SERIES 3000 & 3002

80 YEARS OF INNOVATION

ECOWATER
SYSTEMS®

SERVISOFT • MIRACLE WATER • LINDSAY

SINCE 1925.

P/N: 7283586

OWNERS MANUAL

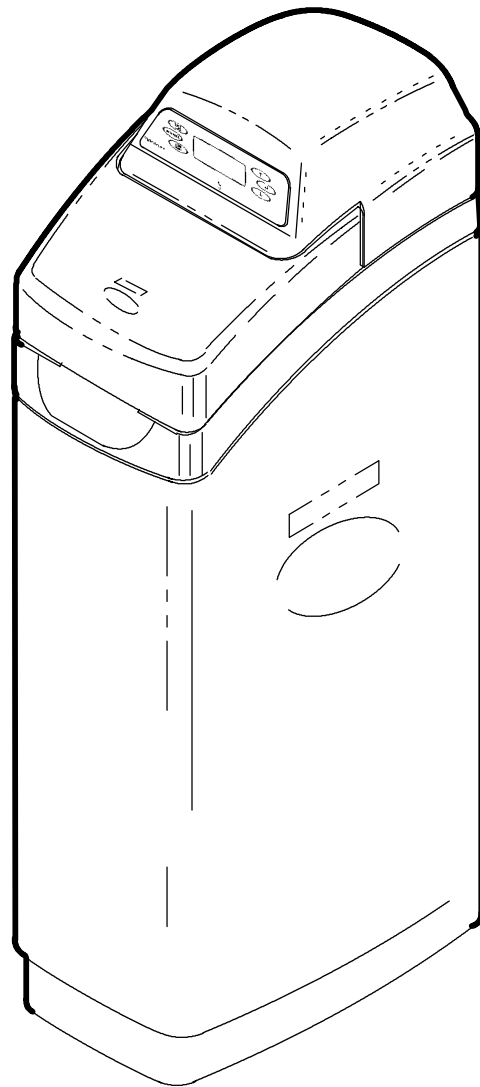## How to maintain and operate your EcoWater Systems digital demand water conditioner

ECOWATER S Y S T E M S ®

EcoWater Systems Conditioner
with Remote (ECR)

EcoWater Systems Refiner
with Remote (ERR)

SERIES 3000 & 3002

80 YEARS OF INNOVATION

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EcoWater Systems conditioner models R70 and R50S are shipped from the factory in two cartons. These contain resin tank/controller assembly in one carton and the brine tank, cover, skin pack of small parts needed to assemble and install the unit, and this manual.

EcoWater Systems conditioners, models R20, R30 and R40 are shipped from the factory in one master carton. The carton also includes a skin pack of small parts needed to assemble and install the unit, and this manual.

Thoroughly check the EcoWater Systems conditioner for possible shipping damage and parts loss. Also inspect and note any damage to the shipping carton. Notify the transportation company if damage is present. EcoWater Systems is not responsible for in-transit damages.

Remove and discard (RECYCLE) all packing materials. We suggest you keep the small parts on the skin-pack until you are ready to use them.

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SAFETY GUIDES

Follow the installation instructions carefully. Failure to install the EcoWater Systems conditioner properly **voids the warranty.**

Before you begin installation, read this entire manual. Then, obtain all the materials and tools you will need to make the installation.

Check local plumbing and electrical codes. The installation must conform to them.

Use only lead-free solder and flux for all sweat-solder connections, as required by state and federal codes.

Use care when handling the EcoWater Systems conditioner. Do not turn upside down, drop, or set on sharp protrusions.

Do not locate the EcoWater Systems conditioner where freezing temperatures occur. Do not attempt to treat water over 120°F. **Freezing, or hot water damage voids the warranty.**

Avoid installing in direct sunlight. Excessive sun heat may cause distortion or other damage to non-metallic parts.

The EcoWater Systems conditioner requires a minimum water flow of 3 gallons per minute at the inlet. **Maximum allowable inlet water pressure is 125 psi.** If daytime pressure is over 80 psi, nighttime pressure may exceed the maximum. Use a pressure reducing valve if necessary. (Adding a pressure reducing valve may reduce the flow.)

The EcoWater Systems conditioner works on 24 volt-60 hz electrical power only. Be sure to use the included transformer and plug it into a nominal 120V, 60 cycle household outlet that is in a **dry location only**, grounded and properly protected by an over current device such as a circuit breaker or fuse. If transformer is replaced, use only the authorized service, Class II, 24 volt, 10 VA transformer.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

If conditioner is being used to remove barium and / or radium 226 and 228, please verify performance by contacting 612-607-1700, ext. 6470 for testing treated water supply or check the water testing section of your local phone directory.

European Directive 2002/96/EC requires all electrical and electronic equipment to be disposed of according to Waste Electrical and Electronic Equipment (WEEE) requirements. This directive or similar laws are in place nationally and can vary from region to region. Please refer to your state and local laws for proper disposal of this equipment.

LIMITED WARRANTY
EcoWater Systems LLC
Advantage Warranty
Series ECR & ERR 3000 Water System

Congratulations! You have just purchased the highest quality water conditioning product on the market. To register your warranty, complete the enclosed Warranty Registration Card and mail it within 30 days of purchase.

To whom is this warranty extended?

EcoWater Systems LLC warrants its products to the original owner and guarantees that the products will be free from defects in materials and workmanship from the original date of installation.

How does my warranty work?

If, during the respective warranty period, a part proves, after inspection by EcoWater, to be defective, EcoWater will, at its sole option repair or replace that part at no charge, other than normal shipping, installation or service charges.

What is covered by the warranty?

EcoWater Systems LLC guarantees that,

for the LIFETIME of the original owner, the SALT TANK and the MINERAL TANK will not rust, corrode, leak, burst, or in any other manner fail to perform their proper functions and that,

for a period of TEN YEARS, the VALVE BODY will be free of defects in materials and workmanship and will perform its proper function and that,

for a period of FIVE YEARS, the ELECTRONIC FACEPLATE and ALL OTHER PARTS, including the REMOTE MONITOR will be free of defects in materials and workmanship and will perform their normal functions.

Only on models designated as ERR on the rating decal, is the resin bed guaranteed, for the lifetime of the original owner, to be free of defects in materials and workmanship and to remove chlorine taste and odor from a municipal water supply.

How do I obtain warranty service?

Should you need service, your local, independent EcoWater Dealer is only a phone call away.
PHONE: _____

To obtain warranty service, notice must be given, within thirty (30) days of the discovery of the defect, to your local EcoWater Systems dealer.

If I need a part replaced after the factory warranty expires, is the replacement part warranted?

Yes, EcoWater Systems LLC warrants FACTORY REPAIRS as well as all REPLACEMENT PARTS for a period of 90 DAYS. This warranty does not include normal shipping, installation or service charges.

Are any additional warranties available?

We are pleased to say, YES! EcoWater Systems LLC sells an EXTENDED, PARTS ONLY WARRANTY for the ELECTRONICS portion of your product. This warranty is called the "Perfect Ten" and extends the five year warranty on the electronic FACEPLATE, WIRING HARNESS, DRIVE MOTOR, TRANSFORMER, POWER CORD, SENSOR HOUSING, and MICRO SWITCHES to a total of TEN YEARS from the date of original installation. Your local dealer will provide details regarding this warranty or will refer you to the factory for additional information. In addition, the 3000 SERIES product carries the CREST OF EXCELLENCE GUARANTEE that, should you experience a repetitive problem that remains uncorrected, EcoWater will, during the FIRST YEAR OF INSTALLATION, replace the product with the exact or comparable product.* This guarantee may be subject to normal shipping and installation or service charges.

General Provisions

The above warranties are effective provided the water conditioner is operated at water pressures not exceeding 125 psi, and at water temperatures not exceeding 120°F (and on a municipal chlorinated water supply – *models designated as ERR on the rating decal*); provided further that the water conditioner is not subject to abuse, misuse, alteration, neglect, freezing, accident or negligence; and provided further that the water conditioner is not damaged as the result of any unusual force of nature such as, but not limited to, flood, hurricane, tornado or earthquake. EcoWater Systems LLC, is excused if failure to perform its warranty obligations is the result of strikes, government regulation, materials shortages, or other circumstances beyond its control.

*THERE ARE NO WARRANTIES ON THE WATER CONDITIONER BEYOND THOSE SPECIFICALLY DESCRIBED ABOVE. ALL IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED TO THE EXTENT THEY MIGHT EXTEND BEYOND THE ABOVE PERIODS. THE SOLE OBLIGATION OF ECOWATER SYSTEMS LLC UNDER THESE WARRANTIES IS TO REPLACE OR REPAIR THE COMPONENT OR PART WHICH PROVES TO BE DEFECTIVE WITHIN THE SPECIFIED TIME PERIOD, AND ECOWATER IS NOT LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES. NO ECOWATER DEALER, AGENT, REPRESENTATIVE, OR OTHER PERSON IS AUTHORIZED TO EXTEND OR EXPAND THE WARRANTIES EXPRESSLY DESCRIBED ABOVE.

Some states do not allow limitations on how long an implied warranty lasts or exclusions or limitations of incidental or consequential damage, so the limitations and exclusions in this warranty may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. This warranty applies to consumer–owned installations only.

GUARANTEE BOND

The Safeco Insurance Company of America has issued it's bond in the form shown below, guaranteeing full performance by EcoWater Systems LLC

SAFECO INSURANCE COMPANY OF AMERICA, hereinafter called "Surety," guarantees unto Bank of New York as Trustee holding said Guarantee Bond under the terms of a Trust Agreement dated April 9, 2003, for the use and benefit of original purchasers of residential EcoWater Systems Units within the Continental United States, as described herein, that EcoWater Systems LLC, will discharge the obligations of the "EcoWater Bonded Parts and Service Guarantee Policy."

PROVIDED, HOWEVER, that:

1 Liability of Surety hereunder shall not exceed the sum of FIVE HUNDRED AND 00/100th DOLLARS ($500.00) as to any one installation, and shall not exceed the sum of FIVE HUNDRED THOUSAND AND 00/100th DOLLARS ($500,000.00) in the aggregate, and

2 There shall be no liability hereunder as to any purchaser to whom there has not been issued at the time of installation and purchase completed registration card which is enclosed with a facsimile of this bond, and who has not returned such card in accordance with this guarantee.

3 Claim must be made by such original purchaser in writing within 30 days from the expiration of these guarantees upon EcoWater Systems LLC, PO Box 64420, St. Paul, MN 55164, to perform the terms of said guarantee, and notice of any default on such guarantee must be sent to Surety at its address by Registered Mail.

SAFECO INSURANCE COMPANY OF AMERICA

This is to certify that the original of the above guarantee and bond is on file with Bank of New York.

BANK OF NEW YORK
As Trustee

WATER CONDITIONING

Water conditioning is the treatment of several conditions occuring in household water. The conditions treated by the unit you have purchased are: (1) Hardness, (2) Iron, (3) Sediments, (4) Barium and (5) Radium 226 and 228. These are described below:

1. HARDNESS is a term to describe the presence of calcium and magnesium minerals in water. A chemical analysis accurately measures the amount of minerals in grain weight. For example, one gallon of water with 5 grains per gallon (gpg) hardness has dissolved minerals, that if solidified, about equals the size of one ordinary aspirin tablet. One gallon of water, 25 gpg hard, has a mineral content equal in size to 5 aspirin tablets. Water hardness varies greatly across the country. It generally contains from 3 to 100 gpg.

Hard water affects living in general. Hardness minerals combine with soap to make a soap curd. The curd greatly reduces the cleaning action of soap. Precipitated hardness minerals form a crust on cooking utensils, appliances, and plumbing fixtures. Even the tastes of foods are affected. A water softener removes the hardness minerals to eliminate these problems, and others.

IMPORTANT: Water softeners using sodium chloride (NaCl) salt for regeneration add sodium to the water. Persons on sodium restricted diets should consider the added sodium as part of their overall intake. Water softeners using potassium chloride (KCl) salt for regeneration add potassium to the water. Persons on potassium restricted diets should consider the added potassium as part of their overall intake.

2. IRON in water is measured in parts per million (ppm). The total* ppm of iron, and type or types*, is determined by chemical analysis. Three different types of iron in water are: (a) Ferrous (clear water), (b) Ferric (red water), and (c) Bacterial and organically bound iron.

*Water may contain one or more of the four types of iron and any combination of these. Total iron is the sum of the contents.

a. Ferrous (clear water) iron is soluble and dissolves in water. It is usually detected by taking a sample of water in a clear bottle or glass. Immediately after taking, the sample is clear. As the water sample stands, it gradually clouds and turns slightly yellow or brown as air oxidizes the iron. This usually occurs in 15 to 30 minutes. An EcoWater Systems conditioner will remove moderate amounts of this type of iron (see specifications).
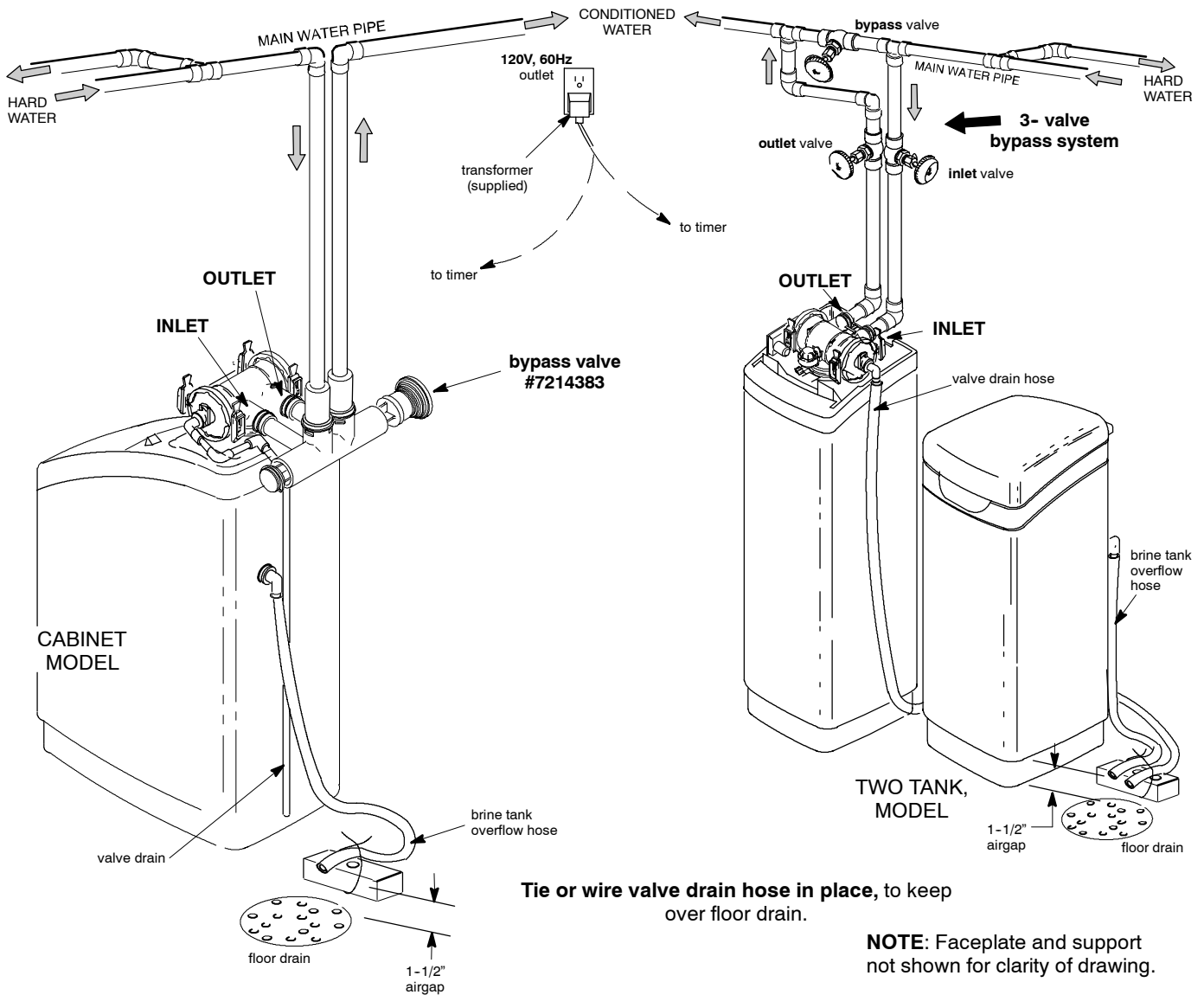
b. Ferric (red water), and **c. Bacterial and organically bound** irons are insoluble. This iron is visible immediately when drawn from a faucet because it has oxidized before reaching the home. It appears as small cloudy yellow, orange, or reddish suspended particles. After the water stands for a period of time, the particles settle to the bottom of the container. Generally these irons are removed from water by filtration. Chlorination is also recommended for bacterial iron. An EcoWater Systems conditioner will remove minimal quantities (see specifications) of ferric iron.

3. SEDIMENT is fine, foreign material particles suspended in water. This material is most often clay or silt. Extreme amounts of sediment may give the water a cloudy appearance. A sediment filter normally corrects this condition.

4. BARIUM is a naturally occurring metal that makes its way into water through drilling wastes, smelting copper, and producing motor vehicle parts. The Environmental Protection Agency (EPA) has the authority to determine chemicals that cause health effects and at what levels. EPA created a list of harmful chemicals and their maximum contaminant levels (MCL), to set limits for public water supplies to maintain. Barium's MCL is 2 parts per million (PPM). The level of barium in water can be determined through a chemical analysis.

5. RADIUM is a naturally occurring radioactive metal that can be found in most drinking water at low levels. Higher levels occur when ground water passes through bedrock containing high concentrations of radium. Radium 226 and 228 are also regulated by EPA with an MCL of 5 picocuries per liter (pCi/l). A chemical analysis is needed to measure the concentration of Radium 226 and 228.

FIGURE 1 – TYPICAL INSTALLATION DRAWINGS

MAIN WATER PIPE

CONDITIONED WATER

bypass valve

HARD WATER

120V, 60Hz outlet

MAIN WATER PIPE

HARD WATER

3- valve bypass system

transformer (supplied)

outlet valve

inlet valve

to timer

to timer

OUTLET

INLET

OUTLET

INLET

valve drain hose

bypass valve #7214383

brine tank overflow hose

CABINET MODEL

TWO TANK, MODEL

brine tank overflow hose

valve drain

floor drain

1–1/2" airgap

floor drain

1–1/2" airgap

Tie or wire valve drain hose in place, to keep over floor drain.

**NOTE**: Faceplate and support not shown for clarity of drawing.

INLET – OUTLET PLUMBING OPTIONS

- ALWAYS INSTALL either an EcoWater Systems bypass valve #7214383, or a 3 valve bypass system. Bypass valves allow you to turn off water to the softener for repairs if needed, but still have water in house pipes.

OTHER REQUIREMENTS

- A drain is needed for regeneration discharge water. A floor drain is preferred, close to the EcoWater Systems conditioner. A laundry tub, standpipe, etc., are other drain options.

FIGURE 2 – DRAIN OPTIONS

drain hose

1–1/2" airgap

STANDPIPE

drain hose

1–1/2" airgap

LAUNDRY TUB
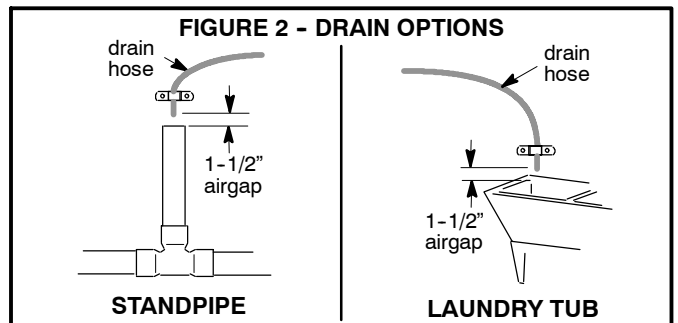
- A 120V–60Hz, grounded, continuously "live", electrical outlet is needed within 10' of the EcoWater Systems conditioner.

NOTE: Codes in the state of Massachusetts require installation by a licensed plumber. For installation, use plumbing code 248–CMR of the Commonwealth of Massachusetts.

1. INSTALL BYPASS VALVE and/or COPPER TUBES

a. IF INSTALLING AN ECOWATER SYSTEMS BY-PASS VALVE, put lubricated o-ring seals onto both bypass valve ports (FIGURE 3B). Carefully slide the bypass valve into the softener valve and install the "C" clips.

b. Slide a lubricated o-ring seal onto each of the copper tubes. Carefully insert the copper tubes into the bypass valve (FIGURE 3B), or into the softener valve (FIGURE 3 and 3A). Then install the "C" clips.

NOTE: For lubrication, use silicone grease approved for potable water supplies.

2. TURN OFF WATER SUPPLY

a. Close the main water supply valve, near the well pump or water meter.

b. Shut off the electric or fuel supply to the water heater.

c. Open high and low faucets to drain all water from the house pipes.
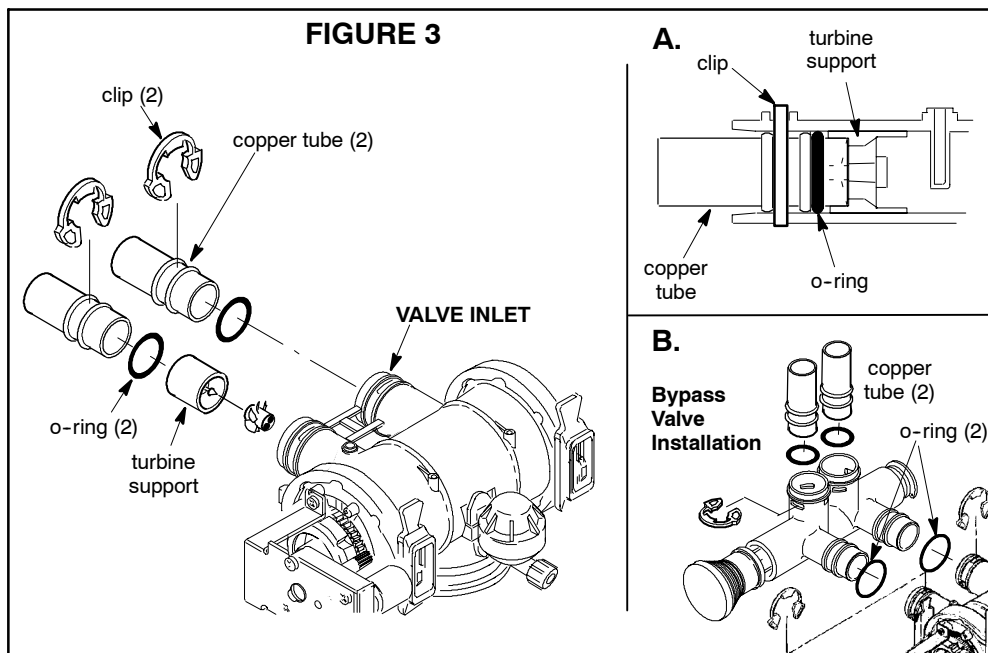
3. INSTALLING THREE VALVE BYPASS

If installing a 3-valve bypass system, plumb as needed using FIGURE 1 as a guide. When installing sweat copper, **be sure to use lead-free solder and flux**, required by federal and state codes. Use pipe joint compound on outside pipe threads.

4. ASSEMBLE INLET AND OUTLET PLUMBING

Measure, cut, and loosely assemble pipe and fittings from the main water pipe (or from the bypass valves installed in step 3), to the inlet and outlet copper tubes, installed in step 1b.

FIGURE 3

clip (2)

copper tube (2)

o-ring (2)

turbine support

VALVE INLET

A. clip

turbine support

copper tube

o-ring

B.

Bypass Valve Installation

copper tube (2)

o-ring (2)

5. CONNECT INLET AND OUTLET PLUMBING

a. SOLDERED COPPER

(1) Thoroughly clean and flux all joints.

(2) Pull the plastic "C" clips and remove the inlet and outlet tubes from the valve. Remove o–rings from the tubes. **DO NOT solder with tubes in the valve.** Soldering heat will damage the valve.

NOTE: If installing a ground as shown in FIGURE 4A, **place hose clamps on copper tubes before soldering** (see step 6a).

(3) Make all solder connections. Be sure to keep fittings fully together, and pipes square and straight.

b. THREADED PIPE

(1) Apply pipe joint compound to all outside pipe threads.

(2) Tighten all threaded joints.

(3) If soldering to the inlet and outlet tubes, observe step **a** above.

c. CPVC PLASTIC PIPE

(1) Clean, prime and cement all joints, following the manufacturer's instructions supplied with the plastic pipe and fittings.

(2) If soldering to the inlet and outlet tubes, observe step **a** above.

6. COLD WATER PIPE GROUNDING

The house cold water pipe (metal only) is often used as a ground for the house electrical system. The 3-valve bypass type of installation, shown in FIGURE 1, will maintain ground continuity. If you use the plastic bypass, continuity is broken. To restore the ground, do either step **a** or **b** following.

a. Use the included gound clamp kit to make a jumper across the inlet and outlet copper tubes, FIGURE 4A.

b. Install a #4 copper wire across the removed section of main water pipe, securely clamping at both ends, FIGURE 4B (parts not included).
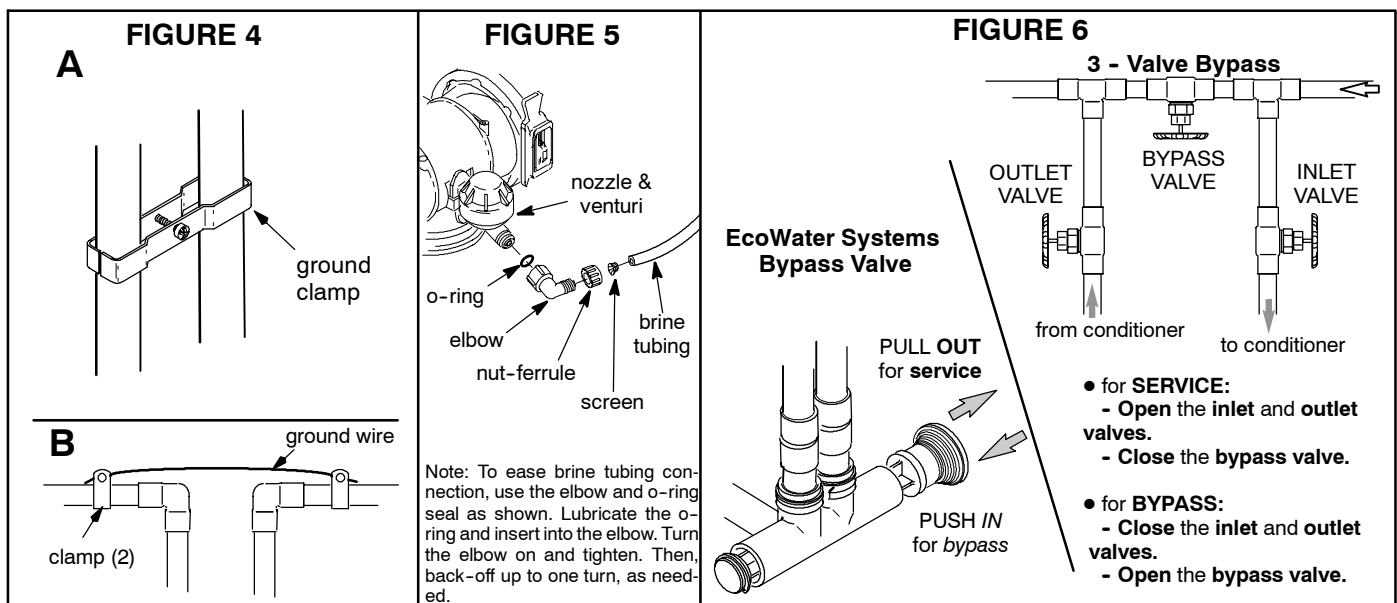
7. INSTALL VALVE DRAIN HOSE

NOTE: See valve drain options on page 5.

a. Connect a length of 1/2" I.D. hose (check codes) to the valve drain elbow, on the controller. Use a hose clamp to hold the hose in place. Route the hose out through the notch in the back of the top cover.

b. Run the hose to the floor drain, and as typically shown in FIGURE 1, tie or wire the end to a brick or other heavy object. This will prevent "whipping" during regenerations. Be sure to provide a 1–1/2" minimum air gap, to prevent possible sewer water backup.

FIGURE 4

A

ground clamp

B

ground wire

clamp (2)

FIGURE 5

nozzle & venturi

o-ring

elbow

nut-ferrule

brine tubing

screen

Note: To ease brine tubing connection, use the elbow and o–ring seal as shown. Lubricate the o-ring and insert into the elbow. Turn the elbow on and tighten. Then, back–off up to one turn, as needed.

FIGURE 6

3 – Valve Bypass

BYPASS VALVE

OUTLET VALVE

INLET VALVE

EcoWater Systems Bypass Valve

PULL **OUT** for **service**

PUSH *IN* for *bypass*

from conditioner

to conditioner

● for **SERVICE**:
- **Open** the **inlet** and **outlet** valves.
- **Close** the **bypass valve**.

● for **BYPASS**:
- **Close** the **inlet** and **outlet** valves.
- **Open** the **bypass valve**.

7

8. INSTALL BRINE TANK OVERFLOW HOSE

a. Connect a length of 1/2" I. D. hose to the brine tank overflow elbow and secure in place with a hose clamp.

b. Run the hose to the floor drain, or other suitable drain point **no higher than the drain fitting** on the tank. If the tank overfills with water, the excess water flows to the drain point.

9. On Two Tank models, connect the brine tubing to the nozzle and venturi housing.

10. ADD WATER AND SALT TO THE BRINE TANK

a. Using a pail or garden hose, add about 3 gallons of water into the brine tank. DO NOT pour into the brinewell.

b. Add salt to the brine tank. It is recommended to fill the brine tank no more than 1/2 full. You can use most water conditioner salts, but it must be clean. Recommended nugget, pellet or coarse solar salts have less than 1% impurities. Salt storage capacity is shown on page 22.

NOTE: See page 17 for additional information on salt.

11. SANITIZING THE ECOWATER SYSTEMS CONDITIONER

Care is taken at the factory to keep your EcoWater System conditioner clean and sanitary. Materials used to make the unit will not infect or contaminate your water supply, and will not cause bacteria to form or grow. However, during shipping, storage, installing and operating, bacteria could get into the unit. For this reason, sanitizing as follows is suggested ⒈ when installing.

...Remove the brinewell cover and pour about 1–1/2 oz. (2 to 3 tablespoons) of common household bleach into the softener brinewell. Clorox, Linco, Bo-Peep, White Sail, Eagle, etc. are brand names of bleach readily available. **Replace the brinewell cover.**

...The final step in the sanitizing procedure is done as you complete the following steps, including controller programming on page 9.

⒈ Recommended by the Water Quality Association. On some water supplies, the EcoWater System Unit may need periodic disinfecting.

12. CONNECT TRANSFORMER

a. Plug the transformer into a continuously "live", grounded, 120V–60Hz house electrical outlet, in a dry location and approved by local codes. *THE UNIT WORKS ON 24V ONLY. DO NOT CONNECT WITHOUT THE TRANSFORMER.*

13. START A RECHARGE

Press the RECHARGE keypad, move cursor to Set Recharge Now and press SELECT/EXIT (↵) keypad, starting a recharge. This recharge draws the sanitizing bleach into and through the EcoWater Systems conditioner. Any air remaining in the unit is purged to the drain.

COMPLETE THE PROGRAMMING STEPS ON PAGES 9 AND 10.
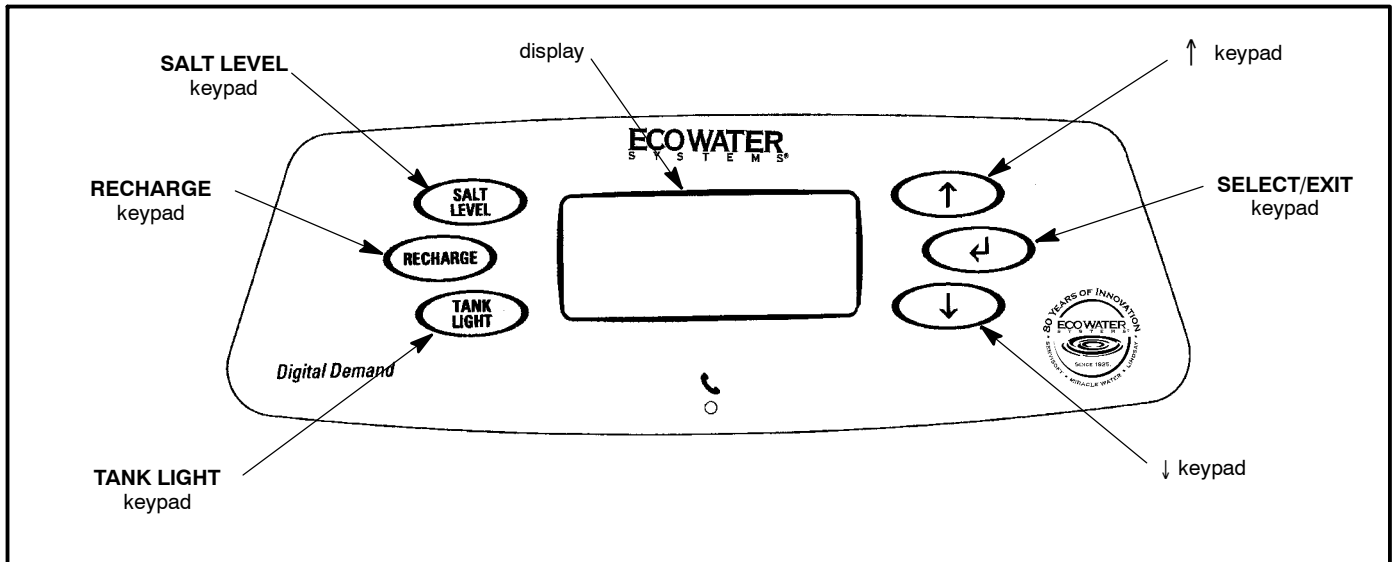
THE FOLLOWING STEPS ARE FOR FIRST TIME SET UP ONLY.

When the transformer is plugged in, a "beep" will sound, followed by the factory set model code display and software version for a few seconds. Then, 12:00 PM present time display.

```
* E c o W a t e r   S y s t e m s *

      M O D E L   R 2 0
      V E R S I O N   M 1 . 0
```
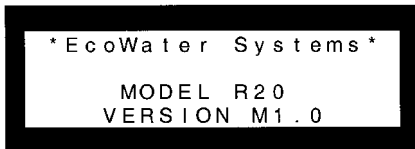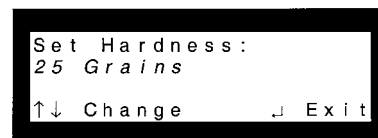
1. MODEL CODE: The controller is factory set to the model code, which provides the shortest recharge times and greatest water savings. Verify the correct model code or set if needed.

Note: To reset the model code, see page 15.

2. SET THE CLOCK: Use the (↑) or (↓) keypads to set the present time of day, being sure AM or PM shows, as applicable. Press (↑) to move the display ahead; press (↓) to move the time backward. **NOTE**: Each press of a keypad changes the time by 1 minute. Holding a keypad in changes the time by 32 minutes each second. Pressing the SELECT/EXIT (↵) keypad will set the clock.

```
S e t   C l o c k :
1 1 : 4 4 A M

↑ ↓   C h a n g e        ↵   E x i t
```

3. SET WATER HARDNESS: The controller is factory set to 25 grains. Set the grains per gallon hardness of your water supply. Water hardness is determined by water analysis, or call your local water department. Use the (↑) keypad to advance the number; use the (↓) keypad to reduce the number. Each press of a keypad changes the display by 1. Hold down the keypad to scroll. After 25, scrolling will be at a faster rate. **NOTE**: To compensate for iron in the water, add 5 to the hardness number for each 1 ppm of iron. Pressing the SELECT/EXIT (↵) keypad will set the hardness level. **NOTE:** If using potassium chloride (KCl) instead of standard sodium chloride (NaCl) water softener salt, hardness setting must be increased by 25%.
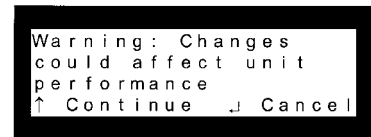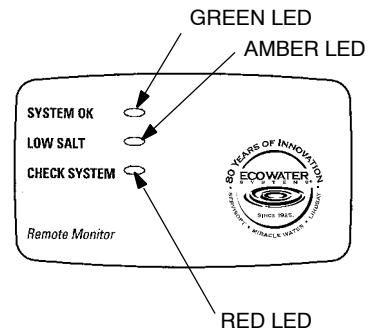
```
S e t   H a r d n e s s :
2 5   G r a i n s

↑ ↓   C h a n g e        ↵   E x i t
```

4. SET RECHARGE (REGENERATION) TIME:

The controller is factory set to 2:00 AM. At this setting, the EcoWater Systems conditioner begins recharge, or regeneration, ending no later than 5:30 AM. This is a good time in most households because water is not being used. If **hot** water is used while the unit is regenerating, the water heater will refill with *hard* water. To select a different recharge start time, use the (↑) or (↓) keypad. Pressing the SELECT/EXIT (↵) keypad will set the recharge time.

```
Set Recharge
Time: 2:00AM

↑↓ Change      ↵ Exit
```
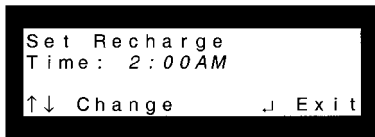
5. REMOTE SET-UP: Press SELECT/EXIT (↵)

to enter the Primary Menu. Move the cursor next to Advanced/Service Menu and press SELECT/EXIT (↵) to enter this Menu. Warning screen will show. Press (↑) keypad to continue. Move cursor to Test Remote and press SELECT/EXIT (↵) to enter this screen. The controller will start sending a signal to the remote every 3 seconds. Press reset on the back of remote. When the remote is receiving this signal, the LED's will flash red, amber, green. Now remote can be placed in a convenient location. The remote may not work in all places in your home. If the red LED flashes twice every 3 seconds, the remote is out of range of signal and needs to be repositioned. Press SELECT/EXIT (↵) to exit to the Advanced/Service Menu. Move square cursor (■) to EXIT and press SELECT/EXIT (↵). Now the unit should start transmitting a normal signal.

GREEN LED
AMBER LED

SYSTEM OK
LOW SALT
CHECK SYSTEM

Remote Monitor

80 YEARS OF INNOVATION
ECOWATER
SINCE 1925

RED LED

```
Warning: Changes
could affect unit
performance
↑ Continue  ↵ Cancel
```

```
Test Remote:
Sending Message

            ↵ Exit
```

6. Press the RECHARGE keypad to get to the recharge menu. Move the cursor to Start Recharge Now and press the SELECT/EXIT (↵), starting a recharge. This recharge **draws the bleach** (see step 11, page 8) through the EcoWater Systems conditioner **to sanitize** it and to purge any air remaining in the resin tank assembly.

```
SALT
LEVEL          ↑
RECHARGE       ↵
TANK
LIGHT          ↓

Digital Demand      ☎
```

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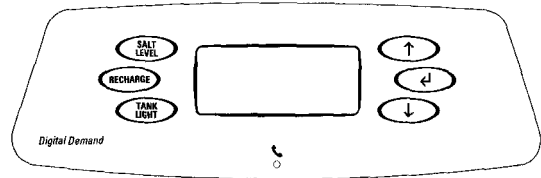
7. RESTART THE WATER HEATER: Turn on the electric or fuel supply to the water heater, and light the pilot, if applies.

NOTE: When the sanitizing regeneration is over, all remaining bleach is flushed from the conditioner and your cold water supply is ready for use. However, the water heater is filled with HARD water and, as hot water is used, it refills with conditioned water. In a few days, the hot water will be fully conditioned. To have fully conditioned hot water immediately, wait until the recharge (step 6) is over. Then, drain the water heater until water runs cold.

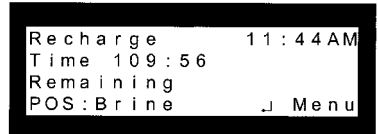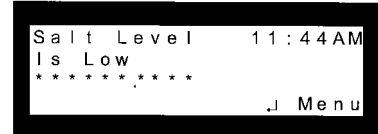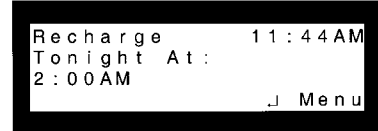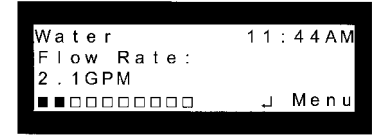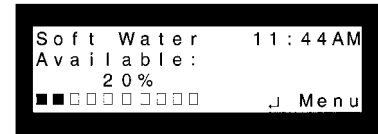### INSTALLATION OF THE DIGITAL DEMAND ECOWATER CONDITIONER IS COMPLETE.
Additional faceplate controller features and options are described on following pages.

FEATURES AND OPTIONS

NORMAL SCREEN VIEWS

The display will scroll through as many as 5 screens at an interval of 4 seconds each.

● Soft Water Available will show a percent of available soft water and a bar graph at the bottom of the display.

● Water Flow Rate shows gallons per minute (GPM) flowing through the system at that time and a moving bar graph at the bottom of the screen.

● Recharge Tonight is shown only if the unit will be initiating a recharge that night.

● Salt Level is Low is shown only if the salt level is below the amount set for warning.

● If the unit is in recharge, the display will show remaining time in recharge and current stage of recharge.

```
Soft Water     11:44AM
Available:
      20%
■■□□□□⊐⊐□□      ⌐Menu
```

```
Water          11:44AM
Flow Rate:
2.1GPM
■■□□□□□□□□      ⌐Menu
```

```
Recharge       11:44AM
Tonight At:
2:00AM
               ⌐Menu
```

```
Salt Level     11:44AM
Is Low
**********
               ⌐Menu
```

```
Recharge       11:44AM
Time 109:56
Remaining
POS:Brine      ⌐Menu
```

PROGRAM MEMORY: If electrical power to the EcoWater Systems conditioner goes off, the display is blank, but the faceplate controller keeps the correct time for at least two days. When electrical power comes on again, you have to verify clock time is correct. The MODEL CODE, HARDNESS and RECHARGE TIME never need resetting unless a change is desired.

Even if the controller is incorrect, after a long power outage, the unit works as it should to keep your water conditioned. However, regenerations may occur at the wrong time of day until you reset the controller to the correct time of day. To reset present time, see step 2 on page 9.

CONTROL FEATURES: There are three keypads on the left side of the display. **Salt Level** keypad is used when adding salt to the brine tank. The level number on the brinewell corresponds to the number to program into the controller. **Recharge** keypad has two options: Set/Cancel recharge tonight, which either sets or cancels a recharge for that night and Start Recharge Now, which will start a recharge immediately. **NOTE**: If in a recharge, and the Recharge keypad is pressed, it will advance the valve to the next regeneration cycle. On cabinet style units, there is also a **Tank Light** keypad. This will turn tank light on or off, and will work while in any screen. The tank light will automatically turn off after 4 minutes.
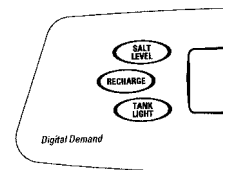
● **SOUND "BEEPER"–** A "beeper" sounds while pressing keypads for controller setup. One beep signals a change in the faceplate display. Repeated beeps means the controller will not accept a change from the keypad you have pressed, telling you to use another keypad. For example, while setting the hardness number, the beeper sounds repeatedly when the display reaches 1 using the (↓) keypad or 160 using the (↑) keypad.

SALT LEVEL: This feature is used when salt is added to the conditioner. Press the salt level keypad and use the (↑) keypad to reset the level of salt as it corresponds to the decal on the brinewell. Press the SELECT/ EXIT (⌐) to set and return to Normal Screen Views.

INITIATING EXTRA RECHARGES

RECHARGE NOW: Press the Recharge keypad to go to the recharge menu. Move square cursor down to Start Recharge Now. Press SELECT/EXIT keypad and a recharge begins immediately.

To assure an adequate supply of conditioned water, at times of unusual or *unexpected* high water use demand, use the RECHARGE NOW feature. For example, if you have guests and the Soft Water Available screen is at or below 50%, you could deplete conditioned water capacity before the next recharge is automatically initiated. To be sure this will not happen, use RECHARGE NOW to restore 100% conditioned water capacity.

RECHARGE TONIGHT: Press the Recharge keypad to go to the recharge menu. Move cursor down to Set/Cancel Recharge Tonight. Press SELECT/EXIT keypad to return to Normal Screen Views. When this feature is set, the EcoWater Systems conditioner will regenerate at the next programmed start time. This feature is beneficial to assure a sufficient supply of conditioned water for *expected* heavy water usage the next day.

To cancel a recharge when RECHARGE TONIGHT <u>is</u> shown, press the Recharge keypad to go to the recharge menu. Move cursor down to Set/Cancel Recharge Tonight. Press SELECT/EXIT keypad to return to Normal Screen Views.
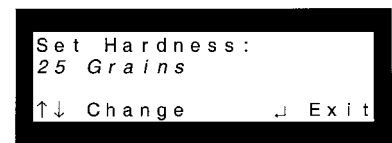
PRIMARY MENU

The following is a description of the options in the Primary Menu. To enter this menu press SELECT/EXIT (↵) keypad and move square cursor (■) to menu choice. To exit to Normal Screen Views move square cursor (■) to EXIT, which appears at either the top or the bottom of this menu. If no keypad has been pressed display will show for 4 minutes before returning back to the Normal Screen Views.
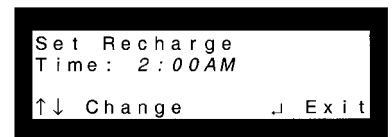
Set Clock: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Set Clock. Again, use the (↑) or (↓) keypads to set the present time of day, being sure AM or PM shows, as applicable. Press (↑) to move the display ahead; press (↓) to move the time backward. **NOTE**: Each press of a keypad changes the time by 1 minute. Holding a keypad in changes the time by 32 minutes each second. Press the SELECT/EXIT (↵) keypad to set.

```
Set Clock:
11:44AM

↑↓ Change        ↵ Exit
```
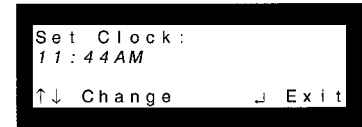
Set Water Hardness: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Set Hardness. Press the SELECT/EXIT (↵) keypad once to display a flashing number and GRAINS. Set the grains per gallon hardness of your water supply. Use the (↑) keypad to advance the number; use the (↓) keypad to reduce the number. Pressing the SELECT/EXIT (↵) keypad will set the hardness level. **NOTE:** If using potassium chloride (KCl) instead of standard sodium chloride (NaCl) water softener salt, hardness setting must be increased by 25%.

```
Set Hardness:
25 Grains

↑↓ Change        ↵ Exit
```

Set Recharge (Regeneration) Time: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Set Recharge Time. Press the SELECT/EXIT (↵) keypad once to display a flashing 2:00 AM. At this setting, the EcoWater Systems conditioner begins recharge, or regeneration, at 2:00 AM., ending no later than 5:30 AM. This is a good time in most households because water is not being used. If **hot** water is used while the unit is regenerating, the water heater will refill with *hard* water. To select a different recharge start time, use the (↑) or (↓) keypad. Pressing the SELECT/EXIT (↵) keypad will set the recharge time.

```
Set Recharge
Time: 2:00AM

↑↓ Change        ↵ Exit
```

Primary Menu, continued

Water Flow Rate: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Water Flow Rate. Press the SELECT/EXIT (↵) keypad. When selected, this screen will show the water flow rate in gallons per minute (GPM) or liters per minute (LPM) with the moving bar graph at the bottom of the display.

```
Water            11:44AM
Flow Rate:
2.1GPM
■■□□□□□□□□    ↵ Menu
```
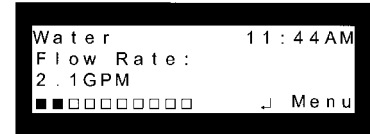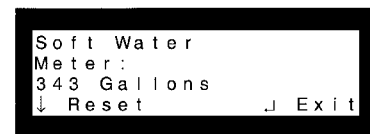
Water Used Today: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Water Used Today. Press the SELECT/EXIT (↵) keypad and the gallons/liters used since midnight will be shown in the display.

```
Soft Water
Used Today:
588 Gallons
              ↵ Exit
```

Average Water Use: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Average Water Use. Press the SELECT/EXIT (↵) keypad and the average gallons/liters use each day will be shown in the display.

```
Average Daily
Water Use:
1522 Liters
              ↵ Exit
```
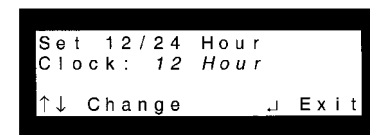
Soft Water Meter: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Soft Water Meter. Press the SELECT/EXIT (↵) keypad. This screen is similar to a trip odometer in that it will count the number of gallons/liters through the system until it is reset. To reset back to zero press the (↓) keypad.

```
Soft Water
Meter:
343 Gallons
↓ Reset       ↵ Exit
```

Set Rolling Screen: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Set Rolling Screen. Press the SELECT/EXIT (↵) keypad. This menu will disable the Normal Screen Views from scrolling and will show only the screen that is most current.

```
Set Rolling Display
Screens: ON

↑↓ Change     ↵ Exit
```
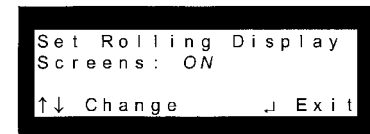
Set 12/24 Hour Clock: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Set 12/24 Hour Clock. Press the SELECT/EXIT (↵) keypad. Moving the (↑) or (↓) keypads will change clock display from 12 hour (AM & PM) or 24 hour format.

```
Set 12/24 Hour
Clock: 12 Hour

↑↓ Change     ↵ Exit
```

Set Gallons/Liters: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Set Gallons/Liters. Press the SELECT/EXIT (↵) keypad. Moving the (↑) or (↓) keypads will change displays to indicate water in gallons or liters.

```
Set Gallons/Liters:
Gallons

↑↓ Change     ↵ Exit
```
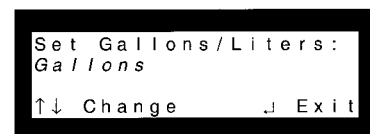
Set Grains/PPM: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Set Grains/PPM. Press the SELECT/EXIT (↵) keypad. Change between diplaying hardness units in grains or parts per million (PPM).

```
Set Grains/PPM:
PPM

↑↓ Change     ↵ Exit
```
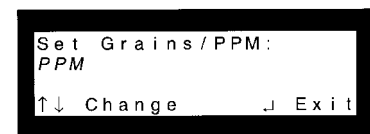
Primary Menu, continued

Remote Status: Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Remote Status. Press the SELECT/EXIT (↵) keypad. The current remote status is displayed.

```
Remote:Installed
Status:Low Salt

              ↵ Exit
```

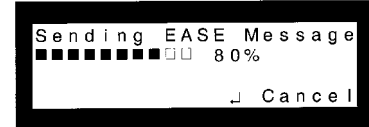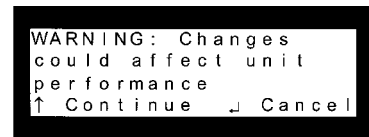**Send E.A.S.E. Message:** Enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Send E.A.S.E. Message. Press the SELECT/EXIT (↵) keypad. The unit will automatically start sending E.A.S.E. message and show a progress bar on the display. See page 18.

```
Sending EASE Message
■■■■■■■□□ 80%

              ↵ Cancel
```

Advanced/Service: By entering these menus, a warning screen will first be displayed. Only technicians or knowledgeable users should use these menus.

```
WARNING: Changes
could affect unit
performance
↑ Continue   ↵ Cancel
```

ADVANCED / SERVICE MENU

The following is a description of the options in the Advanced/Service Menu. To enter any of the following menus, press SELECT/EXIT (↵) to enter Primary Menu. Press the (↑) or (↓) keypads until cursor is next to Advanced/Service. Press the SELECT/EXIT (↵) keypad to enter this menu. Warning screen will show, press the (↑) keypad to continue. To exit to Normal Screen Views move square cursor (■) to EXIT, which appears at either the top or the bottom of this menu. If no keypad has been pressed display will show for 4 minutes before returning back to the Normal Screen Views.

Set Language: Press the (↑) or (↓) keypads until cursor is next to Set Language. Language can be changed from English to Spanish or French.

```
■ English
  Español
  Français
↑↓ Change   ↵ Select
```

Test Remote: Press the (↑) or (↓) keypads until cursor is next to Test Remote and press SELECT/EXIT (↵).   At set up, the unit will send a signal to the remote every 3 seconds to allow for correct positioning of remote monitor. Press SELECT/EXIT (↵) to exit. See page 16 for information on the Remote Monitor.

```
Test Remote:
Sending Message

              ↵ Exit
```

Set Low Salt Alert: Press the (↑) or (↓) keypads until cursor is next to Set Low Salt Alert and press SELECT/EXIT (↵). Use the (↑) or (↓) keypads to change Alert Level. At this level the controller will signal that salt needs to be added to the conditioner brine tank. Press SELECT/EXIT (↵) to exit.

```
Set Low Salt
Alert Level: 2

↑↓ Change    ↵ Exit
```

NOTE: This warning will indicate the softener's inability to reduce barium & radium 226/228 effectively. Changing the Low Salt Alert to less than 2 will void the proper function of this indicator.

Efficiency Mode: Press the (↑) or (↓) keypads until cursor is next to Efficiency Mode and press SELECT/EXIT (↵). Default is **Auto Adjusting** which has a minimum efficiency of 3350 grains/lb of salt. Use the (↑) or (↓) keypads to change to either **High Capacity** which sets the regeneration salt doses that are increased by a certain % to handle applications requiring 1.5 PPM (parts per million) or less soft water, or to handle special cases such as low leakage requirement or problem water conditions; and **Salt Efficient** which operates at a minimum of 4000 grains/lb of salt. Changing this setting will prompt a warning that changes could affect performance. Press SELECT/EXIT (↵) to exit.
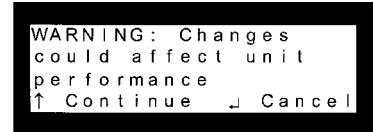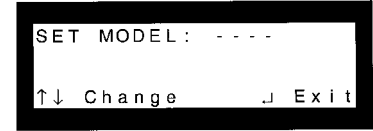
```
Set Efficiency Mode:
Auto Adjusting

↑↓ Change    ↵ Exit
```

```
Warning: Changes
could affect unit
performance
↑ Continue   ↵ Cancel
```
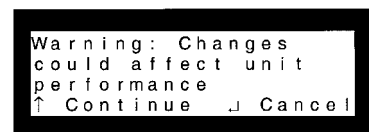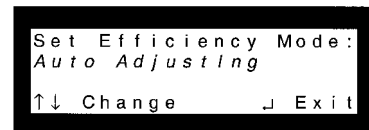
NOTE: California regulations require the Efficiency Mode to be ON for sale in California.

Advanced/Service Menu, continued

Set Model: The controller is factory set to the model code, which provides the shortest recharge times and greatest water savings. For operation at higher salt efficiency levels, the alternate model code selection is required (see the product specification sheet). Do the following to change to this code, if desired.

1) Press the (↑) or (↓) keypads until cursor is next to Set Model and press SELECT/EXIT (↵). Warning screen will display, press (↑) to continue.
2) Use the (↑) or (↓) keypads to change to new model code. **Be sure to set the correct code, or the EcoWater conditioner will operate on incorrect timing. NOTE**: If this feature is changed, it will delete all information stored in the controller (Hardness, Recharge time will have to be reset. All usage history will be cleared). When you are certain the correct code appears, press SELECT/EXIT (↵) to exit. Warning screen will appear after changing model code, press (↑) to continue. The display will return to the start-up screens.

```
SET  MODEL:   - - - -


↑↓  Change        ↵ Exit
```

```
WARNING:  Changes
could  affect  unit
performance
↑ Continue    ↵ Cancel
```

MODEL NUMBER (on rating decal)	Required Code	Alternate Code
ECR 3000R20	**R20**	**E20**
ERR 3000R20	**R20+**	**E20+**
ECR 3000R30	**R30**	**E30**
ECR 3002R30	**2R30**	**2E30**
ERR 3002R30	**2R30**	**2E30**
ECR 3002R40	**2R40**	**2E40**
ECR 3002R50S	**2H50**	**-**
ECR 3002R70	**2R70**	**2E70**

Restore To Factory Settings: Press the (↑) or (↓) keypads until cursor is next to Restore System and press SELECT/EXIT (↵). Default is No. If set to Yes will restore controller to factory settings. **NOTE**: This will affect **ALL** settings, and controller will go through first time set-up screens again. Press SELECT/EXIT (↵) to exit.

```
Restore  To  Factory
Settings:  NO

↑↓  Change        ↵ Exit
```

15
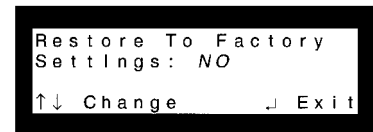
This EcoWater Systems conditioner comes with a Remote Monitor which can conveniently be placed in your home for viewing of your conditioners' status. During normal operation, the green LED will flash at intervals of 5 seconds. If the unit requires salt, the amber LED will flash, and if the unit needs to be checked the red LED will flash.
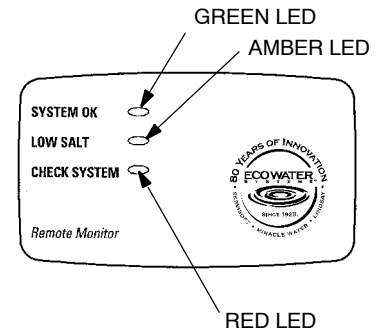
The controller on the EcoWater Systems conditioner will send a signal to the remote monitor every minute. The remote monitor will listen for a signal every 10 minutes. Any changes in softener status could possibly take up to 10 minutes before the remote registers the change. If the unit stops sending a signal, the remote will keep trying to listen for the signal. If after 10 minutes with no signal received, the remote will try 1 minute later and 2 minutes later to find the signal, gradually increasing the time between, but will keep trying to listen for the signal for up to two days. After 20 minutes with no signal received, the remote monitor will turn off the LED's to conserve battery life, but will still be active. After two days with no signal received, the remote monitor will shut down untill the reset button is pushed (on back of remote).

The EcoWater Systems remote uses 3 "AAA" batteries, which are included. To check batteries, press reset button on back of remote monitor. If batteries are good, the LED's on the remote should scroll green, amber, red. If LED's do not light, batteries need to be changed.

If there is another EcoWater Systems conditioner within range of the remote, it may cause a conflict with the channel that the remote monitor is receiving. If the remote monitor displays the wrong message (example: low salt when salt is above warning level) this is an indication that the remote monitor is receiving a different signal. Follow the steps below to change the remote channel.

Set Remote Channel: Enter Advanced/Service Menu. Move cursor next to Set Remote Channel and press SELECT/EXIT (↵). Default is random from 1 to 16. Press (↑) or (↓) to select new channel. Press SELECT/EXIT (↵) to exit to the Primary Menu and press reset button on back of remote monitor.
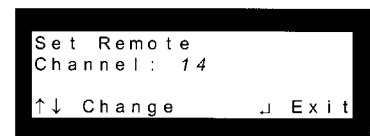
NOTE: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

REFILLING WITH SALT

Remove the brine tank cover and check the salt storage level frequently. If the conditioner uses all the salt before you add more, you will get hard water. **Be sure the brinewell cover is on when adding salt.**

NOTE: In humid areas, it is best to keep the salt storage level lower, and to refill more often.

RECOMMENDED SALT: Cube, pellet, coarse solar, etc., water conditioner salt is recommended. This type of salt is from high purity evaporated crystals, sometimes formed, or compressed, into briquets. It has less than 1% insoluble (will not dissolve in water) impurities. *Clean, high grade* rock salts are acceptable, but may require frequent brine tank cleaning to remove the "sludge" residue (insolubles) that collects at the bottom of the tank.

SALT NOT RECOMMENDED: Rock salt, high in impurities, block, granulated, table, ice melting, ice cream making salts, etc., are not recommended.

SALT WITH IRON REMOVING ADDITIVES: Some salts have an additive to help a water conditioner handle iron in a water supply. Although this additive may help keep the resin bed clean, it may also release corrosive fumes that will weaken and shorten the life of some EcoWater Systems conditioner parts.

BREAKING A SALT BRIDGE

Sometimes, a hard crust or salt bridge forms in the brine tank. It is usually caused by high humidity or the wrong kind of salt. When the salt bridges, an empty space forms between the water and the salt. Then, salt will not dissolve in the water to make brine. Without brine, the resin bed is not regenerated and you will have hard water.

If the brine tank is full of salt, it is hard to tell if you have a salt bridge. Salt is loose on top, but the bridge is under it. Take a broom handle, or like tool, and push it straight down into the salt. If a hard object is felt, it's most likely a salt bridge. *Carefully* push into the bridge in several places to break it.
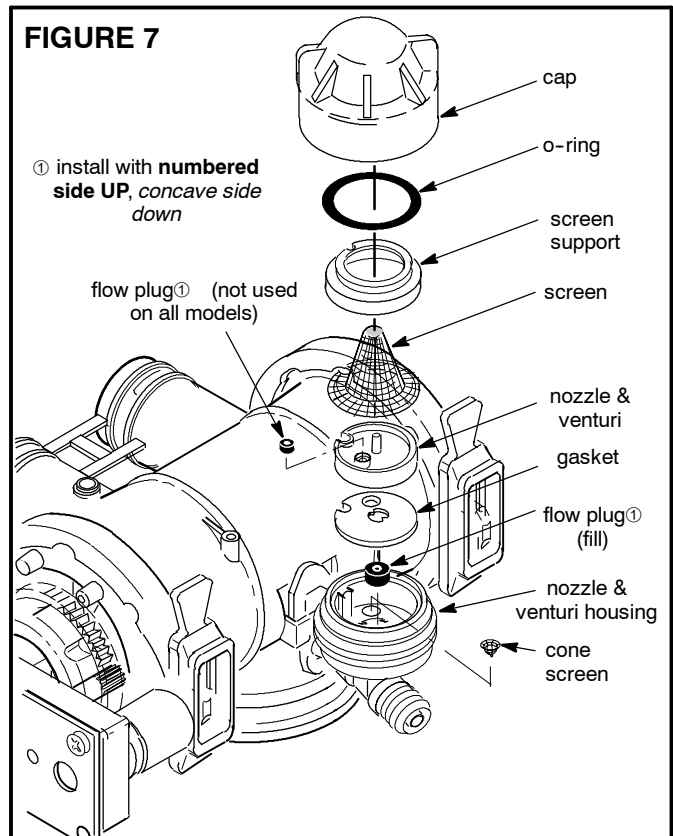
RESIN BED CLEANING

If the water supply contains "clear water " iron (see page NO TAG), regular resin bed cleaning is needed to keep the bed from coating with iron. Use resin bed cleaner, available from EcoWater Systems, following directions on the container. Clean the resin every 6 months, or more often if iron appears in your conditioned water supply.

CLEANING THE NOZZLE AND VENTURI

A clean nozzle and venturi (FIGURE 7) is a must for the EcoWater Systems conditioner to work right. This small unit creates the suction to move brine from the brine tank, into the resin tank. If it should become plugged with sand, silt, dirt, etc., the EcoWater Systems conditioner will not work, and you will get hard water.

To get to the nozzle and venturi, remove the conditioner top cover. **Be sure the conditioner is in the service cycle** (no water pressure at nozzle and venturi). Then, holding the nozzle and venturi housing with one hand, turn off the cap. *Do not lose the o-ring seal.* Lift out the screen support and screen. Then, remove the nozzle and venturi. Wash the parts in warm, soapy water and rinse in fresh water. If needed, use a small brush to remove iron or dirt. Be careful not to scratch, misshape, etc., surfaces of the nozzle and venturi. Also, check and clean the gasket and flow plug(s) if dirty.

Carefully replace all parts in the correct order. Lubricate the o-ring seal with silicone grease and locate in position. Install and tighten the cap, **by hand only. Do not overtighten** and break the cap or housing.

FIGURE 7

① install with **numbered side UP**, *concave side down*

flow plug① (not used on all models)

cap
o-ring
screen support
screen
nozzle & venturi
gasket
flow plug① (fill)
nozzle & venturi housing
cone screen

CAUTION: ALWAYS relieve water pressure in the EcoWater Systems conditioner, as follows, before removing parts from the valve or resin tank.

DE-PRESSURIZE
1. Put bypass valve(s) in bypass position.
2. Do Manual Advance step 1, page 20, (fill water to brine tank will depressurize the resin tank).
PRESSURIZE
1. Put bypass valve(s) in service position.
2. Do Manual Advance steps 2 – 5, page 20, to return unit to service.

EcoWater Systems Bypass Valve

PULL **OUT** for **service**

PUSH *IN* for *bypass*

ALTERNATE METHOD

3–VALVE BYPASS	ECOWATER SYSTEMS BYPASS VALVE
DE-PRESSURIZE	**DE-**PRESSURIZE
1. Close the INLET valve.	**1.** Close the house main water supply valve.
2. Open HOT and COLD conditioned water house faucets.	**2.** Open HOT and COLD **conditioned** water faucets.
3. Close the OUTLET valve and open the BYPASS valve.	**3.** Push the bypass valve handle to bypass position.
4. Close all house faucets.	
	Note: For hard water bypass to house faucets, reopen the main water supply valve.
PRESSURIZE	
1. Open HOT and COLD house faucets.	PRESSURIZE
2. Close the BYPASS valve and open the OUTLET valve.	**1.** Open HOT and COLD house faucets (main water supply valve open).
3. Slowly, open the INLET valve.	**2.** Pull the bypass valve handle to service position.
4. Close all house faucets	**3.** Close all house faucets.
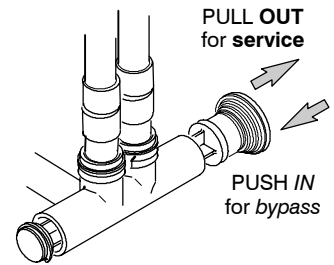
3 – Valve Bypass

water flow

OUTLET VALVE

BYPASS VALVE

INLET VALVE

from conditioner   to conditioner
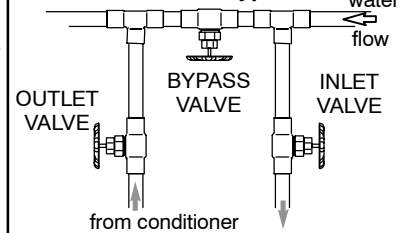
● for **SERVICE:**
  - **Open** the **inlet** and **outlet valves.**
  - **Close** the **bypass valve.**

● for **BYPASS:**
  - **Close** the **inlet** and **outlet valves.**
  - **Open** the **bypass valve.**

ECOWATER CONDITIONER OPERATION, ELECTRONIC CHECKOUT

ALWAYS MAKE THE INITIAL CHECKS FIRST

INITIAL CHECKS:

1. Does the time display show the correct time of day?
...*If display is blank,* check power source to the Eco-Water Systems conditioner.
...*If time is incorrect,* power was off for over 2 days. The conditioner resumes normal operation, when power returns, but regenerations occur at the wrong time.
...*If an error code shows* in the display (example: Error 3), go to AUTOMATIC ELECTRONIC DIAGNOSTICS, page 19.

2. Are plumbing bypass valve(s) in **service** position (all the way open or closed, as applies).

3. Are the inlet and outlet pipes connected to the EcoWater Systems conditioner inlet and outlet respectively.

**4.** Is the transformer plugged into a "live", grounded wall outlet?

5. The valve drain hose must be free of kinks and sharp bends, and not elevated over 8' above the floor.

6. Is there salt in the brine tank?

7. Is the brine tubing connected? See FIGURE 5, page 7.

8. Press SELECT/EXIT (↵) to enter Primary Menu. Move the cursor so that it is next to Set Hardness. Press the SELECT/EXIT (↵) keypad once to display the hardness setting. Be sure it is the correct setting for the household's water supply. –– Make a hardness test of the raw water and compare with the hardness setting. Also test a conditioned water sample to verify if a problem exists. ––Press SELECT/EXIT (↵) keypad to exit to Normal View Screens.

If you do not find a problem after making the initial checks, do MANUAL INITIATED ELECTRONIC DIAGNOSTICS, and the MANUAL ADVANCE REGENERATION CHECK, pages 19 and 20.

E.A.S.E.: EcoWater Systems digital demand controllers have the latest diagnostic technology. With E.A.S.E., or Electronic Automated Service Evaluation, a service person or homeowner can transmit operational data through the telephone, to a personal computer (PC). The PC processes the data to determine if all electrical functions are working normally, or helps to identify a problem should one occur. Ask your participating EcoWater Systems dealer for more information on this feature.

AUTOMATIC ELECTRONIC DIAGNOSTICS

The faceplate computer has a self–diagnostic function for the electrical system (except input power and water meter). The computer monitors electronic components and circuits for correct operation. If a malfunction occurs, the computer attempts to self correct, displaying ADJUST VALVE in the Normal View Screen. If self correction fails, an error code appears in the faceplate display.

```
** Error 1 **
Service Required
↑ EASE ↵ Diagnostics
```
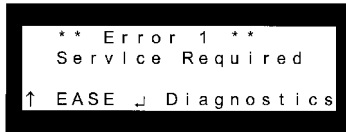
The chart below shows the error codes that could appear, and the possible defects for each code.

While an error code appears in the display, all faceplate keypads are inoperable except the SELECT keypad. SELECT remains operational so the service person can make the MANUAL INITIATED ELECTRONIC DIAGNOSTICS, below, to further isolate the defect, to check the water meter and to send an E.A.S.E. transmission.
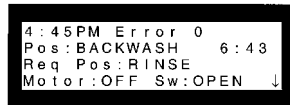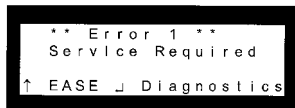
POSSIBLE DEFECT

CODE	MOST LIKELY ▶ . . . . ▶ LEAST LIKELY
Error 1 Error 2 Error 3 Error 4	wiring harness or connection to position switch / switch / valve defect causing high torque / motor inoperative
Error 5	faceplate

PROCEDURE FOR REMOVING ERROR CODE FROM FACEPLATE: 1. Unplug transformer–––– 2. Correct defect–––– 3. Plug in transformer–––– 4. Wait for 8 minutes. The error code will return if the defect was not corrected.

TROUBLESHOOTING, MANUAL INITIATED ELECTRONIC DIAGNOSTICS

To enter diagnostics, press the SELECT/EXIT (↵) to enter the menu. This screen contains information that can be used to troubleshoot errors. Use the (↑) and (↓)

```
** Error 1 **
Service Required
↑ EASE ↵ Diagnostics
```

```
4:45PM Error 0
Pos:BACKWASH    6:43
Req Pos:RINSE
Motor:OFF Sw:OPEN    ↓
```

keypads to scroll through all lines on this screen.

The first line shows time of day and error code.

Second line is **Pos:** which shows what position the valve is in. Example: Service, Fill, Brining and Brine Rinse, Backwash and Fast Rinse. The clock to the right counts backward the time for each of the positions to be completed.

The next line is **Req Pos:** which is for requested position, or what position the valve is travelling to.

Next line displays **Motor:**, either on or off, and **Sw:** (switch) either open or closed.

Next is **Trbn:** (turbine) and **Gals:** (gallons) which indicate water meter operation as follows.

000 (steady) = conditioned water not in use...no flow through the meter.

–open a nearby CONDITIONED WATER faucet–

000 to 151 (continual) = repeats display for each gallon of water passing through the meter. Gallons up by one.

If you don't get a reading in the display, with a faucet open, pull the sensor housing from the valve outlet port. Pass a small magnet back and forth in front of the sensor. You should get a reading. If you **do get a reading**, disconnect the outlet plumbing and check the turbine for binding. If you **don't get a reading**, the sensor is probably defective.

BACK OF CONTROLLER
CIRCUIT BOARD
magnet
sensor housing
sensor pickup
turbine support
turbine
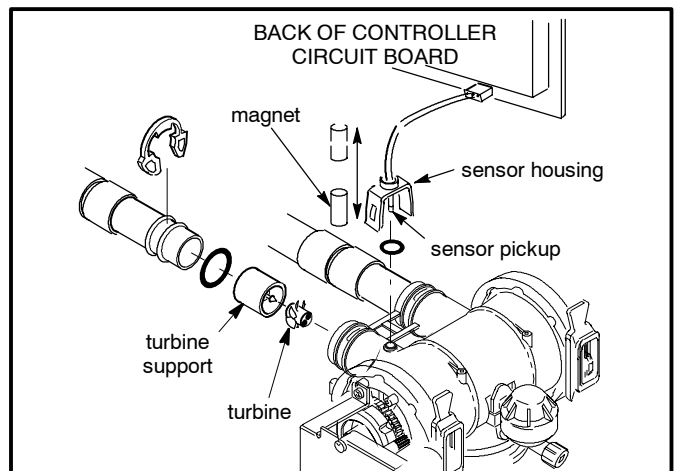
continued from page 19

Use the recharge keypad to manually advance the valve into each cycle and check correct switch operation, and observe the valve position indicator.

NOTE: *The position switch is closed when the plunger is depressed, open when extended.*

While in this diagnostic screen, the following information is available and may be beneficial. This information is retained by the computer from the first time electrical power is applied to the faceplate.

...**Remote:** either Installed or Not Installed.

...**Days:** displays the number of days this faceplate has had electrical power applied.

...**Rchg:** to show the number of regenerations initiated by this faceplate since power was first applied.

NOTE: This number resets to 0 if the model code is changed.

...**Last Rchg:** displays the number of days since last recharge.

...**Cap:** displays numerically the capacity the softener is operating at with 1 lowest and 5 highest.

Press the SELECT/EXIT (↵) to exit to the Advanced/Service menu, move cursor up to EXIT and press SELECT/EXIT (↵) to go to Normal Screen Views.

TROUBLESHOOTING,
MANUAL ADVANCE REGENERATION CHECK

This check verifies proper operation of the gearmotor, brine tank fill, brine draw, regeneration flow rates, and other controller functions. *Always make the initial checks, and the manual initiated diagnostics first.*

1. Press the RECHARGE keypad. Move cursor down to Start Rchg Now and press SELECT/EXIT

(↵) to start a recharge. As the EcoWater Systems conditioner enters the fill cycle of regeneration, remove the brinewell cover and, using a flashlight, observe fill water entering the tank.

a. If water does not enter the tank, look for an obstructed nozzle and venturi, fill flow plug or brine tubing FIGURE 7, page 17.

2. After verifying fill, press Recharge keypad to move the valve into brining*. A slow flow of water to the drain will begin. Verify brine draw from the brine tank by shining the flashlight into the brinewell and observing a noticeable drop in the liquid level.

*If the 2ND BACKWASH option is set, the valve will enter backwash and fast rinse before brining...see page NO TAG.

NOTE: Be sure water is in contact with the salt, and not separated by a salt bridge...see page 17.

a. If the unit does not draw brine, check for...
...dirty or defective nozzle and venturi, page 17
...nozzle and venturi not seated on the gasket, or gasket defective
...restriction in valve drain, causing a back-pressure (bends, kinks, elevated too high, etc.), installation step 7, page 7
...obstruction in brine valve or brine tubing, page NO TAG and FIGURE 5, page 7
...inner valve failure (obstructed outlet disc, wave washer defective, etc.)

3. Again press Recharge keypad to move the valve into backwash. Look for a fast flow of water from the drain hose.

a. If flow is slow, check for a plugged top distributor, backwash flow plug or drain hose.

4. Press Recharge keypad to move the valve to fast rinse position. Again look for a fast drain flow. Allow the unit to rinse for several minutes to flush out any brine that may remain from the brining cycle test.

5. To return the valve to service position, press ReCHARGE ONCE AGAIN.

OTHER SERVICE

HARD WATER BYPASS (hard water "bleeds" into conditioned water supply).

1. Defective inlet disc, seal, or wave washer (see pages 26 and 27).

2. Missing or defective o–ring(s) at resin tank to valve connection.

WATER LEAKS FROM DRAIN HOSE (during service).

1. Defective inlet disc, seal, or wave washer.

2. Defective o–ring on inlet disc shaft.

3. Defective outlet disc, seal, or wave washer.

FLOODED SALT TANK

1. Nozzle venturi plugged.

2. Defective valve seals.

3. Restricted or plugged backwash/fast rinse controls.

4. Restricted or plugged drain line.

WATER HAS SALTY TASTE

1. House water pressure low (adjust pump, if well system).

2. Partially restricted valve drain hose, top distributor, backwash flow plug, resin tank internal riser, or bottom distributor.

WIRING SCHEMATIC
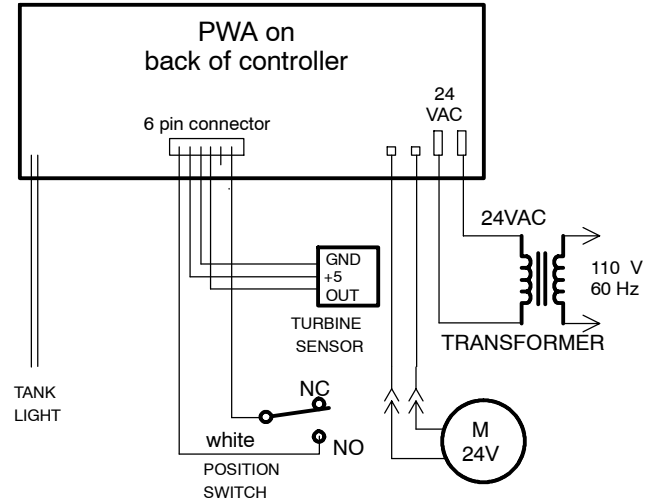
FOR FUTURE REFERENCE, ENTER THE FOLLOWING INFORMATION

MODEL NO. ①② _____   SERIAL NO. ①② _____

DATE CODE ② _____   INSTALLATION DATE _____

WATER HARDNESS_____ GPG   IRON CONTENT_____ PPM

WATER HARDNESS SETTING_____ (see page 15)

① on rating decal   ② on shipping carton
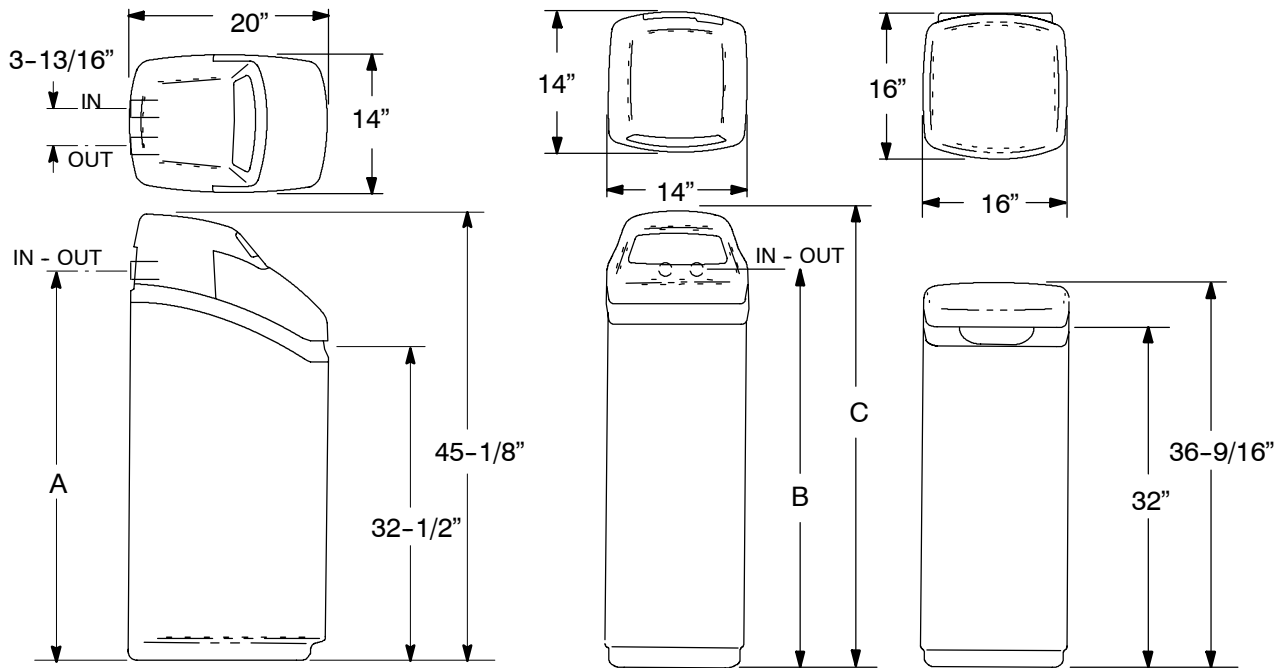
MODEL	NOMINAL RESIN TANK SIZE	A	B	C
ECR 3000R20	8" DIA. X 35"	39.5"	–	–
ECR 3000R30, ECR 3002R30, ERR 3000R20	10" DIA. X 35"	39.5"	39.5"	44.8"
ECR 3002R40, ERR 3002R30	10" DIA. X 47"	–	51.3"	56.6"
ECR 3002R50S, ECR 3002R70	12" DIA. X 54"	–	57.1"	62.2"

SALT STORAGE CAPACITIES

■ *Two Tank* Brine Tank – 300 lbs

■ *Cabinet* Brine Tank (with 8 x 35 resin tank) – 225 lbs

■ *Cabinet* Brine Tank (with 10 x 35 resin tank) – 200 lbs

	ECR 3000R20	ERR 3000R20	ECR 3000R30 ECR 3002R30	ERR 3002R30	ECR 3002R40	ECR 3002R50S	ECR 3002R70
Rated Softening Capacity (Grains@ lbs Salt Dose)	5,700 @ 1.1 16,800 @ 4.3 20,400 @ 7.5	6,700 @ 1.4 19,300 @ 5.2 23,600 @ 8.9	8,300 @ 1.6 25,000 @ 6.4 30,200 @ 11.3	8,100 @ 1.7 23,800 @ 6.4 29,200 @ 11.0	11,300 @ 2.2 33,200 @ 8.5 40,100 @ 14.8	23,000 @ 4.5 40,800 @ 9.9 47,900 @ 15.3	32,900 @ 6.2 57,600 @ 12.8 71,500 @ 19.3
Rated Efficiency (gr/lb of Salt at Minimum Salt Dose) ▲	5150	4790	5160	4790	5150	5110	5310
Service Flow Rate (gpm)	9.0	9.0	11.0	10.0	12.0	20.0	12.0
Pressure Drop at Service Flow Rate (psi)	10	6	8	8	13	15	11
Intermittent Flow Rate (gpm) @ 15 psi ●	12.0	17.1	16.5	15.8	13.6	20.0	17.0
Intermittent Flow Rate (gpm) @ 30 psi ●	19.4	26.8	25.8	25.2	21.6	30.0	**22.0**
Amount of High Capaciy Resin (cu ft)	0.60	0.71	0.89	0.88	1.18	1.53	2.05
Water Supply Max. Hardness (gpg)	40	50	60	60	75	95	125
Water Supply Max. Clear Water Iron (ppm) ■	10	10	12	12	15	15	15
Min.-Max. Working Pressure (psi) ◆	20 – 125						
Min.-Max. Operating Temperature (°F)	40 – 120						
Min. Water Supply Flow Rate (gpm)	3						
Max. Flow Rate (gpm) to Drain During Regeneration Cycle	2.4	3.0	3.0	3.0	3.0	5.4	5.4

▲ Efficiency ratings are only valid at the lowest salt dosage and service flow rate. These softeners were efficiency rated according to NSF/ANSI standard 44.

● Intermittent flow rate does not represent the maximum service flow rate used for determining the softeners rated capacity and efficiency. Continuous operation at flow rates greater than the service flow rate may affect capacity and efficiency performance. The validity of these flow rates is verified by NSF.

■ Capacity to remove clear water iron is substantiated by WQA test data. State of Wisconsin requires additional treatment if water supply contains greater than 5 ppm clear water iron.

◆ Canada working pressure limits: 1.4–7.0 kg/cm^2

These softeners conform to NSF/ANSI 44 for the specific capacity claims as verified and substantiated by test data. ERR 3000R20 and ERR 3002R30 also conform to NSF/ANSI 42 for specific performance claims verified and substantiated by test data from Water Quality Association (WQA).

ECOWATER SYSTEMS CONDITIONER ASSEMBLY
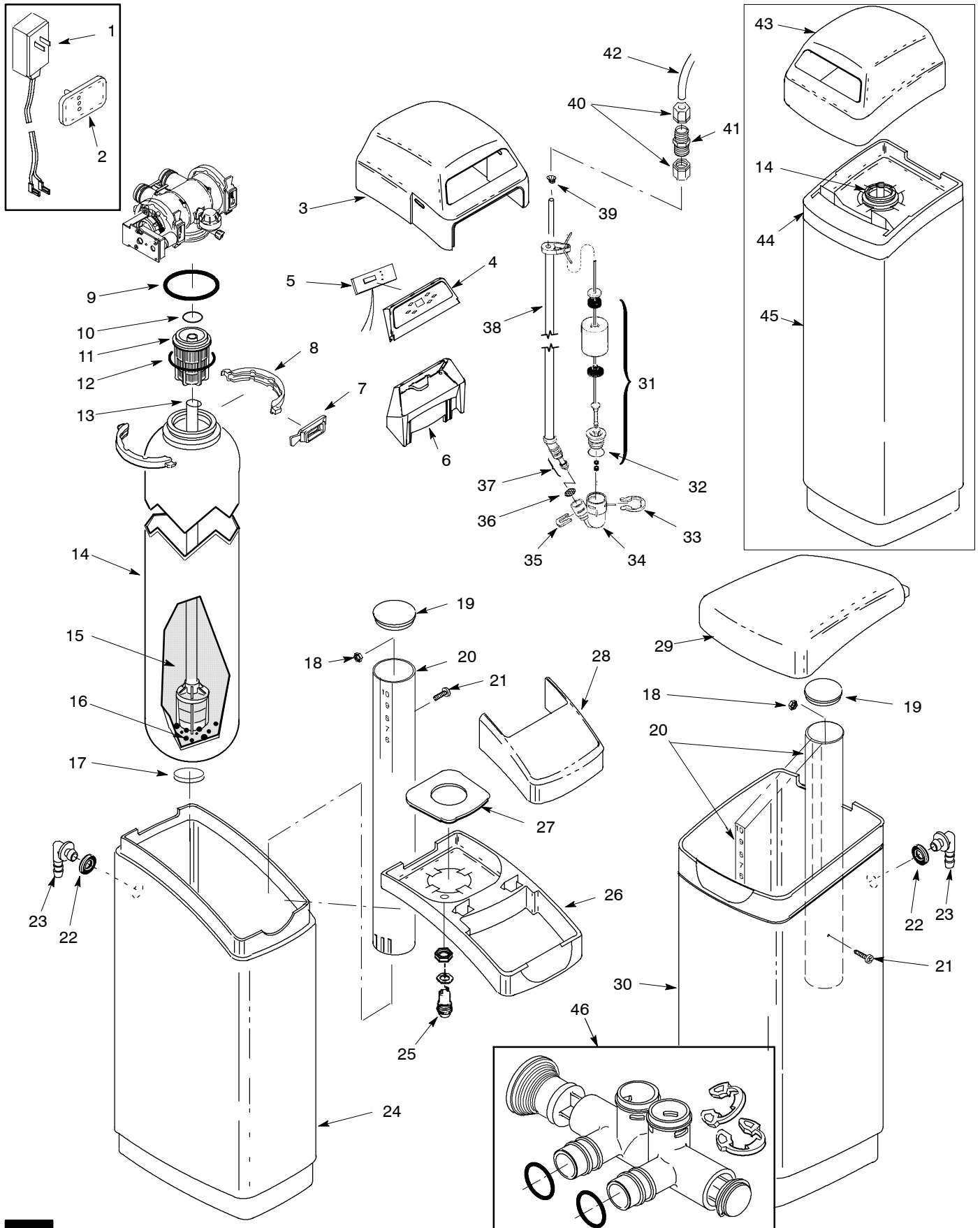
ECOWATER SYSTEMS CONDITIONER ASSEMBLY

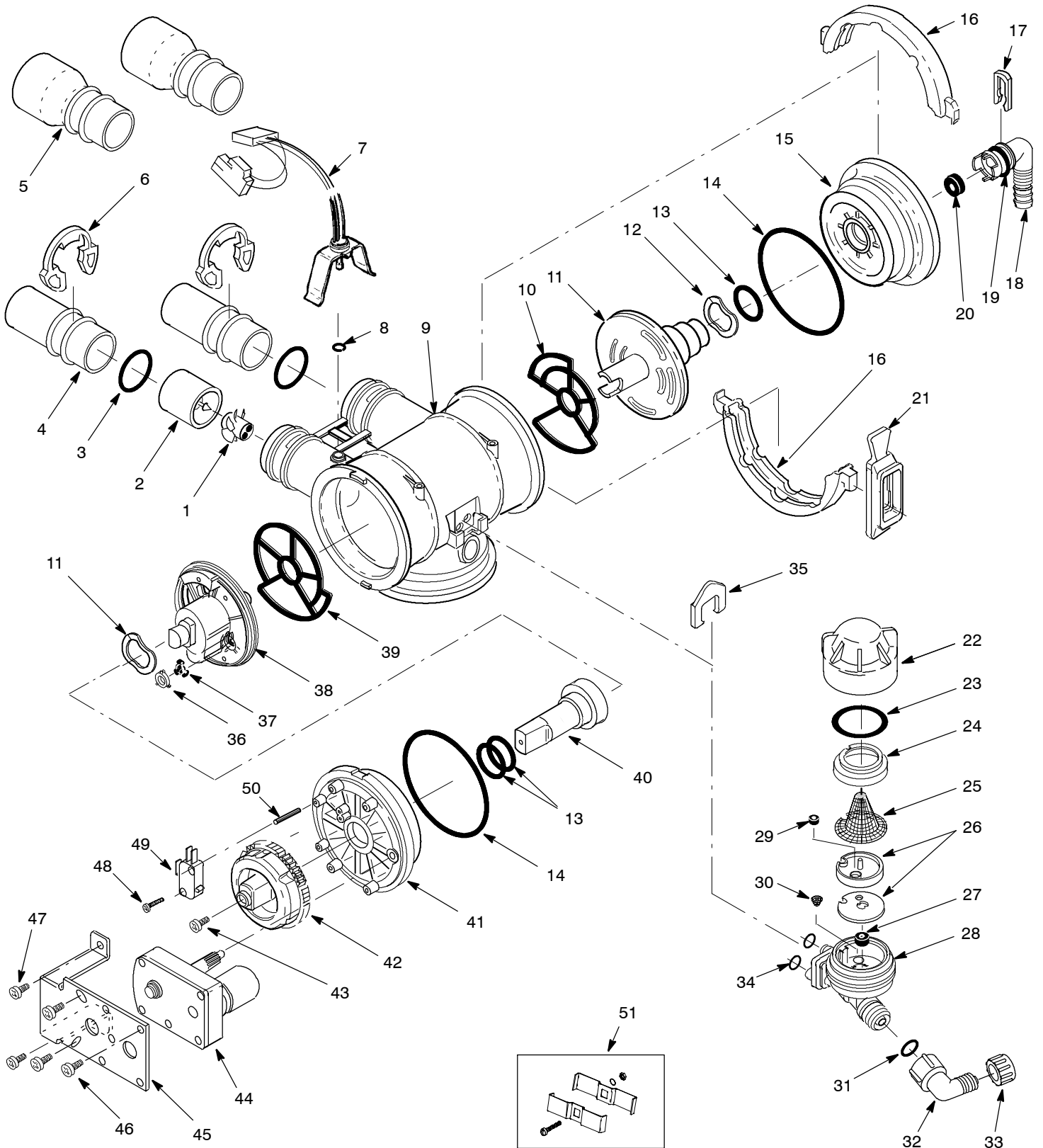| KEY NO.	PART NUMBER	PART DESCRIPTION
1	7275907	Transformer, 24V – 10VA
2	7288489	Remote Indicator (batteries not included)
3	7218662	Top Cover (Cabinet)
4	7210410	Faceplate (order one of following decals)
–	7274359	Faceplate Decal (Cabinet)
–	7274553	Faceplate Decal (Cabinet Refiner)
–	7274367	Faceplate Decal (Two Tank)
–	7274561	Faceplate Decal (Two Tank Refiner)
5	7285790	Rep'l PWA
6	7211173	Faceplate Support
7	7088033	Clamp Retainer, 2 req.
8	7176292	Clamp Section, 2 req.
9	7170296	O – ring Seal, 2–7/8" x 3–1/4"
10	7170254	O – ring, 13/16" x 1–1/16"
11	7077870	Top Distributor
12	7170270	O – ring, 2–3/4" x 3"
13	7105047	Repl. Distributor (bottom)
14	7114787	Resin Tank, 8" dia. x 35"
–	7113066	Resin Tank, 10" dia. x 35"
–	7092202	Resin Tank, 10" dia. x 47"
–	7113074	Resin Tank, 12" dia. x 54"
15	0502272	Resin, 1 cu ft (stand. mesh)
–	7052202	Resin, 1 cu ft (fine mesh)
–	0501741	Resin, 1/2 cu ft (stand. mesh)
–	7175149	Shell Carbon (Refiner Models)
16	7124415	Gravel, 17 lbs.
17	1184700	Spacer, Models R20 only
18	7219595	Washer
19	7219888	Brinewell Cover
20	7109871	Brinewell
–	7214236	Decal, Salt Level
21	7219587	Screw
22	9003500	Grommet
23	1103200	Hose Adaptor
–	7112882	Hose Clamp (not shown)
24	7218604	Brine Tank (Cabinet)
25	7218696	Light Assembly (includes o – ring and nut)

KEY NO.	PART NUMBER	PART DESCRIPTION
26	7274210	Rim (Cabinet)
27	7214244	Vapor Barrier
28	7273997	Salt Hole Cover
29	7274008	Brine Tank Cover (Two Tank)
30	7218612	Brine Tank (Two Tank)
31	7113008	Float, Stem and Guide Assembly
–	7221754	Float, Stem & Guide Asm, Model ECR 3002R50S, ECR 3002R70
32	7170288	O – ring, 15/16" x 1–3/16"
33	1205500	Clip
34	7092252	Brine Valve Body
35	7080653	Clip
36	7131365	Screen
37	7113016	Tubing Assembly, BV
38	7095470	Brine Tube
–	7221746	Brine Tube, Model ECR 3002R50S, ECR 3002R70
39	7171349	Screen
40	9003201	Nut – Ferrule, 2 req. ①
41	7094987	Union Connector ①
42	7161807	Tubing, 20 ft.
–	7161768	Tubing, 100 ft.
43	7218670	Top Cover (Two Tank)
44	7274286	Rim (Two Tank)
45	7218638	Tank Sleeve, Model ECR 3002R30
–	7218646	Tank Sleeve, Model ERR 3002R30, ECR 3002R40
–	7218654	Tank Sleeve, Model ECR 3002R50S, ECR 3002R70
46	7214383	Bypass Valve (includes following)
	7172882	Stem
	7173016	O-ring, 1.11" x 1.387", 4 req.
	7175238	C-ring
	7089306	Clip, 2 req.
	7170262	O-ring, 1-1/8" x 1-3/8", 2 req.
■	7116488	Brine Valve Assem. (incl. key nos. 31 through 39)
■	7220928	Brine Valve Assem. (incl. key nos. 31 through 39) Model ECR 3002R50S, ECR 3002R70
■	7108118	Hose, 1/2" I.D. Drain

① optional parts, not included with conditioner

■ not illustrated

VALVE ASSEMBLY

VALVE ASSEMBLY

KEY NO.	PART NO.	PART DESCRIPTION
1	7101548	Turbine Asm. (All models except below)
–	7123061	Turbine Asm. (ERR 3002R30, ECR 3002R40, ECR 3002R50S, ECR 3002R70)
2	7094898	Turb. Mnt. Asm. (All models except below)
–	7119177	Turb. Mnt. Asm. (ERR 3002R30, ECR 3002R40, ECR 3002R50S, ECR 3002R70)
3	7170262	O–ring, 1.109" x 1.387", 2 req.
4	7077642	Copper Tube, 2 req. (for 1" pipe)
5	7234553	Copper Tube, 2 req. (for 1–1/4" pipe)
6	7089306	Clip Retainer, 2 req.
7	7276084	Sensor Housing (with Pos. Sw. connector)
8	0900060	O–ring, 3/8" x 1/2" [1]
9	7159949	Disc Valve Housing
10	7078282	Inlet End Seal [2]
11	7214286	Inlet Disc [2]
12	7058216	Wave Washer, 2 req.
13	7170220	O–ring, 3/4" x 15/16", 3 req. [2]
14	7170296	O–ring, 2–7/8" x 3–1/4", 2 req.
15	7077498	Inlet End Cap
16	7176292	Clamp Section, 4 req. [3]
17	7142942	Clip
18	7219066	Drain Nipple
–	7141239	Drain Hose Adaptor (optional – not incl.)
19	7170327	O–ring, 5/8" x 13/16"
20	1110600	Flow Washer, 2.5 F.Rns. (ECR 3000R20)
–	7097969	Flow Washer, 3.0 F. Rns. (ERR 3000R20, ECR 3000R30, ECR 3002R30, ERR 3002R30, ECR 3002R40)
–	7097977	Flow Washer, 4.0 F.Rns. (ECR 3002R50S, ECR 3002R70)
21	7088033	Clamp Retainer, 4 req. [3]
22	7199729	Cap
23	7170262	O–ring, 1–1/8" x 1–3/8"
24	7167659	Screen Support
25	7146043	Screen
26	7113032	Nozz., Vent. (black) – Gasket Kit (ECR 3000R20 [4], ERR 3000R20 [4], ECR 3000R30, ECR 3002R30, ERR 3002R30, ECR 3002R40) [5]
–	7114533	Nozz., Vent. (blue) – Gasket Kit (ECR 3002R50S, ECR 3002R70) [5]
–	7204362	Gasket, only (black)

KEY NO.	PART NO.	PART DESCRIPTION
27	1148800	Fill Flow Plug, .3
28	7269176	Noz., Ven. Asm. (ECR 3000R20 [4]) [5]
–	7091866	Nozz., Vent. Asm. (ERR 3000R20, ECR 3000R30, ECR 3002R30, ERR 3002R30, ECR 3002R40) [5]
–	7085247	Nozz., Vent. Asm. (ECR 3002R50S, ECR 3002R70) [5]
29	7084607	Flow Plug, .15 (ECR 3000R20 [4])
30	7095030	Cone Screen
31	7292323	O–ring, .171" x .449"
32	7120526	Elbow, 90°
33	1202600	Nut–Ferrule
34	7170319	O–ring, .1/4" x .3/8", 2 req.
35	7081201	Clip, Nozzle & Venturi
36	7078313	Retainer
37	7104774	Flow Washer, 1.0 Bkw. (ECR 3000R20)
–	7104570	Flow Washer, 1.7 Bkw. (ERR 3000R20, ECR 3000R30, ECR 3002R30, ERR 3002R30, ECR 3002R40) – not used on ECR 3002R50S and ECR 3002R70
38	7214278	Outlet Disc [2] [6]
39	7078274	Outlet End Seal [2]
40	7091329	Driver, Outlet Disc
41	7159965	Outlet End Cap
42	7283497	Cam and Gear
43	7203104	Washerhead Screw, #8–18 x 1/2"
44	7281275	Motor
45	7289702	Motor Bracket
46	7168524	Screw, #10–32 x 5/16", 3 req.
47	7103972	Screw, #8–18 x 7/16", 2 req.
48	7140738	Screw, #4–24 x 3/4"
49	7145186	Switch
50	7140746	Expansion Pin
51	7248706	Ground Clamp Kit

[1] optional – not required

[2] included in Disc Kit, # 7218688

[3] not all parts are shown

[4] Use black nozzle along with key no. 29 flow plug on water pressures of 50 psi and less (ref: Service Bulletin #94068).

[5] includes key nos. 22 through 27 and 30

[6] order key nos. 36 and 37 if needed