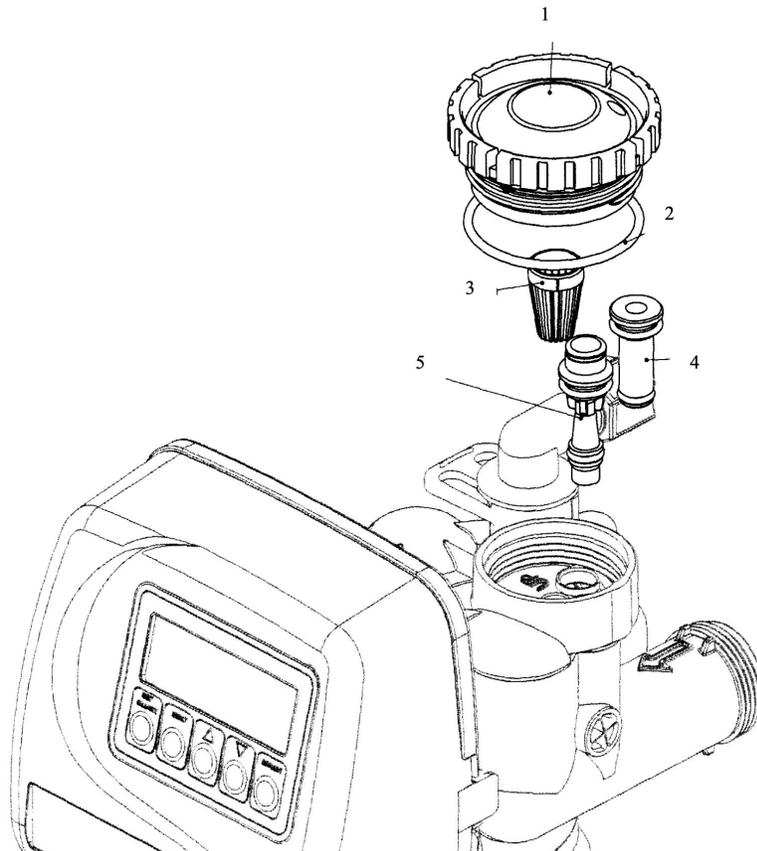


Injector Assembly Breakdown

| Drawing No. | Order No. | Description | Quantity |
|-------------|--------------------------------|--------------------------------|----------|
| 1 | V3176 | Injector Ca 1 | 1 |
| 2 | V3152 | O-ring 135 1 | 1 |
| 3 | V3177 | Injector Screen 1 | 1 |
| 4 | V3010-1I | WSI Injector ASY G Plug I | 1 |
| 5 | V3010-1A | WS I INJECTOR ASY A BLACK | 1 |
| | V3010-1B | WSI INJECTOR ASY B BROWN | |
| | V3010-1C | WS I INJECTOR ASY C VIOLET | |
| | V3010-1D | WS I INJECTOR ASY D RED | |
| | V3010-1E | WS I INJECTOR ASY E WHITE | |
| | V3010-1F | WSI INJECTOR ASY F BLUE 1 | |
| | V3010-1G | WS I INJECTOR ASY G YELLOW | |
| | V3010-1H | WS I INJECTOR ASY H GREEN | |
| | V3010-1I | WS I INJECTOR ASY I ORANGE | |
| | V3010-1J | WS I INJECTOR ASY J LIGHT BLUE | |
| V3010-1K | WSI INJECTOR ASY K LIGHT GREEN | | |
| Not Shown | V3170 | O-ring 0 111 | * |
| Not Shown | V3171 | O-ring 013 | * |

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

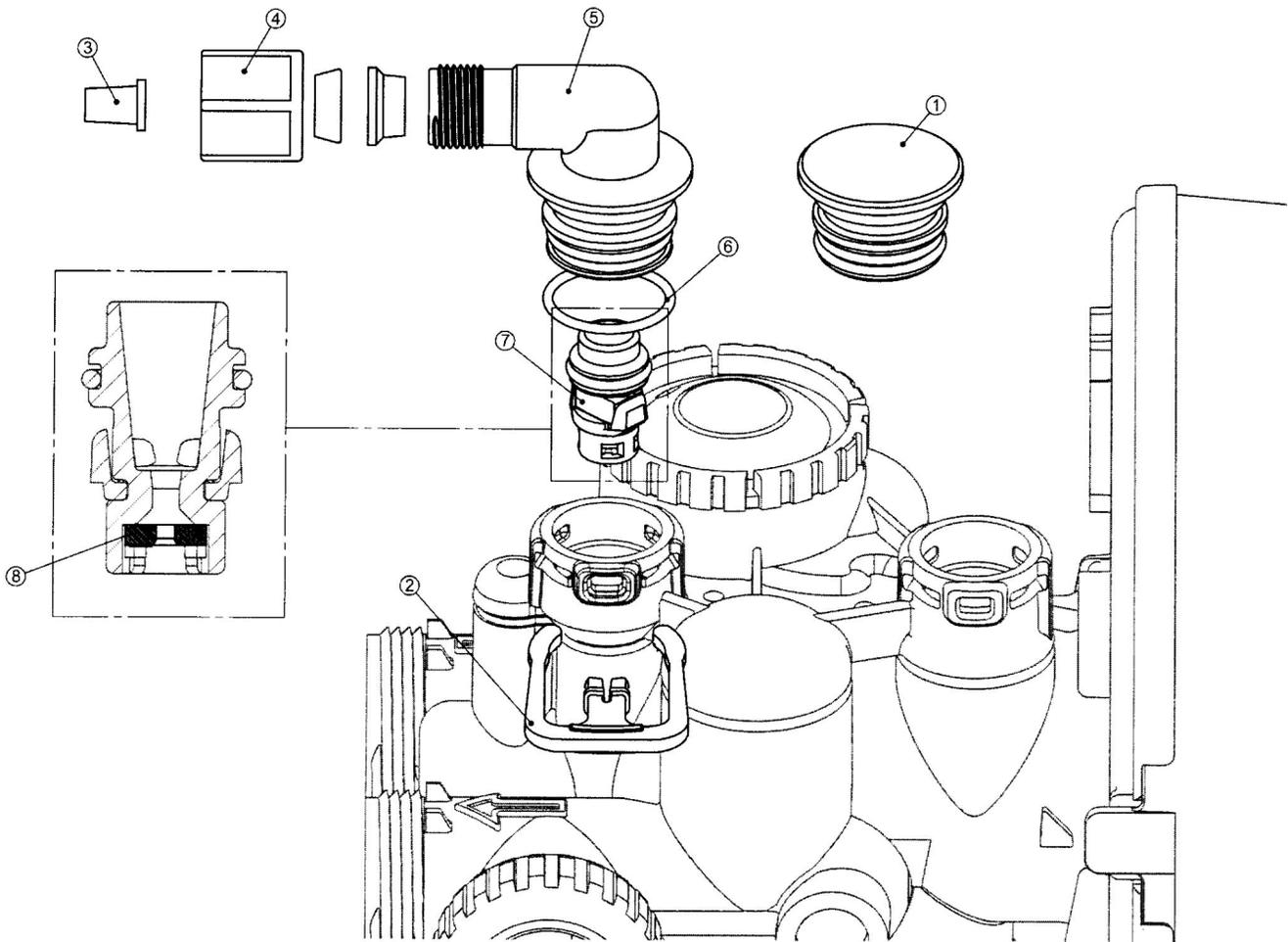
Note: For upflow position, injector is located in the up hole and injector plug in the down hole. For a filter that only backwashes injector plugs are located in both holes



Brine Elbow Assembly Breakdown

| Drawing No. | Order No. | Description | Quantity |
|------------------|------------|--------------------------------|--|
| 1 | V3195-01 | WSI Refill Port Plug ASY | This art is required for backwash only systems |
| 2 | H4615 | Elbow Lock in Clip | 1 |
| 3 | JCP-P-6 | Pol tube insert 3/8 | 1 |
| 4 | JCPG-6PBLK | Nut 3/8 | 1 |
| 5 | H4613 | Elbow Cap 3/8 | 3 |
| 6 | V3163 | O-ring 019 | 1 |
| 7 | V3165-01* | WS I RFC Retainer ASY | * |
| 8 | V3182 | WSI RFC | 1 |
| Not Shown | H4650 | Elbow 1/2" with nut and insert | Option |

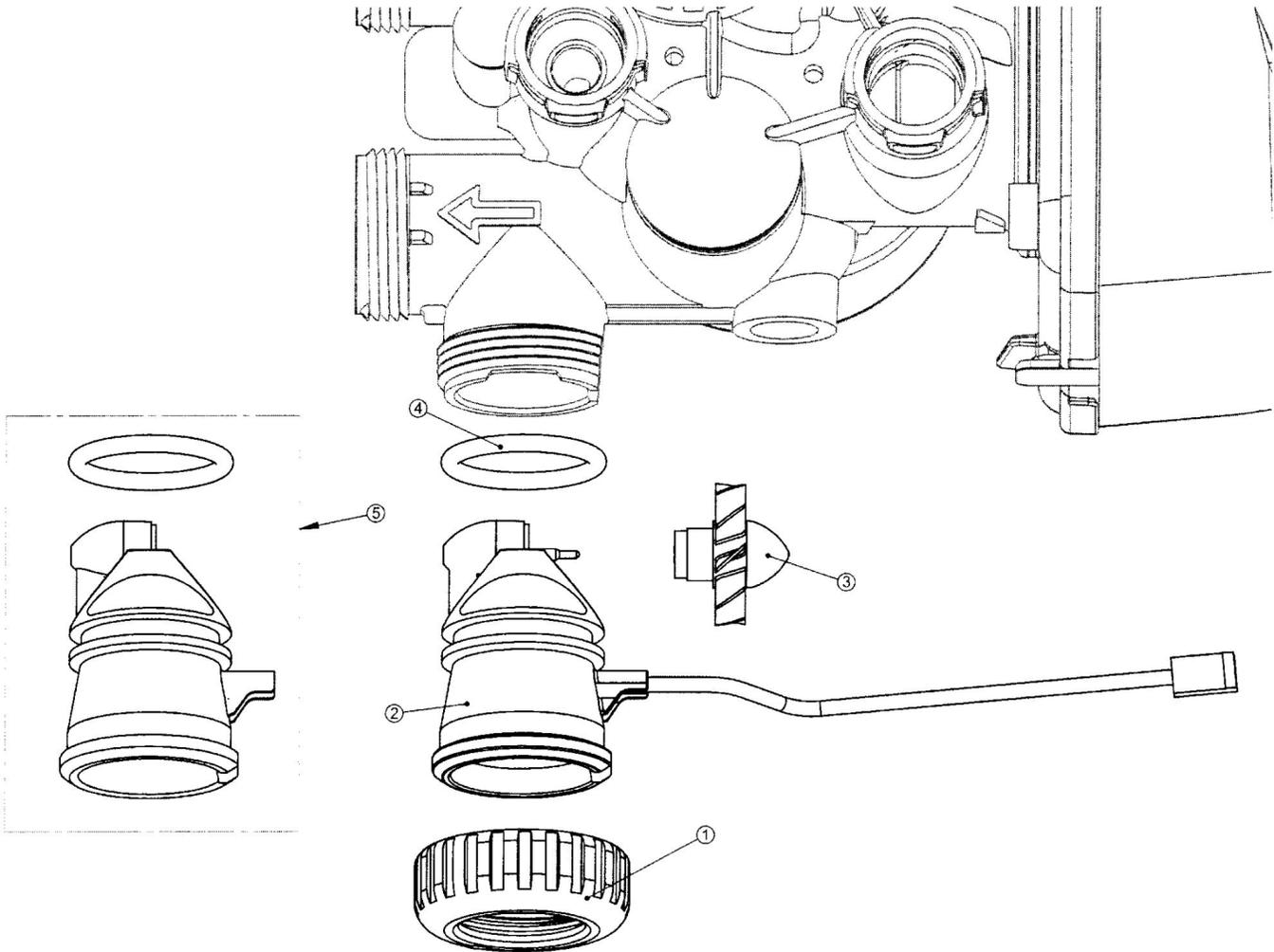
*Assembly includes WS I RFC.



Meter Assembly Breakdown

| Drawing No. | Order No. | Description | Quantity |
|-------------|-----------|---------------------|----------|
| 1 | V3151 | WSI Nut 1" QC | 1 |
| 2 | V3003* | WSI Meter ASY | 1 |
| 3 | V3118-01 | WS I Turbine ASY | 1 |
| 4 | V3105 | O-ring 215 | 1 |
| 5 | V3003-01 | WS I Meter Plug ASY | 1 |

*Order number V3003 includes V3118-01 and V3105.

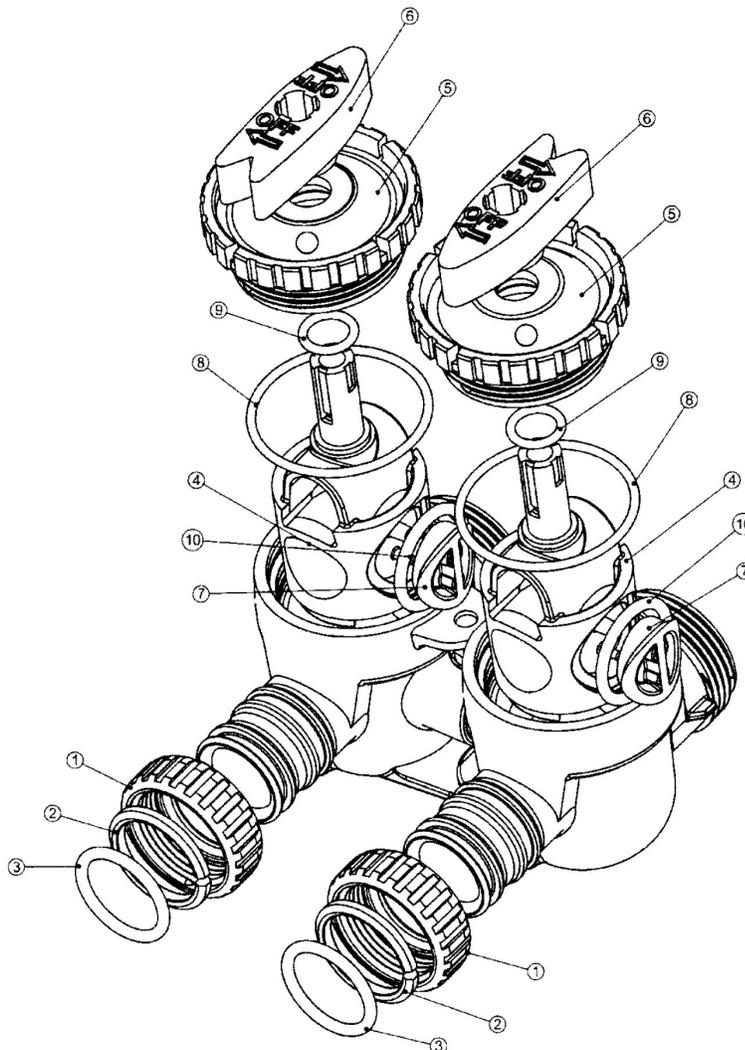


Bypass Assembly Breakdown

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

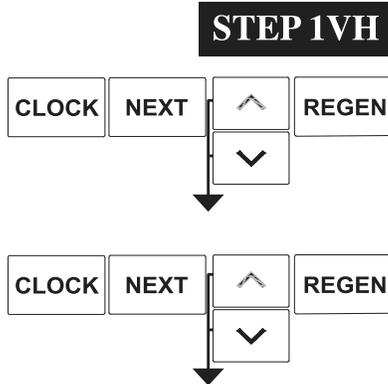
(Not Shown) Order No. V3191-01, Description: WS I Bypass Vertical Adapter Assembly

| Order No. | Description | Quantity |
|-----------|---|----------|
| V3151 | WS I Nut 1" Quick Connect | 2 |
| V3150 | WS I Slit Ring | 2 |
| V3105 | O-Ring 215 | 2 |
| V3191-01 | WS I Bypass Vertical Adapter Assembly 2 | 2 |

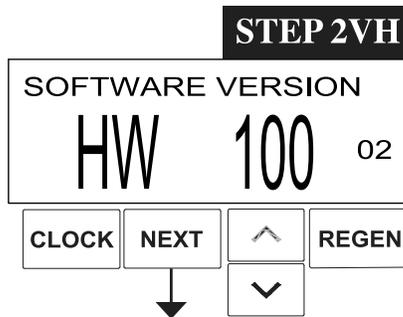


Valve History

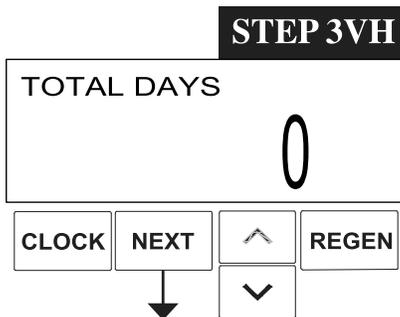
Step 1VH – Press ▼ and ▲ simultaneously for 3 seconds and release. Then press ▼ and ▲ simultaneously for 3 seconds again and release. If screen in Step 2VH does not appear in 5 seconds, the lock on the valve is activated. To unlock, press ▼, NEXT, ▲, and CLOCK in sequence and try again.



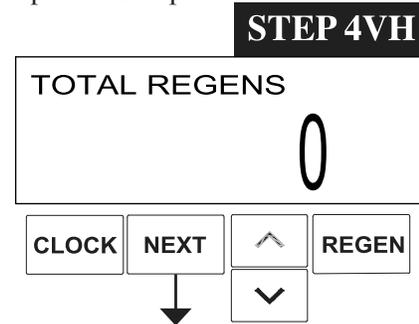
Step 2VH – Software Version. Press NEXT to go to Step 3VH. Press REGEN to exit Valve History.



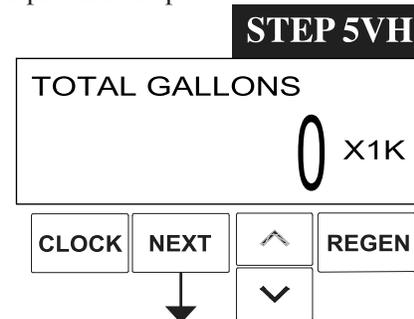
Step 3VH⁵ – Total Days Since Startup. Press NEXT to go to Step 4VH. Press REGEN to return to previous step.



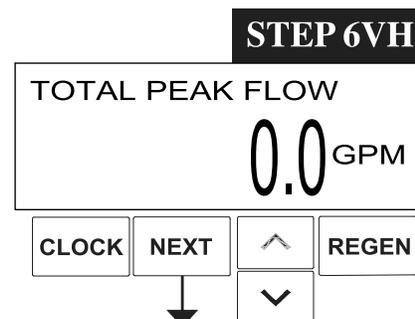
Step 4VH – Total Regenerations Since Startup. Press NEXT to go to Step 5VH. Press REGEN to return to previous step.



Step 5VH – Total Volume Used Since Startup: This display shows zero if a water meter is not installed. Press NEXT to go to Step 6VH. Press REGEN to return to previous step.



Step 6VH – Maximum Flow Rate Since Startup. Press NEXT to go to Step 7VH. Press REGEN to return to previous step.

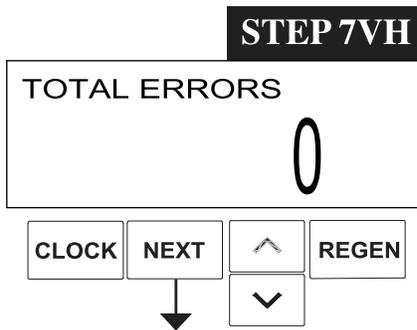


⁵ Values in Step 3VH – Step 8VH cannot be reset.

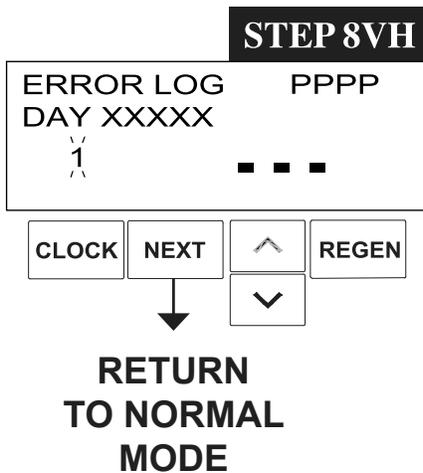
Valve History

Step 7VH – Total Errors Since Startup.

Press NEXT to go to Step 8VH. Press REGEN to return to previous step.



Step 8VH – Error Log: Use ▼ or ▲ to scroll through the last 10 errors generated by the control during operation. PPPP = Motor position at the time of error detection (w/logged drive errors) DAY XXXXX = Upon error detection, day count viewed in Step 3VH – Total Days Since Startup. Press NEXT to exit Valve History. Press REGEN to return to previous step.



Trouble Shooting 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 |
| | d. Defective PC board | d. 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 0" (immediate regeneration) | d. Check control valve set-up procedure regeneration time option |
| | e. Control valve set at NORMAL + on 0 | e. Check control valve set-up procedure regeneration time option |
| 5. ERROR followed by code number Error Code 1001 - Unable to recognize start of regeneration Error Code 1002 - Unexpected stall Error Code 1003 - Motor ran to long, timed out trying to reach next cycle position Error Code 1004 - 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 | b. Check motor and wiring. Replace motor if necessary |
| | f. Motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure | f. Check motor and wiring. Replace motor if necessary |
| | g. Drive bracket incorrectly aligned to back plate | g. Reseat 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 on to 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 |

Trouble Shooting Procedures

| Problem | Possible Cause | Solution |
|--|---|--|
| 7. Control valve does not regenerate automatically when REGEN button is depressed and held | a. Transformer unplugged | a. Connect power |
| | 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 | a. By-pass valve in bypass position | a. Put control 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 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 |

Manufactured with pride in Utah By:



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