
Patriot Water Softening System

Owner's Installation and Operation Manual

Software Version 3.9a

Every day, thousands of billions of tons of water evaporate from the earth's surface.

As the heat of the sun evaporates the water and draws it from the earth's surface into the atmosphere, many impurities are left behind. The water vapor eventually cools to form clouds and then falls back to earth as precipitation. On its way from the clouds to your faucet, soft rain water dissolves and absorbs a part of almost everything it passes. The falling rain cleans the air as it falls. Unfortunately the impurities that were removed from the air have not left; they have just been relocated through the water onto the ground. Gases and other contaminants can cause undesirable tastes, colors and odors.

Rain falls onto the ground, collecting sediments like rust, sand and algae. The water eventually finds its way to a surface water supply or percolates downward and collects in an aquifer. As it percolates through the earth, the water can absorb hardness minerals, iron, heavy metals, radioactivity, organic contaminants, and many other complex elements and compounds.

Water can also collect numerous harmful man-made chemical impurities throughout this cycle. These synthetic chemicals are generally odorless, colorless, and tasteless; and can often be life-threatening. The statement, "my parents drank this water for 75 years and it never hurt them", is no longer a valid excuse to not be concerned with water quality.

There has been a massive global increase in harmful chemical waste over the last 50 years.

The scientific and medical community has not had time or the ability to study the long-term health effects of the more than 70,000 harmful chemicals that can be found in use today.

Approximately 1,000 new synthetic chemical compounds are entering the industrial marketplace each and every year. Precipitation falls upon commercial and municipal dumpsites, toxic waste sites, industrial refuse depots, military test sites, leach fields, mining operations, farmer's fields etc... Where it dissolves minute amounts of the toxic chemicals present and carries them along.

The United States Government estimated in 1986 that close to two percent of the nation's ground water supplies were moderately polluted by sources such as hazardous waste dumps and leaking landfills.

Industrial wastewater is also a major source of water contamination. When certain chemicals come in contact with others, they create new compounds.

Chemicals that are considered generally acceptable in controlled amounts may react with other elements and/or chemicals to form new compounds that could be highly carcinogenic.

Chlorine is one of the best-publicized examples; it reacts with organic matter in water and forms deadly trihalomethanes.

Hard water is probably the single largest threat facing the American home in the 21st century. Hard water can coat your family, your home and your appliances with thousands of pounds of inorganic mineral rock-scale each and every year; hard water slowly destroys everything it touches. Left untreated, hard water costs you money, ruins your lifestyle and can even lower the value of your home.

No one needs to tell you that you're living with Hard Water though. Soap doesn't lather easily, glasses are cloudy after washing, a ring forms around the bathtub, faucets and shower heads are crusty, laundering results are poor and there are many other easily recognized signs.

There are several degrees of water hardness. Even moderately hard, can seriously damage the plumbing system in your home and, in time, cause inconvenient and expensive problems.

Hard water is a poor cleaner because it is loaded with a variety of impurities. These dissolved impurities react with certain chemicals found in soap to form a gummy, insoluble curd.

This soap curd clings stubbornly to everything it touches. The ring around your bathtub is curd. That same curd causes your hair to become dull and hard to manage.

Soap curd clogs skin pores and prevents your natural oils from moisturizing your skin. This dryness causes itching and also aggravates skin conditions like psoriasis, eczema and acne.

Soap curd is especially noticeable by the scummy film it forms on dishes, glassware, walls and floors. Hardness and other dissolved solids combine to form the residue you see as spots on glasses, crockery, cutlery and shower enclosures.

Hard water harms fabrics

Laundry washed in hard water takes on a gray color and wears out faster than expected. With hard water in your washing machine, it's almost impossible to wash clothes white - even when you use large amounts of detergent and bleach. Minerals and insoluble particles in hard water trap dirt and soap curd in the fabric of your clothes and linens. These deposits give fabric a dull gray "washed-out" look and cause the clothing fibers to be brittle. Your clothes and linens then feel harsh and rough - they deteriorate faster.

Hard water harms foods

Some vegetables such as peas and beans become tough and unpalatable when cooked in hard water. Baking with hard water imparts an undesirable taste from the hardness minerals into your food. Tea, Coffee and other beverages prepared with hard water taste awful and often contain flakes of hardness.

Hard water affects your house plumbing

Perhaps the greatest damage done by hard water is the damage that you can't easily see. Water heaters, humidifiers, boilers and household pipes become lined with an increasingly thick layer of calcium and magnesium scale.

As this scale builds up, the water flow in your pipes diminishes to such a point that new piping is usually the only realistic option to remedy the situation.

Hard water scale inside a water heater forms an insulating layer that prevents the burners or heating elements from heating the water efficiently. Just 1/8" of scale inside the tank can require up to 30% more fuel to heat the water to the desired temperature.

How water hardness is measured

Water hardness is measured in imperial Grains per Gallon (gpg). A grain, in this case, is the weight of an average dry grain of wheat, approximately 1/7000th of a pound. The water treatment industry generally uses the following standards to classify water hardness.

Soft Water	0 - 0.5 gpg
Slightly Hard Water	.5 - 3.5 gpg
Moderately Hard Water	3.5 - 7 gpg
Very Hard Water	7 - 10.5 gpg
Extremely Hard Water	10.5 gpg and greater

THE CRIMES OF HARD WATER, METALS & CHLORINE

- Increased Water Heating Costs
- Damaged Clothing
- Excessive Soap Consumption
- Pipe Scaling
- Faucet and Fixture Damage
- Skin Problems
- Unpalatable Food
- Undesirable Tastes and Odors
- Premature Appliance Failure
- Unsatisfactory Laundry Results
- Unpleasant Tastes & Odors in Water
- Staining on Faucets, Fixtures & Appliances

Principles of Ion Exchange

The smallest units that make up chemical compounds and still retain the properties of those compounds are called molecules. Molecules are made up of atoms or groups of atoms. Electrically charged atoms are called ions. The charge of a single ion can be either positive or negative - Ions of metals and of hydrogen are usually positively charged and are called cations. Ions such as chlorine, nitrate, phosphate, fluoride and sulfates are negatively charged and called anions.

Certain insoluble materials are made up of large ions forming a skeletal structure containing oppositely charged ions. These ions can be exchanged with other similar ions in an ion exchange.

The first commercial application of ion exchange was water softening in 1905. Since then, ion exchange has been the most reliable method of softening and conditioning water in homes and industry.

The Conditioning of water by ion exchange relies on the replacement of the calcium and magnesium ions in the water by an equivalent number of sodium ions.

The Conditioning process may be illustrated by the following equation:-

$R_2.Na +$	$Ca(HCO_3)_2 =$	$R_2 . Ca +$	$2NaHCO_3$
Sodium Ion Exchange Resin	Calcium Bicarbonate in water	Calcium Ion Exchange Resin	Sodium Bicarbonate in Water

Obviously, the system can only exchange a certain amount of hardness and other contaminants. This is referred to as the capacity of the resin. The capacity of the resin is referred to as grains of calcium carbonate hardness removed per cubic foot of resin or Milliequivalents per liter. When the capacity has been exhausted, the resin needs to be regenerated with a solution of sodium chloride (brine) as follows:-

$R_2.Ca +$	$2NaCl =$	$2 R.Na +$	$CaCl_2$
Calcium Ion Exchange Resin	Sodium Chloride Brine	Sodium Ion Exchange Resin	Calcium Chloride Waste

Your Patriot System can be regenerated with Potassium Chloride if desired.

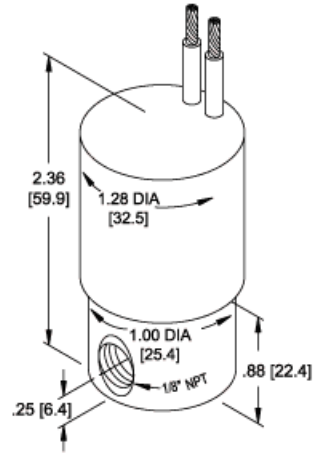
Over the years the composition of ion exchange media has advanced, reflecting sophisticated global technological advances.

Ion exchange resins used in your Patriot System are made in the USA, without harmful toxic solvents. This media is designed to be physically and chemically strong while making water that feels good, tastes great and works hard for you.

Your Patriot system includes a proprietary Pur-Gard injection system. This injection system is specially engineered to work in conjunction with the Evertech electronic control centre to inject precise amounts of Pur-Gard systemic performance enhancer into your system during various phases of the cleaning cycle and during anti-bacterial flushes.

Your Patriot system will use varying amounts of Pur-Gard, depending on your water consumption habits; always maximizing efficiency and performance while providing you with the water quality that you deserve.

- Voltages Available**
AC 50/60 Hz: 12, 24, 120, or 240
DC: 6, 12, 24
- Power Consumption**
AC: 5 Watts DC: 6 Watts
- Coil Construction**
Class A (105°C)
- Coil Encapsulant**
Thermoplastic Polyester (PBT)
- Operating Temperature**
to 120°F (49°C)
- Seals**
Nitrile, EPDM, Fluoroelastomer
- Internal Components**
Stainless Steel
- Shading Ring (AC Units)**
Copper or Silver
- Yoke**
Internal
- Valve Body**
Brass, Stainless Steel, Glass Filled Polypropylene



Dimensions in Inches [Metric]
Shown with Metal Valve Body

Pur-Gard is designed to:-

- Clean ion-exchange resin without damaging structured matrix media
- Create an inert protective coating on metallic moving parts
- Clean and lubricate all moving components
- Create an unhealthy environment for bacteria in the system
- Activate Purafeel technology on compatible systems
- Enhance self-sanitization process on compatible systems

Always keep your Pur-Gard reservoir full to ensure proper system performance, longevity & efficiency.

System Features & Benefits

Efficient

Your Patriot System learns your lifestyle and adapts itself to meet your needs, allowing the Patriot System to deliver soft water to your home while saving you salt, water and electricity.

Upgradeable

Designed for the future, your Patriot System is capable of being modularly upgraded, as new technologies are developed to accommodate for rapidly degrading water conditions. The Evertech control center can be updated with the latest software updates & upgrades as they become available.

Reliable

The mechanical subsystem in the Patriot System is revolutionary in its own right. The Patriot System is built around Open-platform™ technology, building on a 40-year legacy of reliable design and using 21st century composite materials to ensure reliable and dependable performance.

Safe

Every Patriot System is handcrafted by skilled artisans in a world-class ISO 9001:2000 facility to provide you with a water treatment system that exceeds industry safety, manufacturing & quality control standards to give you peace of mind.

Simple

Advanced manufacturing methods and skillfully crafted computer hardware & software makes the Patriot System one of the easiest water softening systems to own and operate.

Your responsibilities as an equipment owner

Your Patriot System is manufactured to be efficient and very reliable. To ensure continued performance while keeping your system operating within manufacturer's specifications, the following operating conditions must be ensured by you, the equipment owner:

Water Pressure Regulator

The influent water pressure into this water system must be regulated by a code-compliant pressure-regulating device not to exceed 75psi.

Power Protection

Power to this system must be supplied by an unswitched 110VAC supply. Surge protection is mandatory and is to be supplied by you, the equipment owner. The use of a UPS (Uninterruptible Power Supply) is encouraged.

Salt

This water system uses salt to clean itself. The brine tank must be filled with a high quality pellet or cubed salt to ensure system operation. Rock salt is usually not suitable for this system, as it usually contains high levels of impurities that can possibly compromise the system functionality. Consult with your local water professional to decide on the best salt for your application.

Pur-Gard

The Pur-Gard injection feeder should be kept full to ensure proper system operation and maximum efficiency. Pur-Gard works synergistically with the Matrix 525-3 media and Chlorgon to ensure the very best water taste and feel. Check the level of your Pur-Gard feeder each time you fill your brine tank with salt.

Annual Service

Water chemistry changes over the years and will have an effect on your system's ability to do its job. Natural attrition on the system due to chlorine & wear will usually occur at 3-5% per year, even when protected with Pur-Gard. Your system should be inspected and recalibrated annually to ensure your system is performing at optimum levels and that you stay current with the latest technologies and software updates, and upgrades as they become available.

Periodic replacement of media

While built to the highest standards, certain media in your Patriot System will need to be replaced periodically by your local authorized service agent. Replacement intervals vary depending on your water chemistry and water consumption habits. Consult with your water specialist during your annual inspection/tune-up service to ensure that you enjoy the very best water quality.

System Installation & Start-up Guidelines

Clear the installation area and carefully sweep the floor where the system will be installed.

Test home water pressure and make sure it is 50 – 75 psi static. A code-compliant pressure regulator must be installed to protect the system on all municipal water installations.

Check to confirm that the water heater has adequate heat expansion protection to protect the system from hot water damage.

Connect to house plumbing using code approved methods & materials and ensure that a bypass device is installed.

Install surge protector or uninterruptable power supply.

Install ½” poly pipe or equivalent to the system drain fitting and terminate to sewer drain in a code-approved manner.

Bypass System.

Run bathtub cold to purge piping of debris and chemical residue from installation, this will take approx. 15 minutes at 3gpm.

Leave bathtub running and slowly open the inlet valve to the system.

Slowly open the outlet valve from the system.

Observe flow of water from the bathtub. Water will become a dark brown/black color. This color is caused by the system disinfectant/preservative as well as dust from shipping & handling. Allow water to run until clear. Observe water for particles. If resin or chlorogon particles are found in the water, bypass the system and call tech-support.

Turn off bathtub cold

Press the star button to enter programming mode

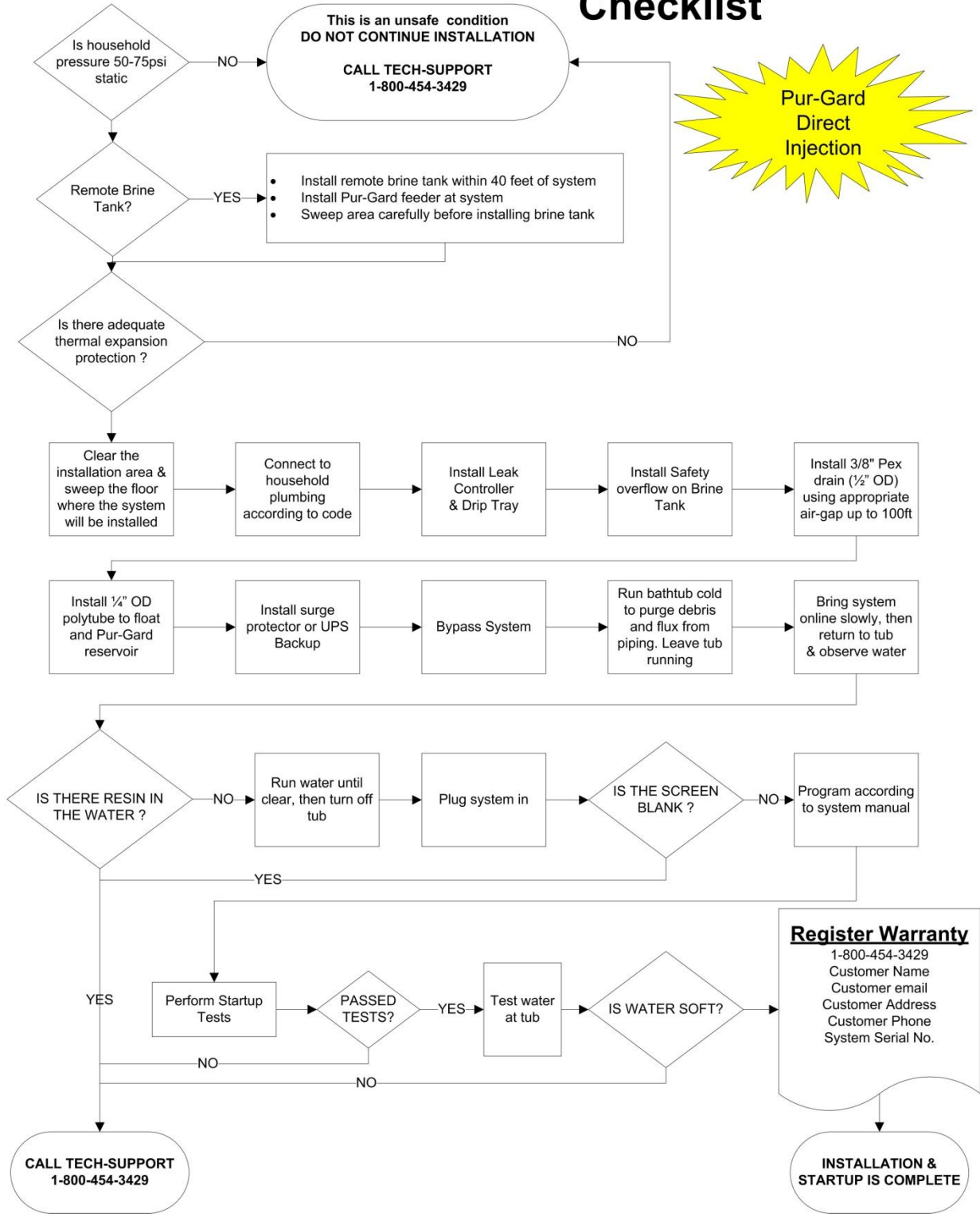
Program the system according to the programming instructions in this manual

Short cycle the system by stepping it through each cycle step

Observe the system during each cycle and advance to the next cycle by pressing the star button.

Once the system has been advanced to normal operating mode, test the water at any faucet that is softened by the system to ensure proper output water quality.

Water Softener Installation And Startup Checklist



System Control & Operation

Your Patriot System incorporates a highly sophisticated microprocessor control system, making it as efficient and reliable as possible. All system settings are pre-programmed at the factory and then carefully calibrated by your installer for your exact water chemistry.

Your Patriot System incorporates flash EEPROM memory and an innovative power backup system, which means that your system programming should never have to be reset, even in the event of a power outage.

Normal Operating Mode

In **normal operating mode**, the display shows the time of day and remaining capacity:

8:00 am	1600GL
Patriot	

When the system determines that it is necessary to clean, the display will show the time of day and the word “CLEAN”, indicating that a delayed cleaning cycle will be started at the programmed time of cleaning:

8:00 am	CLEAN
Patriot	

Cleaning mode

In **cleaning mode** the display shows the current cleaning cycle step description and the remaining time for that cycle to execute:

Cycle Time:	9
Tank Fill	

The control valve can be **advanced to service mode** at any time by repeatedly pushing the star button, and manually advancing it through the cleaning cycle steps.

Flow meter

In **service mode** the display will show the time of day and remaining capacity; the remaining capacity counter counts back per unit, i.e. per gallon. By opening a faucet after the unit, the correct functioning of the flow meter can be checked by means of this counter.

Power-Failure Handling

In the event of a power failure, your system’s integrated Snapshot memory system will retain all programmed data for an indefinite period of time. The system will maintain the correct time of day during a period of several hours; in the case of a prolonged power failure, the time of day might not be maintained; if this happens, the time of day indication will, when the power supply is re-established, be *flashing*, indicating that the time of day needs to be set. All other programming is unaffected.

If a power failure occurs during the execution of an automatic cleaning, the control valve will immediately return to the service position; when the power supply is re-established, the control valve will stay in the service position for 60 sec. and restart a complete cleaning cycle to ensure that your quality is returned to normal as quickly as possible.

Critical Software/Hardware failure

In the event of a critical failure, the display will show the message:

**CALL FOR SERVICE
1-800-454-3429**

Call your local service provider for help.

End-user programming is generally not necessary. If you need to change programming, the following procedure should be used:-

Programming

Programming instructions at the End-User level

1. Accessing the End-User level:

Make sure that the system is in the service mode.

Push the STAR button; the display will show:

Time: 8:00 am

You are now in the End-User level; use the STAR button to advance through the different programming parameters.

2. Available programming parameters:

Time of day setting:

The display will show:

Time: 8:00 am

Push the ▲ button or ▼ button to set the correct time of day.

System Efficiency

The display will show:

**Efficiency:
Low-----|-----High**

Push the ▲ button or ▼ button to select the level of efficiency that you'd like to operate your system at. Best performance is usually realized when the efficiency level is kept in the middle.

Water Hardness

The display will show:

Water Hard:20 Grn

Push the ▲ button or ▼ button to enter the hardness to tested level in grains per gallon.

Iron Chemistry

The display will show:

**Iron Level: 000
Parts/Billion**

Push the ▲ button or ▼ button to enter the tested amount of ferrous (clean water) iron in your water

Antibacterial Override

The display will show:

**Override: 7 Days
Antibacterial**

Push the ▲ button or ▼ button to adjust the number of days the system will clean if water usage does not initiate the system to perform a cleaning cycle. Due to advance fractional brining technology, the system will only use the exact amount of salt to match the amount of water that you have used. If you haven't used any water, the system will simply backwash and inject Pur-Gard, keeping your water fresh & saving you money.

Delayed Cleaning Mode

The display will show:

Clean At: 11:00pm

Push the ▲ button or ▼ button to adjust the time in which you want the system to clean at, if left in this mode the system will perform its regeneration at the programmed time of regeneration.

Immediate Cleaning Mode

The display will show:

Clean In 10 Sec.

If the control is left in this position, the counter timer will count down to 0 sec and start a manual cleaning cycle. To cancel this mode, push the ⏸ button before the counter timer has reached 0 sec.

Diagnosics Mode

Your Patriot System incorporates highly advanced logic, record-keeping and diagnostics functions. Diagnostics mode is accessed as follows:-

Press the UP arrow and hold it for 5 seconds after which you will see the following display:-

**DIAGNOSTICS MODE
PRESS STAR**

Pressing the STAR button will allow you to advance through each of the informational displays as follows:-

Clean xxx days ago	Days since the system last cleaned
In Srvc xxxx days	Total number of days that system has been in service
Cleanings : xxx	Total number of cleanings since system was first installed
TotVol: xxxxxxxx GL	Total volume of water processed by the system since first installation
LastCln@ xxxxx GL	The number of gallons processed since the last cleaning
PeakFlow xxx GPM	The HIGHEST flow rate ever sensed through the system
AvgVol: xxxx GL/d	The average daily water consumption recorded by the system
WaterHard: xx gpg	The programmed water hardness level
Clean at : xx:xx am/pm	The designated system cleaning time
Override: xx Days	The antibacterial cleaning override interval
Cycle Time:	Individual cycle times and descriptions
Srg/Sag:	Number of power surge or sag conditions recorded by the system that have forced a microprocessor reset
Power Outages:	Number of Power Outages sensed by the system since installation
xxxx xxxxxx.xx	Firmware and Software version ID
Flow Rate xx gpm	Realtime Flowmeter display

After the last diagnostic display, you will see the following:-

**EXIT
PRESS UP ARROW**

Pressing the UP Arrow will return you to Normal Operating Mode, or you can press STAR to advance to the first diagnostic display again.

Understanding how your system operates

Water softening process

Your system is designed to remove hardness and certain metals from your water through the processes of ion exchange. Your system should only be used on water that is microbiologically safe. For optimum performance, the Patriot System should only be installed when the following operating criteria are met:-

	Minimum	Maximum
Water Temperature	40 F	75 F
Water Pressure	40psi	80psi
Influent Water Hardness	0gpg	90gpg
Influent pH	6.7	8.7
Influent TDS	10 ppm	900 ppm
Pathogenic Bacteria	0 CFU	0 CFU
Chlorine	0 ppm	5 ppm
Chloramine	0 ppm	4 ppm
Ambient Temperature	40 F	90 F

Evertech control center operational process

Your Patriot System is smart as a result of the proprietary Evertech control center. This advanced microprocessor control system incorporates the latest hardware and software to ensure that your water is continuously soft. Your system can also be upgraded with the latest software and hardware as they become available. See your authorized dealer for more information.

During Service

The control center constantly monitors your water usage in your home, learning your lifestyle and adapting itself to ensure that you have a consistent supply of softened water. The control center makes daily decisions about how and when it should clean itself using the latest algorithms that consider your water usage habits, water hardness, iron level and various other factors. Your system will periodically perform an antibacterial cleaning. This cleaning cycle will occur after a designated period of time (we recommend at least every 7 days). This cleaning routine will inject Pur-Gard into your system and possibly even use salt to clean itself, depending on your water usage. If you haven't used in water during the interval, the system will not use any salt during the antibacterial cleaning cycle.

During Cleaning

Once your system determines that it needs to be cleaned, it will initiate a cleaning cycle at the pre-programmed cleaning time. The cleaning cycle is controlled by the Evertech control center and cycle times will vary depending on your water usage habits.

The cleaning sequence is as follows:-

System Protector	Your system will educt a measured dose of Pur-Gard into the brine system.
Tank Fill	Your system will dispense a measured amount of Pur-Gard into the brine tank and then fill will a measured amount of clean water that is determined by your water usage habits.
Percolation	Your system now enters a rest period to allow sufficient contact time between the Pur-Gard, water and salt. The system is online at this time and continues to provide you with softened water for your home.
Inject Pur-Gard	Your system will inject a measured amount of Pur-Gard into the media tank, at the very lowest point, where the media is the cleanest. The system goes offline at this time and stays offline until the cleaning cycle is complete. Any water used in the home during this and subsequent steps of the cleaning cycle will not be softened by the system.
Ion-Displacement	Your system will extract brine water from the brine tank and apply it to the cleanest media at the bottom of the media tank. This “up flow” or counter current cleaning process maximizes your system efficiency, minimizes the environmental impact of your system and creates softer water for you.
Vortex Rinse	Your system vigorously rinses the media bed to reclassify the media, remove pockets of brine and purge broken resin beads.

At the completion of this sequence, the system will bring itself online & return to normal operating mode.

Troubleshooting

Hard (untreated) water to service

Cause	Solution
1. Open or defective bypass	1. Close or verify bypass
2. Loss of resin	2. Refer to problem “Loss of resin”
3. Valve in regeneration	3. Check system clock to verify correct time of day
4. Change in raw water hardness	4. Adjust programming accordingly
5. Unit fails to regenerate	5. Refer to problem “System fails to clean”
6. Valve fails to draw brine	6. Refer to problem “Valve fails to draw brine”
7. Decreasing exchange capacity of resin	7. Clean or replace resin bed
8. No salt in brine tank	8. Add salt
9. Leak at riser tube	9. Verify that riser tube is seated correctly and is not damaged by heat or high water pressure

System fails to clean

Cause	Solution
1. Faulty electrical supply	1. Verify electrical service – Confirm unswitched power outlet
2. Obstructed flow meter	2. Clean and/or replace flow meter
3. Damaged PCB	3. Replace PCB
4. Damaged drain motor	4. Replace drain motor
5. Body stem assembly switches continuously	6. Check minimum operating pressure; refer to Installation “Drain flow adjuster”

Valve fails to draw brine

Cause	Solution
1. Low operating pressure	1. Verify operating pressure; must exceed 40 psi static
2. Drain flow control closed	2. Open drain flow control slowly until unit draws brine
3. Plugged injector	3. Clean injector
4. Plugged injector filter	4. Clean injector filter
5. Vortex rinse solenoid plunger stuck in open position	5. Clean or replace plunger and solenoid diaphragm
6. Restricted/Obstructed drain line	6. Check drain line for kinks, restrictions or obstructions
7. Restricted/Obstructed brine line	7. Check brine line for kinks, restrictions or obstructions
8. Leak in brine line	8. Verify brine line and connections for air leakage
9. Insufficient water in brine tank	9. Refer to problem “Valve fails to refill brine tank”
	10. Check brine tank for damage

Excessive water in brine tank

Cause	Solution
1. Valve fails to draw brine	1. Refer to problem "Valve fails to draw brine"
2. Improper brine refill time setting	2. Verify that brine refill time corresponds to the proper salt level and amount of hydrolyte 523-3 resin
3. Missing brine refill flow control	3. Verify that flow control is installed and properly sized
4. Leak from valve to brine tank	4. Clean or replace plunger and solenoid diaphragm of refill solenoid

Valve fails to refill brine tank

Cause	Solution
1. Improper brine refill time setting	1. Verify that refill time corresponds to salt level and amount of resin
2. Plugged refill flow control	2. Clean flow control

System uses too much salt

Cause	Solution
1. Excessive water in brine tank	1. Refer to problem "Excessive water in brine tank"
2. Unit regenerates too frequently	2. Verify capacity, reserve capacity and day setting

Salt water to service

Cause	Solution
1. Excessive water in brine tank	1. Refer to problem "Excessive water in brine tank"
2. Injector undersized	2. Verify injector selection
3. Improper brine/slow rinse time setting	3. Verify that brine/slow rinse time corresponds to the proper salt level and amount of resin
4. Improper fast rinse time setting	4. Verify that fast rinse time corresponds to the proper salt level and amount of resin

Loss of resin through drain line

Cause	Solution
1. Excessive backwash/fast rinse flow	1. Adjust drain flow adjuster
2. Lower and/or upper distributor damaged	2. Replace distributor(s)
3. Leak between riser tube and upper distributor	3. Verify that riser tube is seated correctly and is not cracked

Loss of water pressure

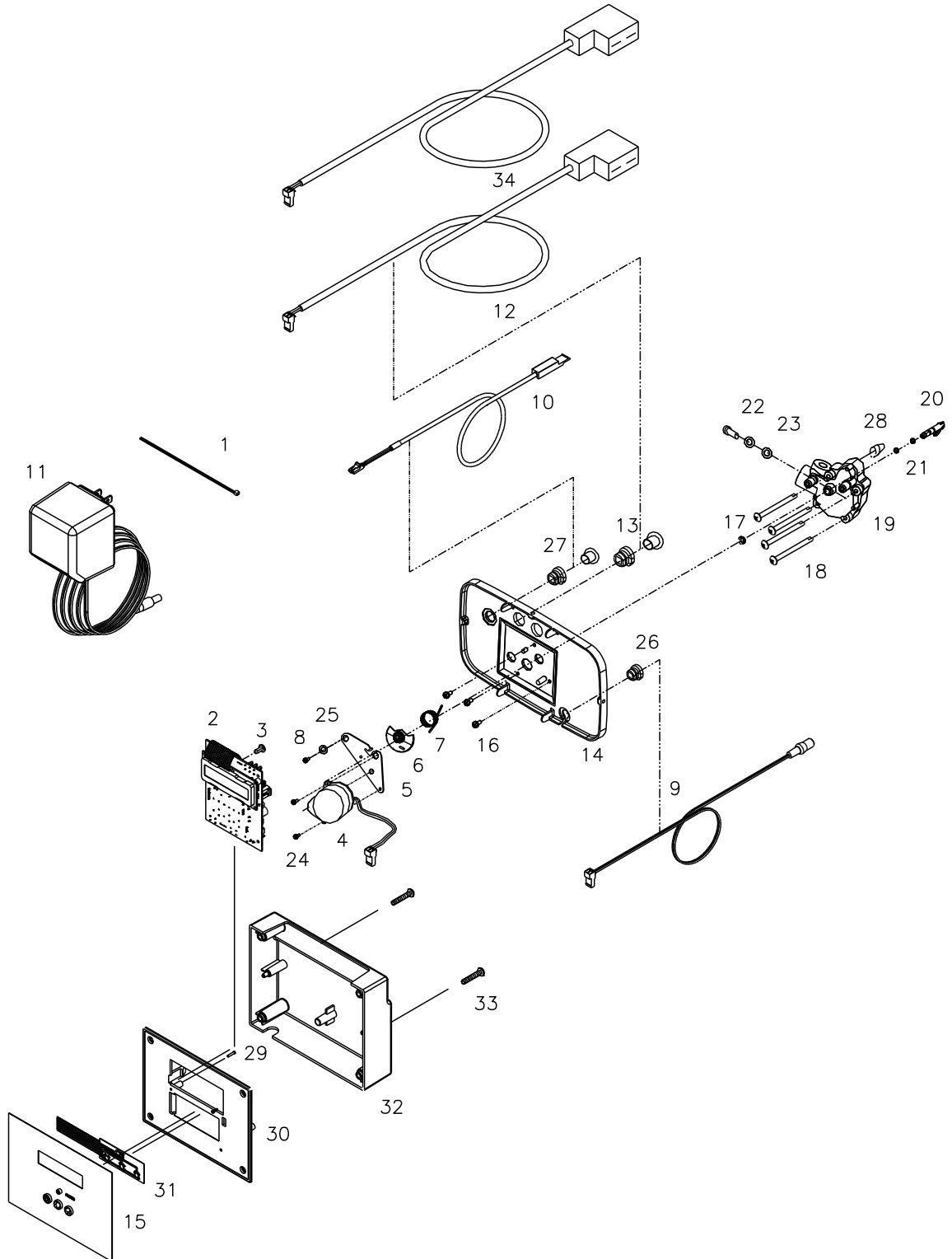
Cause	Solution
1. Mineral or iron build-up in resin tank	1. Clean resin bed and control valve; increase regeneration frequency
2. Plugged lower and/or upper distributor	2. Verify that distributors are free of debris
3. Crushed lower and/or upper distributor	3. Replace distributor(s)

Drain flows continuously

Cause	Solution
1. Drain paddle stuck in open position	1. Clean drain paddle seat
2. Drain motor doesn't return	2. Verify correct installation of drain paddle return spring

Exploded Views & Part Numbers

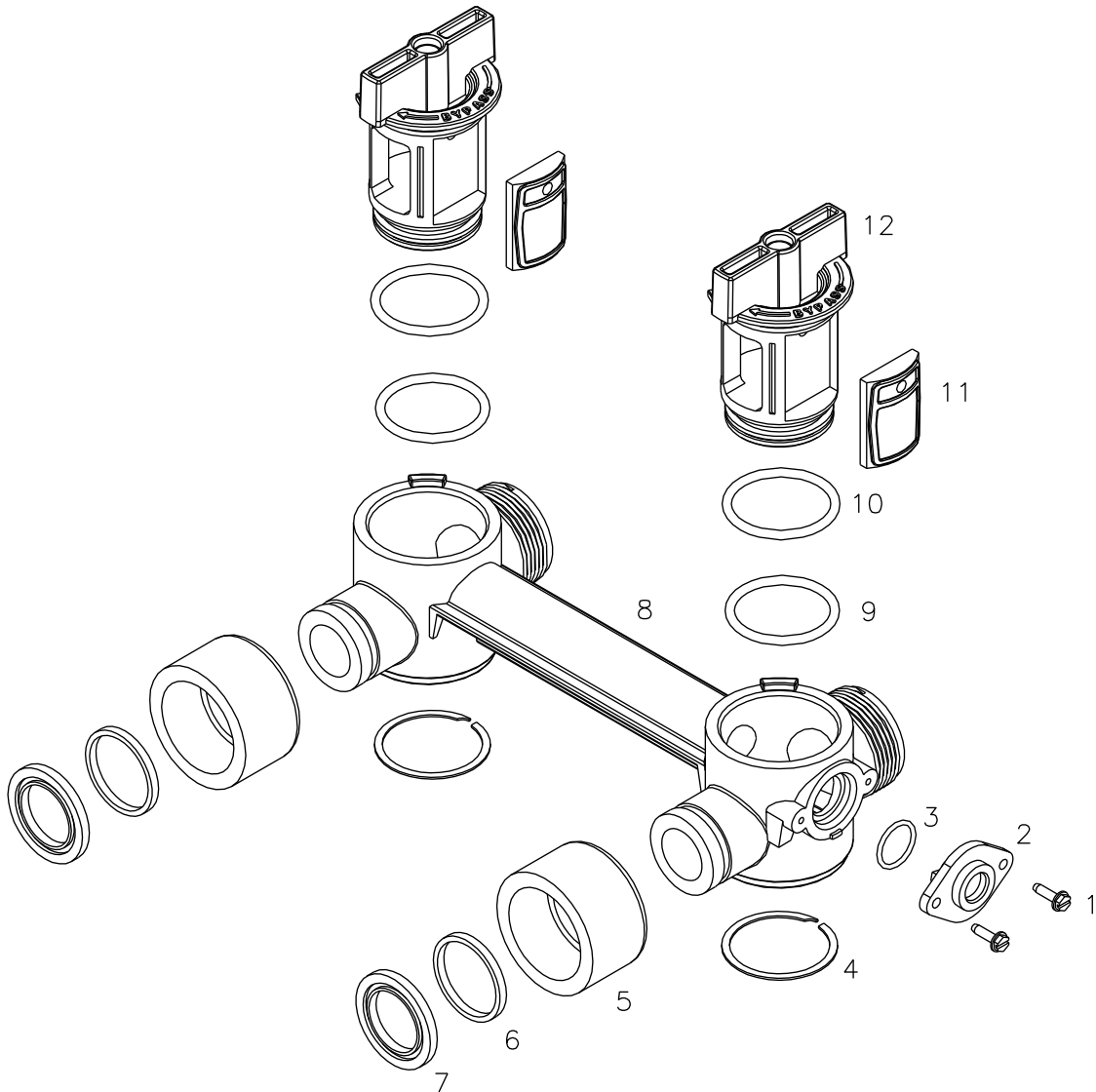
Evertech control Center



ITEM	PART NUMBER	DESCRIPTION
1	71348	Cable Tie
2	72415	PCB Assy
3	70618	Screw 4-24x.38
4	71675	Motor Drain 24V/60Hz
5	72244	Motor Plate
6	71753	Gear Assy
7	71755	Torsion Spring
8	71507	Screw
9	38052	Power Lead
10	72576	Sensor Cable 45in Latched
11	72518	Transformer Euro 220V
12	38198	Solenoid Cable Assy Black 45in
13	71638	Heyco Bushing
14	71687	Backplate
15	38239	Label PCB
16	71507	Screw
17	71550	Retaining Ring
18	71509	Screw
19	72045	Valve Head
20	71734	Stem Assy
21	13366	O-Ring -007
22	71698	Seat
23	71539	O-Ring 5/16 x 3/32
24	70627	Screw #5-40x0.25
25	72245	Washer .125x.437x.04 SS
26	70312	Heyco 2P-4
27	72134	Heyco SR5P4
28	71972	Backwash Flow Control 2.0
29	70618	Screw 4-24x3/8
30	38049	PCB Frame
31	70968	PCB Switch
32	38048	PCB Box Rear
33	38377	Screw 1/4x1-1/2
34	38199	Solenoid Cable Assy White 45in

15	71986	Injector Gasket
16	71718	Injector #4
17	71937	Injector Cap
18	71511	Screw
19	71538	O-Ring Riser Adapter
20	71935	Riser Adapter
21	70662	O-Ring Riser Adapter
22	71010	Adapter, Upper Basket
23	71541	Tank O-Ring
24	71512	Screw
25	71947	Spring Clip
26	37375	Elbow 1/8 NPT x 1/4 Comp PP
27	37374	Check Valve 1/8 x 1/8
28	38225	Solenoid PP 1/8 NPT 24 VAC
29	12625	Tube Support 3/8
30	71459	Valve Head
31	72308	Screw #8-18x2-3/4
32	75033	Check Disk
33	71942	Spring Check Disk
34	71925	Back Cap Seal
35	71497	Screw
36	13366	O-Ring Drain Paddle
37	71734	Stem Assembly
38	71707	Solenoid Diaphragm
39	71709	Plunger
40	70984	Spring Solenoid
41	71706	Guide
42	71938	Spacer
43	71702	Solenoid Coil 24V
44	71513	Screw
45	71961	Check Ball, Brine Refill
46	71204	Brine Refill Flow Control 0.25 GPM
47	71960	Back cap - Timed Brine Refill
48	71532	O-Ring
49	71496	Screw #4-14x.38
50	72542	Elbow Inlet Assembly
51	72245	Washer
52	72467	Gasket 541
53	72543	Elbow Outlet Assembly
54	72544	Impeller Assembly
55	72545	Hub Assembly
56	38224	Flow Restrictor 50 ml
57	38234	Brine Line Fitting 1/8 NPT
58	70667	O-Ring
59	72552	Screw

Bypass Valve



ITEM	PART NUMBER	DESCRIPTION
1	72595	Screw 6x32 Hex Head Slotted
2	72580	Bypass End Cap 541
3	13328	O-Ring -017
4	72584	Retaining Ring VS-156-S02
5	71161	Nut Bypass Valve
6	71162	Ring Nut Retainer
7	71110	Gasket Bypass
8	72578	Bypass Body 541
9	72585	O-Ring - 220 EPC 70 Duro
10	72286	O-Ring -222 EPC 70 Duro
11	72583	Seal Bypass Valve
12	72579	Handle Bypass 541

Intermountain Soft Water, Inc.

STATEMENT OF LIMITED PRODUCT WARRANTY

1st year of ownership

This residential water system is warranted as to workmanship and material for a period of one year from date of original installation at the original installation site, if properly installed by an Intermountain Soft Water Certified Installer. Should any component in your system prove defective in the first year, it will be repaired, rebuilt or replaced at our option, provided it is returned directly to us.

After the 1st year of ownership, should any component in your system prove defective, it will be repaired, rebuilt or replaced at our option for a maximum charge of \$50.00, provided it is returned directly to us. Labor, transportation, shipping or other charges incurred in the diagnosis, replacement or repair of defective components are not covered by this warranty. If you choose not to send a defective component back to us, repairs to your system can be conducted in your home by a factory authorized service technician if your home is within the operating radius of an Intermountain authorized repair center. This warranty does not cover transportation, shipping, diagnosis, replacement and repair charges resulting from your in-home repair request. Intermountain Soft Water or its subsidiaries will not be held responsible for loss or damage caused by any defective component.

Conditions

This warranty must be presented at time of claim and all claims must be presented within 30 days of occurrence.

This warranty is void if your water system is not installed in compliance with prevailing plumbing codes, according to Intermountain Soft Water's installation protocol, or if the influent water temperature is hotter than 90F or where the static water pressure is less than 40psi, or more than 80psi. Intentional/malicious damage, misuse, neglect, unauthorized modifications or accidental damage to the system are not covered by this warranty. This warranty does not cover damage caused by pressure surges, water hammer, power surges or sags, lightning, fire, flood, freezing, earthquake, acts of God or other casualty.

Wear and Tear

Your water system is subject to normal wear and tear during its usable service life.

Wear and tear is not regarded as a product defect and is not covered by this warranty.

No Liability for Consequential Damages

Unless otherwise required by applicable law, Intermountain Soft Water shall not be liable for any damages whatsoever (including without limitation, loss time, inconvenience, expenses such as telephone calls, labor or material charges incurred in connection with the removal or replacement of the part(s) or product(s), special, incidental, consequential, or indirect damages for personal injury, loss of business profits, business interruption, loss of business information, or any other pecuniary loss) arising out of the use of or inability to use the defective part(s) or product(s), even if Intermountain Soft Water has been advised of the possibility of such damages. Intermountain Soft Water's entire liability under any provision of this Limited Warranty shall be limited to the amount actually paid for the part(s) or product(s).

No Other Warranties:

Intermountain Soft Water specifically disclaims all other warranties, either express or implied, including, but not limited to implied warranties of merchantability and fitness for a particular purpose, with regard to the part(s), product(s) and/or any accompanying written materials. This limited warranty gives you specific legal rights. You may have other rights that vary from state/jurisdiction to state/jurisdiction.

Pur-Gard

Your water system includes a Pur-gard/Pur-Gard Plus performance-enhancing injection system. The Pur-gard/Pur-Gard Plus performance-enhancing additive is essential to proper functioning of your system. If Pur-gard is not added to the injection system at the prescribed interval in your owner's manual, this warranty will be void.

Periodic replacement of media

While built to the highest standards, certain media in your Water System will need to be replaced periodically by your local authorized service agent. Replacement intervals vary depending on your water chemistry and water consumption habits. Consult with your water specialist during your annual inspection/tune-up service to ensure that you enjoy the very best water quality. Media replacement is not covered under this warranty.

This limited lifetime warranty is only valid if registered within 10 days of initial installation. If unregistered, this warranty is only valid for 1 year from the date of original manufacture.

Toll-free customer service: 1-800-454-3429

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