



## **WATER SOFTENER 1.5" DUPLEX INSTALLATION AND USER GUIDE**



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## 1) INSTALLATION

### 1.1) Pre-installation instructions

The cycle times, sequence of cycles, salt dose refill time and exchange capacity are preset to default by Excalibur. Installer must program the valve to recommended hardness, Day override and time of regeneration. Set time of day, read normal operating displays, read power loss and error displays if any.

#### WATER TEST

Hardness	_____	gpg
Iron	_____	ppm
pH	_____	number
*Nitrates	_____	ppm
Manganese	_____	ppm
Sulphur	_____	yes/no
Total Dissolved Solids	_____	

### 1.2) General Installation and Service Warnings

- The softener is designed so that it can be installed easily with minor plumbing changes on previous plumbing.
- The piping must be clamped properly and the weight of the plumbing must not be on the softener.
- Do not use any kind of lubricant including silicone. A silicone based lubricant can be only used on O- Rings but not necessary.
- The nuts and caps can be fastened and unfastened by hand or the plastic service wrench. Do not use pipe wrench to tighten the caps and nuts.

### 1.3) Site Requirements

- Water Pressure: - 40-110 psi
- Water Temperature: - 40-110°F (4.4-43°C)
- Electrical- 115/120 V, 60Hz Uninterrupted Outlet
- Current required is 0.5 Amperes
- The plug-in transformer is for dry locations only
- The tank should be on a firm level surface

## 1.4) Loading Instructions

**Step 1:** Check the product upon removal and remove from box packaging checking for any shipping damage or shortages that must be reported to Excalibur Water Systems immediately for confirmation.

**Step 2:** Insert distributor(s) inside of media mineral tank(s) so it is positioned properly in the bottom centre groove. If not already sized properly cut the top of the distributor pipe  $\frac{1}{2}$  -  $\frac{3}{4}$ " above top of tank opening and clean off and excess PVC materials with grit cloth.

**Step 3:** Plug the top inlet opening of the distributor (Hub & Lateral) or bottom stack with a clean cloth, rag, or tape to prevent any gravel or resin from entering into the distributor tube.

**Step 4:** Load the gravel under bedding onto the mineral tank using a funnel or some sort of loading device. If multiple layers of gravel with different sizes being utilized always load the largest gravel size in diameter to the smallest last.

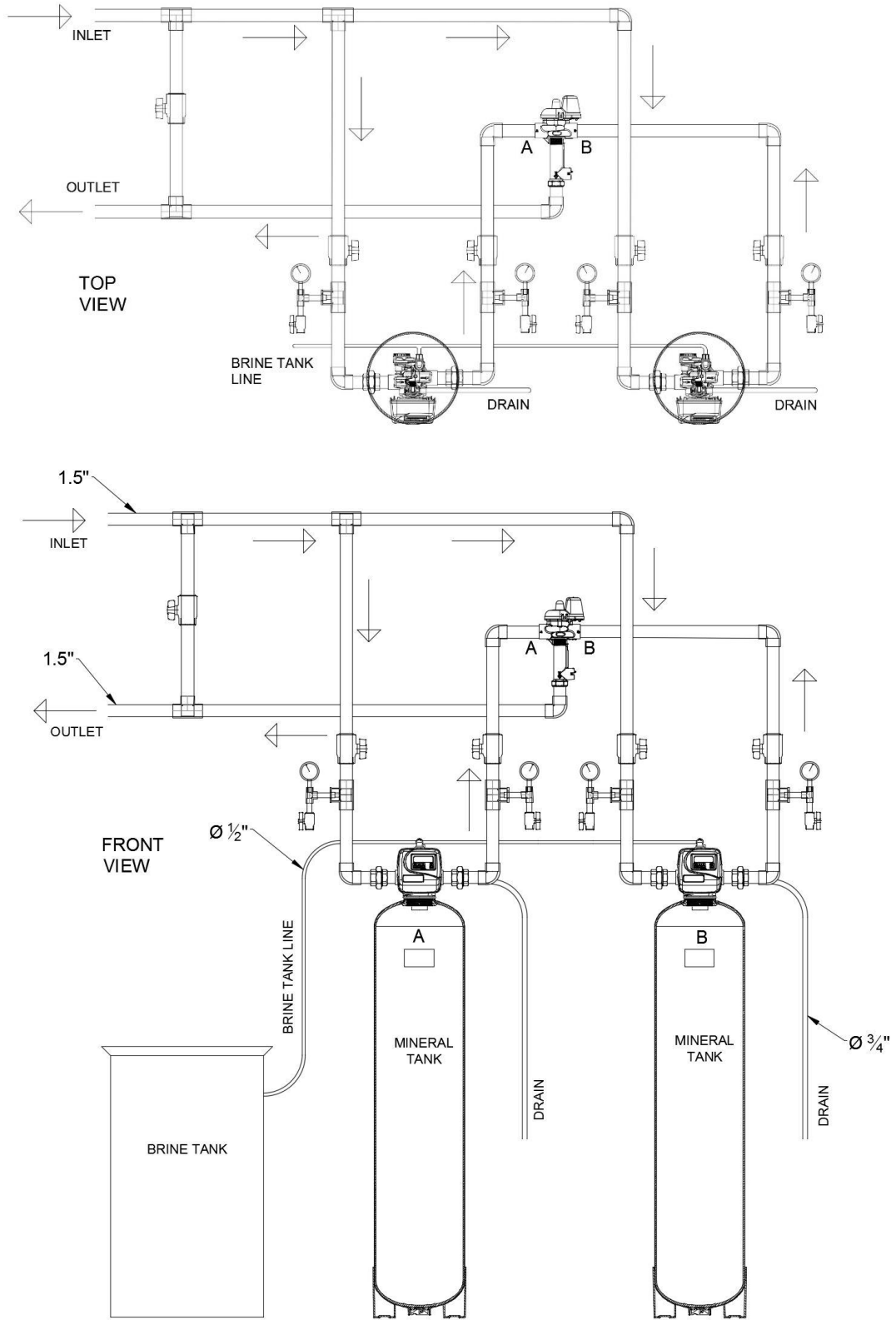
**Step 5:** Load the water softening cation exchange resin also by the use of a funnel or some sort of loading device until all resin is inside of mineral tank. If loading a duplex system that has two tanks divide the resin and gravel up equally when loading.

**Step 6:** Remove top opening cover of the distributor carefully not to move or disturb the distributor tube not allowing any debris or materials to get inside of the now loaded softener(s).

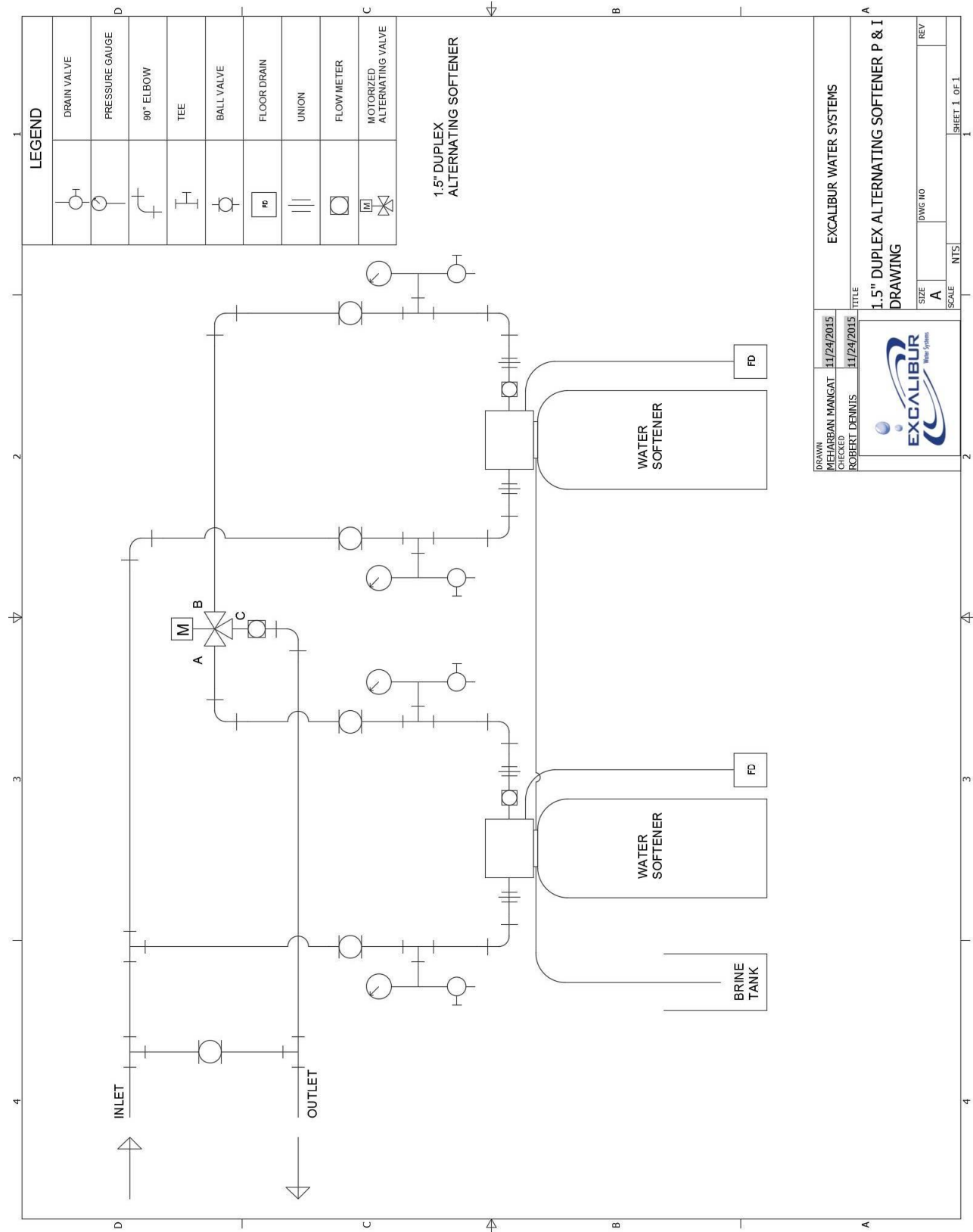
**Step 7:** Thread on control valves onto top opening tanks be sure to check and verify that the O-ring on the bottom base of the control valve is present and properly lubricated with silicone. Tighten control valve(s) clockwise until you have reached the end of the thread and have secured a water tight seal. (If control valves that utilize quick connect collars thread the collars the same into the tanks then attach control valves).

**Step 8:** Precede now with the unit(s) in their proper installation locations to run piping and materials for all inlet, outlet, and drain connections properly with isolation valves and test ports for future water tests. Also, unions should be included in installation materials for easy future servicing of the control valves when necessary on all inlet, outlet, and drain lines.

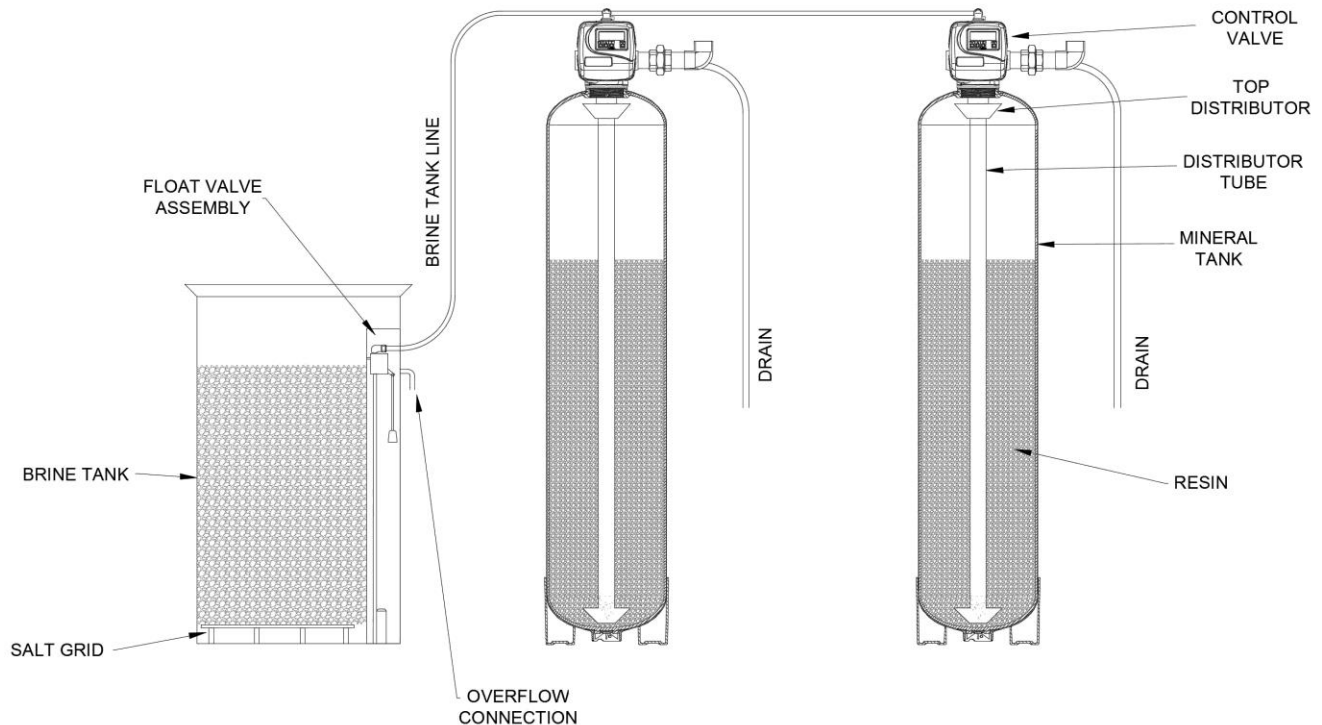
### 1.5) Installation Drawing



### 1.6) Piping and Instrumentation Drawing



## 1.7) System Drawing



## 1.8) Plumbing

- The 3-way bypass valves must be installed.
- The softener system must be close to drain as much as possible.
- The primer, solder or solder flux must not get on the O-rings.
- After soldering the lines must be cooled before installing the O-Rings, nuts and caps.
- If the electrical system is grounded to the plumbing than copper strap must be connected between inlet and outlet as shown in figure above.
- The plumbing must be done by following the local plumbing codes.
- The water heater's inlet and outlet must be at least 10ft away from softener.
- The unit including the drain must be located in a room temperature above 40° F.
- Never let the vacuum occur in tank this may cause implosion and leakage. If vacuum occurrence is expected than vacuum breaker must be installed in line.

## 1.9) Brine Line Connection

Install the 1/2" or 3/4" O.D. Polyethylene tube according to specification sheet from the brine tank to the control valve.



### 1.10) Overflow Line Connection

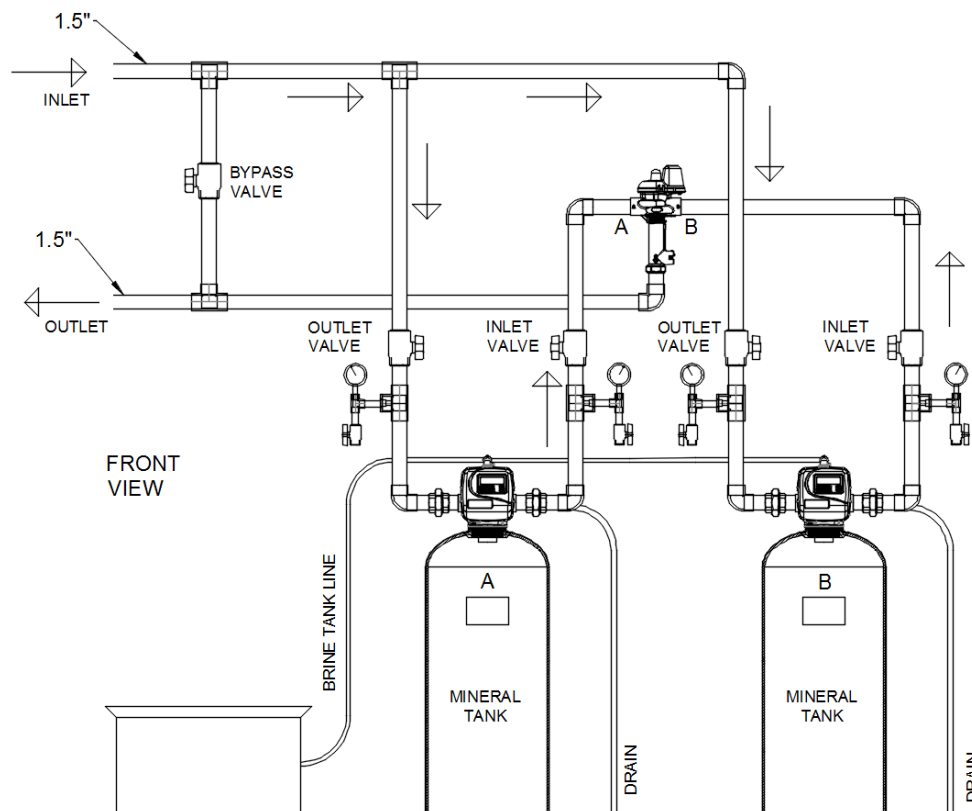
The overflow drain line is used where overflow of the brine tank can damage the floor finishing or structure. The brine tank line is equipped with safety float valve which prevents the overflow so, the overflow line is only used in case is overflow float valve fails. The overflow line will transfer fluid from brine tank to the drain hence prevents the spillage.

### 1.11) Drain Line

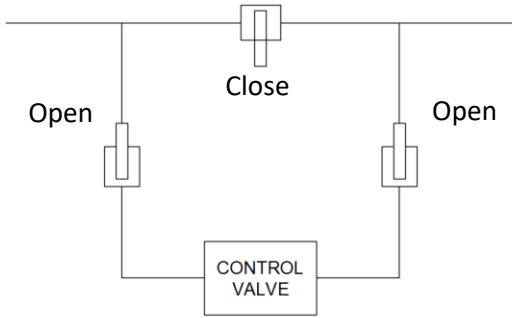
- The size of the drain must be according to the specifications.
- Leave minimum of 6" gap between flow control fitting and solder joints. The gap less than this can damage the flow control.
- Use  $\frac{3}{4}$ ", 1" or 1.25" tubing for drain line according to the specifications.
- If the drain line is elevated and then emptied into the drain below the level the of control valve the 7" loop should make at the end of drain line.
- The air gap between the drain and the end of the drain line must be twice the diameter of the tube.
- The strap must be tied at the end to secure the line.

### 1.12) 3-Way Bypass Valve

The shut off valves must be installed at inlet and outlet of control valve. The bypass pipe including the ball valve must also be installed to bypass the hard water to demand outlet.

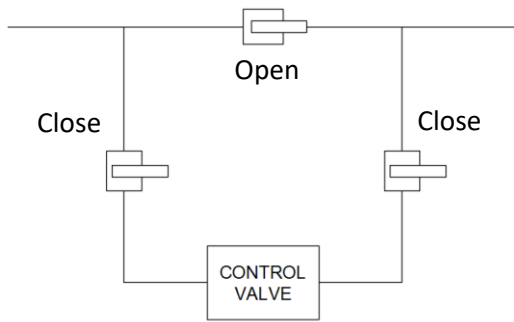


**NORMAL POSITION**



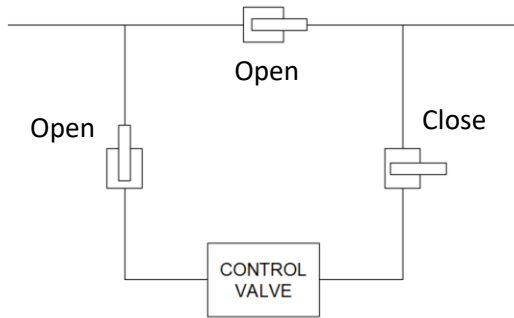
**Normal Position:** - Fully close the bypass valve and fully open both valves at inlet and outlet of the control valve. The supply water (untreated) enters in and treated water exits.

**BYPASS POSITION**



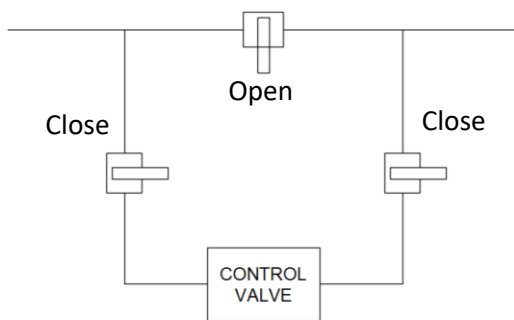
**Bypass Position:** - The inlet and outlet valves at the control valve must be fully closed but the bypass valve must be fully open. The supply water enters and bypass the control valve and exits untreated as supply water.

**DIAGNOSTIC POSITION**



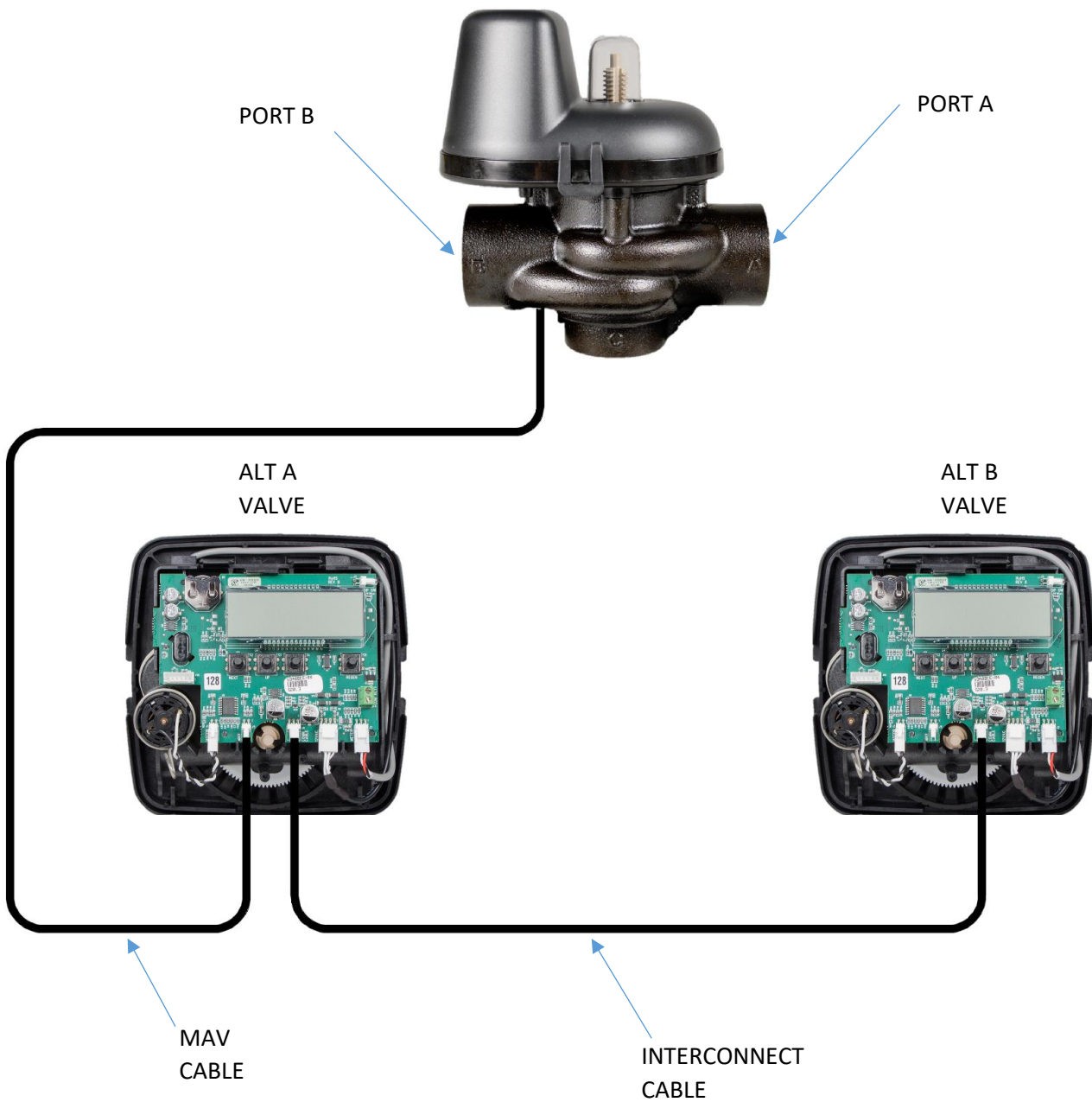
**Diagnostic Position:** - The outlet valve must be fully closed but bypass valve and inlet valve must be fully open. The untreated water will be supplied but in this position technician will be able to draw a brine and perform other tests.

**SHUT OFF POSITION**



**Shut Off Position:** - All three valves must be at fully closed position. The water supply is shut down means there will be no flow at the outlet.

### 1.13) Wiring



Connect the MAV cable to ALT A control valve's MAV port.

Connect the interconnect cable between both valves on interconnect ports.

Note: - ALT B unit will be shipped with connected interconnect cable

### 1.14) ALT A Control Valve Wiring



Use Phillip's screwdriver to remove the screw and cover.



Weave the MAV cable and interconnect cable through the strain relief. Place the cover over the strain relief and fasten the screw.

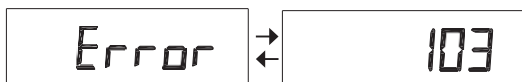
## 2) PROGRAMMING AND STARTUP

### 2.1) Regeneration and Error Screens



#### Regen Screen

Displays the time remaining in the current cycle. Pressing REGEN advances to the next cycle.



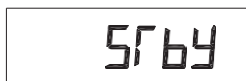
#### Error Screen

Alternated flashing Error and error code every 3 seconds.

Clear by disconnecting the power supply at the PC board and reconnecting, or press NEXT and REGEN simultaneously for 3 seconds.



When a unit is waiting to initiate the first cycle step of regeneration, "REGEN Pndg" is displayed.



"STby" is displayed in alternator systems when a valve is in Standby state.



"REGEN Pndg RINSE FILL" is displayed whenever a zero-capacity tank has transferred to an off-line state and is currently waiting to initiate the second portion of a regeneration cycle.

### 2.2) Button Operation



Scrolls to the next display.



- Pressing once and releasing will schedule a regeneration at the preset delayed regeneration time.
- Pressing again and releasing will cancel the regeneration.
- Pressing and holding for 3 seconds will initiate an immediate regeneration
- Pressing while in regeneration will advance to the next cycle.
- Pressing in the program levels will go backwards to the previous screen



Change Variable being displayed.



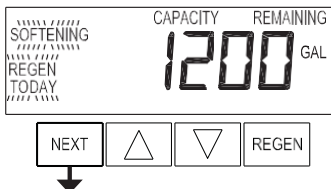
Key sequence to lock and unlock program settings



Holding for 3 seconds initiates a control reset. The software version is displayed and the piston returns to the home/service position, resynchronizing the valve.

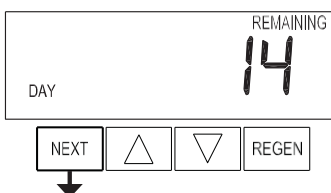
## 2.3) User Displays

When the system is operating, one of five displays may be shown. Pressing NEXT will alternate between the displays shown below.



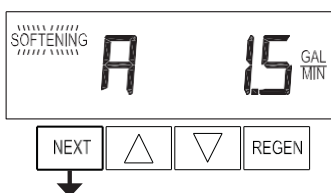
### User 1

Typical user display. Shows volume remaining to regeneration. This screen will not be viewed if the control is set for time-clock operation.



### User 2

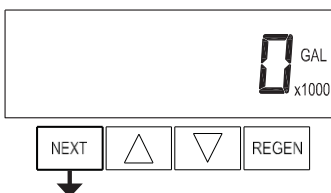
Displays number of days to next regeneration.



### User 3

Flow Rate.

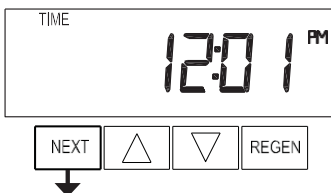
Displays present flow rate.



### User 4

Displays total volume in gallons since last reset. If a meter is not used this display will be shown but 0 will be displayed.

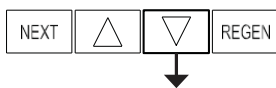
PRESS ▼ FOR 3 SECONDS TO RESET TO 0.



### User 5

Shows current time.

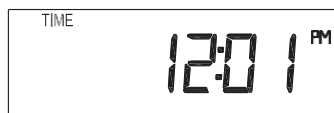
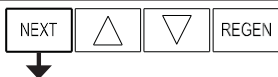
## 2.4) Setting Time of Day



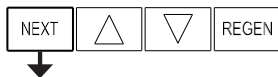
Push "NEXT" until time of day screen is displayed. Press and hold ▼ until SET TIME is displayed and the hour flashes once. Press ▲ or ▼ until the correct hour is displayed.



Then press NEXT. The minutes will flash. Press ▲ or ▼ until the correct minute is displayed.



Press NEXT to return to the User Displays. Time of day should only need to be set after power outages lasting more than 8 hours, if the battery has been depleted and a power outage occurs, or when daylight saving time begins or ends. If a power outage lasting more than 8 hours occurs, the time of day will flash on and off which indicates the time of day should be reset. If a power outage lasts less than 8 hours and the time of day flashes on and off, the time of day should be reset and the battery replaced.



**Exit Setting Time of Day**

## 2.5) Startup Instructions

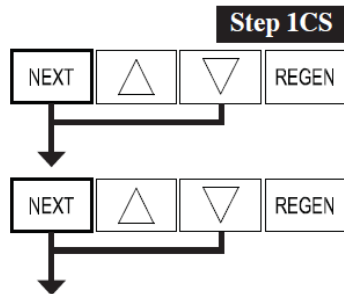
- Plug in transformers of both valves to wall socket.
- Pour some water in brine tank so that water level reaches air check valve.
- One control valve must show status “Standby” and other one must displays the time of day.
- Press and hold “REGEN” button on valve which shows time of day.



- This valve must initiate the immediate regeneration while other valve becomes online showing time of day. The MAV motor starts turning to change the flowing port.
- Slowly turn the inlet valve handle halfway, the air must exit through the drain for first few minutes.
- When drain water flows steady, turn the inlet valve handle to fully open. Allow the backwash cycle to run for at least 3 minutes with full opened inlet.
- Press the “REGEN” button once to advance the regeneration to brine cycle. Confirm the water suction in brine line by lifting the brine tank cover.
- Press the “REGEN” button again to advance the regeneration to 2<sup>nd</sup> Backwash cycle.
- When the countdown for 2<sup>nd</sup> backwash starts, press the REGEN button again to advance the regeneration to rinse cycle.
- Allow the valve to run rinse cycle for full amount of time.
- When valve automatically advances to fill cycle, check for leaks and then press the REGEN button to finish the regeneration.
- Fully open the outlet valve, then open the test port downstream of softener.
- Confirm the “SOFTENING” blinking on display to verify the meter working. Shut off the test port when water comes clear out of it.
- Now press and hold REGEN button on other valve to start the regeneration.
- Follow the above given sequence for regeneration in backwash cycle, brine cycle, 2<sup>nd</sup> Backwash cycle and rinse cycle.
- Check for leaks during fill cycle and let the fill cycle to run for full amount of time so that valve can fill correct amount of water in brine tank to dissolve salt.
- Now close the 3-way bypass valve.

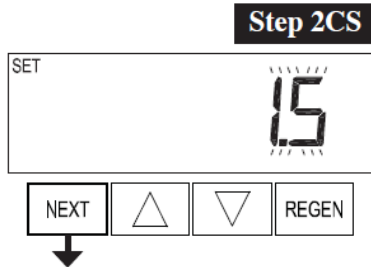


## 2.6) Configuration Settings



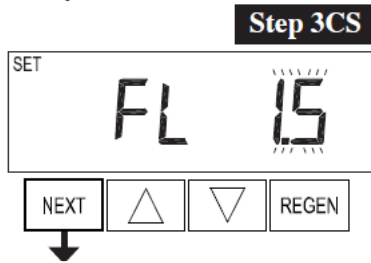
### Step 1CS

**Step 1CS** – Press NEXT and ▼ simultaneously for 5 seconds and release. Press NEXT and ▼ simultaneously for 5 seconds and release. If the screen in Step 2CS does not appear, the lock on the valve is activated. To unlock, press ▼, NEXT, ▲ and REGEN in sequence, then press NEXT and ▼ simultaneously for 5 seconds and release. Press NEXT and ▼ simultaneously for 5 seconds and release.



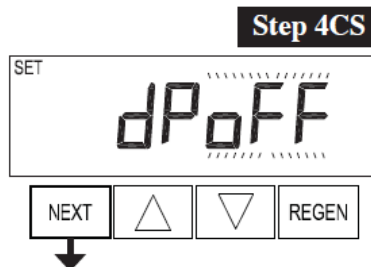
### Step 2CS

**Step 2CS** – Use ▲ or ▼ to select 1.5 for 1.5” valve. Press NEXT to go to Step 3CS. Press REGEN to exit Configuration Settings.



### Step 3CS

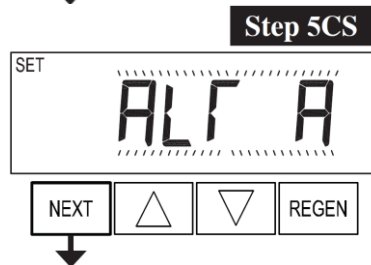
**Step 3CS** – Use ▲ or ▼ to select “1.5” meter size. Press NEXT to go to Step 4CS. Press REGEN to return to previous step.



### Step 4CS

**Step 4CS** – Select dP OFF – outside regeneration signal feature not used, by using ▲ or ▼ buttons.

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



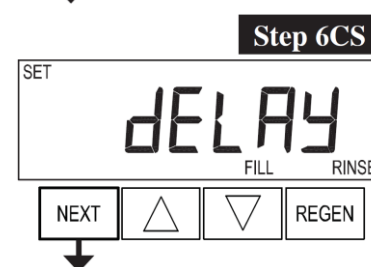
### Step 5CS

**Step 5CS** – Select “ALT” when control valve act as an alternator following using ▲ or ▼ buttons. Then press NEXT button.

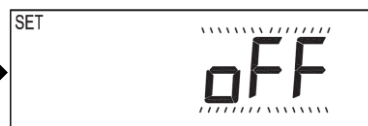
Choose the ALT unit A or B

“ALT A” must be the unit in which MAV wire is connected and outlet is connected to A port of the MAV.

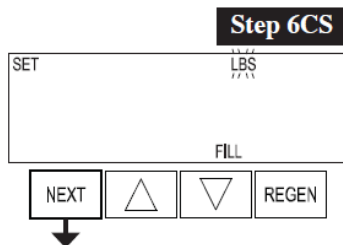
“ALT B” must be the unit in which outlet is connected to B port of the MAV.



### Step 6CS

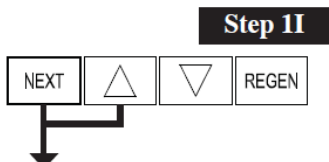


**Step 6CS** - Select “off” the delay for fill and rinse cycle. All regeneration cycles will be done at once. This option is only in ALT A.



**Step 6CS** – Fill Units, LBS should be selected. MIN (minutes) should be selected only for model# EWS SD15450. Press NEXT to exit OEM Configuration Setup. Press REGEN to return to previous step.

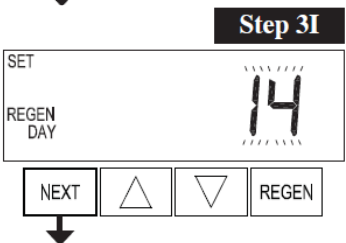
2.7) **Installer Display Settings**



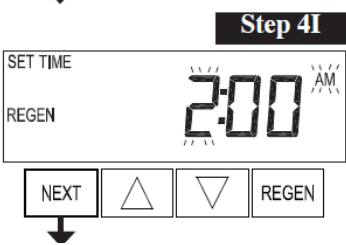
**Step 1I** - To enter Installer Display press NEXT and ▲ simultaneously for about 5 seconds and release.



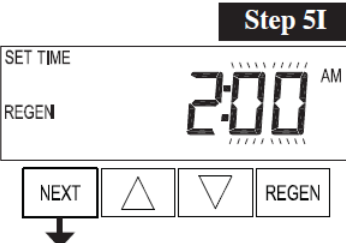
**Step 2I** – Hardness: Set the amount of influent hardness using ▲ or ▼. Press NEXT to go to step 3I. Press REGEN to exit Installer Display Settings.



**Step 3I** – Day Override: Set “14” maximum number of days between regenerations. Set Day Override using ▲ or ▼: See Setting Options Table for more detail on setup. Press NEXT to go to step 4I. Press REGEN to return to previous step.



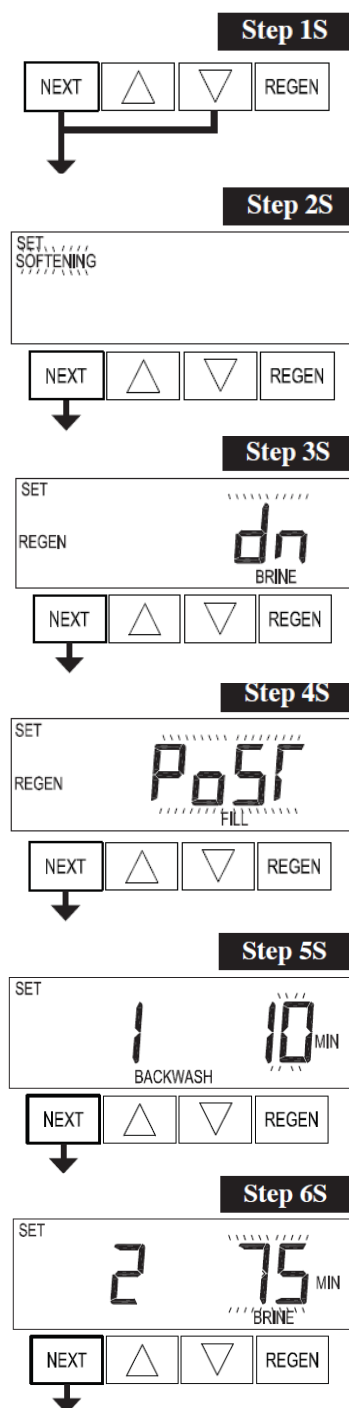
**Step 4I** – Next Regeneration Time (hour): Set the hour of day for regeneration using ▲ or ▼. The default time is 2:00. Press NEXT to go to step 5I. Press REGEN to return to previous step.



**Step 5I** – Next Regeneration Time (minutes): Set the minutes of day for regeneration using ▲ or ▼. Press NEXT to exit Installer Display Settings. Press REGEN to return to previous step.

**Exit Installer Display Settings**

## 2.8) OEM Softener System Setup



**Step 1S** - Press NEXT and ▼ simultaneously for 5 seconds and release. If screen in Step 2S does not appear, the lock on valve programming has been activated.

**Step 2S** – Choose SOFTENING using ▲ or ▼. Press NEXT to go to Step 3S. Press REGEN to exit OEM Softener System Setup.

**Step 3S** – Choose “dn” Downflow Brining Direction using ▲ or ▼. This screen is not viewed when Step 2S is set to Filtering. Press NEXT to go to Step 4S. Press REGEN to return to previous step.

**Step 4S** – Set Post Refill location using ▲ or ▼:

“PoST” to refill the brine tank after the final rinse; or

Press NEXT to go to Step 5S. Press REGEN to return to previous step.

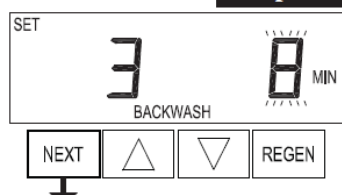
**Step 5S** – Select the time for the first backwash cycle using ▲ or ▼ buttons. Press NEXT to go to Step 6S. Press REGEN to return to previous step.

**Step 6S** – Select the time the brine cycle using ▲ or ▼.

NOTE: The display will flash between cycle number and time, and brine direction (dn).

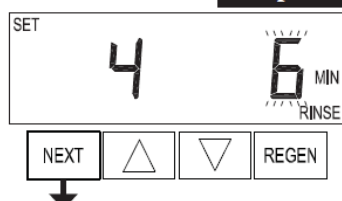
Press NEXT to go to Step 7S. Press REGEN to return to previous step.

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**Step 7S**

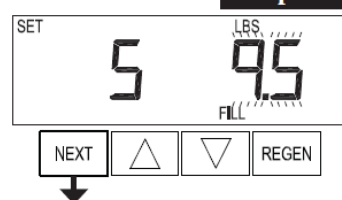
**Step 7S** – Select the time for second backwash cycle using ▲ or ▼ buttons.

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

**Step 8S**

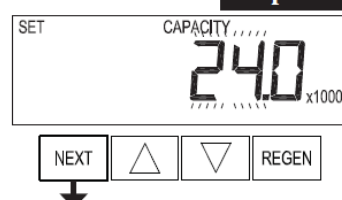
**Step 8S** – Select the time for rinse cycle using ▲ or ▼.

Press NEXT to go to Step 9S. Press REGEN to return to previous step.

**Step 9S**

**Step 9S** – Select the pounds for the fifth cycle using ▲ or ▼. According to the specifications of the softener model.

Press NEXT to go to Step 10S. Press REGEN to return to previous step.

**Step 10S**

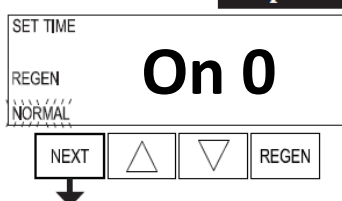
**Step 10S** – Set System Capacity using ▲ or ▼. The System Capacity setting should be based on the volume of resin and LBS of salt fill set in Step 9S. Press NEXT to go to Step 11S. Press REGEN to return to previous step.

For reference see page#24

**Step 11S**

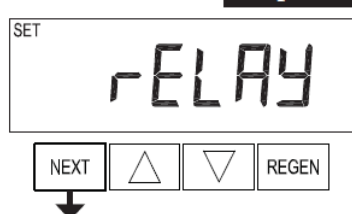
**Step 11S** – Set “AUTO” Volume Capacity using ▲ or ▼. The capacity will be automatically calculated and reserve capacity will be automatically estimated.

Press NEXT to go to Step 12S. Press REGEN to return to previous step.

**Step 12S**

**Step 12S** – Set Regeneration Time “on0” Options using ▲ or ▼ buttons the regeneration will occur immediately when the volume capacity reaches 0 (zero).

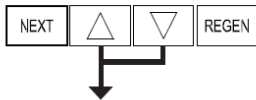
Press NEXT to go to Step 13S. Press REGEN to return to previous step.

**Step 13S**

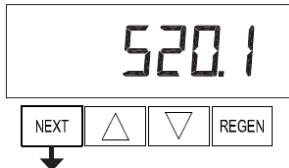
**Step 13S** – Set Relay Operation “OFF” using ▲ or ▼. The choices are: Steps 14S and 15S will not be shown. Press NEXT to go to Step 14S. Press REGEN to return to previous step.

## 2.9) Diagnostics

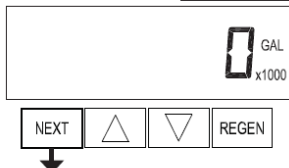
**Step 1D** **Step 1D** - Press ▲ and ▼ simultaneously for 5 seconds and release. If screen in Step 2D does not appear the lock on the valve is activated. To unlock press ▼, NEXT, ▲, REGEN in sequence, then press ▲ and ▼ simultaneously for 5 seconds and release.



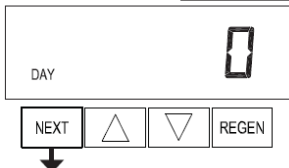
**Step 2D** **Step 2D** – Software Version. Press NEXT to go to Step 3D. Press REGEN to exit Diagnostics.



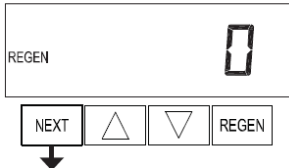
**Step 3D** **Step 3D** – Volume, total used since start-up: This display shows the total gallons treated since startup. This display will equal zero if a water meter is not installed. Press the NEXT button to go to Step 4D. Press REGEN to return to previous step.



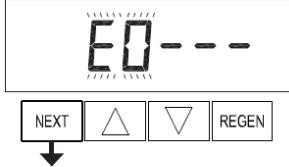
**Step 4D** **Step 4D** – Days, total since start-up: This display shows the total days since startup. Press the NEXT button to go to Step 5D. Press REGEN to return to previous step.



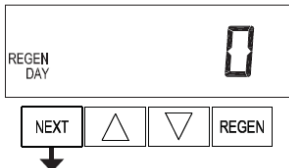
**Step 5D** **Step 5D** – Regenerations, total number since start-up: This display shows the total number of regenerations that have occurred since startup. Press the NEXT button to go to Step 6D. Press REGEN to return to previous step.



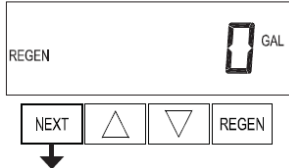
**Step 6D** **Step 6D** – Error Log: This display shows a history of the last 10 errors generated by the control during operation. Press ▲ or ▼ to view each recorded error. Press NEXT to go to Step 7D. Press REGEN to return to previous step.

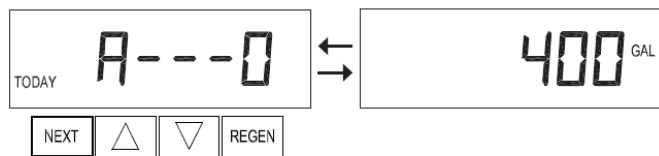


**Step 7D** **Step 7D** – Days, since last regeneration: This display shows the days since the last regeneration occurred. Press NEXT to go to Step 8D. Press REGEN to return to previous step.



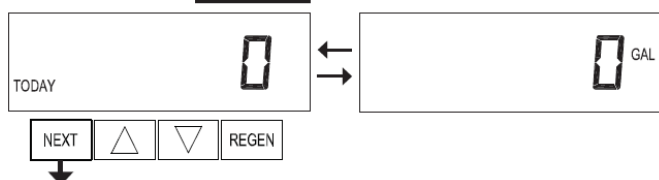
**Step 8D** **Step 8D** – Volume, since last regeneration: This display shows the volume of water that has been treated since the last regeneration. This display will equal zero when a water meter is not installed. Press NEXT to go to Step 9D. Press REGEN to return to previous step.



**Step 9D**

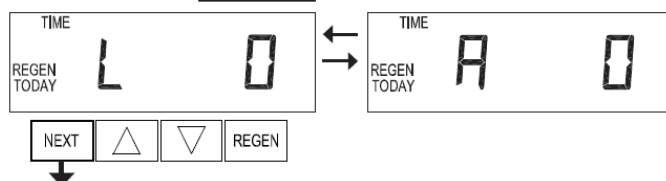
**Step 9D** – Volume, reserve capacity used for last 7 days. This display shows day 0 (for today) and flashes the reserve capacity. Pressing ▲ will show day 1 (which would be yesterday) and flashes the reserve capacity used. Pressing ▲ again will show day 2 (the day before yesterday) and the reserve capacity. Keep pressing ▲ to show the capacity for days 3, 4, 5 and 6. ▼ can be pressed to move backwards in the day series.

Press NEXT at any time to go to Step 10D. Press REGEN to return to previous step.

**Step 10D**

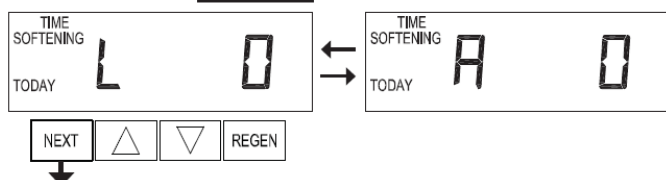
**Step 10D** – Volume, 63-day usage history: This display shows day 0 (for today) and flashes the volume of water treated today. Pressing ▲ will show day 1 (which would be yesterday) and flashes the volume of water treated on that day. Continue to press ▲ to show the maximum volume of water treated for the last 63 days. If a regeneration occurred on that day, the word “REGEN” will also be displayed. This display will show dashes if a water meter is not installed.

Press NEXT at any time to go to Step 11D. Press REGEN to return to previous step.

**Step 11D**

**Step 11D** – MAV drive history in the direction of retracted piston rod position. L stands for latest and A stands for average time took for MAV to reach retracted park position. Drive time is 1/100 of a second up to 4 units will be shown on display.

Press and hold REGEN and ▲ for 3 seconds to view the old drive history.

**Step 12D**

**Step 12D** – MAV drive history in the direction of extended piston rod position. L stands for latest and A stands for average time took for MAV to reach retracted park position. Drive time is 1/100 of a second up to 4 units will be shown on display. Press and hold REGEN and ▲ for 3 seconds to view the old drive history. Press and hold ▲ or ▼ for 3 seconds to reset the retracted and extended drive history. Press NEXT button to exit the diagnostics.

### 3) MODEL VARIABLE PROGRAMMING AND COMPONENTS

#### 3.1) Programming

OEM Softener System Setup								
Model #	Mineral Tank	Brine Tank	5S	6S	7S	8S	9S	10S
			Backwash Mins	Brine Mins	2nd Backwash Mins	Rinse Mins	Salt LBS	System Capacity Kgr
EWS SD1590	14x65	24x41	6	60	4	4	45 (30)	90 (81)
EWS SD15120	16x65	24x41					60 (40)	120 (108)
EWS SD15150	18x65	24x50					75 (50)	150 (135)
EWS SD15180	18x65	24x50					90 (60)	180 (162)
EWS SD15210	21x62	24x50					105 (70)	210 (189)
EWS SD15240	24x72	30x50					120 (80)	240 (216)
EWS SD15300	24x72	30x50					150 (100)	300 (270)
EWS SD15450	30x72	30x50					15 (10) mins	450 (405)

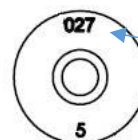
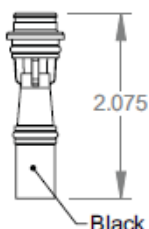
Configuration Settings					
Step #	2CS	3CS	4CS	5CS	6CS
Option	1.5	1.5	oFF	ALT A or b	LBS

Step 6CS: - Select "MIN" only for model# EWS S15450

OEM Softener System Setup						
Step #	2S	3S	4S	11S	12S	13S
Option	Softening	Down	Post	Auto	Normal	Off

#### 3.2) Flow Controls and Injectors

Model #	Mineral Tank	Brine Tank	Injector		Drain Flow Control		
			Color	Order #	Flow GPM	Drain Line Size	Order #
EWS SD1590	14x65	24x41	White	V3010-15D	5.3	3/4"	V3162-053
EWS SD15120	16x65	24x41	Blue	V3010-15E	6.5		V3162-065
EWS SD15150	18x65	24x50	Yellow	V3010-15F	9.0	1"	V3190-090
EWS SD15180	18x65	24x50	Yellow	V3010-15F	9.0		V3190-090
EWS SD15210	21x62	24x50	Green	V3010-15G	11.0		V3190-110
EWS SD15240	24x72	30x50	Orange	V3010-15H	15.0	1.25"	V3190-150
EWS SD15300	24x72	30x50	Orange	V3010-15H	15.0		V3190-150
EWS SD15450	30x72	30x50	Machined PVC	V3010-15I	25.0		V3190-250



Flow Rate Identification

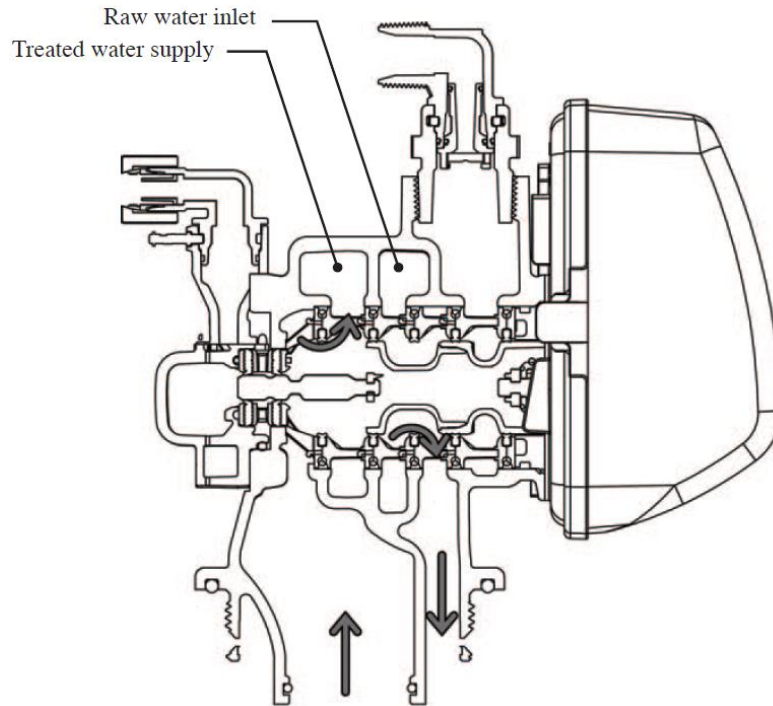
## 4) CONTROL VALVE

### 4.1) Specifications

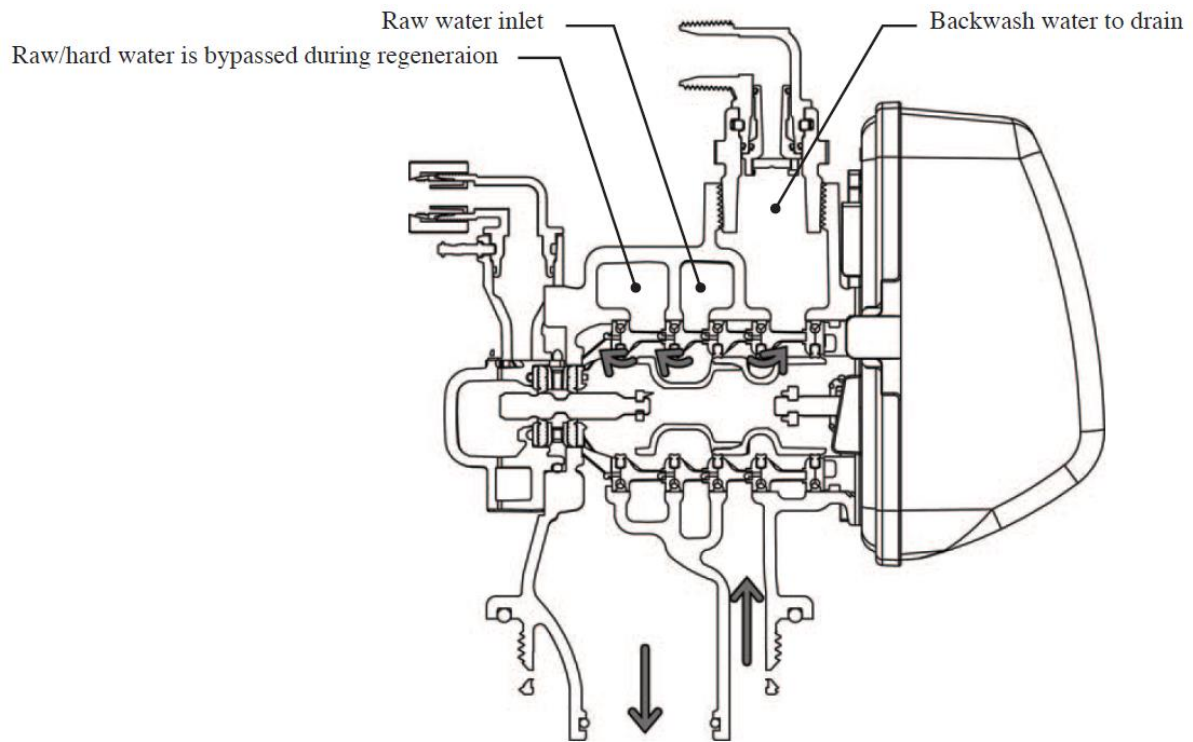
Minimum/Maximum Operating Pressures	20 psi (138 kPa) -125 psi (862 kPa)
Minimum/Maximum Operating Temperatures	40°F (4°C) - 110°F (43°C)
Power Adapter: Supply Voltage Supply Frequency Output Voltage Output Current	110V AC 60Hz 12V AC 0.5 Amperes
No user serviceable parts are on the PC board, the motor, or the Power adapter. The means of disconnection from the main power supply is by unplugging the Power adapter	
Service flow rate	70 gpm (265 lpm, 15.9 m <sup>3</sup> /h) @ 15 psig (103 kPa) drop
Backwash flow rate	52 gpm (192 lpm, 11.8 m <sup>3</sup> /h) @ 25 psig (172 kPa) drop
CV Service	1.5" Valve: 18.1
CV Backwash	1.5" Valve: 10.4
Meter: Accuracy Flow Range	± 5% 0.5 – 75 gpm (1.9 – 283 lpm)
Regenerant Refill Rate	0.5 gpm (1.9 lpm)
Injectors	See Injector Graphs V3010-15A through 15I
Inlet / Outlet	1.5" Female NPT or BSPT
Drain Line	1.25" Female NPT
Distributor Tube Opening	Female NPT Inlet & Outlet 1.90" OD (1.5" NPS)
Tank Connection	4"-8UN
Shipping Weight (with meter)	23 lbs (11 kg)
PC Board Memory	Nonvolatile EEPROM (electrically erasable programmable read only memory)
Compatible with the following typical concentrations of regenerants/chemicals	Sodium chloride, potassium chloride, potassium permanganate, sodium bisulfite, chlorine and chloramines



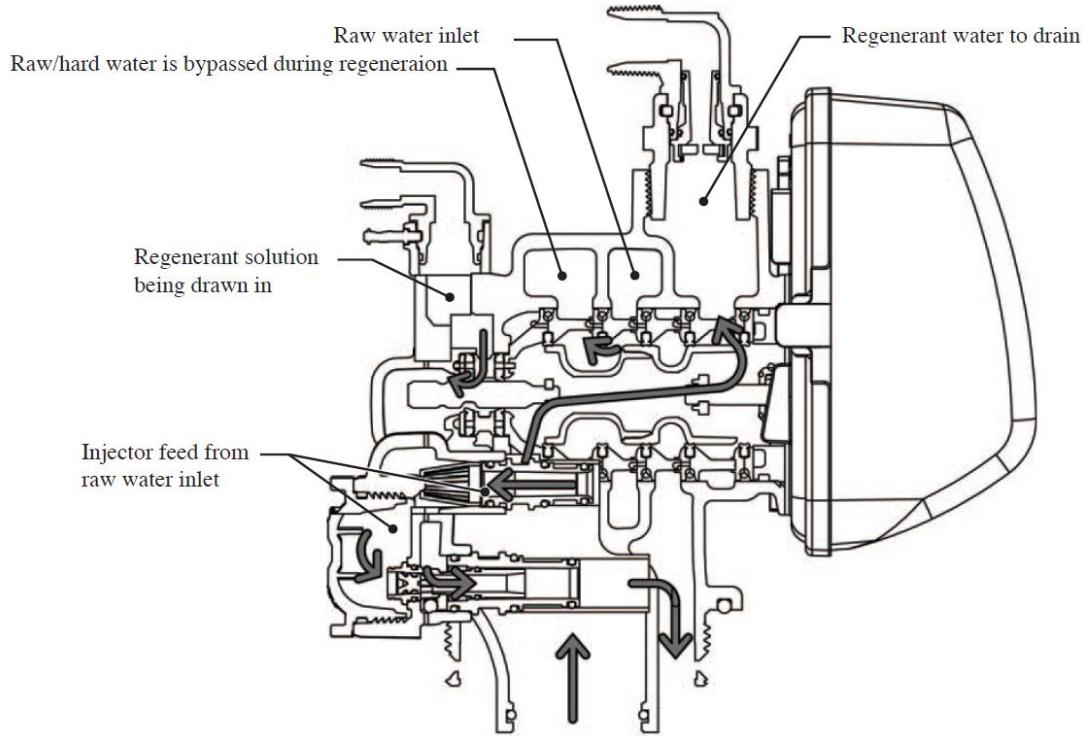
### 4.2) Flow Diagrams



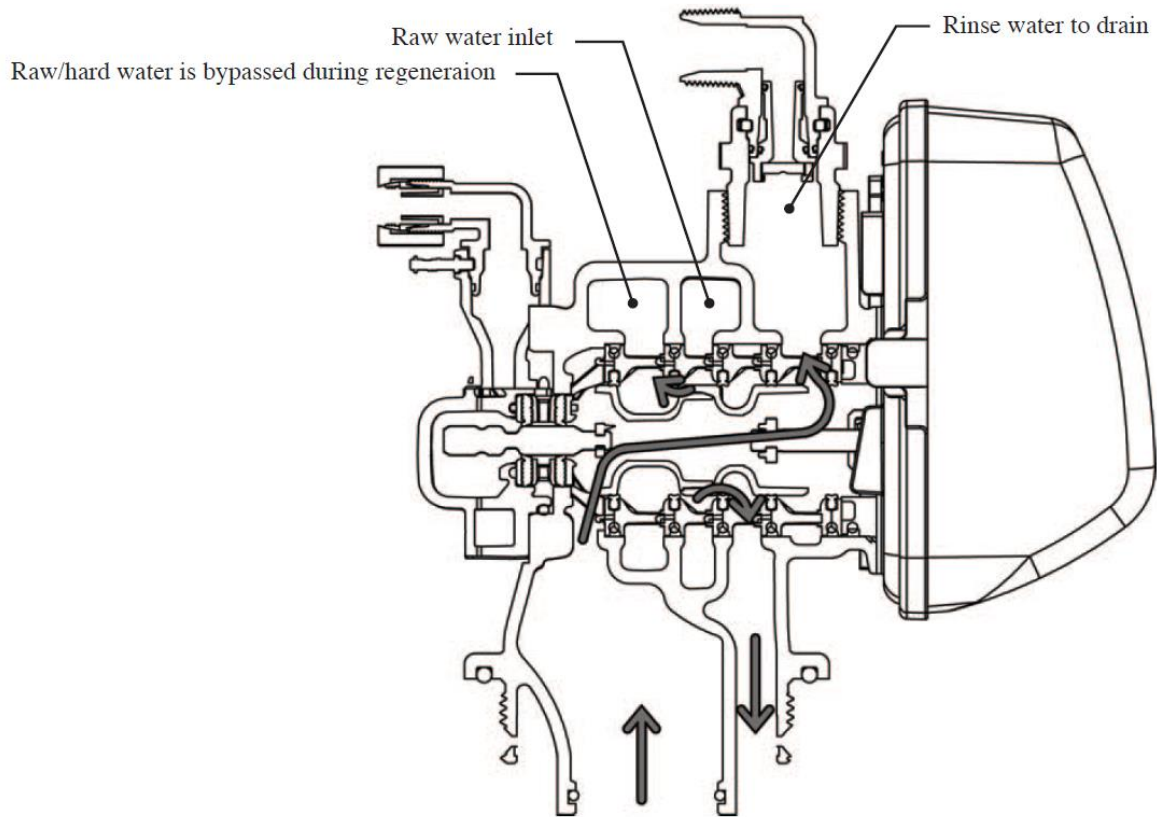
**SERVICE**



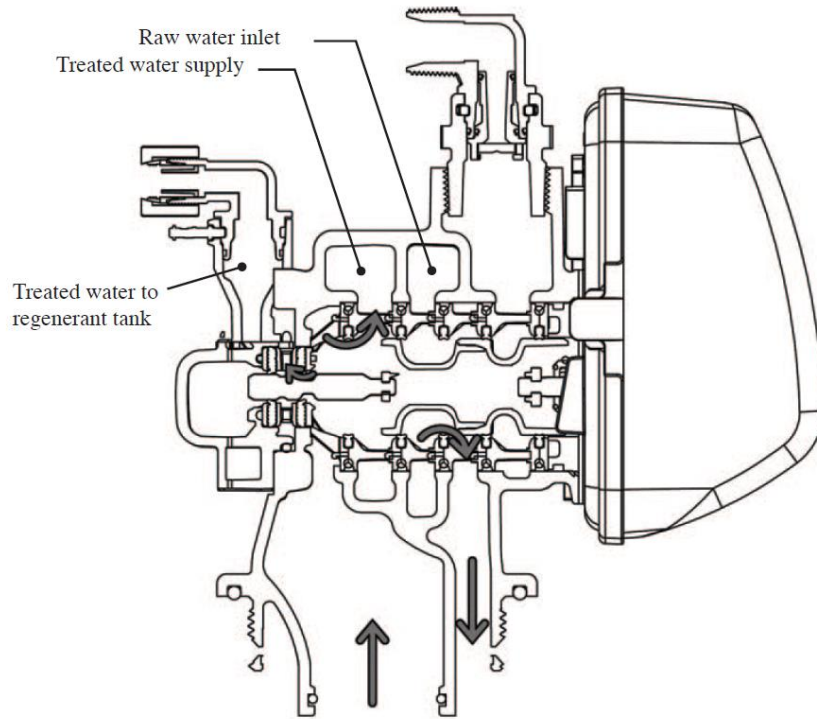
**BACKWASH CYCLE**



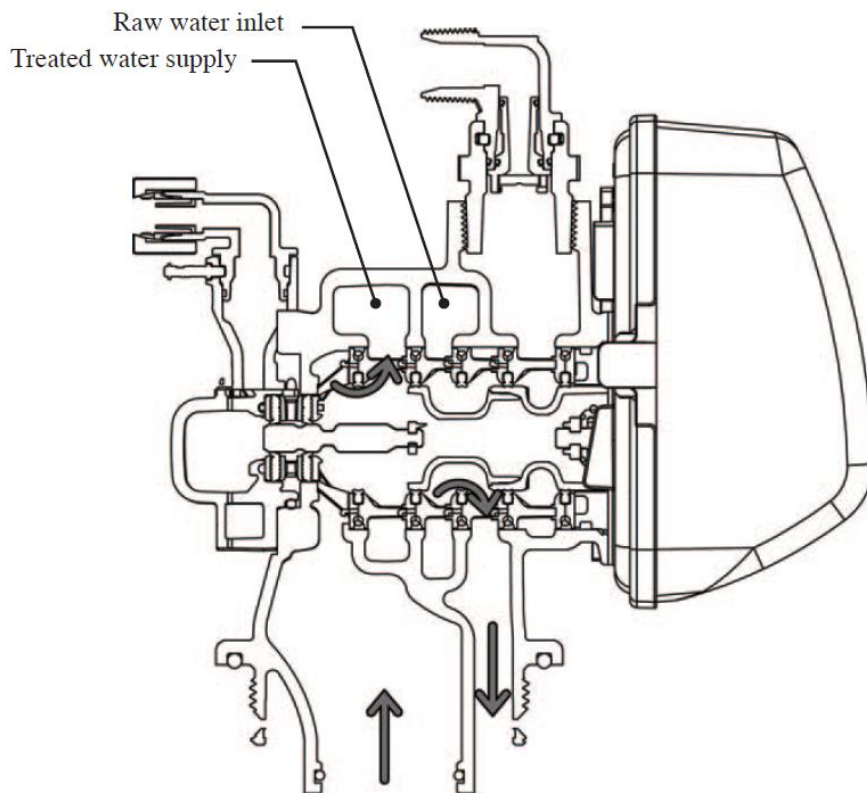
**BRINE CYCLE**



**RINSE CYCLE**



**FILL CYCLE**



**SERVICE**

### 4.3) Components of Control Valve

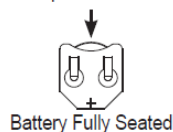
#### 4.3.1) Front Cover and PC Board

Drawing No.	Order No.	Description	Quantity
1	CLK V3175EE01	WS1EE FRONT COVER ASSEMBLY	1
2	CLK V310701	WS1 MOTOR	1
3	CLK V310601	WS1 DRIVE BRACKET & SPRING CLIP	1
4	CLK V3408EE04BOARD	WS1THRU/2 EE PCB 5 DIGIT REPL	1
5	CLK V3110	WS1 DRIVE GEAR 12X36	3
6	CLK V3109	WS1 DRIVE GEAR COVER	1
Not Shown	CLK V3186	WS1 AC ADAPTER 120V-12V	1
	CLK V3186-01	WS1 AC ADAPTER CORD ONLY	
Not Shown	CLK V3178	WS1 Drive Back Plate	1

Wiring for Correct On/Off Operation	
PC Board Relay Terminal Block	Relay
RLY 1	Coil -
+ COM	Coil +

AC Adapter	U.S.
Supply Voltage	120 V AC
Supply Frequency	60 Hz
Output Voltage	12 V AC
Output Current	500 mA

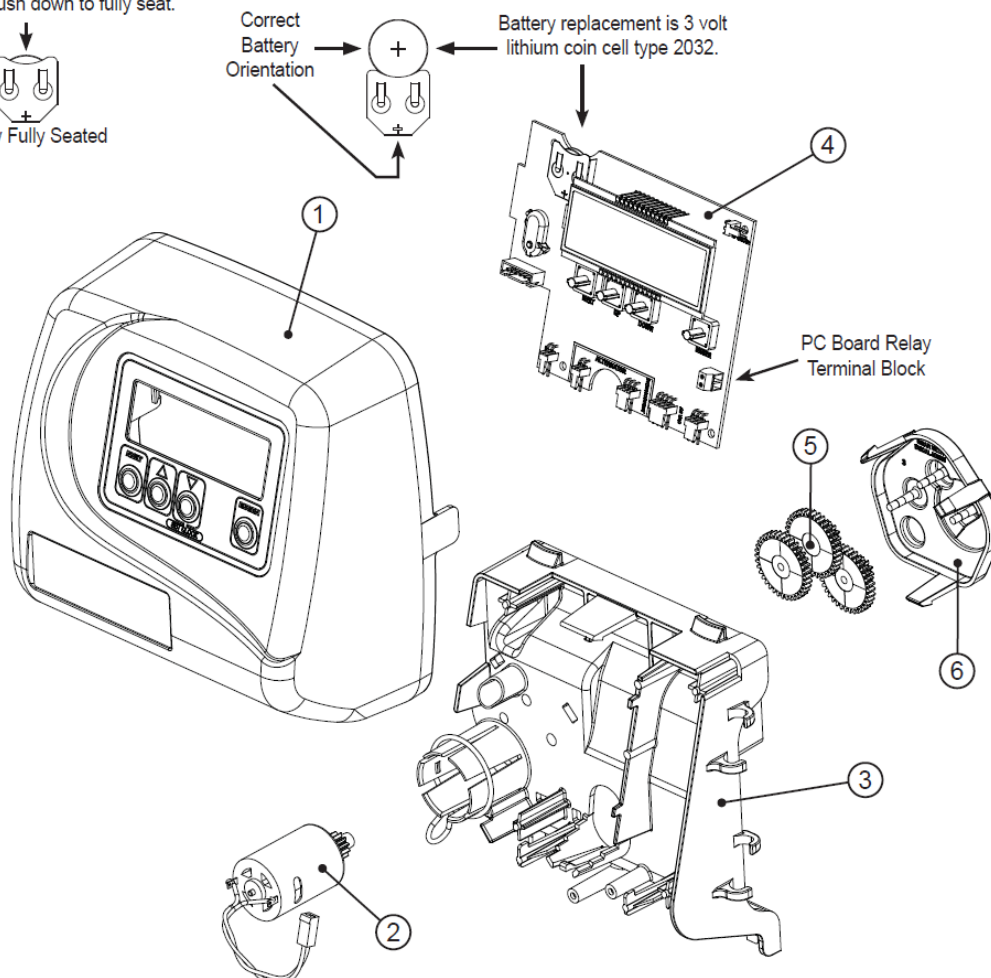
When replacing the battery, align positives and push down to fully seat.



Correct Battery Orientation

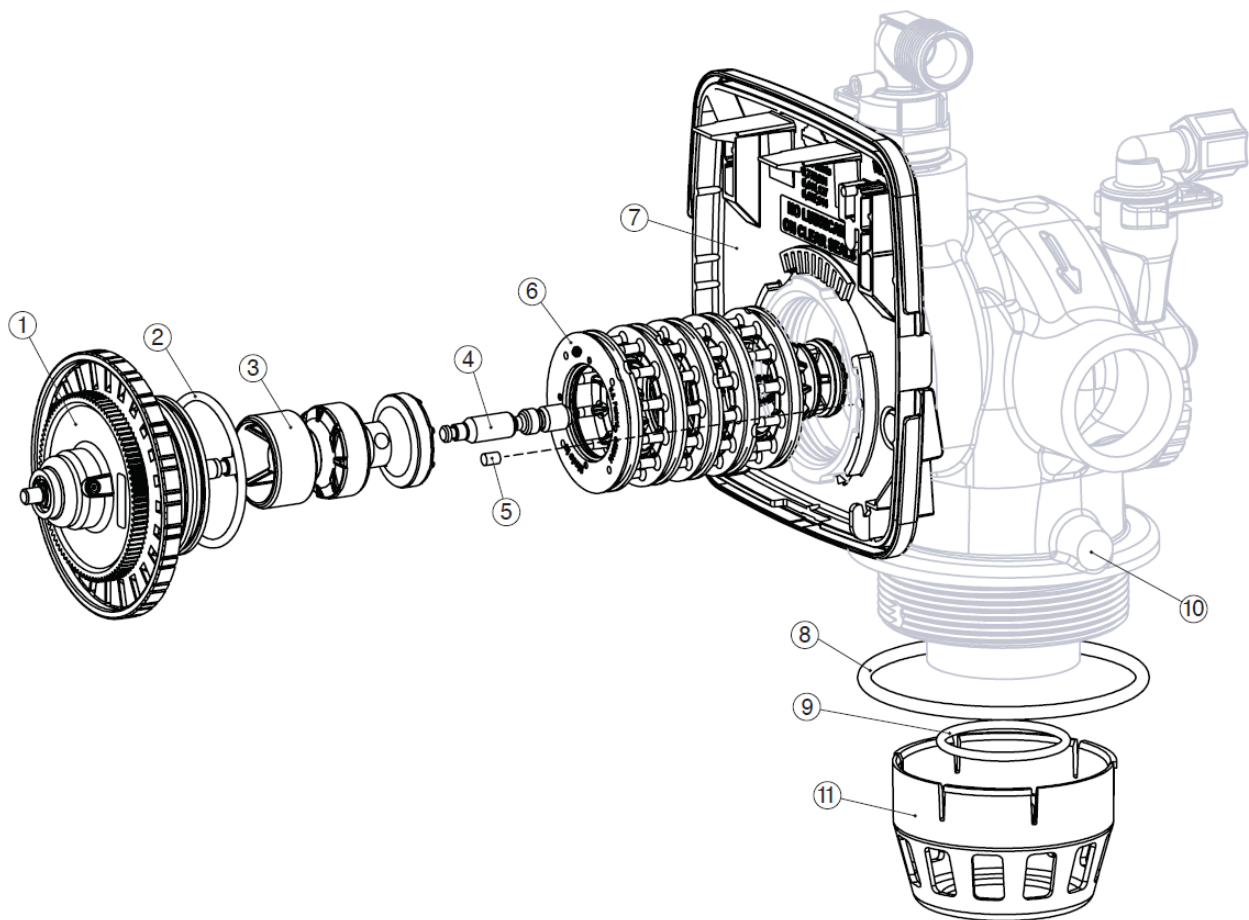


Battery replacement is 3 volt lithium coin cell type 2032.



## 4.3.2) Drive assembly, Piston and Spacer stack

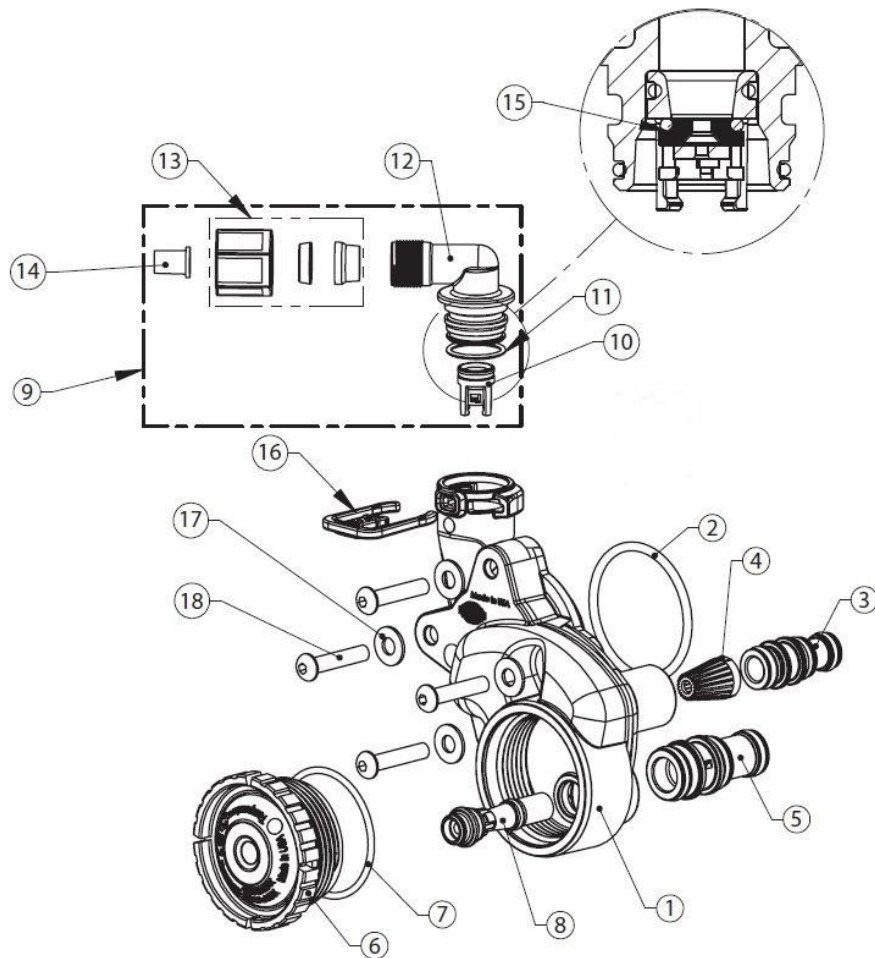
Drawing No.	Order No.	Description	Quantity
1	CLK V3004	WS1 DRIVE CAP ASSEMBLY	1
2	CLK V3135	O-RING 228	1
3	CLK V3407	WS1.25/1.5 PISTON DOWNFLOW ASSEMBLY (AMBER IN COLOR)	1
4	CLK V3174*	WS1 REGENERANT PISTON	1
5	CLK V3423	WS1.5 BACKPLATE DOWEL	1
6	CLK V3430	WS1.5 SPACER STACK ASSEMBLY	1
7	BACK PLATE	REFER TO PROGRAMMING AND COVER DRAWING MANUAL	1
8	CLK V3419	O-RING 347	1
9	CLK V3641	O-RING 225 FOR VALVE BODIES WITH NPT THREADS	1
10	CLK V3950-01	WS 1.5 NPT VALVE BODY, W/V3468	1
NOT SHOWN	CLK V3468	TEST PORT PLUG, 1/4" NPT	2
11	CLK D1300	TOP BAFFLE DIFFUSER, 1.5/50MM	1





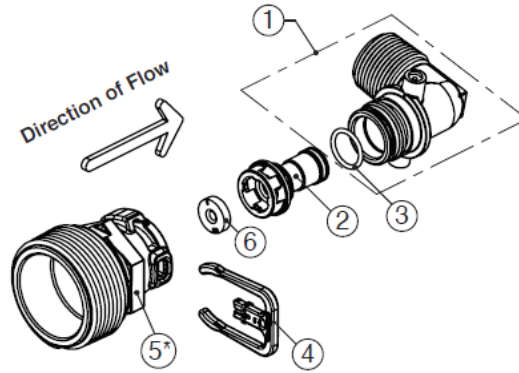
## 4.3.3) Regenerant Components

Drawing No.	Order No.	Description	Quantity
1	CLK V3967	WS1.5 INJECTOR BODY, WELDED ASSEMBLY	1
2	CLK V3441	O-RING -226	1
3	CLK V3968	WS1.5 INJECTOR FEED TUBE DOWNFLOW (BLACK IN COLOR)	1
4	CLK V317701	WS1 INJECTOR SCREEN	1
5	CLK V3969	WS1.5 INJECTOR DRAW TUBE DOWNFLOW (BLACK IN COLOR)	1
6	CLK V3176	WS1 INJECTOR CAP	1
7	CLK V3152	O-RING -135	1
8	SEE PAGE 33	WS 1.5 INJECTOR	1
9	CLK V3498	REFILL FLOW CONTROL, 1/2"	1
10	CLK V3428	WS 1.5 REFILL RETAINER ASSEMBLY (0.5 GPM)	1
11	CLK V3163	O-RING, -019	1
12	CLK H4612	REGENERANT ELBOW W/FLOW CONTROL	1
13	CLK JCPG8PBLK	NUT, COMPRESSION, 1/2" BLACK	1
14	CLK JCPP8	INSERT, POLYTUBE 1/2"	1
15	CLK V3182	REFILL FLOW CONTROL (0.5 GPM)	1
16	CLK H4615	RETAINING CLIP	1
17	CLK V3724	WASHER, FLAT STAINLESS STEEL	4
18	CLK V3642	BOLT, BHCS STAINLESS STEEL 1/4-20X 1 1/4	4

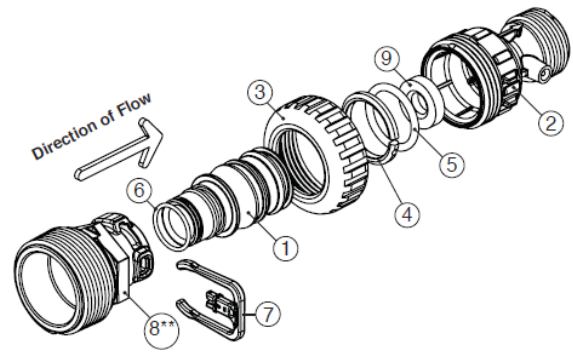


4.3.4) Drain Line Flow Control

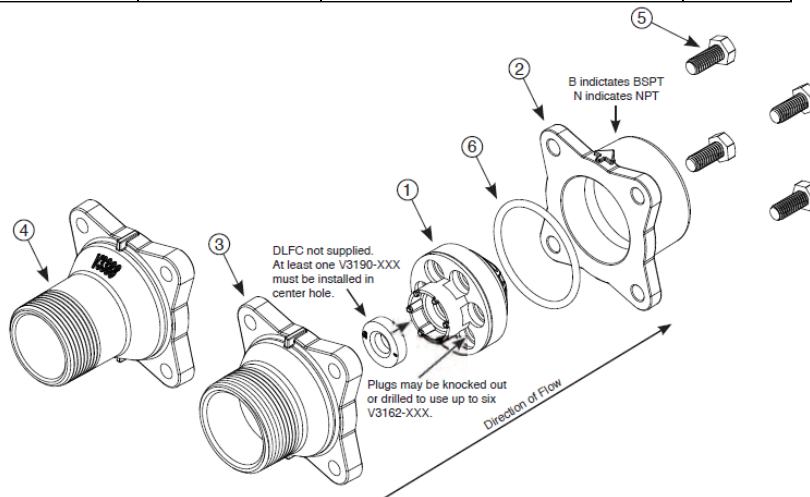
Item	Part#	Description	Qty.
<b>CLK V315804</b>		<b>WS Drain Fitting, 3/4" Elbow</b>	
1	CLK V315803	Drain Elbow, 3/4 NPT	1
2	CLK V315901	DLFC Retainer Assembly	1
3	CLK V3163	O-ring, -019	1
4	CLK H4615	Locking Clip	1
5*	CLK V3983	WS2 DLFC Adapter	1
6	CLK V3162xx	See DLFC Section	1



Item	Part#	Description	Qty.
<b>CLK V300805</b>		<b>WS Drain Fitting, 1" Straight</b>	
1	CLK V3167	WS Drain Fitting Adapter, 1"	1
2	CLK V316601	Drain Fitting Body	1
3	CLK V3151	WS1 Nut, QC	1
4	CLK V3150	WS1 Split Ring	1
5	CLK V3105	O-ring -215	1
6	CLK V3163	O-ring -019	1
7	CLK H4615	Locking Clip	1
8	CLK V3983	WS2 DLFC Adapter	1
9	CLK V3190xx	See DLFC Section	1



Item	Order No.	Description	Quantity
			V3079
1	CLK V3081	WS15 RETAINER DLFC ASY	1
2	CLK V3645	WS15 DLFC FLANGE OUTLET FNPT	1
4	CLK V3388	WS125 DLFC FLANGE INLET MNPT	1
5	CLK V3652	BOLT HEXHD S/S HCS 5/16-18x3/4	4
6	CLK V3441	O-RING 226	1
7	CLK V3162-xx	See DLFC Section	0-6
8	CLK V3190-xx	See DLFC Section	1



### 4.3.5) Outlet Meter Assembly

Note: Be sure the proper meter size is programmed in the software.

Standard meter cable used for spacing up to 3" between valve body and meter body, longer distance requires longer cable #V3221.

Service or replace the turbine by:

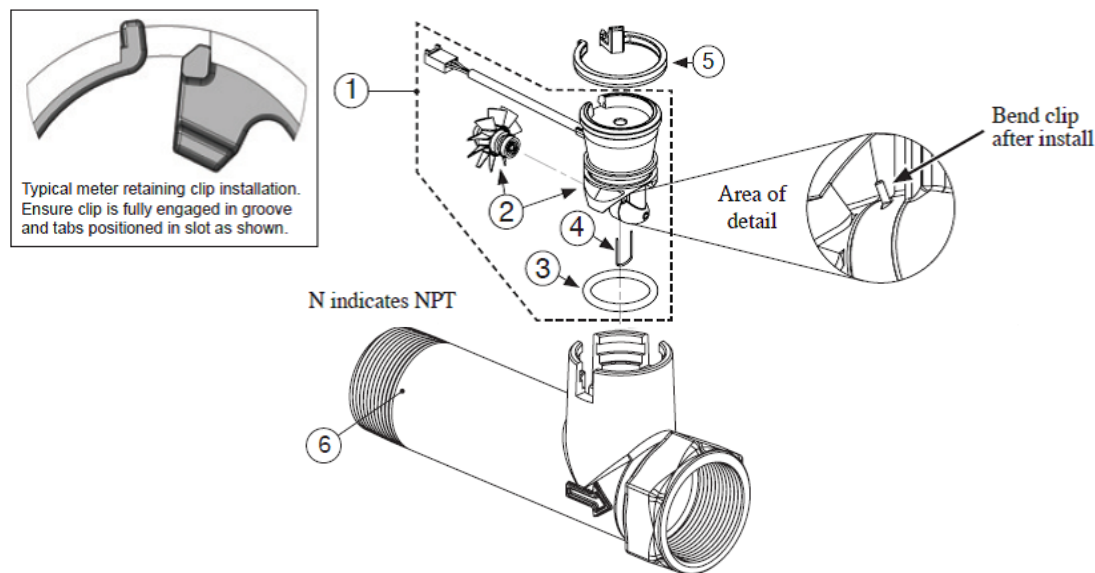
1. Turn the bypass for the system on and relieve the pressure on the system before removing the meter.
2. Press downward on the remote meter assembly to relieve tension on the retaining clip V3632.

Remove the clip and take the meter assembly out of the housing.

3. Remove the bend from the two exposed tips of the retaining clip V3501 and remove clip.
4. Service or replace the V3118-03 WS15/2 Turbine Assembly and place it back on the turbine shaft.
5. Insert the V3501 WS15/2 Turbine Clip and re-bend the exposed ends of the clip. The V3118-03 turbine has a groove to line up with the V3501 WS15/2 Turbine Clip.
6. Insert meter assembly back into the meter housing.
7. Re-install the meter retaining clip V3632 as shown below.

8. Open the bypass for the system slowly to bring back into service and check to be sure you have no water leaks.

The V3118-03 has a groove to line up with the V3501 WS1.5/2 Turbine Clip.



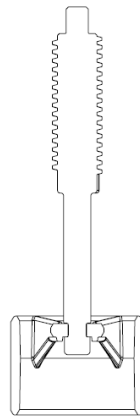
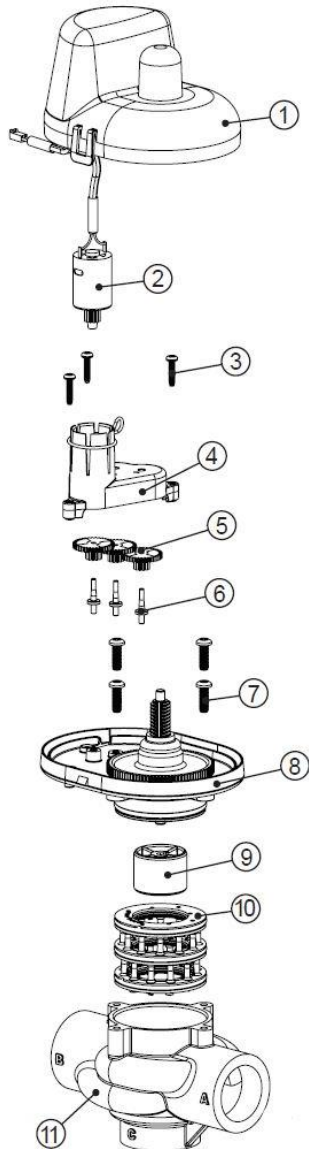
Drawing No.	Order No.	Description	Quantity
1	CLK V3003-02	Commercial meter assembly, 28" Cable	1
	CLK V3221	Commercial meter assembly, 15' Cable	
2	CLK V311803	Commercial meter turbine assembly	1
3	CLK V3105	O-ring 215	1
4	CLK V3501	Turbine clip	1
5	CLK V3632	Meter Retaining Clip	1
6	CLK V340104	WS1.5 Meter Housing NPT	1
Not Shown	CLK V3437	WS1.5 Flow Straightener	1

CLK V3040	1.5" NPT Meter, 28" Cable
CLK V304015	1.5" NPT Meter, 15' Cable



4.3.6) Motorized Alternating Valve (MAV)

Drawing No.	Order No.	Description	Quantity
			V3071
1	CLK V3073	MAV/NOHWBY COVER ASY	1
2	CLK V3476	WS MOTOR ASY 8 FT	1
3	CLK V3592	SCREW #8-1 PHPN T-25 SS	3
4	CLK V326201	WS1.5&2ALT/2BY REDUCGEARCVRAS	1
5	CLK V311001	WS1 DRIVE REDUCING GEAR PLAIN	3
6	CLK V3264	WS2 BYPASS REDUCTION GEAR AXLE	3
7	CLK V3527	SCREW 1/4-20 X 3/4 BHSCS SS (5/32" HEX ALLEN WRENCH REQUIRED)	4
8	CLK V3072	MAV/NOHWBY 1/125/15 DRIVE ASY	1
9	CLK V350601	MAV/NOHRD 1/125/15 PISTON	1
10	CLK V3074	MAV/NOHWBY 1/125/15 STACK ASY	1
11	CLK V352501	MAV BODY 1.5 NPT	1
Not Shown	CLK V3474	WS ALT CONNECT CORD 8FT BLK	1

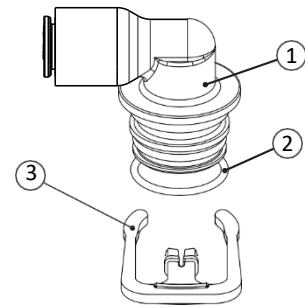


Piston Orientation

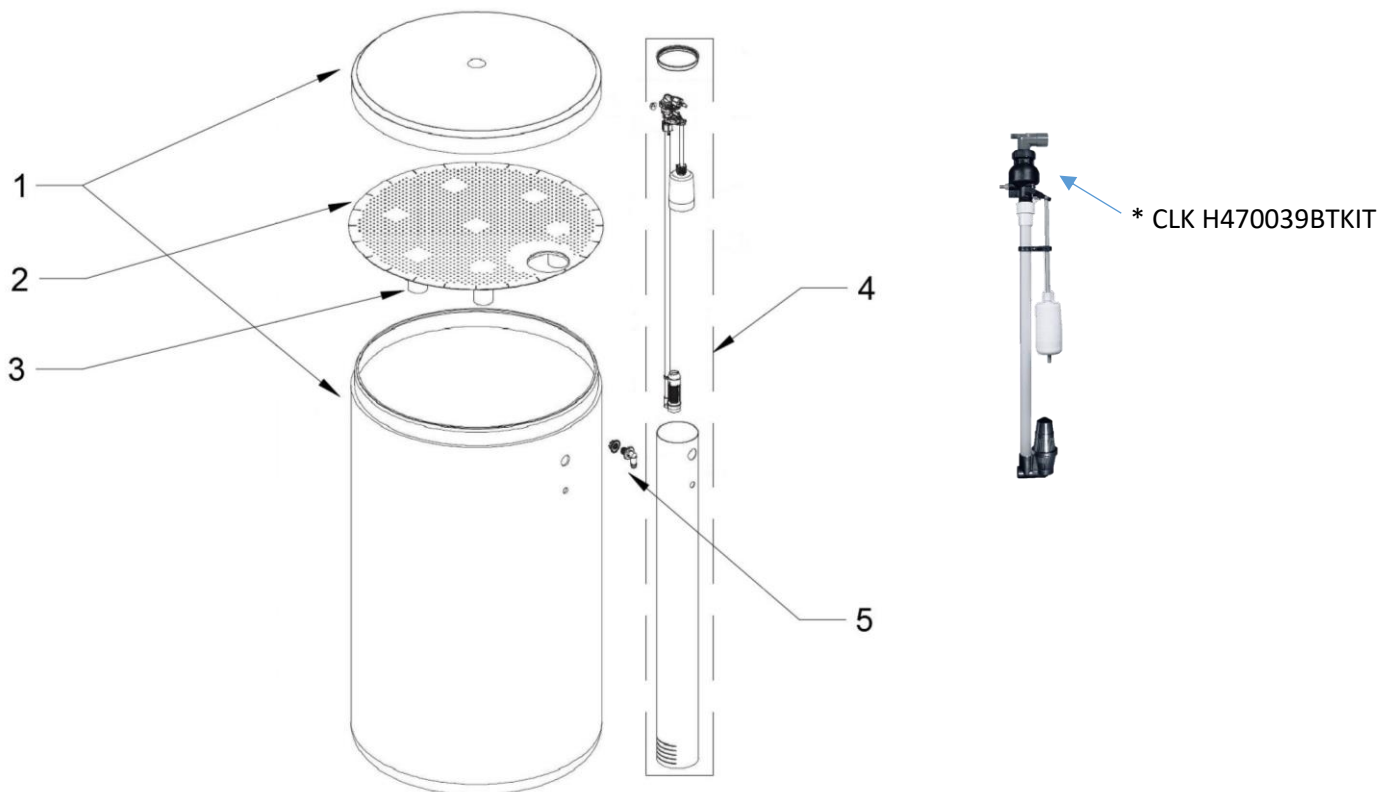


## 5) BRINE TANK ASSEMBLY

SAFETY FLOAT BRINE ELBOW			
Item No.	Part No.	Description	Qty.
1		Quick Connect Elbow	1
2	CV3163	O-Ring 019	1
4	CH4615	Elbow locking clip	1



BRINE TANK ASSEMBLY				
Item	Part No.	Description	Models	Qty.
1	CLK BT2441BR	Brine Tank with Cover	24"x41"	1
	CLK BT2450BKR		24"x50"	1
	CLK BT3050BKRA		30"x50"	1
2	CLK H1032	Salt Grid Platform with legs	30"x50"	1
	CLK H1080	Salt Grid Platform without legs	24"x41" & 24"x50"	1
3	CLK H1089	24" Salt Grid Legs		7
4	CLK H4900BVK	Float Brine Valve Assembly	30"x50"	1
	CLK H470039BTKIT		24"x41"	1
	CLK H4900BVK			1
5	CLK V3007	2 Piece Overflow Set	24"x50"	1
	1.0 X 0.75 RB PVC			1
	CLK H1018		24"x41"	1
6	CLK BT3050BKRA	Brine Tank Assembly	30"x50"	1



## 6) QUICK REFERENCE GUIDE

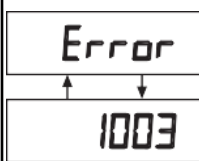
### Manual Regeneration



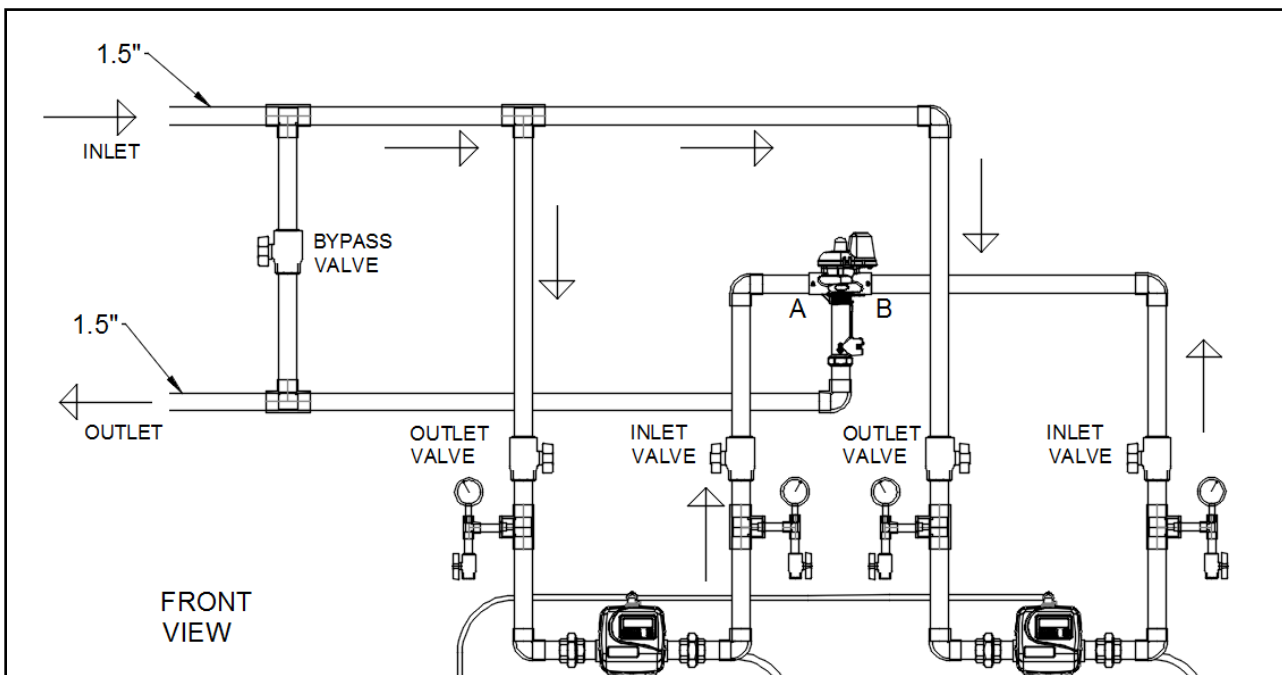
**Immediate Regeneration:** - Press and hold "REGEN" button for more than 3 seconds. Press "REGEN" button to advance the unit to next cycle in regeneration.

**Delayed Regeneration:** - Press and release "REGEN" button once the "REGEN TODAY" will be flashing on screen. Now the regeneration will occur tonight at preset time. The delayed regeneration can be cancelled by pressing "REGEN" button again.

**Note:** - If brine tank needs to be refilled please fill the salt at least two hours before regeneration



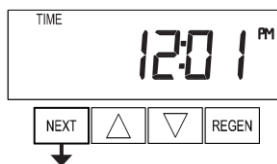
This error screen and error number will toggle. Contact Service Technician or OEM and report the error code.



**Normal Position:** - The inlet and outlet valve must be fully open and bypass valve must be fully closed.

**Bypass Position:** - To shut off supply to the Unit, the inlet and outlet valves must be fully closed and bypass valve must be fully

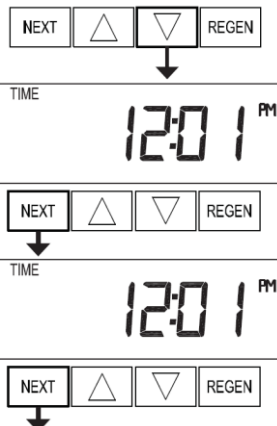
## General Operation



The first display will show the capacity remaining or days remaining in next regeneration.

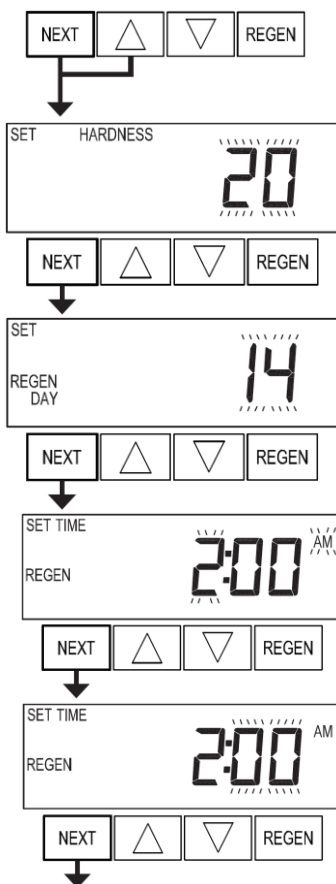
Pressing "NEXT" button will toggle this display with current time of day.

## To Set Time of Day



- Press "SET CLOCK" button.
- Hours will flash press up and down buttons to adjust hours to current hour of day. Then press "NEXT" button.
- By pressing up and down buttons adjust minutes. Then press "NEXT" button.
- The time is set and the valve display will return to normal display.

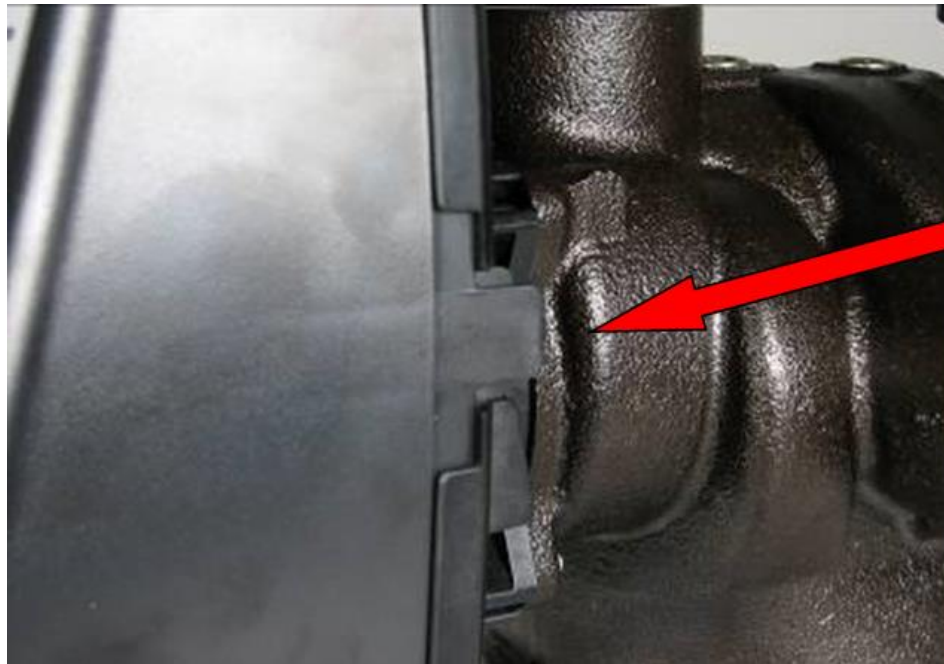
## Installer Settings



- Press "NEXT" and "UP" arrow button simultaneously.
- Adjust hardness by pressing "UP" and "DOWN" arrow buttons then press "NEXT" button.
- Adjust day override or the number of days between regenerations by using "UP" and "DOWN" arrow buttons.
- Adjust hour of the time of regeneration by using "UP" and "DOWN" buttons. Then press "NEXT" button.
- Adjust minutes of time of regeneration by pressing "UP" and "DOWN" arrow buttons. Press "NEXT" to save and return to normal operation.

## 7) SERVICE INSTRUCTIONS

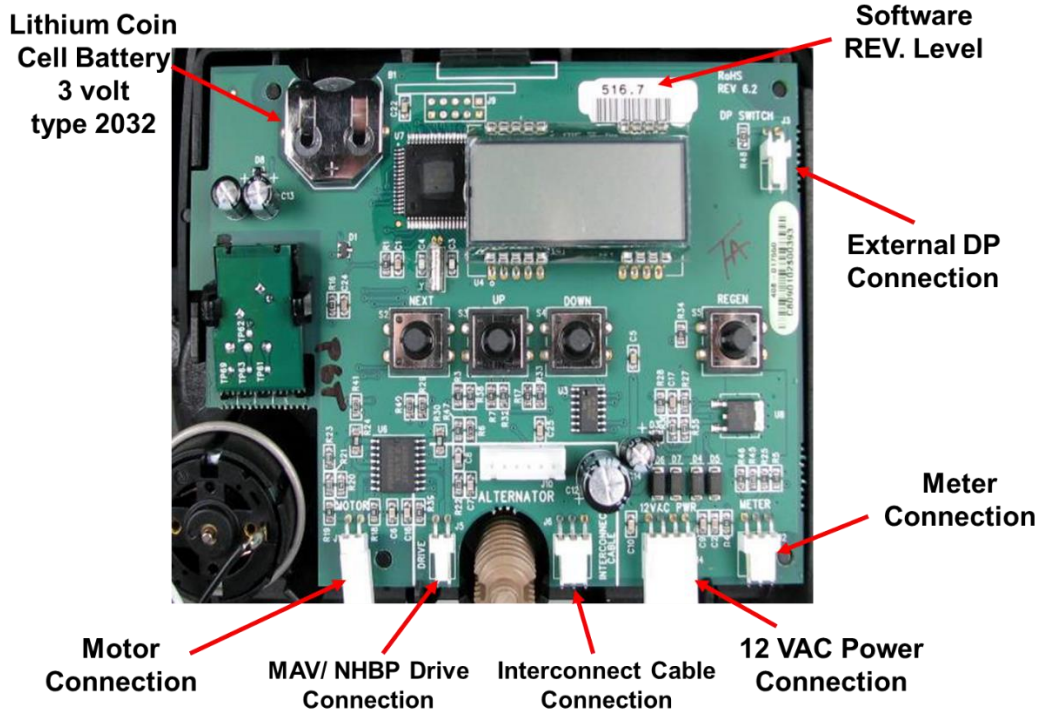
### 7.1) Front Cover Removal



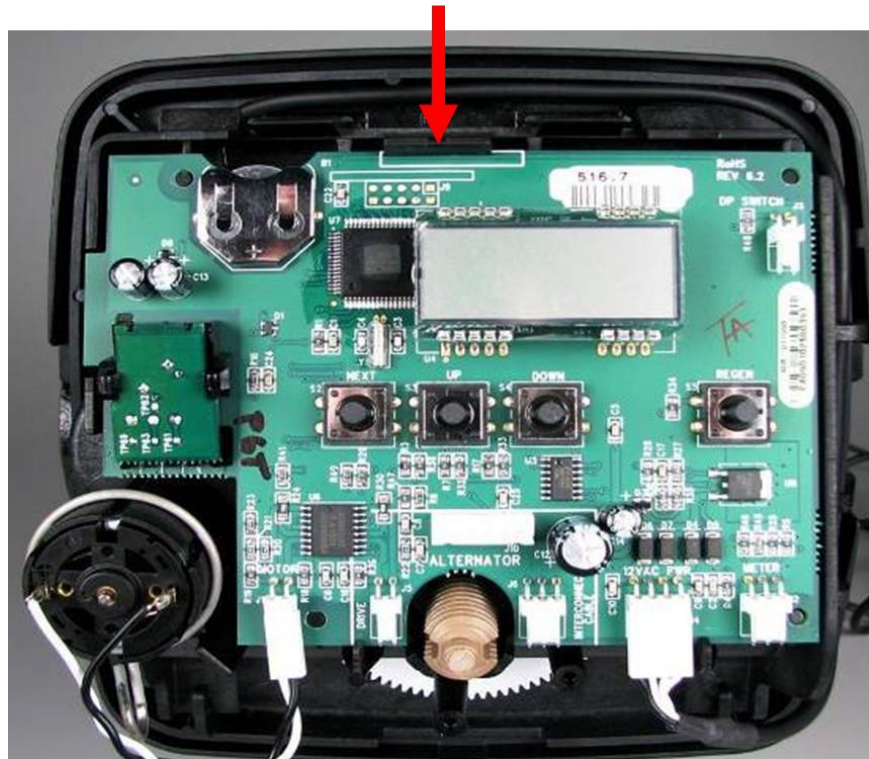
Pull out on each side of the covers locking tabs



## 7.2) PC Board Removal

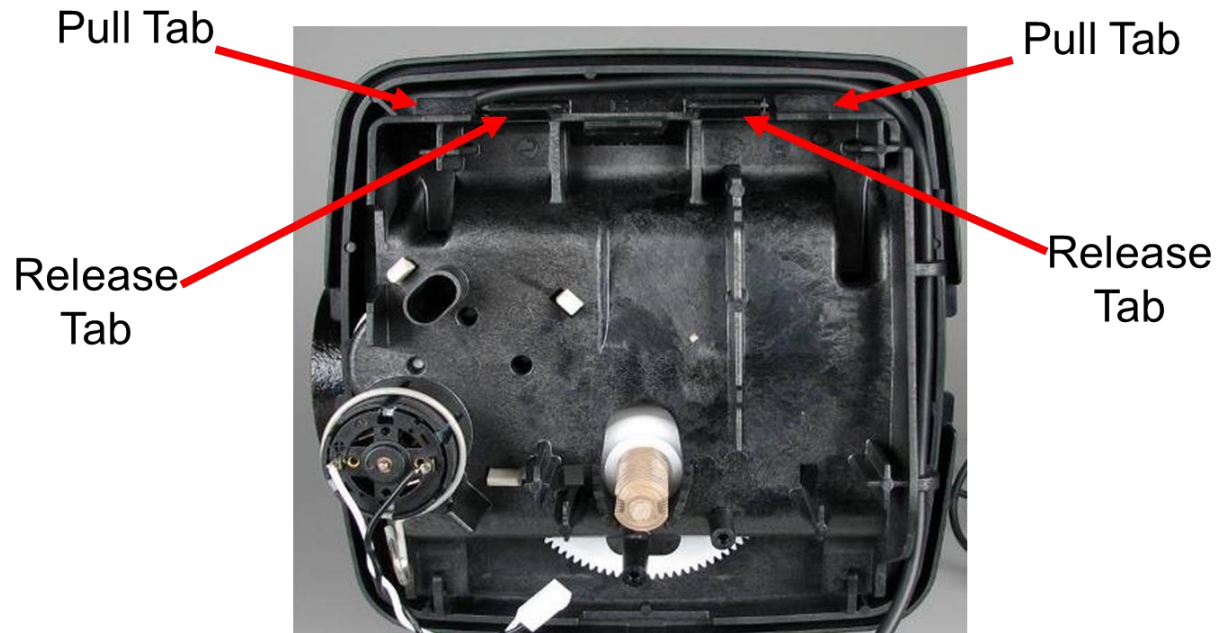


Disconnect the power cable first and then disconnect other cables.

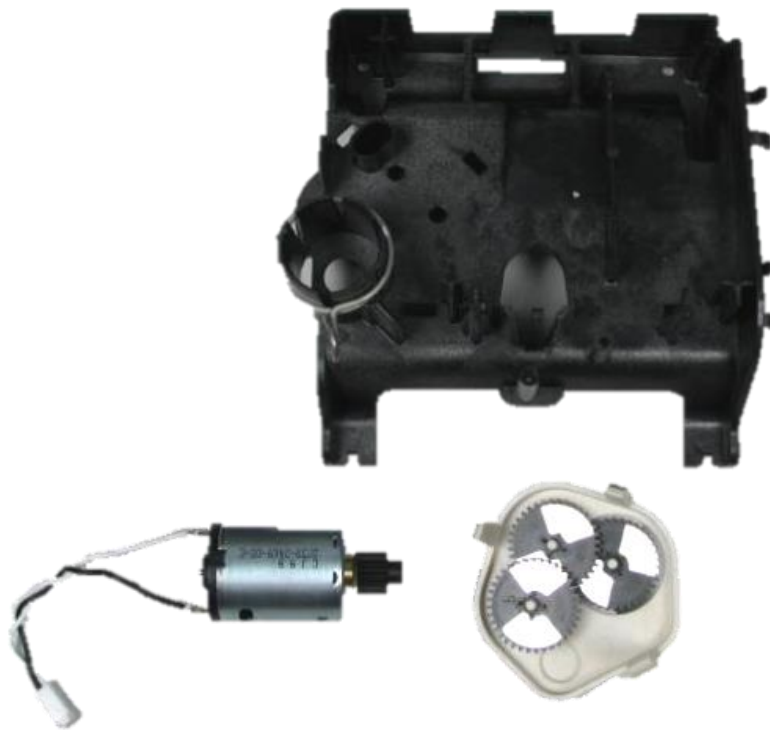


Lift up the locking tab and then pull out the PC board from top.

## 7.3) Drive Bracket Removal



Lift up both locking tabs and pull out the bracket.



Motor can be removed by pressing the locking spring to the right and then pull the motor out. Gearbox can be removed by pushing the beige colored locking tabs inwards.

### 7.4) Drive Cap Removal



Turn the drive cap counter clockwise with the closed end of service wrench.



Pull out the drive cap with main piston and brine piston.



### 7.5) Piston Removal



The main piston and brine piston are attached with snap off connection.



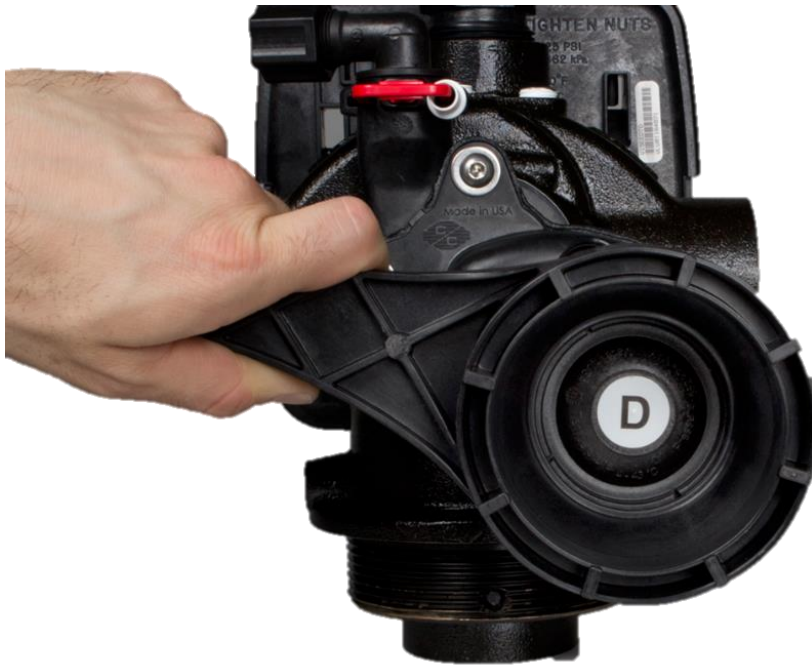
Fully extend the piston by rotating white gear. Then put a side pressure in the direction of cavity to snap off the piston from rod.

## 7.6) Stack Assembly Removal



Stack assembly can be simply pulled out by hand from the control valve body.

### 7.7) Injector Cap Removal



Turn injector cap counter clockwise with closed end of service wrench.



Gently pry the curled rim of injector with the bottom of injector cap to remove the injector.

## 8) TROUBLESHOOTING

### 8.1) Troubleshooting Procedures

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 <b>does</b> 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

## SOFTENER INSTALLATION AND USER GUIDE

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
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



<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
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.
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.

## SOFTENER INSTALLATION AND USER GUIDE

Problem	Possible Cause	Solution
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 without having a MAV or NHBP valve attached to operate that function	a. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect. Then re-program valve to proper setting.
	b. MAV/ NHBP motor wire not connected to PC Board	b. Connect MAV/ NHBP motor to PC Board two pin connection labeled 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.

## 8.2) Possible Error Codes

Possible Errors	
Code	Description
Err-1001	Control unable to sense motor movement
Err-101	
Err-1002	Control Valve motor ran too short
Err-102	
Err-1003	Control Valve motor ran too long and unable to find next cycle
Err-103	
Err-1004	Control Valve ran too long and timed out
Err-104	
Err-1006	MAV/NHWP motor ran too long
Err-106	
Err-1007	MAV/NHWP motor ran too short and stalled
Err-107	

## 9) 5 YEAR WARRANTY

### Commercial Duplex Water Softener

Thank you for your purchase of our COMMERCIAL DUPLEX WATER SOFTENER. For proof of purchase, please retain your Invoice/Sales Order Copy.

#### **Warranty ~ Offered**

Excalibur Water Systems warrants its products to be free from defect in materials and workmanship to the original owner from the date on the proof of purchase as described below.

#### **Warranty ~ Working Procedures**

If during the suitable warranty period, a part is defective, then Excalibur Water Systems will repair or replace that part at no charge to the original owner, with the exception of charges for nominal shipping, service and/or installation.

#### **Warranty ~ Coverage Outlined**

Excalibur Water Systems guarantees, to the original owner, a period of 5 years, the CONTROL BODY to be free of defects in materials and workmanship and to perform its proper functions. To the original owner, a period of 5 years, the ELECTRONIC CONTROL VALVES as well as all parts to be free of defects in materials and workmanship and to perform their normal functions. To the original owner, the SALT TANK and the MINERAL TANKS will not rust, corrode, leak, burst or in any other form fail to perform their proper functions for a period of 10 YEARS.

#### **Warranty ~ Service**

In the event you require service, Excalibur Water Systems Dealer will provide all necessary service and installation for your Duplex Commercial Water Softener. To obtain warranty service within 30 days of discovery of the defect, notification must be given to Excalibur Water Systems.

#### **General Provisions**

The above warranties are effective provided the WATER SOFTENER is operated at water pressures not exceeding 110psi and at water temperatures not exceeding 110°F; also provided that the water softener is not subject to abuse, misuse, alteration, neglect, freezing, accident or negligence; and provided further that the water softener is not damaged as the result of any unusual force of nature such as, but not limited to flood, hurricane, tornado or earthquake. Excalibur Water Systems is excused if failure to perform its warranty obligations is the result of strikes, government regulation, materials shortages or other circumstances beyond its control.

THERE ARE NO WARRANTIES ON THE WATER SOFTENER BEYOND THOSE SPECIFICALLY DESCRIBED ABOVE. ALL IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED TO THE EXTENT THEY MIGHT EXTEND BEYOND THE ABOVE PERIODS. THE SOLE OBLIGATION OF EXCALIBUR WATER SYSTEMS UNDER THESE WARRANTIES IS TO REPLACE OR REPAIR THE COMPONENT OR PART PROVES TO BE DEFECTIVE WITHIN THE SPECIFIED TIME PERIOD AND EXCALIBUR WATER SYSTEMS IS NOT LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES. NO DEALER, AGENT, REPRESENTATIVE OR OTHER PERSON IS AUTHORIZED TO EXTEND OR EXPAND THE WARRANTIES EXPRESSED ABOVE.

Certain provinces or states do not allow limitations on how long an implied warranty lasts or exclusions or limitations of incidental or consequential damage, therefore limitations and exclusions in this warranty may not apply to you. This warranty extends you specific legal rights as you may have other rights which vary from province to province or state to state.

Excalibur Water Systems is a manufacturer of water treatment products.

142 Commerce Park Drive

Barrie, Ontario Canada

