

MAYTAG[®]

ST 300 SERIES

WATER TREATMENT SYSTEM OPERATION MANUAL



Certified by
International Association of Plumbing and Mechanical Officials (IAPMO) R&T
NSF/ANSI 42, 44, 61 & 372 · IPC · IRC

Reference Performance Data Sheet

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WATER TREATMENT SYSTEM SAFETY

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.



This is the safety alert symbol.

This symbol alerts you to potential hazards that can kill or hurt you and others.

All safety messages will follow the safety alert symbol and either the word "DANGER" or "WARNING." These words mean:

! DANGER

You can be killed or seriously injured if you don't immediately follow instructions.

! WARNING

You can be killed or seriously injured if you don't follow instructions.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed.

INTRODUCTION

IMPORTANT: Failure to follow this instruction can result in personal injury or damage to the equipment. This purpose of this installation manual is to guide the installer through the installation and operation process of MAYTAG® series water treatment system.

This manual is a reference and not included in every system installation situation. The technician installing this equipment must have:

- Training in the MAYTAG® series controllers.
- Knowledge of water treatment and how to determine proper control settings.
- Basic plumbing skills.
- The directional instructions “left” and “right” are determined by looking at the front of unit.

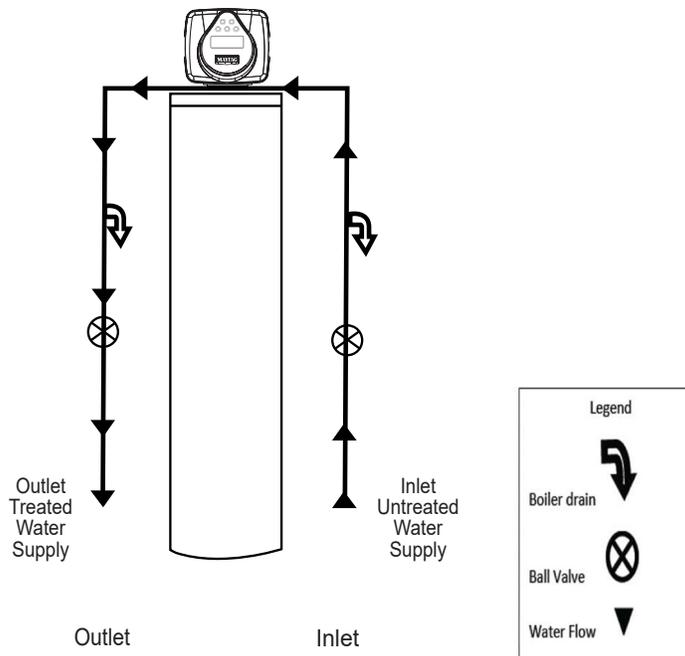
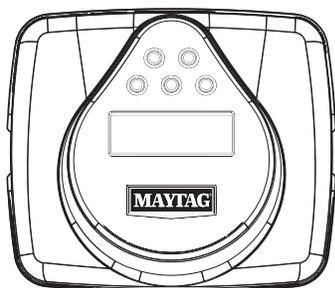


Figure 1: Typical Inlet/Outlet Piping and Valves for Proper Startup and Servicing

Left



Right

Inspect the unit for damage or missing parts. Contact your supplier if any discrepancies exist.

Main Parts

- Mineral Tank with Valve
- Brine Tank with Cover
- Brine Well Assembly
- Water Bypass
- Plumbing Connectors

INSPECTION

The system is shipped with several parts unassembled. When parts are removed from the packing, they must be inspected for damage.

If any parts are damaged or missing, contact your supplier.

IMPORTANT: When handling the mineral tank do not turn it upside down or drop on its side.

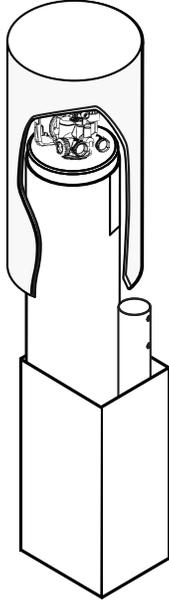


Figure 2

Remove system from carton:

1. Remove the box top from the system.
2. Remove the brine tank cover and lay aside for now.
3. Lift the brine tank up and off the top of the system. Set brine tank up and in position.
NOTE: 3M-ST64-XXXX, 3M-ST80-XXXX, and 3M-STR64-XXXX systems' brine tank is shipped in a separate box, including the brine well and safety brine valve assembly and tubing.
4. Remove the components from the shipping carton (bypass box, brine tube assembly, plumbing connectors & brine tubing).
5. Remove tank w/valve from box. Set upright and in position.

To assemble the Salt Tank:

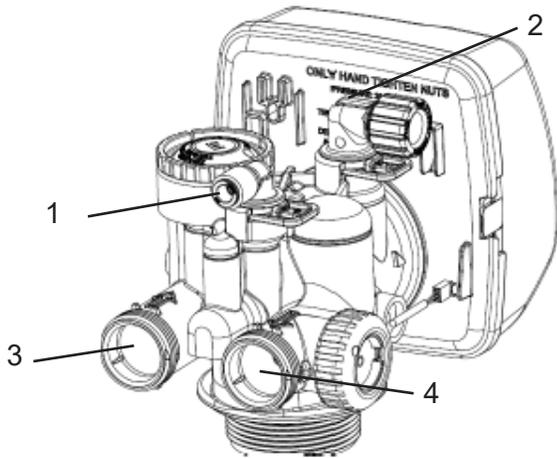
1. Stand the salt tank up and in position. Level as needed. The tank has two ports that will be connected. One to a drain and one to the valve.
2. Remove the brine well cap from the brine well.
3. Remove the overflow fitting from the brine well cap.
4. Place the brine well in position inside the brine tank aligning the two holes in the brine well with the two holes in the side of the brine tank.
5. Install the overflow fitting in the bottom hole to secure the brine well to the brine tank.

IMPORTANT: The mineral tank contains loose particles that will shift. If the tank is turned upside down or laid back quickly, the particles may enter the valve. If this happens, the valve may need to be disassembled and cleaned.

1. Stand the tank up and in position.
2. If the floor under the mineral tank is uneven, level as needed.

PARTS AND FEATURES

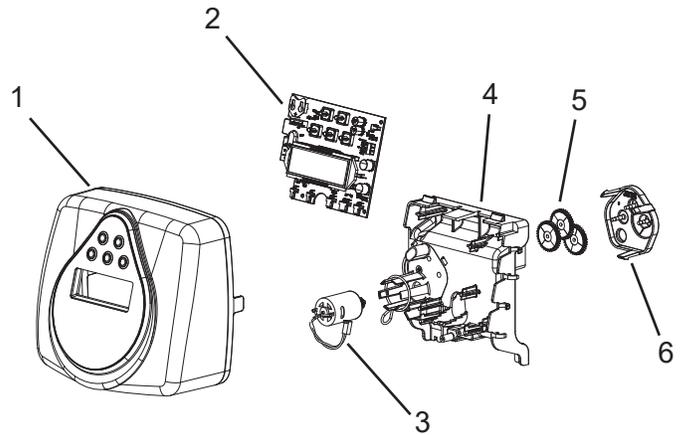
Valve Layout



- 1. Refill Flow Control Fitting
- 2. Drain Fitting
- 3. Untreated Water Inlet
- 4. Treated Water Outlet

Figure 3

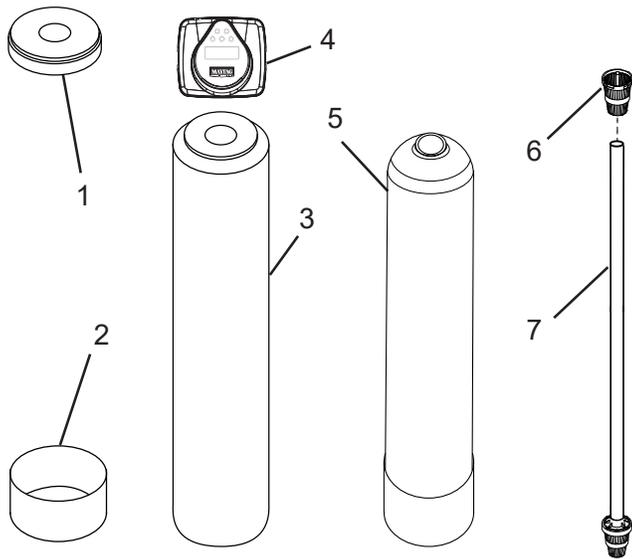
Control Layout



- 1. Face Cover Assembly
- 2. Circuit Board
- 3. Motor
- 4. Drive Bracket Asy
- 5. Drive Gear 12x36
- 6. Drive Gear Cover

Figure 5

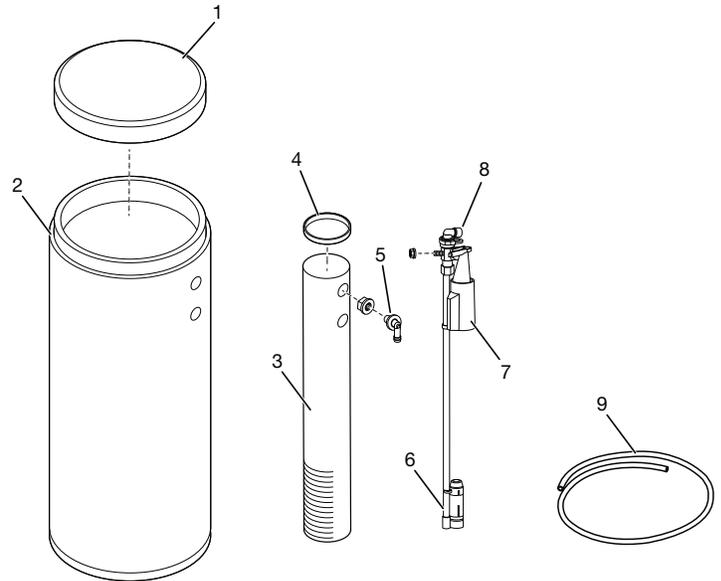
Mineral Tank



- 1. Tank Jacket Cover
- 2. Tank Jacket Sleeve
- 3. Tank Jacket
- 4. Valve
- 5. Mineral Tank
- 6. Upper Basket
- 7. Distributor Asy

Figure 4

Brine Tank

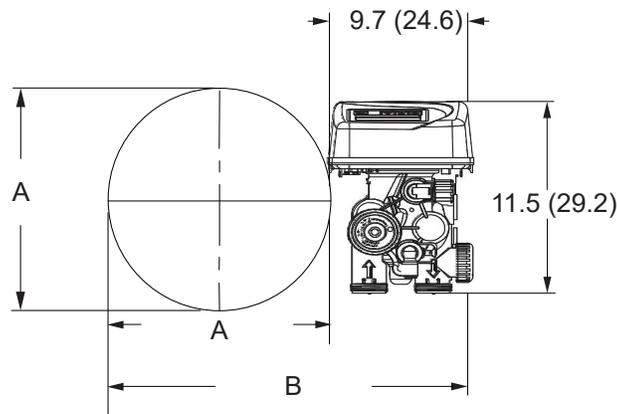


- 1. Cover
- 2. Brine Tank
- 3. Brine Well
- 4. Brine Well Cap
- 5. Overflow Fitting
- 6. Air Check
- 7. Float
- 8. Brine Valve Asy
- 9. Tubing

Figure 6

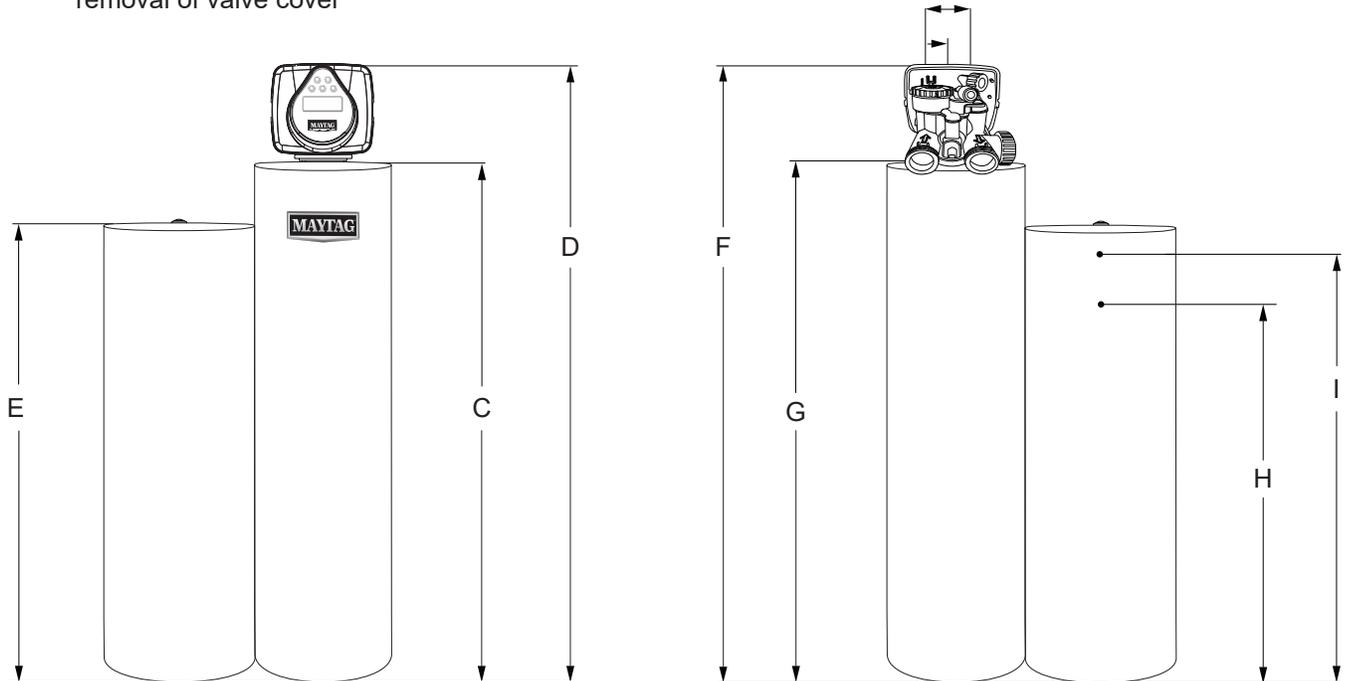
EQUIPMENT DIMENSIONS

Dimensions	10" x 44" Tank (25.4 x 111.76 cm)	10" x 54" Tank (25.4 x 137.16 cm)	13" x 54" Tank (33.02 x 137.16 cm)
A	16.0" (40.6 cm)	16.0" (40.6 cm)	18.0" (45.7 cm)
B	25.7" (65.2 cm)	25.7" (65.2 cm)	27.7" (70.4 cm)
C	44.25" (112.39 cm)	54.25" (137.79 cm)	54.25" (137.79 cm)
D	52.0" (132.08 cm)	62.0" (157.48 cm)	62.0" (154.9 cm)
E	41.25" (104.77 cm)	41.25" (104.77 cm)	41.25" (104.77 cm)
F	52.0" (132.08 cm)	62.0" (157.48 cm)	62.0" (157.48 cm)
G	47.0" (119.38 cm)	57.0" (144.78 cm)	57.0" (144.78 cm)
H	32.0" (81.28 cm)	32.0" (81.28 cm)	32.0" (81.28 cm)
I	35.31" (89.68 cm)	35.31" (89.68 cm)	35.31" (89.68 cm)



NOTE: Allow for an additional 7 (17.7) height for removal of valve cover

Inlet - Outlet
3 (7.6) on Center



Dimensions are given in: In (cm)

Figure 7: Equipment Dimensions

SYSTEM LAYOUT

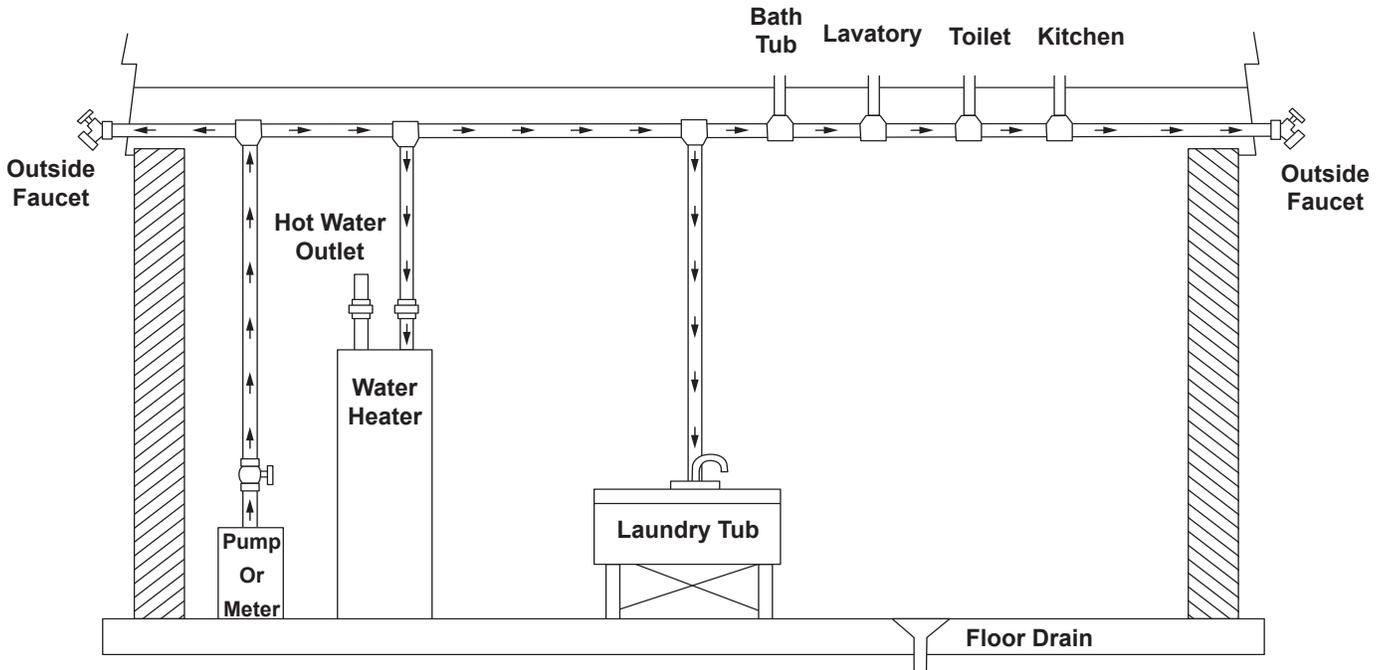


Figure 8: Standard Basement Before Installation (Cold water lines shown)

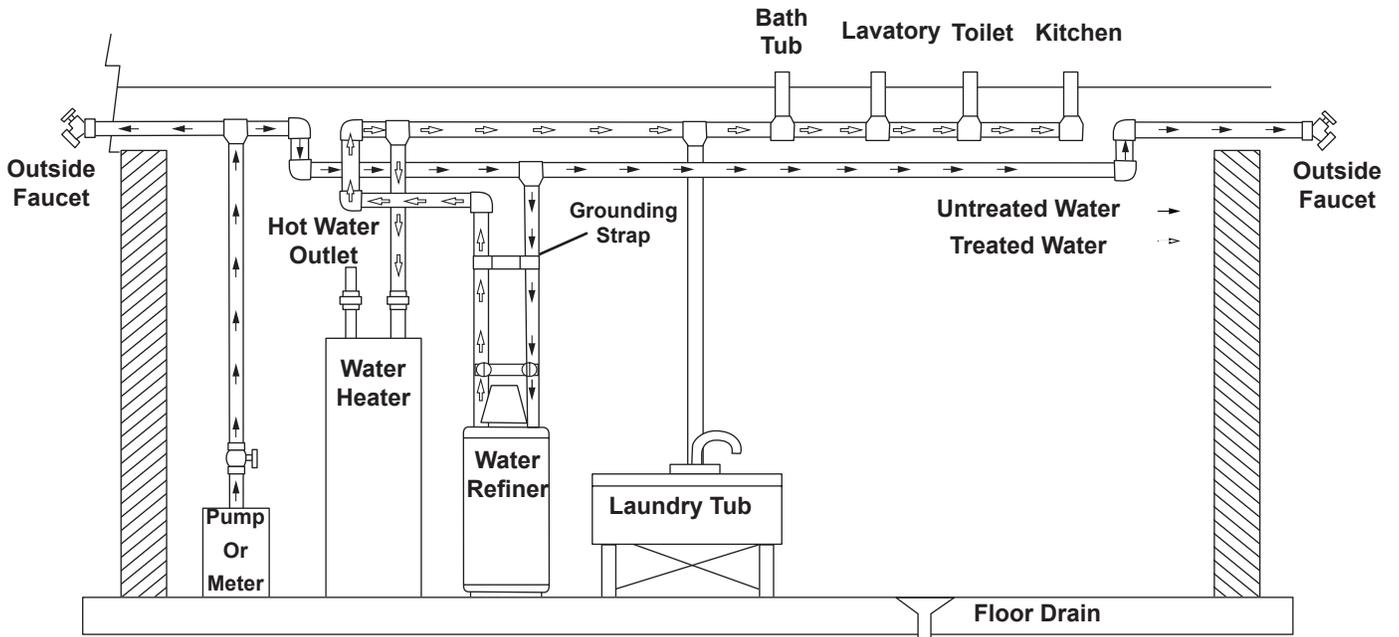


Figure 9: Treated Water Flow Diagram

SYSTEM SPECIFICATIONS

Model Number	3M-ST32-XXX	3M-ST40-XXX	3M-ST48-XXX	3M-ST64-XXX	3M-ST80-XXX
Recharge Style	Upflow	Upflow	Upflow	Upflow	Upflow
Mineral Tank Size	10" x 44"	10" x 54"	10" x 54"	13" x 54"	13" x 54"
Resin Volume	1.00 ft ³	1.25 ft ³	1.50 ft ³	2.00 ft ³	2.50 ft ³
Recharge (Salt) Tank Size	16" x 40"	16" x 40"	16" x 40"	18" x 40"	18" x 40"
Salt Storage	338 lbs	338 lbs	338 lbs	447 lbs	447 lbs
Drain Water Rate	2.7 gpm	2.7 gpm	2.7 gpm	4.2 gpm	4.2 gpm
Service Connection Size	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT
Drain Connection Size	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT
Recharge (Brine) Connection Size	3/8" NPT	3/8" NPT	3/8" NPT	3/8" NPT	3/8" NPT
Typical Installation Space Requirement	28"W x 20"D x 62"H	28"W x 20"D x 62"H	28"W x 20"D x 62"H	34"W x 20"D x 72"H	34"W x 20"D x 72"H
Shipping Weight	104 lbs	121 lbs	134 lbs	174 lbs 2 Box Shipment	199 lbs 2 Box Shipment

Model Number	3M-STR32-XXX	3M-STR32XC-XXX	3M-STR40-XXX	3M-STR64-XXX
Recharge Style	Upflow	Upflow	Upflow	Upflow
Mineral Tank Size	10" x 44"	10" x 54"	10" x 54"	13" x 54"
Resin Volume	1.00 ft ³	1.00 ft ³	1.25 ft ³	2.00 ft ³
Recharge (Salt) Tank Size	16" x 40"	16" x 40"	16" x 40"	18" x 40"
Salt Storage	338 lbs	338 lbs	338 lbs	447 lbs
Drain Water Rate	2.7 gpm	2.7 gpm	2.7 gpm	4.2 gpm
Service Connection Size	1" NPT	1" NPT	1" NPT	1" NPT
Drain Connection Size	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT
Recharge (Brine) Connection Size	3/8" NPT	3/8" NPT	3/8" NPT	3/8" NPT
Typical Installation Space Requirement	28"W x 20"D x 62"H	28"W x 20"D x 62"H	28"W x 20"D x 62"H	34"W x 20"D x 72"H
Shipping Weight	116 lbs	127 lbs	133 lbs	192 lbs 2 Box Shipment

INSTALLATION INSTRUCTIONS

Location Requirements

Indoor Location Requirements

IMPORTANT:

For indoor location of the Water Treatment System, make sure to follow these requirements:

- Install the appliance on flat and level surface.
- Make sure to maintain the space to access the equipment for maintenance and adding regenerant (salt) to brine tank.
- Operating ambient temperature: 34°F - 120°F (1°C - 49°C).
- Operating water temperature: 35°F - 100°F (1.7°C - 37.8°C). Working water pressure range: 20 psi - 120 psi (1.38 bar - 8.27 bar).
- Maintain constant electrical supply to operate the control.
- Total minimum pipe run to water heater of 10 ft. (3 m) to avoid the backup of hot water into system.
- Local drain for discharge as close as possible to the appliance.
- Water line connections with shutoff or bypass valves.
- Must meet any local and state codes for site of installation.
- Valve is designed for minor plumbing misalignments. Do not support weight of system on the plumbing.
- Make sure that all the soldered pipes are fully cooled before attaching plastic valve to the plumbing.

Outdoor Location Requirements

IMPORTANT:

- Place the unit at the dry location only, unless listed as Class 2 Power Supply which is suitable for outdoor use.
- A protected environment is recommended when the water system is installed outdoors. Ensure that important measures are taken for outdoor location as mentioned below:
- **Moisture** - Water projected by a nozzle against the enclosure from any direction shall not effect the operation of the machine.
- **Direct Sunlight** - In direct sunlight the material will fade or discolor over time. The integrity of the material will not degrade to cause system failures. Use of weather cover is recommended.

- **Temperature** - Extreme hot or cold temperature will cause damage to the valve or control. Freezing temperatures will freeze the water in the valve. This will cause physical damage to the internal parts as well as the plumbing and mineral. High temperatures will affect the control. The display may become unreadable but the control must continue to function. When the temperature returns to normal operating limits, the display will re-appear. A weather cover is recommended to assist with high temperature applications.
- **Insects and Dust** - The controller and valve have been designed to keep all but the smallest insects out of the critical areas. Dust is not totally avoidable, but cannot enter in an amount sufficient to interfere with satisfactory operation of the machine. Use of weather cover is recommended.

Electrical Requirements

⚠ WARNING



- **INGESTION HAZARD:** This product contains a button cell or coin battery.
- **DEATH** or serious injury can occur if ingested.
- A swallowed button cell or coin battery can cause **Internal Chemical Burns** in as little as **2 hours**.

- **KEEP** new and used batteries **OUT OF REACH of CHILDREN**.
- **Seek immediate medical attention** if a battery is suspected to be swallowed or inserted inside any part of the body.

- There are no user serviceable parts in the AC adapter, motor, or PC board, in the event of a failure, these parts must be replaced
- All electrical connections must be completed according to the local codes.
- Only use the AC power adapter which is supplied with the appliance. Plug the AC adapter into an electrical outlet that is not switched ON/OFF. To disconnect power, unplug the AC adapter from power supply.

Mechanical Requirements

⚠ WARNING



Electrical Shock Hazard

Prior to installation on metallic plumbing, securely install two grounding clamps and a #4 copper wire per installation instructions.

Failure to follow these instructions can result in death or electrical shock.

IMPORTANT:

- Plumbing must be installed in accordance with the International Plumbing Code and any local codes and ordinances.
- Do not use petroleum based lubricants, oils, or hydrocarbon based lubricants. Use only 100% silicone lubricants.
- All plastic connections should be hand tightened. Thread seal tape may be used on connections where o-ring seal is not used.
- **NOTE:** Do not use pliers or pipe wrenches to tighten the plastic connections.
- Soldering near the drain line must be done before connecting the drain line to the valve. Excessive heat will cause interior damage to the valve.
- Refer to the drain line requirements.
- Do not use lead based solder for sweat solder connections.
- The drain line must be a minimum of 1/2" (1.27 cm) diameter. Use 3/4" (1.9 cm) pipe if the backwash flow rate is greater than 7 gpm (26.5 Lpm) or the pipe length is greater than 20 feet (6 m).
- Do not support the weight of the system on the control valve fittings, plumbing, or the bypass.
- It is not recommended to use sealants on the threads. Use thread seal tape on the threads of the 1" (2.54 cm) NPT elbow, drain line connections, and other NPT threads.

General Requirements

⚠ WARNING

Excessive Weight Hazard

Use two or more people to move and install water treatment system.

Failure to do so can result in back or other injury.

IMPORTANT: Make sure that the valve and tank components of this unit have been assembled and tightened to the proper factory torque specifications. Over tightening can cause improper valve and tank alignment and can damage the tank O-ring (P/N V3180).

- Keep the mineral tank in the upright position. Do not turn upside down or drop. Turning the tank upside down will cause media to enter the valve.
- Do not allow the water system to freeze. Damage from freezing will void this water system's warranty.
- Operating ambient temperature: 34°F - 120°F (1°C - 49°C).
- Operating water temperature: 35°F - 100°F (1.7°C - 37.8°C).
- Working water pressure range: 20 psi - 120 psi (1.38 bar - 8.27 bar).
- Use only regenerant designed for water softening. Do not use ice melting salt, block salt or rock salt.
- When filling mineral tank, do not open water valve completely. Fill tank slowly to avoid media from exiting the tank.
- When installing the water connection (bypass or plumbing adapters) connect to the plumbing system first. Allow heated parts to cool and cemented parts to set before installing any plastic parts. Do not get primer or solvent on o-rings, nuts, or the valve.

Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. Systems certified for cyst reduction may be used on disinfected waters that may contain filterable cysts.

EQUIPMENT INSTALLATION

NOTE: Before turning on the water.

- If the plumbing to the water treatment system is metal, two grounding clamps and a #4 copper wire must be installed.
- The plumbing must be self-supporting and secure to avoid movement. A piece of metal or a ground strap is secured to both the inlet and outlet pipes. (See Figure 10)

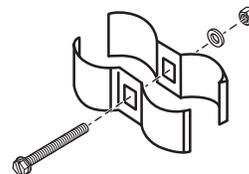


Figure 10

IMPORTANT: The inlet water must be connected to the inlet port of the valve. When replacing an existing system, it is possible that the inlet and outlet get exchanged or plumbing to be installed in an opposite order. Do not solder pipes with lead-based solder.

IMPORTANT: Do not use tools to tighten plastic fittings. Over time, stress can cause break of the connections. When the bypass is used, only hand tighten the nuts.

IMPORTANT: Do not use petroleum based lubricants. Use only 100% silicone based lubricant products when installing any MAYTAG® brand valve. Non-silicone based lubricants can cause plastic components to fail over time.

NOTE: Several fitting packages are available to connect the valve to the water plumbing. See “Bypass Fitting Packages”.

NOTE: The MAYTAG® system should be installed by someone familiar with plumbing practices.

- The system is located after the pressure tank (or incoming water supply) and any filtration equipment. Water that leaves the system will feed the hot water heater and the rest of the building.
- Place the mineral tank and brine tank in position.
- Connect the drain line and Overflow. See “Drain Line and Overflow Line Connection”.
- Use the bypass and plumbing adapters and connect the valve to the building plumbing. Make sure that the water inlet and outlet on the valve matches the inlet and outlet of the plumbing. “Water Line Connection”.
- Connect the brine line. See “Brine Line Connection to Valve”.
- Connect the brine tank overflow. See “Overflow Line Connection”.
- Before loading regenerant or applying power, read the entire manual and refer to the following sections: “Installation Instructions”, “Equipment Installation”, “System Operation” and “Placing Water System into Operation”.

Bypass Valve Operation

The bypass valve is typically used to isolate the control valve from the plumbing system’s water pressure in order to perform control valve repairs or maintenance. The bypass valve is particularly unique in the water treatment industry due to its versatility and state of the art design features. The full flow bypass valve incorporates four positions: normal, bypass, diagnostic mode and shut off mode; the diagnostic position allows service personal to work on a pressurized system while still providing untreated bypass water to the facility or residence. Its completely non-metallic, all-plastic design allows for easy access and serviceability without the need for tools. Radial seals handle side-to-side and up/down minor

plumbing misalignments, connections need only hand tightening.

The bypass body and rotors are glass-filled Noryl¹ (or equivalent) and the nuts and caps are glass-filled polypropylene. All seals are self-lubricating EPDM to help avoid the valve from seizing after long periods of non-use. Internal o-rings can easily be replaced if service is required. One internally lubricated o-ring on the rotor creates less friction.

The bypass consists of two interchangeable plug valves that are operated independently by red arrow-shaped handles. The handles identify the flow direction of the water. The plug valves enable the bypass valve to operate in four positions.

1. **Normal Operation:** The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve. Water flows through the control valve during normal operation and this position also allows the control valve to isolate the media bed during the regeneration cycle. (See Figure 11)
2. **Bypass Operation:** The inlet and outlet handles point to the center of the bypass, the control valve is isolated from the water pressure contained in the plumbing system. Untreated water is supplied to the plumbing system. (See Figure 12)
3. **Diagnostic Mode:** The inlet handle points in the direction of flow and the outlet handle points to the center of bypass valve, system water pressure is allowed to the control valve and the plumbing system while not allowing water to exit from the control valve to the plumbing. (See Figure 13)
4. **Shut Off Mode:** The inlet handle points to the center of the bypass valve and the outlet handle points in the direction of flow, the water is shut off to the plumbing system. If water is available on the outlet side of the softener it is an indication of water bypass around the system (i.e. a plumbing connection somewhere in the building bypasses the system). (See Figure 14)

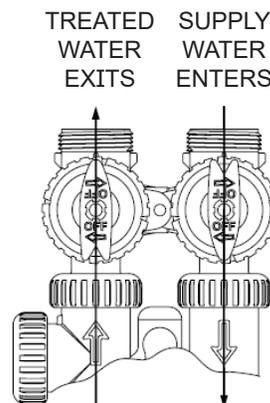


Figure 11
NORMAL
OPERATION

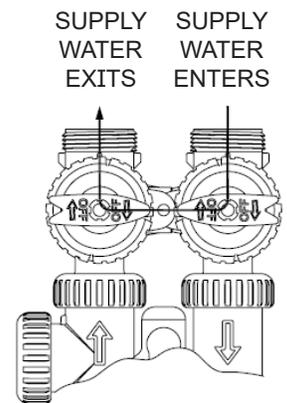


Figure 12
BYPASS
OPERATION

SUPPLY WATER EXITS
SUPPLY WATER ENTERS

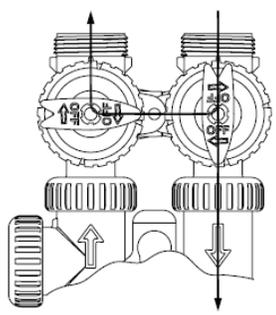


Figure 13

DIAGNOSTIC MODE

NO WATER EXITS
SUPPLY WATER IS SHUT OFF FROM THE VALVE

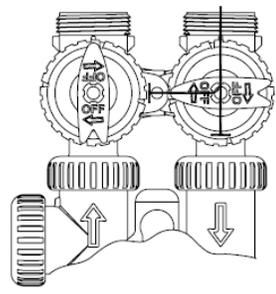
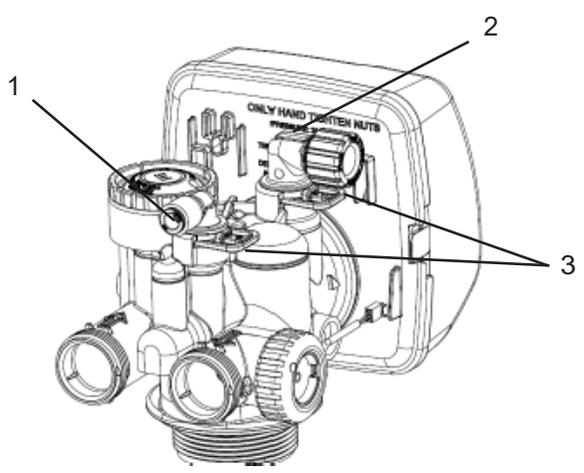


Figure 14

SHUT OFF MODE

1. Trim tubing to length. Be sure tubing is free of debris, nicks or scratches, which may cause fittings to leak past the quad seal.
2. Firmly insert the tubing into the fitting. Be certain tubing goes past the quad seal and properly bottoms in fitting. (See figure 16) The fitting will grab the tubing and hold and seal it in place.
3. To remove the tubing, push the collet around the tubing in and at the same time pull the tubing out.

Brine Line and Safety Brine Valve Connections



1. Refill Flow (regenerant) Control Fitting
2. Drain Fitting
3. Locking Clip (2) Required

Figure 15
Brine Line Connection to Valve

The brine line must be connected from the control valve to the safety brine valve assembly in the brine tank. Be sure that the brine line tube is secure and free from air leaks. Even a small leak may cause the brine line tube to drain out, and the system will not draw regenerant from the brine tank. This may also introduce air into the valve causing problems with valve operation. Connect the brine line to the refill flow control (regenerant) fitting and safety brine valve fitting by following the instructions. (See figures 15 & 16)

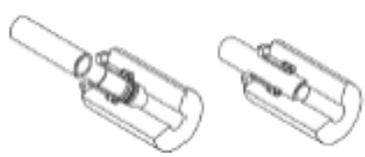
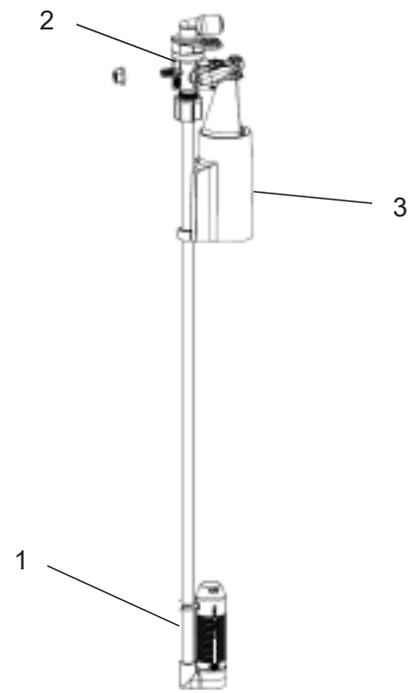


Figure 16
Brine Line Insertion

Safety Brine Valve Assembly



1. 474 Air Check Assy. with 1/2" (1.27 cm) riser pipe.
2. 474 Safety Brine Valve with 3/8" (0.95 cm) elbow.
3. 474 Float Assy.

Figure 17
Safety Brine Valve Assembly

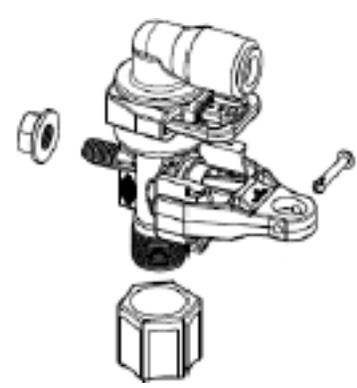


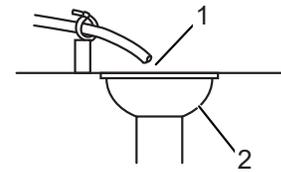
Figure 18
Safety Brine Valve

Drain Line and Overflow Connection

Drain Line Connection

NOTE: Standard commercial practices are expressed here. Local codes may require changes to the following suggestions. Check with local authorities before installing a system.

1. The unit should be above and not more than 40 feet (12.2 m) from the drain. The drain line flow control can be installed with the standard 3/4" NPT (1.9 cm) drain line elbow, which accommodates 3/4" NPT (1.9 cm) drain line or the optional nut and poly tube insert which can be used with a 5/8" O.D. (1.59 cm) flexible poly tube drain line connection. Use thread seal tape when using the 3/4" NPT (1.9 cm) to connect to PVC or CPVC pipe to the drain line connection of the control valve. The drain line flow control can be rotated 180 degrees so the drain line can be orientated to the nearest drain.
2. If the backwash flow rate exceeds 7 gpm (26.5 Lpm) or if the unit is located more than 40 feet (12.2 m) from drain, use 3/4" (1.9 cm) tubing, PVC or CPVC pipe. Use an appropriate fitting to connect the 3/4" (1.9 cm) tubing, PVC or CPVC pipe to the drain connection of the control valve.
3. The drain line may be elevated up to 6 feet (1.8 m) providing the run does not exceed 40 feet (12.2 m) and water pressure at the system is not less than 40 psi (2.76 bar). Elevation can increase by 2 feet (61 cm) for each additional 10 psi (.69 bar) of water pressure at the drain connector.
4. Where the drain line is elevated but empties into a drain below the level of the control valve, form a 7" (17.7 cm) loop at the far end of the line, ensuring that the bottom of the loop is level with the drain line connection. This will provide an adequate siphon trap. Tie or wire the hose in place at the drain point. Also provide an air gap of at least 1-1/2" (3.8 cm) between the end of the hose and the drain point.
5. Where the drain empties into an overhead sewer line, a sink-type trap must be used.
6. Secure the end of the drain line to avoid it from moving.



1. Air Gap
2. Drain

Figure 19
Secure Drain Line

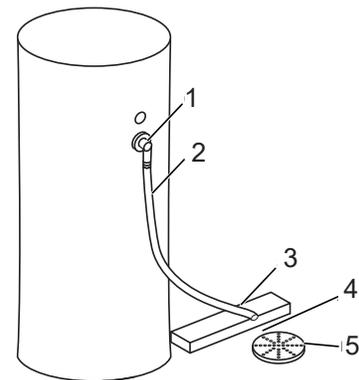
Overflow Line Connection

In the event of a malfunction, the brine (regenerant) tank overflow will direct "overflow" to the drain instead of spilling on the floor. This fitting will be located under the brine line tubing hole on the side of the brine tank.

To connect the overflow line, locate overflow fitting on side of brine tank. Slide one end of the 5/8" O.D. (1.59 cm) overflow line over the barbed end of the overflow fitting approximately 3/4" (1.9 cm), then run the other end of the overflow line to the drain. Do not elevate overflow line higher than overflow fitting. (See Figure 20)

Drain Tubing sold separately in 100 ft rolls (Part No. 3PET58100B).

NOTE: Do not tie into drain line of system. Overflow line must be a direct, separate line from overflow fitting to drain, sewer or tub. Allow an air gap as per drain line instructions.



1. Overflow Fitting
2. Drain Tubing
3. Secure hose in place
4. Air Gag
5. Drain

Figure 20
Brine Tank with Overflow Fitting

Media Volume, Salt and Capacity Settings

Water Treatment System Set Up: Softening Media Volume, Salt Amounts and Estimated Capacity

Table 1 shows the estimated salt amount for each Program Number, as well as the estimated capacity of that salt setting for each resin amount.

Program Number	Media Volume (ft ³)	Salt Setting	Total Salt Amount Per Regeneration (lbs)	Estimated Capacity (grains)
100L		L	4.5	18,000
100S	1.0	S	9	23,500
100H		H	15	28,000
125L		L	5.5	22,500
125S	1.25	S	11	29,000
125H		H	19	35,000
150L		L	6.5	26,500
150S	1.5	S	13.5	35,000
150H		H	22.5	42,000
200L		L	9	36,500
200S	2.0	S	18	47,000
200H		H	30	56,000
250L		L	11	44,500
250S	2.5	S	22.5	58,500
250H		H	37.5	70,000
999U	Fully Adjustable Upflow Softener Program			

L= Low salt, approximately 4.5 lbs.
per cu. ft. of media

S = Standard salt, approximately 9 lbs.
per cu. ft. of media

H = High salt, approximately 15 lbs.
per cu. ft. of media

Table 1

Cycles and Softening Set Up

The Maytag® series control valve is an upflow valve, only one backwash occurs after brining. The Maytag water treatment professional has the option of having the regenerant refill after the rinse cycle or have the regenerant prefill before regeneration. If the Maytag water treatment professional chooses to have the regenerant prefill before regeneration, the prefill starts 240 minutes prior to the brine draw cycle. The system remains in Normal Mode in which the brine is being made, treated (conditioned) water is still available.

When setting up the system refer to Table 1 to select the Program Number that corresponds to the volume of media and the desired Salt Setting (Low, Standard, High), which defaults the Total Salt Amount Per Regeneration and Estimated Capacity to the values shown.

NOTE: The regeneration cycle times are fully adjustable. Refer to Table 3.

Up flow Regenerant Prefill	Up flow Regenerant Refill After Rinse
1st Cycle: Fill	Rinse (0:00:15 SEC)
Dissolve Brine	1st Cycle: Regenerate (Brine Draw)
Rinse (0:00:15 SEC)	2nd Cycle: Backwash
2nd Cycle: Regenerate (Brine Draw)	3rd Cycle: Rinse
3rd Cycle: Backwash	4th Cycle: Fill/Dissolve
4th Cycle: Rinse	5th Cycle: Service
Fill (0:00:05 SEC)	
5th Cycle: Service	

**Table 2
System Cycles**

Cycle	Units	Range
Backwash	Minutes	1 – 120 or OFF
Rinse	Minutes	1 – 120 or OFF
Draw (Up or Down)	Minutes	1 – 180 or OFF
Fill (all but 2" valve)	Pounds	0.1 – 200 or OFF
Fill (1.5" MIN or 2" valve)	Minutes	0.1 – 99 or OFF
Softening	Minutes	1 – 480 or OFF

**Table 3
Regeneration Cycle Times in Units**

SYSTEM OPERATION

Fill/Dissolve Water is directed down through the media bed up through the distributor tube at a controlled rate to provide treated water to the brine tank, to create brine for the next regeneration.

Regenerate (Upflow) The control directs water through the brine injector and brine is drawn from the regenerant tank. The brine is then directed down the distributor tube up through the resin bed then up to the drain. The hardness ions are displaced by sodium ions and are sent to the drain. The resin is regenerated during the brine cycle. Brine draw is completed when the air check closes.

Backwash (Upflow) The flow of water is directed down the distributor tube and up through the resin bed. During the backwash cycle, the bed is expanded and debris is flushed to the drain.

Rinse (Downflow) The control directs water down through the resin bed up through the distributor tube to the drain. Any remaining brine residual is rinsed from the resin bed.

Service (Downflow) Untreated water is directed down through the resin bed and up through the distributor tube. The hardness ions attach themselves to the resin and are removed from the water. The water is refined as it passes through the resin bead.

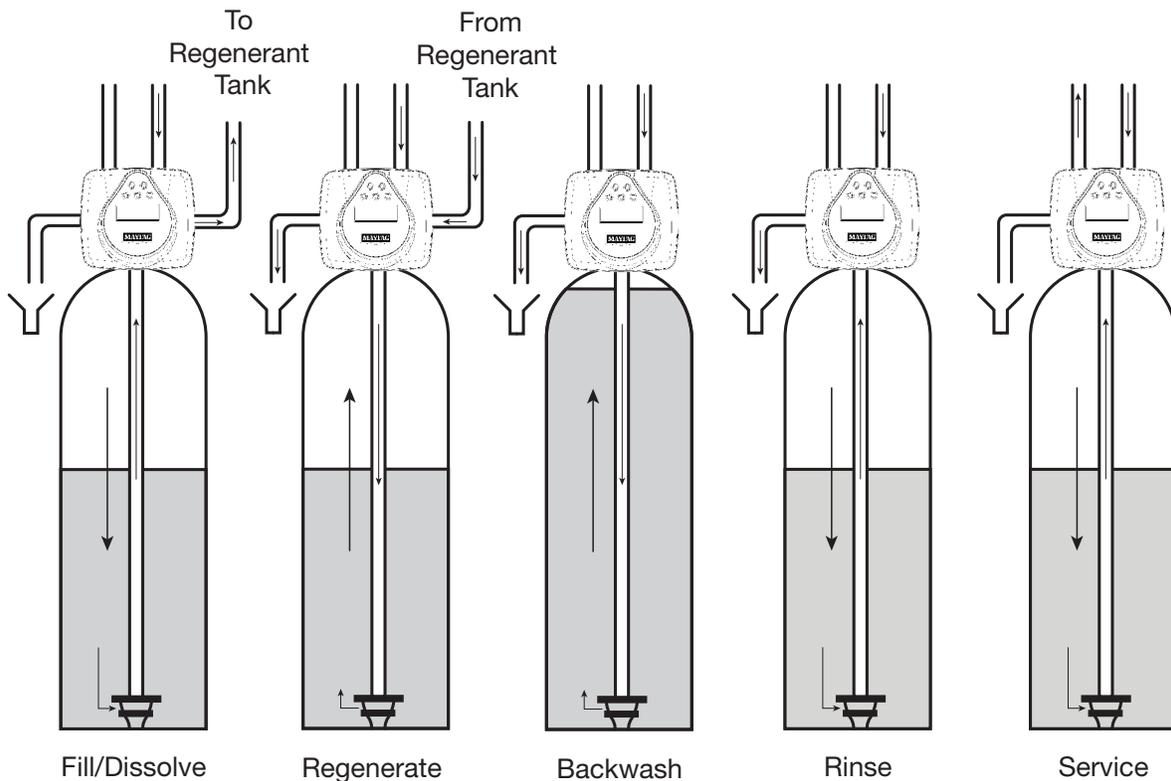


Figure 21
Cycle Water Flows

General Programming Instructions

The control valve offers multiple procedures that allow the valve to be modified to suit the needs of the installation. These procedures are:

- Program Selection
- Cycle Sequence
- Softener System Setup
- Installer Display Settings
- User Display Settings
- Diagnostics
- Valve History

The procedures can be accessed in any order. Details on each of the procedures are provided on the following pages.

When in operation, normal user displays such as time of day, volume remaining before regeneration, present flow rate, or days remaining before regeneration are shown. When stepping through a procedure, if no buttons are pressed within 5 minutes, the display returns to a normal user display. Any changes made prior to the 5 minute time-out are incorporated.

To quickly exit Softener System Setup, Installer Display Settings, Diagnostics, or Valve History, press CLOCK. Any changes made prior to the exit are incorporated.

To clear the service call reminder, press ▼ and ▲ simultaneously while the reminder screen is displayed.

When desired, all information in Diagnostics and programming may be reset to defaults when the valve is installed in a new location. To reset to defaults, press NEXT and ▼ simultaneously to go to the Brand/Line display, then press NEXT to go to the Treatment Type display. Press ▼ and ▲ simultaneously to reset diagnostic and programming values to defaults. Screen will return to User Display.

Sometimes it is desirable to have the valve initiate and complete two regenerations within 24 hours and then return to the preset regeneration procedure. It is possible to do a double regeneration if the Regeneration Time Option is set to DELAYED REGENERATION or DELAY + IMMEDIATE REGENERATION. To do a double regeneration:

1. Press the “REGEN” button once. REGEN TODAY will flash on the display.
2. Press and hold the “REGEN” button for three seconds until the valve regeneration initiates.

Once the valve has completed the immediate regeneration, the valve will regenerate one more time at the preset regeneration time.

Prior to selecting the upflow regeneration cycle, verify that the correct body, main piston, regenerant piston and stack are being used, and that the injector plug(s) are in the correct location. Refer Figure 29 & Figure 30.

Proportional Brining

If the system is set up as a prefill upflow softener the control valve can also be set to normal or proportional brining.

STEP 6S



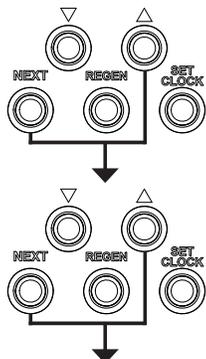
This step will appear after Step 5S and before Step 7S if the system is set up as a prefill upflow softener. The following options can be selected:

- NORMAL FILL - System always prefills with the salt level selected.
- PROPORTIONAL FILL - If proportional brining is selected, the actual salt fill time will be calculated by dividing the actual volume of treated water used by the full volumetric capacity, then multiplying this value by the maximum salt fill time.

Press NEXT to go to the next step. Press REGEN to return to the previous step.

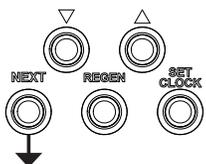
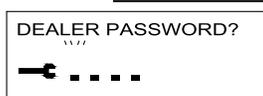
Program Selection

STEP 1DL



Step 1DL – Press NEXT and ▲ simultaneously for 3 seconds until the Water Hardness or Day Override display appears. Then, press NEXT and ▲ simultaneously for 3 seconds again until the Dealer Password display appears. If a password has not been previously set, the screen in Step 3DL is shown.

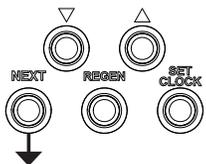
STEP 2DL



Step 2DL – Enter Password: Use ▼ or ▲ to select the first digit of the password. Press NEXT to select the next digit.

Once all 4 digits are entered correctly, press NEXT to go to Step 3DL. Press REGEN to exit Dealer Lockout. If the password is entered incorrectly, the control will return to the User displays.

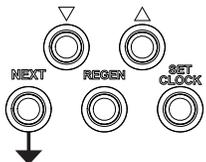
STEP 3DL



Step 3DL – Program Number: Use ▼ or ▲ to set the program number based on the amount of resin in the system. Refer to Table 1 for program number default values. Program Numbers 999U and 999D are available as open setting programs for upflow and downflow softening systems.

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

STEP 4DL

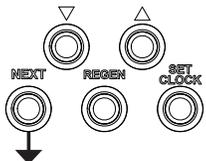


Step 4DL – Dealer Lockout: Use ▼ or ▲ to select one of the following options:

- ON: Only User Display Settings, Diagnostics, and Valve History displays are able to be viewed.
- OFF: All display levels are able to be viewed. Step 5DL does not appear if this option is selected.

Press NEXT to go to Step 5DL or exit Dealer Lockout. Press REGEN to return to previous step.

STEP 5DL

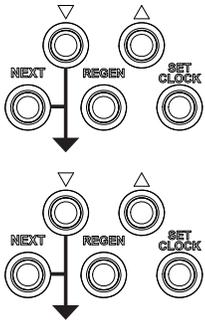


Step 5DL – Dealer Lockout Password: Use ▼ or ▲ to set the first digit of the password. Press NEXT to set the next digit.

Once all 4 digits are set, press NEXT to exit Dealer Lockout. Press REGEN to return to previous step.

Cycle Sequence

STEP 1CS



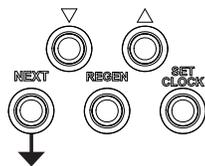
Step 1CS – Press NEXT and ▼ simultaneously for 3 seconds and release. Then, press NEXT and ▼ simultaneously for 3 seconds again and release. If screen in Step 2CS does not appear in 5 seconds, the lock on the valve is activated. To unlock, refer to the Program Selection section.

STEP 2CS



Step 2CS – Valve Type: Use ▼ or ▲ to select 1.0 for 1" valve, 1.25 for 1.25" valve, 1.5 for 1.5" valve, 2.0 for 2" valve, or 1.0T for 1" twin valve.

Press NEXT to go to Step 3CS. Press REGEN to exit OEM Configuration Setup.

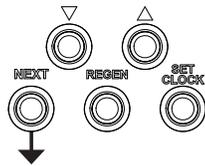


STEP 3CS



Step 3CS – Meter Size: Use ▼ or ▲ to select which size flow meter is to be used with the valve: 1.0r, 1.5, 2.0, or 3.0. Variable meter pulses of 0.1 – 150 PPG can also be selected. This display only appears if Step 2CS is set to 1.5 or 2.0.

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



STEP 4CS



Step 4CS – ALT MAV Output: Use ▼ or ▲ to select one of the following options:

- ALT A or ALT B: The control valve acts as an alternator.
- SYSTEM CONTROLLER: The control valve operates with the Clack system controller.
- PROGRESSIVE FLOW: The control valve operates as a progressive flow system.
- SEPARATE SOURCE: The control valve has a separate source during the regeneration cycle.
- NO HARD BYPASS: The control valve operates with a no hard water bypass.
- OFF: None of these features are used.

Only use Clack no hard water bypass valves or Clack motorized alternating valves (MAVs) with these selections. Clack no hard water bypass valves (1" or 1.25" V3070FF or V3070FM) are not designed to be used with the Alternator or Separate Source functions.

This display does not appear if Step 2CS is set to 1.0T.

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

STEP 5CS

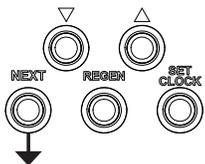


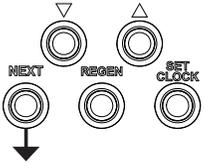
Step 5CS – Auxiliary MAV Output: Use ▼ or ▲ to select one of the following options:

- TIME: Allows auxiliary MAV to switch positions at a set time in relation to the start of regeneration for a preset duration, independently of the actual regeneration status.
- SEPARATE SOURCE: Allows auxiliary MAV to switch positions before the start of regeneration and then switch back at the end of regeneration.
- OFF: Deactivates this output.

NOTE: Only use Clack motorized alternating valves (MAVs) with these selections. Clack no hard water bypass valves (1" or 1.25" V3070FF or V3070FM) are not designed to be used with this function.

Press NEXT to go to Step 6CS. Press REGEN to return to previous step.



STEP 6CS

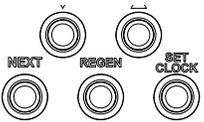
Step 6CS – Auxiliary (dP) Input: Allows for use of an outside signal to control the initiation of regeneration. Selection only needed if a connection is made to the 2-pin connector labeled DP SW located on the printed circuit board.

NOTE: In a twin alternating system, each control must have a separate dP signal or dP switch. One dP signal or one dP switch cannot be used for both controls.

Use ▼ or ▲ to select one of the following options:

- OFF: Feature not used.
- IMMED REG: Regeneration will occur immediately if the dP switch is closed for 2 uninterrupted minutes. In a twin alternating system, the MAV will transition first to switch units so that the signaled unit can start regeneration. After the MAV is fully transitioned, the regeneration begins immediately. If this option is selected, the Delayed Rinse and Fill feature will not be available for WS1 – WS1.5 control valves programmed for twin alternating.
- DELAY REG: Regeneration will occur at the scheduled delayed regeneration time if the dP switch is closed for 2 uninterrupted minutes. In a twin alternating system, once the dP switch is triggered, the PC Board will display REGEN TODAY. At the delayed regeneration time, the control will switch tanks and the triggered unit will go into regeneration. If this option is selected, the Delayed Rinse and Fill feature will not be available for WS1 – WS1.5 control valves programmed for twin alternating.
- HOLD REG: Regeneration will be prevented from occurring while the dP switch is closed. In a twin alternating system, the regeneration of a unit can be prevented upon switch closure. If the unit depletes the capacity down to zero, it will not be allowed to switch tanks to regenerate until the switch is open. The Delayed Rinse and Fill feature can be set in conjunction with this option if desired.

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

STEP 7CS

Step 7CS – Fill Units: Use ▼ or ▲ to set fill units to LBS or MIN.

This display only appears if the system is set as a softener, Step 2CS is set to 1.5, and Fill is part of the regeneration cycle sequence.

Press NEXT to exit OEM Configuration Setup. Press REGEN to return to previous step.

↓
RETURN TO NORMAL MODE

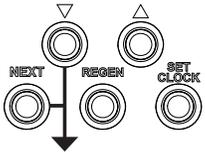
Softener System Setup

In Softener System Setup the Manufacturer may adjust the default values for the selected Program Number and specify other operating parameters for the system. If a cycle is present the value can be set to off. Fill is in pounds of salt and all other cycles are in minutes. For 2.0" valves all cycles are in minutes.

Type	Fill	Softening	Backwash	Draw	Backwash	Rinse	Fill
Softening DN Post			8	60	8	8	9.5 lb
Softening DN Pre	9 lb	240	8	60	8	8	
Softening UP Post				60	8	8	9.5 lb
Softening UP Pre	9 lb	240		60	6	4	
Softening DN Post (2.0" Valve)			8	60	8	8	9.5 min
Softening DN Pre (2.0" Valve)	9 min	240	8	60	8	8	
Softening UP Post (2.0" Valve)				60	8	8	9.5 min
Softening UP Pre (2.0" Valve)	9 min	240		60	6	4	

Table 4: Regeneration Programs (Softening)

NOTE: If Treatment Type (Step 3S) is set to "Softening UP Pre," Fill Type (Step 6S) will appear after Step 5S and before Step 7S.

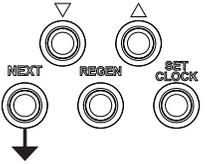
STEP 1S

Step 1S – Press NEXT and ▼ simultaneously for 3 seconds and release.

STEP 2S

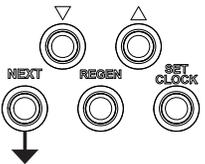
Step 2S – Brand/Line Display: Shows the Line Name and Model Number set in Step 3DL. This is a view-only display.

Press NEXT to go to Step 3S. Press REGEN to exit Softening System Setup. If screen in Step 3S does not appear, the lock on the valve is activated. To unlock, see Dealer Lockout section.

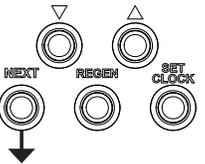
**STEP 3S**

Step 3S – Treatment Type: Use ▼ or ▲ to choose the softening program desired (see table above). This display is only adjustable if Program Number is set to 999D or 999U.

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

**STEP 4S**

Step 4S – Cycle Durations: Use ▼ or ▲ to set the value for the first cycle of the program selected in Step 3S. Value ranges and units may vary depending on the cycle, see table below for more detail. Press NEXT to set the value for the next cycle



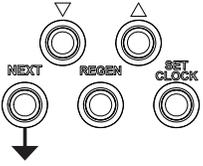
Cycle	Units	Range
Backwash	Minutes	1 – 120 or OFF
Rinse	Minutes	1 – 120 or OFF
Draw (Up or Down)	Minutes	1 – 180 or OFF
Fill (all but 2" valve)	Pounds	0.1 – 200 or OFF
Fill (1.5" MIN or 2" valve)	Minutes	0.1 – 99 or OFF
Softening	Minutes	1 – 480 or OFF

Table 5: Cycle Options Value Ranges (Softening)

Once a value is set for all cycles, press NEXT to go to Step 5S. Press REGEN to return to previous step.

STEP 5S

GRAINS OF CAPACITY
← 20.0 x1K

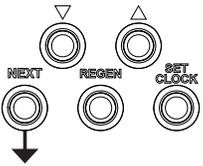


Step 5S – Ionic Capacity: Use ▼ or ▲ to set a value for the ionic capacity (Range: 5 x1k – 3,000 x1k grains). The default value will vary depending on the selection made in Step 3DL, see table to the right for more detail. The ionic capacity is in grains of hardness as calcium carbonate for the system based on the pounds of salt that will be used. Calculate the pounds of salt using the fill time previously selected. The capacity and hardness levels entered are used to automatically calculate reserve capacity when Volume Capacity is set to AUTO.

Press NEXT to go to Step 6S. Press REGEN to return to previous step.

STEP 6S

PROPORTIONAL FILL
← TYPE



Step 6S – Fill Type: Use ▼ or ▲ to select one of the following options:

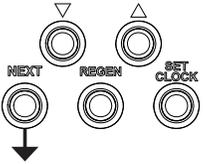
- **NORMAL FILL:** System always pre-fills with the salt level selected.
- **PROPORTIONAL FILL:** The actual salt fill time will be calculated by dividing the actual volume of treated water used by the full volumetric capacity, then multiplying this value by the maximum salt fill time.

This display only appears if the system is set up as a pre-fill upflow softener.

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

STEP 7S

GALLONS CAPACITY
← AUTO



Step 7S – Volume Capacity: Use ▼ or ▲ to select one of the following options:

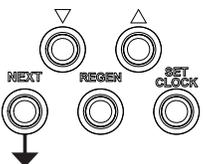
- **AUTO:** Capacity is automatically calculated and reserve capacity is automatically estimated.
- **A number:** Regeneration is based off the value specified (Range: 20 – 1,500,000 gallons).
- **OFF:** Regeneration is based solely on Day Override set in Step 3I. This option does not appear if Step 6S is set to PROPORTIONAL FILL.

See Setting Options Table for more detail.

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

STEP 8S

DELAYED REGENERATION
← TYPE



Step 8S – Regeneration Time Option: Use ▼ or ▲ to select one of the following options:

- **DELAYED REGENERATION:** Regeneration will occur at the preset time.
- **IMMEDIATE REGENERATION:** Regeneration will occur immediately when volume capacity reaches 0 (zero).
- **DELAY + IMMEDIATE REGENERATION:** Regeneration will occur at one of the following:
 - The preset time when the volume capacity falls below the reserve or the specified number of days between regenerations is reached, whichever comes first; or
 - Immediately after 10 minutes of no water usage when the volume capacity reaches 0 (zero).

This option is not available if Step 2CS is set to 1.0T or if Step 4CS is set to ALTA or ALTB.

This display does not appear if Step 7S is set to OFF. See Setting Options Table for more detail.

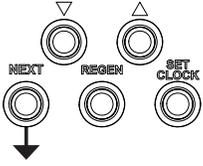
Press NEXT to go to Step 9S. Press REGEN to return to previous step.

Program Number	Default Value
100L	18000
100S	23500
100H	28000
125L	22500
125S	29000
125H	35000
150L	26500
150S	35000
150H	42000
200L	36500
200S	47000
200H	56000
250L	44500
250S	58500
250H	70000
999U	23500
999D	23500

Table 6: Ionic Capacity Default Values

STEP 9S

OFF
 RELAY 1



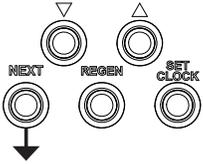
Step 9S – Relay 1 Output: Use ▼ or ▲ to select one of the following options:

- **REGEN TIME:** Relay activates a set time after the start of regeneration and deactivates after a set period of time. The start of regeneration is defined as the first Backwash, Regenerant Draw UP (1" only), or Regenerant Draw DN cycle, whichever comes first.
- **VOLUME:** Relay activates after a set volume has been used while in service and deactivates after the meter stops registering flow and the set time period has expired.
- **REGEN VOLUME:** Relay activates after a set volume has been used while in service or during regeneration and deactivates after the meter stops registering flow and the set time period has expired.
- **LOW SALT LEVEL:** Relay activates when the Low Salt Level trigger is reached and deactivates when the salt level is reset. This relay will continue operation during a power outage or during error mode. Step 9S(A) and Step 9S(B) do not appear if this option is selected.
- **OFF:** Feature not used. Step 9S(A) and Step 9S(B) do not appear if this option is selected.

Press NEXT to go to Step 9S(A) or Step 10S. Press REGEN to return to previous step.

STEP 9S(A)

RELAY 1 SETPOINT
 10 MIN



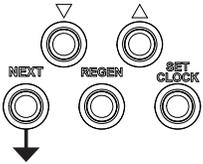
Step 9S(A) – Relay 1 Setpoint: Use ▼ or ▲ to set the actuation value. The unit and range will vary depending on the selection made in Step 9S.

- **Regen Time:** Set the length of time after the start of regeneration prior to relay activation (Range: 0 – 500 minutes).
- **Volume or Regen Volume:** Set the volume of water that will be treated prior to relay activation (Range: 0.1 – 20,000 gallons).

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

STEP 9S(B)

RELAY 1 DURATION
 3:00 MIN

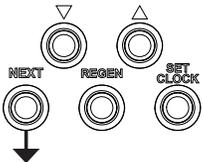


Step 9S(B) – Relay 1 Duration: Use ▼ or ▲ to set the length of time the relay will stay active prior to deactivation (Range: 1 second – 500 minutes).

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

STEP 10S

OFF
 RELAY 2

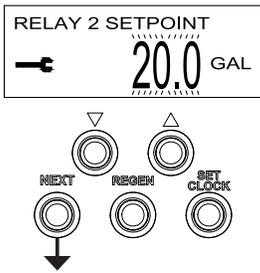


Step 10S – Relay 2 Output: Use ▼ or ▲ to select one of the following options:

- **REGEN TIME:** Relay activates a set time after the start of regeneration and deactivates after a set period of time. The start of regeneration is defined as the first Backwash, Regenerant Draw UP (1" only), or Regenerant Draw DN cycle, whichever comes first.
- **VOLUME:** Relay activates after a set volume has been used while in service and deactivates after the meter stops registering flow and the set time period has expired.
- **REGEN VOLUME:** Relay activates after a set volume has been used while in service or during regeneration and deactivates after the meter stops registering flow and the set time period has expired.
- **ERROR MONITOR:** Relay activates when the control enters an error state and immediately deactivates when the control exits the error state. Step 10S(A) and Step 10S(B) do not appear if this option is selected.
- **OFF:** Feature not used. Step 10S(A) and Step 10S(B) do not appear if this option is selected.

Press NEXT to go to Step 10S(A) or Step 11S. Press REGEN to return to previous step.

STEP 10S(A)

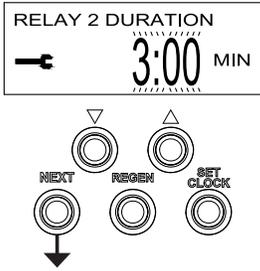


Step 10S(A) – Relay 2 Setpoint: Use ▼ or ▲ to set the actuation value. The unit and range will vary depending on the selection made in Step 10S.

- Regen Time: Set the length of time after the start of regeneration prior to relay activation (Range: 0 – 500 minutes).
- Volume or Regen Volume: Set the volume of water that will be treated prior to relay activation (Range: 0.1 – 20,000 gallons).

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

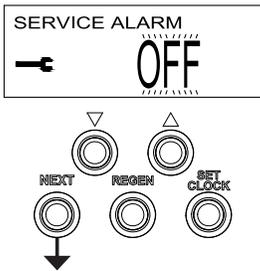
STEP 10S(B)



Step 10S(B) – Relay 2 Duration: Use ▼ or ▲ to set the length of time the relay will stay active prior to deactivation (Range: 1 second – 500 minutes).

Press NEXT to go to Step 11S. Press REGEN to return to previous step.

STEP 11S

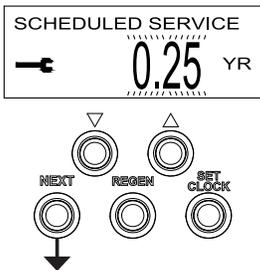


Step 11S – Scheduled Service Alarm: Use ▼ or ▲ to select one of the following options:

- TIME: Activates the service alarm after a set duration of time.
- GALLONS: Activates the service alarm after a set volume of water is treated.
- BOTH: Activates the service alarm after a set duration of time or after a set volume of water is treated, whichever comes first.
- OFF: Disables this feature. Step 11S(A) – Step 11S(D) do not appear if this option is selected.

Press NEXT to go to Step 11S(A) or Step 12S. Press REGEN to return to previous step.

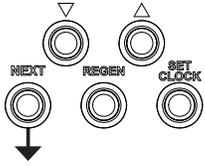
STEP 11S(A)



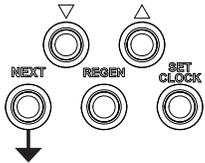
Step 11S(A) – Service Alarm (Time): Use ▼ or ▲ to set the duration of time between service alarms.

This display only appears if Step 11S is set to TIME or BOTH.

Press NEXT to go to Step 11S(B) or Step 11S(C). Press REGEN to return to previous step.

STEP 11S(B)

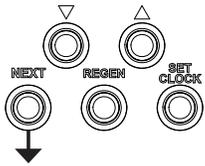
Step 11S(B) – Service Alarm (Volume): Use ▼ or ▲ to set the volume of water treated between service alarms. This display only appears if Step 11S is set to GALLONS or BOTH. Press NEXT to go to Step 11S(C). Press REGEN to return to previous step.

STEP 11S(C)

Step 11S(C) – Status Display (Time): Time remaining until service alarm generation. To reset this value to the value set in Step 11S(A), press ▼ and ▲ simultaneously for 3 seconds.

This display only appears if Step 11S is set to TIME or BOTH.

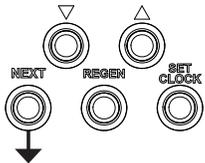
If Step 11S is set to TIME, press NEXT to go to Step 12S. If Step 11S is set to BOTH, press NEXT to go to Step 11S(D). Press REGEN to return to previous step.

STEP 11S(D)

Step 11S(D) – Status Display (Volume): Capacity remaining until service alarm generation. To reset this value to the value set in Step 11S(B), press ▼ and ▲ simultaneously for 3 seconds.

This display only appears if Step 11S is set to GALLONS or BOTH.

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

STEP 12S

Step 12S – Salt Level Alarm: Use ▼ or ▲ to set the trigger level for the Low Salt display (Range: 80 – 400 lb).

This display does not appear if Step 3S is set to FILTERING, if Step 2CS is set to 2.0, or if Step 2CS is set to 1.5 with Step 7CS set to MIN.

Press NEXT to exit OEM Softener System Setup. Press REGEN to return to previous step.

RETURN TO NORMAL MODE

Setting Options Table¹

System Type	Regeneration Option	Regeneration Type	Day Override	
Softening	Auto	Delayed	1 – 28 days	Regeneration occurs at the next regeneration time when volume capacity falls below the reserve capacity or the specified number of days is reached, whichever comes first.
Softening	Auto	Delayed	OFF	Regeneration occurs at the next regeneration time when volume capacity falls below the reserve capacity.
Softening or Filtering	20 – 1,500,000 Gallons	Delayed	1 – 28 days	Regeneration occurs at the next regeneration time when volume capacity reaches 0 or the specified number of days is reached, whichever comes first.
Softening or Filtering	20 – 1,500,000 Gallons	Delayed	OFF	Regeneration occurs at the next regeneration time when volume capacity reaches 0.
Softening or Filtering	OFF	Delayed	1 – 28 days	Time clock operation. Regeneration occurs at the next regeneration time when the specified number of days is reached.
Softening	Auto or 20 – 1,500,000 Gallons	Immediate	1 – 28 days	Regeneration occurs immediately when volume capacity reaches 0 or the specified number of days is reached, whichever comes first.
Softening or Filtering	20 – 1,500,000 Gallons	Immediate	OFF	Regeneration occurs immediately when volume capacity reaches 0.
Softening	Auto	Delayed + Immediate	1 – 28 days	Regeneration occurs at the next regeneration time when volume capacity falls below the reserve capacity or the specified number of days is reached, or regeneration occurs after 10 minutes of no water usage when volume capacity reaches 0.
Softening or Filtering	20 – 1,500,000 Gallons	Delayed + Immediate	1 – 28 days	Regeneration occurs at the next regeneration time when the specified number of days is reached or regeneration occurs after 10 minutes of no water usage when volume capacity reaches 0.
Softening	Auto	Delayed + Immediate	OFF	Regeneration occurs at the next regeneration time when volume capacity falls below the reserve capacity, or regeneration occurs after 10 minutes of no water usage when volume capacity reaches 0.

¹ Reserve capacity estimate is based on history of water usage. Reserve capacity estimate is not available with alternator systems or twin tank valve.

User Display Settings

General Operation:

When the system is operating, one of several displays may be shown. Press NEXT to alternate between the displays.

One of the displays is always the current time of day. Gallons Remaining is the volume of water that will be treated before the system regenerates. Press ▼ while on the Gallons Remaining display to decrease the capacity remaining in 10 gallon increments and increase the volume used in Diagnostics Steps 3D, 4D, and 5D and Valve History Step 6VH. Days Remaining is the number of days left before the system regenerates. If a water meter is installed, the flow indicator flashes on the display when water is being treated (i.e., water is flowing through the system).

If an R is shown on the left side of the display, regeneration will occur in the next 24 hours. If a P is displayed, a regeneration is pending.

Flow Rate shows the current rate treated water is flowing through the system.

The Salt Level is displayed if Step 12S is set to anything other than OFF.

Either REGENERATION DP or REGENERATION HOLD will be displayed if the dP switch is closed and enabled for either function.

To clear the service call reminder, press ▼ and ▲ simultaneously while the number and banner text screen is displayed.

Regeneration Mode:

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

When the system begins to regenerate, the display will change to include information about the step of the regeneration process and the time remaining for that step to be completed. The system runs through the steps automatically and will reset itself to provide treated water when the regeneration has been completed.

Manual Regeneration:

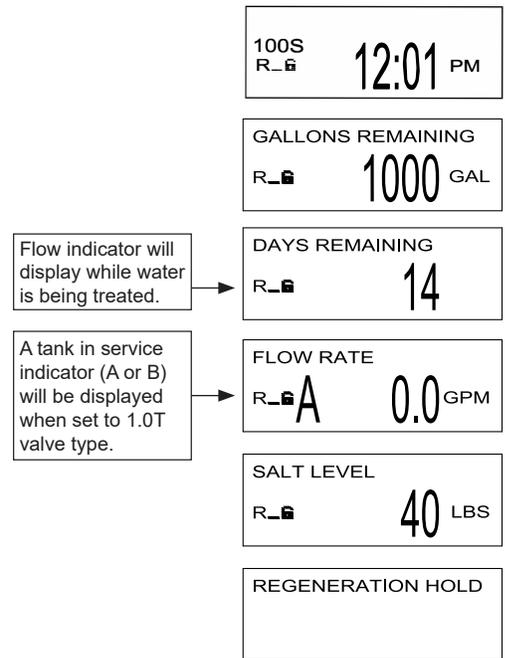
Sometimes, there is a need to regenerate the system sooner than when the system calls for it, usually referred to as manual regeneration. There may be a period of heavy water usage because of guests or a heavy laundry day.

To initiate a manual regeneration at the preset delayed regeneration time when the Regeneration Time Option is set to DELAYED REGENERATION or DELAY + IMMEDIATE REGENERATION, press and release REGEN. The letter R is shown on the display to indicate that the system will regenerate at the preset delayed regeneration time. Press REGEN again to cancel the request.

NOTE: If the Regeneration Time Option is set to IMMEDIATE REGENERATION, there is no set delayed regeneration time, so R will not activate if REGEN is pressed.

To initiate a manual regeneration immediately, press and hold REGEN for 3 seconds. The system will begin to regenerate immediately. The request cannot be canceled.

NOTE: For softeners, if brine tank does not contain salt, fill with salt and wait at least 2 hours before regenerating.

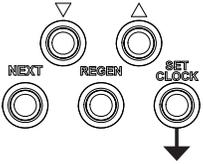


Set Time of Day:

The user can also set the time of day. Time of day should only need to be set if the battery has been depleted because of extended power outages or when daylight saving time begins or ends. If an extended power outage occurs, the time of day will flash, which indicates the time of day should be reset and the non-rechargeable battery replaced.

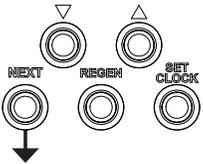
STEP 1U

Step 1U – Press CLOCK.



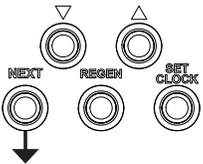
STEP 2U

Step 2U – Current Time (Hour): Use ▼ or ▲ to set the hour of the day. a.m./p.m. toggles after 12. Press NEXT to go to Step 3U.



STEP 3U

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



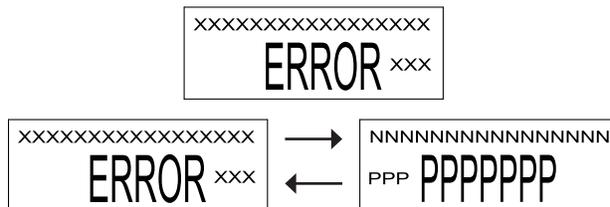
RETURN TO NORMAL MODE

Power Loss:

If the power goes out, the system will keep time until the battery is depleted. If an extended power outage occurs, the time of day will flash, which indicates the time of day should be reset and the non-rechargeable battery replaced. The system will retain all valve programming and diagnostic information.

Error Message:

If the word ERROR and a number are displayed, contact the OEM for help. This indicates that the valve was not able to function properly. If the number and banner text in the Contact Screens has been edited, the 2 displays below will alternate.



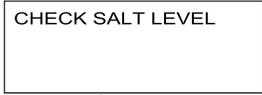
Salt Alarm:

If the Salt Level Alarm was set in Step 12S, the following screens will be viewed in the User Display.

To reset the amount of salt remaining to zero, press and hold ▼ and ▲ simultaneously for 5 seconds.



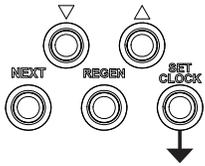
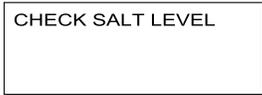
When the salt remaining has gone below the set point, the display will show CHECK SALT LEVEL.



Reset Salt Level:

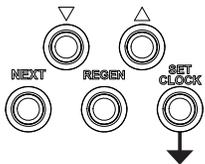
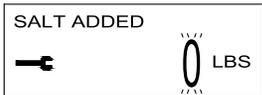
STEP 1SA

Step 1SA – Press NEXT until the Check Salt Level display appears. Then, press CLOCK.



STEP 2SA

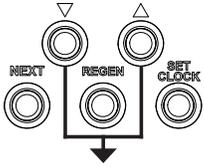
Step 2SA – Use ▼ or ▲ to set the pounds of salt added (Range: 0 – 10,000 pounds). Press CLOCK to exit.



Diagnostics

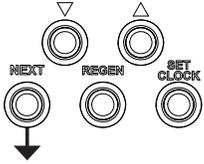
STEP 1D

Step 1D – Press ▼ and ▲ simultaneously for 3 seconds.



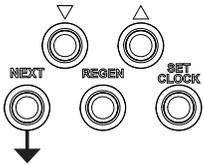
STEP 2D

Step 2D – Days Since Last Regeneration.
Press NEXT to go to Step 3D. Press REGEN to exit Diagnostics.



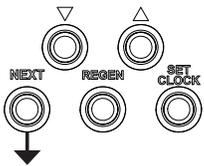
STEP 3D

Step 3D – Volume Since Last Regeneration: This display shows zero if a water meter is not installed.
Press NEXT to go to Step 4D. Press REGEN to return to previous step.



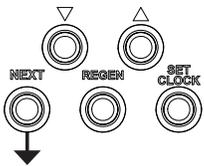
STEP 4D

Step 4D – Reserve History, Last 7 Days: Use ▼ or ▲ to scroll through the reserve capacity for each of the last 7 days. Day 0 is today, day 1 is yesterday, etc.
This display only appears if the valve is set up as a softener, a meter is installed, and Volume Capacity is set to AUTO.
Press NEXT at any time to go to Step 5D. Press REGEN to return to previous step.

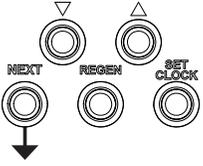


STEP 5D

Step 5D – Usage History, Last 63 Days: Use ▼ or ▲ to scroll through the volume of water treated on each of the last 63 days. Day 0 is today, day 1 is yesterday, etc. If a regeneration occurred on the day, the letter R will also be displayed. This display shows dashes if a water meter is not installed.
Press NEXT at any time to go to Step 6D. Press REGEN to return to previous step.



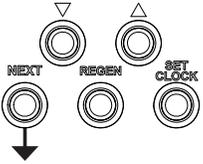
STEP 6D



Step 6D – Maximum Flow Rate, Last 7 Days: Use ▼ or ▲ to scroll through the maximum flow rate in gallons per minute that occurred on each of the last 7 days. This display shows zero if a water meter is not installed.

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

STEP 7D

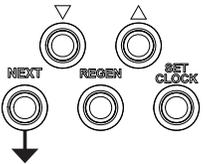


Step 7D – Tank Transfer History: Use ▼ or ▲ to scroll through the last 10 tank transfers. This display only appears if Step 2CS is set to 1.0T. This display shows:

- The transfer number (1 – 10)
- The tank transferring (A or B)
- How many days ago the transfer occurred (99-day maximum)
- Time of transfer
- The volume used at time of tank transfer

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

STEP 8D



Step 8D – MAV Drive History: Use ▼ or ▲ to scroll through the drive time history of all active MAV outputs. The display can be read as follows:

- TTT: Measured MAV drive time
- VVV: Measured MAV drive voltage
- CCC: Total number of drives (in or out); (+) indicates piston drive out of MAV; (-) indicates piston drive in to MAV.

NOTE: When a MAV is replaced, it is recommended that the diagnostics screen for that MAV be cleared. That is done by selecting the + or – screen for that MAV. Press and hold ▼ and ▲ for about 3 seconds. Failure to do this may result in inconsistent MAV operation.

**RETURN TO
NORMAL MODE**

When a MAV error occurs, the Drive History will automatically be reset. To view previously recorded history, press and hold CLOCK and ▲. The display will be similar to the normal MAV drive history display, with the addition of EEE: MAV error code present at the time of reset. If the display shows dashes, there was no MAV error before the reset.

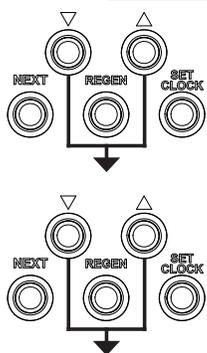


Press NEXT to exit Diagnostics. Press REGEN to return to previous step.

When desired, all information in Diagnostics and programming may be reset to defaults when the valve is installed in a new location. To reset to defaults, press NEXT and ▼ simultaneously to go to the Brand/Line display, then press NEXT to go to the Treatment Type display. Press ▼ and ▲ simultaneously to reset diagnostic and programming values to defaults. Screen will return to User Display.

Valve History

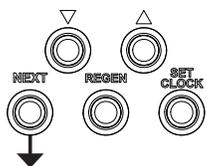
STEP 1VH



Step 1VH – Press ▼ and ▲ simultaneously for 3 seconds and release. Then, press ▼ and ▲ simultaneously for 3 seconds again and release.

STEP 2VH

SOFTWARE VERSION
LE 100 02

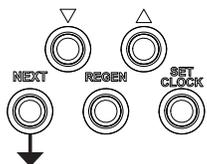


Step 2VH – Software Version.

Press NEXT to go to Step 3VH. Press REGEN to exit Valve History.

STEP 3VH

MAX FLOW
0.0 GPM

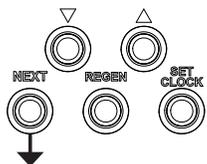


Step 3VH⁴ – Maximum Flow Rate Since Startup: This display shows zero if a water meter is not installed.

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

STEP 4VH

TOTAL DAYS
0

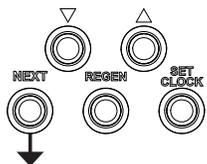


Step 4VH – Total Days Since Startup.

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

STEP 5VH

TOTAL REGENS
0



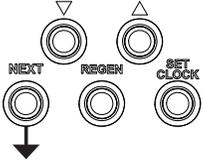
Step 5VH – Total Regenerations Since Startup.

Press NEXT to go to Step 6VH. Press REGEN to return to previous step.

⁴ Values in Step 3VH – Step 7VH cannot be reset.

STEP 6VH

TOTAL GALLONS
0 x1K

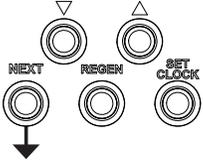


Step 6VH – Total Volume Used Since Startup: This display shows zero if a water meter is not installed.

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

STEP 7VH

ERROR LOG XXXX
403



Step 7VH – Error Log: Use ▼ or ▲ to scroll through the last 10 errors generated by the control during operation. The motor position count at the time of drive error detection is recorded in the top line of the display.

Press NEXT to exit Valve History. Press REGEN to return to previous step.

RETURN TO NORMAL MODE

PLACING WATER SYSTEM INTO OPERATION

1. Flush water lines

NOTE: After inlet, outlet, brine and drain connections are completed, but before restoring water to house:

- Open the inlet ball valve.
- Close the inlet boiler drain.
- Close the outlet ball valve.
- Turn the bypass handles to the bypass position as shown in Figure 22 to the right
- Open the outlet boiler drain on the outlet side of the system.
- Slowly turn on the water supply to the house and flush the lines into a bucket or garden hose to purge color, cement, sealants or solder residue.
- Once the lines are clear close the outlet boiler drain.
- Check all new connections for leaks.
- With the water supply to the house still on and the bypass in bypass position proceed to the next section.

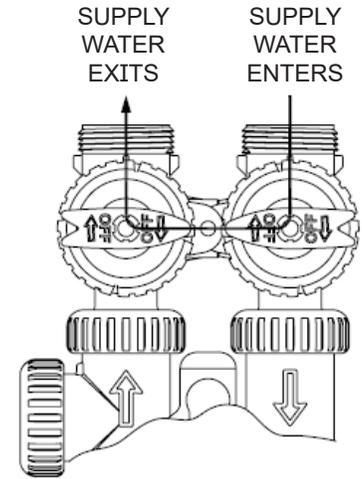


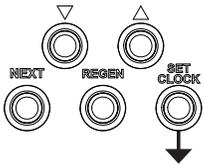
Figure 22

2. Plug in, initialize, and set time on the water system control

- Plug the control into power outlet, the display will flash through diagnostic screens, the motor will energize, and index the piston to the service cycle.
- The display will flash "TIME OF DAY". Set Time of Day:

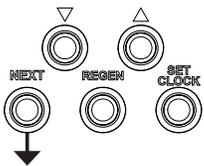
STEP 1U

Step 1U – Press CLOCK.



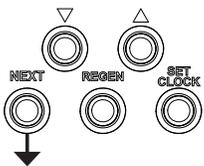
STEP 2U

Step 2U – Current Time (Hour): Use ▼ or ▲ to set the hour of the day. a.m./p.m. toggles after 12. Press NEXT to go to Step 3U.



STEP 3U

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



RETURN TO NORMAL MODE

3. Fill mineral tank, purge air, backwash and rinse to flush lines

Fill the mineral tank with water

- Press and hold REGEN button more than 3 seconds until the motor starts. Wait until the motor stops and display shows the current cycle.
- Press and release the REGEN button each time the motor stops to advance through each cycle until you reach the “BACKWASH” cycle. Once in the “BACKWASH” cycle.
- Begin to fill the unit slowly by slightly opening the bypass valve INLET handle allowing air to purge, then open the Inlet bypass handle to ½ service flow rate. Do not open fully.
- **IMPORTANT:** If water flows too rapidly, there may be a loss of the media.
- Once the air has finished purging from the tank, and water begins to flow steadily from the drain line. Verify all air is out, then open the bypass valve INLET handle all the way to maximum flow.
- Unplug the AC power adapter, allowing extended backwashing of media. This may take 15 to 30 minutes until water to the drain runs clear of color and media fines.
- Continue letting the water run to drain until the water runs clear from the drain line. This flushes color, and media fines from the media bed. To aid in rinsing the media, turn the water on and off quickly to spur water hammer, releasing more color. Once the water to the drain continuously runs clear, plug the AC power adapter back in and proceed to next step.
- Press and release the REGEN button. The control will advance to the “RINSE” cycle. Once in the “RINSE” cycle, allow water to run to the drain until water runs clear. You may need to unplug the AC power adapter allowing extended rinsing time to the media. Once water continuously runs clear to the drain, plug the AC power adapter back in. Then press and release the REGEN button, once the motor stops, press and release the REGEN button again to advance to the service position. “SOFTENING” will flash then “TIME OF DAY” will be displayed. These backwashing and rinsing steps are mandatory to properly startup the system. Failure to complete these steps will lead to service issues. The backwash and rinse steps may need to be repeated to make sure the drain water is completely clear.
- Continue to next section.

4. Brine cycle check & initial brine tank fill

Add water to brine (regenerant) tank (Proceed ONLY when color in drain water is completely clear).

NOTE: Before starting next cycle (Fill). Verify brine line is properly attached to the control valve, and brine elbow in brine tank. During the fill cycle water will begin to flow into brine tank.

- Press and hold the REGEN button more than 3 seconds until the motor starts. Wait until the motor stops and display shows the current cycle.
- When Pre Fill is selected in set up: The control will advance to the “FILL” cycle to prime the brine line tube between the brine tank and the control valve and add treated water to the brine tank. The Maytag® series controller will direct water down through the brine line tube and into the brine tank. Watch the bottom of the brine tank, once all air bubbles have been purged from the brine line tube and the water level is rising. Allow about 4 to 5 inches of water to fill the bottom of brine tank. Do not overfill.
- When Pre Fill is selected in set up press and release the REGEN button to advance to the next cycle. Each time the motor stops, press and release the REGEN button to advance through each cycle until you reach the “BRINE” cycle.
- Continue to next section.
- Proceed with the normal regeneration.

5. Brine cycle check & initial brine draw

Draw water from the brine (regenerant) tank.

- With the controller in the “BRINE” cycle, check to see that the water in the brine tank is being drawn out of the brine tank. The water level in the brine tank should recede very slowly.
- If the water in the brine tank does not recede, or goes up, refer to the troubleshooting section.
- If the water level is receding from the brine tank, wait for the air check assembly to check and stop the flow of water from the brine tank. Press and release the REGEN button to advance to the next cycle. Each time the motor stops, press and release the REGEN button again until you reach the “SERVICE” position. “SOFTENING” will flash then time of day will be displayed.
- Slowly turn the bypass outlet handle to the “Normal Operation” position and open the outlet ball valve allowing water to flow through system and enter the house. (Refer to Figure 23)
- Check all plumbing for leaks.
- Turn on a faucet plumbed after the water system. Run the faucet until the water runs clear. Once the water runs clear turn faucet off.
- Place salt (regenerant) in the brine tank. Replace cover on brine tank securely.
- Continue to next section.

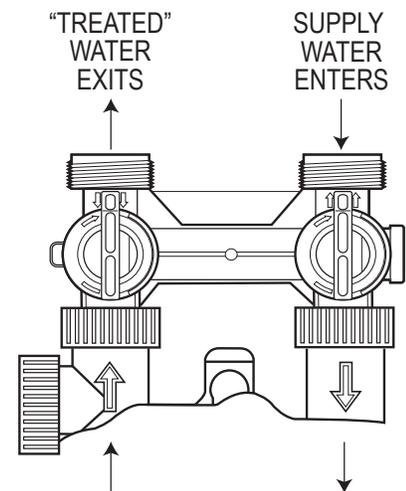


Figure 23

6. To Sanitize and Disinfect the System (last step after placing the system into operation)

Depending upon the conditions of use, the style of Water Treatment System, the type of ion exchanger, and the disinfectant available, a choice can be made among the following methods.

Sodium or Calcium Hypochlorite

These materials are satisfactory for use with polystyrene resins, synthetic gel zeolite, greensand and bentonites.

5.25% Sodium Hypochlorite.

These solutions are available under trade names such as Clorox*. If stronger solutions are used, such as those sold for commercial laundries, adjust the dosage accordingly.

- Dosage
 - Polystyrene resin; 1.2 fluid ounce (35.5 ml) per cubic foot.
 - Non-resinous exchangers; 0.8 fluid ounce (23.7 ml) per cubic foot.
- Regenerant tank conditioners
 - Backwash the conditioner and add the required amount of hypochlorite solution to the well of the regenerant tank. The regenerant tank should have water in it to permit the solution to be carried into the conditioner.
 - Proceed with the normal regeneration.

*Clorox is a trademark of the Clorox Company.

Calcium Hypochlorite

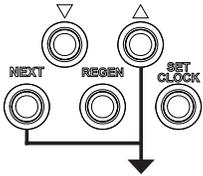
Calcium hypochlorite, 70% available chlorine, is available in several forms including tablets and granules. These solid materials may be used directly without dissolving before use.

- Dosage
 - Two grains (approximately 0.1 ounce [3 ml]) per cubic foot.
- Regenerant tank
 - Backwash the system and add the required amount of hypochlorite to the well of the regenerant tank. The regenerant tank should have water in it to permit the chlorine solution to be carried into the conditioner.

7. Programming: Installer Settings

New controls are sent with the battery turned off. The battery back up will turn on automatically the first time that the time of day is programmed on page 35.

STEP 11

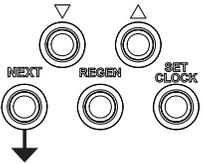


Step 11 – Press NEXT and ▲ simultaneously for 3 seconds.

STEP 21



Step 21 – Hardness: Use ▼ or ▲ to set the grains of hardness as calcium carbonate per gallon (Range: 1 – 150 grains). The grains per gallon can be increased if soluble iron needs to be reduced. This display only appears if Step 7S is set to AUTO. Press NEXT to go to Step 31. Press REGEN to return to previous step.



STEP 31

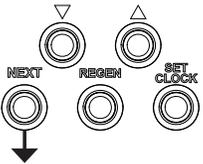


Step 31 – Day Override: If Volume Capacity is set to OFF, sets the number of days between regenerations. If Volume Capacity is set to AUTO or to a number, sets the maximum number of days between regenerations. Use ▼ or ▲ to select one of the following options:

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

See Setting Options Table for more detail.

Press NEXT to go to Step 41. Press REGEN to return to previous step.



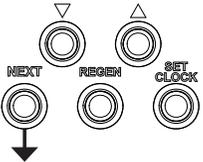
STEP 41



Step 41 – Regeneration Time: Use ▼ or ▲ to set the hour of day for regeneration. a.m./p.m. toggles after 12. The default time is 2:00 a.m. Press NEXT to set the minutes.

This display does not appear if Regeneration Time Option is set to IMMEDIATE REGENERATION.

Press NEXT to go to Step 51. Press REGEN to return to previous step.



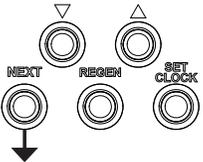
STEP 51



Step 51 – Energy Saver: Use ▼ or ▲ to select one of the following options:

- ON: The control will automatically turn off the display backlight after 5 minutes of keypad inactivity. The display will re-illuminate for 5 minutes after any keypad activity or water use.
- OFF: The display backlight is always on.

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



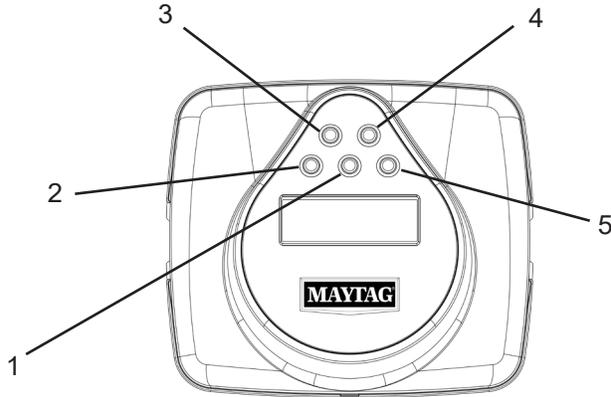
RETURN TO NORMAL MODE

The MAYTAG® Water Treatment System is now fully operational.

DRAWINGS AND PART NUMBERS

Control Valve - Front and Back View

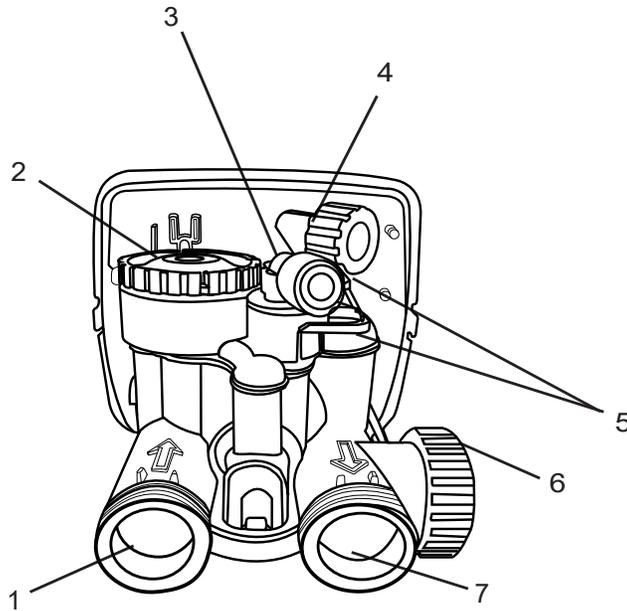
FRONT



- 1. Regen Button
- 2. Next Button
- 3. Down Button
- 4. Up Button
- 5. Set Clock

Figure 24

BACK



- 1. Inlet
- 2. Injector Cap
- 3. Brine Fitting w/Nut
- 4. 3/4 inch Drain Line Flow Control Assembly
- 5. Locking Clip (2) Required
- 6. Meter Assembly
- 7. Outlet

Figure 25

Control Valve - Front Cover and Drive Assembly

Front Cover and Drive Assembly

Drawing No.	Order No.	Description	Quantity
1	V4510LE-BOARD	WS1THRU2 LE 20PIN PCB REPLACE	1
2	V3107-01	WS1 MOTOR ASY	1
3	V3002	WS1 DRIVE BRACKET ASY W/ MOTOR	1
4	V4378_WR	FRONT COVER ASSEMBLY GRAY	1
5	V3110	WS1 DRIVE REDUCING GEAR 12X36	3
6	V3109	WS1 DRIVE GEAR COVER	1
Not Shown	V3186-06	WS1 POWER SUPPLY US 15VDC HOCP	1
	V3186AUS-05OD	WS1 POWER SUPPLY AUS 15VDC VI OUTDOOR	
	V3186EU-06	WS1 POWER SUPPLY EU 15VDC HOCP	
	V3186UK-06	WS1 POWER SUPPLY UK 15VDC HOCP	
	V3186-01	WS1 POWER CORD ONLY	
Not Shown	V3946	BACKPLATE MIDSIZE	1

There are no user serviceable parts on the PC board, the motor, or the AC adapter.

Relay Driver Output Type: Dual Solid-State 12 VDC wet contacts - N.O.

Relay Driver Output Capacity: 12 VDC @100 mA per relay output (total current through both outputs not to exceed 200 mA).

NOTE: Check for proper mounting dimensions on valve backplate prior to mounting an external relay under control cover.

We recommend that each externally wired relay contain a suppressor diode, which is normally placed across the relay coil in order to protect the control against back EMF at relay coil deactivation.

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

Wiring for Correct On/Off Operation	
PC Board Relay Terminal Block	Relay
RLY 1	Coil -
V+	Coil +
RLY 2	Coil -

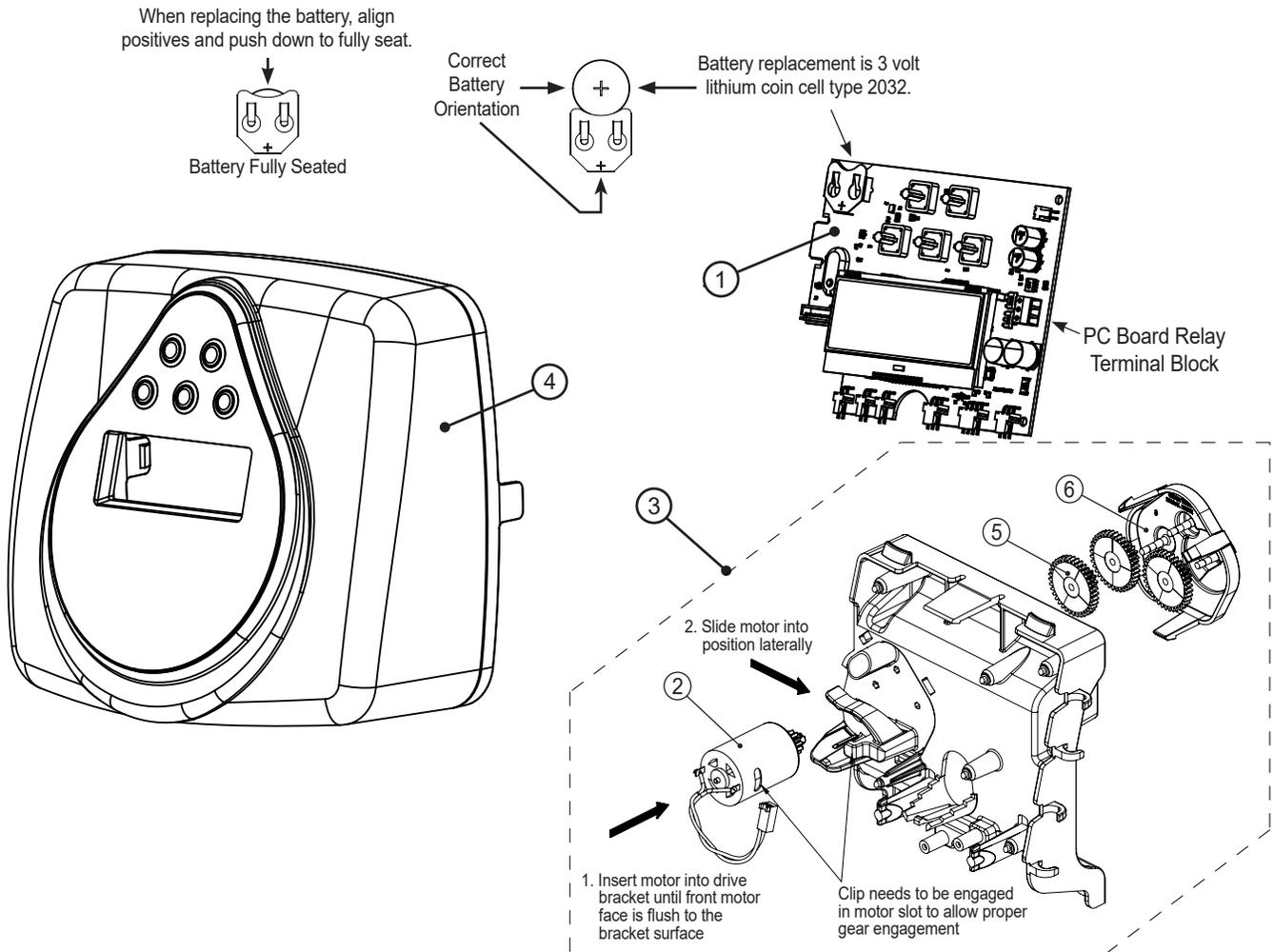


Figure 26

Brine Tank Assembly and Parts List

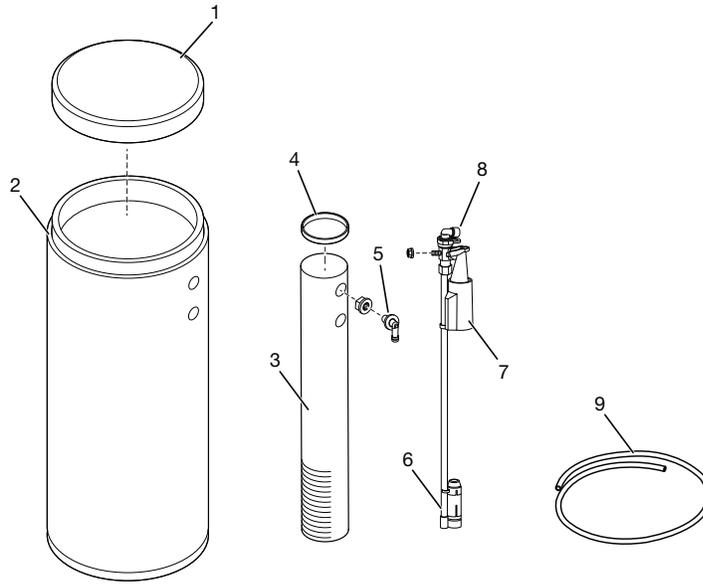


Figure 27

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3BTCVR16GRAYNL-M		16in IM BT Cover w/Label	1
***2	3BTASY1640MOBILGREY		Brine Tank Assembly w/SBV	1
	3BTASY1840MGCGNL		Brine Tank Assembly w/SBV, Tubing	1
3	3BW436SL	H1030-36S	Brine Well w/Slots	1
4	3BWCAP4	H7016	Brine Well Cap	2
5	3OF2PC	H1018	Overflow Fitting Assembly	1
6	3BVACPU474	H4500-48	Air Check Assembly	1
7	3BVFLOAT4749	H4640-9.5	Brine Float Assembly w/Pin	1
8	3BV474W/3/8E	H4600	Brine Valve 474 w/ 3/8 Elbow	1
**9	3PET38BLK100	2T20-0604BK	Tubing	1
*	3LLB-M-BT_2.85X11.85	309060	Brine Tank Cover Label	1

* Not shown on drawing

** Includes 5 ft of tubing supplied with the system. To reorder, tubing is sold in 100 ft roll

*** Complete 16" brine tank assembly includes all parts in the drawing above except for the cover, the cover will need to be ordered separately. Complete 18" brine tank assembly includes all parts in the drawing above

Some images are enlarged for viewing purposes

Mineral Tank Assembly, Valve Cover, and Parts List

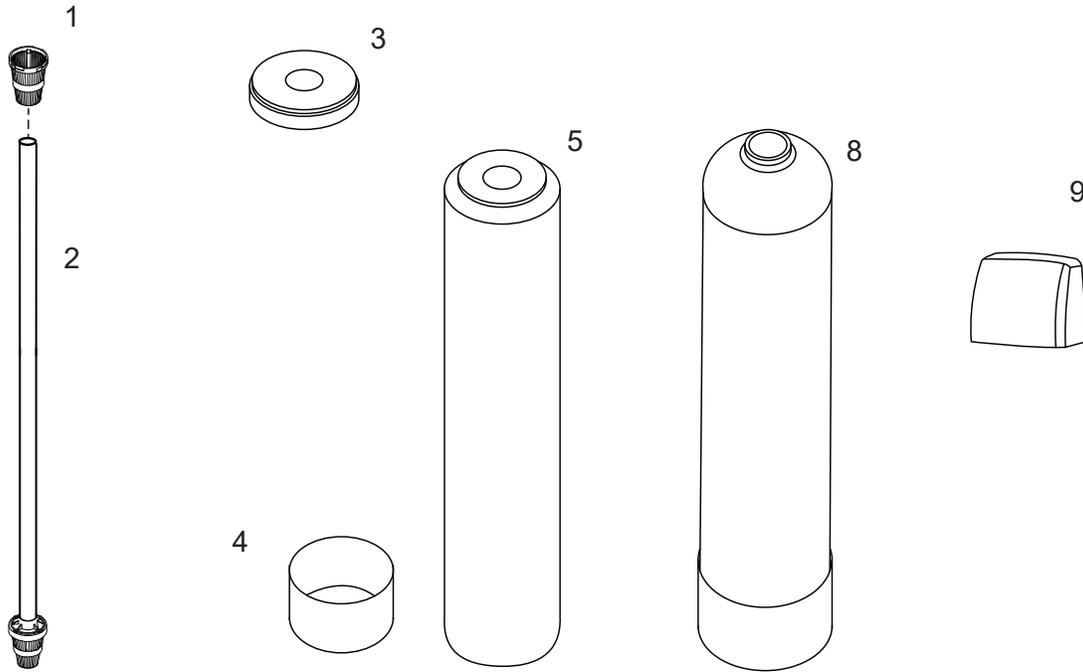


Figure 28

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3TDD1203		Top Distributor	1
*2	3DIST10554ST		Distributor Assembly	1
*3	3TJCAPGRAY		Tank Jacket Cap Cool Gray 10 inch	1
	3TJCAPGRAY13INCH		Tank Jacket Cap Cool Gray 13 inch	
*4	3TJSLEEVE MOBILGRAY		Tank Jacket Sleeve 10" Mobil Gray	1
*5	3TJBM1044 MOBILGRAY		Tank Jacket 10 x 44 Mobil Gray	1
	3TJBM1054 MOBILGRAY		Tank Jacket 10 x 54 Mobil Gray	
	3TJBM1354 MOBILGRAY		Tank Jacket 13 x 54 Mobil Gray	
**6	3LLB-M-TJ_4.5X1.6331		Tank Jacket Label	1
* **7	3TJBMFOAMSTRIP30FT		Foam strips for Tank Jacket (Length varies by Model)	
*8	3MT1044PK12		Mineral Tank 10 x 44	1
	3MT1054PK12		Mineral Tank 10 x 54	
	3MT1354PK12		Mineral Tank 13 x 54	
**** 9	3CVWTHRCVR-LD-COOLGRAY		Mid Size Weather Cover Cool Gray	1
* Varies by Model				
** Not Shown				
**** Optional				

Control Valve - Drive Cap, Piston, Regenerant Piston, and Stacker Assembly

Drawing No.	Part No.	Mfg Part No.	Description	Quantity
1	3CVSPACERSTACKV3005	V3005	Spacer Stack Assembly	1
2	3CVDRIVECAPASYV3004	V3004	Drive Cap Assembly	1
3		V3496	Drive Back Plate	1
4a	3CVPISTONDWNFLOW3011	V3011	Piston Downflow Asy (solid amber color)	1
4b	3CVPISTONUPFLOW30110	V3011-01	Piston Upflow Asy (black & amber color)	1
5	3CVPISTONREGENV3174	V3174	Regenerant Piston	1
6		V3135	O-Ring 228	1
7	3CVTNKADPTORINGV3180	V3180	O-Ring 337	1
8	3CVBPFTG ORINGV3105	V3105	O-Ring 215 (Distributor Tube)	1
9		V3001	Body Assembly Downflow	1
		V3001UP	Body Assembly Upflow	1

NOTE: V3004 drive cap assembly includes o-ring 228
The control valve uses the upflow position V3011-01 (black & amber color).

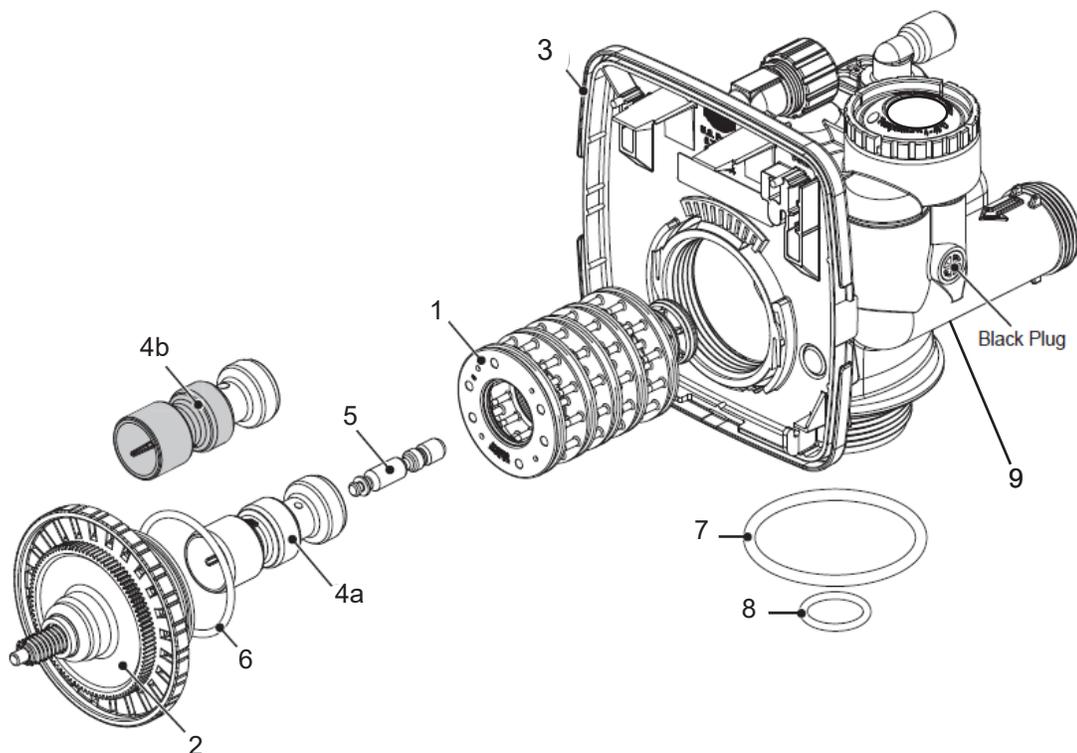


Figure 29
Drive Cap, Piston, Regenerant Piston and Stacker Assembly

Control Valve - Injector Cap and Injector

Drawing No.	Part No.	Mfg Part No.	Description	Quantity
1	3CVINJCAPV3176	V3176	Injector Cap	1
2	3CVORINGINJBPV3152	V3152	O-Ring 135	1
3	3CVINJSCREENV3177-01	V3177-01	Injector Screen Cage	1
4	3CVINJASYV3010-1Z	V3010-1Z	Injector Asy Z Plug	1
	3CVINJASYCV3010-1C	V3010-1C	Injector Asy C Violet	1
	3CVINJASYEV3010-1E	V3010-1E	Injector Asy E White	1
	3CVINJASYGV3010-1G	V3010-1G	Injector Asy G Yellow	1
Not Shown		V3170	O-Ring 011	*
Not Shown		V3171	O-Ring 013	*

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

NOTE: The control valve uses the upflow position and the injector is located in the UP hole and injector plug is in the other hole.

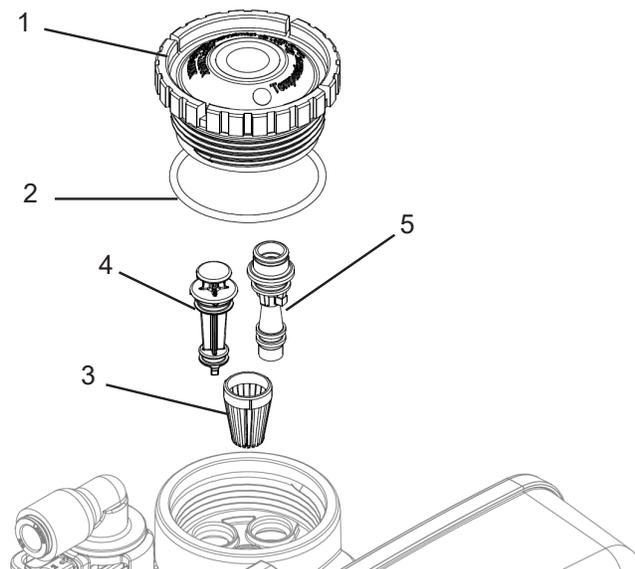


Figure 30

Refill Flow Control Assembly and Refill Port Plug

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVREFILLPORTPLUGASY	V3195-01	Refill Port Plug Asy	This part is required for back wash only filters
2	3CVLOCKINGCLIPH4615	H4615	Elbow Locking Clip	1
3		H4628	Elbow 3/8"	1
4	3CVELBOWORINGV3163	V3163	O-Ring 019	1
5	3CVRETAINERASYV3165	V3165-01*	RFC Retainer Asy (0.5 gpm)	*
6		V3182	Refill Flow Control	1
7	3CVBRINEELBOW3/8ASY	V4144-01	Brine Elbow Asy w/RFC 3/8"	1

* V3165-01 Assembly includes V3182 (0.5 gpm Refill Flow Control)

**Not Shown

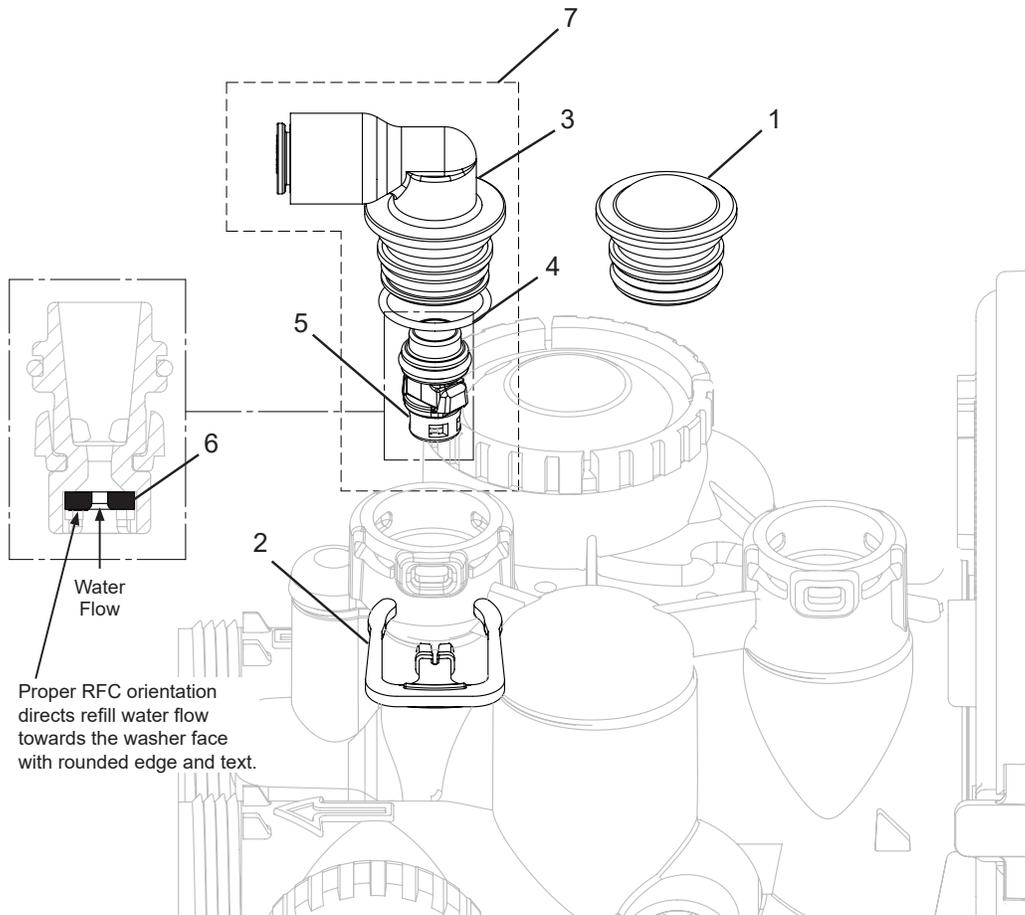


Figure 31

Drain Line Flow Control Assembly

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVLOCKINGCLIPH4615	H4615	Elbow Locking Clip	1
2	3CVDRAININSERT5/8TUB	PKP10TS8-Bulk	Polytube insert $\frac{5}{8}$ "	Option
3	3CVDRAINNUT5/8V3192	V3192	Nut $\frac{5}{8}$ " Drain Elbow	Option
4	3CVDRAINELBOW3/4ASY	V3158-01	Drain Elbow $\frac{3}{4}$ " Male	1
4*	3CVDRAINELBOWNOSILEN	V3158-02	Drain Elbow $\frac{3}{4}$ " Male No Silencer	Option
5	3CVELBOWORINGV3163	V3163	O-Ring 019	1
6	3CVDLFCRETAINERASY	V3159-01	DLFC Retainer Asy	1
7	3CVDLFC022 V3162-022	V3162-022	DLFC 2.2 gpm for $\frac{3}{4}$ "	One DLFC must be used if $\frac{3}{4}$ " fitting is used
	3CVDLFC027 V3162-027	V3162-027	DLFC 2.7 gpm for $\frac{3}{4}$ "	
	3CVDLFC032 V3162-032	V3162-032	DLFC 3.2 gpm for $\frac{3}{4}$ "	
	3CVDLFC042 V3162-042	V3162-042	DLFC 4.2 gpm for $\frac{3}{4}$ "	
	3CVDLFC053 V3162-053	V3162-053	DLFC 5.3 gpm for $\frac{3}{4}$ "	
* Not Shown				

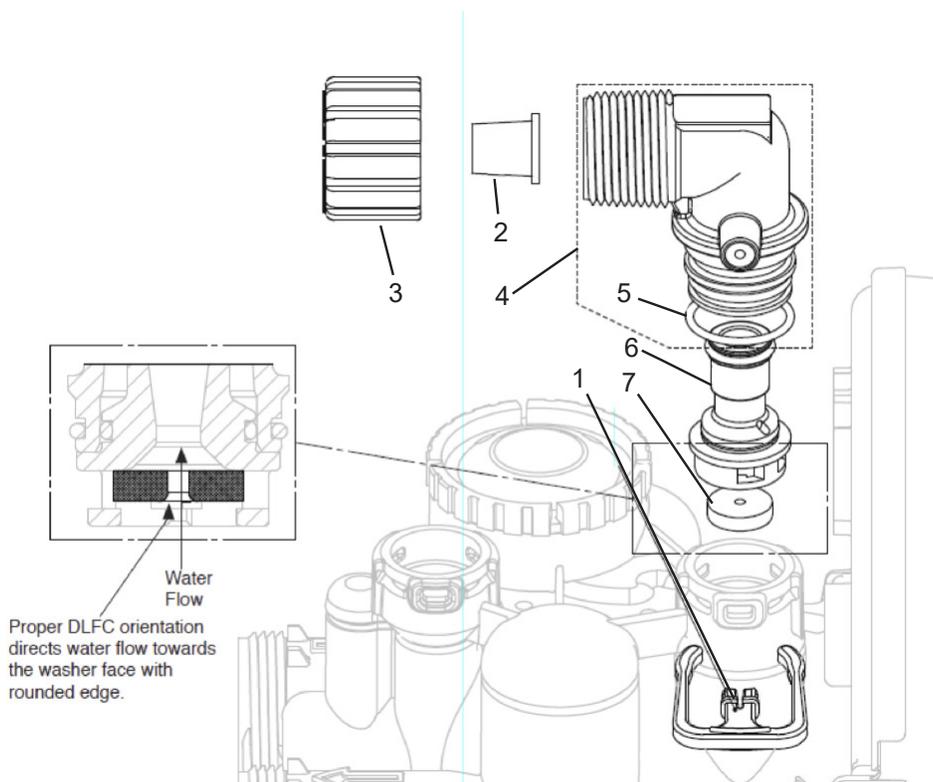


Figure 32

Water Meter, Meter Plug, and Mixing Valve

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" QC	1
2	3CVMETERASYV3003	V3003*	Meter ASY	1
3	3CVTURBINEASYV311801	V3118-01	Turbine ASY	1
4	3CVBPFTG ORINGV3105	V3105	O-Ring 215	1
5	3CVMETERPLUG300301	V3003-01	Meter Plug ASY	1

*Order number V3003 includes V3118-01 Turbine Asy and V3105 O-Ring 215.

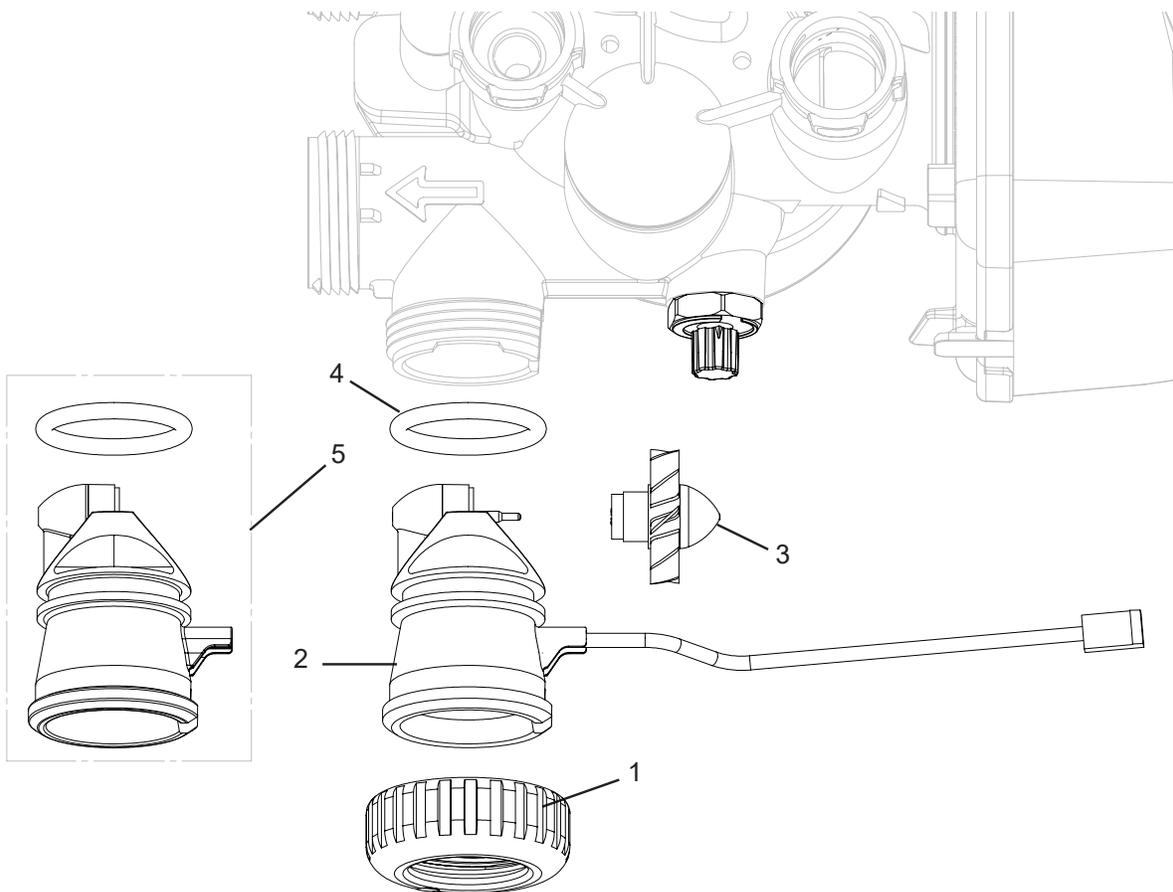


Figure 33

Bypass Valve

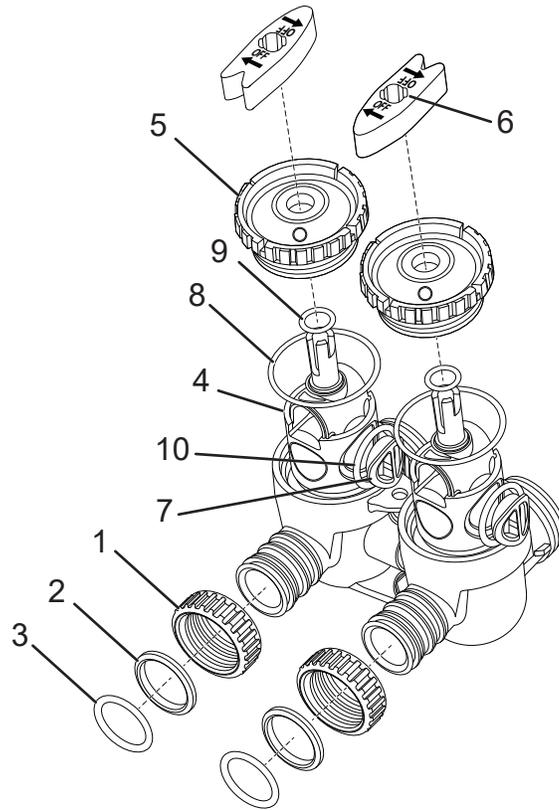


Figure 34

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
	3CVBYPASSV3006	V3006	Bypass Assembly	1
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) Quick Connect (QC)	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V3145	Bypass 1" (2.54 cm) Rotor	2
5		V3146	Bypass Cap	2
6		V3147	Bypass Handle	2
7		V3148	Bypass Rotor Seal Retainer	2
8	3CVORINGINJBPV3152	V3152	O-Ring 135	2
9		V3155	O-Ring 112	2
10		V3156	O-Ring 214	2

BYPASS FITTING PACKAGES

Bypass Fitting Packages

Order No.: 3CVBPFTGV3007-01

Description: Fitting 3/4" x 1" (1.9 x 2.54 cm) PVC Solvent Elbow Assembly

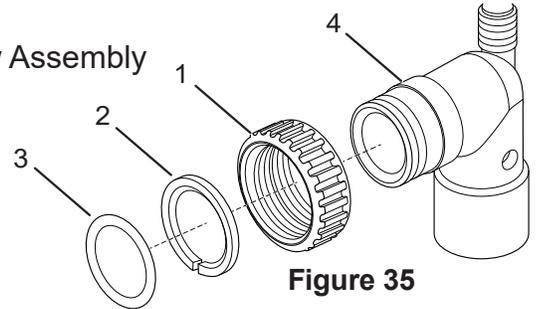


Figure 35

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V3189	3/4"x1" PVC 90°	2

Order No.: 3CVBPFTGV3007-15

Description: 3/4" (1.9 cm) John Guest® QC 90° Assembly

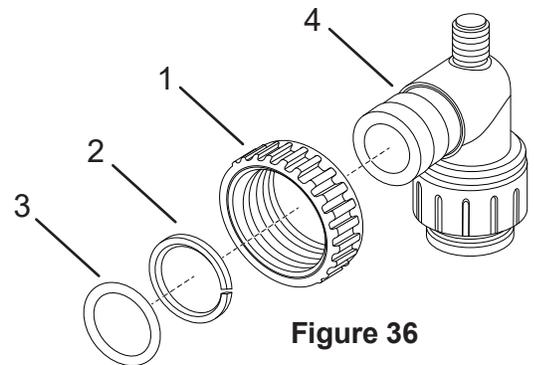


Figure 36

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V3790	3/4" John Guest® QC 90°	2

Bypass Fitting Packages

Order No.: 3CVBPFTGV3007-03

Description: Fitting 3/4" (1.9 cm) Brass Sweat Assembly LF

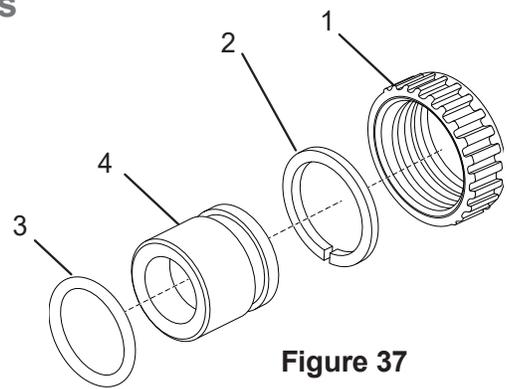


Figure 37

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V3188-01LF	3/4" Brass Sweat LF	2
Do not install in California				

Order No.: 3CVBPFTGV3007-02

Description: Fitting 1" (2.54 cm) Brass Sweat Assembly LF

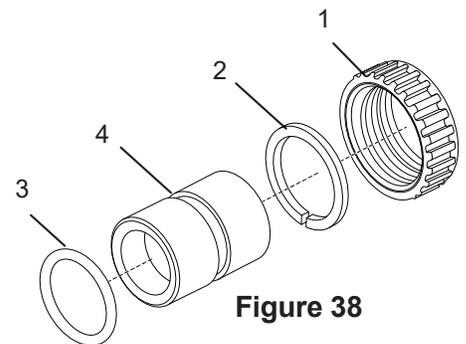


Figure 38

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V3188-LF	1" Brass Sweat LF	2
Do not install in California				

Order No.: 3CVBPFTGV007-04

Description: Fitting 1" (2.54 cm) Male MPT Assembly

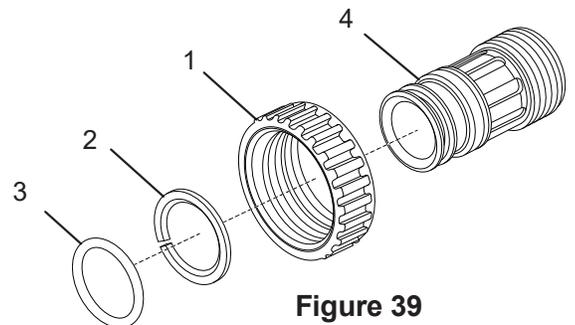


Figure 39

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V3164	1" Male MPT	2

Bypass Fitting Packages

Order No.: 3CVBPFTGV3007-12

Description: Fitting 3/4" (1.9 cm) Brass SharkBite® Assembly LF

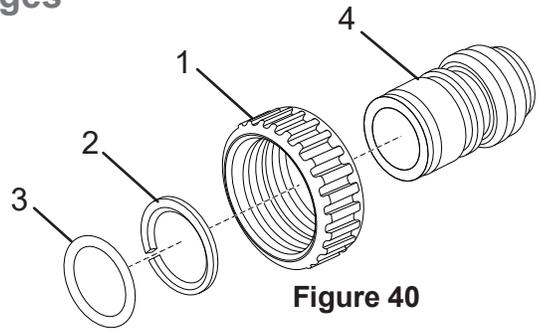


Figure 40

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V3628-LF	3/4" Brass SharkBite® Assembly LF	2

Order No.: 3CVBPFTG1.0V3007-13

Description: Fitting 1" (2.54 cm) Brass SharkBite® Assembly LF

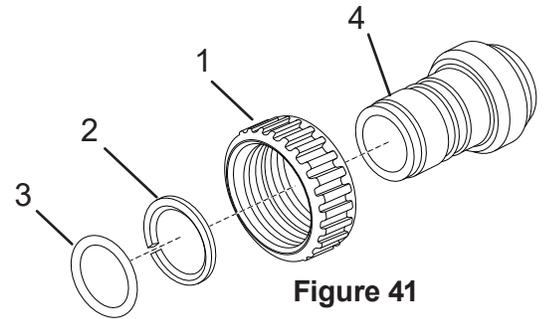


Figure 41

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V3629-LF	1" Brass SharkBite® LF	2

Order No.: 3CVBPFTGV3191-01

Description: Fitting Bypass Vertical Adapter Assembly

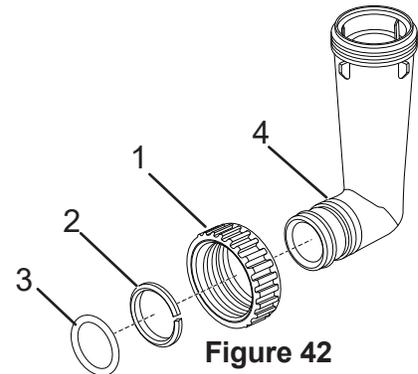


Figure 42

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V3191	Bypass Vertical Adapter	2

Bypass Fitting Packages

Order No.: 3CVBPFTGV3007-17

Description: Fitting 1" (2.54 cm) John Guest® QC Assembly

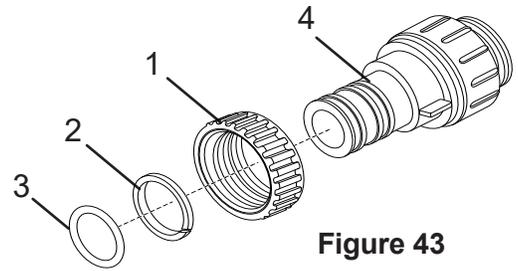


Figure 43

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V4045	1" John Guest® QC ASY	2

Order No.: 3CVBPFTGV3007-00

Description: Fitting 1" (2.54 cm) PVC Male NPT Elbow Assembly

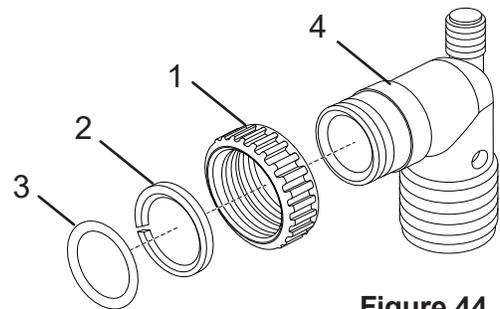


Figure 44

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V3149	1" PVC Male NPT Elbow	2

Order No.: 3CVBPFTGV3007-18

Description: Fitting 3/4" (1.9 cm) Plastic Male NPT Assembly

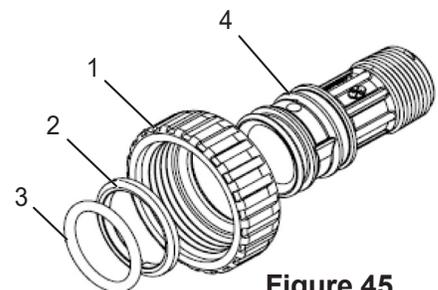


Figure 45

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V4232	3/4" Plastic male NPT Fitting	2

Bypass Fitting Packages

Order No.: 3CVBPFTGV3007-19

Description: Fitting 3/4" (1.9 cm) John Guest® Straight QC Assembly

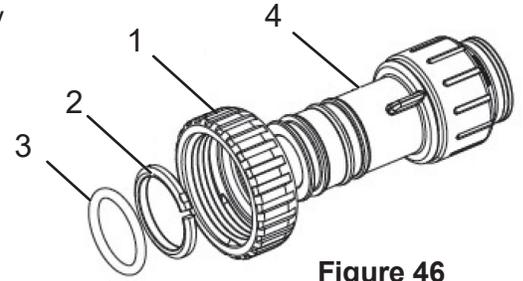


Figure 46

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V4223	3/4" John Guest® Straight QC Fitting	2

Order No.: 3CVBPFTGV3007-20

Description: Fitting 1" (2.54 cm) John Guest® QC Elbow Assembly

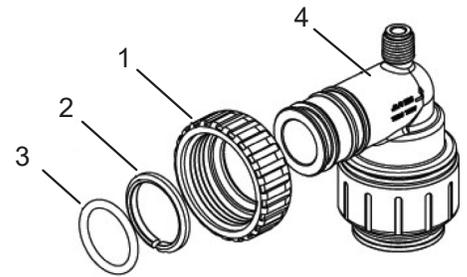


Figure 47

Drawing No.	Part No.	Mfg. Part No.	Description	Quantity
1	3CVBPFTG NUT1INV3151	V3151	Nut 1" (2.54 cm) QC	2
2	3CVBPFTG RINGV3150	V3150	Split Ring	2
3	3CVBPFTG ORINGV3105	V3105	O-Ring 215	2
4		V4317	1" John Guest® QC Elbow Fitting	2

TROUBLESHOOTING

Problem	Possible Cause	Solution
No Display on PC Board	<ol style="list-style-type: none"> 1. No power at electric outlet 2. Control valve Power Adapter not plugged into outlet or power cord end not connected to PC board connection 3. Improper power supply 4. Defective Power Adapter 5. Defective PC Board 	<ol style="list-style-type: none"> 1. Repair outlet or use working outlet 2. Plug Power Adapter into outlet or connect power cord end to PC Board connection 3. Verify proper voltage is being delivered to PC Board 4. Replace Power Adapter 5. Replace PC Board
PC Board does not display correct time of day	<ol style="list-style-type: none"> 1. Power Adapter plugged into electric outlet controlled by light switch 2. Tripped breaker switch and/or tripped GFI 3. Power outage 4. Defective PC Board 	<ol style="list-style-type: none"> 1. Use uninterrupted outlet 2. Reset breaker switch and/ or GFI Switch 3. Reset time of day. If PC Board has battery back up present the battery may be depleted. Refer to battery replacement drawing for instructions 4. Replace PC Board
Display does not indicate that water is flowing. Refer to User Display Settings for how the display indicates water is flowing	<ol style="list-style-type: none"> 1. Bypass valve in bypass position 2. Meter is not connected to meter connection on PC Board 3. Restricted/stalled meter turbine 4. Meter wire not installed securely into three pin connector 5. Defective meter 6. Defective PC Board 	<ol style="list-style-type: none"> 1. Turn bypass handles to place bypass in service position 2. Connect meter to three pin connection labeled METER on PC board 3. Remove meter and check for rotation or foreign material 4. Verify meter cable wires are installed securely into three pin connector labeled METER 5. Replace meter 6. Replace PC Board
Control valve regenerates at wrong time of day	<ol style="list-style-type: none"> 1. Power outage 2. Time of day not set correctly 3. Time of regeneration set incorrectly 4. Control valve set at "on 0" (immediate regeneration) 5. Control valve set at "NORMAL + on 0" (delayed and/ or immediate) 	<ol style="list-style-type: none"> 1. Reset time of day. If PC Board has battery back up present the battery may be depleted. Refer to battery replacement for instructions. 2. Reset to correct time of day 3. Reset regeneration time 4. Check programming setting and reset to NORMAL (for a delayed regen time) 5. Check programming setting and reset to NORMAL (for a delayed regen time)
Time of day flashes on and off	Power outage	Reset time of day. If PC Board has battery back up present the battery may be depleted. Refer to battery replacement for instructions.

Problem	Possible Cause	Solution
Timer does not display correct time of day	<ol style="list-style-type: none"> 1. Switched outlet 2. Power outage 3. Defective PC board 	<ol style="list-style-type: none"> 1. Use uninterrupted outlet 2. Transformer unplugged 3. Replace PC board
Timer does not display time of day	<ol style="list-style-type: none"> 1. Transformer unplugged 2. No electric power at outlet 3. Defective transformer 4. Defective PC board 	<ol style="list-style-type: none"> 1. Connect power 2. Repair outlet or use working outlet 3. Replace transformer 4. Replace PC board
Control valve does not regenerate automatically when the correct button (s) is depressed and held. For TC valves the buttons are ▲&▼. For all other valves the button is REGEN	<ol style="list-style-type: none"> 1. Broken drive gear or drive cap assembly 2. Broken Piston Rod 3. Defective PC Board 	<ol style="list-style-type: none"> 1. Replace drive gear or drive cap assembly 2. Replace piston rod 3. Defective PC Board
Control valve does not regenerate automatically but does when the correct button (s) is depressed and held. For TC valves the buttons are ▲&▼ For all other valves the button is REGEN	<ol style="list-style-type: none"> 1. Bypass valve in bypass position 2. Meter is not connected to meter connection on PC Board 3. Restricted/ stalled meter turbine 4. Incorrect programming 5. Meter wire not installed securely into three pin connector 6. Defective meter 7. Defective PC Board 	<ol style="list-style-type: none"> 1. Turn bypass handles to place bypass in service position 2. Connect meter to three pin connection labeled METER on PC Board 3. Remove meter and check for rotation or foreign material 4. Check for programming error 5. Verify meter cable wires are installed securely into three pin connector labeled METER 6. Replace meter 7. Replace PC Board
Hard or untreated water is being delivered	<ol style="list-style-type: none"> 1. Bypass valve is open or faulty 2. Media is exhausted due to high water usage 3. Meter not registering 4. Water quality fluctuation 5. No regenerant or low level of regenerant in regenerant tank 6. Control fails to draw in regenerant 7. Insufficient regenerant level in regenerant tank 	<ol style="list-style-type: none"> 1. Fully close bypass valve or replace 2. Check program settings or diagnostics for abnormal water usage 3. Remove meter and check for rotation or foreign material 4. Test water and adjust program values accordingly 5. Add proper regenerant to tank 6. Refer to Trouble Shooting Guide "Control valve fails to draw in regenerant/air" 7. Check refill setting in programming. Check refill flow control for restrictions or debris and clean or replace

Problem	Possible Cause	Solution
Control valve uses too much regenerant	<ol style="list-style-type: none"> 1. Improper refill setting 2. Improper program settings 3. Control valve regenerates frequently 	<ol style="list-style-type: none"> 1. Check refill setting 2. Check program setting to make sure they are specific to the water quality and application needs 3. Check for leaking fixtures that may be exhausting capacity or system is undersized
Residual regenerant being delivered to service	<ol style="list-style-type: none"> 1. Low water pressure 2. Incorrect injector size 3. Restricted drain line 	<ol style="list-style-type: none"> 1. Check incoming water pressure – water pressure must remain at minimum of 25 psi 2. Replace injector with correct size for the application 3. Check drain line for restrictions or debris and clean
Excessive water in regenerant tank	<ol style="list-style-type: none"> 1. Improper program settings 2. Plugged injector 3. Drive cap assembly not tightened in properly 4. Damaged seal/ stack assembly 5. Restricted or kinked drain line 6. Plugged backwash flow controller 7. Missing refill flow controller 	<ol style="list-style-type: none"> 1. Check refill setting 2. Remove injector and clean or replace 3. Re-tighten the drive cap assembly 4. Replace seal/ stack 5. Check drain line for restrictions or debris and or un-kink drain line 6. Remove backwash flow controller and clean or replace 7. Replace refill flow controller
Control valve fails to draw in regenerant/air	<ol style="list-style-type: none"> 1. Injector is plugged 2. Faulty regenerant piston 3. Regenerant line connection leak 4. Drain line restriction of debris cause excess back pressure 5. Drain line too long or too high 6. Low water pressure 	<ol style="list-style-type: none"> 1. Remove injector and clean or replace 2. Replace regenerant piston 3. Inspect regenerant line for air leak 4. Inspect drain line and clean to correct restriction 5. Shorten length and or height 6. Check incoming water pressure-water pressure must remain at minimum of 20 psi (1.38 bar)
Water running to drain	<ol style="list-style-type: none"> 1. Power outage during regeneration 2. Damaged seal/ stack assembly 3. Piston assembly failure 4. Drive cap assembly not tightened in properly 	<ol style="list-style-type: none"> 1. Upon power being restored control will finish the remaining regeneration time. Reset time of day. 2. Replace seal/ stack assembly 3. Replace piston assembly 4. Re-tighten the drive cap assembly

Problem	Possible Cause	Solution
Err – 101 = Control unable to sense motor movement	<ol style="list-style-type: none"> 1. Motor not inserted full to engage pinion, motor wires broken or disconnected 2. PC Board not properly snapped into drive bracket 3. Missing reduction gears 	<ol style="list-style-type: none"> 1. 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 2. 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 3. Replace missing gears
Err – 102 = Control valve motor ran too short and was unable to find the next cycle position and stalled	<ol style="list-style-type: none"> 1. Foreign material is lodged in control valve 2. Mechanical binding 3. Main drive gear too tight 4. Improper voltage being delivered to PC Board 	<ol style="list-style-type: none"> 1. 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 2. 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 3. 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 4. Verify that proper voltage is being supplied. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect

Problem	Possible Cause	Solution
<p>Err – 103 = Control valve motor ran too long and was unable to find the next cycle position</p>	<ol style="list-style-type: none"> 1. Motor failure during a regeneration 2. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor 3. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface 	<ol style="list-style-type: none"> 1. 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 2. 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 3. 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
<p>Err – 104 = Control valve motor ran too long and timed out trying to reach home position</p>	<p>Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface</p>	<p>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</p>
<p>Err – 106, Err - 116 = MAV/ SEPS/ NHBP/ AUX MAV valve motor ran too long and unable to find the proper park position</p> <p>Motorized Alternating Valve = MAV</p> <p>Separate Source =SEPS</p> <p>No Hard Water Bypass = NHBP</p> <p>Auxiliary MAV = AUX MAV</p>	<ol style="list-style-type: none"> 1. Control valve programmed for ALT A or B, nHbP, SEPS, or AUX MAV with out having a MAV or NHBP valve attached to operate that function 2. MAV/ NHBP motor wire not connected to PC Board 3. MAV/ NHBP motor not fully engaged with reduction gears 4. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor 	<ol style="list-style-type: none"> 1. Press NEXT and REGEN buttons for 3 seconds to re synchronize software with piston position or disconnect power supply from PC board for 5 seconds and then reconnect. Then re-program valve to proper setting 2. 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 3. 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 4. 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
<p>Err – 107, Err - 117 = MAV/ SEPS/ NHBP/AUX MAV valve motor ran too short (stalled) while looking for proper park position</p> <p>Motorized Alternating Valve = MAV</p> <p>Separate Source = SEPS\</p> <p>No Hard Water Bypass = NHBP</p> <p>Auxiliary MAV = AUX MAV</p>	<ol style="list-style-type: none"> 1. Foreign material is lodged in MAV/ NHBP valve 2. Mechanical binding 	<ol style="list-style-type: none"> 1. 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 2. 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

Error Code	Description of Error
101	Valve Motor Output Energized - NOT SENSING VALVE MOVEMENT - perform soft reset to clear
102	Valve Motor/Stager #1 RAN TOO SHORT, STALLED - unable to find next cycle position - perform soft reset to clear try to regen to be sure obstruction is clear
103	Valve Motor/Stager #1 RAN TOO LONG - unable to find next cycle position - perform soft reset to clear
104	Valve Motor UNABLE TO FIND HOME POSITION - during regeneration or control reset - perform soft reset to clear
106	Alternator MAV/NHBP Motor RAN TOO LONG - unable to find proper park position - perform soft reset to clear
107	Alternator MAV/NHBP Motor RAN TOO SHORT, STALLED - unable to find proper park position - perform soft reset to clear
109	INVALID MOTOR STATE DETECTED, Internal Software Error - proper software operation can no longer be maintained by the micro-controller - perform soft reset to clear
116	Aux MAV / NHBP Motor RAN TOO LONG - unable to find proper park position - perform soft reset to clear

PERFORMANCE DATA SHEET

MAYTAG® WATER TREATMENT SYSTEM

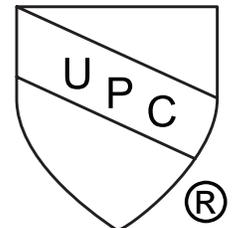
Model Numbers	*** 3M-ST32-XXX	*** 3M-ST40-XXX	**** 3M-ST48-XXX	*** 3M-ST64-XXX	*** 3M-ST80-XXX
Rated flow rate	9.0 gpm	10.0 gpm	13.0 gpm	15.0 gpm	15.0 gpm
Pressure drop @ rated flow rate	8 psi	9 psi	15 psi	15 psi	15 psi
Peak flow rate and pressure drop	15.9 gpm @ 15 psi 18.2 gpm @ 20 psi 22.4 gpm @ 25 psi	16.2 gpm @ 15 psi 19.2 gpm @ 20 psi 22.0 gpm @ 25 psi	17.7 gpm @ 15 psi 21.1 gpm @ 20 psi 24.0 gpm @ 25 psi	20.0 gpm @ 15 psi 23.5 gpm @ 20 psi 26.6 gpm @ 25 psi	14.5 gpm @ 15 psi 17.3 gpm @ 20 psi 19.8 gpm @ 25 psi
Electrical Requirements	Input: 100V-120V ~ 50/60Hz 0.35A12V Output: 15VDC = 0.5A	Input: 100V-120V ~ 50/60Hz 0.35A12V Output: 15VDC = 0.5A	Input: 100V-120V ~ 50/60Hz 0.35A12V Output: 15VDC = 0.5A	Input: 100V-120V ~ 50/60Hz 0.35A12V Output: 15VDC = 0.5A	Input: 100V-120V ~ 50/60Hz 0.35A12V Output: 15VDC = 0.5A
Capacities at rated service flow	18,200 @ Low (4.5lbs) 23,500 @ Std (9.0lbs) 28,000 @ High (15.0lbs)	22,750 @ Low (5.6lbs) 29,375 @ Std (11.3lbs) 35,000 @ High (18.8lbs)	27,300 @ Low (6.75lbs) 35,250 @ Std (13.5lbs) 42,000 @ High (22.5lbs)	36,400 @ Low (9.0lbs) 47,000 @ Std (18.0lbs) 56,000 @ High (30.0lbs)	45,500 @ Low (11.25lbs) 58,750 @ Std (22.5lbs) 70,000 @ High (37.5lbs)
Type and amount of Ion Exchange resin	Premium Cation 1.0 cu ft	Premium Cation 1.25 cu ft	Premium Cation 1.5 cu ft	Premium Cation 2.0 cu ft	Premium Cation 2.5 cu ft
Working Water Pressure	20 to 120 psi (1.38 to 8.27 kg/cm ²)	20 to 120 psi (1.38 to 8.27 kg/cm ²)	20 to 120 psi (1.38 to 8.27 kg/cm ²)	20 to 120 psi (1.38 to 8.27 kg/cm ²)	20 to 120 psi (1.38 to 8.27 kg/cm ²)
Operating Temperature (min/max)	35 to 100°F (1.7 to 37.8°C)	35 to 100°F (1.7 to 37.8°C)	35 to 100°F (1.7 to 37.8°C)	35 to 100°F (1.7 to 37.8°C)	35 to 100°F (1.7 to 37.8°C)
Maximum flow rate in gpm or L/min to drain during regeneration	2.7 gal/min (10.22 L/min)	2.7 gal/min (10.22 L/min)	2.7 gal/min (10.22 L/min)	4.2 gal/min (10.22 L/min)	4.2 gal/min (17.03 L/min)
Efficiency rating Efficiency rated salt setting	4043 grains/pound Low (4.5 lbs)	4043 grains/pound Low (5.6 lbs)	4043 grains/pound Low (6.75 lbs)	4043 grains/pound Low (9.0 lbs)	4043 grains/pound Low (11.25 lbs)
Efficiency rated capacity	18,200 grains	22,750 grains	27,300 grains	36,400 grains	45,500 grains
Accepted type or grade, pellet or solar salt for water softeners.	Sodium Chloride	Sodium Chloride	Sodium Chloride	Sodium Chloride	Sodium Chloride

* These systems conform to NSF/ANSI 44 for the specific performance claims as verified and substantiated by test data. NSF/ANSI 44 Performance Claims: – Hardness, Radium 226, 228 and Barium claims; NSF/ANSI 61: Drinking Water System Components – Health Effects; NSF/ANSI 372 Lead Free Compliance; Uniform Plumbing Code (UPC), International Plumbing Code (IPC) and International Residential Code (IRC).

** These systems conform to NSF/ANSI Standard 42: Reduction claim: Aesthetic Chlorine/Taste and Odor up to 197,389 gallons as verified and substantiated by test data The concentration of the indicated substances in water entering the conditioner was reduced to a concentration less than or equal to the permissible limit.

*** A study by Kent State University (Reduction in Strontium in Drinking Water by Whole House Ion exchange) has found that water softeners that reduce hardness to less than one grain per gallon will also effectively reduce Strontium from the water.

Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.



**Certified by
IAPMO R&T
NSF/ANSI 42, 44, 61 & 372 · IPC · IRC**

Substance	Influent Challenge Concentration	Reduction Requirement
Chlorine	2.0 mg/L ± 10%	>50% reduction
Barium	2.0 mg/L	<2.0 mg/L
Radium 226/228	5 pCi/L	<5.0 pCi/L

- Efficiency rated water softener is a demand initiated regeneration (DIR) softener which also complies with specific performance specifications intended to minimize the amount of (regenerant) brine and water used in its operation.
- Efficiency rated water softeners shall have a rated salt efficiency of not less than 3350 grains of total hardness exchange per pound of salt (based on NaCl equivalency) (477 grams of total hardness exchanged per kilogram of salt), and shall not deliver more salt than its listed rating. The Efficiency of the water softener, the salt dosage at that efficiency, the capacity at that salt dosage and that of the efficiency is only valid at the stated salt dosage.
- Efficiency is measured by a laboratory test described in NSF/ANSI 44. The test represents the maximum possible efficiency that the system can achieve. Operational efficiency is the actual efficiency achieved after the system has been installed. It is typically less than the efficiency due to individual application factors including water hardness, water usage, and other contaminants that reduce softeners capacity. While the testing was performed under standard laboratory conditions, actual performance can vary.
- Refer to the system installation and operations manual for set-up and programming instructions.
- System testing utilized sodium chloride regenerant specifically formulated for water conditioning units. Please see operations manual for user responsibility, parts and service availability, any further restrictions or limitations to the use of this product.

PERFORMANCE DATA SHEET

MAYTAG® WATER TREATMENT SYSTEM

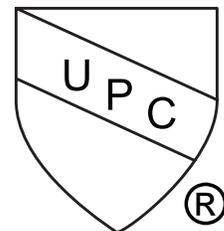
Model Numbers	* ** *** 3M-STR32-XXX	* ** *** 3M-STR32XC-XXX	* ** *** 3M-STR40-XXX	* ** *** 3M-STR64-XXX
Rated flow rate	9.0.0 gpm	10.0.0 gpm	10.0 gpm	15.0 gpm
Pressure drop @ rated flow rate	8 psi	8 psi	9 psi	15 psi
Peak flow rate and pressure drop	15.9 gpm @ 15 psi 18.2 gpm @ 20 psi 22.4 gpm @ 25 psi	15.9 gpm @ 15 psi 18.2 gpm @ 20 psi 22.4 gpm @ 25 psi	15.5 gpm @ 15 psi 18.7 gpm @ 20 psi 21.7 gpm @ 25 psi	16.5 gpm @ 15 psi 19.8 gpm @ 20 psi 22.8 gpm @ 25 psi
Electrical Requirements	Input: 100V-120V ~ 50/60Hz 0.35A12V Output: 15VDC = 0.5A	Input: 100V-120V ~ 50/60Hz 0.35A12V Output: 15VDC = 0.5A	Input: 100V-120V ~ 50/60Hz 0.35A12V Output: 15VDC = 0.5A	Input: 100V-120V ~ 50/60Hz 0.35A12V Output: 15VDC = 0.5A
Capacities at rated service flow	18,200 @ Low (4.5lbs) 23,500 @ Std (9.0lbs) 28,000 @ High (15.0lbs)	18,200 @ Low (4.5lbs) 23,500 @ Std (9.0lbs) 28,000 @ High (15.0lbs)	22,750 @ Low (5.6lbs) 29,375 @ Std (11.3lbs) 35,000 @ High (18.8lbs)	36,400 @ Low (9.0lbs) 47,000 @ Std (18.0lbs) 56,000 @ High (30.0lbs)
Type and amount of Ion Exchange resin	Premium Cation 1.0 cu ft	Premium Cation 1.0 cu ft	Premium Cation 1.25 cu ft	Premium Cation 2.0 cu ft
Working Water Pressure	20 to 120 psi (1.38 to 8.27 kg/cm ²)	20 to 120 psi (1.38 to 8.27 kg/cm ²)	20 to 120 psi (1.38 to 8.27 kg/cm ²)	20 to 120 psi (1.38 to 8.27 kg/cm ²)
Operating Temperature (min/max)	35 to 100°F (1.7 to 37.8°C)	35 to 100°F (1.7 to 37.8°C)	35 to 100°F (1.7 to 37.8°C)	35 to 100°F (1.7 to 37.8°C)
Maximum flow rate in gpm or L/min to drain during regeneration	2.7 gal/min (10.22 L/min)	2.7 gal/min (10.22 L/min)	2.7 gal/min (10.22 L/min)	4.2 gal/min (10.22 L/min)
Efficiency rating Efficiency rated salt setting	4043 grains/pound Low (4.5 lbs)	4043 grains/pound Low (4.5 lbs)	4043 grains/pound Low (5.6 lbs)	4043 grains/pound Low (9.0 lbs)
Efficiency rated capacity	18,200 grains	18,200 grains	22,750 grains	36,400 grains
Accepted type or grade, pellet or solar salt for water softeners.	Sodium Chloride	Sodium Chloride	Sodium Chloride	Sodium Chloride

* These systems conform to NSF/ANSI 44 for the specific performance claims as verified and substantiated by test data. NSF/ANSI 44 Performance Claims: – Hardness, Radium 226, 228 and Barium claims; NSF/ANSI 61: Drinking Water System Components – Health Effects; NSF/ANSI 372 Lead Free Compliance; Uniform Plumbing Code (UPC), International Plumbing Code (IPC) and International Residential Code (IRC).

** These systems conform to NSF/ANSI Standard 42: Reduction claim: Aesthetic Chlorine/Taste and Odor up to 197,389 gallons as verified and substantiated by test data The concentration of the indicated substances in water entering the conditioner was reduced to a concentration less than or equal to the permissible limit.

*** A study by Kent State University (Reduction in Strontium in Drinking Water by Whole House Ion exchange) has found that water softeners that reduce hardness to less than one grain per gallon will also effectively reduce Strontium from the water.

Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.



**Certified by
IAPMO R&T
NSF/ANSI 42, 44, 61 & 372 · IPC · IRC**

Substance	Influent Challenge Concentration	Reduction Requirement
Chlorine	2.0 mg/L ± 10%	>50% reduction
Barium	2.0 mg/L	<2.0 mg/L
Radium 226/228	5 pCi/L	<5.0 pCi/L

- Efficiency rated water softener is a demand initiated regeneration (DIR) softener which also complies with specific performance specifications intended to minimize the amount of (regenerant) brine and water used in its operation.
- Efficiency rated water softeners shall have a rated salt efficiency of not less than 3350 grains of total hardness exchange per pound of salt (based on NaCl equivalency) (477 grams of total hardness exchanged per kilogram of salt), and shall not deliver more salt than its listed rating. The Efficiency of the water softener, the salt dosage at that efficiency, the capacity at that salt dosage and that of the efficiency is only valid at the stated salt dosage.
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MAYTAG® WATER TREATMENT SYSTEMS



WHAT'S INSIDE MATTERS™

LIFETIME LIMITED WARRANTY

The LeverEdge (hereinafter LE) warrants any Maytag brand water treatment system manufactured by LE and installed by a duly authorized Maytag dealer, to be free from defects in materials and workmanship to the original residential purchaser (hereinafter CONSUMER) from the date of purchase. All aspects of this warranty are subject to the following limitations, terms and conditions.

1. DURATION OF WARRANTY

If LE equipment consisting of the Mineral and Storage Tanks, Controls and Valves, Pumps and Switches, Ion Exchange Resin and Treatment Media, Drinking Water Systems (excluding replacement exchange modules or inline filters), and Ultraviolet Lights (excluding bulbs and sleeves) is determined to have failed as a result of a manufacturing defect, LE will, at its sole discretion, repair or replace the defective part at NO CHARGE to the CONSUMER (excluding labor, and applicable shipping and handling costs) for the duration of the CONSUMER'S ownership of the original equipment (hereinafter "LIFETIME").

2. LIMITATIONS OF COVERAGE

This warranty extends only to the CONSUMER for damage resulting from defects in materials and workmanship, and does not include renewable components. It does not extend to damage caused by the CONSUMER'S neglect or abuse, or by accident, to damage caused by wind, hail, or abnormal weather conditions, or to damage caused by acts of God, civil insurrection, or extraordinary circumstances beyond the control of LE.

LE shall not be liable for any direct or indirect damage resulting from the use of the equipment, and in no event shall the extent of this warranty coverage exceed the purchase price of the equipment.

LE cannot know the characteristics of a CONSUMER'S water supply or the purpose for which one is purchasing LE equipment. Also, water qualities vary seasonally and over time. Therefore, LE assumes no liability for the determination of the proper equipment necessary to meet a CONSUMER'S requirements, nor does it authorize others to assume such obligations on its behalf.

This warranty excludes any equipment which was not manufactured by LE and installed by an authorized Maytag dealer or on which the date code has been removed or altered. Any tampering or attempted repair performed by anyone other than an authorized dealer, including the CONSUMER, voids this warranty.

3. MISCELLANEOUS

In order to be considered for validation, all claims for warranty coverage must be accompanied by a copy of the purchase agreement indicating the date of initial installation, and proof of the CONSUMER'S residency, such as a current real estate annual tax bill, utility bill, or credit card statement. LE reserves the right to inspect the LE equipment prior to honoring any warranty claim.

This warranty is only issued by LE, an authorized licensee of Maytag. The CONSUMER is hereby advised that Maytag is not the manufacturer of the equipment, and provides no additional or separate warranty whatsoever in connection with the equipment.

This warranty gives you specific legal rights, and you may have other rights which may vary from state to state. Any and all inquiries or claims under this warranty must be submitted in writing to The LeverEdge, Attn: Warranty Department, 1423 Gunn Highway, Odessa, FL 33556.

THE LEVEREDGE
1423 Gunn Highway
Odessa, FL 33556
Phone: (866) 910-8351
www.theleveredge.com

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NOTES

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Limited warranty provided by the manufacturer.

1423 Gunn Highway Odessa, FL 33556

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