



**VELOCITY WATER WORKS**

*Elevating the Standard.*

# Velocity Water Works

Water Softener



## Installation & Start-up

**Velocity Water Works**

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# Introduction



Velocity Water Works - Warrants that the water treatment equipment supplied will conform to the description stated, that when shipped all parts will be free from defects in material and/or workmanship. If the goods do not conform to the description, or if there are defects in material and/or workmanship, Velocity Water Works' responsibility and liability shall be limited solely and exclusively to the replacement of the repair of such goods when returned to Velocity Water Works. Velocity Water Works shall not be liable for any other damages, whether direct or consequential, nor will be responsible for any labor charges and/or other cost resulting from the removal or installation of the repaired or replaced part. This warranty does not cover defects caused by accident, fire, flood, acts of God, misuse, misapplication or neglect.

### **LIMITED WARRANTY**

#### **1. Water Softeners and Carbon Filters**

Velocity Water Works warrants to the original consumer/purchaser against defect in material and/or workmanship from the date of the original manufacture as follows:

- CONTROL VALVE o Commercial Valve: 3 Years
- POLYGLASS and/or FIBERGLASS MINERAL TANKS o Commercial Mineral Tank: 5 Years
- POLYETHYLENE BRINE TANK o Commercial Brine Tank: 3 Years

#### **2. Reverse Osmosis Systems**

Velocity Water Works warrants to the original consumer/purchaser against defects in material and/or workmanship from the date of original manufacture for 1 year.

#### **3. Constant Pressure, Booster, and Repress Pumps**

Velocity Water Works warrants to the original consumer/purchaser against defects in material and/or workmanship from the date of original manufacture for 1 year.

#### **4. Water Reclamation Systems**

Velocity Water Works warrants to the original consumer/purchaser against defects in material and/or workmanship from the date of original manufacture for 2 year.

### **WARRANTY TERMS & CONDITIONS**

- Improper installation, operation and/or maintenance voids warranty coverage.
- Warranty is void if component Failure or damage results from, but not limited to, misuse, misapplication (unacceptable water conditions), neglect (inadequate filter changes, failure to fill brine tank, use of poor-quality salt, etc), alteration of equipment design, accidents, and freezing.
- Warranty coverage assumes all necessary, preventative maintenance has been performed by consumer/operator. In order to receive warranty, proper maintenance documentation may be required.
- Warranty does not cover RO Membrane fouling due to hardness scaling, deterioration (including chlorine), and poor-quality feed supply water.
- All components assembled as part of Velocity Water Works equipment that are manufactured by others are warranted by those manufactures, and therefore covered by their warranty.

### **WARRANTY INVOICING & SHIPPING POLICY:**

Replacement parts are shipped to consumer/purchases via \*Fed-Ex Ground. Consumer/purchaser will be invoiced for replacement parts when the product is shipped. Normal terms will be applied to the invoice. When the returned product is confirmed to be covered under warranty, the consumer's account be credited for the cost of the replacement part.

### **WARRANTY CLAIM & RETURN PRODUCT PROCEDURE:**

Please refer to Returned Materials Authorization (RMA) form. Call (920) 423-7170 or e-mail



## **WARNING**

THE PLUG IN POWER ADAPTER IS FOR DRY LOCATIONS ONLY AND SHOULD BE CONNECTED TO AN UNINTERRUPTED OUTLET INSTALLED WITHIN 15' OF THE SOFTENER.



## **WARNING**

DO NOT LOCATE SOFTENER WHERE IT OR ITS CONNECTIONS (INCLUDING DRAIN LINE AND OVERFLOW LINES) WILL BE SUBJECTED TO TEMPERATURES BELOW 40° F (4° C)



## **WARNING**

THE CONTROL VALVE AND FITTINGS ARE NOT DESIGNED TO SUPPORT THE WEIGHT OF THE SYSTEM OR THE PLUMBING.



## **WARNING**

DO NOT USE VASOLINE, OILS, OR OTHER HYDROCARBON LUBRICANTS OR SPRAY SILICONE ANYWHERE.



## **NOTICE**

CONSULT A TRAINED TECHNICIAN. ONLY A TRAINED OR AUTHORIZED INDIVIDUAL, KNOWLEDGEABLE IN THE RELATED PROCEDURES SHOULD INSTALL, INSPECT, MAINTAIN OR SERVICE THIS EQUIPMENT.



## **NOTICE**

ALL PLUMBING SHOULD BE DONE IN ACCORDANCE WITH LOCAL CODE.



## **NOTICE**

NEVER INSERT A DRAIN LINE DIRECTLY INTO A DRAIN, SEWER LINE OR TRAP. ALWAYS ALLOW AN AIR GAP BETWEEN THE DRAIN LINE AND THE RECEPTACLE TO PREVENT BACK SIPHONAGE.

# Introduction



## Unpacking your Water Softener

Your Water Softener has been tested, inspected, and carefully packaged. It was shipped in proper working order and in excellent condition. Before you remove the Water Softener from the packaging check it for signs of concealed damage which may have occurred during shipping. If damage has occurred, immediately contact the delivering carrier and file a claim for damages.

**IMPORTANT: Installation must comply with local plumbing, electrical and sanitation codes.**

## Softener Receiving Checklist

- Softener Tanks (figure 1)
- Brine Tank (figure 2)
- Resin (table 1)
- Gravel (table 1)
- Control Valves (figure 3)
- MAV **2 TANK SOFTENERS ONLY** (figure 4)
- Stainless Steel Meter **1-1/2" & 2" SOFTENERS ONLY** (figure 5)
- Pre-Plumbed Copper Bypass Manifold **OPTIONAL 1-1/2" & 2" SOFTENERS ONLY** (figure 6)
- Pre-Fabricated connection Elbows **2 TANK 1" & 1-1/4" SOFTENERS** (figure 7)



## NOTICE

**PLEASE CALL IMMEDIATELY IF ANY ITEMS ARE MISSING OR DAMAGED.**

Table 1

<i>Model #</i>	<i>Resin in Cubic Ft.</i>	<i># Bags of Resin</i>	<i>Gravel in Pounds</i>	<i># Bags of Gravel</i>
VSX-XXX-030	Tanks Come Filled	N/A	Tanks Come Filled	N/A
VSX-XXX-045	Tanks Come Filled	N/A	Tanks Come Filled	N/A
VSX-XXX-060	Tanks Come Filled	N/A	Tanks Come Filled	N/A
VSX-XXX-075	Tanks Come Filled	N/A	Tanks Come Filled	N/A
VSX-XXX-090	3 Cubic Ft. (per tank)	3 Bags	30 lbs (per tank)	1 Bag
VSX-XXX-120	4 Cubic Ft. (per tank)	4 Bags	40 lbs (per tank)	1 Bag
VSX-XXX-150	5 Cubic Ft. (per tank)	5 Bags	50 lbs (per tank)	1 Bag
VSX-XXX-180	6 Cubic Ft. (per tank)	6 Bags	100 lbs (per tank)	2 Bags
VSX-XXX-210	7 Cubic Ft. (per tank)	7 Bags	100 lbs (per tank)	2 Bags
VSX-XXX-240	8 Cubic Ft. (per tank)	8 Bags	150 lbs (per tank)	3 Bags
VSX-XXX-300	10 Cubic Ft. (per tank)	10 Bags	150 lbs (per tank)	3 Bags
VSX-XXX-450	15 Cubic Ft. (per tank)	15 Bags	250 lbs (per tank)	5 Bags

# Introduction



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Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



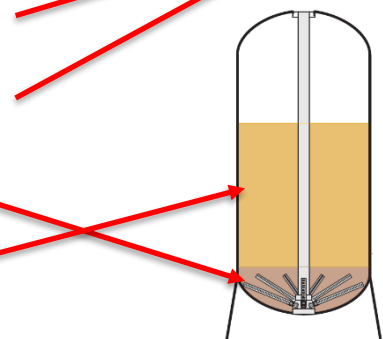
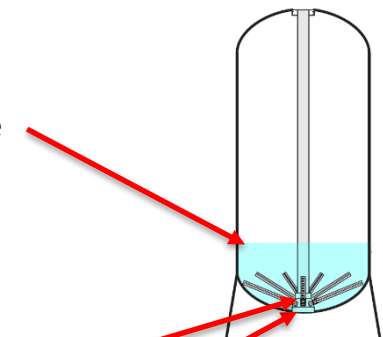
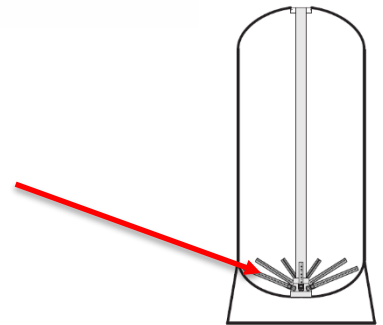
# Installation



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1. Before starting installation inspect outside of tanks for any visible damage. Using bright light inspect distributor tube inside of tank along with the laterals at the bottom of the tank. DO NOT fill tank if damage is detected.
2. Before filling tanks thread softener valves on tanks (Valve A on the Left) to determine the front of the tank. Mark front of tank with tape or marker.
3. Set tanks in place with front forward facing.
  - a. Twin Softeners with pre-plumbed bypass manifold included are built with a 6" gap in-between the tanks.
4. Level tanks. Tanks should be placed on a level floor space; tanks will need to be shimmed level and straight for the manifold to fit.
5. If pre-plumbed bypass manifold was purchased with water softener install at this time to ensure tanks are in proper position. Tanks are heavy and difficult to move after they have been filled.
6. Remove Bypass Manifold (if purchased) and Softener valves.
7. Using a hose fill tank 1/3 of the way with water to avoid damaging the laterals inside of the tank while pouring the media into tank.
8. Cap 1-1/2" distributor pipe using shipping cap or duct tape. **DO NOT FILL TANK WITHOUT CAPPING DISTRIBUTOR, DOING SO WILL CAUSE IRREVERSIBLE DAMAGE AND VOID SOFTENER WARRANTY.**
9. Insert Funnel into the tank
10. Ensure distributor is centered and **resting** on the bottom of the tank.
11. **DISTRIBUTOR TUBE MUST BE HELD DOWN AND IN PLACE WHILE GRAVEL IS Poured**
12. Pour Gravel into tank first (see table 1-4-1 for gravel amount per tank)
13. Pour Resin in tank (see table 1-4-1 for resin amount per tank)





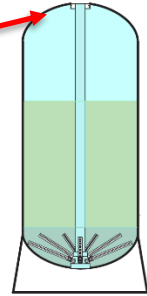
# Installation



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14. Fill Tanks with water up to 2"-4" below threads in collar, this will eliminate any "airhead" forming in tank that will blow resin up into the valve.
15. Thread softener valves onto tanks, install valve **A** on the left tank and Valve **B** on the right tank
16. Install Drain Line Flow Controls, these will be in a baggie zip tied to the softener valve.



**WARNING**  
*DO NOT* TURN WATER  
ON TO SOFTENER  
UNTIL FLOW CONTROL  
IS INSTALLED



**WARNING**

**DO NOT START WATER SOFTENERS WITHOUT DRAIN LINE FLOW CONTROLS INSTALLED**

17. Plumb water softener to floor drain or stack, check table 2-3-1 for backwash flow rate to ensure proper drain line sizing
18. Connect brine lines to brine connection on softener valves
19. Set Brine Tank in place within 15' of softeners for proper performance of the brine system
20. Connect Brine Tank to the water softener using poly line.
  - Remove brine-well cap (located inside brine tank) and connect brine line to brine pick-up tube inside the brine well through the hole provided in tank.
  - Install tee provided in brine line in-between softener tanks to connect the brine lines together (twin systems & triple systems only)





Table 2-3-1

### Plumbing and Drain Line Flow Spec Sheet

<b>Model #</b>	<b>Tank Size</b>	<b>Resin in Cubic Ft.</b>	<b>Backwash Flow GPM</b>	<b>Minimum Drainpipe Size OD</b>	<b>Minimum Plumbing Size</b>	<b>Salt Tank Size</b>	<b>Salt Used Per Tank Regeneration</b>
VSS2-100-030	10" x 44"	1 Cubic ft	2.2 gpm	5/8"	3/4"	18" x 40"	10 lbs
VSS2-100-045	10" x 54"	1.5 Cubic ft	2.2 gpm	5/8"	3/4"	18" x 40"	15 lbs
VSS2-100-060	12" x 52"	2 Cubic ft	3.2 gpm	5/8"	1"	18" x 40"	20 lbs
VSS2-100-075	13" x 54"	2.5 Cubic ft	4.2 gpm	3/4"	1"	18" x 40"	25 lbs
VS2-125-090	14" x 65"	3 Cubic ft	5.3 gpm	3/4"	1-1/4"	24" x 50"	30 lbs
VS2-125-120	16" x 65"	4 Cubic ft	6.5 gpm	1"	1-1/4"	24" x 50"	40 lbs
VS2-125-150	18" x 65"	5 Cubic ft	7.5 gpm	1"	1-1/4"	24" x 50"	50 lbs
VS2-150-120	16" x 65"	4 Cubic ft	6.5 gpm	1"	1-1/2"	24" x 50"	40 lbs
VS2-150-150	18" x 65"	5 Cubic ft	7.5 gpm	1"	1-1/2"	24" x 50"	50 lbs
VS2-150-180	21" x 62"	6 Cubic ft	13 gpm	1"	1-1/2"	24" x 50"	60 lbs
VS2-150-210	21" x 62"	7 Cubic ft	13 gpm	1"	1-1/2"	24" x 50"	70 lbs
VS2-150-240	24" x 72"	8 Cubic ft	15 gpm	1"	1-1/2"	30" x 50"	80 lbs
VS2-200-150	18" x 65"	5 Cubic ft	7.5 gpm	1"	2"	24" x 50"	50 lbs
VS2-200-180	21" x 62"	6 Cubic ft	13 gpm	1"	2"	24" x 50"	60 lbs
VS2-200-210	21" x 62"	7 Cubic ft	13 gpm	1"	2"	24" x 50"	70 lbs
VS2-200-240	24" x 72"	8 Cubic ft	15 gpm	1"	2"	30" x 50"	80 lbs
VS2-200-300	24" x 72"	10 Cubic ft	15 gpm	1"	2"	30" x 50"	100 lbs
VS2-200-450	30" x 72"	15 Cubic ft	25 gpm	1-1/2"	2"	30" x 50"	150 lbs

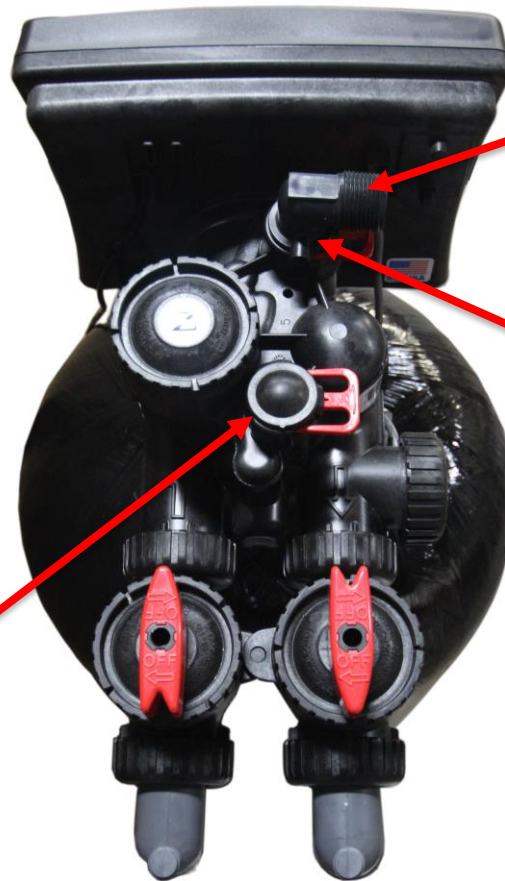


## 1" & 1-1/4" Valve

Drain Line Flow Control, Plumb to floor drain or stack using 1/2" OD tubing or pipe or 3/4" NPT male threaded connection



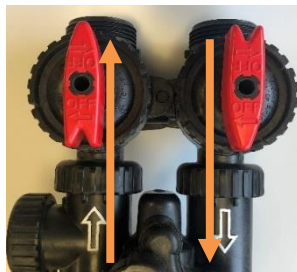
ALT Drain Line Flow Control for 21" and larger tanks



Brine Elbow Connection, plumb to Brine Tank with poly tubing provided

**INLET    OUTLET**

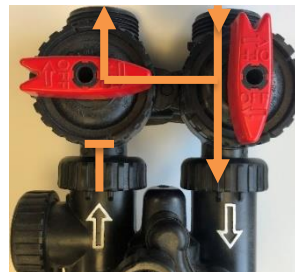
### BYPASS VALVE OPERATION



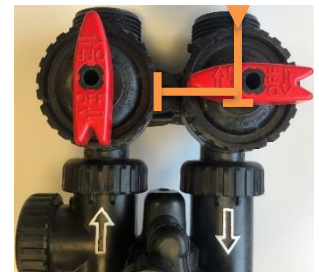
**NORMAL OPERATION**



**BYPASS**



**DIAGNOSTIC MODE**



**SHUT OFF**



## 1-1/2" & 2" Valve

Drain Line  
Flow Control



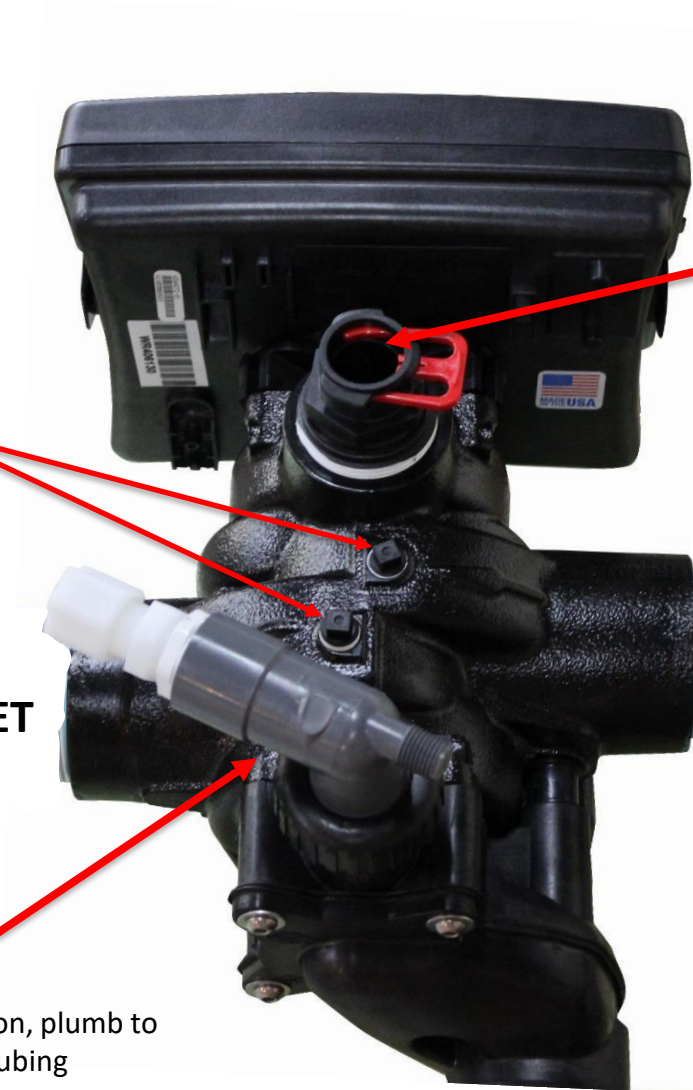
Plumb to floor  
drain or stack

Test Sample  
Ports

**OUTLET**

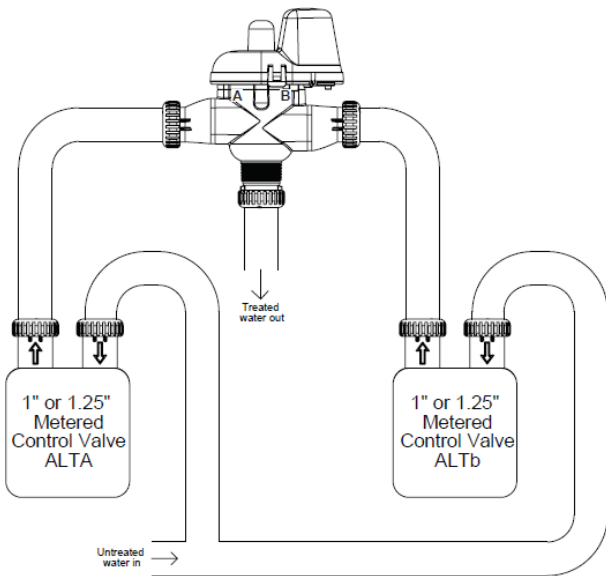
**INLET**

Brine Elbow Connection, plumb to  
Brine Tank with poly tubing  
provided

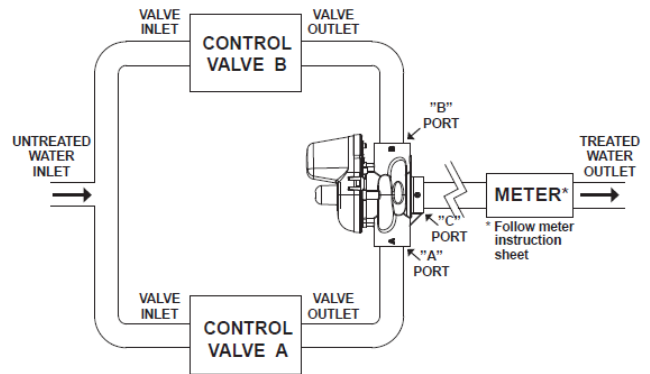


## M.A.V. Motorized Alternating Valve

### 1" & 1-1/4" Valve



### 1-1/2" & 2" Valve

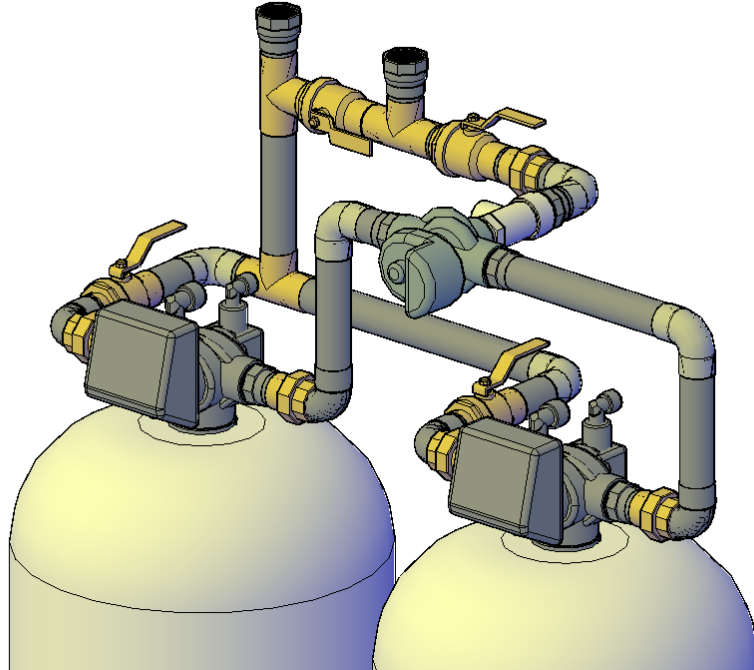


Part Number	Description
312-125-MV	1" Motorized Alternating Valve
312-125-MV	1-1/4" Motorized Alternating Valve

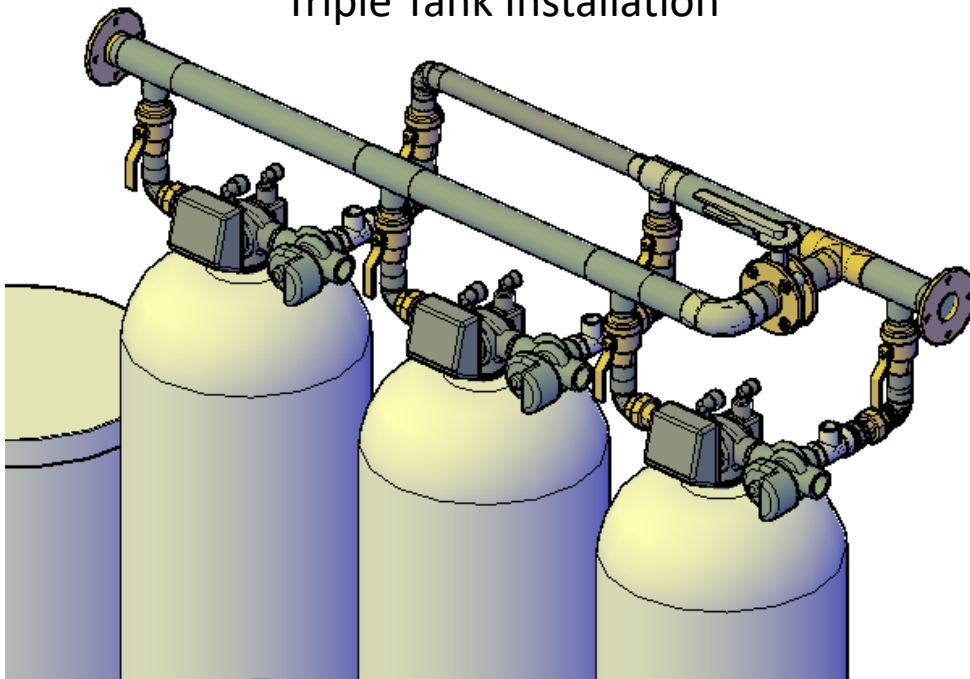
Part Number	Description
312-150-MV	1-1/2" Motorized Alternating Valve
312-200-MV	2" Motorized Alternating Valve



## Twin Tank Installation



## Triple Tank Installation



# Installation



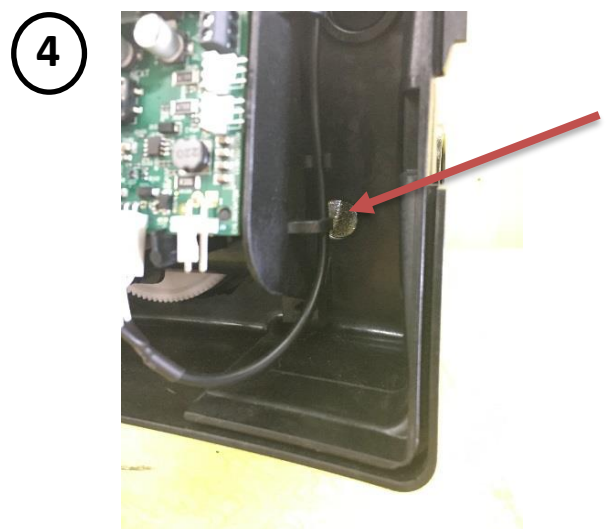
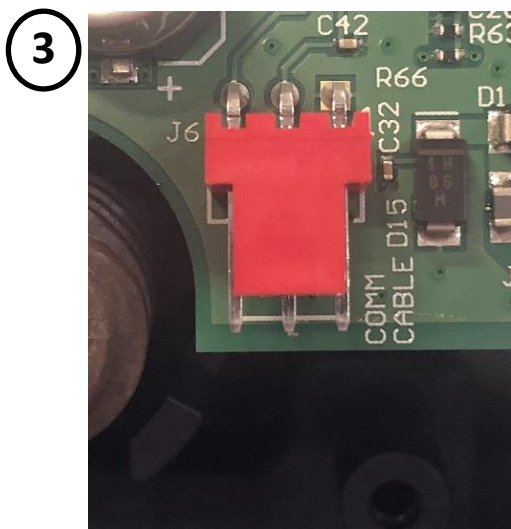
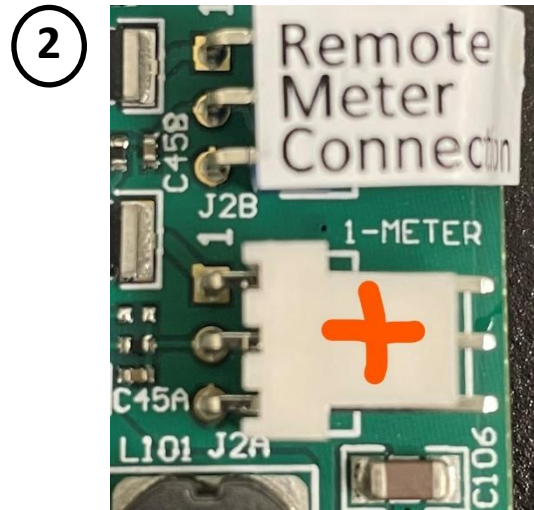
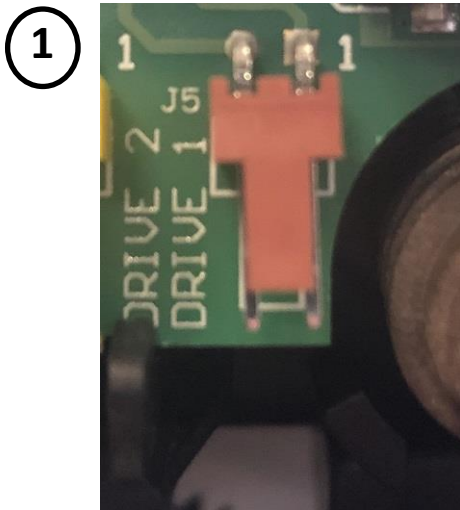
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## Wiring Instructions

1. Connect MAV (three way valve) wire to Valve A at **Drive 1** connection on circuit board (see figure 2-8-1)
2. Connect Meter cable to Valve A at **1-METER** connection on circuit board (see figure 2-8-2)
3. Connect Communication cable to Valve B at **COMM CABLE** connection on circuit board (see figure 2-8-3)

**\*NOTE:** Wires should be run into valve through knockout on lower right side of the backplate (see figure 2-8-4)



# Programming



**VELOCITY WATER WORKS**



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## Programming Instructions



### Set time of day


Time of day will need to be set upon initial installation and after a prolonged power outage. If prolonged power outage occurs, the time of day will flash on and off indicating that the time should be reset.



1. Press 


2. **Current Hour** will Flash. Set the hour using the  and  buttons.

AM/PM toggles after 12. Press  to advance to step 3.

3. **Current Minute** will flash. Set the minutes using the  and  buttons

Press  to advance to step 4.

4. **Current Day** will display. Set the current day using the  and  buttons

Press  to return to general display





# Programming



**VELOCITY WATER WORKS**


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## Programming Instructions

Velocity Water Softeners are automatic regeneration water softeners that regenerate based off gallons used. Velocity has preset the softener so that the gallons between regenerations will be automatically calculated after the incoming hardness is entered. Default hardness is set at 20 grains.

### Field Programming

1. To enter programming mode push and hold  and  together for 3 sec.

2. **WATER HARDNESS:** Default hardness is 20, set incoming hardness using  or 


Press  to advance to step 3.



3. **DAY OVERRIDE:** Day override can be set to regenerate the softener based on maximum days in-between regenerations or gallons used whichever comes first. This number can be set between 1-28 or set to OFF. If set to off unit will regenerate only based on gallons used. Default setting is OFF.

Press  to advance to step 4.




4. **REGEN IMMEDIATE:** ON ZERO is pre-set, this cannot be changed. Press  to advance to step 5

5. **SERVICE ALARM – GALLONS:** This feature is used to signal service into the future. This is typically set by the installing dealer to warn the end user that service is required after a preset number of gallons have run through the softener. If the feature is active, a specific gallon amount will appear. Default is OFF.

Press  to advance to step 6



6. **SERVICE ALARM – TIME:** This feature is used to signal service into the future. This is typically set by the installing dealer to warn the end user that service is required after a period of time has passed. If the feature is active a specific number of years will display. Default is OFF. Press  to advance to step 7.



# Programming



**VELOCITY WATER WORKS**

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## Programming Instructions


7. **ALARM BUZZER:** Audible alarm will sound if an error has occurred, Default is ON. Turn

alarm on or off using the  button. Press  to advance to step 8



ALARM BUZZER  
SET ON

8. **ALARM BUZZER START:** Set start time of alarm buzzer, Default is 6:00 am

Press  to advance to step 9



ALARM BUZZER START  
SET 6:00 AM

9. **ALARM BUZZER OFF:** Set end time of alarm buzzer, Default is 10:00 pm

Press  to advance to step 10



ALARM BUZZER END  
SET 10:00 PM

10. **BACKLIGHT DISPLAY:** Sets if the display backlight is on or off. Default is ON

Press  to exit installer programming.



LIGHT NORMALLY  
SET ON


## Manual Regeneration

• To initiate a manual regeneration at the next preset regeneration time press and release



softener display will flash REGEN TODAY to indicate the softener will regenerate

at the designated regen time. *If you pressed the REGEN button in error, pressing the button again, will cancel the command.*

• To initiate an immediate regeneration press and hold the  for 5-7 seconds. The

softener will display REGEN PNDG and will begin the regeneration within minutes.

**This command cannot be cancelled.** You can “Fast Forward” through cycles by pressing



button once the cycle has started the countdown.



### General Operation

When the system is operating one of five displays may be shown. On a twin softener only the online valve will have this display, the other display will read "STANDBY"

1. **CURRENT TIME OF DAY:** Display will show time of day along with current gpm



2. **FLOW RATE:** Display will show the current flow rate



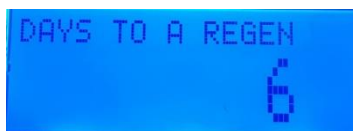
3. **VACATION MODE:** Allows the system to be "shut down" when there will be no water usage for an extended period of time. Default is NO, if vacation mode is accidentally turned on it will resume normal operation after a minimum of 50 gallons of water is metered through the softener in a single day.



4. **CAPACITY REMAINING:** Display will show the capacity remaining until regeneration along with the current gpm



5. **DAYS TO REGEN:** Display will show days until next regen if a day override is set





### Power Loss and Battery Replacement

The transformer comes with a 15' power cord and is designed for use with the control valve. The transformer should only be used in a dry location.

In the event of a power outage the control valve will retain all of the settings and time of day. If an extended power outage occurs the control valve will keep the time of day until the battery is depleted, all other settings will remain. If the battery depletes and the time of day needs to be reset the time of day on the display will be flashing. All other settings are permanently stored in the nonvolatile memory.

The battery will need to be replaced periodically, it is a 3 Volt Lithium Coin Cell type 2032 and is readily available at most stores.

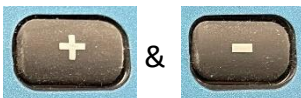


### Audible Alarm

This control valve is equipped with an audible alarm and visual alarm.

- **To turn off alarm:** If the audible alarm sounds, press any button on the face of the control valve to turn off.
- **To reset alarm:** Both the gallon alarm and time alarm seeing are reset by pushing and

holding the



simultaneously for three seconds.

- **To reset valve:** Both the Errors and Faults can be reset by pressing and holding the



simultaneously for three to five seconds.

# Troubleshooting



**VELOCITY WATER WORKS**

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PROBLEM	CAUSE	CORRECTION
<b>No display on PC board</b>	A. No power at electric outlet	A. Repair outlet, turn on breaker to outlet or switch to 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 (15VDC)
	D. Defective power adapter	D. Replace power adapter
	E. Defective PC board	E. Replace PC board
<b>Display is not displaying flow or correct flow.</b>	A. Bypass valve in bypass position	A. Turn bypass to service position
	B. Meter cable is not connected to meter connection on PC board	B. Connect meter cable to meter connection on PC board Valve A (see figure 2-8-2)
	C. Restricted/stalled meter turbine	C. Remove meter and check for rotation and or foreign material
	D. Meter wire not installed securely into three pin connector on PC board	D. Verify meter cable wires are installed securely into white connector and onto PC board labeled meter
	E. Defective meter	E. Replace meter
	F. Defective PC board	F. Replace PC board
<b>Time of day flashes on and off</b>	A. Power outage	A. Reset time of day. If PC board has battery back up the battery may be depleted. See page 3-5 for battery location and type
<b>Control valve does not regenerate automatically but does when manually started</b>	A. Bypass valve in bypass position	A. Turn bypass to service position
	B. Meter cable is not connected to meter connection on PC board	B. Connect meter cable to meter connection on PC board Valve A (see figure 2-8-2)
	C. Restricted/stalled meter turbine	C. Remove meter and check for rotation and or foreign material
	D. Meter wire not installed securely into three pin connector on PC board	D. Verify meter cable wires are installed securely into white connector and onto PC board labeled meter
	E. Defective meter	E. Replace meter
	F. Defective PC board	F. Replace PC board
<b>Hard water being delivered by softener</b>	A. Bypass valve in bypass position	A. Turn bypass to service position
	B. Bypass valve is faulty	B. Replace bypass valve
	C. Resin is exhausted due to improper incoming hardness setting	C. Test incoming water, confirm hardness setting, see page 3-2 for instructions
	D. Water quality fluctuation	D. Test incoming water daily and adjust incoming hardness setting accordingly
	E. No salt or improper level of salt in brine tank	E. Add salt to tank, verify salt level is higher than water level at all times
	F. Valve not drawing brine solution	F. Clean or replace Injector
	G. Insufficient water level in brine tank	G. Confirm refill cycle is filling tank
	H. Damaged stack assembly	H. Replace stack assembly
	I. Fouled resin bed	I. Replace resin

# Troubleshooting



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PROBLEM	CAUSE	CORRECTION
<b>Valve does not regenerate automatically</b>	A. Broken drive gear or drive cap assembly	A. Replace drive cap assembly
	B. Broken piston rod	B. Replace drive cap assembly
	C. Defective PC board	C. Replace PC board
<b>Residual salt being delivered to service</b>	A. Low water pressure	A. Check incoming water pressure, water pressure needs to be at a minimum of 25psi
	B. Incorrect injector	B. Replace injector with correct size for the application
	C. Restricted drain line	C. Check drain line for kinks, restrictions or debris and clean it out
	D. Undersized drain line	D. Install proper sized drain line see page 2-3 for drain line minimum sizing
<b>Excessive water in brine tank</b>	A. Plugged injector	A. Clean or replace injector
	B. Drive cap assembly not tightened in properly	B. Re-tighten the drive cap assembly
	C. Damaged stack assembly	C. Replace stack assembly
	D. Restricted drain line	D. Check drain line for kinks, restrictions or debris and clean it out
	E. Undersized drain line	E. Install proper sized drain line see page 2-3 for drain line minimum sizing
	F. Missing refill flow control	F. Check brine elbow for proper flow control
<b>Valve does not draw brine</b>	A. Plugged injector	A. Clean or replace injector
	B. Faulty regenerate piston	B. Replace regenerate piston
	C. Brine line connection leak	C. Inspect brine line for air leak, loose connection split brine line
	D. Restricted drain line	D. Check drain line for kinks, restrictions or debris and clean it out
	E. Brine line too long or too much lift	E. Shorten brine line, lower brine line
	F. Low water pressure	F. Check incoming water pressure, water pressure needs to be at a minimum of 25psi
<b>Water running to drain</b>	A. Power outage during regeneration	A. Upon power being restored control will finish the remaining regeneration time
	B. Damaged stack assembly	B. Replace stack assembly
	C. Piston assembled incorrectly	C. Check piston assembly
	D. Drive cap assembly not tightened in properly	D. Re-tighten the drive cap assembly

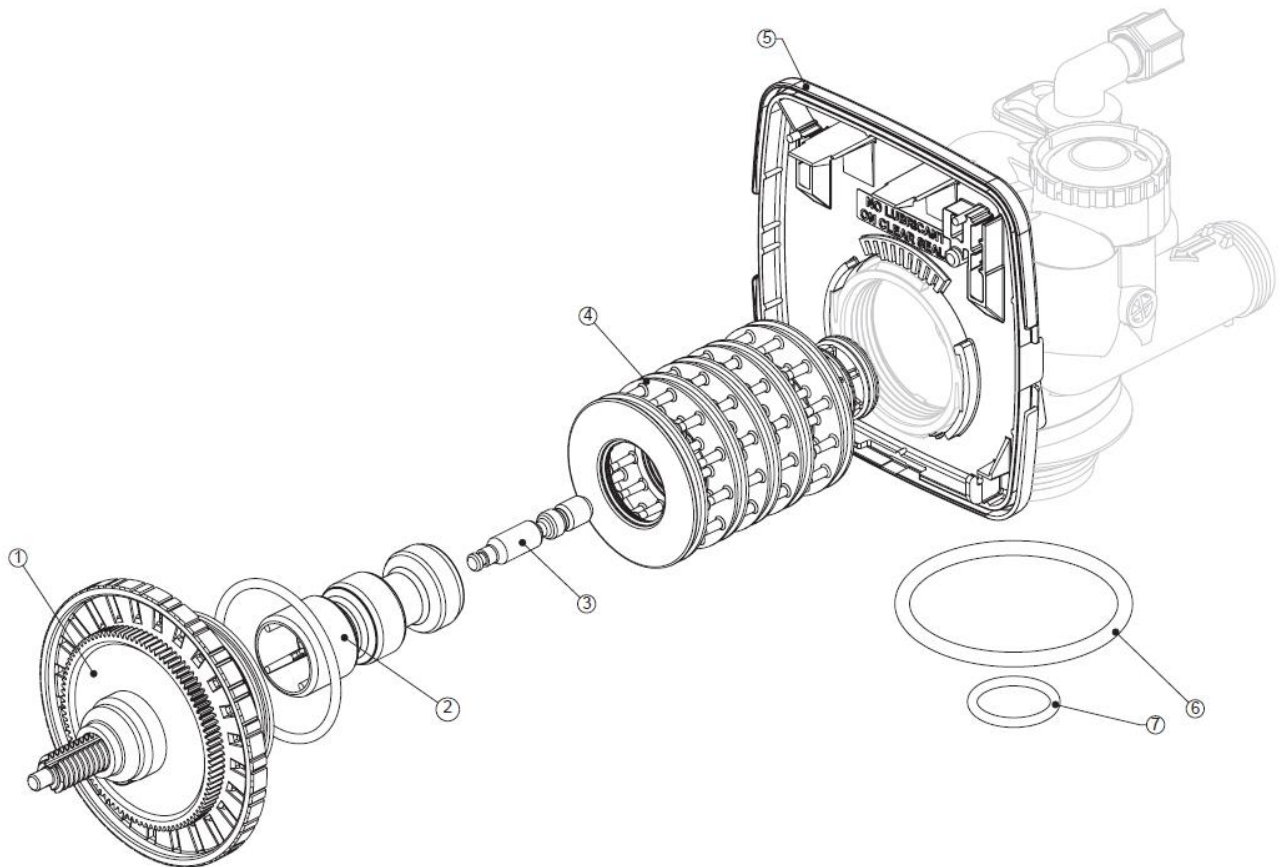
# Errors



ERROR	CAUSE	CORRECTION
<b>ERROR - 101</b> Control valve unable to sense motor movement	A. Motor not inserted full to engage pinion gear	A. Disconnect power, make sure motor is fully inserted and engaged with pinion gear. Press NEXT and REGEN for 3 seconds to reset
	B. Motor wires broken or disconnected	B. Check for broken wires, confirm motor wire connected to the PC board labeled MOTOR. Press NEXT and REGEN for 3 sec. to reset
	C. PC board not properly snapped into drive bracket	C. Properly snap PC board into drive bracket, two holes on bottom of PC board should be inserted onto pegs on drive bracket and clip should be snapped over top of board. Press NEXT and REGEN for 3 sec. to reset
	D. Missing or broken reduction gears	D. Replace missing or broken gears
<b>ERROR - 102</b> Control valve motor ran too short and was unable to find the next position	A. Foreign material is lodged in control valve	A. Remove drive cap assembly and pull out piston assembly and stack assembly for inspection. Press NEXT and REGEN for 3 sec. to reset
	B. Mechanical binding	B. Check piston and stack assemblies, check reduction gears, check drive bracket and main drive gear interface. Press NEXT and REGEN for 3 sec. to reset
	C. Main drive gear too tight	C. Loosen main drive gear. Press NEXT and REGEN for 3 sec. to reset
	D. Improper voltage being delivered to PC board	D. Verify proper voltage is being delivered to PC board (15VDC)
<b>ERROR - 103</b> Control valve motor ran too long and was unable to find the next position	A. Motor failure during a regeneration	A. Check motor connections. Press NEXT and REGEN for 3 sec. to reset
	B. Foreign matter built up on piston and stack assemblies creating friction and drag	B. Replace piston and stack assemblies. Press NEXT and REGEN for 3 sec. to reset
	C. Drive bracket not snapped into back plate properly not allowing reduction gears to engage drive gear	C. Check for wires interfering with drive brackets ability to snap in properly. Snap drive bracket in properly. Press NEXT and REGEN for 3 sec. to reset
<b>ERROR - 106</b> MAV/NHWBP motor ran too short and was unable to find next position	A. MAV/NHWBP motor wire not connected to PC board or not connected to correct terminal	A. Connect MAV/NHWBP motor to PC board "brown" connector (see figure 2-8-1). Press NEXT and REGEN for 3 sec. to reset
	B. MAV/NHWBP motor not fully engaged with reduction gears	B. Insert motor into casing verifying that the gears are meshing. Press NEXT and REGEN for 3 sec. to reset
	C. Foreign matter built up on piston and stack assemblies creating friction and drag	C. Replace piston and stack assemblies. Press NEXT and REGEN for 3 sec. to reset
<b>ERROR - 107</b> MAV/NHWBP motor ran too long and was unable to find next position	A. Foreign material is lodged in MAV/NHWBP valve	A. Remove MAV drive cap assembly and remove piston and stack assemblies for inspection. Replace if necessary. Press NEXT and REGEN for 3 sec. to reset
	B. Mechanical binding	B. Check piston and stack assemblies, check reduction gears, check drive bracket and main drive gear interface. Press NEXT and REGEN for 3 sec. to reset



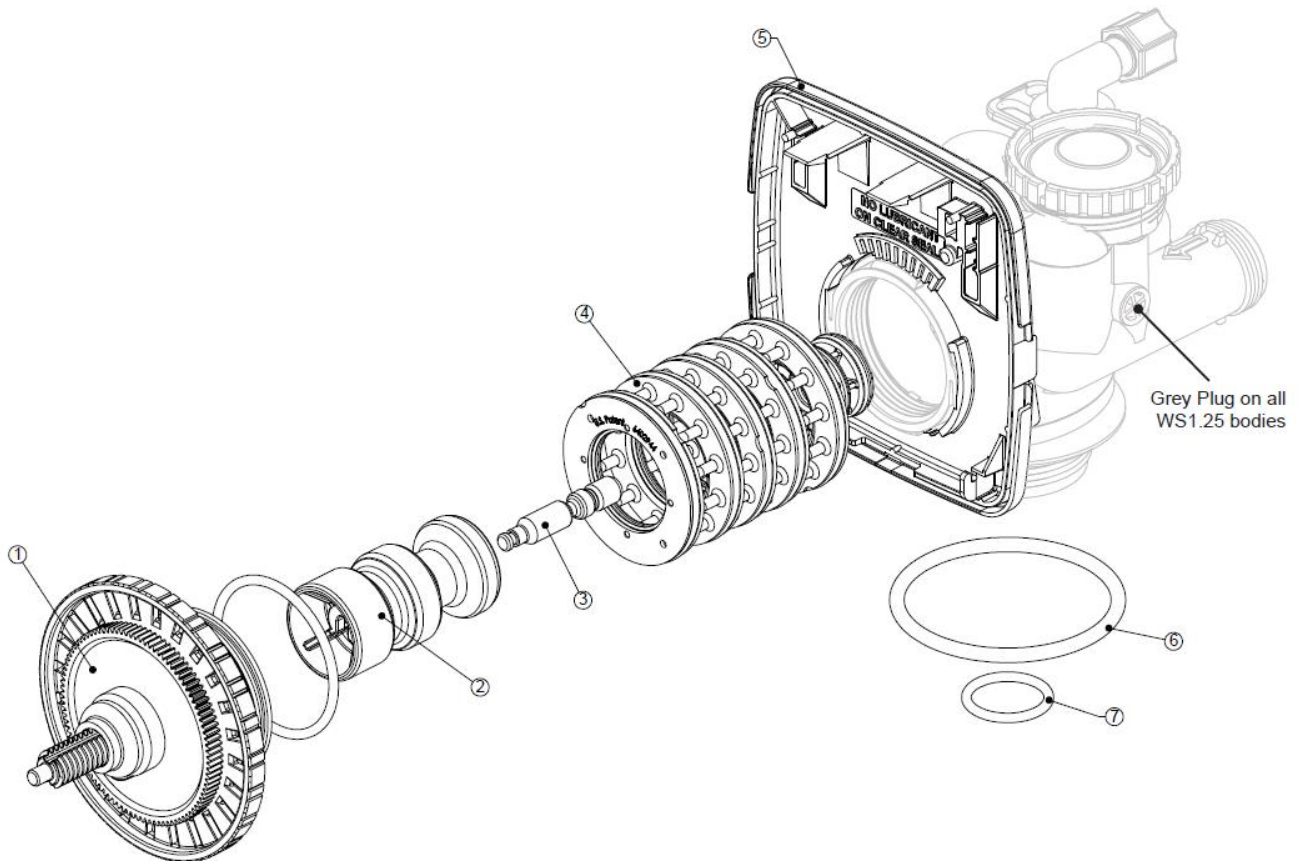
1" Softener Valve Parts Breakdown		
Drawing #	Part #	Description
1	300-020-CP	Drive Cap Assembly
2	300-102-CP	Downflow Piston
3	300-103-CP	Brine Piston
4	300-101-CP	Stack Assembly
5	300-046-CP	Back Plate
6	300-070-CP	Valve/Tank O-Ring
7	300-071-CP	Distributor O-Ring
8	300-045-CP	Drive Motor
9	300-042-CP	Drive Bracket
10	300-024-CP	Control Board





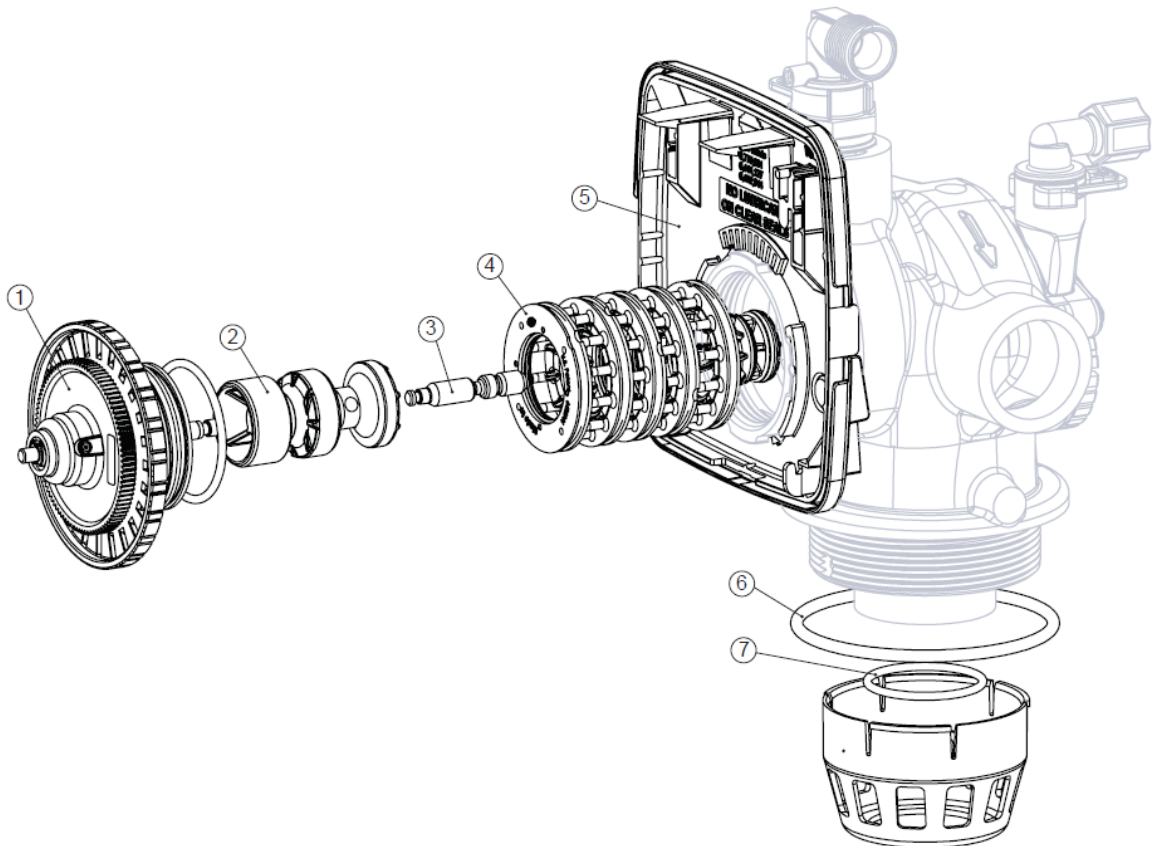


1-1/4" Softener Valve Parts Breakdown		
Drawing #	Part #	Description
1	300-020-CP	Drive Cap Assembly
2	300-152-CP	Downflow Piston
3	300-103-CP	Brine Piston
4	300-151-CP	Stack Assembly
5	300-046-CP	Back Plate
6	300-070-CP	Valve/Tank O-Ring
7	300-074-CP	Distributor O-Ring
8	300-045-CP	Drive Motor
9	300-042-CP	Drive Bracket
10	300-024-CP	Control Board



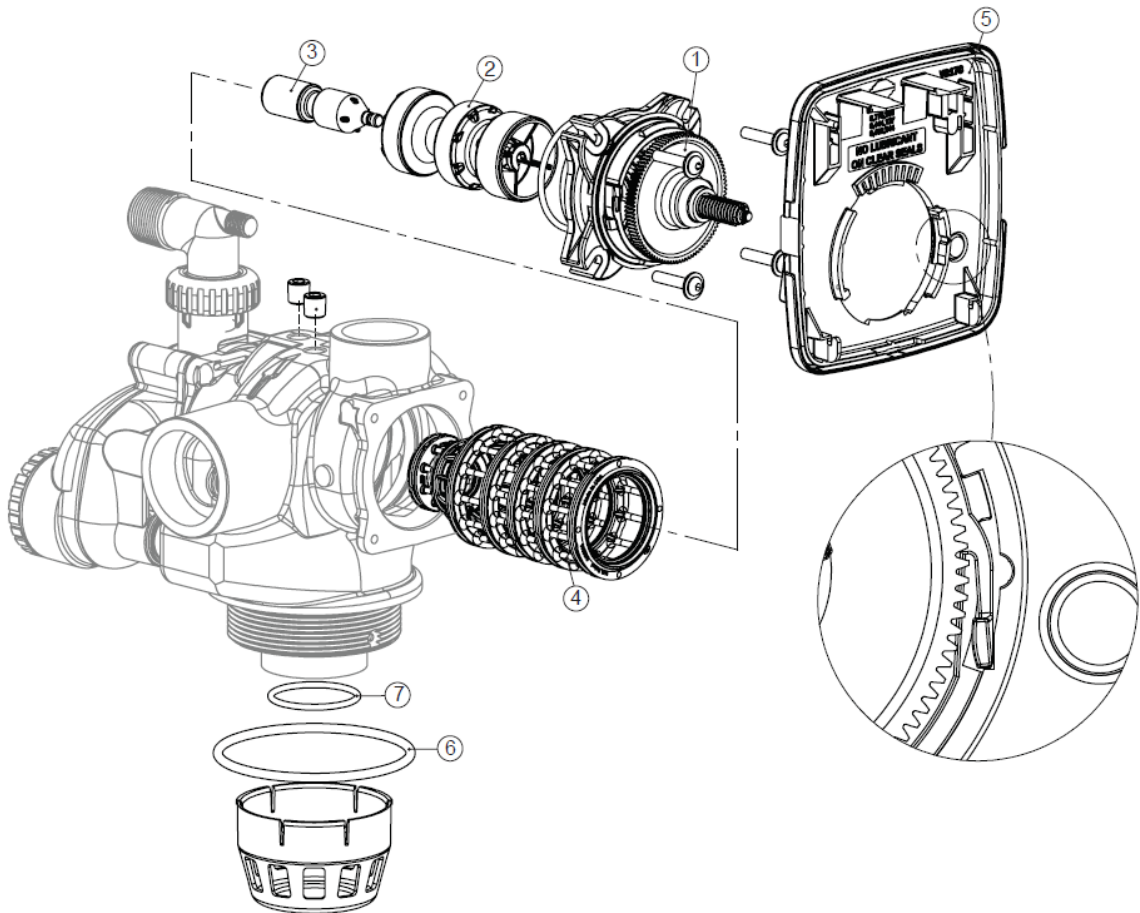


1-1/2" Softener Valve Parts Breakdown		
Drawing #	Part #	Description
1	300-020-CP	Drive Cap Assembly
2	300-152-CP	Downflow Piston
3	300-103-CP	Brine Piston
4	300-151-CP	Stack Assembly
5	300-046-CP	Back Plate
6	300-072-CP	Valve/Tank O-Ring
7	300-073-CP	Distributor O-Ring
8	300-045-CP	Drive Motor
9	300-042-CP	Drive Bracket
10	300-024-CP	Control Board





2" Softener Valve Parts Breakdown		
Drawing #	Part #	Description
1	300-022-CP	Drive Cap Assembly
2	300-202-CP	Downflow Piston
3	300-203-CP	Brine Piston
4	300-201-CP	Stack Assembly
5	300-046-CP	Back Plate
6	300-072-CP	Valve/Tank O-Ring
7	300-073-CP	Distributor O-Ring
8	300-045-CP	Drive Motor
9	300-042-CP	Drive Bracket
10	300-024-CP	Control Board



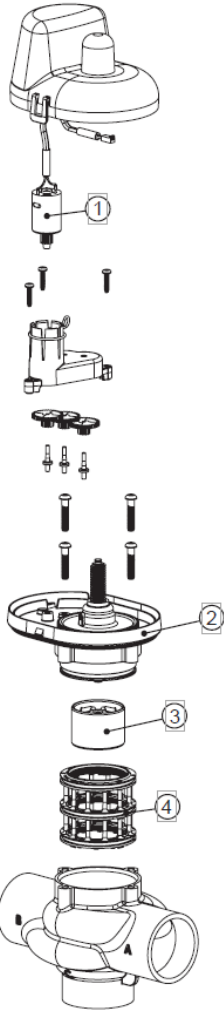
# Parts



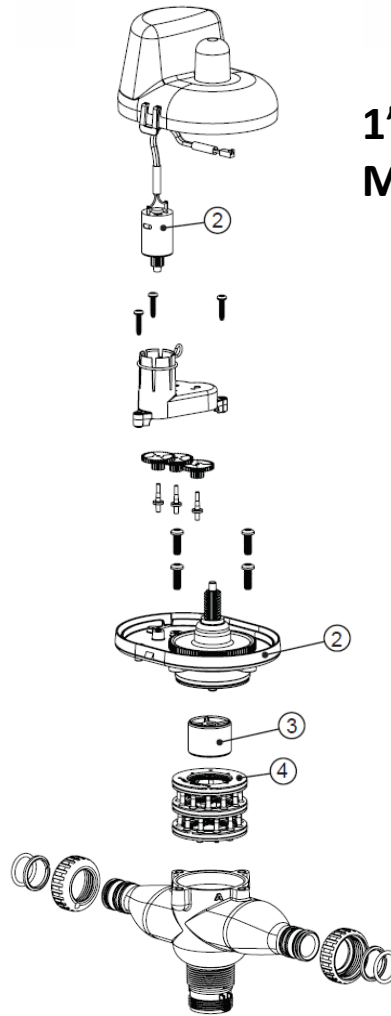
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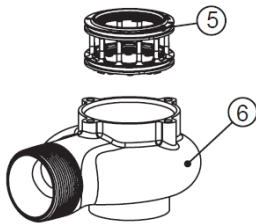
**1-1/2" &  
2" MAV**



**1" & 1-1/4"  
MAV**

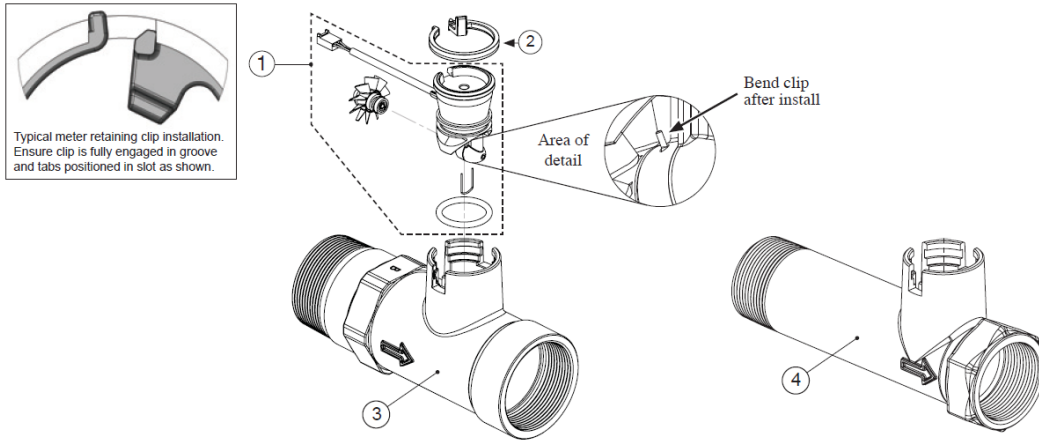


**1-1/2" &  
2" NHWBP**

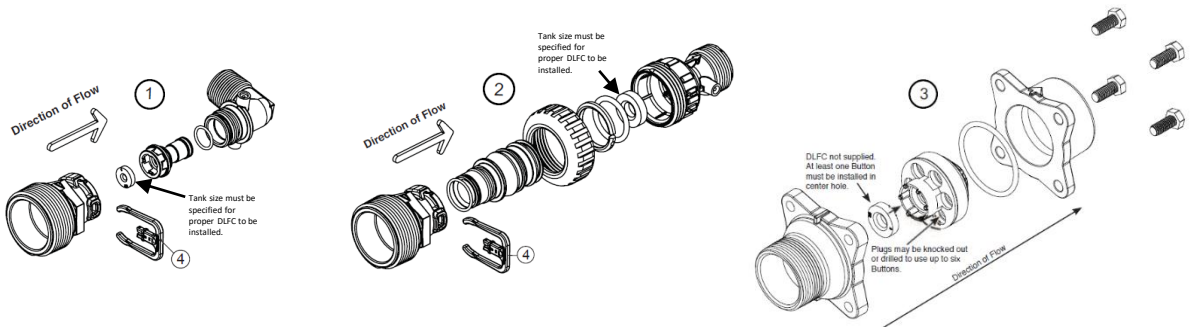


## MAV Parts Breakdown

<b>Drawing #</b>	<b>Part #</b>	<b>Description</b>
1	314-205-CP	MAV Motor, 8' Cable
2	314-121-CP	1", 1-1/4" & 1-1/2" MAV Drive Cap
	314-204-CP	2" MAV Drive Cap
3	314-122-CP	1", 1-1/4" & 1-1/2" MAV Piston
	314-202-CP	2" MAV Piston
4	314-123-CP	1", 1-1/4" & 1-1/2" Stack Assembly
	314-201-CP	2" Stack Assembly
5	313-151-CP	1-1/2" NHWBP Stack Assembly
	313-201-CP	2" NHWBP Stack Assembly
6	313-150-CP	1-1/2" NHWBP
	313-200-CP	2" NHWBP



1-1/2" & 2" Meter Parts Breakdown		
Drawing #	Part #	Description
1	300-023-CP	Turbine Meter Assembly 15' Cable
2	300-051-CP	Meter Red Retaining Clip
3	340-200-CP	2" SS Meter Assembly
4	340-150-CP	1-1/2" SS Meter Assembly





Drain Line Flow Control Parts Breakdown		
Drawing #	Part #	Description
1	300-011-CP	Drain Fitting Elbow (up to 9 gpm)
2	300-015-CP	Drain Fitting Straight (up to 25 gpm)
3	300-016-CP	SS Drain Fitting (30 gpm and up)
4	300-027-CP	Red Retaining Clip

## Faults & ERROR Message



### **ERR 101 – Control unable to sense motor movement**

- Motor not fully inserted
  - Check that motor is inserted and engaged with white gear.
- PC board not properly snapped into drive bracket
  - Reinstall PC board confirming holes on bottom of board line up with tabs and board is snapped in with clip on top.

Press  &  buttons simultaneously for 3 seconds to reset



### **ERR 102 – Control valve motor ran too short and was unable to find next position**

- Foreign material is lodged in control valve
  - Check piston, stack assembly and drive cap assembly for obstruction or build up, remove obstruction or replace parts.
- Mechanical Binding
  - Check piston, stack assembly and drive cap assembly, check reduction gears, check drive bracket and main drive gear for problems. Replace parts if necessary.
- Improper voltage being delivered to PC board
  - Verify proper voltage is being supplied.

Press  &  buttons simultaneously for 3 seconds to reset

### **ERR 103 – Control valve motor ran too long and was unable to find next position**



- Motor Failure during a regeneration
  - Check motor connections, verify good connection on board and motor
- Foreign matter built up on piston and/or stack assembly creating friction and drag enough to time out motor
  - Check piston and stack assembly for build up, remove obstruction, clean parts or replace parts.
- Drive Bracket is not snapped into backplate properly
  - Reinstall drive bracket onto backplate confirming tabs on bottom of bracket are inserted into tabs on backplate
  - Reinstall drive bracket confirming all wires behind bracket are tucked into wire harnesses and not prohibiting bracket from snapping in correctly with both clips latching on bracket at the top.

Press  &  buttons simultaneously for 3 seconds to reset

## Faults & ERROR Message

### **ERR 104 – Control valve motor ran too long and timed out trying to reach home position**

- Drive bracket not snapped in properly.
  - Reinstall drive bracket onto backplate confirming tabs on bottom of bracket are inserted into tabs on backplate
  - Reinstall drive bracket confirming all wires behind bracket are tucked into wire harnesses and not prohibiting bracket from snapping in correctly with both clips latching on bracket at the top.



Press  &  buttons simultaneously for 3 seconds to reset

### **ERR 106 – MAV valve motor ran too long and unable to find park position**

- MAV motor wire not connected to PC board.
  - Connect MAV motor wire to the PC board on Valve “A” brown connector
- MAV motor not fully inserted into motor casing
  - Check to see that motor is fully inserted into motor casing





- Foreign matter is built up on piston and/or stack assembly creating friction and drag enough to time out motor
  - Check piston and stack assembly for obstruction or build up. Remove obstruction, clean parts or replace parts.

Press  &  buttons simultaneously for 3 seconds to reset

### **ERR 107 – MAV valve motor ran too short (stalled) while looking for park position**

- Foreign material is lodged in MAV valve
  - Check piston, stack assembly and drive cap assembly for obstruction or build up. Remove obstruction or replace parts.
- Mechanical Binding
  - Check piston and stack assembly, check reduction gears, check drive bracket and drive gear for problems. Replace parts if necessary.

Press  &  buttons simultaneously for 3 seconds to reset



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