



AUTOTROL 368

SERVICE MANUAL

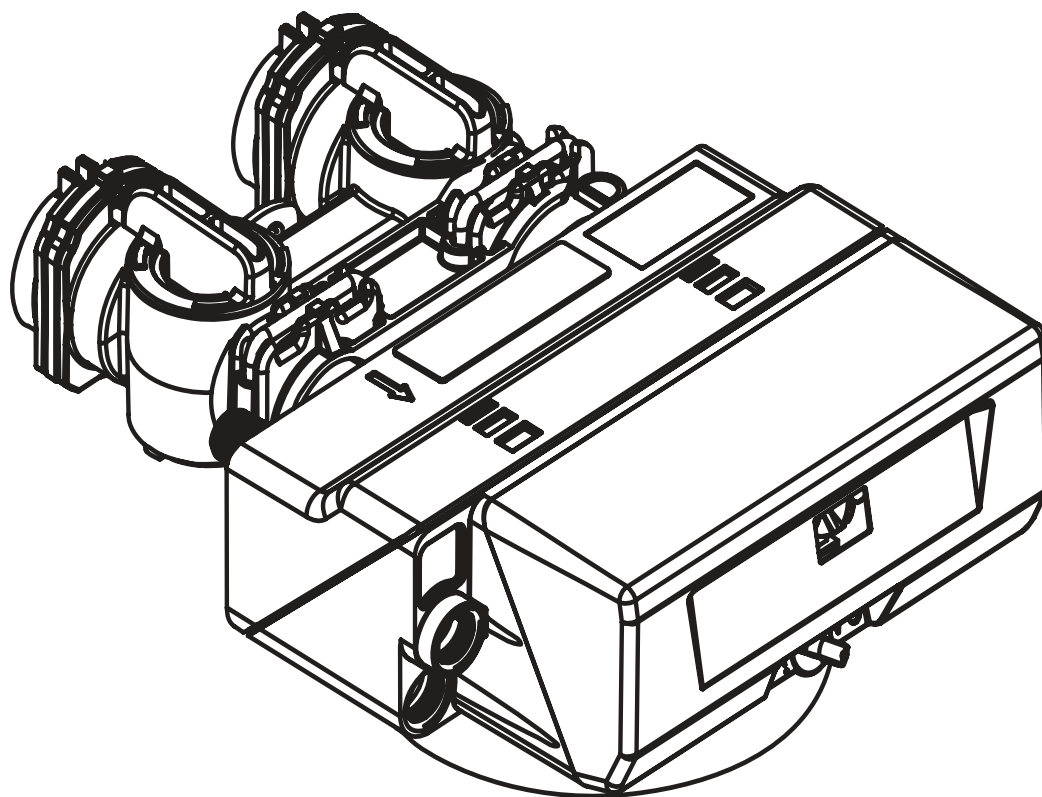


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MANUAL OVERVIEW

How To Use This Manual

This installation manual is designed to guide the installer through the process of installing and starting the softener.

This manual is a reference and will not include every system installation situation. The person installing this equipment should have:

- Knowledge in the water softener installation
- Basic plumbing skills

Icons That Appear In This Manual

▲ WARNING: Failure to follow this instruction can result in personal injury or damage to the equipment.

NOTE: This will make the process easier if followed.

Inspection

Inspect the unit for damage or missing parts.

SAFETY INFORMATION

- Review the entire Operation Manual before installing the water conditioning system.
- Follow all applicable plumbing and electrical codes when installing this water conditioning system.
- This water conditioning system is not intended for the treatment of water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.
- This water conditioning system is to be used only for potable water.
- Inspect the water conditioning system for carrier shortage or shipping damage before beginning installation.

California Proposition 65 Warning

▲ WARNING: This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

- Use caution when installing soldered metal piping near the water conditioning system. Heat can adversely affect the plastic control valve or bypass valve system. Be sure all soldered pipes are fully cooled before attaching plastic valve to the plumbing.
- All plastic connections should be hand tightened. Plumber's tape may be used on connections that do not use an O-ring seal. Do not use pipe dope type sealants on the valve body. Do not use pliers or pipe wrenches.
- Minimum pipe run to water heater of three meters to prevent backup of hot water into system.
- Do not use petroleum-based lubricants, oils or hydrocarbon-based lubricants. Use only 100% silicone lubricants.
- Use only the power transformer supplied with this water conditioning system.
- The power outlet must be grounded.
- Install an appropriate grounding strap across the inlet and outlet piping of the water conditioning system to ensure that a proper ground is maintained.
- To disconnect power, unplug the AC adapter from its power source.
- Observe drain line requirements. The drain line must be a minimum of 1/2-inch diameter. Use 3/4-inch pipe if the total length of the drain line exceeds 6 meters.
- Do not support the weight of the system on the control valve connections, or plumbing.
- Do not allow this water conditioning system to freeze. Damage from freezing will void this water conditioning system's warranty.
- Keep the media tank in the upright position. Do not turn upside down or drop. Turning the tank upside down or laying the tank on its side can cause media to enter the valve.
- Use only regenerants designed for water conditioning.

TYPICAL TOOLS AND FITTINGS REQUIRED

- Pipe Cutter
- Tubing Cutter
- File
- Pliers
- Tape Measure
- Soldering Tools
- Lead Free Solder
- Bucket
- Towel
- Plumbers Tape
- Adjustable Wrench
- Tube 100% Silicone Grease

EQUIPMENT INSTALLATION

General Warnings And Safety Information Electrical

There are no user-serviceable parts in the AC adapter, motor, or controller. In the event of a failure, these should be replaced.

- All electrical connections must be completed according to local codes.
- Use only the power AC adapter that is supplied. If the AC adapter is replaced, use a Class II, 12 volt, 150 mA supply.
- The power outlet must be grounded and always on.
- To disconnect power, unplug the AC adapter from its power source.
- Install an appropriate grounding strap across the inlet and outlet piping of the water system to ensure proper grounding is maintained.

Mechanical

- Do not use petroleum based lubricants such as petroleum jelly, oils, or hydrocarbon based lubricants. Use only 100% silicone lubricants.
- All plastic connections should be hand tightened. Plumber's tape should be used on connections that do not use an O-ring seal. Do not use pliers or pipe wrenches.
- All plumbing must be completed according to local codes.
- Soldering of the plumbing should be done before connecting to the valve. Excessive heat will cause interior damage to the valve.
- Observe drain line requirements.
- Do not use lead-based solder for sweat solder connections.
- The drain line must be a minimum of 1/2-inch diameter. Use 3/4-inch pipe 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 plumber's tape on all threads.

General

- Observe all warnings that appear in this manual.
- This system is not intended to be used for treating water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.
- Keep the unit in the upright position. Do not turn on side, upside down, or drop. Turning the tank upside down will cause media to enter the valve.
- Operating ambient temperature is between 34°F (1°C) and 120°F (49°C).
- Operating water temperature is between 35°F (1°F) and 100°F (38°C).
- Working water pressure range is 20 to 125 psi (1.38 to 8.61 bar). In Canada, the acceptable working water pressure range is 20 to 100 psi (1.38 to 6.89 bar).
- Use only salts designed for water softening. Acceptable salt type is sodium chloride pellet salt.
- Follow state and local codes for water testing. Do not use water that is micro-biologically unsafe or of unknown quality.
- When filling media tank, do not open water valve completely. Fill tank slowly to prevent media from exiting the tank.

- Always make modifications to house plumbing first. Connect to valve last.
- Plastic parts and O-rings may be damaged by heat and solvents. When constructing plumbing connections, allow heated parts to cool and protect parts from solvents.

System Recharge Cycles

Service (Downflow):

Untreated water is directed down through the resin bed and up through the riser tube. The hardness ions attach themselves to the resin and are removed from the water. The water is conditioned as it passes through the resin bed.

When a recharge cycle starts, the softener goes through seven cycles. During the recharge cycle, the softener will allow untreated water to bypass into the building.

1. Backwash 1 (Upflow):
The flow of water is reversed by the control valve and directed down the riser tube and up through the resin bed. During the backwash cycle, the bed is expanded and debris is flushed to the drain.
2. Brine Draw (Downflow):
The brine draw cycle takes place during the slow rinse cycle. The control directs water through the brine injector and brine is drawn from the salt tank. Brine draw is completed when the air check in the salt tank closes.
Slow Rinse (Downflow):
The brine is directed down through the resin bed and up through the riser tube to the drain. The hardness ions are displaced by sodium ions and are sent to the drain. The resin is recharged during the brine cycle.
3. Repressurize Cycle (Hard Water Bypass Flapper Open):
This cycle closes the flappers for a short time to allow the air and water to hydraulically balance in the valve before continuing the recharge.
4. Fast Rinse 1 (Downflow):
The control directs water down through the resin bed and up through the riser tube to the drain. Any remaining brine residual is rinsed from the resin bed.
5. Backwash 2 (Upflow):
The flow of water is reversed by the control valve and directed down the riser tube and up through the resin bed. During the backwash cycle, the bed is expanded and debris is flushed to the drain.
6. Fast Rinse 2 (Downflow):
The control directs water down through the resin bed and up through the riser tube to the drain. Any remaining brine residual is rinsed from the resin bed.
7. Brine Refill:
Water is directed to the salt tank at a controlled rate, to create brine for the next recharge.

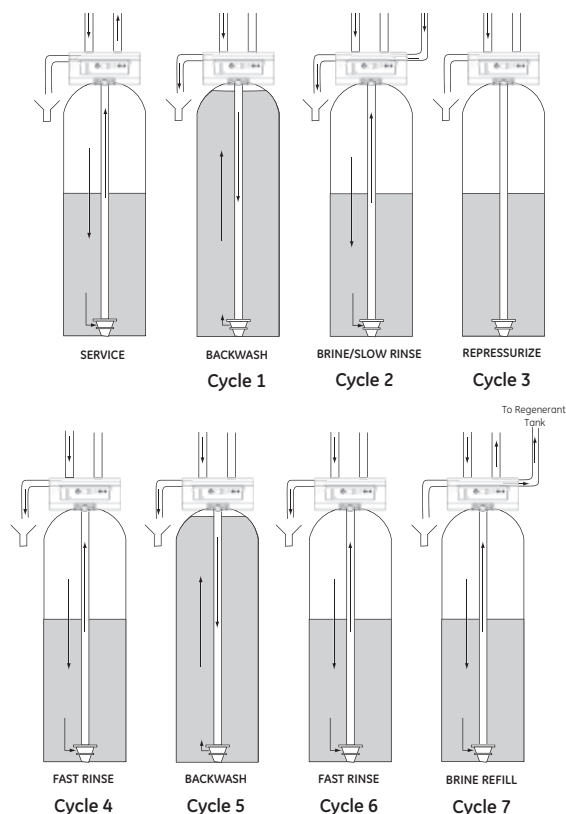


Figure 4 Flow Patterns

Location Selection

Location of a water treatment system is important. The following conditions are required:

- Level platform or floor.
- Ambient temperatures over 34°F (1°C) and below 120°F (49°C).
- Water pressure below 125 psi (8.61 bar) and above 20 psi (1.4 bar).
- In Canada, the water pressure must be below 100 psi (6.89 bar).
- Constant electrical supply to operate the controller.
- Total minimum pipe run to water heater of ten feet (three meters) to prevent backup of hot water into system.
- Local drain or tub for discharge as close as possible.
- 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.
- Be sure all soldered pipes are fully cooled before attaching plastic valve to the plumbing.
- Room to access equipment for maintenance and adding salt to tank.

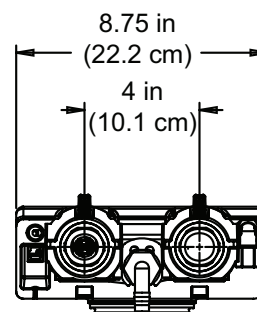


Figure 5

Outdoor Locations

It is recommended that the equipment be installed indoors. When the water conditioning system must be installed outdoors, several items must be considered.

- **Moisture** — The valve and controller are rated for NEMA 3 locations. Falling water should not affect performance. The system is not designed to withstand extreme humidity or water spray from below. Examples are: constant heavy mist, near corrosive environment, upwards spray from sprinkler.
- **Direct Sunlight** — The materials used will fade or discolor over time in direct sunlight. The integrity of the materials will not degrade to cause system failures.
- **Temperature** — Extreme hot or cold temperatures may cause damage to the valve or controller. Freezing temperatures will freeze the water in the valve. This will cause physical damage to the internal parts as well as the plumbing.
- **Insects** — The controller and valve have been designed to keep all but the smallest insects out of the critical areas.

Things You Need to Know

- When the controller is first plugged in, it may display an Err 3, this means that the controller is rotating the camshaft to the home position.
- The preset default time of recharge is 2:00 AM.
- Make sure control power source is plugged in. The transformer should be connected to a non-switched power source.
- Test your water. Take a 4-5 oz sample of your water to someone who can test for hardness. This information will be used to setup the control.

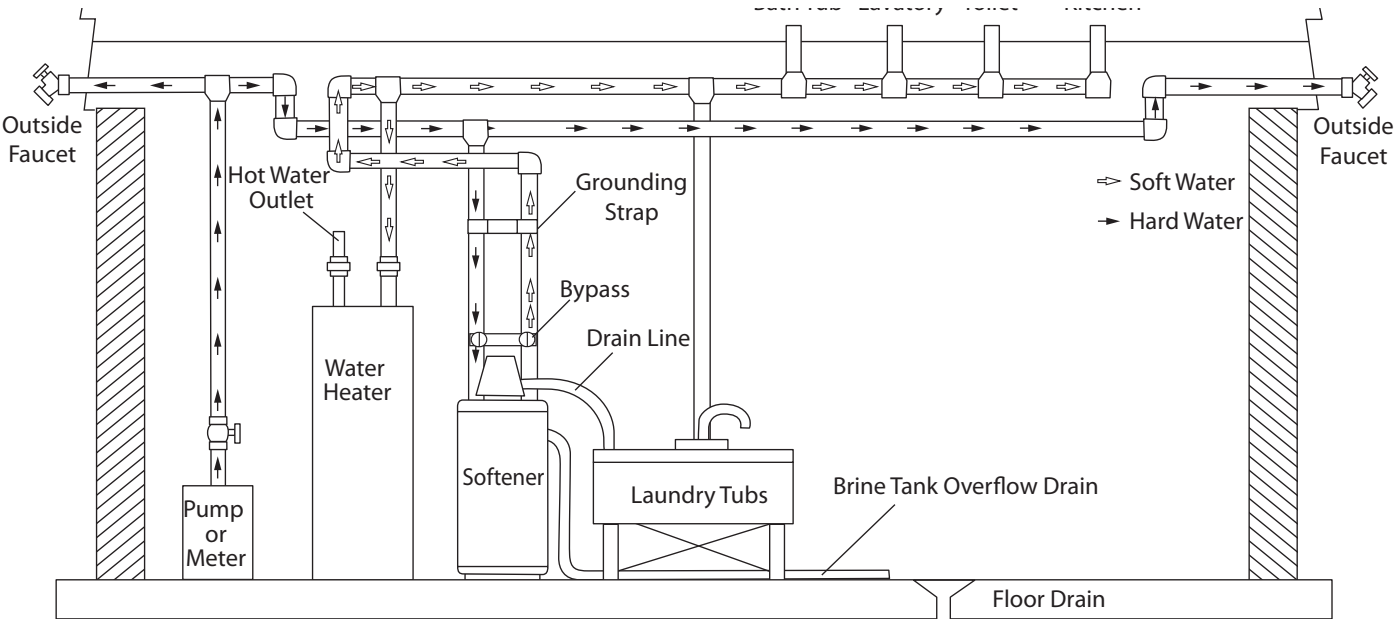


Figure 6 Softened Water Flow

EQUIPMENT INSTALLATION *continued*

Grounding the Plumbing

It is important that the plumbing system be electrically grounded. When a water softener is installed, a nonmetallic bypass valve may interrupt the grounding. To maintain continuity, a grounding strap can be purchased at a hardware store. When it is installed, the strap will connect the plumbing into the softener to the plumbing out of the softener.

If you have other water treating equipment such as; chlorinator, sediment filter, neutralizer, iron filter, or taste & odor filter, they should be installed upstream of the water softener.

You may wish to consult a water professional if additional water treating equipment is to be installed.

Valve Layout

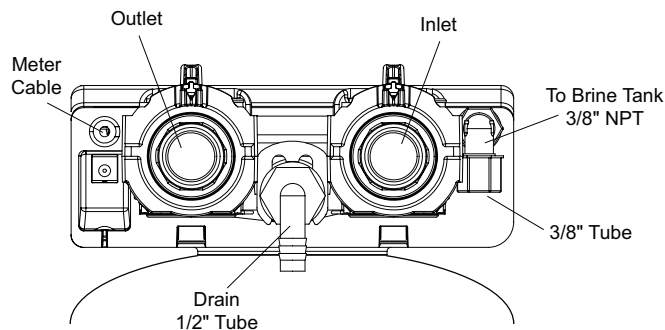


Figure 7

Drain Line Flow Control

The drain line flow control (DLFC) requires assembly (Figure 8).

1. Locate parts and a roll of plumber's tape. The plumbing adapters should be removed (Figure 10 Connector Assembly).
2. Wrap the tape over threads of the flow control.
3. Screw the flow control and the 90° elbow together. Hand tighten.
4. Place the ball into the flow control and insert the assembly into the drain line opening.
5. Push the assembly in and secure with the drain line clip.

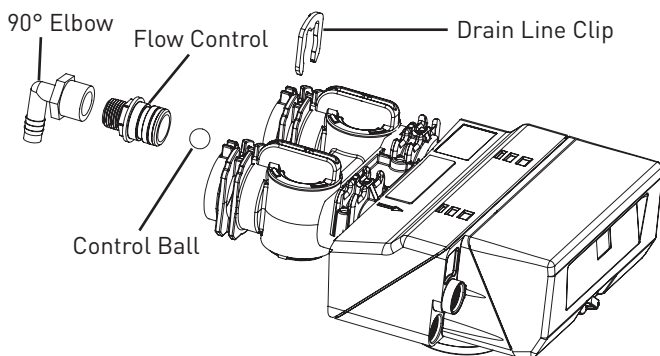


Figure 8

Water Line Connection

Once you have selected your location, check the direction of the water flow in the main pipe.

Inspect the main water pipe. Write down the type of pipe (copper, plastic, galvanized etc.). Record the size of the pipe. Plastic style pipes usually have the size printed on the outside. Other pipes can be measured for the outside diameter and converted into the pipe size at the store. Do not use pipe that is smaller than the main water pipe.

If the main plumbing is galvanized pipe and you are installing copper pipe, then you must use dielectric insulating connectors between the two styles of pipe.

⚠ WARNING: If pipes will be sweat soldered, do not connect adapters to the bypass until the pipes have cooled.

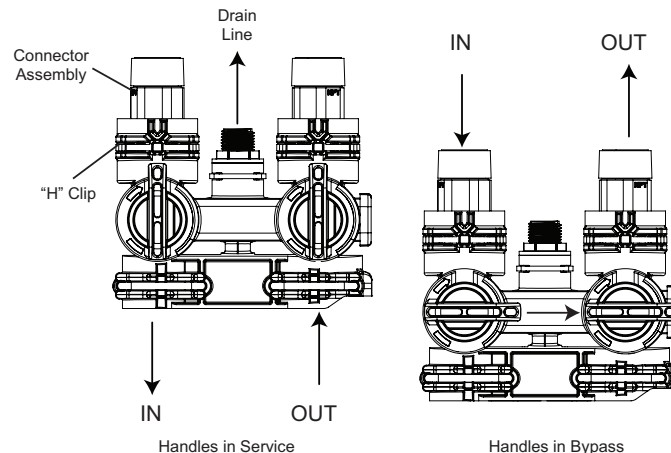


Figure 9 Bypass Operation

IMPORTANT: When the valve is in bypass, water will not enter the softening tank. The water in the building will not be treated. Figure 9 Bypass Operation, shows the handles in the service position.

⚠ WARNING: The inlet water must be connected to the inlet port of the valve. When replacing a water valve, it is possible that the inlet and outlet plumbing is installed in a reversed position. Be certain the inlet connection on the valve is connected to the incoming water fitting from the water supply. Do not solder pipes with lead-based solder.

⚠ WARNING: Do not use petroleum grease on gaskets when connecting bypass plumbing. Use only 100% silicone grease products when installing any plastic valve. Non-silicone grease may cause plastic components to fail over time.

The bypass assembly connects to the water system by means of a connector assembly. The connector is secured to the plumbing and then inserted into the bypass. A clip is used to hold it in place.

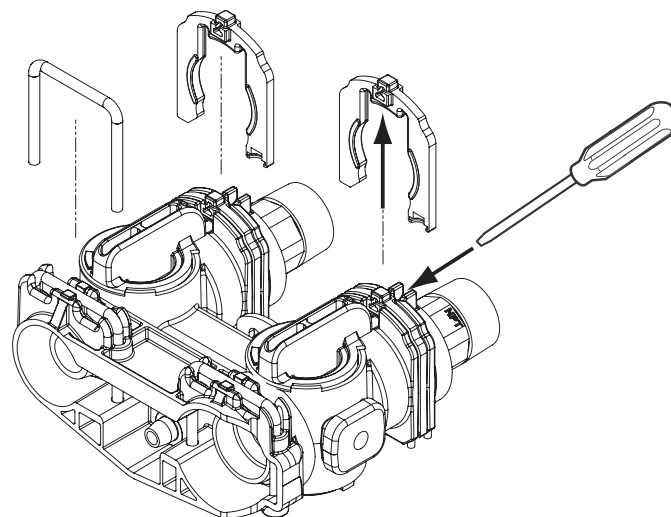


Figure 10 Connector Assembly

EQUIPMENT INSTALLATION *continued*

Before inserting the connector:

- Check that all O-rings are in place and not damaged.
- O-rings are pre-lubricated. Sliding surfaces should be lubricated with 100% silicone grease.

Firmly insert connector into bypass. Press locking clip into position. Make certain the clip is fully engaged.

NOTE: Before turning on the water to the valve, rotate the two handles on the bypass valve 2-3 times. This will help seat O-rings and prevent leaking.

To remove a clip:

1. Turn off water and release water pressure at the valve.
2. Push the water line connectors into the bypass and valve. This will help release O-rings that may have seated in place.
3. Remove the clip by inserting a flat blade under the top center of the clip and lifting (prying up) (Figure 10 Connector Assembly).

⚠ WARNING: Do not use pliers to remove a clip. It is likely the clip will break.

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 20 feet (6.1 m) from the drain. Use an appropriate adapter fitting to connect 1/2-inch (1.3 cm) plastic tubing to the drain line connection of the control valve.
2. If the unit is located 20-40 feet (6.1-12.2 m) from drain, use 3/4-inch (1.9 cm) tubing. Use appropriate fittings to connect the 3/4-inch tubing to the 3/4-inch NPT drain connection on valve.
3. The drain line may be elevated up to 6 feet (1.8 m) providing the run does not exceed 15 feet (4.6 m) and water pressure at the softener 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-inch (18-cm) loop at the far end of the line so that the bottom of the loop is level with the drain line connection. This will provide an adequate siphon trap.
Where the drain empties into an overhead sewer line, a sink-type trap must be used.

NOTE: The drain line connects to the elbow previously installed. It is located between the water line connections at the rear of the valve.

5. Use pliers to expand a clamp. Slide the clamp up one end of the longer length drain line tubing about 1-2 inches and release.
6. Push the tubing over the ribbed drain line fitting.
7. Expand the clamp and move it up the tube to pinch the tube to the fitting.
8. Secure the discharge end of the drain line to prevent it from moving.

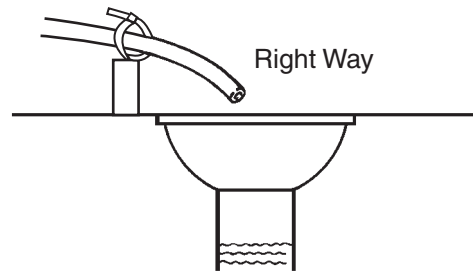


Figure 11 Drain Line Connection

NOTE: Waste connections or drain outlet shall be designed and constructed to provide for connection to the sanitary waste system through an air-gap of 2 pipe diameters or 1 inch (22 mm) whichever is larger.

⚠ WARNING: Never insert drain line directly into a drain, sewer line, or trap (Figure 11 Drain Line Connection). Always allow an air gap between the drain line and the wastewater to prevent the possibility of sewage being back-siphoned into the softener.

Overflow Line Connection

In the event of a malfunction, the salt TANK OVERFLOW will direct "overflow" to the drain instead of spilling on the floor. This fitting should be on the side of the cabinet.

To connect the overflow line, locate the tubing connector on the side of the tank (Figure 12 Tubing Connections). Attach length of 1/2-inch (1.3-cm) I.D. tubing to fitting and run to drain. Do not elevate overflow line higher than overflow fitting.

Do not tie into drain line of control unit. 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.

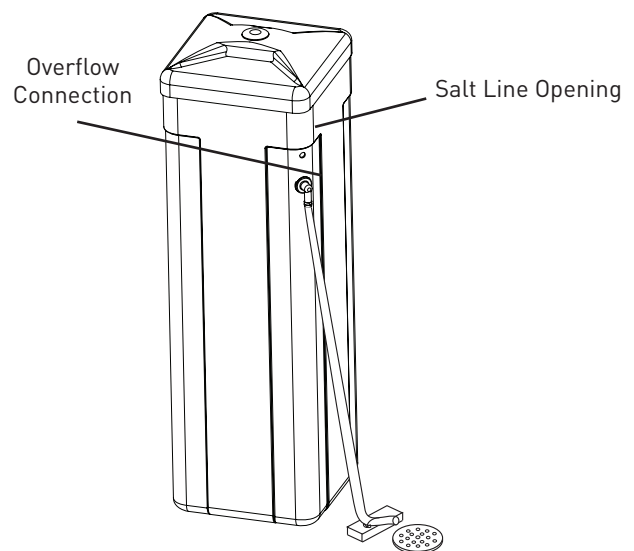


Figure 12 Tubing Connections

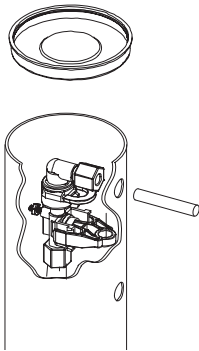
EQUIPMENT INSTALLATION *continued*

Salt Line Connection

The salt line from the brine tube connects to the valve. Make certain the connections are hand tightened. Be sure that the salt line is secure and free from air leaks. Even a small leak may cause the salt line to drain out, and the softener will not draw salt from the tank. This may also introduce air into the valve causing problems with valve operation.

To install the brine line:

1. Inside the salt tank, remove the cap from the large cylinder to gain access to the connection.
2. Be sure the brass insert is in the end of the brine tubing. Insert the tubing through the opening in the tank.
3. Push the tubing into the plastic nut. Slowly unscrew the nut until the tubing moves into the connection. The tubing will hit bottom.



NOTE: Once the tubing has been pushed into the nut, it cannot be pulled out. The nut will need to be removed. See Figure 13 for correct assembly.

4. Hand tighten the nut until the connection is tight.

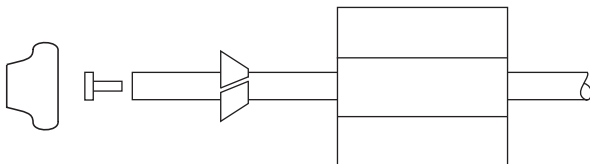


Figure 13

Electrical Connection

⚠ WARNING: This valve and control are for dry location use only, unless used with a Listed Class 2 power supply suitable for outdoor use.

The controller operates on 12-volt alternating current power supply. This requires use of the an AC adapter with your system.

Make sure power source matches the rating printed on the AC adapter.

NOTE: The power source should be constant. Be certain the AC adapter is not on a switched outlet. Power interruptions longer than 8 hours may cause the controller to lose the time setting. When power is restored, the time setting must then be re-entered.

CONTROL OPERATION & LAYOUT

Large LED Display

A large 2 digit LED readout is highly visible in most installations.

Simplified Three-Step Programming

Only three buttons are required to fully program the control.

Camshaft Indicator

A column of windows located on the left of the control provides a visual indicator of the camshaft rotation.

Manual Regen Button

The Manual Regen button, when pressed, initiates either a delayed regeneration or immediate regeneration.

Time Button

When pressed, will display the current hour of day for 5 seconds. Press again to increase the hour of day by 1. Press and hold to change rapidly.

Salt Button

Press to display the current setting (HE/HC) for 5 seconds. Press again during the 5 seconds to change the setting.

Hardness Button

Press to display the hardness setting for 5 seconds. Press again during the 5 seconds to increase the setting by 1 grain per gallon. Press and hold to change rapidly.

Flow Indicator

The decimal point/flow indicator blinks on and off when water flow turns the meter.

Power Loss Memory Retention

The control features battery-free Time of Day retention during loss of power. The Time will remain in memory.

NOTE: All other programmed parameters are stored in the flash memory and are retained during power outages. Flash memory retention is 100 years

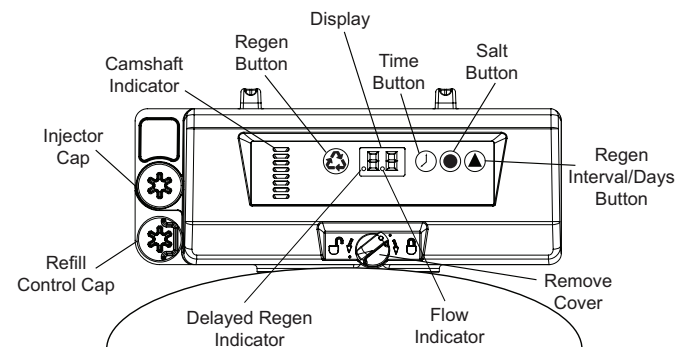


Figure 14

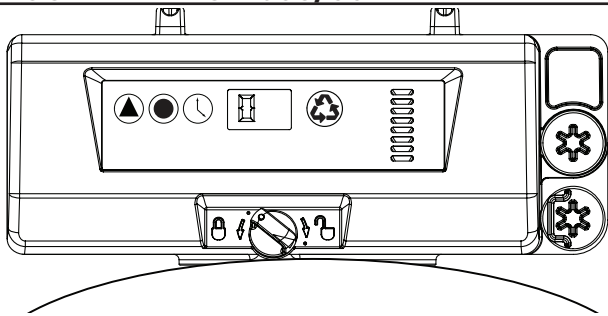


Figure 15

Time of Day: Press until desired hour appears. Release.

Range: 0 through 23 hours

NOTE: The elapsed minutes will reset to zero when the hours are changed.

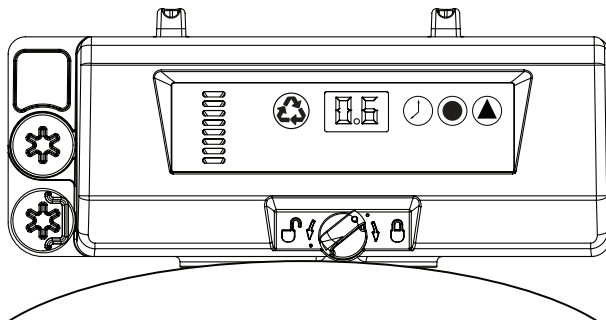


Figure 16

Regenerant Dosage: Press until desired regenerant dosage appears. Release.

Range: 0.5 lbs to 30 lbs

0.5 lbs to 5.0 lbs by increments of 0.5 lbs (10 increments)

6.0 lbs to 30 lbs by increments of 1.0 lbs (25 increments)

Default: 3.0 lbs

Range: 0.20 kg to 6.0 kg

0.20 kg to 1.0 kg by increments of 0.05 kg

1.0 kg to 3.0 kg by increments of 0.1 kg

3.0 kg to 60 kg by increments of 0.5 kg

Default: 0.6 kg

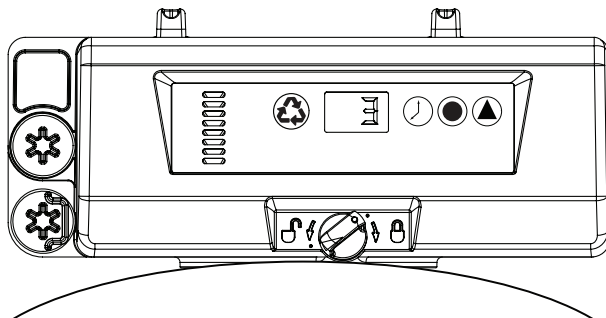


Figure 17

Regen Interval: Press until desired interval appears. Release.

Range: 0 through 30

0 = Disabled

0.3 = Regeneration every 8 hours: at 2, 10 and 18 hrs

0.5 = Regeneration every 12 hours: at 2 and 14 hrs

1-30 = Days: 2

Programming is complete.

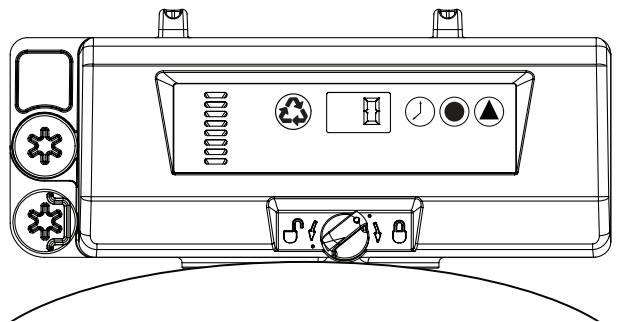


Figure 18

Time of Day: Press until desired hour appears. Release.

Range: 0 through 23 hours

NOTE: The elapsed minutes will reset to zero when the hours are changed.

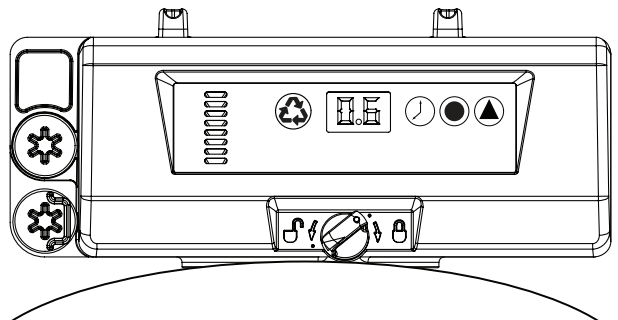


Figure 19

Regenerant Dosage: Press until desired regenerant dosage appears. Release.

Range: 0.5 lbs to 30 lbs

0.5 lbs to 5.0 lbs by increments of 0.5 lbs (10 increments)

6.0 lbs to 30 lbs by increments of 1.0 lbs (25 increments)

Default: 30 lbs

Range: 0.20 kg to 6.0 kg

0.20 kg to 1.0 kg by increments of 0.05 kg (16 increments)

1.0 kg to 3.0 kg by increments of 0.1 kg (20 increments)

3.0 kg to 60 kg by increments of 0.5 kg (6 increments)

Default: 0.6 kg

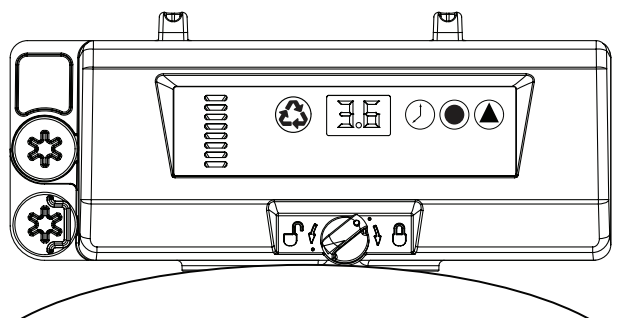


Figure 20

Regen Interval: Press until desired interval appears. Release. 1 (x100 gallon) to 40 (x100 gallon) by increments of 1 (x100 gallon) [40 steps]

Default: 10 (x100 gallon)

Range: 0.40 to 9.5 cubic meters

0.4 m³ to 1.0 m³ by increments of 0.05 m³ [12 increments]

1.0 m³ to 3.0 m³ by increments of 0.1 m³ [20 increments]

3.0 m³ to 5.0 m³ by increments of 0.2 m³ [10 increments]

5.0 m³ to 9.5 m³ by increments of 0.05 m³ [10 increments]

Programming is complete.

Calendar Override Setting

The model 606 demand control needs a method to set days between regeneration for regulatory requirements and for cases when the flow sensor has failed.

Enter by holding and for 3 seconds. The programmed calendar override is displayed. Press to increase value. Values the same as 604.

0 = no calendar override

0.3 = Regeneration every 8 hours

0.5 = Regeneration every 12 hours

1-30 days between regeneration

Default: 0

MANUAL REGENERATION

Delayed Regeneration

Press and release to program a delayed regeneration. The system will regenerate at the next Time of Regeneration (2:00 AM). Repeat procedure to disable the Delayed Regen. Regen dot blinks when delayed regeneration is on.

Immediate Regeneration

Press and hold the for 3 seconds to initiate an immediate regeneration. The control cycles to backwash. The control will proceed through a complete regeneration. A cascading symbol (- -) will be displayed until regeneration is complete. The symbol (- -) is not displayed during a quick cycling of the control.

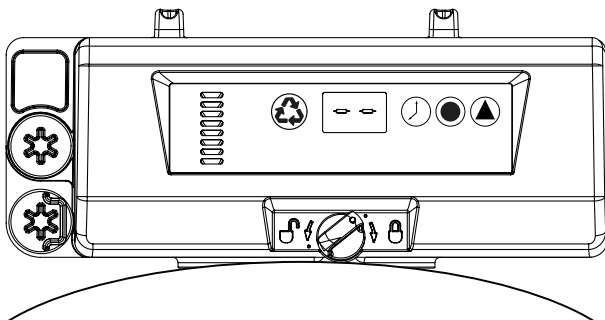


Figure 21

QUICK CYCLING THE CONTROL

Quick Cycling

Press and hold the for 3 seconds to initiate an immediate regeneration. The control will cycle to the backwash cycle.

1. Press and release the to display "C 1"
2. Simultaneously press then release and to move the control to the next cycle.

NOTE: The time may be displayed for 5 seconds.

3. Press and release the to display "- -" or the "C#". Continued pressing of will switch the display between "- -" and "C#".
4. Repeat steps 2 and 3 to cycle through each position.

Quick Cycle to Service Position

Simultaneously press and and hold for 3 seconds during any regeneration cycle. The control will skip the remaining regeneration cycles and return to the service position. The Time of Day will be displayed when the control reaches the service position.

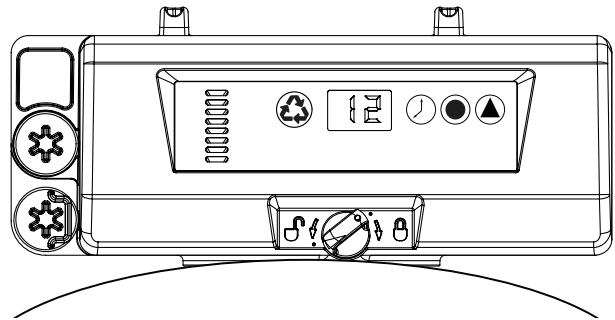


Figure 22

SYSTEM SELECTION AND RESET PROCEDURES

The 604 and 606 controls have four system settings available. The system selections accommodate multiple tank sizes and various feedwater water conditions. Please contact your installer before changing system settings.

System Selection:

1. Press and hold the and buttons simultaneously for 3 seconds.
2. A small "u" will be displayed in the left digit. The right digit will display the current system setting.
3. Press the button to scroll through the system settings. Release the button when the desired system setting is displayed.
4. The displayed system setting will be stored in Flash memory when the control exits programming after 5 seconds.

System Selection Reset:

All programmed settings with the exception of Time of Day can be reset. Entering the value "0" will reset the flash memory to the factory default.

1. Press and hold the and buttons simultaneously for 3 seconds.
2. A small "u" will be displayed in the left digit. The right digit will display the current system setting.
3. Press the button and scroll the display to the "u 0" display.

SYSTEM SELECTION AND RESET

PROCEDURES *continued*

- Wait 5 seconds for the setting to be stored into flash memory. The display will revert to the Time of Day setting. The control has now defaulted to System 1 setting.
- Follow steps 1-4 of the System Selection procedure to select the desired system setting.

Programmed Settings

C#	Cycle	Resin Bed Flow Direction	System u1 (min)	System u2 (min)	System u3 (min)	System u4 (min)
C1	Backwash	↑	8	8	1	3
C2	Brine Draw	↓	Calculated	Calculated	Calculated	Calculated
	Slow Rinse		25	45	25	45
C3	Repressurize	None	3	3	3	3
C4	Fast Rinse	↓	3	3	1	3
C5	2nd Backwash	↑	1	1	1	1
	2nd Fast Rinse	↓	1	1	1	1
C7	Brine Refill	None	Calculated	Calculated	Calculated	Calculated

ACCESSING HISTORY VALUES

The control features a review level that displays the operation history of the system. This is a great troubleshooting tool for the control valve.

To access history values, press Recharge (⌂) followed by the Salt Amount button (●) and hold for 3 seconds to view the Diagnostic Codes.

NOTE: If a button is not pushed for 30 seconds, the controller will exit the history table.

Press the Time of Day button (⌚) to increment through the table. When the desired code is reached, Press the Salt Amount button (●) to display the value.

Some of the values have four digits 1, 2, 3, 4. Press the Salt Amount button (●) to display the first two (1, 2). Press the Water Hardness button (▲) to display the last two (3, 4).

When the Salt Amount button (●) is pressed to view H2 the current flow rate will be displayed but not updated. Continue to press and release the Salt Amount button (●) every 5 seconds to update the display. The flow dot on the display will flash when there is flow thru the softener.

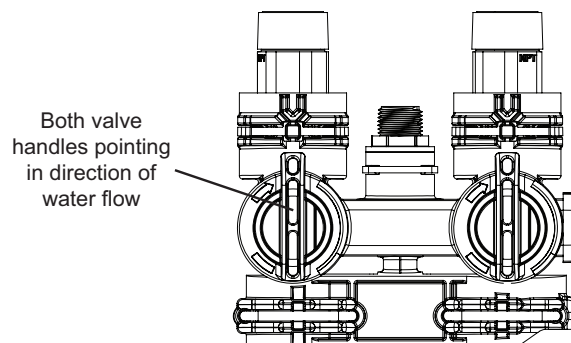
Code	Description	Notes
H1	Days since last recharge	Days since last recharge
H2	Current flow rate	Gallons per minute
H3	Current day of week	Current day of week
H4	Water used today since 0200	In gallons, max value displayed 9999 max value stored 65,535.
H5	Water used since last recharge	
A0	Average water usage for day 0	
A1	Average water usage for day 1	
A2	Average water usage for day 2	
A3	Average water usage for day 3	
A4	Average water usage for day 4	
A5	Average water usage for day 5	
A6	Average water usage for day 6	

START-UP

The conditioner will now need to be placed into operation. Please review Quick Cycling the Control procedure before attempting start-up.

DO NOT put regenerant material into the brine tank.

- With the supply water for the system still turned off, position the bypass valve to the "not in bypass" (normal operation) position.



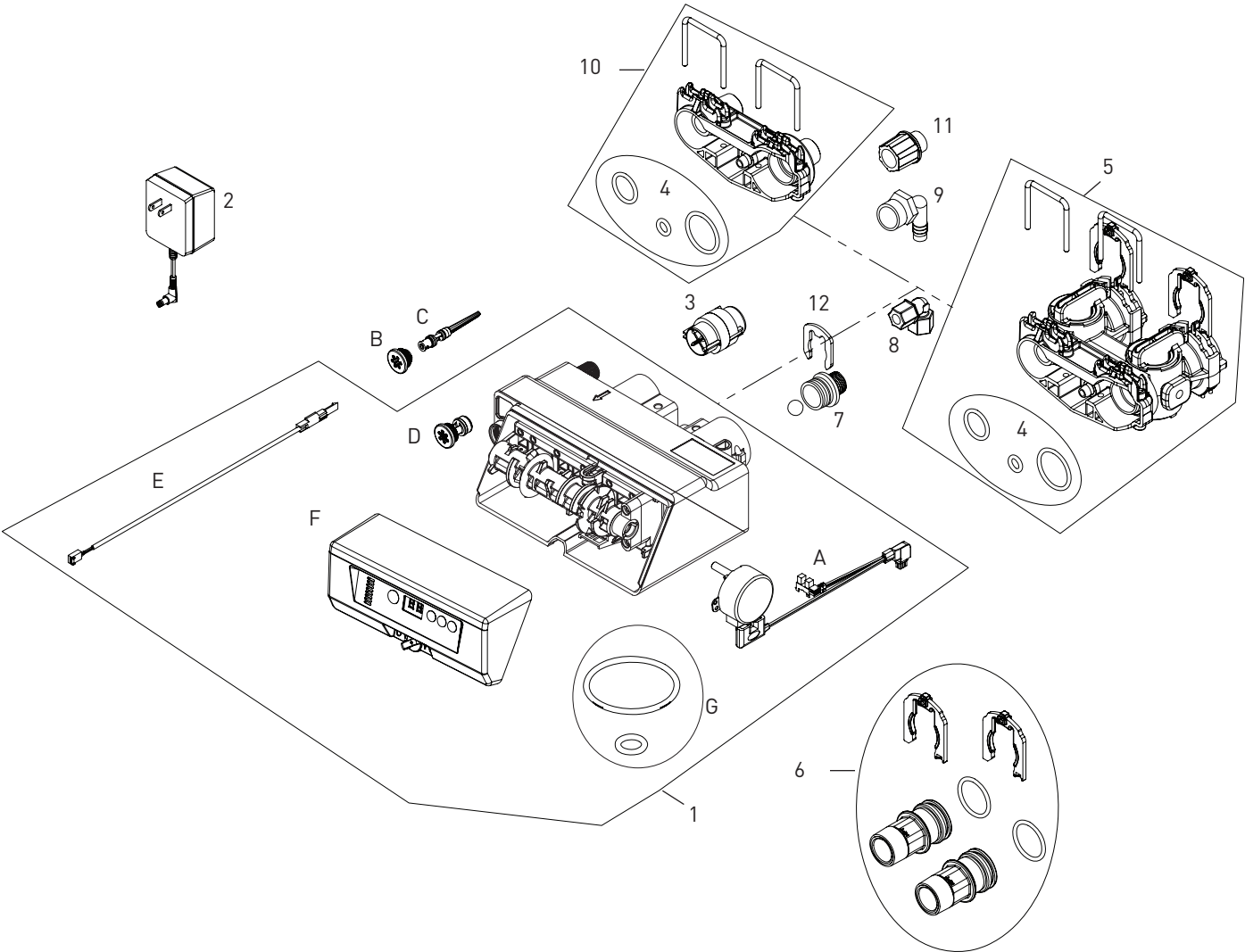
- Press and hold the (⌂) button on the controller for 3 seconds. This will initiate a manual regeneration, and cycle to the backwash position.
- Filling the media tank with water.
 - With the conditioner in backwash, open the water supply valve very slowly to approximately the 1/4 open position. Water will begin to enter the media tank. Air will begin to be purged to drain as the media tank fills with water.
- When all of the air has been purged from the media tank (water begins to flow steadily from the drain line), open the main supply valve all of the way. This will purge the final air from the tank.
- Allow water to run to drain until the water runs clear from the drain line. This purges any debris from the media bed.
- Pour water into the brine tank. Advance to cycle 2 (Brine Draw) by pressing the (⌂) and (⌚) buttons at the same time. The water in the brine tank should be drawn into the valve. If the water is not receding from the tank, refer to Troubleshooting.
- Quickly cycle the control to the refill cycle (C7). Place salt in brine tank. Allow this cycle to finish and the control to move to service. The brine tank will have the correct amount of water.

WARNING: Ensure that the system has been properly disinfected per the water conditioning system manufacturer's recommendations.

The water conditioning system is now fully operational.

The display will show the hour of the day. The decimal point at bottom center of the display will blink when water is flowing.

VALVE ASSEMBLY - 368



VALVE ASSEMBLY - 368 *continued*

Item No.	QTY	Part No.	Description	Item No.	QTY	Part No.	Description
1	1		Valve Body Assembly	6	1		Kit, Bypass Connectors (2 connectors)
		4001890	Kit, Service, Valve 368-604, .14, WD			4001606	Kit, 3/4" BSP Connectors
		4001891	Kit, Service, Valve 368-606, .14, WD			4001605	Kit, 3/4" NPT Connectors
		4001892	Kit, Service, Valve 368-604B, .33, WD			4000888	Kit, 1" NPT Connectors
		4001893	Kit, Service, Valve 368-606B, .33, WD			4001604	Kit, 1" BSP Connectors
		4001894	Kit, Service, Valve 368-604, .14, NA	7	1		Kit, Drain Line Flow Control Bypass - 368
		4001895	Kit, Service, Valve 368-606, .14, NA			4001297	#6 EXT DLFC - Bypass - BSP
		4001896	Kit, Service, Valve 368-604B, .33, NA			4001298	#7 EXT DLFC - Bypass - BSP
		4001897	Kit, Service, Valve 368-606B, .33, NA			4001299	#8 EXT DLFC - Bypass - BSP
A	1	4001260	12 Volt Motor/Optical Sensor Cable Assembly			4001300	#9 EXT DLFC - Bypass - BSP
B	1	1000269	Injector Cap Assembly			4001545	#10 EXT DLFC - Bypass - BSP
C	1		Injector/Screen Assemblies			4001284	#6 EXT DLFC - Bypass - NPT
		3025326	E Injector 6" Tank - Yellow			4001285	#7 EXT DLFC - Bypass - NPT
		3025327	F Injector 7" Tank - Peach			4001028	#8 EXT DLFC - Bypass - NPT
		3025328	G Injector 8" Tank - Tan			4001286	#9 EXT DLFC - Bypass - NPT
		3025329	H Injector 9" Tank - Lt Purple			4000887	#10 EXT DLFC - Bypass - NPT
		4000880	J Injector 10" Tank - Lt Blue	8	1	4000871	Elbow 36X Valves, 3/8 tube x 3/8 NPT (only used with bypass)
D	1		Refill Flow Control Assemblies	9	1	4000996	Drainline 90° 1/2 NPT x 1/2 Hose Barb
		1000221	Ass'y Refill Cont - 0.14 gpm	10	1		Manifold Assembly - 368
		1243510	Ass'y Refill Cont - 0.33 gpm (Required with 1030502)			3031927	3/4" BSP Adapter - Gray
		1030502	Ball, Brine-Backwash, 0.557" Dia. Required with 1243510)			4000968	3/4" NPT Manifold/Adapter
E	1	3027837	Meter Cable			4000970	3/4" BSP Adapter - Black
F	1		Valve Controller Assembly - 368			4000969	3/4" NPT Adapter - Black
		4001617	368/604B Control - NA 0.33 gpm	11	1		Kit, Drain Line Flow Control Manifold - 368 (only used with manifold)
		4001741	368/604B Control - World 0.33 gpm			3031526	#6 EXT DLFC - Manifold - BSP
		4001618	368/606B Control - NA 0.33 gpm			3031527	#7 EXT DLFC - Manifold - BSP
		4001742	368/606B Control - World 0.33 gpm			3031528	#8 EXT DLFC - Manifold - BSP
		4001739	368/604 Control - NA 0.14 gpm			3031529	#9 EXT DLFC - Manifold - BSP
		4001737	368/604 Control - World 0.14 gpm			4001303	#6 EXT DLFC - Manifold - NPT
		4001740	368/606 Control - NA 0.14 gpm			4001307	#7 EXT DLFC - Manifold - NPT
		4001738	368/606 Control - World 0.14 gpm			4001310	#8 EXT DLFC - Manifold - NPT
G	1	4001889	Valve O-ring Kit			4001313	#9 EXT DLFC - Manifold - NPT
2	1		AC Wall Mound Adapters	12		4000390	Bypass Clip DLFC, 360 Valve
		1000812	Australian Wall Trans - 240V				
		1000813	British Wall Trans - 240 V				
		3031517	China Wall Trans - 240V				
		1262524	Europe Cord Connect Trans - 240V				
		1000814	Europe WallTrans - 240V				
		1000810	Japan Wall Trans - 100V				
		1000811	N. Amer Wall Trans - 120V				
		44193	N. Amer WallTrans - 230V				
		3019151	N. Amer WallTrans - 120V E EFF				
		1235448	N. Amer Outdoor Trans - 120V				
3	1	3027839	Meter Assembly				
4	1	3031825	Kit, O-ring Manifold				
5	1	4000886	368 Bypass				

TROUBLESHOOTING

604-606 Control - Error Codes

Problem	Possible Cause	Solution
Err 1 is displayed.	Program settings have been corrupted.	Press any key. If Err 1 does not clear, replace control.
Err 3 is displayed.	Control does not detect the camshaft position and is returning to the service position.	Wait until the control returns to the service position.
	Camshaft is not turning during Err 3 display.	Check that motor is connected. Verify that the motor wire harness is connected to motor and controller module. Verify that optical sensor is connected and in place. Verify that motor gear has engaged the camshaft. If everything is connected, replace components in this order: 1. Motor Assembly, Optical Sensor 2. Control
	Camshaft is turning more than five minutes to find Home position:	Verify that optical sensor is in place and connected to wire. Inspect for debris in the camshaft slots. If motor continues to rotate indefinitely, replace the following components in this order: 1. Motor Assembly, Optical Sensor 2. Control

System

Problem	Possible Cause	Solution
Salt tank overflow.	Loose salt line connection.	Ensure all salt line connections are tight.
	Drain line restricted with debris.	Clean drain control.
Flowing or dripping water at drain or salt line after recharge.	Debris is preventing #3 or #4 valve disc from closing.	Remove debris.
	Worn #3 or #4 valve disc.	Replace valve discs.
Hard water leakage after recharge.	Improper recharge.	Repeat recharge after making certain correct salt dosage was set.
	Leaking of external bypass valve.	Replace bypass valve.
	O-Ring around riser pipe damaged.	Replace O-ring.
Control will not draw salt.	Restricted drain line.	Remove restriction.
	Injector plugged.	Clean injector and screen.
	Debris is preventing valve discs from closing.	Remove foreign matter from valve discs.
Control will not recharge automatically.	AC adapter or motor not connected.	Connect power.
	Defective motor.	Replace motor.
	Meter clogged with debris.	Remove and clean meter.
Control recharges at wrong time of day.	Time of Day set incorrectly.	Set the correct Time of Day.
Intermittent salt draw.	Low water pressure.	Maintain a minimum of 20 psi (1.3 bar) feed.
No conditioned water after recharge.	No salt in salt tank.	Add salt to salt tank.
	Injector plugged.	Clean injector and screen.
Backwashes or purges at excessively low or high rate.	No drain line flow control.	Install drain line flow control.
	Restricted drain line.	Remove restriction.
Runs out of conditioned water between recharges.	Control improperly programmed.	Verify salt dosage.
Flow indicator on control does not display service flow.	Bypass valve in bypass position.	Remove bypass valve from bypass.
	Meter cable dislodged from valve.	Fully insert meter cable into valve.
	Meter clogged with debris.	Remove and clean meter.

SERVICE ASSEMBLIES

Valve Body Assemblies:

4001890	Kit, Service, Valve 368-604, .14, World
4001891	Kit, Service, Valve 368-606, .14, World
4001892	Kit, Service, Valve 368-604B, .33, World
4001893	Kit, Service, Valve 368-606B, .33, World
4001894	Kit, Service, Valve 368-604, .14, N. America
4001895	Kit, Service, Valve 368-606, .14, N. America
4001896	Kit, Service, Valve 368-604B, .33, N. America
4001897	Kit, Service, Valve 368-606B, .33, N. America
4001889	Valve O-ring Kit

Controllers:

4001617	368/604B Control - North America 0.33 gpm
4001618	368/606B Control - North America 0.33 gpm
4001739	368/604 Control - North America 0.14 gpm
4001740	368/606 Control - North America 0.14 gpm
4001741	368/604B Control - World 0.33 gpm
4001742	368/606B Control - World 0.33 gpm
4001737	368/604 Control - World 0.14 gpm
4001738	368/606 Control - World 0.14 gpm

Motors:

4001260	12 Volt Motor/Optical Sensor/Cable Assembly
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Injectors:

1000269	Injector, Cap Assembly
3025326	E Injector 6" Tank - Yellow
3025327	F Injector 7" Tank - Peach
3025328	G Injector 8" Tank - Tan
3025329	H Injector 9" Tank - Lt Purple
4000880	J Injector 10" Tank - Lt Blue
1000221	Ass'y Refill Cont - 0.14 gpm (Required with 1030502)
1030502	Ass'y Refill Cont - 0.33 gpm (Required with 1243510)

Meters:

3027837	Meter Cable
3027839	Meter Assembly

Bypass/Manifold:

4000886	368 Bypass
3031927	3/4" BSP Adapter - Gray
4000968	3/4" NPT Manifold/Adapter
4000970	3/4" BSP Adapter - Black
4000969	3/4" NPT Adapter - Black
3031825	Kit, O-ring Manifold
3027832	Bar, Locking, SS, 360 Series
40576-01	Clip, H, Plastic

DLFC:

4001297	#6 EXT DLFC - Bypass - BSP
4001298	#7 EXT DLFC - Bypass - BSP
4001299	#8 EXT DLFC - Bypass - BSP
4001300	#9 EXT DLFC - Bypass - BSP
4001545	#10 EXT DLFC - Bypass - BSP
4001284	#6 EXT DLFC - Bypass - NPT
4001285	#7 EXT DLFC - Bypass - NPT
4001028	#8 EXT DLFC - Bypass - NPT
4001286	#9 EXT DLFC - Bypass - NPT
4000887	#10 EXT DLFC - Bypass - NPT
3031526	#6 EXT DLFC - Manifold - BSP
3031527	#7 EXT DLFC - Manifold - BSP
3031528	#8 EXT DLFC - Manifold - BSP
3031529	#9 EXT DLFC - Manifold - BSP
4001303	#6 EXT DLFC - Manifold - NPT
4001307	#7 EXT DLFC - Manifold - NPT
4001310	#8 EXT DLFC - Manifold - NPT
4001313	#9 EXT DLFC - Manifold - NPT
4000390	Bypass Clip, DLFC, 360 Valve

Fittings/Connectors:

4000871	Elbow 36X Valves, 3/8 Tube x 3/8 NPT (Only used w/Bypass)
4000996	Drainline 90°, 1/2 NPT x 1/2 Hose Barb
4001606	Kit, 3/4" BSP Connectors
4001605	Kit, 3/4" NPT Connectors
4000888	Kit, 1" NPT Connectors
4001604	Kit, 1" BSP Connectors

Power:

1000812	Australian Wall Trans - 240V
1000813	British Wall Trans - 240V
3031517	China Wall Trans - 240V
1262524	Europe Cord Connect Trans 240V
1000814	Europe Wall Trans - 240V
1000810	Japan Wall Trans - 100V
1000811	N. Amer Wall Trans - 120V
44193	N. Amer Wall Trans - 230V
3019151	N. Amer Wall Trans - 120V E EFF
1235448	N. Amer Outdoor Trans - 120V

VALVE DIMENSIONS- 368

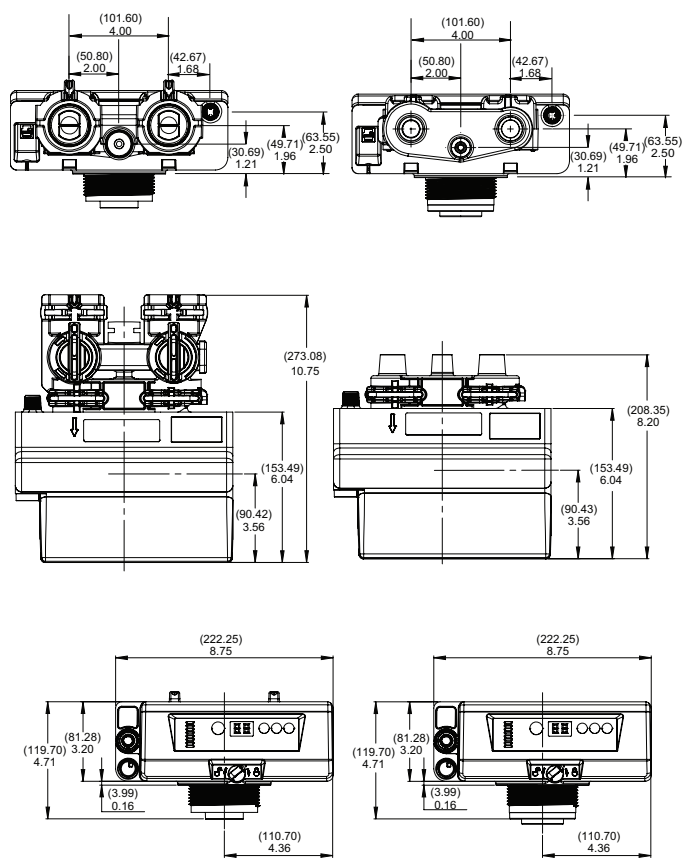


Figure 1

VALVE LAYOUT - 368

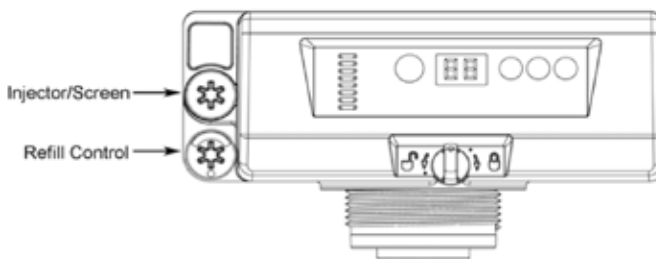


Figure 2

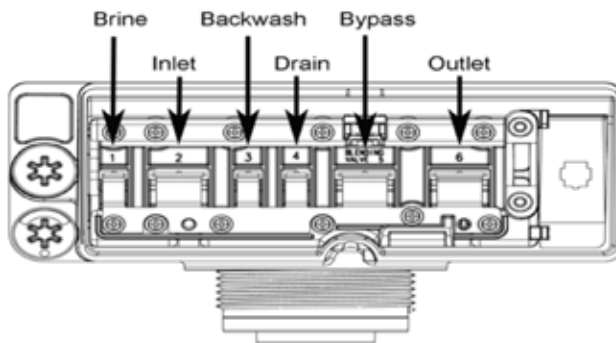
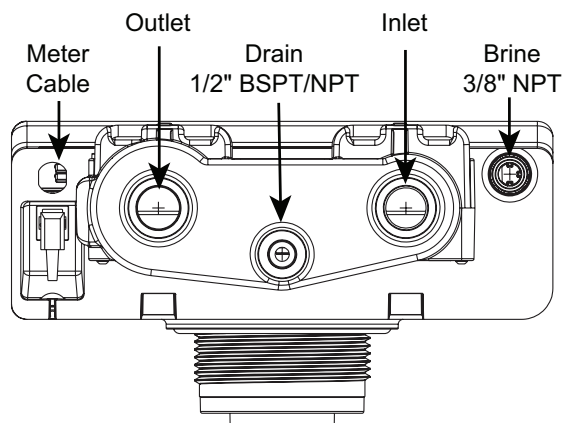


Figure 3

PERFORMANCE SPECIFICATIONS

Flow Rates (Valve Only)

Service @ 15 psi (1.03 bar drop)	16.6 gpm (4.3 Cv) / 3.77 m ³ /h (3.68kV)
Backwash @ 25 psi (1.72 bar drop)	2.75 gpm (.55 Cv) / 0.62 m ³ /h (.48kV)
Service	3.68 Kv
Backwash	0.48 Kv

Valve Connections

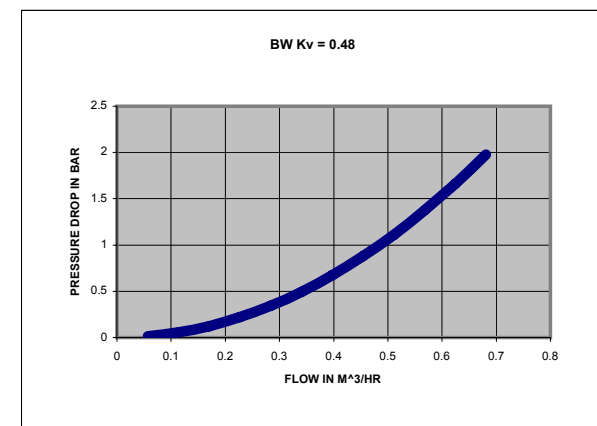
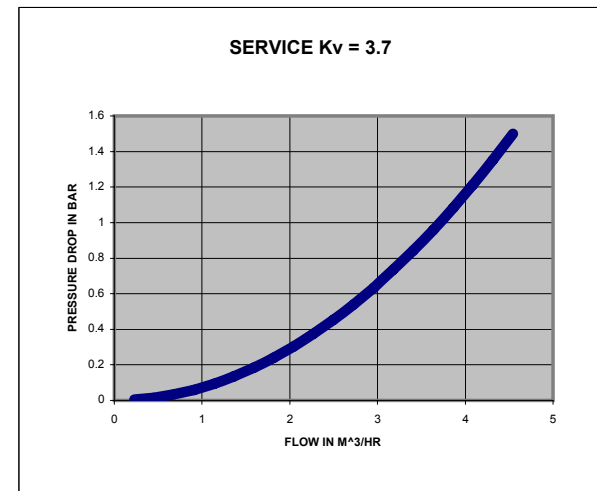
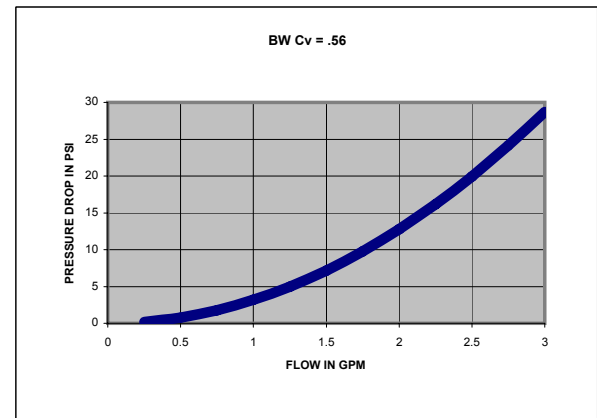
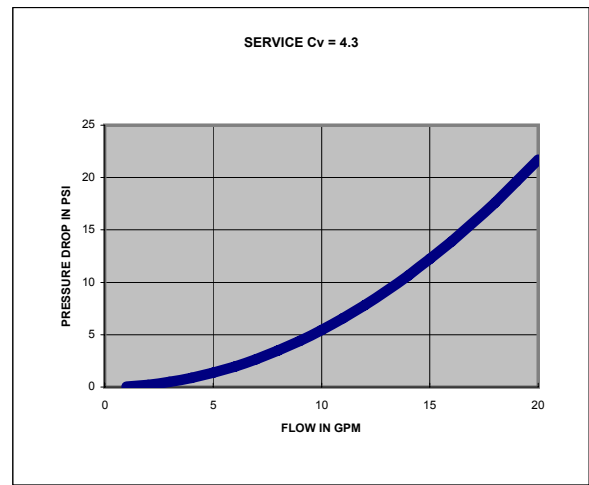
Tank Thread	2-1/2-inches – 8, male
Inlet/Outlet Thread	3/4" BSPT, male, 3/4" NPT, male, 1" BSPT, male, 1" NPT, male
Drain Line	1/2" – BSPT, male, 1/2" – NPT, male
Brine Line	3/8" – BSPT male, 3/8" – NPT, male
Distributor Tube Diameter	1.050 inch (27 mm)
Distributor Tube Length	Flush to top of tank ± 1/2-inch

Design Specifications

Valve Body	Glass-filled Noryl*
Rubber Components	Compounded for cold water
Operating Pressure	20-125 psi (1.38 – 8.61 bar)
Water Temperature	35-100°F (2 – 38°C)
Ambient Temperature	35-122°F (2 – 50°C)
Refill Flow Rate	0.14 gpm (0.53 Lpm)/0.33 gpm (1.25 Lpm)

Options/Accessories (6" to 10" diameter tanks)

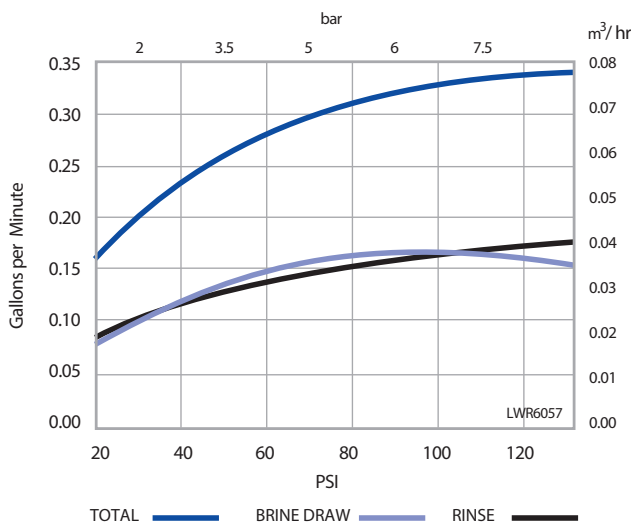
Regenerant Injectors	E, F, G, H, and J
External Drain Line Flow Controls	1.0, 1.3, 1.7, 2.2 gpm (3.8, 4.9, 6.4, 8.3 Lpm)



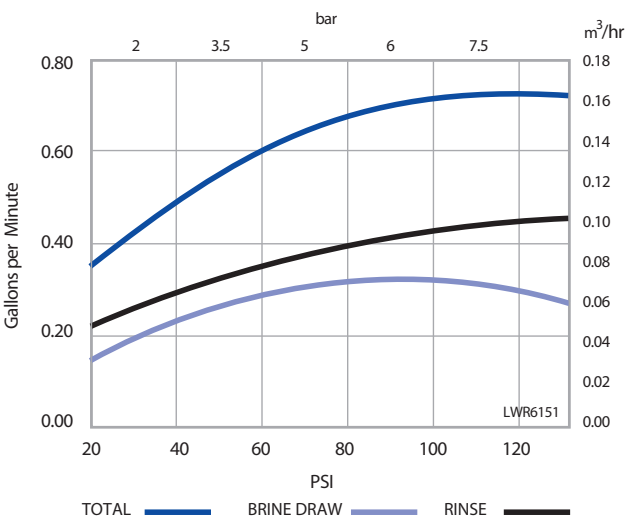
FLOW DATA CHARTS

Injector Performance Graphs

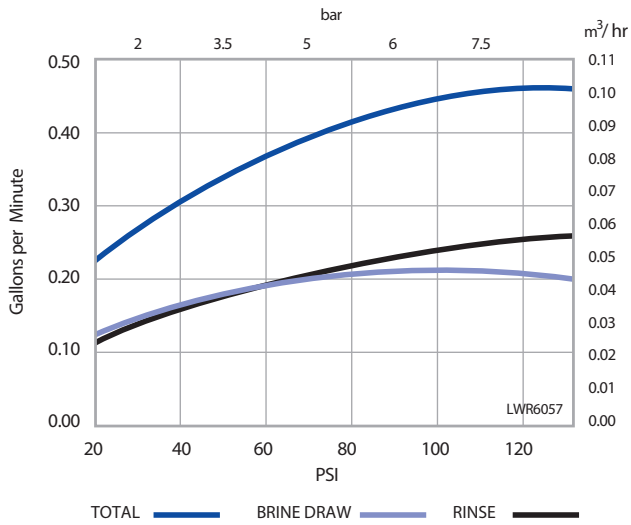
Injector "F" (Peach)
For 7-inch Tanks



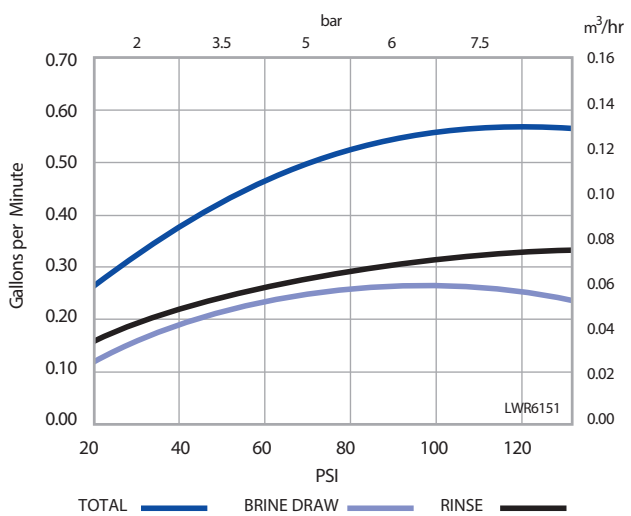
Injector "J" (Light Blue)
For 10-inch Tanks



Injector "G" (Tan)
For 8-inch Tanks



Injector "H" (Light Purple)
For 9-inch Tanks



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