

PRF 368 Valve

Installation and Operation 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.

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.

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

Adjustable Wrench Tube 100% Silicone Grease

VALVE DIMENSIONS- 368



SPECIFICATIONS

Flow Rates (Valve Only)

Service @ 15 psi (1	.03 bar drop)
	16.6 gpm (4.3 Cv) / 3.77 m³/h (3.68kV)
Backwash @ 25 ps	i (1.72 bar drop)
	2.75 gpm (.55 Cv) / 0.62 m³/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 Diamete	r 1.050 inch (27 mm)
Distributor Tube Length	Flush to top of tank \pm 1/2-inch

Design Specif cations

Rubber Components	Compounded for cold water
Operating Pressure	20-125 psi (1.38 – 8.61 bar)
Water Temperature	35-100°F (2 - 38°C)

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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	4.9, 6.4, 8.3 Lpm)









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 vaseline, oils, or hydrocarbon based lubricants. Use only 100% silicone lubricants.

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

It is not recommended to use sealants on the 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 $35^{\circ}F$ (1°F) and $100^{\circ}F$ (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.

completely. Fill tank slowly to prevent media from exiting the tank.

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

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.

directed down the riser tube and up through the resin bed. During the backwash cycle, the bed is expanded and debris

2.

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.

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):

air and water to hydraulically balance in the valve before continuing the recharge.

4.

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.

directed down the riser tube and up through the resin bed. During the backwash cycle, the bed is expanded and debris

6.

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.

Water is directed to the salt tank at a controlled rate, to create brine for the next recharge.



EQUIPMENT INSTALLATION continued



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,

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



Drain Line Flow Control

(Figure 8).

1.

adapters should be removed (Figure 10 Connector Assembly).

- 2.
- 3.

tighten.

4.

into the drain line opening.

5. Push the assembly in and secure with the drain line clip.

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.



EQUIPMENT INSTALLATION continued

Overfow Line Connection

In the event of a malfunction, the salt TANK OVERFLOW will

side of the tank (Figure 12 Tubing Connections). Attach length

Allow an air gap as per drain line instructions.



Figure 12 Tubing Connections

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.

CONTROL OPERATION & LAYOUT

arge LED Display

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

Simplifed Three-Step Programming

 ϕ r y three but ons 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 rptation.

Manual Regen Button

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

Time Button

Wren 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.

Sat 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 gran per galon. Press and hold to change rapidly.

Flow Indicator

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 fash memory and are retained during power outages. Flash memory retermor is 100 years

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QUICK CYCLING THE CONTROL

Quick Cycling

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

1. Press and release the C

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.

1. With the supply water for the system still turned off, position

position.







VALVE ASSEMBLY - 368 continued

ltem	No.	QTY	Part No.	Description
1		1		. Valve Body Assembly
			4001890	. Kit, Service, Valve 368-604B, 14,WD
			4001891	. Kit, Service, Valve 368-606B, 14,WD
			4001892	. Kit, Service, Valve 368-604B, 33,WD
			4001893	. Kit, Service, Valve 368-606B, 33,WD
			4001494	. Kit, Service, Valve 368-604B, 14, NA
			4001495	. Kit, Service, Valve 368-606B, 14, NA
			4001896	. Kit, Service, Valve 368-604B, 33, NA
			4001897	. Kit, Service, Valve 368-606B, 33, NA
	A	1	4001260	. 12 Volt Motor/Optical Sensor Cable Assembly
	B	1	1000269	. Injector Cap Assembly
	C	1		. Injector/Screen Assemblies
			3026445	. E Injector 6" Tank - Yellow
			3026446	. F Injector 7" Tank - Peach
			3026447	. G Injector 8" Tank - Tan
			3026448	H Injector 9" Tank - Lt Purple
			4000880	J Injector 10" Tank - Lt Blue
	D	1		
			1000221	
			1243510	
				(Required with 1030502)
			1030502	. Ball, Brine-Backwash, 0.557"Dia. Required with 1243510)
	E	1	3027837	Meter Cable
	F	1		. Valve Controller Assembly - 368
			4001617	368/604B Control - NA 0.33 gpm
			4001741	368/604B Control - World 0.33 gpm
			4001618	368/606B Control - NA 0.33 gpm
			4001742	368/606B Control - World 0.33 gpm
			4001739	368/604 Control - NA 0.14 gpm
			4001737	368/604 Control - World 0.14 gpm
			4001740	368/606 Control - NA 0.14 gpm
			4001738	368/606 Control - World 0.14 gpm
	G	1	4001889	Valve O-ring Kit
2		1		. AC Wall Mound Adapters
			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
			1030418	. 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

ltem	No.	QTY	Part No.	Description
6		1		. Kit, Bypass Connectors (2 connectors)
			4001606	. Kit, 3/4" BSP Connectors
			4001605	. Kit, 3/4" NPT Connectors
			4000888	Kit, 1" NPT Connectors
			4001604	. Kit, 1" BSP Connectors
7		1		. Kit, Drain Line Flow Control Bypass - 368
			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
8		1	4000871	. Elbow 36X Valves, 3/8 tube x 3/8 NPT (only used with bypass)
9		1	4000996	. Drainline 90° 1/2 NPT x 1/2 Hose Barb
10		1		. Manifold Assembly - 368
			3031927	3/4" BSP Adapter - Gray
			4000968	3/4" NPT Manifold/Adapter
			4000970	3/4" BSP Adapter - Black
			4000969	3/4" NPT Adapter - Black
11		1		. Kit, Drain Line Flow Control Manifold - 368 (only used with manifold)
			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
			4000887	#10 EXT DLFC Bypass, NPT
12			4000390	. Bypass Clip DLFC, 360 Valve

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
	position:	Verify that optical sensor is in place and connected to wire. Inspect for debris in the camshaft slots. components in this order: 1. Motor Assembly, Optical Sensor 2. Control

System

Problem	Possible Cause	Solution
	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.	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	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 368-604B, 14, World
4001891	Kit, Service, Valve 368-606B, 14, World
4001892	Kit, Service, Valve 368-604B, 33, World
4001893	Kit, Service, Valve 368-606B, 33, World
4001494	Kit, Service, Valve 368-604B, 14, N. America
4001495	Kit, Service, Valve 368-606B, 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:

. 368/604B Control - North America 0.33 gpm
. 368/606B Control - North America 0.33 gpm
. 368/604 Control - North America 0.14 gpm
. 368/606 Control - North America 0.14 gpm
. 368/604B Control - World 0.33 gpm
. 368/606B Control - World 0.33 gpm
. 368/604 Control - World 0.14 gpm
. 368/606 Control - World 0.14 gpm

Motors:

4001260...... 12 Volt Motor/Optical Sensor/Cable Assembly

Injectors:

injectors.	
1000269	Injector, Cap Assembly
3026445	E Injector 6" Tank - Yellow
3026446	F Injector 7" Tank - Peach
3026447	G Injector 8" Tank - Tan
3026448	H Injector 9" Tank - Lt Purple
4000880	J Injector 10" Tank - Lt Blue
1000221	
	with 1030502)
1030502	······
	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	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
4001287	#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
4000887	#10 EXT DLFC - Bypass - 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
1030418	. N. Amer Wall Trans - 230V
3019151	. N. Amer Wall Trans - 120V E EFF
1235448	. N. Amer Outdoor Trans - 120V